GW - __028__

2017
AGWMR
(2 of 7)

2018

Table 1 - Well Information and Gauging Data

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Water-Bearing Zone [1]	Northing (ft)	Easting (ft)	Land Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Top of Screen Elevation (ft amsl)	Screen Interval (ft bgs)	Date Measured	Depth to PSH (ft btoc)	Depth to Water (ft btoc)	Corrected Groundwater Elevation [2] (ft amsl)	PSH Thickness (ft)
Cross-Gradient	KWB-13	Shallow	669077.00	524892.42	3366.02	3365.67	Unknown	Unknown	4/25/2017	--	24.51	3,341.16	--
									10/3/2017	--	21.20	3,344.47	--
	NP-5	Shallow	675512.24	524698.19	3,346.31	3,349.29	3,336.06	10.25 to 20	4/25/2017	--	11.56	3,337.73	--
									10/3/2017	--	12.71	3,336.58	--
	MW-136	Shallow	675343.45	522975.40	3,358.62	3,360.83	3,348.62	10 to 25	4/25/2017	--	11.11	3,349.72	--
									10/3/2017	--	10.55	3,350.28	--
Evaporation Ponds	MW-1R	Shallow	675135.17	538636.78	3,311.58	3,313.28	3,303.58	8 to 23	4/25/2017	--	10.95	3,302.33	--
									10/3/2017	--	10.43	3,302.85	--
	MW-2A	Shallow	675979.09	540803.91	3,310.55	3,312.97	Unknown	Unknown	4/25/2017	--	10.72	3,302.25	--
									10/3/2017	--	10.27	3,302.70	--
	MW-2B	Valley Fill	675969.73	540801.44	3,309.94	3,312.49	3,271.44	38.5 to 48	4/25/2017	--	10.60	3,301.89	--
									10/3/2017	--	11.01	3,301.48	--
	MW-3	Shallow	674443.34	540503.24	3,309.07	3,310.32	Unknown	Unknown	4/25/2017	--	9.06	3,301.26	--
									10/3/2017	--	9.45	3,300.87	--
	MW-4A	Shallow	674083.00	540529.44	3,308.64	3,312.71	Unknown	Unknown	4/25/2017	--	11.59	3,301.12	--
									10/3/2017	--	12.11	3,300.60	--
	MW-4B	Valley Fill	674089.71	540541.34	3,308.73	3,312.01	3,248.48	60.25 to 70	4/25/2017	--	10.85	3,301.16	--
									10/3/2017	--	11.35	3,300.66	--
	MW-5A	Shallow	674272.84	541759.78	3,306.59	3,308.62	Unknown	Unknown	4/25/2017	--	8.18	3,300.44	--
									10/3/2017	--	8.94	3,299.68	--
	MW-5B	Valley Fill	674272.33	541739.12	3,306.71	3,308.95	3,265.21	41.5 to 50.5	4/25/2017	--	8.34	3,300.61	--
									10/3/2017	--	8.85	3,300.10	--
	MW-5C	Valley Fill	674279.57	541728.80	3,306.55	3,309.28	3,247.30	59.25 to 68.75	4/25/2017	--	8.54	3,300.74	--
									10/3/2017	--	9.03	3,300.25	--
	MW-6A	Shallow	674427.07	539833.47	3,310.40	3,313.46	Unknown	Unknown	4/25/2017	--	12.21	3,301.25	--
									10/3/2017	--	12.61	3,300.85	--
	MW-6B	Valley Fill	674418.57	539834.04	3,310.09	3,313.35	3,270.59	39.5 to 49	4/25/2017	--	12.10	3,301.25	--
									10/3/2017	--	12.48	3,300.87	--
	MW-7A	Shallow	674447.64	542716.01	3,306.04	3,309.24	Unknown	Unknown	4/25/2017	--	7.57	3,301.67	--
									10/3/2017	--	7.96	3,301.28	--
	MW-7B	Valley Fill	674455.63	542715.61	3,306.05	3,307.87	3,266.55	39.5 to 49	4/25/2017	--	8.87	3,299.00	--
									10/3/2017	--	9.27	3,298.60	--
	MW-10	Shallow	672121.15	541540.05	3,304.14	3,304.76	3,304.14	0 to 19.4	4/25/2017	--	5.20	3,299.56	--
									10/3/2017	--	5.93	3,298.83	--
	MW-11A	Shallow	677317.73	543675.36	3,308.42	3,310.76	3,302.92	5.5 to 20	4/25/2017	--	9.69	3,301.07	--
									10/3/2017	--	9.23	3,301.53	--

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Area	Well ID	Water-Bearing Zone [1]	Northing (ft)	Easting (ft)	Land Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Top of Screen Elevation (ft amsl)	Screen Interval (ft bgs)	Date Measured	Depth to PSH (ft btoc)	Depth to Water (ft btoc)	Corrected Groundwater Elevation [2] (ft amsl)	PSH Thickness (ft)
Evaporation Ponds	MW-11B	Valley Fill	677305.72	543685.50	3,308.34	3,310.76	3,272.84	35.5 to 45	4/25/2017	--	9.66	3,301.10	--
									10/3/2017	--	9.18	3,301.58	--
	MW-12	Shallow	676952.63	541505.50	3,310.37	3,312.73	3,303.87	6.5 to 16	4/25/2017	--	10.76	3,301.97	--
									10/3/2017	--	9.74	3,302.99	--
	MW-13	Shallow	674951.80	539762.62	3,311.95	3,314.24	3,302.45	9.5 to 19	4/25/2017	--	12.40	3,301.84	--
									10/3/2017	--	11.88	3,302.36	--
	MW-14	Shallow	676122.48	543280.49	3,309.44	3,311.84	3,303.94	5.5 to 20	4/25/2017	--	11.84	3,300.00	--
									10/3/2017	--	10.59	3,301.25	--
	MW-15	Shallow	674731.39	539003.75	3,310.97	3,313.72	3,301.97	9 to 19	4/25/2017	--	11.85	3,301.87	--
									10/3/2017	--	11.53	3,302.19	--
	MW-18A	Shallow	672548.16	543447.78	3,306.33	3,308.58	3,296.33	10 to 20	4/25/2017	--	10.29	3,298.29	--
									10/3/2017	--	10.00	3,298.58	--
	MW-18B	Valley Fill	672557.96	543458.22	3,306.23	3,308.74	3,269.23	37 to 47	4/25/2017	--	10.27	3,298.47	--
									10/3/2017	--	9.93	3,298.81	--
	MW-18T	Valley Fill	672559.79	543449.75	3,306.30	3,308.55	3,269.30	37 to 47	4/25/2017	--	10.06	3,298.49	--
									10/3/2017	--	9.73	3,298.82	--
	MW-22A	Shallow	672866.82	541801.63	3,305.24	3,307.62	3,299.74	5.5 to 20.5	4/25/2017	--	7.75	3,299.87	--
									10/3/2017	--	8.38	3,299.24	--
	MW-22B	Valley Fill	672866.58	541786.97	3,305.08	3,307.63	3,262.78	42.3 to 52	4/25/2017	--	7.60	3,300.03	--
									10/3/2017	--	8.20	3,299.43	--
	MW-24	Shallow	676498.23	544101.56	3,310.33	3,312.85	3,295.33	15 to 20	4/25/2017	--	12.46	3,300.39	--
									10/3/2017	--	11.48	3,301.37	--
	MW-69	Shallow	675962.29	540401.29	3,311.40	3,313.86	3,306.40	5 to 20	4/25/2017	--	11.53	3,302.33	--
									10/3/2017	--	10.51	3,303.35	--
	MW-70	Shallow	670892.66	542787.60	3,303.84	3,306.30	3,298.84	5 to 20	4/25/2017	--	8.10	3,298.20	--
									10/3/2017	--	8.29	3,298.01	--
	MW-72	Shallow	676691.27	542662.31	3,306.40	3,308.45	3,304.40	2 to 12	4/25/2017	--	7.06	3,301.39	--
									10/3/2017	--	7.70	3,300.75	--
	MW-73	Shallow	675910.20	542130.56	3,308.02	3,310.18	3,306.02	2 to 17	4/25/2017	--	8.75	3,301.43	--
									10/3/2017	--	10.82	3,299.36	--
	MW-74	Shallow	675059.14	541546.30	3,307.78	3,310.03	3,305.78	2 to 17	4/25/2017	--	8.81	3,301.22	--
									10/3/2017	--	9.57	3,300.46	--
	MW-75	Shallow	674622.31	541132.78	3,307.80	3,310.21	3,304.80	3 to 18	4/25/2017	--	9.08	3,301.13	--
									10/3/2017	--	9.57	3,300.64	--
	MW-76	Shallow	674482.47	541053.83	3,309.70	3,311.84	3,306.70	3 to 18	4/25/2017	--	10.68	3,301.16	--
									10/3/2017	--	11.15	3,300.69	--

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Area	Well ID	Water-Bearing Zone [1]	Northing (ft)	Easting (ft)	Land Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Top of Screen Elevation (ft amsl)	Screen Interval (ft bgs)	Date Measured	Depth to PSH (ft btoc)	Depth to Water (ft btoc)	Corrected Groundwater Elevation [2] (ft amsl)	PSH Thickness (ft)
Evaporation Ponds	MW-77	Shallow	674529.89	541104.86	3,307.97	3,310.07	3,304.97	3 to 18	4/25/2017	--	8.92	3,301.15	--
									10/3/2017	--	9.38	3,300.69	--
	MW-78	Shallow	674529.23	541073.45	3,307.94	3,310.14	3,305.94	2 to 17	4/25/2017	--	8.92	3,301.22	--
									10/3/2017	--	9.42	3,300.72	--
	MW-79	Shallow	675349.67	540906.08	3,309.08	3,311.43	3,307.08	2 to 17	4/25/2017	--	9.84	3,301.59	--
									10/3/2017	--	10.17	3,301.26	--
	MW-80	Shallow	675371.74	540646.46	3,310.27	3,310.79	3,308.27	2 to 17	4/25/2017	--	8.90	3,301.89	--
									10/3/2017	--	9.04	3,301.75	--
	MW-81	Shallow	675252.80	540544.47	3,310.19	3,312.34	3,308.19	2 to 17	4/25/2017	--	10.71	3,301.63	--
									10/3/2017	--	10.80	3,301.54	--
	MW-82	Shallow	675035.42	540806.88	3,308.64	3,310.75	3,306.64	2 to 17	4/25/2017	--	9.05	3,301.70	--
									10/3/2017	--	9.71	3,301.04	--
	MW-83	Shallow	674524.97	540832.80	3,307.93	3,310.19	3,305.93	2 to 17	4/25/2017	--	8.91	3,301.28	--
									10/3/2017	--	9.41	3,300.78	--
	MW-84	Shallow	674798.43	540109.13	3,309.83	3,311.59	3,307.83	2 to 17	4/25/2017	--	9.22	3,302.37	--
									10/3/2017	--	9.32	3,302.27	--
	MW-85	Shallow	674566.12	539805.49	3,308.99	3,311.09	3,305.99	3 to 18	4/25/2017	9.70	10.42	3,301.25	0.72
									10/3/2017	9.94	11.19	3,300.90	1.25
	MW-86	Shallow	674645.96	539671.17	3,308.98	3,311.06	3,306.98	2 to 17	4/25/2017	9.52	9.55	3,301.53	0.03
									10/3/2017	9.69	10.03	3,301.30	0.34
	MW-87	Shallow	673379.98	543280.45	3,305.42	3,307.64	3,303.42	2 to 17	4/25/2017	--	8.58	3,299.06	--
									10/3/2017	--	8.65	3,298.99	--
	MW-88	Shallow	672899.14	540832.09	3,306.43	3,308.68	3,303.43	3 to 18	4/25/2017	--	8.45	3,300.23	--
									10/3/2017	--	9.17	3,299.51	--
	MW-120	Shallow	674678.95	539555.77	3,310.66	3,313.55	3,300.66	10 to 25	4/25/2017	--	12.14	3,301.41	--
									10/3/2017	--	12.23	3,301.32	--
	MW-121	Shallow	674851.38	539923.70	3,311.77	3,314.68	3,301.77	10 to 25	4/25/2017	--	12.71	3,301.97	--
									10/3/2017	--	12.21	3,302.47	--
	MW-122	Shallow	675231.06	540401.60	3,308.78	3,311.69	3,298.78	10 to 20	4/25/2017	--	10.38	3,301.31	--
									10/3/2017	--	10.40	3,301.29	--
	MW-123	Shallow	671352.15	541523.94	3,302.78	3,303.98	3,292.78	10 to 25	4/25/2017	--	5.59	3,298.39	--
									10/3/2017	--	6.34	3,297.64	--
	MW-124	Shallow	669844.77	542735.51	3,302.99	3,305.84	3,297.99	5 to 20	4/25/2017	--	9.62	3,296.22	--
									10/3/2017	--	8.96	3,296.88	--
	OCD-1R	Shallow	676741.31	541568.00	3,310.69	3,314.27	Unknown	Unknown	4/25/2017	--	12.33	3,301.94	--
									10/3/2017	--	11.70	3,302.57	--

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Area	Well ID	Water-Bearing Zone [1]	Northing (ft)	Easting (ft)	Land Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Top of Screen Elevation (ft amsl)	Screen Interval (ft bgs)	Date Measured	Depth to PSH (ft btoc)	Depth to Water (ft btoc)	Corrected Groundwater Elevation [2] (ft amsl)	PSH Thickness (ft)
Evaporation Ponds	OCD-2A	Shallow	677036.12	542157.14	3,310.83	3,314.16	3,302.33	8.5 to 23.5	4/25/2017	--	12.42	3,301.74	--
									10/3/2017	--	11.61	3,302.55	--
	OCD-2B	Valley Fill	677034.65	542167.57	3,310.66	3,313.07	3,272.16	38.5 to 48	4/25/2017	--	11.36	3,301.71	--
									10/3/2017	--	11.44	3,301.63	--
	OCD-3	Shallow	677516.31	543024.47	3,310.89	3,314.43	3,304.39	6.5 to 21.5	4/25/2017	--	12.94	3,301.49	--
									10/3/2017	--	12.29	3,302.14	--
	OCD-4	Shallow	678099.52	543893.55	3,310.31	3,313.68	3,303.81	6.5 to 21.5	4/25/2017	--	12.20	3,301.48	--
									10/3/2017	--	11.57	3,302.11	--
	OCD-5	Shallow	677081.54	544295.35	3,308.76	3,311.27	Unknown	Unknown	4/25/2017	--	10.40	3,300.87	--
									10/3/2017	--	9.70	3,301.57	--
	OCD-6	Shallow	676538.82	543540.03	3,308.11	3,311.40	3,300.11	8 to 23	4/25/2017	--	10.95	3,300.45	--
									10/3/2017	--	10.28	3,301.12	--
	OCD-7AR	Shallow	676169.74	543071.88	3,308.86	3,310.03	3,303.36	5.5 to 19.5	4/25/2017	--	9.72	3,300.31	--
									10/3/2017	--	9.41	3,300.62	--
	OCD-7B	Valley Fill	676157.36	543081.99	3,307.57	3,310.26	3,264.07	43.5 to 52.5	4/25/2017	--	9.57	3,300.69	--
									10/3/2017	--	9.36	3,300.90	--
	OCD-7C	Valley Fill	676155.95	543069.21	3,307.74	3,310.10	3,247.49	60.25 to 69.75	4/25/2017	--	8.99	3,301.11	--
									10/3/2017	--	9.19	3,300.91	--
	OCD-8A	Shallow	674976.41	543376.95	3,306.43	3,308.72	3,303.43	3 to 18	4/25/2017	--	8.61	3,300.11	--
									10/3/2017	--	9.41	3,299.31	--
	OCD-8B	Valley Fill	674992.24	543375.06	3,306.11	3,309.19	3,262.61	43.5 to 53	4/25/2017	--	8.77	3,300.42	--
									10/3/2017	--	9.01	3,300.18	--
Field East of Refinery	KWB-1A	Shallow	672969.12	526181.36	3,351.25	3,353.46	3,333.25	18 to 32	4/25/2017	--	12.20	3,341.26	--
									10/3/2017	--	14.55	3,338.91	--
	KWB-1B	Shallow	672968.90	526191.02	3,351.14	3,352.83	3,333.14	18 to 32	4/25/2017	--	13.85	3,338.98	--
									10/3/2017	--	16.25	3,336.58	--
	KWB-1C	Valley Fill	672968.22	526202.95	3,351.18	3,351.38	3,320.68	30.5 to 49.5	4/25/2017	--	14.42	3,336.96	--
									10/3/2017	--	16.84	3,334.54	--
	KWB-7	Shallow	671266.72	529055.47	3,343.00	3,346.16	3,325.00	18 to 32	4/25/2017	--	18.54	3,327.62	--
									10/3/2017	17.77	17.78	3,328.39	0.01
	KWB-8	Shallow	671000.57	527874.87	3,347.90	3,350.41	3,332.90	15 to 34	4/25/2017	19.26	19.27	3,331.15	0.01
									10/3/2017	16.65	16.66	3,333.76	0.01
	KWB-10R	Shallow	671756.34	526206.06	3,351.23	3,350.97	3,342.23	9 to 29	4/25/2017	--	15.31	3,335.66	--
									10/3/2017	--	15.65	3,335.32	--
	KWB-11A	Shallow	670643.67	529043.46	3,346.13	3,348.72	3,316.13	30 to 39.5	4/25/2017	--	19.14	3,329.58	--
									10/3/2017	--	17.43	3,331.29	--

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Field East of Refinery	KWB-11B	Valley Fill	670653.84	529044.06	3,345.91	3,348.03	3,295.91	50 to 69.5	4/25/2017	--	19.88	3,328.15	--
									10/3/2017	--	18.12	3,329.91	--
	KWB-12A	Shallow	669074.44	527590.88	3,352.01	3,351.81	3,336.51	15.5 to 24.5	4/25/2017	--	22.71	3,329.10	--
									10/3/2017	--	18.48	3,333.33	--
	KWB-12B	Valley Fill	669064.18	527590.12	3,351.84	3,351.63	3,326.34	25.5 to 39.5	4/25/2017	--	22.52	3,329.11	--
									10/3/2017	--	18.27	3,333.36	--
	KWB-P4	Shallow	670970.10	537416.92	3,305.76	3,305.39	Unknown	Unknown	4/25/2017	--	4.36	3,301.03	--
									10/3/2017	--	--	--	--
	MW-57	Shallow	669935.59	527579.02	3,350.95	3,350.91	3,340.95	10 to 30	4/25/2017	--	19.91	3,331.00	--
									10/3/2017	--	15.88	3,335.03	--
	MW-58	Shallow	670207.27	525197.99	3,362.56	3,362.22	3,349.56	13 to 28	4/25/2017	--	20.12	3,342.10	--
									10/3/2017	--	17.73	3,344.49	--
	MW-111	Shallow	670494.22	525254.30	3,362.52	3,365.51	3,337.52	25 to 40	4/25/2017	--	23.40	3,342.11	--
									10/3/2017	--	21.79	3,343.72	--
	MW-112	Shallow	670890.64	526198.73	3,355.38	3,358.38	3,330.38	25 to 35	4/25/2017	20.05	20.37	3,338.27	0.32
									10/3/2017	18.85	19.15	3,339.47	0.30
	MW-113	Shallow	670693.80	527483.95	3,350.06	3,352.93	3,330.06	20 to 35	4/25/2017	--	20.98	3,331.95	--
									10/3/2017	--	18.44	3,334.49	--
	MW-125	Shallow	673288.01	524663.00	3,355.60	3,358.81	3,340.60	15 to 25	4/25/2017	--	6.48	3,352.33	--
									10/3/2017	--	11.29	3,347.52	--
	MW-126A	Shallow	672845.69	525458.24	3,353.60	3,356.60	3,334.60	19 to 34	4/25/2017	--	12.20	3,344.40	--
									10/3/2017	--	15.67	3,340.93	--
	MW-126B	Valley Fill	672843.26	525464.41	3,353.60	3,356.67	3,313.60	40 to 50	4/25/2017	--	12.09	3,344.58	--
									10/3/2017	--	15.50	3,341.17	--
	MW-127	Shallow	672184.21	525464.20	3,355.50	3,358.39	3,335.50	20 to 50	4/25/2017	--	17.43	3,340.96	--
									10/3/2017	--	18.95	3,339.44	--
	MW-128	Shallow	671846.09	524917.06	3,358.80	3,358.77	3,343.80	15 to 35	4/26/2017	--	12.96	3,345.81	--
									10/3/2017	--	14.01	3,344.76	--
	MW-129	Shallow	671185.08	524876.72	3,361.60	3,364.38	3,341.60	20 to 50	4/25/2017	--	20.80	3,343.58	--
									10/3/2017	20.48	20.49	3,343.90	0.01
	MW-130	Shallow	670331.35	524029.44	3,370.20	3,369.86	3,340.20	30 to 45	4/25/2017	--	18.89	3,350.97	--
									10/3/2017	--	17.83	3,352.03	--
	MW-131	Shallow	671104.83	525228.77	3,360.40	3,363.49	3,340.40	20 to 50	4/25/2017	--	22.00	3,341.49	--
									10/3/2017	--	21.59	3,341.90	--
	MW-132	Shallow	670346.80	526629.79	3,354.30	3,357.12	3,339.30	15 to 40	4/25/2017	18.58	18.84	3,338.49	0.26
									10/3/2017	16.46	16.51	3,340.65	0.05

Table 1 - Well Information and Gauging Data

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Water-Bearing Zone [1]	Northing (ft)	Easting (ft)	Land Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Top of Screen Elevation (ft amsl)	Screen Interval (ft bgs)	Date Measured	Depth to PSH (ft btoc)	Depth to Water (ft btoc)	Corrected Groundwater Elevation [2] (ft amsl)	PSH Thickness (ft)
Field East of Refinery	MW-133	Shallow	672005.89	527446.73	3,343.40	3,349.45	3,328.40	15 to 35	4/25/2017	16.77	17.06	3,332.62	0.29
									10/3/2017	16.89	17.16	3,332.51	0.27
	MW-134	Shallow	673271.80	527263.99	3,343.10	3,346.23	3,323.10	20 to 30	4/25/2017	--	14.16	3,332.07	--
									10/3/2017	--	16.52	3,329.71	--
	MW-135	Shallow	671758.72	530211.23	3,338.00	3,337.65	3,303.00	35 to 65	4/25/2017	--	26.53	3,311.12	--
									10/3/2017	--	26.35	3,311.30	--
	RW-12R	Shallow	670542.50	527519.20	3,350.58	3,351.54	3,335.58	15 to 35	4/25/2017	--	21.04	3,330.50	--
									10/3/2017	--	18.14	3,333.40	--
	RW-13R	Shallow	671049.37	527506.74	3,349.60	3,351.54	3,334.60	15 to 35	4/25/2017	19.53	19.64	3,331.99	0.11
									10/3/2017	17.05	17.28	3,334.44	0.23
	RW-14R	Shallow	671592.73	527504.45	3,347.39	3,349.37	3,332.39	15 to 35	4/25/2017	16.92	17.98	3,332.24	1.06
									10/3/2017	16.59	17.71	3,332.56	1.12
	RW-18A	Shallow	673750.19	526188.64	3,349.04	3,350.84	Unknown	Unknown	4/25/2017	--	10.09	3,340.75	--
									10/3/2017	--	13.06	3,337.78	--
	RW-20A	Shallow	671032.06	527790.95	3,347.75	3,348.44	Unknown	Unknown	4/25/2017	>19.98 [3]	--	--	>0.00 [3]
									10/3/2017	19.94	20.01	3,328.49	0.07
	RW-20B	Shallow	671032.06	527790.95	3,347.75	3,348.44	Unknown	Unknown	4/25/2017	>20.3 [3]	--	--	>0.18 [3]
									10/3/2017	19.98	20.37	3,328.38	0.39
	RW-22	Shallow	671009.70	527889.44	3,347.17	3,349.21	3,335.67	11.5 to 39	4/25/2017	26.68	29.13	3,322.04	2.45
									10/3/2017	16.88	17.31	3,332.24	0.43
North Refinery	MW-23	Shallow	672851.25	522821.05	3,365.09	3,368.38	3,350.09	15 to 20	4/25/2017	--	10.31	3,358.07	--
									10/3/2017	--	12.88	3,355.50	--
	MW-29	Shallow	673481.15	523544.65	3,359.79	3,360.64	3,350.04	9.75 to 19.25	4/25/2017	--	7.49	3,353.15	--
									10/3/2017	--	11.65	3,348.99	--
	MW-30	Shallow	674124.92	523550.16	3,359.14	3,361.98	Unknown	Unknown	4/25/2017	--	8.30	3,353.68	--
									10/3/2017	--	9.43	3,352.55	--
	MW-39	Shallow	673039.50	523422.93	3,357.94	3,358.79	3,343.94	14 to 24	4/25/2017	--	5.25	3,353.54	--
									10/3/2017	--	9.31	3,349.48	--
	MW-40	Shallow	673161.12	523489.02	3,356.56	3,356.93	Unknown	Unknown	4/25/2017	--	3.30	3,353.63	--
									10/3/2017	--	7.54	3,349.39	--
	MW-41	Shallow	673379.87	523374.64	3,356.38	3,356.58	3,342.38	14 to 19	4/25/2017	--	3.41	3,353.17	--
									10/3/2017	--	7.10	3,349.48	--
	MW-42	Shallow	673480.27	523263.53	3,355.64	3,358.44	Unknown	Unknown	4/25/2017	--	6.60	3,351.84	--
									10/3/2017	--	9.86	3,348.58	--
	MW-43	Shallow	673115.86	522950.40	3,363.38	3,365.49	3,347.88	15.5 to 20.5	4/25/2017	--	7.03	3,358.46	--
									10/3/2017	--	9.75	3,355.74	--

Table 1 - Well Information and Gauging Data

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Water-Bearing Zone [1]	Northing (ft)	Easting (ft)	Land Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Top of Screen Elevation (ft amsl)	Screen Interval (ft bgs)	Date Measured	Depth to PSH (ft btoc)	Depth to Water (ft btoc)	Corrected Groundwater Elevation [2] (ft amsl)	PSH Thickness (ft)
North Refinery	MW-59	Shallow	672814.66	523854.12	3,359.44	3,362.43	3,344.44	15 to 30	4/25/2017	--	5.85	3,356.58	--
									10/3/2017	--	10.00	3,352.43	--
	MW-60	Shallow	672849.58	524143.12	3,359.26	3,361.98	3,344.26	15 to 30	4/25/2017	--	7.11	3,354.87	--
									10/3/2017	--	11.23	3,350.75	--
	MW-61	Shallow	672453.76	522578.38	3,369.45	3,369.47	3,355.45	14 to 29	4/25/2017	--	10.03	3,359.44	--
									10/3/2017	--	11.57	3,357.90	--
	MW-62	Shallow	672650.76	522696.50	3,368.35	3,368.81	3,354.35	14 to 29	4/25/2017	--	10.84	3,357.97	--
									10/3/2017	--	12.88	3,355.93	--
	MW-67	Shallow	673224.88	522342.43	3,365.59	3,365.45	3,353.59	12 to 27	4/25/2017	--	8.18	3,357.27	--
									10/3/2017	--	9.06	3,356.39	--
	MW-90	Shallow	672909.28	521960.18	3,367.13	3,369.42	3,362.13	5 to 20	4/25/2017	--	10.47	3,358.95	--
									10/3/2017	--	11.29	3,358.13	--
	MW-91	Shallow	672945.86	522167.26	3,365.72	3,367.73	3,358.72	7 to 22	4/25/2017	--	9.53	3,358.20	--
									10/3/2017	--	10.54	3,357.19	--
	MW-92	Shallow	672766.10	522167.26	3,366.75	3,368.72	3,361.75	5 to 20	4/25/2017	10.15	10.19	3,358.56	0.04
									10/3/2017	11.26	11.31	3,357.45	0.05
	MW-93	Shallow	672897.25	522446.83	3,364.22	3,363.79	3,359.22	5 to 20	4/25/2017	--	5.83	3,357.96	--
									10/3/2017	--	7.37	3,356.42	--
	MW-94	Shallow	673510.54	522336.27	3,365.82	3,367.97	3,360.82	5 to 20	4/25/2017	--	10.52	3,357.45	--
									10/3/2017	11.73	11.80	3,356.23	0.07
	MW-95	Shallow	673084.72	522308.89	3,366.48	3,368.70	3,359.48	7 to 22	4/25/2017	--	11.02	3,357.68	--
									10/3/2017	--	12.03	3,356.67	--
	MW-96	Shallow	673143.60	521917.50	3,366.83	3,368.92	3,359.83	7 to 22	4/25/2017	--	10.28	3,358.64	--
									10/4/2017	--	10.93	3,357.99	--
	MW-97	Shallow	672660.45	522295.96	3,366.38	3,365.92	3,358.38	8 to 23	4/25/2017	8.20	8.23	3,357.71	0.03
									10/3/2017	9.45	10.29	3,356.30	0.84
	MW-98	Shallow	672517.05	523220.39	3,358.96	3,361.36	3,345.96	13 to 23	4/25/2017	--	6.48	3,354.88	--
									10/3/2017	--	8.73	3,352.63	--
	MW-137	Shallow	672923.48	522924.27	3,363.15	3,364.83	3,353.15	10 to 30	4/25/2017	--	5.04	3,359.79	--
									10/3/2017	--	7.93	3,356.90	--
	MW-138	Shallow	672876.52	523041.05	3,364.73	3,363.24	3,354.73	10 to 25	4/25/2017	--	6.78	3,356.46	--
									10/3/2017	--	9.49	3,353.75	--
	RW-1R	Shallow	672825.27	522204.68	3,365.29	3,367.03	Unknown	Unknown	4/25/2017	--	9.09	3,357.94	--
									10/3/2017	--	10.18	3,356.85	--
	RW-2R	Shallow	672781.86	522337.29	3,368.17	3,368.17	Unknown	Unknown	4/25/2017	10.19	10.20	3,357.98	0.01
									10/3/2017	--	11.48	3,356.69	--

Table 1 - Well Information and Gauging Data

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Water-Bearing Zone [1]	Northing (ft)	Easting (ft)	Land Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Top of Screen Elevation (ft amsl)	Screen Interval (ft bgs)	Date Measured	Depth to PSH (ft btoc)	Depth to Water (ft btoc)	Corrected Groundwater Elevation [2] (ft amsl)	PSH Thickness (ft)
North Refinery	RW-7R	Shallow	673579.35	522098.94	3,365.03	3,367.09	Unknown	Unknown	4/25/2017	--	15.61	3,351.48	--
									10/3/2017	--	10.11	3,356.98	--
	RW-8R	Shallow	673266.20	522321.21	3,364.89	3,368.10	Unknown	Unknown	4/25/2017	--	9.96	3,358.14	--
									10/3/2017	10.70	10.74	3,357.39	0.04
	RW-9	Shallow	673423.49	523371.16	3,356.30	3,359.51	Unknown	Unknown	4/27/2017	--	5.74	3,353.77	--
									10/3/2017	--	9.44	3,350.07	--
	RW-10	Shallow	673076.17	523469.29	3,356.12	3,360.61	Unknown	Unknown	4/27/2017	--	4.99	3,355.62	--
									10/3/2017	--	9.14	3,351.47	--
	RW-16B	Shallow	673876.71	523156.09	3,357.20	3,360.97	Unknown	Unknown	4/25/2017	--	9.78	3,351.19	--
									10/3/2017	--	11.72	3,349.25	--
	RW-17A	Shallow	673978.33	522723.59	3,362.76	3,364.72	Unknown	Unknown	4/25/2017	--	9.02	3,355.70	--
									10/3/2017	--	10.06	3,354.66	--
North RO Reject Field	MW-117	Shallow	674301.52	522979.73	3,360.07	3,363.01	3,350.07	10 to 25	4/25/2017	--	9.19	3,353.82	--
									10/3/2017	--	8.65	3,354.36	--
	MW-118	Shallow	674819.18	523375.94	3,359.62	3,361.95	3,349.62	10 to 25	4/25/2017	--	11.69	3,350.26	--
									10/3/2017	--	5.83	3,356.12	--
	MW-119	Shallow	674860.11	524575.80	3,353.83	3,356.11	3,343.83	10 to 25	4/25/2017	--	10.41	3,345.70	--
									10/3/2017	--	10.69	3,345.42	--
NCL	MW-18	Shallow	674172.45	522318.86	3,363.06	3,365.42	3,348.06	15 to 19	4/25/2017	--	9.55	3,355.87	--
									10/3/2017	--	10.13	3,355.29	--
	MW-19	Shallow	673597.29	521670.75	3,366.00	3,368.00	3,361.00	5 to 19.5	4/25/2017	--	9.27	3,358.73	--
									10/3/2017	--	8.38	3,359.62	--
	MW-45	Shallow	674247.07	523663.75	3,351.32	3,351.51	3,340.82	10.5 to 15.5	4/25/2017	--	4.10	3,347.41	--
									10/3/2017	--	4.63	3,346.88	--
	MW-53	Shallow	673626.07	521459.12	3,368.86	3,368.73	3,355.06	13.8 to 23.8	4/25/2017	--	9.54	3,359.19	--
									10/3/2017	--	9.25	3,359.48	--
	MW-54A	Shallow	674138.65	522110.51	3,363.55	3,366.49	3,350.85	12.7 to 27.7	4/25/2017	--	10.39	3,356.10	--
									10/3/2017	--	10.83	3,355.66	--
	MW-54B	Valley Fill	674148.44	522118.80	3,363.47	3,366.47	3,329.67	33.8 to 43.8	4/25/2017	--	10.37	3,356.10	--
									10/3/2017	--	10.93	3,355.54	--
	MW-55	Shallow	674091.95	522766.46	3,361.90	3,364.77	3,348.20	13.7 to 23.7	4/25/2017	--	9.73	3,355.04	--
									10/3/2017	--	10.23	3,354.54	--
	MW-56	Shallow	674160.38	523450.14	3,354.84	3,357.44	3,341.44	13.4 to 23.4	4/25/2017	--	9.55	3,347.89	--
									10/3/2017	--	10.32	3,347.12	--
	MW-108	Shallow	673659.33	521910.16	3,366.25	3,369.11	3,357.25	9 to 24	4/25/2017	--	12.31	3,356.80	--
									10/3/2017	--	10.78	3,358.33	--

Table 1 - Well Information and Gauging Data

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Water-Bearing Zone [1]	Northing (ft)	Easting (ft)	Land Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Top of Screen Elevation (ft amsl)	Screen Interval (ft bgs)	Date Measured	Depth to PSH (ft btoc)	Depth to Water (ft btoc)	Corrected Groundwater Elevation [2] (ft amsl)	PSH Thickness (ft)
NCL	NCL-31	Shallow	673629.51	521669.01	3,366.21	3,367.54	3,353.21	13 to 18	4/25/2017	--	8.91	3,358.63	--
									10/3/2017	--	8.11	3,359.43	--
	NCL-32	Shallow	673984.83	521808.14	3,364.96	3,364.91	3,347.96	17 to 22	4/25/2017	--	8.26	3,356.65	--
									10/3/2017	--	8.39	3,356.52	--
	NCL-33	Shallow	673967.20	522245.18	3,364.26	3,363.97	3,351.26	13 to 18	4/25/2017	--	7.89	3,356.08	--
									10/3/2017	--	8.01	3,355.96	--
	NCL-34A	Shallow	673885.52	522235.08	3,364.82	3,365.49	3,348.82	16 to 21	4/25/2017	--	9.81	3,355.68	--
									10/3/2017	--	9.51	3,355.98	--
	NCL-44	Shallow	673986.41	522062.11	3,364.01	3,364.45	Unknown	Unknown	4/25/2017	--	8.12	3,356.33	--
									10/3/2017	--	7.97	3,356.48	--
	NCL-49	Shallow	674099.16	521648.40	3,368.26	3,371.13	3,351.46	16.8 to 17.8	4/25/2017	--	14.03	3,357.10	--
									10/3/2017	--	15.08	3,356.05	--
South Refinery	KWB-2R	Shallow	670207.24	524897.59	3,364.56	3,364.32	Unknown	Unknown	4/25/2017	--	21.13	3,343.19	--
									10/3/2017	--	18.80	3,345.52	--
	KWB-4	Shallow	670616.38	524572.44	3,368.36	3,370.25	3,348.36	20 to 39	4/25/2017	22.96	23.05	3,347.27	0.09
									10/3/2017	21.88	22.16	3,348.31	0.28
	KWB-5	Shallow	670729.55	525244.51	3,362.60	3,364.72	3,337.90	24.7 to 38.7	4/25/2017	--	22.28	3,342.44	--
									10/3/2017	--	21.09	3,343.63	--
	KWB-6	Shallow	670449.36	526158.70	3,358.02	3,360.30	3,340.52	17.5 to 36.5	4/25/2017	--	21.02	3,339.28	--
									10/3/2017	--	18.81	3,341.49	--
	MW-28	Shallow	671508.38	524521.56	3,366.79	3,370.27	3,341.79	25 to 30	4/25/2017	--	20.31	3,349.96	--
									10/3/2017	--	20.74	3,349.53	--
	MW-48	Shallow	670689.39	524080.35	3,363.04	3,362.97	Unknown	Unknown	4/25/2017	--	17.03	3,345.94	--
									10/3/2017	--	16.30	3,346.67	--
	MW-50	Shallow	671502.45	521857.84	3,368.91	3,371.05	Unknown	Unknown	4/25/2017	--	14.24	3,356.81	--
									10/3/2017	--	14.34	3,356.71	--
	MW-52	Shallow	670165.24	523370.99	3,368.36	3,368.30	Unknown	Unknown	4/25/2017	--	17.74	3,350.56	--
									10/3/2017	--	16.33	3,351.97	--
	MW-64	Shallow	670716.03	523338.61	3,365.56	3,369.52	3,350.56	15 to 30	4/25/2017	--	18.50	3,351.02	--
									10/3/2017	--	18.20	3,351.32	--
	MW-65	Shallow	670949.22	523711.75	3,363.84	3,363.60	3,349.34	14.5 to 29.5	4/25/2017	--	14.32	3,349.28	--
									10/3/2017	--	13.95	3,349.65	--
	MW-66	Shallow	671247.57	524560.06	3,363.66	3,363.46	3,349.06	14.6 to 29.6	4/25/2017	--	15.00	3,348.46	--
									10/3/2017	--	14.82	3,348.64	--
	MW-99	Shallow	671652.52	524579.74	3,365.11	3,364.51	3,353.11	12 to 27	4/25/2017	--	16.02	3,348.49	--
									10/3/2017	--	15.47	3,349.04	--

Table 1 - Well Information and Gauging Data

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

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South Refinery	MW-101	Shallow	671628.25	523506.58	3,362.07	3,364.23	3,354.07	8 to 23	4/25/2017	--	12.27	3,351.96	--
									10/3/2017	--	12.48	3,351.75	--
	MW-102	Shallow	671176.70	522937.01	3,365.51	3,367.64	3,353.51	12 to 27	4/25/2017	--	13.95	3,353.69	--
									10/3/2017	--	14.12	3,353.52	--
	MW-103	Shallow	670472.55	522607.80	3,370.89	3,372.47	3,363.89	7 to 22	4/25/2017	--	17.10	3,355.37	--
									10/3/2017	--	17.00	3,355.47	--
	MW-104	Shallow	670450.35	522729.44	3,369.41	3,371.43	3,366.41	3 to 18	4/25/2017	--	16.48	3,354.95	--
									10/3/2017	--	16.10	3,355.33	--
	MW-105	Shallow	671924.44	522454.93	3,365.20	3,364.99	3,357.20	8 to 18	4/25/2017	--	8.60	3,356.39	--
									10/3/2017	--	9.26	3,355.73	--
	MW-106	Shallow	672207.14	523454.55	3,359.29	3,358.98	3,359.29	0 to 11	4/25/2017	--	5.70	3,353.28	--
									10/3/2017	--	6.97	3,352.01	--
	MW-107	Shallow	671961.38	524600.45	3,359.63	3,359.44	3,347.63	12 to 22	4/25/2017	--	9.91	3,349.53	--
									10/3/2017	--	11.68	3,347.76	--
	MW-109	Shallow	670174.25	523065.52	3,368.27	3,368.09	3,353.27	15 to 29.5	4/25/2017	--	16.01	3,352.08	--
									10/3/2017	--	14.63	3,353.46	--
	MW-110	Shallow	670174.33	522796.69	3,368.46	3,368.03	3,353.46	15 to 29.5	4/25/2017	--	13.99	3,354.04	--
									10/3/2017	--	13.26	3,354.77	--
	RW-4R	Shallow	671378.27	523010.47	3,364.41	3,364.86	Unknown	Unknown	4/25/2017	--	12.48	3,352.38	--
									10/3/2017	--	12.62	3,352.24	--
	RW-5R	Shallow	671258.01	523662.01	3,362.79	3,368.56	3,349.79	13 to 33	4/25/2017	14.72	14.85	3,353.81	0.13
									10/3/2017	14.75	14.86	3,353.79	0.11
	RW-6	Shallow	670969.39	522843.22	3,366.03	3,368.36	Unknown	Unknown	4/25/2017	13.55	13.62	3,354.80	0.07
									10/3/2017	13.65	13.74	3,354.69	0.09
	RW-11-0	Shallow	669938.15	527541.66	3,351.48	3,353.95	Unknown	Unknown	4/25/2017	--	22.08	3,331.87	--
									10/3/2017	--	17.81	3,336.14	--
	RW-15C	Shallow	670820.45	524123.41	3,362.65	3,361.41	Unknown	Unknown	4/25/2017	--	14.74	3,346.67	--
									10/3/2017	--	14.19	3,347.22	--
	RW-19	Shallow	670611.43	524592.99	3,367.09	3,369.11	3,356.09	11 to 46	4/25/2017	23.16	23.19	3,345.94	0.03
									10/3/2017	22.10	22.26	3,346.98	0.16
South RO Reject Field	MW-114	Shallow	673082.16	523818.86	3,358.62	3,361.68	3,338.62	20 to 35	4/25/2017	--	3.63	3,358.05	--
									10/3/2017	--	8.49	3,353.19	--
	MW-115	Shallow	673997.34	523932.93	3,356.48	3,359.31	3,346.48	10 to 25	4/25/2017	--	5.43	3,353.88	--
									10/3/2017	--	7.42	3,351.89	--
	MW-116	Shallow	673966.06	525339.63	3,350.99	3,353.77	3,340.99	10 to 25	4/25/2017	--	7.06	3,346.71	--
									10/3/2017	--	8.13	3,345.64	--

Table 1 - Well Information and Gauging Data

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Water-Bearing Zone [1]	Northing (ft)	Easting (ft)	Land Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Top of Screen Elevation (ft amsl)	Screen Interval (ft bgs)	Date Measured	Depth to PSH (ft btoc)	Depth to Water (ft btoc)	Corrected Groundwater Elevation [2] (ft amsl)	PSH Thickness (ft)
TEL	MW-49	Shallow	672051.80	523610.79	3,359.69	3,359.77	Unknown	Unknown	4/25/2017	--	7.60	3,352.17	--
									10/3/2017	--	8.77	3,351.00	--
	TEL-1	Shallow	672966.33	523412.82	3,356.79	3,358.23	3,343.79	13 to 23	4/25/2017	--	4.66	3,353.57	--
									10/3/2017	--	8.79	3,349.44	--
	TEL-2	Shallow	672885.90	523419.29	3,356.80	3,359.12	3,343.80	13 to 23	4/25/2017	--	5.45	3,353.67	--
									10/3/2017	--	9.63	3,349.49	--
	TEL-3	Shallow	672796.06	523459.33	3,356.43	3,358.33	3,343.43	13 to 23	4/25/2017	--	4.78	3,353.55	--
									10/3/2017	8.79	8.84	3,349.53	0.05
	TEL-4	Shallow	672715.99	523181.18	3,358.21	3,360.24	3,345.21	13 to 23	4/25/2017	--	5.81	3,354.43	--
									10/3/2017	--	9.04	3,351.20	--
TMD	MW-8	Shallow	673215.93	529055.18	3,334.81	3,336.42	Unknown	Unknown	4/25/2017	--	9.04	3,327.38	--
									10/3/2017	--	9.80	3,326.62	--
	MW-9	Shallow	673169.56	529232.03	3,334.50	3,336.20	Unknown	Unknown	4/25/2017	--	9.51	3,326.69	--
									10/3/2017	--	10.21	3,325.99	--
	MW-16	Shallow	675613.35	534389.17	3,313.50	3,316.12	3,305.00	8.5 to 19	4/25/2017	--	8.18	3,307.94	--
									10/3/2017	--	7.63	3,308.49	--
	MW-20	Shallow	673800.56	527834.67	3,338.43	3,340.91	3,328.93	9.5 to 23.5	4/25/2017	--	10.28	3,330.63	--
									10/3/2017	--	12.24	3,328.67	--
	MW-21	Shallow	673180.38	529150.62	3,334.65	3,337.31	3,327.15	7.5 to 22	4/25/2017	--	10.41	3,326.90	--
									10/3/2017	--	11.13	3,326.18	--
	MW-25	Shallow	675386.30	537955.86	3,310.35	3,312.29	3,294.60	15.75 to 25.25	4/25/2017	--	11.62	3,300.67	--
									10/3/2017	--	13.92	3,298.37	--
	MW-26	Shallow	676229.18	535348.61	3,312.08	3,314.87	3,296.83	15.25 to 24.25	4/25/2017	--	9.39	3,305.48	--
									10/3/2017	--	9.38	3,305.49	--
	MW-27	Shallow	674495.64	532942.65	3,319.46	3,320.85	3,301.21	18.25 to 27.75	4/25/2017	--	16.06	3,304.79	--
									10/3/2017	--	14.88	3,305.97	--
	MW-46R	Shallow	674223.03	524920.28	3,350.41	3,350.11	3,346.91	3.5 to 18.5	4/25/2017	--	4.29	3,345.82	--
									10/3/2017	--	5.18	3,344.93	--
	MW-68	Shallow	674301.02	531466.90	3,325.81	3,328.21	3,311.06	14.75 to 24.5	4/25/2017	--	15.46	3,312.75	--
									10/3/2017	--	15.81	3,312.40	--
	MW-71	Shallow	673016.80	529560.41	3,332.99	3,335.29	3,323.24	9.75 to 19.5	4/25/2017	--	11.71	3,323.58	--
									10/3/2017	--	12.43	3,322.86	--
	MW-89	Shallow	675221.56	533835.00	3,316.38	3,318.32	3,314.38	2 to 17	4/25/2017	--	9.78	3,308.54	--
									10/3/2017	--	8.33	3,309.99	--
	NP-1	Shallow	672992.73	528035.04	3,339.69	3,342.40	3,330.19	9.5 to 19	4/25/2017	--	13.44	3,328.96	--
									10/3/2017	--	15.29	3,327.11	--

Table 1 - Well Information and Gauging Data

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Water-Bearing Zone [1]	Northing (ft)	Easting (ft)	Land Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Top of Screen Elevation (ft amsl)	Screen Interval (ft bgs)	Date Measured	Depth to PSH (ft btoc)	Depth to Water (ft btoc)	Corrected Groundwater Elevation [2] (ft amsl)	PSH Thickness (ft)
TMD	NP-2	Shallow	673571.19	527611.64	3,340.58	3,342.77	3,331.08	9.5 to 18.5	4/25/2017	--	12.83	3,329.94	--
									10/3/2017	--	15.47	3,327.30	--
	NP-3	Shallow	673990.66	528019.54	3,340.40	3,342.93	3,330.90	9.5 to 18.5	4/25/2017	--	11.74	3,331.19	--
									10/3/2017	--	19.04	3,323.89	--
	NP-4	Shallow	674337.35	528351.85	3,343.24	3,345.73	3,318.74	24.5 to 33.5	4/25/2017	--	17.79	3,327.94	--
									10/3/2017	--	25.10	3,320.63	--
	NP-6	Shallow	672945.23	529083.91	3,336.31	3,338.05	3,327.56	8.75 to 18.75	4/25/2017	--	10.23	3,327.82	--
									10/3/2017	--	11.33	3,326.72	--
	NP-8	Shallow	675399.60	538245.49	3,310.53	3,314.67	Unknown	Unknown	4/25/2017	--	12.65	3,302.02	--
									10/3/2017	--	12.46	3,302.21	--
	NP-9	Shallow	674767.14	523571.69	3,357.86	3,360.62	Unknown	Unknown	4/25/2017	--	10.69	3,349.93	--
									10/3/2017	--	6.84	3,353.78	--
Up-Gradient	UG-1	Shallow	672453.27	520746.73	3,373.02	3,372.94	3,365.02	8 to 23	4/25/2017	--	13.22	3,359.72	--
									10/3/2017	--	--	--	--
	UG-2	Shallow	670726.77	520942.36	3,380.30	3,380.41	3,365.30	15 to 30	4/25/2017	--	17.42	3,362.99	--
									10/3/2017	--	--	--	--
	UG-3R	Shallow	671992.70	519424.77	3,384.62	3,384.08	3,367.62	17 to 37	4/25/2017	--	24.62	3,359.46	--
									10/3/2017	--	--	--	--
	UG-4	Shallow	674087.85	520541.74	3,377.78	3,377.36	3,358.28	19.5 to 39.5	4/25/2017	--	18.09	3359.27	--
									10/3/2017	--	--	--	--

Notes:

[1] Wells screened in the shallow water-bearing zone are typically screened at depths of 20 to 25 ft bgs. The shallow water-bearing zone varies between confined and unconfined conditions. Wells screened in the valley fill zone are typically screened at depths ranging between 35 and 70 ft bgs. The clay lens separating the shallow and valley fill zones is discontinuous in some locations resulting in connectivity between the two zones.

[2] Water elevations corrected for PSH, if present, using a specific gravity of 0.8.

[3] Top of recovery pump prevented deeper measurement

Definitions:

ft = feet
-- = not applicable
amsl = above mean sea level
bgs = below ground surface
btoc = below top of casing
NCL = North Colony Landfarm
PSH = phase separated hydrocarbons
RO = Reverse Osmosis
TEL = Tetra Ethyl Lead Surface Impoundment
TMD = Three Mile Ditch
TOC = Top of Casing
unknown = screen interval not readily availble

Table 2 - Well Purging and Water Quality Field Measurement Data

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well	Purge Method[1]	Date	Time	Temperature (°C)	Specific Conductivity (S/m)	DO (mg/L)	pH (std units)	ORP (mV)	Field Observations of Purge Water[2]
Cross-Gradient	KWB-13	Bladder	4/26/2017	11:20	18.0	0.3980	3.7	6.89	102.9	Colorless and slightly cloudy to colorless and cloudy
	NP-5	Low Flow	4/25/2017	14:10	18.8	0.5410	1.7	7.04	102.5	Clear; colorless
	RA-3156	Grab	4/26/2017	10:15	20.5	0.2862	4.2	6.84	-46.3	Cloudy with brown particles
	MW-136	Low Flow	4/25/2017	13:20	19.2	0.4490	1.4	11.18	109.5	Colorless and slightly cloudy to colorless and clear
			10/3/2017	10:55	17.9	0.3990	1.7	6.86	99.5	Colorless and slightly cloudy to colorless and clear
Evaporation Ponds	MW-1R	Low Flow	4/26/2017	16:00	18.7	1.2460	0.5	7.23	-122.8	Clear with orange algae particles
	MW-2A	Low Flow	4/26/2017	15:00	19.0	1.3680	0.7	7.05	-86.5	Clear
			10/3/2017	13:40	23.4	0.8220	1.0	7.04	-88.6	Slightly cloudy with small particles to clear with small particles
	MW-3	Low Flow	4/26/2017	14:55	18.9	0.7480	1.1	7.11	-14.9	Clear
			10/3/2017	15:15	23.3	0.7500	1.1	7.04	-28.1	Clear
	MW-4A	Low Flow	4/26/2017	9:25	17.5	0.7050	2.4	7.15	-178.9	Clear with black particles
			10/3/2017	11:10	22.7	0.6030	2.4	7.14	-174.5	Clear with black particles
	MW-4B	Low Flow	4/26/2017	10:10	18.8	0.5460	3.0	7.09	-125.4	Clear
	MW-5A	Low Flow	4/25/2017	12:35	21.1	1.5520	1.1	7.24	-142.1	Clear with orange particles
			10/3/2017	10:15	21.9	0.9380	1.1	7.05	-137.4	Clear with orange particles
	MW-5B	Low Flow	4/25/2017	13:30	21.2	0.8970	0.9	7.00	-96.1	Clear
	MW-5C	Low Flow	4/25/2017	14:15	21.8	0.4480	1.1	7.21	-93.8	Clear with white particles
	MW-6A	Low Flow	4/26/2017	18:10	20.2	0.5600	1.3	7.69	-114.3	Clear
	MW-6B	Low Flow	4/26/2017	18:50	20.4	0.5770	0.7	7.58	-53.0	Clear
	MW-7A	Low Flow	4/25/2017	10:55	19.2	1.0390	1.0	7.21	-81.3	Cloudy with orange particles
			10/3/2017	9:15	21.3	0.9220	1.2	7.16	-74.6	Clear with orange particles
	MW-7B	Low Flow	4/25/2017	11:50	21.1	0.5810	0.9	7.08	-9.3	Clear
	MW-10	Low Flow	4/26/2017	13:20	19.1	0.7190	1.1	6.80	-20.8	Clear with small orange particles
			10/3/2017	13:40	21.9	0.6426	1.7	6.87	-31.8	Clear with small orange particles
	MW-11A	Low Flow	4/26/2017	11:20	19.0	2.7800	0.7	7.02	-3.4	Clear
			10/3/2017	16:00	22.6	2.7500	0.6	6.79	-34.5	Clear
	MW-11B	Low Flow	4/26/2017	12:05	19.8	1.8660	0.8	7.17	-82.7	Clear
	MW-15	Low Flow	4/26/2017	16:50	20.2	0.9810	0.6	7.39	45.3	Clear
	MW-18A	Low Flow	4/25/2017	13:30	21.2	0.6730	0.6	7.16	-152.7	Clear
			10/3/2017	10:25	20.6	2.3400	0.9	7.06	-90.3	Clear
	MW-18B	Low Flow	4/25/2017	14:20	22.5	0.4940	0.6	7.03	-5.3	Clear
	MW-22A	Low Flow	4/26/2017	11:40	18.0	0.9010	1.2	7.01	-35.6	Clear with orange particles to slightly cloudy to clear
			10/3/2017	12:40	22.8	0.7540	1.3	6.95	-33.8	Clear with orange particles
	MW-22B	Low Flow	4/26/2017	12:35	18.7	0.7370	1.2	7.04	-47.9	Clear
	MW-70	Low Flow	4/25/2017	15:20	21.4	0.6320	0.5	7.16	-82.9	Clear with orange algae particles to clear
			10/3/2017	11:10	21.7	0.6930	0.8	7.11	-82.1	Clear with orange algae particles
	MW-72	Low Flow	4/25/2017	12:55	22.9	1.3340	0.7	7.00	33.0	Clear

Table 2 - Well Purging and Water Quality Field Measurement Data

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well	Purge Method[1]	Date	Time	Temperature (°C)	Specific Conductivity (S/m)	DO (mg/L)	pH (std units)	ORP (mV)	Field Observations of Purge Water[2]
Evaporation Ponds	MW-73	Low Flow	4/25/2017	14:05	20.4	1.1910	1.1	7.51	49.9	Slightly cloudy
	MW-74	Low Flow	4/25/2017	14:50	21.6	1.1810	0.7	7.23	75.7	Clear
			10/4/2017	11:25	21.6	1.1350	1.0	6.86	28.9	Clear
	MW-75	Low Flow	4/26/2017	18:50	19.6	0.8310	1.1	7.08	-106.5	Clear; gold tint; odor
			10/3/2017	17:45	22.8	0.7950	1.4	7.01	-94.9	Clear; gold tint; odor
	MW-76	Low Flow	4/26/2017	16:40	19.8	0.7470	1.4	6.92	-89.7	Clear
			10/3/2017	16:45	22.8	0.6400	1.3	6.76	-85.8	Clear
	MW-77	Low Flow	4/26/2017	17:25	19.2	0.8670	2.6	6.89	-83.9	Clear; gold tint; odor
	MW-78	Low Flow	4/26/2017	18:05	19.0	0.4830	2.0	6.99	54.2	Clear with gold tint
	MW-79	Low Flow	4/26/2017	11:55	17.2	0.7260	1.1	7.57	-192.4	Clear
			10/4/2017	8:55	20.2	0.7080	1.3	6.78	-43.8	Clear
	MW-80	Low Flow	4/26/2017	12:45	17.7	0.9260	1.6	7.12	-161.1	Clear
	MW-81	Low Flow	4/26/2017	13:30	19.2	0.7990	2.5	7.32	-79.9	Clear
	MW-82	Low Flow	4/25/2017	16:05	21.5	0.8090	0.7	7.41	-47.2	Clear with orange particles
	MW-83	Low Flow	4/26/2017	15:15	19.9	0.6080	1.2	7.01	-123.1	Clear with gold tint
			10/3/2017	16:00	23.0	0.5470	1.2	6.84	-135.2	Clear with gold tint
	MW-84	Low Flow	4/26/2017	14:15	19.8	1.0620	0.6	7.19	-21.0	Clear with gold tint
			10/3/2017	10:15	22.2	0.1059	0.8	6.79	-181.5	Clear with gold tint
	MW-87	Low Flow	4/25/2017	17:20	20.4	1.5230	0.6	7.34	-122.9	Clear
			10/3/2017	9:35	21.4	1.7380	0.5	7.03	-113.6	Clear
	MW-88	Low Flow	4/26/2017	10:55	17.6	0.8070	1.2	7.01	-70.4	Clear with orange particles
			10/3/2017	11:55	21.8	0.6300	1.1	7.16	-73.9	Clear with orange particles
	MW-120	Low Flow	4/25/2017	17:25	19.7	1.1940	0.4	7.41	-137.8	Clear
			10/3/2017	10:55	21.5	1.0230	0.7	7.04	-203.1	Clear
	MW-121	Low Flow	4/26/2017	16:40	19.6	0.7050	0.7	7.67	-31.1	Clear
			10/3/2017	11:35	23.2	0.6480	1.0	7.08	-50.2	particles
	MW-122	Low Flow	4/26/2017	15:15	18.4	1.1680	0.5	7.22	-57.1	Clear with orange particles
			10/3/2017	12:30	22.0	0.6900	0.7	7.08	-125.1	particles
	MW-123	Low Flow	4/26/2017	14:05	19.2	0.8160	1.3	6.99	-18.6	Clear with white particles
			10/3/2017	14:25	21.6	0.6780	1.4	6.98	-30.1	Clear
	MW-124	Low Flow	4/25/2017	16:20	19.6	1.1660	0.6	7.20	-94.1	Clear with orange algae particles
			10/3/2017	11:50	21.7	1.2780	0.9	6.94	-85.7	Clear with orange algae particles
	OCD-1R	Low Flow	4/26/2017	14:25	19.0	1.0140	0.7	7.22	22.4	Clear
			10/3/2017	13:00	22.3	1.0070	0.6	7.17	-18.4	Clear
	OCD-2A	Low Flow	4/26/2017	13:40	19.0	0.7270	0.5	7.37	-122.8	Clear with orange algae particles
			10/3/2017	16:40	22.4	0.6890	0.6	7.47	-117.3	Clear with orange algae particles

Table 2 - Well Purging and Water Quality Field Measurement Data

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well	Purge Method[1]	Date	Time	Temperature (°C)	Specific Conductivity (S/m)	DO (mg/L)	pH (std units)	ORP (mV)	Field Observations of Purge Water[2]
Evaporation Ponds	OCD-3	Low Flow	4/26/2017	12:50	19.8	0.8170	1.1	7.23	86.2	Clear
			10/3/2017	15:25	22.0	0.7990	0.8	7.24	-17.9	Clear
	OCD-4	Low Flow	4/26/2017	9:50	18.8	1.3230	0.6	7.33	-5.7	Clear with orange algae particles
			10/3/2017	14:50	22.3	1.4610	0.5	7.13	-80.4	Clear with orange algae particles
	OCD-5	Low Flow	4/26/2017	10:35	18.9	1.4720	0.6	7.40	-52.6	Slightly cloudy; orange algae particles
			10/3/2017	14:15	21.8	1.6830	0.7	7.35	-105.8	Slightly cloudy; orange algae particles
	OCD-6	Low Flow	4/25/2017	10:05	21.6	1.5700	0.6	6.87	31.1	Slightly cloudy to clear
			10/4/2017	9:55	20.4	1.5150	0.9	6.89	-114.2	Slightly cloudy with small particles to clear with small particles
	OCD-7AR	Low Flow	4/25/2017	10:55	21.7	1.2610	0.7	7.05	10.4	Clear with orange particles
			10/4/2017	10:40	21.8	1.2350	0.8	6.98	-156.7	Clear with orange particles
	OCD-8A	Low Flow	4/25/2017	10:10	21.2	1.3410	1.2	7.06	-145.3	Clear with orange particles
			10/3/2017	8:15	21.5	1.1060	1.1	6.72	-143.3	Clear with orange particles
	OCD-8B	Low Flow	4/25/2017	9:25	21.3	0.9820	0.8	6.92	-95.3	Clear
Field East of Refinery	KWB-1A	Low Flow	4/25/2017	11:15	19.7	0.5390	0.8	6.71	57.3	Clear; colorless
			10/3/2017	12:30	18.1	0.4400	2.3	6.82	29.1	Clear; colorless
	KWB-1C	Low Flow	4/25/2017	11:50	19.7	0.5370	1.6	6.73	90.1	Clear; colorless
	KWB-7	Low Flow	4/25/2017	18:20	20.2	0.3389	0.8	6.77	-105.9	Clear; strong hydrocarbon odor
			10/3/2017	13:30	19.3	0.3177	0.6	6.79	-101.7	Clear; strong hydrocarbon odor
	KWB-8	Low Flow	4/25/2017	17:35	21.2	0.3622	0.9	6.76	-197.7	Clear; strong hydrocarbon odor
			10/3/2017	16:40	26.1	0.3418	0.7	6.74	-234.6	Clear; strong hydrocarbon odor
	KWB-10R	Low Flow	4/25/2017	10:30	20.6	0.1897	0.9	6.60	-163.2	Clear; colorless; odor
			10/3/2017	11:45	18.8	0.1564	1.6	6.67	-124.2	Clear; colorless; odor
	KWB-11A	Low Flow	4/25/2017	19:10	19.1	0.6244	0.9	6.69	-12.3	Clear
			10/3/2017	14:55	19.3	0.5164	0.7	6.82	-95.4	Clear
	KWB-11B	Low Flow	4/25/2017	20:00	18.6	0.2962	0.8	6.88	69.2	Clear
			10/3/2017	14:15	20.1	0.2840	0.8	6.91	67.2	Clear
	KWB-12A	Low Flow	4/26/2017	12:10	18.9	0.3770	3.5	6.79	101.1	Clear; colorless
			10/3/2017	14:15	19.2	0.3180	3.5	6.90	84.8	Clear; colorless
	KWB-12B	Bladder	4/26/2017	12:50	18.6	0.3870	4.3	6.84	80.8	Clear; colorless
			10/3/2017	15:00	19.0	0.3270	3.5	6.87	-40.0	Clear; colorless
	KWB-P4	Low Flow	4/26/2017	8:55	16.9	0.5610	1.2	7.29	83.6	Clear
	MW-57	Low Flow	4/26/2017	13:45	19.2	0.5040	1.0	6.71	103.6	Colorless and slightly cloudy to colorless and clear
			10/3/2017	13:35	19.2	0.4520	1.7	6.89	81.1	Clear; colorless
	MW-58	Low Flow	4/25/2017	16:30	20.6	0.2340	1.6	6.82	-246.0	Clear; colorless; odor
			10/4/2017	10:30	20.8	0.2140	1.0	6.70	-298.8	Clear; odor

Table 2 - Well Purging and Water Quality Field Measurement Data

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well	Purge Method[1]	Date	Time	Temperature (°C)	Specific Conductivity (S/m)	DO (mg/L)	pH (std units)	ORP (mV)	Field Observations of Purge Water[2]
Field East of Refinery	MW-111	Low Flow	4/26/2017	15:35	21.0	0.2980	2.0	6.62	-101.1	Colorless and slightly cloudy to colorless and clear
			10/4/2017	10:55	20.2	0.2540	2.0	6.68	-69.1	Clear; colorless
	MW-113	Low Flow	4/27/2017	9:10	21.7	0.2920	2.0	6.53	-49.6	Clear
			10/4/2017	11:40	21.1	0.2610	1.8	6.81	-167.4	Clear
	MW-125	Low Flow	4/26/2017	16:00	21.1	0.4130	1.3	7.09	65.3	Clear; colorless
			10/3/2017	16:45	25.4	0.4620	2.4	6.84	-146.2	Clear; colorless
	MW-126A	Low Flow	4/27/2017	9:20	19.4	0.3550	0.9	6.62	-181.3	Colorless and slightly cloudy to colorless and clear
			10/3/2017	16:25	20.2	0.2530	1.8	6.90	-132.3	Colorless and slightly cloudy to colorless and clear
	MW-126B	Low Flow	4/27/2017	10:00	18.9	0.4240	0.7	6.64	12.5	Clear; colorless
			10/3/2017	17:05	19.9	0.3650	1.3	6.76	-12.3	Clear; colorless
	MW-127	Low Flow	4/27/2017	10:50	20.6	0.2830	0.8	6.75	-276.1	Colorless and slightly cloudy to colorless and clear
			10/3/2017	17:45	20.1	0.2430	1.4	6.79	-198.8	Clear; colorless
	MW-128	Low Flow	4/26/2017	14:10	23.0	0.1990	1.6	6.90	-63.2	Colorless and slightly cloudy to clear
			10/3/2017	15:00	24.9	0.2000	1.6	6.67	-182.9	Clear; colorless
	MW-129	Low Flow	4/27/2017	11:40	22.5	0.2270	1.4	6.70	-206.5	Colorless and cloudy to colorless and clear
	MW-130	Low Flow	4/26/2017	10:50	21.6	0.3200	1.5	6.80	-241.0	Clear; colorless
			10/4/2017	12:45	22.8	0.3060	0.8	6.66	-78.9	Clear
	MW-131	Low Flow	4/27/2017	11:10	22.7	0.2008	0.6	6.78	-218.1	Slightly cloudy to clear
			10/4/2017	12:25	19.3	0.1853	1.3	6.63	-128.5	Colorless and cloudy to colorless and clear
	MW-134	Low Flow	4/26/2017	8:45	18.7	0.5047	0.9	6.61	106.1	Clear
			10/4/2017	11:10	19.2	0.5277	1.1	6.76	67.7	Clear
	MW-135	Bladder	4/26/2017	16:50	18.3	0.7337	3.4	6.69	157.9	Clear with tiny white particles
			10/3/2017	15:50	19.0	0.6639	2.5	6.68	124.6	Clear with tiny white particles
	RA-4196	Grab	4/26/2017	9:45	22.5	0.1968	1.7	7.18	51.8	Clear
			10/4/2017	11:45	23.8	0.2581	1.9	6.91	13.8	Clear
	RA-4798	Grab	4/26/2017	9:25	19.6	0.1150	1.5	7.31	79.5	Clear
			10/3/2017	17:00	19.1	0.1189	1.7	7.03	76.4	Clear
	RW-12R	Low Flow	4/27/2017	12:30	19.7	0.3861	0.2	9.01	-210.1	Clear; strong odor
	RW-18	Low Flow	4/25/2017	12:35	18.7	0.4400	2.0	7.08	95.2	Clear; colorless
	MW-23	Low Flow	4/26/2017	11:15	25.6	0.2870	1.2	7.59	-342.2	Clear; odor; brown tint
			10/4/2017	10:25	27.2	0.2760	1.0	7.18	-347.0	Clear; black tint; odor
	MW-29	Low Flow	4/26/2017	17:25	21.2	0.3400	0.7	7.62	-295.9	Clear; colorless
			10/3/2017	15:55	25.0	0.3520	0.6	7.07	-294.4	Clear
	MW-39	Low Flow	4/26/2017	19:20	21.8	0.4430	0.9	7.68	-345.6	Clear; colorless
			10/4/2017	8:55	21.7	0.3890	1.2	7.27	-328.1	Clear; black tint; odor

Table 2 - Well Purging and Water Quality Field Measurement Data

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well	Purge Method[1]	Date	Time	Temperature (°C)	Specific Conductivity (S/m)	DO (mg/L)	pH (std units)	ORP (mV)	Field Observations of Purge Water[2]
North Refinery	MW-40	Low Flow	4/27/2017	12:10	24.3	0.3220	0.9	6.91	-353.8	Slightly cloudy to clear; black tint; odor
	MW-41	Low Flow	4/26/2017	18:25	21.1	0.3330	0.8	7.47	-318.9	Clear; colorless
	MW-42	Low Flow	4/26/2017	16:25	20.6	0.3850	0.8	7.54	-293.5	Clear; colorless
	MW-43	Low Flow	4/28/2017	11:25	24.0	0.4620	1.0	7.41	-400.6	Clear with black particles
			10/4/2017	9:40	22.6	0.4530	1.1	7.18	-345.2	Clear with black particles
	MW-59	Low Flow	4/27/2017	9:25	24.5	0.3040	1.8	6.97	-252.4	Clear; colorless
	MW-60	Low Flow	4/27/2017	10:15	24.8	0.3510	1.4	6.99	-307.2	Clear; colorless
			10/3/2017	15:45	28.3	0.3950	2.1	6.69	-301.3	Clear; colorless
	MW-61	Low Flow	4/26/2017	9:35	22.9	0.2650	0.9	7.58	-354.4	Clear
			10/4/2017	9:25	24.3	0.2960	0.5	7.00	-363.9	Clear
	MW-62	Low Flow	4/26/2017	10:20	22.4	0.3590	0.9	7.35	-380.2	Clear; colorless
			10/4/2017	10:25	23.5	0.3630	0.8	6.78	-369.0	Clear; odor
	MW-67	Low Flow	4/26/2017	16:15	21.3	0.2560	1.4	6.89	-396.8	Clear with light yellow tint; odor
			10/3/2017	13:25	24.0	0.2430	1.5	6.95	-358.1	Clear; light yellow tint; odor; small black particles
	MW-90	Low Flow	4/25/2017	14:30	21.0	0.4960	1.0	6.93	-336.0	Clear; odor
			10/3/2017	12:20	22.8	0.3390	1.1	6.86	-354.0	Clear; colorless; odor
	MW-91	Low Flow	4/25/2017	13:50	23.0	0.2320	1.0	6.72	-408.0	Clear with black tint; odor
			10/3/2017	11:40	23.0	0.2460	1.5	6.37	-376.5	Clear with black tint; odor
	MW-93	Low Flow	4/26/2017	12:15	21.1	0.2920	0.7	7.22	-373.2	Clear; colorless
	MW-94	Low Flow	4/26/2017	14:20	21.2	0.3170	1.5	6.94	-442.0	Clear with yellow tint; odor
	MW-95	Low Flow	4/26/2017	17:10	22.6	0.2380	1.4	6.86	-369.0	Clear; odor
	MW-96	Low Flow	4/25/2017	15:10	22.2	0.2130	1.5	6.75	-386.0	Clear with white particles; odor
			10/4/2017	8:50	21.8	0.2110	1.9	6.71	-354.9	Clear; colorless; white particles; odor
	MW-98	Low Flow	4/25/2017	10:25	23.1	0.3140	1.1	7.47	-385.0	Clear; colorless
			10/3/2017	12:25	24.2	0.3200	0.7	6.90	-375.5	Clear; odor
	MW-137	Low Flow	4/25/2017	13:25	26.7	0.5270	1.7	7.03	-406.9	Clear; odor
			10/4/2017	11:55	26.3	0.4760	1.8	6.93	-373.5	Clear; odor
	MW-138	Low Flow	4/25/2017	12:25	30.9	0.3160	1.0	7.01	-361.1	Clear with black particles
			10/4/2017	11:10	29.2	0.2890	1.0	6.89	-364.2	Clear with black particles
	RW-1R	Low Flow	4/25/2017	13:05	22.2	0.3860	1.0	6.77	-346.1	Clear with black tint and black particles; odor
	RW-2R	Low Flow	4/26/2017	13:15	24.0	0.3570	0.8	7.17	-388.2	Clear with black particles; light sheen; odor
	RW-7R	Low Flow	4/26/2017	13:35	23.5	0.6840	1.0	6.77	-184.5	Clear with small black particles; odor
	RW-8R	Low Flow	4/26/2017	15:05	21.8	0.2220	1.0	6.69	-354.5	Slightly cloudy to clear; black particles; odor
	RW-9	Low Flow	4/27/2017	11:15	23.2	0.3870	1.4	6.91	-355.8	Clear with black tint; odor
	RW-10	Low Flow	4/27/2017	9:55	21.8	0.2530	0.2	8.16	-368.4	Clear; colorless
	RW-16	Low Flow	4/26/2017	15:25	20.8	0.4510	0.8	7.71	-226.7	Clear; colorless
	RW-17	Low Flow	4/26/2017	17:55	19.3	0.5050	1.2	6.81	-237.6	Clear

Table 2 - Well Purging and Water Quality Field Measurement Data

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well	Purge Method[1]	Date	Time	Temperature (°C)	Specific Conductivity (S/m)	DO (mg/L)	pH (std units)	ORP (mV)	Field Observations of Purge Water[2]
North Refinery	MW-117	Low Flow	4/26/2017	8:55	15.8	0.3740	0.8	6.80	80.0	Colorless; cloudy to slightly cloudy
			10/4/2017	8:35	17.0	0.3320	1.3	6.86	83.4	Clear; colorless
	MW-118	Low Flow	4/26/2017	9:40	15.5	0.4220	4.0	6.89	94.7	Colorless and cloudy to colorless and clear
			10/4/2017	9:20	17.8	0.3660	4.7	6.98	110.1	Clear; colorless
	MW-119	Low Flow	4/26/2017	10:25	16.1	0.3950	0.9	6.81	82.9	Colorless and slightly cloudy to clear
			10/4/2017	10:05	19.7	0.3620	1.8	6.76	100.5	Clear; colorless
North RO Reject Field	MW-18	Low Flow	4/27/2017	9:15	20.3	0.3010	2.4	6.92	41.6	Clear
	MW-45	Low Flow	4/25/2017	18:20	20.7	0.4780	1.2	7.67	-200.4	Clear with brown particles
			10/3/2017	16:45	23.4	0.4790	1.3	7.06	-219.6	Clear
	MW-53	Low Flow	4/25/2017	9:05	21.0	0.2690	1.6	6.87	79.6	Clear; colorless
	MW-54A	Low Flow	4/25/2017	11:15	23.2	0.2110	1.7	6.62	75.0	Clear; colorless
			10/3/2017	8:50	21.6	0.2180	1.4	6.51	76.3	Clear; colorless
NCL	MW-54B	Low Flow	4/25/2017	10:35	21.8	0.2040	1.2	6.76	74.1	Clear; colorless
	MW-55	Low Flow	4/27/2017	10:00	20.7	0.3380	1.6	6.70	-142.6	Clear; colorless
			10/4/2017	10:50	21.3	0.3750	1.8	7.11	-235.2	Clear; colorless
	MW-56	Low Flow	4/26/2017	14:25	21.8	0.4160	1.0	7.38	-290.9	Clear; colorless
	MW-108	Low Flow	4/26/2017	9:05	19.1	0.2470	1.6	6.86	-383.5	Clear with yellow tint; odor
			10/3/2017	14:30	23.5	0.2620	1.5	7.02	-362.1	Clear with yellow tint; odor
	NCL-31	Low Flow	4/26/2017	9:50	18.4	0.3050	1.2	7.01	-150.5	Clear with small white particles; slight odor
			10/3/2017	15:15	25.2	0.2850	0.9	7.31	-218.0	Clear; colorless with small white particles
	NCL-32	Low Flow	4/26/2017	10:35	19.2	0.2440	1.8	6.97	-26.5	Clear with small white particles
			10/3/2017	16:05	22.6	0.2520	0.8	7.08	-131.7	Clear; colorless with small white particles
	NCL-33	Low Flow	4/26/2017	12:10	20.8	0.3030	1.5	6.66	38.4	Clear; colorless
			10/4/2017	10:10	21.9	0.3070	1.7	7.04	-219.7	Clear; colorless
	NCL-34A	Low Flow	4/26/2017	12:50	21.3	0.2110	1.3	6.58	-378.3	Clear; odor
			10/4/2017	9:30	22.5	0.1923	1.6	6.66	-328.3	Clear; colorless; odor; sheen
	NCL-44	Low Flow	4/26/2017	11:25	19.6	0.2560	1.5	6.63	-256.2	Clear with light yellow tint; slight odor
			10/3/2017	16:55	22.9	0.2620	1.1	6.87	-237.6	Clear with light yellow tint
	NCL-49	Low Flow	4/25/2017	9:45	21.4	0.3030	1.3	6.93	76.5	Clear; colorless
			10/3/2017	9:35	21.5	0.3070	1.5	6.96	80.9	Clear; colorless
South Refinery	KWB-2R	Low Flow	4/25/2017	17:15	21.0	0.3220	1.6	6.85	-202.7	Clear; colorless; odor
			10/4/2017	11:10	20.8	0.3110	0.9	6.71	-347.2	Clear; odor
	KWB-5	Low Flow	4/26/2017	16:40	21.1	0.2940	2.3	6.61	-146.0	Clear; colorless
			10/4/2017	11:40	19.9	0.2500	2.0	6.67	-107.9	Clear; colorless
	KWB-6	Low Flow	4/26/2017	14:35	20.2	0.2400	0.9	6.81	-275.6	Dark tint; clear; odor
			10/4/2017	11:50	21.1	0.2440	0.7	6.53	-314.7	Clear with black tint; odor

Table 2 - Well Purging and Water Quality Field Measurement Data

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well	Purge Method[1]	Date	Time	Temperature (°C)	Specific Conductivity (S/m)	DO (mg/L)	pH (std units)	ORP (mV)	Field Observations of Purge Water[2]
South Refinery	MW-28	Low Flow	4/26/2017	12:10	23.4	0.3150	1.4	6.87	-334.1	Clear; colorless
			10/3/2017	14:20	27.3	0.3080	2.2	6.60	-318.9	Clear; colorless
	MW-48	Low Flow	4/26/2017	9:15	21.0	0.4300	1.4	6.78	-375.1	Clear; colorless; odor
			10/4/2017	12:25	24.3	0.3960	1.5	6.65	-413.8	Black tint; odor
	MW-50	Low Flow	4/25/2017	12:00	23.1	0.7040	1.0	6.89	87.4	Clear; colorless
			10/3/2017	10:25	22.4	0.7010	1.2	6.96	97.4	Clear; colorless
	MW-52	Low Flow	4/27/2017	8:55	21.2	0.5250	0.7	6.84	114.9	Clear
			10/4/2017	8:15	20.4	0.3300	0.9	6.94	47.3	Clear
	MW-64	Low Flow	4/25/2017	13:00	30.6	0.2540	1.4	7.24	-325.3	Clear; colorless
			10/3/2017	10:30	25.1	0.2550	1.1	6.89	-268.0	Clear; colorless
	MW-65	Low Flow	4/25/2017	13:50	27.3	0.2120	1.5	7.06	-227.7	Clear; colorless; odor
			10/3/2017	11:10	26.7	0.2170	1.0	6.64	-165.2	Clear; colorless; odor
	MW-66	Low Flow	4/26/2017	11:15	22.5	0.1504	2.1	7.25	-224.8	Clear; colorless
			10/3/2017	13:40	24.6	0.1724	1.7	6.75	-179.1	Clear; colorless
	MW-99	Low Flow	4/26/2017	10:20	22.6	0.2040	1.3	6.96	-317.3	Clear; colorless
			10/3/2017	13:00	25.2	0.2230	1.3	6.68	-295.7	Clear; colorless
	MW-101	Low Flow	4/27/2017	9:45	22.0	0.2110	1.2	6.60	-137.1	Clear; colorless
			10/3/2017	17:35	23.9	0.2070	0.9	6.78	-170.7	Clear
	MW-102	Low Flow	4/26/2017	9:25	22.7	0.2180	1.6	7.07	-320.6	Clear; colorless
			10/3/2017	12:00	25.2	0.2380	1.2	6.79	-292.6	Clear; colorless
	MW-103	Low Flow	4/25/2017	14:45	31.6	3.3300	1.9	7.39	-329.1	Clear; colorless
	MW-104	Low Flow	4/25/2017	15:35	24.5	0.1750	1.5	7.14	-329.2	Clear; colorless
			10/3/2017	9:30	23.9	0.1491	0.9	6.69	-278.5	Clear; colorless
	MW-105	Low Flow	4/26/2017	8:25	20.5	0.1358	1.0	7.89	-379.3	Clear with black tint; odor
			10/4/2017	8:25	23.8	0.1731	0.8	6.99	-358.1	Clear; odor
	MW-106	Low Flow	4/25/2017	9:25	23.7	0.3000	0.6	7.31	-374.2	Clear; colorless; odor
			10/4/2017	12:45	26.2	0.3510	0.8	6.72	-372.1	Clear; colorless; odor
	MW-107	Low Flow	4/26/2017	15:10	23.0	0.1957	1.6	7.11	-107.6	Clear; colorless
	MW-109	Low Flow	4/27/2017	9:40	22.8	0.3370	0.4	6.82	-369.2	Clear with black tint; odor
			10/4/2017	9:00	21.8	0.3510	0.5	6.53	-361.9	Clear with black tint; odor
	MW-110	Low Flow	4/27/2017	10:25	22.6	0.1827	0.5	7.05	-349.9	Clear; odor
			10/4/2017	9:45	21.4	0.2160	0.5	6.98	-266.3	Clear; odor
	RA-313	Grab	4/27/2017	9:30	20.7	0.1303	3.1	7.08	-68.4	Clear
	RW-4R	Low Flow	4/26/2017	13:10	24.3	0.2190	1.1	7.25	-318.8	Clear; colorless
	RW-15	Low Flow	4/26/2017	10:00	20.5	0.2720	2.7	6.77	-337.9	Clear

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2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well	Purge Method[1]	Date	Time	Temperature (°C)	Specific Conductivity (S/m)	DO (mg/L)	pH (std units)	ORP (mV)	Field Observations of Purge Water[2]
South RO Reject Field	MW-114	Low Flow	4/27/2017	11:30	19.7	0.3669	0.9	6.91	149.1	Clear
			10/4/2017	10:10	22.2	0.3967	1.2	6.77	47.2	Clear
	MW-115	Low Flow	4/27/2017	10:40	17.5	0.4217	1.1	6.80	92.3	Clear
			10/4/2017	9:15	18.1	0.5273	1.4	6.60	56.4	Clear
	MW-116	Low Flow	4/26/2017	16:55	15.8	0.3480	1.2	7.27	67.0	Clear; colorless
			10/3/2017	17:30	21.0	0.3710	1.5	6.94	21.4	Clear; colorless
TEL	MW-49	Low Flow	4/27/2017	10:30	23.3	0.3240	0.8	7.05	-332.1	Clear with black tint
			10/4/2017	11:25	25.0	0.3200	0.7	6.81	-356.6	Clear
	TEL-1	Low Flow	4/27/2017	8:55	22.2	0.3070	0.4	7.74	-297.9	Clear with black particles
			10/3/2017	11:25	21.8	0.3150	0.5	7.14	-319.2	Clear
	TEL-2	Low Flow	4/27/2017	10:45	23.9	0.3240	0.7	7.34	-359.1	Clear; colorless
			10/3/2017	10:35	22.0	0.3620	0.8	6.88	-312.7	Clear; odor
	TEL-3	Low Flow	4/27/2017	11:50	21.1	0.2310	0.5	6.72	-394.9	Clear; sheen; odor
	TEL-4	Low Flow	4/27/2017	10:55	20.7	0.5170	0.8	6.74	-383.7	Clear with black particles; sheen; odor
			10/3/2017	9:25	22.0	0.4600	0.6	6.42	-187.3	Clear; black tint; odor; sheen
TMD	MW-8	Low Flow	4/27/2017	11:50	21.4	0.4170	1.4	7.21	43.1	Clear
	MW-16	Low Flow	4/26/2017	14:00	17.6	0.7046	0.8	6.85	117.1	Clear
	MW-20	Low Flow	4/27/2017	10:20	22.0	0.5310	1.7	7.04	42.3	Clear
	MW-21	Low Flow	4/27/2017	11:05	21.2	0.5620	1.3	7.10	51.9	Clear
			10/4/2017	12:45	21.2	0.5230	1.4	7.11	-60.3	Clear
	MW-25	Low Flow	4/26/2017	15:10	19.7	1.4350	0.5	7.28	81.2	Clear
	MW-26	Low Flow	4/26/2017	12:55	17.5	0.9022	0.6	6.89	101.9	Clear
	MW-27	Low Flow	4/26/2017	15:55	20.9	0.2785	0.7	6.53	87.3	Clear
	MW-46R	Low Flow	4/27/2017	11:40	24.2	0.3820	2.3	7.02	40.8	Clear; colorless
			10/3/2017	18:10	24.9	0.4110	1.4	6.83	-82.7	Clear; colorless
TMD	MW-68	Low Flow	4/26/2017	11:55	19.7	0.3279	0.5	6.95	121.4	Clear
	MW-71	Low Flow	4/26/2017	11:05	17.7	0.6416	2.4	6.95	122.9	Clear
	MW-89	Low Flow	4/26/2017	14:55	17.9	0.4109	1.7	6.95	52.7	Clear
	NP-1	Low Flow	4/26/2017	18:20	18.2	0.4726	1.1	7.76	137.1	Clear
			10/4/2017	12:45	19.4	0.4896	1.3	6.90	52.7	Clear
	NP-6	Low Flow	4/26/2017	17:40	17.7	0.6222	0.9	6.56	89.1	Clear

Table 2 - Well Purging and Water Quality Field Measurement Data

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well	Purge Method[1]	Date	Time	Temperature (°C)	Specific Conductivity (S/m)	DO (mg/L)	pH (std units)	ORP (mV)	Field Observations of Purge Water[2]
Up-Gradient	UG-1	Low Flow	4/25/2017	11:20	25.9	0.2940	5.5	7.35	167.3	Clear; colorless
	UG-2	Low Flow	4/25/2017	12:10	25.7	0.2220	5.0	7.45	156.7	Clear; colorless
	UG-3R	Bladder	4/25/2017	9:40	23.2	0.2260	5.1	7.05	175.2	Clear; colorless
	UG-4	Low Flow	4/25/2017	10:25	24.1	0.3770	4.1	7.02	176.4	Clear; colorless

[1] **Purge Methods:**

Low Flow = peristaltic pump with dedicated tubing, purged until parameters stabilized

Bladder = bladder pump with dedicated tubing, purged until parameters stabilized

Grab = irrigation well sample collected from tap or valve

Definitions:

°C = Degrees Celsius

DO = Dissolved Oxygen

mg/L = milligrams per liter

mV = milliVolts

ORP = oxidation/reduction potential

S/m = Siemens per meter

std units = standard pH units

[2] **Potential Explanations of Water Quality Observations:**

"Odor" likely due to the presence of petroleum hydrocarbons

"Cloudy water" likely due to presence of suspended inorganic particles (silt, clay)

Dark, black, brown, yellow, gold and orange tints likely due to suspended clay/silt particles or microbial activity

"Particles" of varying color likely due to suspended clay/silt particles

"Orange algae" likely due to microbial activity

Table 3 - Groundwater Screening Levels and Selected Critical Groundwater Screening Levels

2017 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Analyte	WQCC GW Human Health (20.6.2.3103.A)	WQCC GW Domestic (20.6.2.3103.B)	WQCC GW Irrigation (20.6.2.3103.C)	USEPA MCL	NMED Tap Water (Table A-1)	USEPA Tap Water	NMED TPH (Table 6-4)	CGWSL	CGWSL Source
TPH (mg/L)									
TPH - gasoline range organics									
TPH - diesel range organics							3.98E-02	3.98E-02	NMED TPH (2017)
TPH - diesel range organics (Evaporation Ponds)							4.73E-02	4.73E-02	NMED TPH (2017)
VOCs (mg/L)									
1,1,1-Trichloroethane	6.00E-02			2.00E-01				6.00E-02	WQCC GW Human Health (20.6.2.3103.A)
1,1,2,2-Tetrachloroethane	1.00E-02							1.00E-02	WQCC GW Human Health (20.6.2.3103.A)
1,1,2,2-Tetrachloroethene	2.00E-02							2.00E-02	WQCC GW Human Health (20.6.2.3103.A)
1,1,2-Trichloroethane	1.00E-02			5.00E-03				5.00E-03	USEPA MCL
1,1,2-Trichloroethene	1.00E-01							1.00E-01	WQCC GW Human Health (20.6.2.3103.A)
1,1-Dichloroethane	2.50E-02							2.50E-02	WQCC GW Human Health (20.6.2.3103.A)
1,1-Dichloroethene				7.00E-03				7.00E-03	USEPA MCL
1,2-Dibromo-3-chloropropane				2.00E-04				2.00E-04	USEPA MCL
1,2-Dibromoethane (ethylene dibromide)	1.00E-04			5.00E-05				5.00E-05	USEPA MCL
1,2-Dichloroethane	1.00E-02			5.00E-03				5.00E-03	USEPA MCL
1,2-Dichloropropane				5.00E-03				5.00E-03	USEPA MCL
1,2,4-Trimethylbenzene						1.50E-02		1.50E-02	USEPA Tap Water
1,3,5-Trimethylbenzene						1.20E-01		1.20E-01	USEPA Tap Water
2-Butanone (methyl ethyl ketone)					5.56E+00			5.56E+00	NMED Tap Water (Table A-1)
4-Methyl-2-Pentanone (methyl isobutyl ketone)					1.24E+00			1.24E+00	NMED Tap Water (Table A-1)
Acetone					1.41E+01			1.41E+01	NMED Tap Water (Table A-1)
Benzene	1.00E-02			5.00E-03				5.00E-03	USEPA MCL
Bromodichloromethane				8.00E-02				8.00E-02	USEPA MCL
Bromomethane					7.54E-03			7.54E-03	NMED Tap Water (Table A-1)
Carbon Disulfide					8.10E-01			8.10E-01	NMED Tap Water (Table A-1)
Carbon tetrachloride	1.00E-02			5.00E-03				5.00E-03	USEPA MCL
Chlorobenzene				1.00E-01				1.00E-01	USEPA MCL
Chloroethane (ethyl chloride)					2.09E+01			2.09E+01	NMED Tap Water (Table A-1)
Chloroform	1.00E-01			8.00E-02				8.00E-02	USEPA MCL
Chloromethane					2.03E-02			2.03E-02	NMED Tap Water (Table A-1)
cis-1,2-Dichloroethene				7.00E-02				7.00E-02	USEPA MCL
cis-1,3-Dichloropropene					4.71E-03			4.71E-03	NMED Tap Water (Table A-1)
Dibromochloromethane				8.00E-02				8.00E-02	USEPA MCL
Dichlorodifluoromethane					1.97E-01			1.97E-01	NMED Tap Water (Table A-1)
Ethylbenzene	7.50E-01			7.00E-01				7.00E-01	USEPA MCL
Isopropylbenzene (cumene)					4.47E-01			4.47E-01	NMED Tap Water (Table A-1)
m-Xylene					1.93E-01			1.93E-01	NMED Tap Water (Table A-1)
Methyl acetate					1.99E+01			1.99E+01	NMED Tap Water (Table A-1)
Methylene chloride (dichloromethane)	1.00E-01			5.00E-03				5.00E-03	USEPA MCL
Naphthalene	3.00E-02							3.00E-02	WQCC GW Human Health (20.6.2.3103.A)
Methyl tert-butyl ether					1.43E-01			1.43E-01	NMED Tap Water (Table A-1)
o-Xylene					1.93E-01			1.93E-01	NMED Tap Water (Table A-1)
Styrene				1.00E-01				1.00E-01	USEPA MCL
Tetrachloroethene				5.00E-03				5.00E-03	USEPA MCL
Toluene	7.50E-01			1.00E+00				7.50E-01	WQCC GW Human Health (20.6.2.3103.A)
trans-1,2-Dichloroethene				1.00E-01				1.00E-01	USEPA MCL
trans-1,3-Dichloropropene					4.71E-03			4.71E-03	NMED Tap Water (Table A-1)
Trichloroethene				5.00E-03				5.00E-03	USEPA MCL
Trichlorofluoromethane					1.14E+00			1.14E+00	NMED Tap Water (Table A-1)
Vinyl chloride	1.00E-03			2.00E-03				1.00E-03	WQCC GW Human Health (20.6.2.3103.A)
Xylenes	6.20E-01			1.00E+01				6.20E-01	WQCC GW Human Health (20.6.2.3103.A)
Metals (mg/L)									
Aluminum			5.00E+00					5.00E+00	WQCC GW Irrigation (20.6.2.3103.C)
Arsenic	1.00E-01			1.00E-02				1.00E-02	USEPA MCL
Barium	1.00E+00			2.00E+00				1.00E+00	WQCC GW Human Health (20.6.2.3103.A)
Beryllium				4.00E-03				4.00E-03	USEPA MCL
Boron			7.50E-01					7.50E-01	WQCC GW Irrigation (20.6.2.3103.C)
Cadmium	1.00E-02			5.00E-03				5.00E-03	USEPA MCL
Chromium	5.00E-02			1.00E-01				5.00E-02	WQCC GW Human Health (20.6.2.3103.A)
Cobalt			5.00E-02					5.00E-02	WQCC GW Irrigation (20.6.2.3103.C)
Copper		1.00E+00		1.30E+00				1.00E+00	WQCC GW Domestic (20.6.2.3103.B)
Iron		1.00E+00						1.00E+00	WQCC GW Domestic (20.6.2.3103.B)
Lead	5.00E-02			1.50E-02				1.50E-02	USEPA MCL
Manganese		2.00E-01						2.00E-01	WQCC GW Domestic (20.6.2.3103.B)
Mercury	2.00E-03			2.00E-03				2.00E-03	WQCC GW Human Health (20.6.2.3103.A)
Molybdenum			1.00E+00					1.00E+00	WQCC GW Irrigation (20.6.2.3103.C)
Nickel			2.00E-01					2.00E-01	WQCC GW Irrigation (20.6.2.3103.C)
Selenium	5.00E-02			5.00E-02				5.00E-02	WQCC GW Human Health (20.6.2.3103.A)
Silver	5.00E-02							5.00E-02	WQCC GW Human Health (20.6.2.3103.A)
Vanadium					6.31E-02			6.31E-02	NMED Tap Water (Table A-1)
Water Quality Parameters (mg/L, unless noted otherwise)									
Chloride		2.50E+02						2.50E+02	WQCC GW Domestic (20.6.2.3103.B)
Cyanide	2.00E-01			2.00E-01				2.00E-01	WQCC GW Human Health (20.6.2.3103.A)
Fluoride	1.60E+00							1.60E+00	WQCC GW Human Health (20.6.2.3103.A)
Nitrate (NO_3 as N)	1.00E+01			1.00E+01				1.00E+01	WQCC GW Human Health (20.6.2.3103.A)
pH (Std pH units)		6 to 9						6 to 9	WQCC GW Domestic (20.6.2.3103.B)
Sulfate		6.00E+02						6.00E+02	WQCC GW Domestic (20.6.2.3103.B)
Total Dissolved Solids		1.00E+03						1.00E+03	WQCC GW Domestic (20.6.2.3103.B)
Other Parameters (mg/L, unless noted otherwise)									
Uranium	3.00E-02			3.00E-02				3.00E-02	WQCC GW Human Health (20.6.2.3103.A)
Combined Radium 226 and 228 (pCi/L)	3.00E+01			5.00E+00				5.00E+00	USEPA MCL
Polychlorinated Biphenyls	1.00E-03			5.00E-04				5.00E-04	USEPA MCL

Definitions and Notes:

Blank cell indicates no standard is available

CGWSL = Critical Groundwater Screening Level

Heirarchy of selecting the CGWSL is as follows:

1. Lowest of either NM WQCC GW Standard (20.6.2.3103) or USEPA MCL.
2. If no NM WQCC GW Standard or USEPA MCL available, NMED Tap Water value.
3. If no NMED Tap Water value, USEPA Tap Water value, if available.
4. NMED TPH screening for "unknown oil" used for TPH-DRO.
5. NMED TPH screening value for "Diesel #2/New Crankase Oil" applied to TPH DRO samples collected from Evaporation Ponds.

NMAC = New Mexico Administrative Code

NMED = New Mexico Environment Department

NMED Tap Water = NMED Risk Assessment Guidance for Site Investigations and Remediation, March 2017, Table A-1, Tap Water Screening Level

NMED TPH = NMED Risk Assessment Guidance for Site Investigations and Remediation, March 2017, Table 6-4, TPH Groundwater Screening Levels

mg/L = Milligrams per Liter

pCi/L = PicoCuries per Liter

SVOC = Semivolatile Organic Compound

TPH = Total Petroleum Hydrocarbons

USEPA MCL = United States Environmental Protection Agency Maximum Contaminant Level from "Regional Screening Level (RSL) Summary Table", November 2017

USEPA Tap Water = United States Environmental Protection Agency Tap Water Screening Level from"Regional Screening Level (RSL) Summary Table", November 2017

VOC = Volatile Organic Compound

WQCC = New Mexico Water Quality Control Commission

WQCC GW Domestic = WQCC groundwater standard for domestic exposure, 20.6.2.3103.B NMAC

WQCC GW Human Health = WQCC groundwater standard for human health exposure, 20.6.2.3103.A NMAC

WQCC GW Irrigation = WQCC groundwater standard for irrigation exposure, 20.6.2.3103.C NMAC

Table 4A - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons and Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	TPH			Volatile Organic Compounds										
				Analyte:	GRO	DRO	DRO - EP	1,2,4-TMB	1,3,5-TMB	Benzene	cis-1,2-DCE	Ethyl-benzene	MTBE	Naphthalene	o-Xylene	Toluene	Total Xylenes	Trichloro-ethene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473	0.015	0.12	0.005	0.07	0.7	0.143	0.03	0.193	0.75	0.62	0.005
				CGWSL Source:		NMED TPH	NMED TPH	USEPA TW	USEPA TW	USEPA MCL	USEPA MCL	USEPA MCL	WQCC TW	WQCC HH	WQCC TW	WQCC HH	WQCC HH	USEPA MCL
Area	**Well ID**	**Date**	**Dup**															
Cross-Gradient	KWB-13	Apr-14				<0.0200		<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	KWB-13	Apr-15				**0.0630** J		0.00302	0.000456 J	<0.000330	<0.000260	<0.000380	<0.000370	0.00317 J	<0.000340	<0.000780	0.00254 J	<0.000400
	KWB-13	Apr-16				**0.0505** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	KWB-13	Apr-17				0.0370 J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-17	Apr-14				0.0380 J												
	NP-5	Apr-13				**<0.0530**		<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500
	NP-5	Apr-15				0.0387 J		0.000804 J	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	NP-5	Apr-17				<0.0247		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	RA-3156	Nov-13						<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500
	RA-3156	Apr-14						<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	RA-3156	Apr-16						<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	RA-3156	Apr-17						<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-136	Oct-15		<0.0314		**0.0721** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-136	Apr-16		<0.0314		**0.162**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-136	Oct-16		<0.0314		**0.118**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-136	Apr-17		<0.0314		**0.0731** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-136	Oct-17		<0.0314		**0.0937** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
Evaporation Ponds	MW-1R	Apr-14					<0.0200	<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	MW-1R	Apr-15					**0.124**	<0.000373	<0.000387	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-1R	Apr-16					**0.163**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-1R	Apr-17					**0.0583** J	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100 J4	<0.000341	<0.000412	<0.00106	<0.000398
	MW-2A	Apr-15		<0.0310			**0.295**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-2A	Oct-15		0.0363 J			**0.260**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-2A	Apr-16		<0.0314			**0.212**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-2A	Oct-16		0.0435 JB			**0.195**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-2A	Apr-17		<0.0314			**0.164**	<0.00373	<0.00387	<0.00331	<0.00260	<0.00384	<0.00367	<0.0100	<0.00341	<0.00412	<0.0106	<0.00398
	MW-2A	Oct-17		0.0354 J			**0.265**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-3	Apr-15		0.134			**8.50**	<0.000370	<0.000390	0.000609 J	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-3	Apr-15	FD	0.151 J			**8.60**	<0.000370	<0.000390	0.000638 J	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-3	Oct-15		3.59			**11.2**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-3	Oct-15	FD	0.839			**10.2**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-3	Apr-16		0.499			**10.2**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-3	Apr-16	FD	0.490			**9.97**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-3	Oct-16		0.611			**11.0**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-3	Oct-16	FD	0.571			**10.5**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-3	Apr-17		0.205			**8.09**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-3	Apr-17	FD	0.263			**7.74**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100 J4	<0.000341	<0.000412	<0.00106	<0.000398
	MW-3	Oct-17		0.602			**13.1**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-3	Oct-17	FD	0.834			**4.17**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-4A	Apr-15		0.130			**5.60**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.000461 J	<0.00100	0.000658 J	<0.000780	0.00293 J	<0.000400
	MW-4A	Oct-15		3.44			**9.81**	0.000502 J	<0.000387	<0.000331	<0.000260	<0.000384	0.000641 J	<0.00100	<0.000341	<0.000780	0.00237 J	<0.000398
	MW-4A	Apr-16		0.402			**8.76**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000605 J	<0.00100	0.000352 J	<0.000780	0.00201 J	<0.000398
	MW-4A	Oct-16		0.396			**5.84**	0.000553 J	<0.000387	<0.000331	<0.000260	<0.000384	0.000516 J	<0.00100	0.000870 J	<0.000780	0.00365	<0.000398
	MW-4A	Apr-17		0.607			**8.15**	0.000390 J	<0.000387	<0.000331	<0.000260	<0.000384	0.000444 J	<0.00100 J4	<0.000341	<0.000412	<0.00106	<0.000398
	MW-4A	Oct-17		0.730			**7.49**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	0.000597 J	<0.000412	<0.00106	<0.000398
	MW-4B	Apr-13		0.102			**0.360**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500
	MW-4B	Apr-15		0.119			**1.31**	<0.000370	<0.000390	0.00183	<0.000260	0.000462 J	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-4B	Apr-17		0.318			**1.21**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100 J4	<0.000341	<0.000412	<0.00106	<0.000398
	MW-5A	Apr-15		1.19			**4.30**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.00138	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-5A	Oct-15		1.72			**2.31**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00174	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-5A	Apr-16		2.09			**8.92**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00212	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-5A	Oct-16		1.17			**3.08**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00130	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-5A	Apr-17		3.00			**7.60**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00160	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-5A	Oct-17		2.75			**7.16**	0.000456 J	<0.000387	<0.000331	<0.000260	<0.000384	0.00150	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-5B	Apr-13		1.78			**7.10**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500
	MW-5B	Apr-15		1.14			**11.0**	0.000976 J	<0.000390	<0.000330	<0.000260	<0.000380	0.00148	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-5B	Apr-17		2.08			**11.2**	0.000499 J	<0.000387	<0.000331	<0.000260	<0.000384	0.00140	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-5C	Apr-13		0.0652			**0.220**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500
	MW-5C	Apr-15		<0.0310			**0.580**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.000507 J	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-5C	Apr-17		<0.0314			**0.500**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000369 J	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-6A	Apr-14		0.238			**1.50**	<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	0.00160 J	<0.000500	0.00160 J	<0.000500
	MW-6A	Apr-15		<0.0310			**4.50**	<0.000370	<0.000390	0.000715 J	<0.000260	<0.000380	<0.000370	<0.00100	0.000920 J	<0.000780	<0.00110	<0.000400
	MW-6A	Apr-16		<0.0314			**4.81**	<0.000373	<0.000387	<0.000331	<0.000260	0.00116	<0.000367	<0.00100	0.00119	<0.000780	0.00119 J	<0.000398
	MW-6A	Apr-17		0.335			**14.2**	<0.00373	<0.00387	<0.00331	<0.00260	<0.00384	<0.00367	<0.0100	<0.00341	<0.00412	<0.0106	<0.00398
	MW-6B	Mar-13		<0.0500			**<0.0530**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500
	MW-6B	Mar-13	FD	<0.0500			**<0.0540**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500
	MW-6B	Apr-15		<0.0310			**0.386**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-6B	Apr-17		<0.0314			**0.276**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-7A	Apr-15		0.201			**1.20**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.00194	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-7A	Apr-15	FD	0.190 J			**1.20**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.00185	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-7A	Oct-15		0.347			**1.06**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00175	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-7A	Oct-15	FD	0.417			**1.13**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00174	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-7A	Apr-16		0.251			**1.22**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00168	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-7A	Apr-16	FD	0.269			**1.32**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00168	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-7A	Oct-16		0.235			**1.21**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00188	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-7A	Oct-16	FD	0.212			**1.25**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00166	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-7A	Apr-17		0.501			**1.12**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00150	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-7A	Apr-17	FD	0.402			**1.24**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00148	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-7A	Oct-17		0.473			**1.30**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00140	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-7A	Oct-17	FD	0.523			**1.39**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00178	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-7B	Apr-13		<0.0500			**<0.0530**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500
	MW-7B	Apr-15		<0.0310			**0.120**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-7B	Apr-17		<0.0314			**0.0845** J	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-10	Apr-15		0.410 J			**2.60**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.00195	<0.00100	<0.000340	<0.000780 J	<0.00110	<0.000400
	MW-10	Oct-15		0.730			**1.79**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00201	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-10	Apr-16		1.06			**3.19**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00216	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-10	Oct-16		1.05			**2.65**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00190	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-10	Apr-17		0.877			**2.75**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00195	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-10	Oct-17		1.11			**2.51**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00141	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-11A	Apr-15		<0.0310			**0.0558** J	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-11A	Oct-15																
	MW-11A	Apr-16		<0.0314			<0.0247	<0.00100	<0.00100	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-11A	Oct-16																
	MW-11A	Apr-17		<0.0314			<0.0247	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100 J4	<0.000341	<0.000412	<0.00106	<0.000398
	MW-11A	Oct-17																
	MW-11B	Mar-13		<0.0500			**<0.0520**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500
	MW-11B	Apr-15		<0.0310			<0.0250	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-11B	Apr-17		<0.0314			<0.0247	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100 J4	<0.000341	<0.000412	<0.00106	<0.000398
	MW-12	Apr-14					<0.0200											
	MW-13	Apr-14					<0.0200											
	MW-15	Apr-14		0.149			**0.570**	<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	MW-15	Apr-15		<0.160			**1.01**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.000809 J	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-15	Apr-16		0.203			**0.549**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000602 J	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-15	Apr-17		0.0940 J			**0.251**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000373 J	<0.00100 J4	<0.000341	<0.000412	<0.00106	<0.000398

Table 4A - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons and Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	TPH			Volatile Organic Compounds										
				Analyte:	GRO	DRO	DRO - EP	1,2,4-TMB	1,3,5-TMB	Benzene	cis-1,2-DCE	Ethyl-benzene	MTBE	Naphthalene	o-Xylene	Toluene	Total Xylenes	Trichloro-ethene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473	0.015	0.12	0.005	0.07	0.7	0.143	0.03	0.193	0.75	0.62	0.005
				CGWSL Source:		NMED TPH	NMED TPH	USEPA TW	USEPA TW	USEPA MCL	USEPA MCL	USEPA MCL	WQCC TW	WQCC HH	WQCC TW	WQCC HH	WQCC HH	USEPA MCL
Area	**Well ID**	**Date**	**Dup**															
Evaporation Ponds	MW-18A	Apr-15					**0.0770** J	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-18A	Oct-15					**0.215**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-18A	Apr-16					**0.460**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000490 J	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-18A	Oct-16					**0.424**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000586 J	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-18A	Apr-17					**0.516**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000650 J	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-18A	Oct-17					**0.520**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000529 J	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-18B	Apr-13		0.0995			**<0.0520**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500
	MW-18B	Apr-15		<0.0310			**0.280**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-18B	Apr-17		0.0932 J			**0.287**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-22A	Apr-15		2.57			**5.80**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.00557	<0.00100	<0.000340	<0.000780 J	<0.00110	<0.000400
	MW-22A	Apr-15	FD	3.80			**6.39**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.00733	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-22A	Oct-15		3.63			**4.56**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00928	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-22A	Oct-15	FD	3.31			**4.46**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00967	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-22A	Apr-16		3.53			**7.43**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00907	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-22A	Apr-16	FD	4.02			**7.66**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00887	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-22A	Oct-16		3.48			**5.73**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00805	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-22A	Oct-16	FD	3.25			**6.18**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00620	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-22A	Apr-17		3.63			**6.65**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00774	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-22A	Apr-17	FD	4.22			**6.63**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00654	<0.00100 J4	<0.000341	<0.000412	<0.00106	<0.000398
	MW-22A	Oct-17		4.51			**6.03**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00552	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-22A	Oct-17	FD	4.42			**6.50**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00631	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-22B	Apr-13		1.99			**3.00**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	0.00650	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500
	MW-22B	Apr-15		2.34			**5.60**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.00634	<0.00100	<0.000340	<0.000780 J	<0.00110	<0.000400
	MW-22B	Apr-17		1.76			**5.25**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00564	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-70	Apr-15		1.27 J			**0.790**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-70	Oct-15		1.37			**0.599**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-70	Apr-16		1.46			**0.896**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-70	Oct-16		1.32			**0.772**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-70	Apr-17		2.35			**0.899**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-70	Oct-17		1.78			**0.865**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-72	Apr-14		0.0920			**0.760**	<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	MW-72	Apr-15		<0.0310			**1.30**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-72	Apr-16		<0.0314			**0.950**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-72	Apr-17		0.118			**1.03**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100 J4	<0.000341	<0.000412	<0.00106	<0.000398
	MW-73	Apr-14		0.985			**4.80**	0.00210 J	<0.000600	<0.000600	<0.00060	<0.000500	0.00160 J	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	MW-73	Apr-15		0.378			**4.00**	0.00171	<0.000390	<0.000330	<0.000260	<0.000380	0.00290	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-73	Apr-16		0.925			**5.17**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00270	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-73	Apr-17		0.367			**3.68**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00120	<0.00100 J4	<0.000341	<0.000412	<0.00106	<0.000398
	MW-74	Apr-15		0.0910 J			**38.0**	<0.000373	<0.000387	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-74	Oct-15		3.23			**18.9**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000826 J	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-74	Apr-16		1.20			**18.4**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000972 J	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-74	Oct-16		0.135			**64.3**	0.000718 J	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-74	Apr-17		1.01			**31.5**	0.000893 J	<0.000387	<0.000331	<0.000260	<0.000384	0.000473 J	<0.00100 J4	<0.000341	<0.000412	<0.00106	<0.000398
	MW-74	Oct-17		1.18			**36.5**	0.00124	<0.000387	<0.000331	<0.000260	<0.000384	0.000527 J	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-75	Apr-15		2.31			**22.0**	0.000710 J	<0.000390	<0.00330	<0.00260	<0.00380	0.00935 J	<0.0100	<0.00340	<0.00780	<0.0110	<0.00400
	MW-75	Oct-15		10.9			**19.6**	0.00252	<0.000387	<0.000331	<0.000260	<0.000384	0.00463	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-75	Apr-16		1.39			**18.2**	<0.000373	<0.000387	0.00134	<0.000260	<0.000384	0.00577	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-75	Oct-16		2.46			**16.6**	0.000631 J	0.00103	<0.000331	<0.000260	<0.000384	0.00407	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-75	Apr-17		1.46			**16.7**	<0.000373	<0.000387	0.00145	<0.000260	<0.000384	0.00645	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-75	Oct-17		2.52			**20.6**	0.000387 J	0.000912 J	<0.000331	<0.000260	<0.000384	0.00224	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-76	Apr-15		0.356 J			**21.0**	0.000699 J	0.000697 J	<0.000330	<0.000260	<0.000380	0.0122	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-76	Oct-15		0.773			**25.2**	0.000531 J	0.000499 J	<0.000331	<0.000260	<0.000384	0.00839	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-76	Apr-16		0.759			**24.1**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00756	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-76	Oct-16		2.19			**43.7**	0.00187	0.00166	0.00227	<0.000260	0.000437 J	0.0245	<0.00100	<0.000341	<0.000780	0.00214 J	<0.000398
	MW-76	Apr-17		1.02			**31.1**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.0130	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-76	Oct-17		1.92			**45.5**	0.000428 J	0.000827 J	<0.000331	<0.000260	<0.000384	0.0143	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-77	Apr-15		0.893			**140**	0.00333	0.00239	**0.00962**	<0.000260	0.00363	0.0131	<0.00100	0.00101	0.00216 J	0.00531	<0.000400
	MW-77	Oct-15		2.68			**173**	0.00348	0.00223	0.00156	<0.000260	0.00533	0.00722	<0.00100	0.00112	0.00386 J	0.00589	<0.000398
	MW-77	Apr-16		0.968			**101**	<0.000373	0.00161	0.00287	<0.000260	0.00300	0.00647	<0.00100	0.000583 J	0.00138 J	0.00390	<0.000398
	MW-77	Oct-16		1.53 J			**86.1**	0.00432 J	<0.00387	<0.00331	<0.00260	0.00766 J	0.00552 J	<0.0100	<0.00341	<0.00780	<0.0106	<0.00398
	MW-77	Apr-17		1.11			**57.5**	0.00384 J	<0.00387	<0.00331	<0.00260	<0.00384	0.00452 J	<0.0100	<0.00341	<0.00412	<0.0106	<0.00398
	MW-78	Apr-14		0.333 J			**29.0**	<0.00050	<0.000600	0.00310 J	<0.00060	0.00130 J	<0.000600	<0.000700	0.00210 J	0.00140 J	0.00210 J	<0.000500
	MW-78	Apr-15		0.279			**67.0**	0.00132	0.000829 J	**0.0114**	<0.000260	0.00262	0.000629 J	<0.00100	0.00356	0.00385 J	0.00502	<0.000400
	MW-78	Apr-16		0.269			**63.2**	<0.000373	<0.000387	0.00275	<0.000260	0.000942 J	<0.000367	<0.00100	0.00135	0.00125 J	0.00135 J	<0.000398
	MW-78	Apr-17		<0.314			**59.1**	<0.00373	<0.00387	<0.00331	<0.00260	<0.00384	<0.00367	<0.0100	<0.00341	<0.00412	<0.0106	<0.00398
	MW-79	Apr-15		<0.0310			**0.560**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-79	Oct-15		0.0383 J			**0.575**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-79	Apr-16		<0.0314			**0.516**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-79	Oct-16		0.0513 J			**0.413**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-79	Apr-17		<0.0314			**0.498**	<0.00373	<0.00387	<0.00331	<0.00260	<0.00384	<0.00367	<0.0100	<0.00341	<0.00412	<0.0106	<0.00398
	MW-79	Oct-17		0.0568 J			**0.454**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-80	Apr-14		0.0489 J			**0.200**	<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	MW-80	Apr-15		<0.0310			**0.750**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-80	Apr-16		<0.0314			**0.317**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-80	Apr-17		<0.0314			**0.680**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-81	Apr-14		0.0318 J			**3.60**	<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	MW-81	Apr-15		<0.0310			**8.00**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-81	Apr-16		0.0339 J			**8.64**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-81	Apr-17		<0.0314			**4.84**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-82	Apr-14		0.611			**4.20**	<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	MW-82	Apr-14	FD	0.649			**4.20**	<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	MW-82	Apr-15		0.361			**14.0**	<0.000370	<0.000390	0.000339 J	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-82	Apr-16		0.334			**8.41**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-82	Apr-17		0.660			**6.40**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100 J4	<0.000341	<0.000412	<0.00106	<0.000398
	MW-83	Apr-15		0.278			**31.0**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	0.000607 J	<0.000780	<0.00110	<0.000400
	MW-83	Oct-15		6.26			**40.3**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-83	Apr-16		0.310			**26.0**	<0.000373	<0.000387	0.00114	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-83	Oct-16		0.234			**28.9**	<0.000373	<0.000387	0.000449 J	<0.000260	<0.000384	<0.000367	<0.00100	0.000569 J	<0.000780	<0.00106	<0.000398
	MW-83	Apr-17		0.305			**29.8**	<0.00373	<0.00387	<0.00331	<0.00260	<0.00384	<0.00367	<0.0100	<0.00341	<0.00412	<0.0106	<0.00398
	MW-83	Oct-17		0.805			**36.2**	0.000411 J	<0.000387	<0.000331	<0.000260	0.000439 J	<0.000367	<0.00100	0.00120	<0.000412	0.00240 J	<0.000398
	MW-84	Apr-15		0.613			**62.0**	<0.000370	<0.000390	0.000664 J	<0.000260	0.000574 J	0.00279	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-84	Oct-15		1.96			**82.1**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00125	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-84	Apr-16		0.519			**83.8**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00129	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-84	Oct-16		1.58 J			**95.3**	<0.00373	<0.00387	<0.00331	<0.00260	<0.00384	<0.00367	<0.0100	<0.00341	<0.00780	<0.0106	<0.00398
	MW-84	Apr-17		<0.314			**4.92**	<0.00373	<0.00387	<0.00331	<0.00260	<0.00384	<0.00367	<0.0100	<0.00341	<0.00412	<0.0106	<0.00398
	MW-84	Oct-17		1.16			**67.0**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00174	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-87	Apr-15		<0.0310			**0.390**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.000569 J	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-87	Oct-15		0.0451 J			**0.251**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000696 J	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-87	Apr-16		0.0421 J			**0.449**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000646 J	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-87	Oct-16		<0.0314			**0.405**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00107	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-87	Apr-17		<0.0314			**0.356**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000665 J	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-87	Oct-17		0.0463 J			**0.399**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000728 J	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398

Table 4A - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons and Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

	Analyte Group:			TPH			Volatile Organic Compounds										
	Analyte:			GRO	DRO	DRO - EP	1,2,4-TMB	1,3,5-TMB	Benzene	cis-1,2-DCE	Ethyl-benzene	MTBE	Naphthalene	o-Xylene	Toluene	Total Xylenes	Trichloro-ethene
	Units:			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	CGWSL:			---	0.0398	0.0473	0.015	0.12	0.005	0.07	0.7	0.143	0.03	0.193	0.75	0.62	0.005
	CGWSL Source:				NMED TPH	NMED TPH	USEPA TW	USEPA TW	USEPA MCL	USEPA MCL	USEPA MCL	WQCC TW	WQCC HH	WQCC TW	WQCC HH	WQCC HH	USEPA MCL
Area	**Well ID**	**Date**	**Dup**														
Evaporation Ponds	MW-88	Apr-15		<0.0310		**0.610**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-88	Oct-15		<0.0314		**0.455**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-88	Apr-16		<0.0314		**0.636**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-88	Oct-16		0.0848 J		**0.635**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-88	Apr-17		<0.0314		**0.516**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-88	Oct-17		0.0514 J		**0.627**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-120	Apr-15		<0.0310		**3.09**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-120	Oct-15		0.181		**1.30**	<0.000370	<0.000390	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-120	Apr-16		0.0845 J		**1.82**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-120	Oct-16		<0.0314		**0.920**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-120	Apr-17		0.0584 J		**0.813**	<0.00373	<0.00387	<0.00331	<0.00260	<0.00384	<0.00367	<0.0100	<0.00341	<0.00412	<0.0106	<0.00398
	MW-120	Oct-17		0.150		**0.737**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-121	Apr-15		<0.0310		**0.565**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-121	Oct-15		<0.0314		**0.460**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-121	Apr-16		<0.0314		**0.456**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-121	Oct-16		0.0514 JB		**0.593**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-121	Apr-17		<0.0314		**0.428**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-121	Oct-17		<0.0314		**0.567**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-122	Apr-15		<0.0310		**4.79**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-122	Oct-15		0.0340 J		**6.06**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-122	Apr-16		<0.0314		**0.824**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-122	Oct-16		0.0443 JB		**0.412**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-122	Apr-17		<0.0314		**0.850**	<0.00373	<0.00387	<0.00331	<0.00260	<0.00384	<0.00367	<0.0100	<0.00341	<0.00412	<0.0106	<0.00398
	MW-122	Oct-17		0.0385 J		**0.429**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-123	Apr-15		1.90		**3.60**	<0.000400	<0.000310	<0.000330	<0.000260	<0.000380	0.00124	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-123	Oct-15		1.24		**2.13**	<0.000398	<0.000306	<0.000331	<0.000260	<0.000384	0.00126	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-123	Apr-16		1.83		**3.82**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00143	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-123	Oct-16		1.50		**3.53**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00163	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-123	Apr-17		1.96		**3.36**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00114	<0.00100 J4	<0.000341	<0.000412	<0.00106	<0.000398
	MW-123	Oct-17		1.96		**3.08**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00139	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-124	Apr-15		<0.0310 J		**0.0550 J**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-124	Oct-15		<0.0314		0.0298 J	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-124	Apr-16		<0.0314		<0.0247	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-124	Oct-16		<0.0314		<0.0247	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-124	Apr-17		<0.0314		0.0365 J	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-124	Oct-17		<0.0314		**0.0643 J**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	OCD-1R	Apr-15		<0.0310		**0.242**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	OCD-1R	Oct-15		<0.0314		**0.266**	<0.000370	<0.000390	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	OCD-1R	Apr-16		<0.0314		**0.241**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	OCD-1R	Oct-16		0.0450 J		**0.267**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	OCD-1R	Apr-17		<0.0314		**0.255**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100 J4	<0.000341	<0.000412	<0.00106	<0.000398
	OCD-1R	Oct-17		0.0377 J		**0.268**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	OCD-2A	Apr-15		<0.0310		**0.104**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780 J	<0.00110	<0.000400
	OCD-2A	Oct-15		<0.0314		0.0455 J	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	OCD-2A	Apr-16		<0.0314		**0.0682 J**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	OCD-2A	Oct-16		0.0333 J		**0.0722 J**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	OCD-2A	Apr-17		<0.0314		**0.0497 J**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100 J4	<0.000341	<0.000412	<0.00106	<0.000398
	OCD-2A	Oct-17		<0.0314		**0.123**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	OCD-3	Apr-15		<0.0310		**0.0484 J**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	OCD-3	Oct-15		<0.0314		0.0251 J	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	OCD-3	Apr-16		<0.0314		<0.0247	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	OCD-3	Oct-16		<0.0314		<0.0247	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	OCD-3	Apr-17		<0.0314		<0.0247	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100 J4	<0.000341	<0.000412	<0.00106	<0.000398
	OCD-3	Oct-17		<0.0314		**0.173**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	OCD-4	Apr-15		<0.0310		0.0464 J	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	OCD-4	Oct-15		<0.0314		<0.0247	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	OCD-4	Apr-16		<0.0314		<0.0247	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	OCD-4	Oct-16		<0.0314		<0.0247	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	OCD-4	Apr-17		<0.0314		<0.0247	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100 J4	<0.000341	<0.000412	<0.00106	<0.000398
	OCD-4	Oct-17		<0.0314		**0.0981 J**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	OCD-5	Apr-15		<0.0310		**0.218**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	OCD-5	Oct-15		0.0402 J		**0.0951 J**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	OCD-5	Apr-16		<0.0314		**0.0576 J**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	OCD-5	Oct-16		0.0391 J		0.0423 J	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	OCD-5	Apr-17		0.0353 J		**0.102**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100 J4	<0.000341	<0.000412	<0.00106	<0.000398
	OCD-5	Oct-17		0.255		**0.331**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	OCD-6	Apr-15		0.0819 J		**1.00**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	OCD-6	Oct-15		1.88		**1.09**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	OCD-6	Apr-16		0.0939		**1.11**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	OCD-6	Oct-16		0.242		**1.11**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	OCD-6	Apr-17		0.199		**0.858**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100 J4	<0.000341	<0.000412	<0.00106	<0.000398
	OCD-6	Oct-17		0.294		**1.04**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	OCD-7AR	Apr-15		0.715		**4.29**	0.000760 J	<0.000390	<0.000330	<0.000260	<0.000380	0.00196	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	OCD-7AR	Oct-15		1.20		**4.12**	0.00129	<0.000387	<0.000331	<0.000260	<0.000384	0.00202	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	OCD-7AR	Apr-16		0.443		**5.24**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00141	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	OCD-7AR	Oct-16		1.08		**5.28**	0.00172	<0.000387	<0.000331	<0.000260	<0.000384	0.00179	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	OCD-7AR	Apr-17		0.710		**4.43**	0.000840 J	<0.000387	<0.000331	<0.000260	<0.000384	0.00110	<0.00100 J4	<0.000341	<0.000412	<0.00106	<0.000398
	OCD-7AR	Oct-17		1.29		**4.52**	0.00109	<0.000387	<0.000331	<0.000260	<0.000384	0.00107	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	OCD-7B	Mar-13		<0.0500		**<0.0520**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500
	OCD-7B	Apr-15		<0.0310		**0.120**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	OCD-7B	Apr-17		<0.0314		**0.0746 J**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	OCD-8A	Apr-15		0.491		**2.60**	0.000370 J	<0.000390	<0.000330	<0.000260	<0.000380	0.00498	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	OCD-8A	Oct-15		0.648		**2.74**	0.000454 J	<0.000387	<0.000331	<0.000260	<0.000384	0.00510	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	OCD-8A	Apr-16		0.726		**3.26**	0.000482 J	<0.000387	<0.000331	<0.000260	<0.000384	0.00475	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	OCD-8A	Oct-16		0.714		**3.23**	0.00108	<0.000387	<0.000331	<0.000260	<0.000384	0.00507	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	OCD-8A	Apr-17		1.23		**3.46**	0.000518 J	<0.000387	<0.000331	<0.000260	<0.000384	0.00420	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	OCD-8A	Oct-17		1.34		**3.49**	0.000832 J	<0.000387	<0.000331	<0.000260	<0.000384	0.00392	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	OCD-8B	Apr-13		0.298		**0.890**	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500
	OCD-8B	Apr-15		<0.0310		**0.840**	<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.00155	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	OCD-8B	Apr-17		<0.0314		**0.585**	<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000919 J	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
Field East of Refinery	KWB-1A	Apr-15			**0.0932** J		<0.00050	<0.000600	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	KWB-1A	Oct-15			**0.114**		<0.000370	<0.000390	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	KWB-1A	Apr-16			**0.127**		<0.000370	<0.000390	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	KWB-1A	Oct-16			**0.166**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	KWB-1A	Apr-17			**0.102**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	KWB-1A	Oct-17			**0.158**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	KWB-1C	Apr-13			**<0.0440**		<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500
	KWB-1C	Apr-15			**0.113**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	KWB-1C	Apr-17			**0.140**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	KWB-7	Apr-15			**1.43**		**0.0766**	0.000982 J	**0.9290**	<0.000260	0.0285	0.0225	0.0120	0.00377	0.00213 J	0.00718	<0.000400
	KWB-7	Oct-15			**0.721**		0.00557	<0.000387	**0.0164**	<0.000260	0.0240	0.00677	0.00225 J	0.000608 J	<0.000780	0.00145 J	<0.000398
	KWB-7	Apr-16			**1.22**		**0.0482**	0.00903	**0.0365**	<0.000260	0.0248	0.0104	0.0141	0.00167	<0.000780	0.0235	<0.000398
	KWB-7	Oct-16			**1.06**		0.00700	0.000877 J	**0.0364**	<0.000260	0.0167	0.00582	0.00120 JJ4	<0.000341	0.00155 J	0.0196	<0.000398
	KWB-7	Apr-17			**1.40**		0.0115	<0.000387	**0.0135**	<0.000260	0.00858	0.00678	0.00409 J	0.000576 J	<0.000412	0.00757	<0.000398
	KWB-7	Oct-17			**1.69**		**0.0258**	<0.000387	**0.0363**	<0.000260	0.0156	0.00510	0.00350 J	0.00112	<0.000412	0.0143	<0.000398

Table 4A - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons and Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	TPH			Volatile Organic Compounds										
				Analyte:	GRO	DRO	DRO - EP	1,2,4-TMB	1,3,5-TMB	Benzene	cis-1,2-DCE	Ethyl-benzene	MTBE	Naphthalene	o-Xylene	Toluene	Total Xylenes	Trichloro-ethene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473	0.015	0.12	0.005	0.07	0.7	0.143	0.03	0.193	0.75	0.62	0.005
				CGWSL Source:		NMED TPH	NMED TPH	USEPA TW	USEPA TW	USEPA MCL	USEPA MCL	USEPA MCL	WQCC TW	WQCC HH	WQCC TW	WQCC HH	WQCC HH	USEPA MCL
Area	Well ID	Date	Dup															
Field East of Refinery	KWB-8	Oct-16				**3.02**		**0.170** J	<0.0774	**11.5**	<0.0520	**0.828**	<0.0734	**<0.200** J4	0.150 J	**1.48**	**1.16**	**<0.0796**
	KWB-8	Apr-17				**3.41**		**0.380**	0.0863 J	**5.62**	<0.0260	**1.24**	0.129	**0.141** J	0.145	0.747	**2.07**	**<0.0398**
	KWB-8	Oct-17				**3.30**		**0.114**	0.0225	**12.5**	<0.000260	0.617	0.134	**0.0519**	0.0133	0.336	**0.795**	<0.000398
	KWB-10R	Apr-15				**9.16**		**0.457**	**0.136**	**5.65**	<0.00260	0.528	**3.87**	**0.138**	**0.343**	0.141	**1.38**	<0.00400
	KWB-10R	Oct-15				**4.65**		**0.358**	0.100	**6.77**	<0.000260	0.523	**4.66**	**0.186**	**0.254**	0.124	**1.08**	<0.000398
	KWB-10R	Apr-16				**5.24**		**0.323**	0.0886	**5.26**	<0.0130	0.437	**3.71**	**0.150** J	0.184	0.0937 J	**0.829**	**<0.0199**
	KWB-10R	Oct-16				**7.50**		**0.307**	0.0765	**0.565**	<0.00520	0.513	**3.62**	**0.133**	**0.196**	0.110	**0.860**	**<0.00796**
	KWB-10R	Apr-17				**4.01**		**0.360**	0.0907	**4.95**	<0.0130	0.505	**3.65**	**0.156** J	**0.198**	0.0605	**0.914**	**<0.0199**
	KWB-10R	Oct-17				**5.18**		**0.302**	0.0759	**7.06**	<0.000260	0.530	**5.41**	**0.152**	0.112 J	0.0588	**0.767**	<0.000398
	KWB-11A	Apr-15		0.339	**1.87**			**0.0658**	0.00168	**0.0248**	<0.000260	<0.000380	0.00648	0.0233	0.000869 J	<0.000780	0.00275 J	<0.000400
	KWB-11A	Oct-15		0.217	**0.646**			**0.0528**	0.00117	**0.00571**	<0.000260	<0.000384	0.00434	0.0165	0.000511 J	<0.000780	0.00181 J	<0.000398
	KWB-11A	Apr-16		0.267	**3.74**			**0.0256**	0.00122	**0.00541**	<0.000260	<0.000384	0.00477	0.0134	0.000423 J	<0.000780	<0.00106	<0.000398
	KWB-11A	Oct-16		0.223 B	**1.36**			**0.0341**	0.000945 J	**0.00725**	<0.000260	<0.000384	0.00416	0.00936 J4	0.000483 J	<0.000780	0.00158 J	<0.000398
	KWB-11A	Apr-17		0.155	**0.511**			0.0142	<0.000387	0.00359	<0.000260	<0.000384	<0.000367	0.00841	<0.000341	<0.000412	<0.00106	<0.000398
	KWB-11A	Oct-17		0.371	**12.2**			**0.0230**	0.00129	**0.0116**	<0.000260	<0.000384	0.00273	0.00563	<0.000341	<0.000412	<0.00106	<0.000398
	KWB-11B	Apr-15		<0.0310	0.0365 J			<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.00121	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	KWB-11B	Oct-15		<0.0314	<0.0247			0.000489 J	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	KWB-11B	Apr-16		<0.0314	<0.0247			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	KWB-11B	Oct-16		0.0565 JB	0.0388 J			0.000394 J	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	0.00153 JJ4	<0.000341	<0.000780	<0.00106	<0.000398
	KWB-11B	Apr-17		<0.0314	0.0339 J			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	KWB-11B	Oct-17		<0.0314	**0.203**			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000565 J	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	KWB-12A	Apr-15		<0.0310	0.0310 J			0.000452 J	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	KWB-12A	Apr-15	FD	<0.0310	**0.305**			<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	KWB-12A	Oct-15		<0.0314	<0.0247			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	KWB-12A	Apr-16		<0.0314	0.0377 J			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	KWB-12A	Oct-16		0.0348 JB	0.0329 J			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	KWB-12A	Apr-17		<0.0314	0.0359 J			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	KWB-12A	Oct-17		0.0318 J	**0.0474** J			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	KWB-12B	Apr-15		<0.0310	**0.0740** J			<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	KWB-12B	Oct-15		<0.0314	<0.0247			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	KWB-12B	Oct-15	FD	<0.0314	0.0372 J			0.000895 J	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	0.000692 J	<0.000780	0.00226 J	<0.000398
	KWB-12B	Apr-16		<0.0314	<0.0247			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	KWB-12B	Apr-16	FD	<0.0314	<0.0247			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	KWB-12B	Oct-16		0.0581 JB	0.0351 J			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	KWB-12B	Oct-16	FD	0.0416 JB	**0.0806** J			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	0.0139	<0.000341	<0.000780	<0.00106	<0.000398
	KWB-12B	Apr-17		<0.0314	<0.0247			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	KWB-12B	Apr-17	FD	<0.0314	<0.0247			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	KWB-12B	Oct-17		<0.0314	**0.0424** J			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	KWB-12B	Oct-17	FD	<0.0314	**0.0765** J			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	KWB-P4	Apr-13			**<0.0520**			<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500
	KWB-P4	Apr-15			**0.0820** J			<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	KWB-P4	Apr-17			**0.0526** J			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-57	Apr-15		<0.0310	**0.200**			0.00163	0.000463 J	<0.000330	<0.000260	0.000667 J	<0.000370	0.00156 J	0.000561 J	<0.000780	0.00197 J	<0.000400
	MW-57	Oct-15		<0.0314	**0.242**			<0.000373	<0.000387	0.00123 J	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-57	Apr-16		<0.0314	**0.198**			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-57	Oct-16		0.0467 JB	**0.103**			<0.000373	<0.000387	0.000681 J	<0.000260	<0.000384	<0.000367	<0.00100 J4	<0.000341	<0.000780	<0.00106	<0.000398
	MW-57	Apr-17		<0.0314	**0.195**			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-57	Oct-17		<0.0314	**0.0940** J			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	0.00273 J	<0.000341	<0.000412	<0.00106	<0.000398
	MW-58	Apr-15			**9.00**			**1.04**	**0.195**	**6.03**	<0.00260	**1.98**	0.0187	**0.318**	0.0830	0.0174 J	**2.16**	<0.00400
	MW-58	Oct-15			**5.11**			**0.893**	0.0651 J	**6.89**	<0.0260	**2.00**	<0.0367	**0.354** J	0.0603 J	<0.0780	**2.18**	**<0.0398**
	MW-58	Apr-16			**6.27**			**0.753**	0.0179	**4.12**	<0.00260	**1.11**	**0.200**	**0.257**	0.0183	0.00806 J	**0.848**	<0.00398
	MW-58	Oct-16			**7.78**			**0.387**	0.00321	**5.92**	<0.000260	**1.10**	0.0468	**0.0867**	0.0201	0.0159	**0.893**	<0.000398
	MW-58	Apr-17			**7.23**			**0.517**	<0.0387	**3.00**	<0.0260	**0.720**	<0.0367	**0.191** J	<0.0341	<0.0412	0.533	**<0.0398**
	MW-58	Oct-17			**9.77**			**0.166**	0.00130	**4.08**	<0.000260	0.0965	0.0987	**0.0469**	0.00179	0.0101	0.222	<0.000398
	MW-111	Apr-15		1.37	**1.90**			0.00256	0.000567 J	**0.0755**	<0.000260	0.00824	<0.000370	0.00294 J	0.00158	<0.000780	0.00881	<0.000400
	MW-111	Oct-15		0.674	**2.10**			0.00122	<0.000387	**0.0243**	<0.000260	0.00615	**1.32**	0.00645	<0.000341	<0.000780	0.00113 J	<0.000398
	MW-111	Apr-16		1.31	**2.04**			<0.000373	<0.000387	**0.0299**	<0.000260	0.00122	**1.54**	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-111	Oct-16		1.13	**2.04**			0.00215	<0.000387	**0.0432**	<0.000260	0.00226	**1.29**	0.00103 J	<0.000341	<0.000780	0.00177 J	<0.000398
	MW-111	Apr-17		1.27	**2.08**			0.00219	<0.000387	**0.0205**	<0.000260	0.000432 J	**0.955**	0.00310 J	<0.000341	<0.000412	0.00237 J	<0.000398
	MW-111	Oct-17		1.28	**2.39**			0.00188	<0.000387	**<0.0331**	<0.000260	<0.0384	**1.40**	0.00175 J	<0.0341	<0.000412	<0.106	<0.000398
	MW-113	Apr-15		<0.0310	**0.330**			<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.0178	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-113	Apr-15	FD	<0.0310	**0.241**			0.000538 J	<0.000390	0.000402 J	<0.000260	<0.000380	0.0158	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-113	Oct-15		<0.0314	**0.115**			<0.000373	<0.000387	0.000477 J	<0.000260	<0.000384	0.0158	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-113	Oct-15	FD	<0.0314	**0.0917** J			<0.000373	<0.000387	0.000533 J	<0.000260	<0.000384	0.0176	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-113	Apr-16		0.581	**0.156**			0.000753 J	<0.000387	**0.0136**	<0.000260	0.00354	0.0143	<0.00100	<0.000341	<0.000780	0.00518	<0.000398
	MW-113	Apr-16	FD	0.627	**0.180**			0.000813 J	<0.000387	**0.0148**	<0.000260	0.00364	0.0143	<0.00100	<0.000341	<0.000780	0.00531	<0.000398
	MW-113	Oct-16		0.215 B	**0.236**			0.00977	<0.000387	**0.00660**	<0.000260	0.0199	0.0137	0.00208 JJ4	<0.000341	<0.000780	0.0143	<0.000398
	MW-113	Oct-16	FD	0.218 B	**0.188**			0.00933	<0.000387	**0.00588**	<0.000260	0.0175	0.0143	0.00200 JJ4	<0.000341	<0.000780	0.0127	<0.000398
	MW-113	Apr-17		0.984	**0.169**			0.00389	<0.000387	**0.0136**	<0.000260	0.00840	0.0147	0.00157 J	<0.000341	<0.000412	0.0133	<0.000398
	MW-113	Apr-17	FD	1.03	**0.214**			0.00448	<0.000387	**0.0145**	<0.000260	0.00937	0.0140	0.00176 J	<0.000341	<0.000412	0.0148	<0.000398
	MW-113	Oct-17		0.444	**0.335**			**0.0229**	0.000442 J	**0.0132**	<0.000260	0.0269	0.0123	0.00420 J	<0.000341	0.000501 J	0.0279	<0.000398
	MW-113	Oct-17	FD	0.368	**0.355**			**0.0212**	<0.000387	**0.0138**	<0.000260	0.0215	0.0117	0.00399 J	<0.000341	0.000660 J	0.0234	<0.000398
	MW-125	Apr-15		<0.0310 J	<0.0250 B			<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-125	Oct-15		<0.0314	**0.0523** J			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-125	Apr-16		<0.0314	**0.0578** J			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-125	Oct-16		<0.0314	**0.0756** J			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-125	Apr-17		<0.0314	**0.0964** J			<0.000373	<0.000387	0.000603 J	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-125	Oct-17		<0.0314	**0.0631** J			<0.000373	<0.000387	0.000404 J	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-126A	Apr-15		<0.0310	**0.757**			0.000397 J	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-126A	Oct-15		0.640	**0.569**			0.00251	<0.000387	**0.0447**	<0.000260	0.00475	<0.000367	<0.00100	<0.000341	0.000858 J	0.0103	<0.000398
	MW-126A	Apr-16		0.202	**0.751**			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-126A	Oct-16		0.702	**0.924**			<0.000373	<0.000387	**0.0503**	<0.000260	<0.000384	<0.000367	<0.00100 J4	<0.000341	<0.000780	<0.00106	<0.000398
	MW-126A	Apr-17		0.209	**0.665**			<0.000373	<0.000387	0.000354 J	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	0.00141 J	<0.000398
	MW-126A	Oct-17		0.223	**0.793**			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-126B	Apr-15		<0.0310	**0.392**			0.000409 J	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-126B	Oct-15		<0.0314	**0.140**			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-126B	Apr-16		<0.0314	**0.361**			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-126B	Oct-16		0.0546 JB	**0.346**			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100 J4	<0.000341	<0.000780	<0.00106	<0.000398
	MW-126B	Apr-17		<0.0314	**0.245**			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-126B	Oct-17		<0.0314	**0.329**			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-127	Apr-15		9.73	**1.68**			**0.126**	0.00854	**4.41**	<0.000260	0.424	**0.868**	**0.0658**	0.142	0.183	0.296	<0.000400
	MW-127	Oct-15		6.54	**0.585**			**0.0980**	<0.00774	**1.51**	<0.00520	0.299	**0.730**	**0.0415** J	0.0552	0.216	0.141	**<0.00796**
	MW-127	Apr-16		6.40	**1.43**			**0.0941**	0.00632	**2.01**	<0.000260	0.348	**0.629**	**0.0425**	0.0375	0.287	0.149	<0.000398
	MW-127	Oct-16		3.81 B	**1.22**			**0.0332**	<0.00387	**0.644**	<0.00260	0.120	**0.575**	<0.0100 J4	0.0127	0.0877	0.0514	<0.00398
	MW-127	Apr-17		4.45	**1.38**			**0.0562**	0.00490	**1.04**	<0.000260	0.186	**0.525**	0.0175	0.00990	0.0958	0.0810	<0.000398
	MW-127	Oct-17		1.68	**1.41**			**0.0327**	0.00452	**0.462**	<0.000260	0.0937	**0.885**	0.00901	0.00373	0.0396	0.0482	<0.000398
	MW-128	Apr-15		1.23 J	**3.00**			0.00374	0.000551 J	**0.297**	<0.000260	0.0114	**1.60**	0.00346 J	<0.000340	0.000928 J	0.00326	<0.000400
	MW-128	Oct-15		0.644	**1.78**			<0.00746	<0.00774	**0.0297**	<0.00520	<0.00768	**0.860**	<0.0200	<0.00682	<0.0156	<0.0212	<0.000400
	MW-128	Apr-16		0.620	**2.45**			0.00209	<0.000387	**0.0231**	<0.000260	0.00494	**0.846**	0.00104 J	<0.000341	<0.000780	0.00153 J	<0.000398
	MW-128	Oct-16		0.907	**2.75**			0.00197	<0.000387	**0.109**	<0.000260	0.00408	**0.832**	0.00225 J	<0.000341	<0.000780	0.00370	<0.000398
	MW-128	Apr-17		1.09	**2.42**			0.00276	<0.000387	**0.0563**	<0.000260	0.00166	**0.821**	0.00140 J	<0.000341	<0.000412	0.00159 J	<0.000398
	MW-128	Oct-17		1.14	**2.37**			0.00233	<0.000387	**0.0701**	<0.000260	0.00128	**0.785**	0.00142 J	<0.000341	0.000781 J	0.00336	<0.000398

Table 4A - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons and Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	TPH			Volatile Organic Compounds										
				Analyte:	GRO	DRO	DRO - EP	1,2,4-TMB	1,3,5-TMB	Benzene	cis-1,2-DCE	Ethyl-benzene	MTBE	Naphthalene	o-Xylene	Toluene	Total Xylenes	Trichloro-ethene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473	0.015	0.12	0.005	0.07	0.7	0.143	0.03	0.193	0.75	0.62	0.005
				CGWSL Source:		NMED TPH	NMED TPH	USEPA TW	USEPA TW	USEPA MCL	USEPA MCL	USEPA MCL	WQCC TW	WQCC HH	WQCC TW	WQCC HH	WQCC HH	USEPA MCL
Area	**Well ID**	**Date**	**Dup**															
Field East of Refinery	MW-129	Apr-15		3.29	**2.45**		0.00286	0.000679 J	**0.0372**	<0.000260	0.00131	**7.04**	0.00407 J	0.00112	<0.000780	0.00357	<0.000400
	MW-129	Oct-15		4.11 J	**1.31**		**<0.0373**	<0.0387	**<0.0331**	<0.0260	<0.0384	**5.79**	**<0.100**	<0.0341	<0.0780	<0.106	**<0.0398**
	MW-129	Apr-16		2.70	**1.68**		0.00382	0.000880 J	**<0.0166**	<0.000260	<0.0192	**4.59**	0.00534	0.000796 J	<0.0390	0.00278 J	<0.000398
	MW-129	Oct-16		2.17	**1.68**		0.00143	0.000479 J	**0.00791**	<0.000260	0.000985 J	**4.73**	0.00186 JJ4	<0.000341	0.000920 J	0.00124 J	<0.000398
	MW-129	Apr-17		1.79	**2.13**		0.00101	<0.000387	0.00299	<0.000260	<0.000384	**4.34**	0.00247 J	<0.000341	0.000543 J	<0.00106	<0.000398
	MW-130	Apr-15		<0.0310 J	**0.960**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.000510 J	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-130	Oct-15		<0.0314	**0.508**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000449 J	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-130	Apr-16		<0.0314	**1.08**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000538 J	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-130	Oct-16		0.200	**1.09**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00130	0.00112 J	<0.000341	<0.000780	<0.00106	<0.000398
	MW-130	Apr-17		<0.0314	**1.08**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00130	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-130	Oct-17		<0.0314	**1.22**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00136	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-131	Apr-15		7.68	**2.80**		**0.0486**	0.0119	**1.91**	<0.000260	0.0692	**5.23**	**0.0468**	0.0606	0.215	0.145	<0.000400
	MW-131	Oct-15		6.76	**4.00**		**0.0231**	0.00694	**2.19**	<0.000260	0.0480	**4.54**	**0.0589**	0.0243	0.0522	0.0859	<0.000398
	MW-131	Apr-16		9.16	**2.12**		**0.0212**	0.00562	**2.42**	<0.000260	0.0535	**3.69**	**0.0353**	0.0370	0.142	0.0883	<0.000398
	MW-131	Oct-16		6.31	**1.86**		0.0133	0.00398 J	**1.58**	<0.00130	0.0324	**4.09**	0.0135 JJ4	0.0182	0.0299	0.0613	<0.00199
	MW-131	Apr-17		6.81	**1.77**		0.0137	0.00348	**3.09**	<0.000260	0.0532	**3.99**	0.0295	0.0406	0.153	0.114	<0.000398
	MW-131	Oct-17		4.95	**1.58**		**<0.0932**	0.00174	**1.39**	<0.000260	<0.0960	**5.25**	**0.0303**	<0.0852	0.0627	<0.265	<0.000398
	MW-133	Nov-14		9.40	**2.80**		**0.280**	0.0530 J	**0.620**	<0.0260	0.300	**5.60**	**<0.100**	0.0380 J	0.100 J	0.220 J	**<0.0400**
	MW-133	Apr-15		11.3	**3.10**		**0.138**	<0.0390	**0.788**	<0.0260	0.199	**6.67**	**<0.100**	<0.0340	<0.0780	<0.110	**<0.0400**
	MW-134	Apr-15		<0.0310	**0.100**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-134	Apr-15	FD	<0.0310	**0.0886** J		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-134	Oct-15		<0.0314	**0.0503** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-134	Oct-15	FD	<0.0314	**0.0457** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-134	Apr-16		0.0420 J	**0.0971** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.00100	<0.000780	<0.00106	<0.000398
	MW-134	Apr-16	FD	<0.0314	**0.0774** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-134	Oct-16		<0.0314	**0.184**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-134	Oct-16	FD	<0.0314	**0.135**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-134	Apr-17		<0.0314	**0.0894** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-134	Apr-17	FD	<0.0314	**0.0738** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-134	Oct-17		<0.0314	**0.109**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-134	Oct-17	FD	<0.0314	**0.250**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-135	Apr-15		<0.0310	**0.0823** J		0.000793 J	<0.000390	<0.000330	<0.000260	<0.000380	0.000829 J	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-135	Oct-15		<0.0314	**0.0571** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000608 J	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-135	Apr-16		<0.0314	**0.162**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00197	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-135	Oct-16		0.0638 JB	**0.147**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000685 J	<0.00100 J4	<0.000341	<0.000780	<0.00106	<0.000398
	MW-135	Apr-17		<0.0314	**0.0767** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-135	Oct-17		<0.0314	**0.102**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	RA-4196	Apr-15					<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.00173	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	RA-4196	Oct-15					<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00394	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	RA-4196	Apr-16					<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00507	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	RA-4196	Oct-16					<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00657	<0.00100 J4	<0.000341	<0.000780	<0.00106	<0.000398
	RA-4196	Apr-17					<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00618	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	RA-4196	Oct-17					<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00763	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	RA-4798	Apr-15					<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.0163	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	RA-4798	Oct-15					<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00858	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	RA-4798	Apr-16					<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.0121	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	RA-4798	Oct-16					<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.0124	<0.00100 J4	<0.000341	<0.000780	<0.00106	<0.000398
	RA-4798	Apr-17					<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00360	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	RA-4798	Oct-17					<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00889	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	RW-12R	Apr-16			**1.38**		0.0145	<0.00194	**0.424**	<0.00130	0.00606	0.00568	<0.00500	<0.00170	<0.00390	0.0140 J	<0.00199
	RW-12R	Apr-17			**1.61**		**0.0338**	<0.00194	**0.335**	<0.00130	0.00823	0.00210 J	0.00877 J	0.00177 J	0.00354 J	0.0257	<0.00199
	RW-13R	Apr-16			**0.808**		**0.0443**	0.00539	**0.878**	<0.000260	0.0691	0.0779	0.0148	0.0139	0.0175	0.108	<0.000398
	RW-18	Apr-14					<0.000373	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	RW-18	Apr-15					<0.000373	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	RW-18	Apr-16					<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	RW-18	Apr-17					<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	RW-20	Apr-15			**2.10**		**0.539**	0.113	**1.87**	<0.00260	**0.973**	**0.209**	**0.183**	0.0590	0.211	**1.35**	<0.00400
	RW-22	Apr-15			**5.40**		**0.575**	0.0853	**4.07**	<0.00260	**1.09**	**0.178**	**0.164**	0.0952	0.216	**0.945**	<0.00400
North Refinery	MW-23	Apr-15		31.1	**6.79**		**0.473**	0.0997	**11.6**	<0.00650	0.146	0.0253	**0.150** J	0.181	0.431	**1.37**	**<0.0100**
	MW-23	Oct-15		34.0	**41.8**		0.000677 J	<0.000387	**20.3**	<0.000260	0.519	0.0200	**0.213** J	0.00237	0.00501	0.00805	<0.000398
	MW-23	Apr-16		34.7	**28.7**		<0.00186	<0.00194	**15.5**	<0.00130	0.179	0.0297	**0.193**	0.00284 J	0.00412 J	0.0176	<0.00199
	MW-23	Oct-16		37.1	**21.2**		<0.00932	<0.00968	**12.2**	<0.00650	0.168	0.0433	**0.220**	<0.00852	<0.0195	<0.0265	**<0.00995**
	MW-23	Apr-17		29.1	**2.78**		<0.000373	<0.000387	**8.49**	<0.000260	0.0958	0.0270	**0.190**	0.00188	0.00243	0.00549	<0.000398
	MW-23	Oct-17		17.6	**32.0**		0.000578 J	<0.000387	**8.11**	<0.000260	0.0421	0.0203	**0.137**	0.00198	0.00561	0.00525	<0.000398
	MW-29	Apr-15		<0.0310	**1.20**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-29	Oct-15		0.0738 J	**0.658**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-29	Apr-16		<0.0314	**1.27**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-29	Oct-16		<0.0314	**1.04**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000424 J	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-29	Apr-17		<0.0314	**0.857**		<0.000373	<0.000387	0.000616 J	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-29	Oct-17		<0.0314	**4.44**		<0.000373	<0.000387	0.000442 J	<0.000260	<0.000384	0.000990 J	<0.00100	<0.000341	0.000676 J	<0.00106	<0.000398
	MW-39	Apr-15		0.147	**5.20**		<0.000370	<0.000390	<0.000330	<0.000260	0.000713 J	<0.000370	<0.00100	0.00632	0.00137 J	0.00753	<0.000400
	MW-39	Oct-15		0.0759 J	**3.83**		0.000527 J	<0.000387	<0.000331	<0.000260	0.000727 J	<0.000367	0.00583	0.00530	0.00108 J	0.00645	<0.000398
	MW-39	Apr-16		5.16	**12.5**		**0.0526**	<0.00968	**2.14**	<0.00650	0.0211 J	<0.00918	<0.0250	0.0365	0.0293 J	0.181	**<0.00995**
	MW-39	Oct-16		7.24	**9.26**		**0.0673** J	<0.0387	**3.62**	<0.0260	<0.0384	<0.0367	**<0.100**	0.0428 J	<0.0780	0.204 J	**<0.0398**
	MW-39	Apr-17		5.20	**9.81**		**0.0710**	0.00534 J	**1.33**	<0.00260	0.0284	0.00429 J	0.0158 J	0.0454	0.0251	0.186	<0.00398
	MW-39	Oct-17		2.66	**9.16**		**0.0599**	0.00604	**0.476**	<0.000260	0.0206	0.00243	0.00239 J	0.0368	0.00816	0.150	<0.000398
	MW-40	Apr-14		1.01	**0.880**		<0.000373	<0.000387	**0.0110**	<0.00060	<0.000500	<0.000600	0.00280 J	<0.000500	<0.000500	0.00560 J	<0.000500
	MW-40	Apr-15		0.735	**4.50**		<0.000373	<0.000387	**0.0198**	<0.000260	0.000399 J	<0.000370	<0.00100	<0.000340	<0.000780	0.00606	<0.000400
	MW-40	Apr-16		1.03	**4.92**		0.000760 J	<0.000387	**0.0112**	<0.000260	0.000609 J	<0.000367	<0.00100	<0.000341	<0.000780	0.0144	<0.000398
	MW-40	Apr-17		1.29	**4.15**		0.000538 J	<0.000387	**0.00857**	<0.000260	0.000721 J	<0.000367	<0.00100	<0.000341	0.000732 J	0.0117	<0.000398
	MW-41	Apr-14		0.233	**0.300**		<0.00050	<0.000600	**0.0180**	<0.00060	<0.000500	0.00360 J	0.00260 J	<0.000500	<0.000500	<0.00150	<0.000500
	MW-41	Apr-15		0.103	**1.60**		<0.000370	<0.000390	0.00190	<0.000260	<0.000380	0.00440	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-41	Apr-16		0.171	**2.26**		<0.000373	<0.000387	0.00360	<0.000260	<0.000384	0.00384	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-41	Apr-17		0.249	**1.58**		<0.000373	<0.000387	0.00339	<0.000260	<0.000384	0.00380	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-42	Apr-14		2.90	**1.40**		**0.0630**	<0.000600	**0.540**	<0.00060	0.00300 J	0.0220	0.00430 J	0.00110 J	0.00230 J	0.110	<0.000500
	MW-42	Apr-15		1.37	**7.00**		**0.0247**	<0.00390	**0.216**	<0.00260	<0.00380	0.0145	<0.0100	<0.00340	<0.00780	0.0484	<0.00400
	MW-42	Apr-16		0.737	**5.88**		**0.0169**	<0.00194	**0.103**	<0.00130	<0.00192	0.0114	<0.00500	<0.00170	<0.00390	0.0380	<0.00199
	MW-42	Apr-17		0.262	**3.41**		0.00352	<0.000387	**0.0240**	<0.000260	<0.000384	0.0104	<0.00100	<0.000341	0.000845 J	0.00365	<0.000398
	MW-43	Apr-15		2.65	**8.04**		**0.0576**	0.00448 J	**0.992**	<0.00260	0.0483	0.0162	<0.0100 J	0.0227	0.0538	0.300	<0.00400
	MW-43	Oct-15		30.5	**9.95**		**0.477**	0.101	**13.0**	<0.00260	0.179	0.0274	**0.212**	**0.333**	**0.808**	**1.48**	<0.00398
	MW-43	Apr-16		31.6	**6.24**		**0.502**	0.112 J	**12.4**	<0.0650	**0.968**	<0.0918	**<0.250**	**0.626**	**1.66**	**1.86**	**<0.0995**
	MW-43	Oct-16		38.0	**6.51**		**0.433**	<0.0968	**12.4**	<0.0650	**0.810**	<0.0918	**<0.250**	**0.555**	0.618 J	**1.81**	**<0.0995**
	MW-43	Apr-17		29.6	**6.53**		**0.497**	0.108	**9.62**	<0.0130	0.445	0.0484 J	**0.163** J	**0.539**	0.519	**1.80**	**<0.0199**
	MW-43	Oct-17		28.0	**6.03**		**0.839**	**0.182**	**10.7**	<0.0130	0.197	0.0578	**0.305**	**0.421**	0.285	**1.76**	**<0.0199**
	MW-59	Apr-14		0.247	**0.0680**		<0.00050	<0.000600	**0.0130**	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	MW-59	Apr-15		<0.0310	**0.860**		<0.000370	<0.000390	**0.0119**	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-59	Apr-16		<0.0314	**0.919**		<0.000373	<0.000387	0.00329	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-59	Apr-17		0.163	**0.835**		<0.000373	<0.000387	0.00218	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-60	Apr-15		0.238	**1.10**		0.000879 J	<0.000390	**0.0127** J	<0.000260	0.000627 J	<0.000370	<0.00100	<0.000340	<0.000780	0.00280 J	<0.000400
	MW-60	Apr-15	FD	0.228	**1.00**		0.000430 J	<0.000390	**0.00829** J	<0.000260	0.000450 J	<0.000370	<0.00100	<0.000340	<0.000780	0.00163 J	<0.000400
	MW-60	Oct-15		0.241	**0.803**		<0.000373	<0.000387	0.00326	<0.000260	0.000394 J	<0.000367	<0.00100	<0.000341	<0.000780	0.00176 J	<0.000398
	MW-60	Oct-15	FD	0.249	**0.627**		<0.000373	<0.000387	0.00307	<0.000260	0.000395 J	<0.000367	<0.00100	<0.000341	<0.000780	0.00181 J	<0.000398
	MW-60	Apr-16		0.575	**1.21**		<0.000373	<0.000387	0.00473	<0.000260	0.000604 J	<0.000367	<0.00100	<0.000341	<0.000780	0.00283 J	<0.000398
	MW-60	Apr-16	FD	0.396	**1.19**		0.000402 J	<0.000387	**0.00565**	<0.000260	0.000533 J	<0.000367	<0.00100	<0.000341	<0.000780	0.00272 J	<0.000398

Table 4A - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons and Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	TPH			Volatile Organic Compounds										
				Analyte:	GRO	DRO	DRO - EP	1,2,4-TMB	1,3,5-TMB	Benzene	cis-1,2-DCE	Ethyl-benzene	MTBE	Naphthalene	o-Xylene	Toluene	Total Xylenes	Trichloro-ethene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473	0.015	0.12	0.005	0.07	0.7	0.143	0.03	0.193	0.75	0.62	0.005
				CGWSL Source:		NMED TPH	NMED TPH	USEPA TW	USEPA TW	USEPA MCL	USEPA MCL	USEPA MCL	WQCC TW	WQCC HH	WQCC TW	WQCC HH	WQCC HH	USEPA MCL
Area	**Well ID**	**Date**	**Dup**															
North Refinery	MW-60	Oct-16		0.331	**0.628**		0.000948 J	<0.000387	**0.00898**	<0.000260	0.000935 J	<0.000367	<0.00100	<0.000341	<0.000780	0.00736	<0.000398	
	MW-60	Oct-16	FD	0.251	**0.573**		0.000618 J	<0.000387	**0.00574**	<0.000260	0.000825 J	<0.000367	<0.00100	<0.000341	<0.000780	0.00552	<0.000398	
	MW-60	Apr-17		0.309	**0.923**		<0.000373	<0.000387	0.00262	<0.000260	0.000481 J	<0.000367	<0.00100	<0.000341	<0.000412	0.00195 J	<0.000398	
	MW-60	Apr-17	FD	0.343	**0.947**		<0.000373	<0.000387	**0.00526**	<0.000260	0.000556 J	<0.000367	<0.00100	<0.000341	<0.000412	0.00240 J	<0.000398	
	MW-60	Oct-17		0.479	**1.07**		0.000685 J	<0.000387	**0.0110**	<0.000260	0.00137	<0.000367	<0.00100	<0.000341	0.000476 J	0.00622	<0.000398	
	MW-60	Oct-17	FD	0.469	**1.54**		0.000753 J	<0.000387	**0.0122**	<0.000260	0.00121	<0.000367	<0.00100	<0.000341	<0.000412	0.00514	<0.000398	
	MW-61	Apr-15		6.77	**9.40**		**0.531**	**0.130**	**1.74** J	<0.00260	0.209	<0.00370	**0.176** J	0.00784 J	0.0130 J	**1.69**	<0.00400	
	MW-61	Oct-15		5.13	**3.32**		**0.233**	<0.00387	**0.681**	<0.00260	0.0659	<0.00367	**0.0668**	0.00496 J	0.0379 J	0.374	<0.00398 J	
	MW-61	Apr-16		2.60	**3.59**		**0.139**	<0.00194	**0.493**	<0.00130	0.0292	<0.00184	**0.0340**	0.00263 J	0.0185 J	0.226	<0.00199	
	MW-61	Oct-16		4.21	**3.55**		**0.119**	<0.00968	**0.501**	<0.00650	0.0353	<0.00918	**0.0335** J	<0.00852	0.0260 J	0.225	**<0.00995**	
	MW-61	Apr-17		6.48	**2.70**		**0.118**	<0.00968	**0.769**	<0.00650	0.0225 J	<0.00918	**0.0307** J	<0.00852	0.0312	0.228	**<0.00995**	
	MW-61	Oct-17		7.01	**4.21**		**0.141**	0.00349	**0.976**	<0.000260	0.0420	<0.000367	**0.0522**	0.00327	0.0612	0.378	<0.000398	
	MW-62	Apr-15		21.1	**36.9**		<0.00370	<0.00390	**12.8**	<0.00260	0.457	0.0151	**0.158** J	<0.00340	<0.00780	0.0405	<0.00400	
	MW-62	Oct-15		18.5	**7.62**		**0.662**	**0.158**	**1.50**	<0.00520	0.163	<0.00734	**0.186**	0.00886 J	<0.0156	**1.73**	**<0.00796** J	
	MW-62	Apr-16		7.81	**7.54**		**0.502**	0.114	**1.12**	<0.00650	0.356	<0.00918	**0.236**	<0.00852	<0.0195	**1.80**	**<0.00995**	
	MW-62	Oct-16		11.3	**4.72**		**0.620** J6	**0.149** J6	**3.28** J6	<0.0260 J6	0.0535 JJ6	<0.0367 J6	**0.189** JJ6	<0.0341 J6	<0.0780 J6	**1.14** J6	**<0.0398** J6	
	MW-62	Apr-17		8.61	**5.93**		**0.646**	**0.149**	**1.59**	<0.0130	0.248	<0.0184	**0.204** J	<0.0170	<0.0206	**1.13**	**<0.0199**	
	MW-62	Oct-17		9.55	**8.69**		**0.759**	**0.173**	**0.984**	<0.0260	0.268	<0.0367	**0.206** J	<0.0341	<0.0412	**1.35**	**<0.0398**	
	MW-67	Apr-15		0.784	**8.40**		0.00500 J	<0.00190	**0.143**	0.00198	0.00447	**0.869**	<0.00100	<0.000340	0.00260 J	0.00291 J	<0.000400	
	MW-67	Oct-15		2.16	**5.18**		0.00108	<0.000390	**0.172**	<0.00520	<0.00768	**0.924**	<0.0200	<0.00682	<0.0156	<0.0212	**<0.00796**	
	MW-67	Apr-16		1.29	**11.1**		<0.00746	<0.00774	**0.223**	0.00527 J	0.00869 J	**0.359**	<0.0100	<0.00341	<0.00780	<0.0106	<0.00398	
	MW-67	Oct-16		1.03	**9.36**		0.0108	<0.00387	**0.214**	0.00322 J	0.0124	**0.253**	0.0298 J	0.00407 J	<0.00780	0.0120 J	<0.00398	
	MW-67	Apr-17		1.77	**9.40**		0.00498 J	<0.00194	**0.191**	0.00265	0.0128	**0.195**	0.00571 J	<0.00170	0.00361 J	0.0121 J	<0.00199	
	MW-67	Oct-17		0.649	**8.48**		0.00119	<0.000387	**0.130**	0.00275	0.00330	**0.201**	<0.00100	<0.000341	0.00140	0.00245 J	0.000515 J	
	MW-90	Apr-15		0.242	**7.68**		<0.000370	<0.000390	**0.0125**	<0.000260	0.000433 J	0.00575	0.00178 J	<0.000340	0.00194 J	<0.00110	<0.000400	
	MW-90	Oct-15		0.166	**0.992**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398	
	MW-90	Apr-16		0.119	**4.03**		<0.000373	<0.000387	**0.00662**	0.000294 J	<0.000384	<0.000367	0.00105 J	<0.000341	<0.000780	<0.00106	<0.000398	
	MW-90	Oct-16		<0.0314	**1.11**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398	
	MW-90	Apr-17		0.217	**4.20**		<0.000373	<0.000387	0.00225	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398	
	MW-90	Oct-17		0.160	**4.63**		<0.000373	<0.000387	0.00311	<0.000260	<0.000384	<0.000367	<0.00100	0.000368 J	0.000744 J	<0.00106	<0.000398	
	MW-91	Apr-15		14.7	**15.9**		**0.184**	0.0476	**2.91**	<0.00260	0.491	<0.00370	**0.0490** J	0.150	**1.91**	**0.852**	<0.00400	
	MW-91	Oct-15		12.2	**20.3**		**0.226**	0.0626	**3.47**	<0.00650	0.449	<0.00918	**0.0884** J	0.180	0.652	**0.933**	**<0.00995**	
	MW-91	Apr-16		22.1	**22.2**		**0.266**	0.0719	**3.85**	<0.0130	**0.899**	<0.0184	**0.124** J	**0.365**	**4.01**	**1.69**	**<0.0199**	
	MW-91	Oct-16		20.6	**16.3**		**0.218** J	<0.0968	**3.15**	<0.0650	**0.816**	<0.0918	**<0.250**	**0.310**	**3.33**	**1.58**	**<0.0995**	
	MW-91	Apr-17		17.0	**19.8**		**0.235**	0.0634 J	**2.67**	<0.0260	0.473	<0.0367	**<0.100**	**0.216**	**1.61**	**1.05**	**<0.0398**	
	MW-91	Oct-17		13.6	**17.9**		**0.221**	0.0693 J	**3.36**	<0.0260	0.384	<0.0367	**<0.100**	**0.219**	**1.12**	**0.975**	**<0.0398**	
	MW-92	Apr-16		5.50	**20.4**		**0.0588**	0.0174	**2.87**	0.0640	0.462	0.113	**0.224** J	0.0268	0.0173	0.188	<0.000398	
	MW-92	Oct-16		6.05	**22.8**		**0.0308**	0.00835 J	**2.05**	**0.0968**	0.400	0.134	**0.174**	0.0151 J	<0.0156	0.110	**<0.00796**	
	MW-93	Apr-15		3.67	**15.3**		**0.206**	0.0368	**0.734** J	<0.00260	0.0675	<0.00370	**0.0554** J	0.00938 J	0.00961 J	0.319	<0.00400	
	MW-93	Oct-15		5.14	**16.5**		**0.241**	0.0414	**1.21**	<0.00260	0.0717	<0.00367	**0.100**	0.0110	0.0170 J	0.494	<0.00398	
	MW-93	Apr-16		1.06	**7.83**		**0.0331**	0.00543	**0.258**	<0.00130	0.0106	<0.00184	0.0113 J	<0.00170	<0.00390	0.0567	<0.00199	
	MW-93	Oct-16		2.57	**8.66**		**0.103**	0.0146	**0.567**	<0.00260	0.0114	<0.00367	**0.0326** J	<0.00341	<0.00780	0.250	<0.00398	
	MW-93	Apr-17		3.73	**7.89**		**0.148**	0.0236 J	**0.633**	<0.00650	<0.00960	<0.00918	**0.0422** J	<0.00852	<0.0103	0.326	**<0.00995**	
	MW-94	Oct-15		6.12	**25.6**		**0.432**	0.0857	**0.339**	<0.00260	0.509	**0.798**	**0.202**	**0.360**	0.553	0.574	<0.00398	
	MW-94	Apr-16		7.91	**8.69**		**0.489**	0.100	**0.417**	0.0149 J	0.553	**0.621**	**0.228** J	**0.387**	0.687	0.615	**<0.0199**	
	MW-94	Oct-16		6.83	**9.76**		**0.458**	0.0917	**0.297**	<0.00130	0.564	**2.01**	**0.128**	**0.390**	0.468	0.592	<0.00199	
	MW-94	Apr-17		10.2	**9.96**		**0.398**	0.0785	**0.284**	<0.00650	0.432	**0.958**	**0.174**	**0.292**	0.435	0.460	**<0.00995**	
	MW-95	Apr-14		0.0926	**1.10**		<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500	
	MW-95	Apr-15		<0.0310	**7.58**		<0.000370	<0.000390	0.00148	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400	
	MW-95	Apr-16		0.129	**8.06**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000379 J	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398	
	MW-95	Apr-17		0.0826 J	**6.96**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398	
	MW-96	Apr-15		45.1	**12.0**		0.000553 J	<0.000390	0.00288	<0.000260	0.00172	**35.0**	0.00126 J	0.00110	0.00156 J	0.00547	<0.000400	
	MW-96	Oct-15		24.3	**9.23**		**<0.186**	**<0.194**	**<0.166**	**<0.130**	<0.192	**39.2**	**<0.500**	<0.170	<0.390	<0.530	**<0.199**	
	MW-96	Apr-16		25.3	**10.8**		<0.00746	<0.00774	<0.000331	<0.00520	<0.00768	**32.9**	<0.0200	<0.00682	<0.0156	<0.0212	**<0.00796**	
	MW-96	Oct-16		20.0	**7.74**		**<0.0186**	<0.0194	**<0.0166**	<0.0130	<0.0192	**39.6**	**<0.0500**	<0.0170	<0.0390	<0.0530	**<0.0199**	
	MW-96	Apr-17		25.1	**9.02**		**<0.0186**	<0.0194	**<0.0166**	<0.0130	<0.0192	**30.6**	**<0.0500**	<0.0170	<0.0206	<0.0530	**<0.0199**	
	MW-96	Oct-17		13.9	**7.85**		**<0.0186**	<0.0194	**<0.0166**	<0.0130	<0.0192	**40.0**	**<0.0500**	<0.0170	<0.0206	<0.0530	**<0.0199**	
	MW-98	Apr-15		19.3	**7.06**		**0.360**	0.0870	**4.17**	<0.00650	**0.927**	<0.00920	**0.174** J	0.0358	0.283	**1.74**	**<0.0100**	
	MW-98	Oct-15		18.6	**6.38**		**0.380**	0.0836	**4.79**	<0.00650	0.659	<0.00918	**0.237**	0.0316	0.268	**1.71**	**<0.00995**	
	MW-98	Apr-16		14.7	**6.88**		**0.177**	0.0462 J	**4.07**	<0.0260	0.430	<0.0367	**0.139** J	<0.0341	0.220 J	**0.865**	**<0.0398**	
	MW-98	Oct-16		20.0	**4.97**		**0.299**	0.0823 J	**3.59**	<0.0260	0.698	<0.0367	**<0.100**	<0.0341	0.245 J	**1.37**	**<0.0398**	
	MW-98	Apr-17		15.9	**5.94**		**0.382**	0.0852 J	**4.39**	<0.0260	**1.05**	<0.0367	**0.239** J	0.0443 J	0.356	**1.88**	**<0.0398**	
	MW-98	Oct-17		20.1	**5.92**		**0.488**	0.118	**4.09**	<0.0130	**1.26**	<0.0184	**0.245** J	0.0525	0.421	**2.21**	**<0.0199**	
	MW-137	Oct-15		30.0	**20.1**		**0.437**	0.102	**9.44**	<0.0260	**1.59**	0.0606 J	**0.215** J	**0.480**	**2.16**	**1.16**	**<0.0398**	
	MW-137	Apr-16		33.8	**11.8**		**0.460**	0.102 J	**9.65**	<0.0650	**1.65**	<0.0918	**0.262** J	**0.539**	**2.53**	**1.23**	**<0.0995**	
	MW-137	Oct-16		30.9	**9.65**		**0.421**	<0.0968	**10.5**	<0.0650	**1.54**	<0.0918	**<0.250**	**0.343**	**1.51**	**1.10**	**<0.0995**	
	MW-137	Apr-17		14.1 J	**12.6**		**0.414**	0.0969 J	**9.69**	<0.0520	**1.58**	<0.0734	**0.272** J	**0.427**	**2.08**	**1.15**	**<0.0796**	
	MW-137	Oct-17		33.1	**11.3**		**0.559**	**0.137** J	**12.5**	<0.0520	**1.53**	0.0754 J	**0.317** J	**0.265**	**1.54**	**1.16**	**<0.0796**	
	MW-138	Oct-15		5.08	**6.73**		**0.0792**	0.0189 J	**1.54**	<0.00520	0.569	0.0926	**0.0894** J	<0.00682	<0.0156	0.0339 J	**<0.00796**	
	MW-138	Apr-16		4.86	**15.5**		<0.00373	<0.00387	**1.46**	<0.00260	0.309	0.0955	**0.0959**	<0.00341	0.0158 J	<0.0106	<0.00398	
	MW-138	Oct-16		2.28	**10.3**		<0.00373	<0.00387	**0.494**	<0.00260	0.0149	0.0935	**0.0364** J	<0.00341	<0.00780	<0.0106	<0.00398	
	MW-138	Apr-17		1.00	**14.6**		<0.00373	<0.00387	**0.484**	<0.00260	0.0167	0.125	**0.0639**	<0.00341	<0.00412	<0.0106	<0.00398	
	MW-138	Oct-17		2.20	**15.0**		0.00547	<0.00194	**0.701**	<0.00130	0.0244	**0.163**	**0.0635**	<0.00170	0.00577	0.00565 J	<0.00199	
	RW-1	Apr-15		2.95 J	**12.0**		**<0.0190**	<0.0190	**0.962**	**1.02**	0.0470 J	<0.0180	**<0.0500**	<0.0170	<0.0390	<0.0530	**<0.0200**	
	RW-1R	Apr-16		2.13	**8.54**		0.00369	0.000516 J	**0.426**	**2.14**	0.0214	0.0133	0.00762	0.00110	0.00542	0.0122	**0.00959**	
	RW-1R	Apr-17		2.20	**21.5**		<0.00373	<0.00387	**0.696**	**0.624**	0.0169	0.0441	<0.0100	<0.00341	0.0102	<0.0106	**0.00896** J	
	RW-2	Apr-15		18.3	**19.7**		**0.330**	0.0772	**5.34**	**0.619**	**1.02**	<0.00370	**0.157** J	0.0853	0.115	0.530	**0.0326**	
	RW-2R	Apr-16		20.8	**17.3**		**0.188**	0.0419 J	**5.86**	**0.555**	0.591	0.0226 J	**0.145** J	0.0461 J	0.0569 J	0.299	**0.0285** J	
	RW-2R	Apr-17		17.2	**11.6**		**0.271**	0.0664	**7.78**	**0.828**	**0.837**	<0.0184	**0.145** J	0.0183 J	0.0430 J	0.431	**0.0249** J	
	RW-7	Apr-15		1.05	**9.70**		**0.0818**	0.000663 J	**0.0535**	<0.000260	0.0185	0.0122	0.0112	0.00176	0.00396 J	0.0367	<0.000400	
	RW-7R	Apr-16		0.0588 J	**1.97**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.0687	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398	
	RW-7R	Apr-17		<0.0314	**1.15**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.0325	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398	
	RW-8	Apr-15			**7.30**		0.00710 J	<0.00390	**0.0412**	<0.00260	0.00801 J	**2.41**	<0.0100	<0.00340	<0.00780	<0.0110	<0.00400	
	RW-8	Apr-17			**11.6**		**0.0928**	0.0249	**0.0718**	0.000478 J	0.0198	**1.94**	**0.0320**	0.0112	0.00213	0.0498	0.00110	
	RW-9	Apr-14		3.26	**0.480**		0.00650	<0.000600	**0.680**	<0.00060	0.00150 J	0.00340 J	0.00750	<0.000500	0.00190 J	0.0240	<0.000500	
	RW-9	Apr-15		2.55	**3.20**		**<0.0190**	<0.0190	**0.790**	<0.0130	<0.0190	<0.0180	**<0.0500**	<0.0170	<0.0390	<0.0530	**<0.0200**	
	RW-9	Apr-16		0.492 J	**3.44**		**0.0283**	<0.00194	**0.466**	<0.00130	0.00775	0.00656	0.00554 J	<0.00170	<0.00390	0.0708	<0.00199	
	RW-9	Apr-17		2.36	**3.21**		0.000991 J	<0.000387	**0.290**	<0.000260	0.00105	0.00435	<0.00100	<0.000341	0.00184	0.0193	<0.000398	
	RW-10	Apr-14		<0.0100	**0.150**		<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500	
	RW-10	Apr-15		<0.0310	**4.80**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400	
	RW-10	Apr-16		<0.157	**3.66**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398	
	RW-10	Apr-17		0.207	**2.90**		<0.000373	<0.000387	<0.000331	<0.000260	0.000403 J	<0.000367	<0.00100	0.00299	0.00119	0.00378	<0.000398	
	RW-16	Apr-14			**0.110**		<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	0.0130	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500	
	RW-16	Apr-14	FD		**0.230**		<0.000370	<0.000390	<0.000600	<0.00060	<0.000500	0.0120	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500	
	RW-16	Apr-15			**1.90**		<0.000373	<0.000387	<0.000330	<0.000260	<0.000380	0.0190	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400	
	RW-16	Apr-16			**2.29**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.0186	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398	
	RW-16	Apr-17			**1.08**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.0152	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398	
	RW-17	Apr-14		<0.0100	**0.110**		<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	0.00310 J	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500	
	RW-17	Apr-15		<0.0310	**1.20**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.00772	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400	
	RW-17	Apr-16		<0.0314	**1.75**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	**0.195**	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398	
	RW-17	Apr-17		0.0622 J	**2.57**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	**0.189**	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398	

Table 4A - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons and Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	TPH			Volatile Organic Compounds										
				Analyte:	GRO	DRO	DRO - EP	1,2,4-TMB	1,3,5-TMB	Benzene	cis-1,2-DCE	Ethyl-benzene	MTBE	Naphthalene	o-Xylene	Toluene	Total Xylenes	Trichloro-ethene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473	0.015	0.12	0.005	0.07	0.7	0.143	0.03	0.193	0.75	0.62	0.005
				CGWSL Source:		NMED TPH	NMED TPH	USEPA TW	USEPA TW	USEPA MCL	USEPA MCL	USEPA MCL	WQCC TW	WQCC HH	WQCC TW	WQCC HH	WQCC HH	USEPA MCL
Area	**Well ID**	**Date**	**Dup**															
North RO Reject Field	MW-117	Apr-15		<0.0310	0.0323 J		0.00285	0.000897 J	<0.000330	<0.000260	<0.000380	<0.000370	0.00150 J	0.000942 J	<0.000780	0.00229 J	<0.000400
	MW-117	Oct-15		<0.0314	<0.0247		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-117	Apr-16		<0.0314	<0.0247		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-117	Oct-16		<0.0314	0.0265 J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100 J4	<0.000341	<0.000780	<0.00106	<0.000398
	MW-117	Apr-17		<0.0314	<0.0247		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-117	Oct-17		<0.0314	**0.385**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-118	Apr-15		<0.0310	0.0307 J		0.000863 J	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-118	Oct-15		<0.0314	<0.0247		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-118	Apr-16		<0.0314	0.0248 J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-118	Oct-16		<0.0314	<0.0247		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100 J4	<0.000341	<0.000780	<0.00106	<0.000398
	MW-118	Apr-17		<0.0314	<0.0247		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-118	Oct-17		<0.0314	**0.0524** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-119	Apr-15		<0.0310	0.0353 J		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-119	Oct-15		<0.0314	<0.0247		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-119	Apr-16		<0.0314	<0.0247		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-119	Oct-16		0.0557 JB	**0.0570** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100 J4	<0.000341	<0.000780	<0.00106	<0.000398
	MW-119	Apr-17		<0.0314	**0.0622** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-119	Oct-17		<0.0314	**0.0805** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
NCL	MW-18	Apr-14			**0.280**		<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	MW-18	Apr-15			**2.41**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-18	Apr-16			**2.02**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-18	Apr-17			**0.960**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-45	Apr-15			**1.10**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.00356	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-45	Oct-15			**0.874**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00268	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-45	Apr-16			**1.11**		<0.000373	<0.000387	<0.000331	<0.000418	<0.000384	0.00152	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-45	Oct-16			**1.15**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00206	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-45	Apr-17			**0.857**		<0.000373	<0.000387	<0.000331	0.00152	<0.000384	0.00316	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-45	Oct-17			**0.864**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00305	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-53	Apr-14			<0.0210		<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	MW-53	Apr-15			**0.296**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-53	Apr-16			**0.316**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-53	Apr-17			**0.258**		<0.000373	<0.000387	<0.000331	0.000391 J	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-54A	Apr-15			**2.93**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-54A	Oct-15			**3.29**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-54A	Apr-16			**3.34**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-54A	Oct-16			**3.24**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-54A	Apr-17			**2.55**		<0.000373	<0.000387	<0.000331	0.000888 J	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-54A	Oct-17			**2.38**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-54B	Apr-13		<0.0500	**0.630**		<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500
	MW-54B	Apr-15		<0.0310	**2.47**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-54B	Apr-17		<0.0314	**0.881**		<0.000373	<0.000387	<0.000331	0.000616 J	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-55	Apr-15		<0.0310	**0.227**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-55	Oct-15		<0.0314	**0.300**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00433	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-55	Apr-16		<0.0314	**0.691**		**0.0599**	<0.000387	<0.000331	<0.000260	<0.000384	0.0163	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-55	Oct-16		<0.0314	**0.354**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00521	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-55	Apr-17		<0.0314	**1.08**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.0535	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-55	Oct-17		0.0634 J	**0.697**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.0390	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-56	Apr-15			**1.62**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.0129	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-56	Oct-15			**0.680**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00975	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-56	Apr-16			**1.07**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.0160	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-56	Oct-16			**1.18**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00819	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-56	Apr-17			**1.15**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.0222	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-108	Apr-15			**9.03**		**0.0465**	0.00603 J	**0.423**	<0.00260	0.0101	<0.00370	0.0113 J	0.00412 J	0.00956 J	0.0706	<0.00400
	MW-108	Oct-15			**7.89**		**0.0616**	0.00805 J	**0.394**	<0.00260	0.00812 J	<0.00367	0.0166 J	0.00444 J	0.00978 J	0.0855	<0.00398
	MW-108	Apr-16			**9.20**		**0.0599**	<0.0194	**0.504**	<0.0130	<0.0192	<0.0184	**<0.0500**	<0.0170	<0.0390	0.0795 J	**<0.0199**
	MW-108	Oct-16			**15.2**		**0.0561**	<0.00968	**0.362**	<0.00650	<0.00960	<0.00918	<0.0250	<0.00852	<0.0195	0.0721 J	**<0.00995**
	MW-108	Apr-17			**6.80**		**0.0605**	<0.00968	**0.382**	<0.00650	<0.00960	<0.00918	<0.0250	<0.00852	<0.0103	0.0815	**<0.00995**
	MW-108	Oct-17			**7.93**		**0.0451**	0.00330 J	**0.282**	<0.00130	0.00404 J	<0.00184	0.00744 J	0.00238 J	0.00383 J	0.0626	<0.00199
	NCL-31	Apr-15			**2.38**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.000497 J	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	NCL-31	Oct-15			**2.10**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	NCL-31	Apr-16			**1.87**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	NCL-31	Oct-16			**24.2**		0.000554 J	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	NCL-31	Apr-17			**1.37**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	NCL-31	Oct-17			**1.16**		0.000489 J	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	NCL-32	Apr-15			**2.80**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	NCL-32	Oct-15			**7.50**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000476 J	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	NCL-32	Apr-16			**4.05**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000751 J	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	NCL-32	Oct-16			**2.70**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.000385 J	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	NCL-32	Apr-17			**1.88**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	NCL-32	Oct-17			**1.27**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	NCL-33	Apr-15			**4.60**		<0.000370	<0.000390	0.00105	<0.000260	<0.000380	0.000806 J	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	NCL-33	Oct-15			**5.30**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780 J	<0.00106	<0.000398
	NCL-33	Apr-16			**4.53**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	NCL-33	Oct-16			**6.55**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	NCL-33	Apr-17			**4.80**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	NCL-33	Oct-17			**4.78**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	NCL-34A	Apr-15			**10.0**		**0.0979**	0.00122	**1.21**	<0.000260	0.00565	<0.00730	0.00636	0.00121	<0.000780	0.0952	<0.000400
	NCL-34A	Oct-15			**5.11**		**0.0589**	0.000423 J	**0.695** J	<0.000260	0.00215	0.00168	<0.00100	0.000477 J	<0.000780	0.0658	<0.000398
	NCL-34A	Apr-16			**19.2**		**0.102**	<0.0194	**3.25**	<0.0130	0.0758	<0.0184	**<0.0500**	<0.0170	<0.0390	0.188	**<0.0199**
	NCL-34A	Oct-16			**10.8**		**0.0754** J	<0.0387	**1.13**	<0.0260	<0.0384	<0.0367	**<0.100**	<0.0341	<0.0780	0.111 J	**<0.0398**
	NCL-34A	Apr-17			**11.4**		**0.0560**	<0.0194	**1.78**	<0.0130	<0.0192	<0.0184	**<0.0500**	<0.0170	<0.0206	0.100 J	**<0.0199**
	NCL-34A	Oct-17			**6.04**		**0.0290**	0.00141	**0.805**	<0.000260	0.00230	0.000379 J	0.00132 J	0.000631 J	<0.000412	0.0768	<0.000398
	NCL-44	Apr-15			**5.50**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.000410 J	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	NCL-44	Oct-15			**6.17**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	NCL-44	Apr-16			**7.59**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	NCL-44	Oct-16			**8.88**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	NCL-44	Apr-17			**7.97**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	NCL-44	Oct-17			**6.69**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	NCL-49	Apr-15			**0.0967** J		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	NCL-49	Apr-15	FD		**0.0832** J		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	NCL-49	Oct-15			**0.0770** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	NCL-49	Oct-15	FD		**0.0960** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	NCL-49	Apr-16			**0.0890** J		<0.000373	<0.00774	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	NCL-49	Apr-16	FD		**0.0664** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	NCL-49	Oct-16			**0.0712** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	NCL-49	Oct-16	FD		**0.0626** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	NCL-49	Apr-17			**0.0515** J		<0.000373	<0.000387	<0.000331	0.000449 J	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	NCL-49	Apr-17	FD		**0.0582** J		<0.000373	<0.000387	<0.000331	0.000303 J	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	NCL-49	Oct-17			0.0373 J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	NCL-49	Oct-17	FD		0.0355 J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398

Table 4A - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons and Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	TPH			Volatile Organic Compounds										
				Analyte:	GRO	DRO	DRO - EP	1,2,4-TMB	1,3,5-TMB	Benzene	cis-1,2-DCE	Ethyl-benzene	MTBE	Naphthalene	o-Xylene	Toluene	Total Xylenes	Trichloro-ethene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473	0.015	0.12	0.005	0.07	0.7	0.143	0.03	0.193	0.75	0.62	0.005
				CGWSL Source:		NMED TPH	NMED TPH	USEPA TW	USEPA TW	USEPA MCL	USEPA MCL	USEPA MCL	WQCC TW	WQCC HH	WQCC TW	WQCC HH	WQCC HH	USEPA MCL
Area	**Well ID**	**Date**	**Dup**															
South Refinery	KWB-2R	Apr-15			**5.20**		**0.307**	<0.00390	**1.98**	<0.00260	**0.992**	0.0186	0.0260 J	0.0115	0.0140 J	0.236	<0.00400	
	KWB-2R	Oct-15			**3.95**		**0.317**	<0.0387	**4.00**	<0.0260	**1.72**	<0.0367	**<0.100**	<0.0341	<0.0780	0.448	**<0.0398**	
	KWB-2R	Apr-16			**1.49**		**0.0497**	0.000489 J	**0.0558**	<0.000260	0.0483	0.0231	0.00806	0.00189	0.00152 J	0.0515	<0.000398	
	KWB-2R	Oct-16			**1.84**		**0.0347**	0.000427 J	**0.398**	<0.000260	0.0130	0.0184	0.00440 J	0.00185	0.00290 J	0.0289	<0.000398	
	KWB-2R	Apr-17			**1.35**		**0.0341**	<0.000387	**0.0260**	<0.000260	0.00543	0.0192	0.00609	0.000772 J	<0.000412	0.0281	<0.000398	
	KWB-2R	Oct-17			**4.84**		**0.150**	<0.000387	**1.12**	<0.000260	0.325	0.0202	**0.0675**	0.00977	0.0161	0.193	<0.000398	
	KWB-5	Apr-15			**2.30**		**0.0158**	0.00419	<0.000330	<0.000260	0.0395	<0.000370	**0.0392**	0.00713	0.0130	0.0394	<0.000400	
	KWB-5	Oct-15			**1.39**		0.00334	0.00179	**1.20** J	<0.000260	0.0151	**10.7**	0.0156	0.00312	0.00578	0.0166	<0.000398	
	KWB-5	Apr-16			**2.36**		0.00535	0.000901 J	**0.688**	<0.000260	0.00678	**12.6**	0.0114	0.00349	0.00412 J	0.0158	<0.000398	
	KWB-5	Oct-16			**1.89**		<0.00186	<0.00194	**0.367**	<0.00130	<0.00192	**9.88**	0.00511 JJ4	<0.00170	<0.00390	<0.00530	<0.00199	
	KWB-5	Apr-17			**1.98**		**0.0172**	0.00179	**0.525**	<0.000260	0.0103	**8.84**	**0.0302**	0.00472	0.00470	0.0434	<0.000398	
	KWB-5	Oct-17			**1.55**		**<0.0932**	<0.000387	**0.336**	<0.000260	<0.0960	**12.4**	0.0131	<0.0852	0.00156	<0.265	<0.000398	
	KWB-6	Apr-15			**4.50**		**0.680**	**0.124**	**15.9**	<0.00650	**2.04**	0.119	**0.239**	**0.760**	**1.70**	**3.47**	**<0.0100**	
	KWB-6	Oct-15			**1.41**		**0.325** J	**<0.194**	**8.61**	**<0.130**	**0.831**	**9.07**	**<0.500**	**0.297** J	<0.390	**1.33** J	**<0.199**	
	KWB-6	Apr-16			**3.75**		**0.876**	**0.134**	**12.4**	<0.00130	**0.799**	0.138	**0.137**	**0.243**	0.120	**1.88**	<0.00199	
	KWB-6	Oct-16			**1.78**		**0.292**	0.0449	**3.41**	<0.00520	0.241	0.135	**0.0549** J	0.0232	0.0167 J	0.417	**<0.00796**	
	KWB-6	Apr-17			**2.04**		**0.399**	0.0517	**4.67**	<0.00130	0.346	**0.154**	**0.0563**	0.0179	0.0205	0.391	<0.00199	
	KWB-6	Oct-17			**2.16**		**0.206**	0.0302	**3.22**	<0.000260	0.183	0.102	**0.0436**	0.00804	0.0122	0.283	<0.000398	
	MW-28	Apr-15		7.85 J	**13.0**		**0.0950** J	<0.0390	**3.02**	<0.0260	0.0625 J	**1.33**	**<0.100**	<0.0340	<0.0780	0.194 J	**<0.0400**	
	MW-28	Oct-15		9.88	**16.2**		**0.151**	<0.0387	**3.05**	<0.0260	0.0441 J	**1.11**	**<0.100**	<0.0341	<0.0780	0.243 J	**<0.0398**	
	MW-28	Apr-16		4.83	**17.0**		**0.113**	0.00861 J	**1.37**	<0.00260	0.0276	**0.261**	0.0247 J	0.00496 J	0.0350 J	0.161	<0.00398	
	MW-28	Oct-16		6.13	**22.2**		**0.253**	0.0202 J	**2.55**	<0.0130	0.0796	**0.630**	**0.0504** J	<0.0170	0.0683 J	0.338	**<0.0199**	
	MW-28	Apr-17		9.38	**14.4**		**0.168**	<0.0194	**2.58**	<0.0130	0.0489 J	**0.423**	**0.0668** J	<0.0170	0.0587	0.238	**<0.0199**	
	MW-28	Oct-17		7.24	**7.51**		**0.142**	<0.0194	**1.58**	<0.0130	0.0578	**0.158**	**<0.0500**	<0.0170	0.0474 J	0.216	**<0.0199**	
	MW-48	Apr-15		3.65 J	**3.90**		**0.140**	0.00962 J	**0.890**	<0.00260	0.158	**0.223**	0.0245 J	0.00973 J	0.0146 J	0.153	<0.00400	
	MW-48	Oct-15		2.99	**2.97**		**0.211**	0.00235 J	**0.204** J	<0.00130	0.0655	**0.832**	0.0128 J	0.00658	0.0120 J	0.125	<0.00199	
	MW-48	Apr-16		23.3	**15.3**		**0.310**	0.0223	**7.17**	<0.00520	**0.790**	**0.326**	**0.101**	0.0788	0.214	**0.750**	**<0.00796**	
	MW-48	Oct-16		15.8	**7.81**		**0.323**	0.0284	**5.12**	<0.00130	0.448	**0.851**	**0.0832**	0.0356	0.214	0.538	<0.00199	
	MW-48	Apr-17		31.5	**10.6**		**0.482**	0.0577	**11.7**	<0.0130	**1.27**	**0.214**	**0.224** J	0.115	0.667	**1.16**	**<0.0199**	
	MW-48	Oct-17		28.7	**18.5**		**0.368**	0.0465	**11.0**	<0.000260	**0.917**	**0.263**	**0.138**	0.0924	0.722	**0.797**	<0.000398	
	MW-50	Apr-15			**0.902**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.00219	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400	
	MW-50	Oct-15			**0.642**		<0.000373 J	<0.000387 J	<0.000331 J	<0.000260 J	<0.000384 J	<0.000367	<0.00100 J	<0.000341	<0.000780 J	<0.00106 J	<0.000398 J	
	MW-50	Apr-16			**1.10**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398	
	MW-50	Oct-16			**1.02**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398	
	MW-50	Apr-17			**0.835**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398	
	MW-50	Oct-17			**1.12**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398	
	MW-52	Apr-15		<0.0310 J	**0.370**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400	
	MW-52	Oct-15		<0.0314	**0.158**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780 J	<0.00106	<0.000398	
	MW-52	Apr-16		<0.0314	**0.324**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398	
	MW-52	Oct-16		0.0386 J	**0.367**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398	
	MW-52	Apr-17		<0.0314	**0.271**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398	
	MW-52	Oct-17		<0.0314	**0.380**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398	
	MW-64	Apr-16		136	**12.3**		**0.666**	**0.140**	**25.3**	<0.0130	**3.11**	**0.666**	**0.195** J	**2.44**	**18.8**	**7.70**	**<0.0199**	
	MW-64	Oct-16		90.7	**12.0**		**0.435**	0.0904 J	**30.9**	<0.0260	**2.61**	**0.531**	**0.140** J	**1.51**	**11.6**	**5.30**	**<0.0398**	
	MW-64	Apr-17		109	**9.88**		**0.793**	**0.163** J	**3.22**	<0.0650	**3.35**	**0.408**	**<0.250**	**2.09**	**13.2**	**7.58**	**<0.0995**	
	MW-64	Oct-17		88.3	**12.6**		**0.643**	**0.130** J	**30.7**	<0.0650	**3.20**	**0.484**	**<0.250**	**1.44**	**9.81**	**6.01**	**<0.0995**	
	MW-65	Apr-15		33.1	**12.4**		**0.0514**	0.0228	**9.99**	<0.00260	**1.03**	**3.22**	**0.239**	0.0228	0.0294 J	0.158	<0.00400	
	MW-65	Apr-16		19.6	**10.6**		**0.0309**	0.0165	**9.73**	<0.00260	0.288	**3.71**	**0.155**	0.0149	0.0211 J	0.0971	<0.00398	
	MW-65	Oct-16		19.2	**7.99**		<0.00746	<0.00774	**8.04**	<0.00520	0.0574	**2.70**	**0.194**	0.00937 J	0.0271 J	0.0298 J	**<0.00796**	
	MW-65	Apr-17		18.5	**8.30**		**<0.0373**	<0.0387	**6.70**	<0.0260	0.0768 J	**2.27**	**0.205** J	<0.0341	<0.0412	<0.106	**<0.0398**	
	MW-65	Oct-17		17.1	**7.44**		**<0.0373**	<0.0387	**6.25**	<0.0260	0.0507 J	**2.13**	**0.223** J	<0.0341	<0.0412	<0.106	**<0.0398**	
	MW-66	Apr-15		8.18	**4.51**		**<0.0190**	<0.0190	**3.16**	<0.0130	0.0615	**1.66**	**0.0617** J	<0.0170	<0.0390 J	0.0668 J	**<0.0200**	
	MW-66	Oct-15		8.74	**1.40**		0.00409	0.000859 J	**4.10** J	<0.000260	0.0234	**2.42**	**0.133**	0.00390	0.00722	0.0320	<0.000398	
	MW-66	Apr-16		6.09	**4.19**		0.00940 J	<0.00387	**3.09**	<0.00260	0.0181	**1.48**	**0.0638**	<0.00341	<0.00780	0.0285 J	<0.00398	
	MW-66	Oct-16		7.32	**4.24**		0.00241	0.000547 J	**3.80**	<0.000260	0.0214	**1.48**	**0.0979**	0.00365	0.0109	0.0265	<0.000398	
	MW-66	Apr-17		6.04	**4.18**		**<0.0186**	<0.0194	**1.89**	<0.0130	<0.0192	**1.21**	**0.104** J	<0.0170	<0.0206	<0.0530	**<0.0199**	
	MW-66	Oct-17		9.46	**3.58**		<0.00373	<0.00387	**0.276**	<0.00260	<0.00384	0.134	0.0147 J	<0.00341	<0.00412	<0.0106	<0.00398	
	MW-99	Apr-15		6.76	**1.94**		**0.337**	0.0706	**0.973**	<0.00650	0.252	0.0799	**0.0376** J	**0.315**	0.149 J	**0.937**	**<0.0100**	
	MW-99	Oct-15		19.4	**1.87**		**0.400**	0.0169 J	**7.28**	<0.00650	0.551	**3.96**	**0.0453** J	0.0953	0.221	0.604	**<0.00995**	
	MW-99	Apr-16		18.1	**4.29**		**0.498**	0.0129	**5.59**	<0.00260	0.629	**1.99**	**0.0656**	0.0843	0.0427 J	0.615	<0.00398	
	MW-99	Oct-16		17.8 B	**2.26**		**0.343**	<0.00774	**5.08**	<0.00520	0.635	**2.45**	**0.0343** J	0.108	0.190	**0.699**	**<0.00796**	
	MW-99	Apr-17		14.4	**2.06**		**0.252**	0.0196 J	**2.79**	<0.0130	0.402	**4.65**	**<0.0500**	0.106	0.0860	0.522	**<0.0199**	
	MW-99	Oct-17		10.4	**2.23**		**0.152**	<0.0387	**2.58**	<0.0260	0.146	**2.71**	**<0.100**	<0.0341	<0.0412	0.228 J	**<0.0398**	
	MW-101	Apr-15		0.180	**6.00**		<0.00190	<0.00190	**0.0187**	<0.00130	0.00202 J	0.113	<0.00500 J	<0.00170	<0.00390	<0.00530	<0.00200	
	MW-101	Oct-15		0.0803 J	**5.08**		<0.00186	<0.00194	<0.00166	<0.00130	<0.00192	0.0981	<0.00500	<0.00170	<0.00390	<0.00530	<0.00199	
	MW-101	Apr-16		0.614	**5.84**		<0.000373	<0.000387	**0.0664** J6	<0.000260	0.00176	0.119	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398	
	MW-101	Oct-16		0.208	**2.95**		<0.000373	<0.000387	0.000845 J	<0.000260	<0.000384	0.104	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398	
	MW-101	Apr-17		0.311	**3.72**		<0.000373	<0.000387	**0.00650**	<0.000260	0.000830 J	0.107	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398	
	MW-101	Oct-17		0.377	**5.50**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.132	<0.00100	<0.000341	0.000439 J	<0.00106	<0.000398	
	MW-102	Apr-15		24.5	**9.96**		**0.136**	0.0278	**9.83**	<0.00260	0.602	**1.88**	**0.129**	**0.247**	**1.45**	**0.846**	<0.00400	
	MW-102	Oct-15		31.4	**11.4**		**0.465**	0.115	**12.3**	<0.0260	**1.04**	**2.12**	**0.256** J	**0.361**	**1.20**	**1.43**	**<0.0398**	
	MW-102	Apr-16		26.2	**9.69**		**0.402**	0.110	**10.8**	<0.0260	**0.858**	**2.07**	**0.278** J	0.0881 J	0.541	**0.632**	**<0.0398**	
	MW-102	Oct-16		31.5	**14.8**		**0.337**	0.0773 J	**13.2**	<0.0260	**1.03**	**1.61**	**0.278** J	0.0952 J	0.626	**0.719**	**<0.0398**	
	MW-102	Apr-17		26.4	**11.9**		**0.291**	0.0282	**8.38**	<0.00520	**0.726**	**1.87**	**0.200**	0.0189 J	0.243	0.391	**<0.00796**	
	MW-102	Oct-17		335	**18.1**		**0.278**	0.0413 J	**9.24**	<0.0130	**0.897**	**1.89**	**0.483**	0.0353 J	0.275	0.501	**<0.0199**	
	MW-103	Apr-14		1.43 J	**5.9**		0.0150	<0.000600	**0.760**	<0.00060	0.150	<0.000600	**0.0510**	0.00450 J	0.00940	0.0170	<0.000500	
	MW-103	Apr-15		4.15	**8.66**		0.0102	<0.000390	<0.000330	<0.000260	0.0879	0.000441 J	0.0220	0.00549	0.0154	0.0137	<0.000400	
	MW-103	Apr-16		3.55	**7.35**		<0.00186	<0.00194	**1.35**	<0.00130	0.0508	<0.00184	0.0108 J	0.00422 J	0.0153 J	<0.00530	<0.00199	
	MW-103	Apr-17		3.46	**6.94**		**<0.0186**	<0.0194	**1.30**	<0.0130	<0.0192	<0.0184	**<0.0500**	<0.0170	<0.0206	<0.0530	**<0.0199**	
	MW-104	Apr-15		0.783	**0.813**		<0.000370	<0.000390	**0.0243**	<0.000260	<0.000380	0.00138	<0.00100	<0.000340	<0.000780 J	<0.00110	<0.000400	
	MW-104	Apr-15	FD	0.878	**0.790**		<0.000370	<0.000390	**0.0242**	<0.000260	0.000481 J	0.00135	<0.00100	<0.000340	<0.000780 J	<0.00110	<0.000400	
	MW-104	Oct-15		1.05	**1.06**		<0.00186	<0.00194	**0.257**	<0.00130	0.0126	0.00189 J	<0.00500	<0.00170	<0.00390	<0.00530	<0.00199	
	MW-104	Oct-15	FD	1.18	**3.00**		0.000420 J	<0.000387	**0.309**	<0.000260	0.0117	0.00199	0.00132 J	<0.000341	<0.000780	<0.00106	<0.000398	
	MW-104	Apr-16		0.797	**2.23**		<0.000373	<0.000387	**0.0707**	<0.000260	0.00108	0.00130	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398	
	MW-104	Apr-16	FD	0.775	**2.19**		<0.000373	<0.000387	**0.0685**	<0.000260	0.00107	0.00120	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398	
	MW-104	Oct-16		1.35	**2.55**		<0.00186	<0.00194	**0.341**	<0.00130	0.00837	<0.00184	<0.00500	<0.00170	<0.00390	<0.00530	<0.00199	
	MW-104	Oct-16	FD	1.26	**2.68**		<0.00186	<0.00194	**0.284**	<0.00130	0.00721	0.00509	<0.00500	<0.00170	<0.00390	<0.00530	<0.00199	
	MW-104	Apr-17		1.66	**5.36**		<0.00373	<0.00387	**0.741**	<0.00260	0.0244	<0.00367	<0.0100	<0.00341	<0.00412	<0.0106	<0.00398	
	MW-104	Apr-17	FD	2.41	**4.91**		0.00209 J	<0.00194	**0.529**	<0.00130	0.0168	0.0132	<0.00500	<0.00170	<0.00206	<0.00530	<0.00199	
	MW-104	Oct-17		1.52	**5.42**		0.000544 J	<0.000387	**0.144**	<0.000260	0.00651	0.00837	0.00196 J	<0.000341	<0.000412	<0.00106	<0.000398	
	MW-104	Oct-17	FD	1.36	**4.95**		<0.00186	<0.00194	**0.150**	<0.00130	0.00774	0.00820	<0.00500	<0.00170	<0.00206	<0.00530	<0.00199	
	MW-105	Apr-15		6.50	**3.74**		**0.0678**	0.0325	**1.71**	<0.00130	0.545	<0.00180	**0.0623** J	0.00965	0.0314	0.214	<0.00200	
	MW-105	Oct-15		4.37	**2.31**		**0.0487**	0.0291	**0.580**	<0.00260	0.188	<0.00367	0.0299 J	<0.00341	<0.00780	0.109	<0.00398	
	MW-105	Apr-16		33.6	**21.2**		**0.103** J	<0.0968	**13.5**	<0.0650	**2.02**	<0.0918	**<0.250**	<0.0852	<0.195	0.379 J	**<0.0995**	
	MW-105	Oct-16		43.7	**8.66**		**0.141**	<0.0387	**18.2**	<0.0260	**2.77**	<0.0367	**0.129** J	<0.0341	<0.0780	**0.683**	**<0.0398**	
	MW-105	Apr-17		33.9	**13.8**		**0.104**	<0.0387	**13.3**	<0.0260	**1.71**	<0.0367	**0.104** J	<0.0341	<0.0412	0.446	**<0.0398**	
	MW-105	Oct-17		24.0	**19.0**		**0.0964**	0.0250	**9.19**	<0.000260	**0.927**	0.0209	**0.0737**	<0.0341	0.0192	0.390	<0.000398	
	MW-106	Apr-15		1.52	**3.40**		**0.0173**	0.00273	**0.395**	<0.000260	0.0206	<0.000370	0.0126	0.00393	0.0420	0.0514	<0.000400	
	MW-106	Oct-15		23.8	**19.6**		**0.0921** J	<0.0387	**10.4**	<0.0260	0.0823 J	0.0397 J	**0.113** J	<0.0341	0.216 J	0.217 J	**<0.0398**	
	MW-106	Apr-16		23.9	**19.5**		**0.0824**	0.0114 J	**12.7**	<0.00650	0.0446	0.0580	**0.0442** J	<0.00852	0.124 J	0.203	**<0.00995**	
	MW-106	Oct-16		27.1	**21.8**		**0.126**	0.0219 J	**11.3**	<0.0130	0.0440 J	0.109	**0.0690** J	<0.0170	0.146 J	0.297	**<0.0199**	
	MW-106	Apr-17		21.4	**17.9**		**0.0853**	<0.0194	**9.71**	<0.0130	0.0301 J	0.0832	**<0.0500**	<0.0170	0.116	0.236	**<0.0199**	
	MW-106	Oct-17		21.9	**22.2**		**0.0731**	<0.0194	**10.6**	<0.0130	0.0438 J	0.0949	**<0.0500**	<0.0170	0.272	0.195	**<0.0199**	

Table 4A - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons and Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	TPH		Volatile Organic Compounds										
				Analyte:	GRO	DRO	DRO - EP	1,2,4-TMB	1,3,5-TMB	Benzene	cis-1,2-DCE	Ethyl-benzene	MTBE	Naphthalene	o-Xylene	Toluene	Total Xylenes	Trichloro-ethene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473	0.015	0.12	0.005	0.07	0.7	0.143	0.03	0.193	0.75	0.62	0.005
				CGWSL Source:		NMED TPH	NMED TPH	USEPA TW	USEPA TW	USEPA MCL	USEPA MCL	USEPA MCL	WQCC TW	WQCC HH	WQCC TW	WQCC HH	WQCC HH	USEPA MCL
Area	**Well ID**	**Date**	**Dup**															
South Refinery	MW-107	Apr-15		9.85	**7.20**		0.0133	<0.00390	**5.32**	<0.00260	0.00658 J	**1.77**	0.0157 J	<0.00340	0.0106 J	0.0146 J	<0.00400
	MW-107	Oct-15		14.9 J	**4.72**		**0.100**	<0.0387	**6.29**	<0.0260	0.0403 J	**2.77**	**<0.100**	0.0431 J	<0.0780	0.130 J	**<0.0398**
	MW-107	Apr-16		4.89	**6.80**		0.00111	0.000591 J	**1.28**	<0.000260	0.00466	**2.44**	0.00773	0.00145	0.00399 J	0.00572	<0.000398
	MW-107	Oct-16		17.7	**7.24**		0.00205 J	<0.00194	**6.35**	<0.00130	0.0192	**3.05**	**0.0614**	0.00265 J	0.00800 J	0.0112 J	<0.00199
	MW-107	Apr-17		6.67	**7.91**		**<0.0186**	<0.0194	**3.37**	<0.0130	<0.0192	**2.78**	**0.0788** J	<0.0170	<0.0206	<0.0530	**<0.0199**
	MW-109	Apr-15		2.36	**8.10**		<0.00370	<0.00390	**0.621**	<0.00260	0.0190	<0.00370	<0.0100	<0.00340	0.0117 J	0.0176 J	<0.00400
	MW-109	Oct-15		1.46	**0.842**		0.00487 J	<0.00387	**0.845** J	<0.00260	0.0126	<0.00367	<0.0100	<0.00341	0.0141 J	0.0176 J	<0.00398
	MW-109	Apr-16		1.93	**5.92**		0.00418 J	<0.00194	**0.532**	<0.00130	0.00864	<0.00184	<0.00500	<0.00170	0.00837 J	0.0142 J	<0.00199
	MW-109	Oct-16		2.12	**3.19**		<0.00746	<0.00774	**0.995**	<0.00520	0.0115 J	<0.00734	<0.0200	<0.00682	<0.0156	<0.0212	**<0.00796**
	MW-109	Apr-17		5.26	**5.78**		0.00751	<0.00387	**1.25**	<0.00260	0.00980 J	<0.00367	<0.0100	<0.00341	0.0172	0.0272 J	<0.00398
	MW-109	Oct-17		4.62	**6.74**		0.00547	0.00167	**1.30**	<0.000260	0.0124	<0.000367	0.00191 J	<0.000341	0.0182	0.0230	<0.000398
	MW-110	Apr-15		1.12	**2.20**		0.00548	0.00166	**0.132**	<0.000260	0.00609	<0.000370	0.00482 J	<0.000340	0.00352 J	0.00624	<0.000400
	MW-110	Oct-15		1.48	<0.0247		**0.0350**	0.00228 J	**0.348** J	<0.00130	0.182	<0.00184	0.00731 J	<0.00170	0.00464 J	0.0298	<0.00199
	MW-110	Apr-16		0.735	**1.55**		0.000871 J	0.000525 J	**0.0132**	<0.000260	0.000927 J	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-110	Oct-16		0.503	**1.00**		<0.000373	<0.000387	0.000511 J	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-110	Apr-17		2.69	**2.53**		**0.0193**	<0.00194	**0.299**	<0.00130	0.0262	<0.00184	<0.00500	<0.00170	0.00378 J	0.0161	<0.00199
	MW-110	Oct-17		0.379	**1.01**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	RA-313	Apr-14					<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	RA-313	Apr-15					<0.000370	<0.000390	0.000366 J	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	RA-313	Apr-16					<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	RA-313	Apr-17					<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	RW-4	Apr-15			**3.72**		<0.000370	<0.000390	**0.0167**	<0.000260	0.00245	0.0902	<0.00100	<0.000340	<0.000780 J	<0.00110	<0.000400
	RW-4R	Apr-16			**5.03**		<0.000373	<0.000387	**0.0140**	<0.000260	<0.000384	**0.191**	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	RW-4R	Apr-17			**2.35**		<0.00186	<0.00194	**0.0294**	<0.00130	<0.00192	0.132	<0.00500	<0.00170	<0.00206	<0.00530	<0.00199
	RW-5R	Apr-15			**6.42**		**0.298**	0.0558	**2.92**	<0.00260	**1.03**	**2.15**	**0.174**	**0.522**	**2.26**	**1.91**	<0.00400
	RW-5R	Apr-16			**7.39**		**0.437**	0.100	**3.48**	<0.00520	**1.20**	**1.64**	**0.205**	**0.570**	**2.51**	**2.25**	**<0.00796**
	RW-6	Apr-15			**11.4**		**0.134**	0.0280	**0.636**	<0.00260	0.0476	**2.27**	**0.0602**	0.0558	0.0126 J	0.158	<0.00400
	RW-6R	Apr-16			**4.20**		0.00555	0.00111	**0.218**	<0.000260	0.00474	**2.68**	0.00574	0.00275	0.00683	0.00747	<0.000398
	RW-15C	Apr-17			**9.74**		**1.46**	**0.231**	**19.1**	<0.00650	**4.19**	**4.25**	**0.383**	**0.472**	0.172	**5.39**	**<0.00995**
South RO Reject Field	MW-114	Apr-15		<0.0310 J	<0.0250 B		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-114	Oct-15		<0.0314	<0.0247		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-114	Apr-16		<0.0314	0.0317 J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-114	Oct-16		<0.0314	**0.0410** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-114	Apr-17		<0.0314	<0.0247		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-114	Oct-17		<0.0314	**0.0650** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-115	Apr-15		<0.0310 J	<0.0250 B		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-115	Oct-15		0.0324 J	**0.103**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-115	Apr-16		<0.0314	**0.0616** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-115	Oct-16		<0.0314	**0.0582** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-115	Apr-17		<0.0314	**0.0657** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-115	Oct-17		<0.0314	**0.109**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-116	Apr-15		<0.0310 J	<0.0250 B		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-116	Oct-15		<0.0314	**0.0607** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-116	Apr-16		<0.0314	**0.112**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-116	Oct-16		<0.0314	**0.0868** J		0.000389 J	<0.000387	0.000536 J	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-116	Apr-17		<0.0314	**0.0549** J		<0.000373	<0.000387	0.000430 J	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-116	Oct-17		<0.0314	<0.0247		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
TEL	MW-49	Apr-15		0.654	**8.60**		0.00954	<0.000390	**0.0770**	<0.000260	0.00274	0.0553 J	0.00117 J	<0.000340	<0.000780	0.0175	<0.000400
	MW-49	Oct-15		1.58	**7.66**		0.0150	0.000858 J	**0.179**	<0.000260	0.00457	0.0447	0.00255 J	<0.000341	0.00201 J	0.0380	<0.000398
	MW-49	Apr-16		1.75	**8.63**		**0.0305**	<0.000387	**0.196**	<0.00520	<0.00768	0.0535	<0.0200	<0.00682	<0.0156	0.0540 J	**<0.00796**
	MW-49	Oct-16		2.82	**9.26**		**0.0457** J	<0.0387	**0.241**	<0.0260	<0.0384	0.0628 J	**<0.100**	<0.0341	<0.0780	<0.106	**<0.0398**
	MW-49	Apr-17		2.65	**7.62**		**0.0409**	0.00628 J	**0.227**	<0.00260	0.00427 J	0.0811	<0.0100	<0.00341	<0.00412	0.0564	<0.00398
	MW-49	Oct-17		3.45	**8.36**		**0.118**	0.0225	**0.573**	<0.00520	0.0184 J	0.0712	<0.0200	<0.00682	0.0109 J	0.195	**<0.00796**
	TEL-1	Apr-15		0.181	**9.80**		0.00103	<0.000390	<0.000330	<0.000260	<0.000380	0.00478	<0.00100	0.00214	<0.000780	0.00214 J	<0.000400
	TEL-1	Oct-15		0.148	**7.46**		0.000971 J	<0.000387	0.000378 J	<0.000260	<0.000384	0.00245	0.00102 J	0.00197	0.00108 J	0.00197 J	<0.000398
	TEL-1	Apr-16		0.153	**8.51**		0.000807 J	<0.000387	<0.000331	<0.000260	0.000718 J	0.00229	<0.00100	0.00160	0.000793 J	0.00160 J	<0.000398
	TEL-1	Oct-16		0.193	**3.58**		0.000939 J	<0.000387	<0.000331	<0.000260	0.000666 J	0.000724 J	<0.00100	0.00183	<0.000780	0.00183 J	<0.000398
	TEL-1	Apr-17		0.285	**9.45**		0.000500 J	<0.000387	0.000647 J	<0.000260	0.000506 J	0.00231	<0.00100	0.000572 J	0.000539 J	<0.00106	<0.000398
	TEL-1	Oct-17		0.467	**12.7**		0.00219	0.000626 J	<0.000331	<0.000260	0.00119	0.00285	<0.00100	0.00319	0.00203	0.00488	<0.000398
	TEL-2	Apr-15		5.12	**20.0**		**0.138**	0.0198 J	**0.905**	<0.00520	0.0119 J	0.0113 JJ3	<0.0200	0.0182 J	0.0372 J	0.189	**<0.00800**
	TEL-2	Oct-15		2.86	**18.7** J		**0.138**	0.0109	**0.535**	<0.00130	0.00577	0.0110	0.00630 J	0.00970	0.0186 J	0.155	<0.00199
	TEL-2	Apr-16		3.12	**18.1**		**0.125**	0.0143	**0.709**	<0.000260	0.00692	0.0156	0.00966	0.0102	0.0243	0.146	<0.000398
	TEL-2	Oct-16		3.08	**17.0**		**0.0976**	0.00929 J	**0.962**	<0.00260	0.00418 J	0.0110	<0.0100	0.00660 J	0.0218 J	0.123	<0.00398
	TEL-2	Apr-17		3.02	**14.8**		**0.0706**	0.00599 J	**0.556**	<0.00260	<0.00384	0.0104	<0.0100	0.00370 J	0.00914 J	0.0874	<0.00398
	TEL-2	Oct-17		2.51	**22.8**		**0.108**	<0.00387	**0.590**	<0.00260	<0.00384	0.00964 J	<0.0100	<0.00341	0.0143	0.101	<0.00398
	TEL-3	Apr-15		0.666	**9.40**		0.0104	<0.00390	**0.0206**	<0.00260	<0.00380	0.00560 J	<0.0100	<0.00340	<0.00780	<0.0110	<0.00400
	TEL-3	Oct-15		0.633	**5.86**		**0.0213**	0.00128	**0.0385**	<0.000260	0.000880 J	0.000964 J	0.00123 J	0.00316	0.00154 J	0.0202	<0.000398
	TEL-3	Apr-16		1.05	**14.1**		0.0128 J	<0.00968	**0.317**	<0.00650	<0.00960	0.0445	<0.0250	<0.00852	<0.0195	<0.0265	**<0.00995**
	TEL-3	Oct-16		0.589	**4.22**		**0.0157**	0.00115	**0.0123**	<0.000260	0.000539 J	0.00109	0.00107 J	0.00232	0.00119 J	0.0105	<0.000398
	TEL-3	Apr-17		0.716	**5.32**		**0.0163**	0.000748 J	**0.0799**	<0.000260	0.000764 J	0.00327	<0.00100	0.00192	0.00219	0.0102	<0.000398
	TEL-4	Apr-15		2.09	**8.40**		**0.0742**	<0.00390	**0.171**	<0.00260	<0.00380	0.140	<0.0100	<0.00340	<0.00780	0.0394	<0.00400
	TEL-4	Apr-15	FD	2.26	**8.50**		**0.0758**	<0.00390	**0.155**	<0.00260	<0.00380	0.142	<0.0100	<0.00340	<0.00780	0.0407	<0.00400
	TEL-4	Oct-15		2.77	**4.98**		**0.0740**	0.000524 J	**0.637**	<0.000260	0.00655	0.00902	0.00422 J	0.00162	0.00623	0.0719	<0.000398
	TEL-4	Oct-15	FD	2.70	**5.73**		**0.0861**	<0.00387	**0.657**	<0.00260	0.00756 J	0.0127	<0.0100	<0.00341	0.00878 J	0.0837	<0.000398
	TEL-4	Apr-16		2.36	**9.13**		**0.142**	<0.00387	**0.530**	<0.00260	0.0160	0.105	<0.0100	<0.00341	0.0132 J	0.142	<0.00398
	TEL-4	Apr-16	FD	2.65	**8.65**		**0.147**	<0.00387	**0.557**	<0.00260	0.0161	0.0945	<0.0100	<0.00341	0.0128 J	0.147	<0.00398
	TEL-4	Oct-16		2.52	**6.36**		**0.0775**	<0.00387	**0.514**	<0.00260	<0.00384	0.0415	<0.0100	<0.00341	<0.00780	0.0668	<0.00398
	TEL-4	Oct-16	FD	2.72	**6.66**		**0.105**	<0.00387	**0.479**	<0.00260	<0.00384	0.0476	<0.0100	<0.00341	<0.00780	0.0863	<0.00398
	TEL-4	Apr-17		1.25	**8.44**		**0.0287**	<0.00387	**0.0595**	<0.00260	<0.00384	0.0522	<0.0100	<0.00341	<0.00412	0.0243 J	<0.00398
	TEL-4	Apr-17	FD	1.29	**8.00**		**0.0352**	<0.000387	**0.0583**	<0.000260	0.000616 J	0.0492	<0.00100	0.000606 J	0.00218	0.0287	<0.000398
	TEL-4	Oct-17		1.53	**10.0**		**0.0387**	<0.000387	**0.0161**	<0.000260	0.000587 J	0.0975	<0.00100	0.000782 J	0.00131	0.0269	<0.000398
	TEL-4	Oct-17	FD	1.77	**9.67**		**0.0343**	<0.000387	**0.0149**	<0.000260	0.000497 J	0.0874	<0.00100	0.000684 J	0.00118	0.0242	<0.000398
TMD	MW-8	Apr-14		<0.0100	<0.0210		<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	0.00140 J	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	MW-8	Apr-15		<0.0310	**0.380**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-8	Apr-16		<0.0314	**0.230**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-8	Apr-17		0.585	**0.238**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.00228	<0.00100 J4	<0.000341	<0.000412	<0.00106	<0.000398
	MW-16	Apr-14			**0.0580**		<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	MW-16	Apr-15			**0.340**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100 J	<0.000340	<0.000780	<0.00110	<0.000400
	MW-16	Apr-17			**0.275**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-20	Apr-14			<0.0200		<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	MW-20	Apr-14	FD		<0.0200		<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	MW-20	Apr-15			**0.150**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-20	Apr-16			**0.149**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-20	Apr-17			**0.280**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100 J4	<0.000341	<0.000412	<0.00106	<0.000398
	MW-21	Apr-15		<0.0310	**0.180**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.00729	<0.00100 J	<0.000340	<0.000780	<0.00110	<0.000400
	MW-21	Oct-15		<0.0314	**0.194**		<0.000373	<0.000387	0.000613 J	<0.000260	<0.000384	0.00636	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-21	Apr-16		<0.0314	**0.190**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.0101	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-21	Oct-16		<0.0314	**0.132**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.0112	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-21	Apr-17		0.0721 J	**0.169**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.0149	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-21	Oct-17		0.0416 J	**0.106**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.0180	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-25	Apr-14			<0.0200		<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	MW-25	Apr-15			**0.690**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100 J	<0.000340	<0.000780	<0.00110	<0.000400
	MW-25	Apr-16			**0.348**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-25	Apr-17			**0.107**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100 J4	<0.000341	<0.000412	<0.00106	<0.000398

Table 4A - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons and Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	TPH		Volatile Organic Compounds										
				Analyte:	GRO	DRO	DRO - EP	1,2,4-TMB	1,3,5-TMB	Benzene	cis-1,2-DCE	Ethyl-benzene	MTBE	Naphthalene	o-Xylene	Toluene	Total Xylenes	Trichloro-ethene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473	0.015	0.12	0.005	0.07	0.7	0.143	0.03	0.193	0.75	0.62	0.005
				CGWSL Source:		NMED TPH	NMED TPH	USEPA TW	USEPA TW	USEPA MCL	USEPA MCL	USEPA MCL	WQCC TW	WQCC HH	WQCC TW	WQCC HH	WQCC HH	USEPA MCL
Area	**Well ID**	**Date**	**Dup**															
TMD	MW-26	Apr-14				<0.0200		<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	MW-26	Apr-15				**0.0530** J		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-26	Apr-16				**0.103**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-26	Apr-17				**0.0773** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-27	Apr-14				<0.0210		<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	MW-27	Apr-15				**0.110**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-27	Apr-16				**0.134**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-27	Apr-17				**0.0992** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-46R	Nov-14				**0.0420** J		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-46R	Apr-15				**0.0540** J		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-46R	Apr-16				**0.0622** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-46R	Oct-16				**0.0459** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-46R	Apr-17				**0.0889** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-46R	Oct-17				0.0327 J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-68	Apr-14				<0.0200		<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	MW-68	Apr-15				**0.130**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-68	Apr-16				**0.162**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-68	Apr-17				**0.138**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-71	Apr-14				<0.0210		<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	MW-71	Apr-15				**0.0930** J		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	MW-71	Apr-16				0.0252 J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-71	Apr-17				**0.0947** J		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	MW-89	Apr-14				**0.210**		<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	MW-89	Apr-15				**2.40**		<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100 J	0.000538 J	<0.000780	<0.00110	<0.000400
	MW-89	Apr-16				**3.38**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	MW-89	Apr-17				**2.15**		<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	NP-1	Apr-15						<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	**0.204**	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	NP-1	Oct-15						<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	**0.291**	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	NP-1	Apr-16						<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	**0.213**	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	NP-1	Oct-16						<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	**0.283**	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	NP-1	Apr-17						<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	**0.391**	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	NP-1	Oct-17						<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	**0.407**	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	NP-2	Apr-13		<0.0500	**<0.0520**			<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500
	NP-6	Apr-13						<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500
	NP-6	Apr-15						<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	0.00878	<0.00100 J	<0.000340	<0.000780	<0.00110	<0.000400
	NP-6	Apr-17						<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	0.0353	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
Up-Gradient	UG-1	Apr-14		<0.0100	<0.0210			<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	UG-1	Apr-15		<0.0310	<0.0250 B			<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	UG-1	Apr-16		<0.0314	0.0302 J			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	UG-1	Apr-17		<0.0314	**0.0484** J			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	UG-2	Apr-14		<0.0100	<0.0200			<0.00500	<0.00500	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	UG-2	Apr-15		<0.0310	<0.0250 B			<0.00050	<0.000600	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	UG-2	Apr-16		<0.0314	**0.0692** J			<0.000370	<0.000390	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	UG-2	Apr-17		<0.0314	**0.0818** J			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	UG-3R	Apr-14		<0.0100	<0.0200			<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	UG-3R	Apr-14	FD	<0.0100	<0.0200			<0.00050	<0.000600	<0.000600	<0.00060	<0.000500	<0.000600	<0.000700	<0.000500	<0.000500	<0.00150	<0.000500
	UG-3R	Apr-15		<0.0310	<0.0250 B			<0.000370	<0.000390	<0.000330	<0.000260	<0.000380	<0.000370	<0.00100	<0.000340	<0.000780	<0.00110	<0.000400
	UG-3R	Apr-16		<0.0314	<0.0247			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	UG-3R	Apr-17		<0.0314	**0.0517** J			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398
	UG-4	Apr-16		<0.0314	0.0349 J			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000780	<0.00106	<0.000398
	UG-4	Apr-17		<0.0314	**0.0463** J			<0.000373	<0.000387	<0.000331	<0.000260	<0.000384	<0.000367	<0.00100	<0.000341	<0.000412	<0.00106	<0.000398

Definitions

X	Reported concentration, X, exceeds the CGWSL.
X	Analyte detected above the detection limit at a concentration equal to X.
<x	Analyte not detected at detection limit equal to x.
<x	Analyte not detected at detection limit equal to x, but x exceeds the CGWSL.
	Blank cell indicates a sample was collected from the well during the indicated sampling event, but the analyte was not analyzed.
---	No applicable CGWSL.

Abbreviations

1,2,4-TMB	1,2,4-Trimethylbenzene
1,3,5-TMB	1,3,5-Trimethylbenzene
CGWSL	Critical Groundwater Screening Level (see Table 3)
CGWSL Source	Source for CGWSL value (see Table 3)
cis-1,2-DCE	cis-1,2-Dichloroethene
DRO	Diesel Range Organics
DRO-EP	Diesel Range Organics data from wells located in the Evaporation Ponds area
Dup	Duplicate sample
FD	Field duplicate sample
GRO	Gasoline Range Organics
mg/L	Milligrams per Liter
MTBE	Methyl Tert-Butyl Ether
NMED TPH	NMED Risk Assessment Guidance for Site Investigations and Remediation, March 2017, Table 6-4 TPH Groundwater Screening Levels
NMED TW	NMED Risk Assessment Guidance for Site Investigations and Remediation, March 2017, Table A-1, Tap Water Screening Level
TPH	Total Petroleum Hydrocarbons
USEPA TW	United States Environmental Protection Agency Tap Water Screening Level, "Regional Screening Levels (RSL) Summary Table", November 2017
USEPA MCL	United States Environmental Protection Agency Maximum Contaminant Level, "Regional Screening Levels (RSL) Summary Table", November 2017
WQCC HH	NMED Groundwater standard for human health exposure, 20.6.2.3103.A NMAC

Lab Footnote

B	Analyte was also detected in the associated method blank.
J	Indicates an estimated value.
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

Table 4B - Summary of Groundwater Analytical Data - Total Metals

2017 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Total Metals													
				Analyte:	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC Irr	WQCC HH	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
Cross-Gradient	KWB-13	Apr-14		0.00259 J	0.0145				0.00121 J	<0.00500	<0.000700	<0.00250	<0.000040	<0.00100	0.0126		0.0172
	KWB-13	Apr-15		**0.0118**	0.122				0.0182	**12.3**	**0.0190**	**0.399**	<0.000049	0.0144	0.0110		0.0426
	KWB-13	Apr-16		0.00484 J	0.0459	0.384	<0.00500	0.00161 J	0.00621 J	**4.00**	0.00403 J	0.0747	<0.000049	<0.00175	0.0188	0.0261 J	0.0304
	KWB-13	Apr-17		0.00286	0.0229	0.294	<0.000160	0.000487 J	0.00148 J	**1.02**	0.00107 J	0.0234	<0.000049	0.00119 J	0.0130	0.0227	0.0213
	MW-17	Apr-14		<0.00200	0.0152				<0.00200	<0.100	0.00724 J	<0.00500			0.0104		
	NP-5	Apr-13		<0.0100	<0.0100				<0.0100	<0.400	<0.0100	<0.0100			0.0135		
	NP-5	Apr-15		0.00288	0.0159				0.00109 J	0.437	0.000415 J	0.00318 J			0.0125		
	NP-5	Apr-17		0.00305	0.00938				<0.000540	0.0632 J	<0.000240	0.000586 J			0.0124		
	RA-3156	Nov-13															
	RA-3156	Apr-14												<0.00500			
	RA-3156	Apr-16															
	RA-3156	Apr-17															
	MW-136	Oct-15		0.00381	0.103				0.00365	**1.18**	0.00218	**0.204**	<0.000049	0.00425	0.00463		0.0212
	MW-136	Apr-16		0.00280 J	0.0270	0.695	<0.00500	0.00132 J	<0.00270	0.599	<0.00120	0.0591	<0.000049	<0.00350	0.0112	**0.0702**	0.0197 J
	MW-136	Oct-16		0.00284	0.0134	0.512	<0.000160	0.000279 J	0.00118 JB	0.0892 JB	0.000940 JB	0.0112 B	<0.000049	0.00184 JB	0.00562	**0.0720**	0.0176
	MW-136	Apr-17		0.00237	0.0117	0.588	<0.000160	<0.000260	<0.000540	0.0262 J	<0.000240	0.00602	<0.000049	0.00102 J	0.00563	**0.0664**	0.0171
	MW-136	Oct-17		0.00239	0.0144	0.724	<0.000160	0.000362 J	0.000794 J	0.193	0.000313 J	0.0209	<0.000049	0.00157 J	0.00608	**0.0729**	0.0181
Evaporation Ponds	MW-1R	Apr-14		0.00335 J	0.0214				<0.00200	**2.39**	<0.00140	**1.38**			<0.00200		
	MW-1R	Apr-15		0.00366 J	0.0240 J				<0.00270	**3.49**	<0.00120	**2.14** J			<0.00190		
	MW-1R	Apr-16		0.00917 J	0.0301				0.0188	**9.67**	<0.00120	**2.94**			<0.00190		
	MW-1R	Apr-17		0.00221	0.0258				<0.000540	**4.50**	<0.000240	**2.38**			<0.000380		
	MW-2A	Apr-15		**0.0155** J	0.0255 J				<0.00540	0.571 J	<0.00240	**1.98**			<0.00380		
	MW-2A	Oct-15		0.00962	0.0241				<0.00108	0.588	<0.000480	**2.88**			0.00153 J		
	MW-2A	Apr-16		**0.0154**	0.0228 J				<0.00270	**3.37**	<0.00120	**2.50**			0.00432 J		
	MW-2A	Oct-16		0.00798	0.0208				0.00105 J	0.146	<0.000240	**1.43**			0.000560 J		
	MW-2A	Apr-17		0.00923	0.0188				0.000757 J	**3.02**	<0.000240	**1.43**			0.00105 J		
	MW-2A	Oct-17		0.00731	0.0164				<0.000540	0.578	<0.000240	**0.788**			0.00128 J		
	MW-3	Apr-15		**0.0288**	0.0186 J				<0.00270	<0.0750	<0.00120	**1.55**			**0.108**		
	MW-3	Apr-15	FD	**0.0346**	0.0215				0.00198 J	0.0806 J	0.000346 J	**1.85**			**0.112**		
	MW-3	Oct-15		**0.0248**	0.0157				<0.000540	0.366	0.000298 J	**1.29**			0.00892		
	MW-3	Oct-15	FD	**0.0281**	0.0158				0.00107 J	0.559	0.000371 J	**1.33**			0.00804		
	MW-3	Apr-16		**0.0388**	0.0175 J				<0.00270	0.677	<0.00120	**2.61**			0.00580 J		
	MW-3	Apr-16	FD	**0.0348**	0.0168 J				<0.00270	0.612	<0.00120	**2.62**			0.00575 J		
	MW-3	Oct-16		**0.0550**	0.0152				0.000868 J	**1.82**	0.000241 JB	**1.60**			0.00258		
	MW-3	Oct-16	FD	**0.0553**	0.0152				0.000869 J	**1.75**	0.000692 JB	**1.60**			0.00263		
	MW-3	Apr-17		**0.0213**	0.0140				<0.000540	0.532	0.000306 J	**0.945**			0.00303		
	MW-3	Apr-17	FD	**0.0228**	0.0148				0.000571 J	0.718	0.000272 J	**1.10**			0.00386		
	MW-3	Oct-17		**0.0520**	0.0153				0.000568 J	**2.00**	0.000425 J	**1.15**			0.00335		
	MW-3	Oct-17	FD	**0.0519**	0.0148				0.00107 J	**1.99**	0.000243 J	**1.20**			0.00399		
	MW-4A	Apr-15		**0.108** J	0.0139 J				0.00570 J	**3.15**	<0.00120	**2.96**			<0.00190		
	MW-4A	Oct-15		**0.112**	0.0140				0.00126 J	**2.09**	<0.000240	**1.75**			0.000588 J		
	MW-4A	Apr-16		**0.188**	0.0125 J				<0.00270	**3.21**	<0.00120	**2.39**			<0.00190		
	MW-4A	Oct-16		**0.172**	0.0121				0.000815 J	**1.08**	0.000566 JB	**1.69**			0.000608 J		
	MW-4A	Apr-17		**0.172**	0.0123				<0.000540	**2.34**	0.000274 J	**1.91**			0.000665 J		
	MW-4A	Oct-17		**0.100**	0.0143				<0.000540	**2.22**	<0.000240	**1.95**			0.000494 J		
	MW-4B	Apr-13		**0.0371**	<0.0250				<0.0250	<1.00	**<0.0250**	**1.30**			<0.0250		
	MW-4B	Apr-15		**0.101**	0.0349				<0.00110	**3.60**	0.00189 J	**8.68**			<0.000760		
	MW-4B	Apr-17		**0.0371**	0.0182				<0.000540	**3.42**	<0.000240	**7.35**			<0.000380		
	MW-5A	Apr-15		**0.0938**	0.0128 J				<0.00540	**5.62**	<0.00240	**1.84**			<0.00380		
	MW-5A	Oct-15		**0.0705**	0.0143				0.000685 J	**5.34**	<0.000240	**1.82**			0.000954 J		
	MW-5A	Apr-16		**0.213**	0.0149 J				<0.00270	**8.10**	<0.00120	**1.34**			<0.00190		
	MW-5A	Oct-16		**0.0638**	0.0117				<0.000540	**4.19**	0.000445 JB	**1.73**			0.000606 J		
	MW-5A	Apr-17		**0.149**	0.0135				<0.000540	**6.69**	<0.000240	**1.15**			0.000824 J		
	MW-5A	Oct-17		**0.216**	0.0153				<0.000540	**8.41**	<0.000240	**0.811**			0.00119 J		
	MW-5B	Apr-13		**0.122**	<0.0250				<0.0250	<1.00	**<0.0250**	**2.44**			<0.0250		
	MW-5B	Apr-15		**0.201**	0.0112 J				0.00277 J	**6.11**	<0.00120	**3.87**			0.00197 J		
	MW-5B	Apr-17		**0.154**	0.0115				<0.000540	**4.61**	<0.000240	**3.32**			0.00139 J		
	MW-5C	Apr-13		**0.0139**	0.0166				<0.0100	**1.04**	<0.0100	**0.943**			<0.0100		
	MW-5C	Apr-15		**0.0145**	0.0200 J				<0.00270	**1.15**	<0.00120	**0.975**			<0.00190		
	MW-5C	Apr-17		**0.0113**	0.0237				<0.000540	**1.09**	0.000287 J	**0.918**			<0.000380		
	MW-6A	Apr-14		**0.0113**	0.0287				0.00234 J	<0.100	<0.00140	**1.37**			0.0192		
	MW-6A	Apr-15		**0.0129**	0.0308				<0.00270	0.155 J	<0.00120	**1.40**			0.0308		
	MW-6A	Apr-16		0.00953 J	0.0158 J				<0.00270	0.0787 J	<0.00120	**0.505**			<0.00190		
	MW-6A	Apr-17		**0.0105**	0.0135				<0.000540	0.193	0.000366 J	**0.385**			0.000910 J		
	MW-6B	Mar-13		**0.0493**	0.0139				<0.00500	**1.54**	<0.00500	**2.39**			<0.00500		
	MW-6B	Mar-13	FD	**0.0537**	0.0163				<0.00500	**1.69**	<0.00500	**2.43**			<0.00500		
	MW-6B	Apr-15		**0.0333**	0.0164				<0.00110	**1.37**	<0.000480	**3.45**			<0.000760		
	MW-6B	Apr-17		**0.0115**	0.0134				<0.000540	0.149	<0.000240	**0.889**			<0.000380		
	MW-7A	Apr-15		**0.0190**	0.0149				0.000895 J	0.984	<0.000240	**1.11**			0.000620 J		
	MW-7A	Apr-15	FD	**0.0194**	0.0156				0.00131 J	0.996	0.000288 J	**1.06**			0.000570 J		
	MW-7A	Oct-15		**0.0255**	0.0155				0.00116 J	**2.86**	0.000494 J	**0.632**			0.000638 J		
	MW-7A	Oct-15	FD	**0.0253**	0.0159				0.00114 J	**2.86**	0.000524 J	**0.629**			0.000647 J		
	MW-7A	Apr-16		**0.0382**	0.0170 J				0.00370 J	**6.35**	<0.00120	**0.682**			<0.00190		
	MW-7A	Apr-16	FD	**0.0305**	0.0158 J				<0.00270	**4.43**	<0.00120	**0.588**			<0.00190		
	MW-7A	Oct-16		**0.0181**	0.0173				0.00184 J	**1.66**	0.000527 JB	**0.563**			0.000402 J		
	MW-7A	Oct-16	FD	**0.0186**	0.0159				0.00184 J	**1.66**	0.000618 JB	**0.563**			0.000507 J		
	MW-7A	Apr-17		**0.0182**	0.0148				0.000819 J	**3.20**	<0.000240	**0.530**			0.000425 J		
	MW-7A	Apr-17	FD	**0.0195**	0.0154				0.000720 J	**3.07**	<0.000240	**0.521** V			<0.000380		
	MW-7A	Oct-17		**0.0278**	0.0211				0.00136 J	**4.76**	0.000335 J	**0.509**			<0.000380		
	MW-7A	Oct-17	FD	**0.0286**	0.0168				0.00128 J	**4.82**	<0.000240	**0.522**			<0.000380		
	MW-7B	Apr-13		**<0.0250**	<0.0250				<0.0250	<1.00	**<0.0250**	**0.397**			<0.0250		
	MW-7B	Apr-15		0.00588	0.0111				0.000702 J	0.188	<0.000240	**0.580**			<0.000380		
	MW-7B	Apr-17		0.00397	0.0111				<0.000540	0.146	<0.000240	**0.472**			<0.000380		
	MW-10	Apr-15		**0.0200**	0.0128 J				<0.00270	<0.0750	<0.00120	**2.43**			<0.00190		
	MW-10	Oct-15		**0.0173**	0.0124				<0.000540	0.0570 J	<0.000240	**2.55**			<0.000380		
	MW-10	Apr-16		**0.0196**	0.0123 J				<0.00270	<0.0750	<0.00120	**2.83**			<0.00190		
	MW-10	Oct-16		**0.0191**	0.0184				<0.000540	0.589	0.000399 JB	**2.21**			<0.000380		
	MW-10	Apr-17		**0.0156**	0.0118				<0.000540	0.0992 J	0.000290 J	**2.24**			0.000483 J		
	MW-10	Oct-17		**0.0156**	0.0110				<0.000540	0.147	<0.000240	**2.74**			<0.000380		
	MW-11A	Apr-15		<0.00500	0.0410 J				<0.0100	<0.300	<0.00480	**0.912**			<0.00760		
	MW-11A	Oct-15															
	MW-11A	Apr-16		<0.00125	0.0301				0.00353 J	0.416 J	<0.00120	**0.876** V			<0.00190		
	MW-11A	Oct-16															
	MW-11A	Apr-17		0.00056 J	0.0306				0.00121 J	0.804	<0.000240	**0.758**			<0.000380		
	MW-11A	Oct-17															
	MW-11B	Mar-13		**<0.0250**	<0.0250				<0.0250	**3.25**	**<0.0250**	**0.316**			<0.0250		
	MW-11B	Apr-15		0.00453 J	0.0189 J				<0.00540	**4.38**	<0.00240	**0.427**			<0.00380		
	MW-11B	Apr-17		0.00420	0.0189				<0.000540	**4.59**	<0.000240	**0.374**			<0.000380		
	MW-12	Apr-14		<0.00500	0.0194				<0.00500	0.441 J	<0.00140	0.200			0.0172 J		
	MW-13	Apr-14		0.00205 J	0.0310				<0.00200	<0.100	<0.00140	0.192			<0.00200		
	MW-15	Apr-14		**0.0605**	0.0217				0.00381 J	<0.100	<0.00140	**0.363**			0.00535 J		
	MW-15	Apr-15		**0.0279**	0.0236 J				<0.00270	<0.0750	<0.00120	**0.861**			0.0195		
	MW-15	Apr-16		**0.0216**	0.0203 J				<0.00270	<0.0750	<0.00120	**0.887**			0.00201 J		
	MW-15	Apr-17		**0.0130**	0.0180				<0.000540	0.0239 B	<0.000240	0.173			0.000518 J		

Table 4B - Summary of Groundwater Analytical Data - Total Metals

2017 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

	Analyte Group:			Total Metals													
	Analyte:			**Arsenic**	**Barium**	**Boron**	**Cadmium**	**Cobalt**	**Chromium**	**Iron**	**Lead**	**Manganese**	**Mercury**	**Nickel**	**Selenium**	**Uranium**	**Vanadium**
	Units:			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	CGWSL:			0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
	CGWSL Source:			USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC Irr	WQCC HH	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
Area	**Well ID**	**Date**	**Dup**														
Evaporation Ponds	MW-18A	Apr-15		0.00410	0.0129				0.000794 J	0.379	<0.00480	0.0221	<0.000049	0.00225	**0.0503**		0.00652
	MW-18A	Oct-15		0.00485	0.0173				0.00184 J	0.572	0.000262 J	**0.363**	<0.000049	0.00330	0.00108 J		0.00360 J
	MW-18A	Apr-16		0.00644 J	0.0155 J	**3.14**	<0.00500	<0.00130	<0.00270	0.358 J	<0.00120	**0.366**	<0.000049	0.0121 J	<0.00190	**0.0417** J	0.00258 J
	MW-18A	Oct-16		0.00411	0.0166	**2.73**	<0.000160	<0.000260	<0.000540	0.722	<0.000240	**0.576**	<0.000049	0.00618	0.000448 J	**0.0375**	0.00128 J
	MW-18A	Apr-17		0.00466	0.0152	**2.04**	<0.000160	<0.000260	<0.000540	0.637	<0.000240	**0.723**	<0.000049	0.00762	0.000491 J	**0.0305**	0.000435 J
	MW-18A	Oct-17		0.00600 J	0.0173 J	**2.53**	<0.000800	0.00282 J	<0.000540	**1.47**	<0.00120	**2.05**	<0.000049	0.00793 J	<0.00190	**0.0302** J	<0.000900
	MW-18B	Apr-13		<0.0100	0.0126				<0.0100	<0.400	<0.0100	**0.572**			<0.0100		
	MW-18B	Apr-15		**0.0120**	0.0125				0.000942 J	0.139	0.000814 J	**0.789**			<0.000380		
	MW-18B	Apr-17		0.00883	0.0137				<0.000540	0.0793 J	0.00104 J	**0.803**			<0.000380		
	MW-22A	Apr-15		**0.0545**	0.0179 J				<0.00270	**2.34**	<0.00120	**5.18**			<0.00190		
	MW-22A	Apr-15	FD	**0.0362**	0.0147 J				<0.00270	**2.89**	<0.00120	**4.36**			<0.00190		
	MW-22A	Oct-15		**0.0482**	0.0166				<0.000540	**4.62**	<0.000240	**5.86**			0.000966 J		
	MW-22A	Oct-15	FD	**0.0479**	0.0165				<0.000540	**4.54**	<0.000240	**5.81**			0.000979 J		
	MW-22A	Apr-16		**0.0449**	0.0174 J				<0.00270	**4.42**	<0.00120	**6.06**			<0.00190		
	MW-22A	Apr-16	FD	**0.0455**	0.0167				<0.00270	**4.46**	<0.00120	**6.20**			<0.00190		
	MW-22A	Oct-16		**0.0452**	0.0179				0.000678 J	**5.41**	<0.000240	**7.28**			0.000938 J		
	MW-22A	Oct-16	FD	**0.0447**	0.0183				0.000633 J	**5.26**	<0.000240	**7.15**			0.000874 J		
	MW-22A	Apr-17		**0.0411**	0.0161				<0.000540	**6.07**	0.000354 J	**5.82**			0.000886 J		
	MW-22A	Apr-17	FD	**0.0412**	0.0155				0.000813 J	**6.33**	<0.000240	**6.41**			0.000774 J		
	MW-22A	Oct-17		**0.0427**	0.0167				0.0233	**4.91**	0.000434 J	**6.34**			0.000800 J		
	MW-22A	Oct-17	FD	**0.0432**	0.0158				0.000695 J	**4.94**	<0.000240	**6.52**			0.000858 J		
	MW-22B	Apr-13		**0.0343**	<0.0250				<0.0250	**1.78**	**<0.0250**	**3.37**			<0.0250		
	MW-22B	Apr-15		**0.0389**	0.0160 J				<0.00270	**2.32**	0.00134 J	**4.32**			<0.00190		
	MW-22B	Apr-17		**0.0255**	0.0116				<0.000540	**1.03**	0.000313 J	**3.35**			0.000603 J		
	MW-70	Apr-15		**0.0252**	0.0151				0.000653 J	**3.29**	<0.000240	**0.222**			<0.000380		
	MW-70	Oct-15		**0.0163**	0.0166				<0.000540	**2.99**	<0.000240	**0.227**			<0.000380		
	MW-70	Apr-16		**0.0238**	0.0147 J				<0.00270	**6.19**	<0.00120	**0.543**			<0.00190		
	MW-70	Oct-16		**0.0189**	0.0162				<0.000540	**4.69**	<0.000240	**0.381**			<0.000380		
	MW-70	Apr-17		**0.0156**	0.0149				<0.000540	**2.19**	<0.000240	**0.440**			<0.000380		
	MW-70	Oct-17		**0.0180**	0.0159 J				<0.000540	**4.58**	<0.00120	**0.272**			<0.00190		
	MW-72	Apr-14		**0.0480**	0.0154				<0.00100	**7.13**	<0.000700	**5.69**			<0.00100		
	MW-72	Apr-15		**0.149**	0.0321				<0.00270	**32.3**	<0.00120	**3.05**			0.0155		
	MW-72	Apr-16		**0.0318**	0.0195 J				<0.00270	**7.20**	<0.00120	**4.86**			<0.00190		
	MW-72	Apr-17		**0.0164**	0.0213				<0.000540	**1.62**	<0.000240	**3.88**			0.00210		
	MW-73	Apr-14		**0.0982**	0.0132 J				<0.00500	**5.71**	<0.00350	**2.77**			<0.00500		
	MW-73	Apr-15		**0.0757**	0.00999 J				<0.00270	**2.4**	<0.00120	**2.61**			0.00233 J		
	MW-73	Apr-16		**0.0990**	0.0114 J				<0.00270	**8.28**	<0.00120	**3.17**			0.00201 J		
	MW-73	Apr-17		**0.0650**	0.00734				<0.000540	**1.92**	<0.000240	0.187			0.00184 J		
	MW-74	Apr-15		**0.0549**	0.00894 J				<0.00270	0.175 J	<0.00120	**0.406**			**0.480**		
	MW-74	Oct-15		**0.0733**	0.0127				<0.00108	<0.0300	<0.000480	**1.17**			**0.0608**		
	MW-74	Apr-16		**0.136**	0.0151 J				<0.00270	0.756	<0.00120	**2.19**			0.0150		
	MW-74	Oct-16		**0.0699**	0.0147				0.00120 J	0.203 B	<0.000240	0.0907			**0.585**		
	MW-74	Apr-17		**0.0672**	0.0132				<0.000540	0.0369 J	<0.000240	**1.04**			**0.156**		
	MW-74	Oct-17		**0.0696**	0.0146				<0.000540	0.0463 J	<0.000240	**1.05**			**0.144**		
	MW-75	Apr-15		**0.400**	0.0183 J				0.00396 J	**10.7**	<0.00120	**0.901**			0.00311 J		
	MW-75	Oct-15		**0.328**	0.0149				0.00155 J	**3.75**	<0.000240	**0.821**			0.00248		
	MW-75	Apr-16		**0.183**	0.0218 J				<0.00270	**2.52**	<0.00120	**1.01**			0.00310 J		
	MW-75	Oct-16		**0.275**	0.0150				0.00156 J	**3.29**	<0.000240	**0.916**			0.00245		
	MW-75	Apr-17		**0.220**	0.0174				<0.000540	**3.39**	<0.000240	**0.828**			0.00229		
	MW-75	Oct-17		**0.296**	0.0159				0.00133 J	**3.58**	0.000323 J	**0.834**			0.00196 J		
	MW-76	Apr-15		**0.0777**	0.0127 J				<0.00270	**4.04**	<0.00120	**1.10**			0.00258 J		
	MW-76	Oct-15		**0.0582**	0.0143				0.00126 J	**3.75**	0.000242 J	**0.753**			0.00250		
	MW-76	Apr-16		**0.0610**	0.0140 J				<0.00270	**4.68**	<0.00120	**1.07**			0.00298 J		
	MW-76	Oct-16		**0.0818**	0.0163				0.00266	**6.79**	<0.000240	**1.25**			0.00582		
	MW-76	Apr-17		**0.0561**	0.0120				<0.000540	**4.06**	<0.000240	**0.780**			0.00327		
	MW-76	Oct-17		**0.0594**	0.0134				0.00185 J	**3.93**	<0.000240	**0.741**			0.00399		
	MW-77	Apr-15		**0.0928**	0.0158 J				0.0144	**14.9**	<0.00120	**0.666**			0.0135		
	MW-77	Oct-15		**0.0500**	0.0132 J				0.0098 J	**8.54**	<0.00120	**0.703**			0.0119		
	MW-77	Apr-16		**0.0749**	0.0136 J				0.0132	**12.2**	<0.00120	**0.687**			0.0137		
	MW-77	Oct-16		**0.0505**	0.0120 JB				0.00899 J	**7.87**	<0.00120	**0.706**			0.00996 J		
	MW-77	Apr-17		**0.0466**	0.0100				0.00752	**7.88**	<0.000240	**0.521**			0.0106		
	MW-78	Apr-14		**0.0217**	0.0388				0.0476	**7.58**	0.00107 J	**1.46**			0.0105		
	MW-78	Apr-15		**0.0211**	0.0318				**0.133**	**12.3**	<0.00120	**1.29**			0.0156		
	MW-78	Apr-16		**0.0210**	0.0445				**0.0761**	**14.8**	<0.00120	**0.946**			0.0141		
	MW-78	Apr-17		0.00820	0.0388				0.0422	0.469	<0.000240	**0.435**			0.00957		
	MW-79	Apr-15		0.00807 J	0.0154 J				<0.00270	0.276 J	<0.00120	**1.46**			<0.00190		
	MW-79	Oct-15		**0.0126**	0.0165				<0.00108	**3.03**	<0.000480	**3.76**			0.00144 J		
	MW-79	Apr-16		**0.0113**	0.0181 J				<0.00270	0.882	<0.00120	**3.00**			<0.00190		
	MW-79	Oct-16		**0.0208**	0.0184				<0.000540	**5.37**	<0.000240	**3.68** V			<0.000380		
	MW-79	Apr-17		0.00521	0.0166				<0.000540	0.150	<0.000240	**1.11** V			0.000569 J		
	MW-79	Oct-17		0.00441	0.0178				<0.000540	0.751	<0.000240	**3.82**			<0.000380		
	MW-80	Apr-14		**0.0143**	0.0160				<0.00200	**2.10**	<0.00140	**0.703**			<0.00200		
	MW-80	Apr-15		**0.0187**	0.0151 J				<0.00270	**1.73**	<0.00120	**0.555**			<0.00190		
	MW-80	Apr-16		0.00788 J	0.0185 J				0.0465	**1.34**	<0.00120	**0.234**			<0.00190		
	MW-80	Apr-17		0.00643	0.0173				0.00138 J	0.160	<0.000240	**0.598**			0.00218		
	MW-81	Apr-14		**0.0188**	0.0162				<0.00200	<0.100	<0.00140	0.137			0.00757 J		
	MW-81	Apr-15		**0.0220**	0.0131 J				<0.00270	0.183 J	<0.00120	0.132			0.0235		
	MW-81	Apr-16		**0.0300**	0.0212 J				<0.00270	0.136 J	<0.00120	0.106			0.0467		
	MW-81	Apr-17		**0.0157**	0.0144				<0.000540	<0.0150	0.000248 J	0.0117			0.0182		
	MW-82	Apr-14		**0.133**	0.0210				<0.00200	**3.06**	0.000773 J	**1.33**			<0.00200		
	MW-82	Apr-14	FD	**0.126**	0.0210				<0.00200	**2.73**	<0.00140	**1.36**			<0.00200		
	MW-82	Apr-15		**0.0929**	0.0302				0.00570 J	**1.68**	<0.00120	**1.38**			0.00302 J		
	MW-82	Apr-16		**0.0510**	0.0387				<0.00270	0.414 J	<0.00120	**1.76**			0.00199 J		
	MW-82	Apr-17		**0.0468**	0.0273				0.00182 J	0.792	0.000744 J	**2.02**			0.00137 J		
	MW-83	Apr-15		**0.0304**	0.0116 J				0.0115	**8.98**	<0.00120	**0.863**			0.00376 J		
	MW-83	Oct-15		**0.0215**	0.0403				0.00791	**1.87**	0.000860 J	0.170			0.00806		
	MW-83	Apr-16		**0.0313**	0.0248 J				0.0153	**5.63**	<0.00120	**0.573**			0.00364 J		
	MW-83	Oct-16		**0.0131**	0.121				0.00973	**1.85**	0.00141 JB	**0.434**			0.00925		
	MW-83	Apr-17		**0.0236**	0.0387				0.0224	**8.80**	0.00153 J	**0.570**			0.00556		
	MW-83	Oct-17		**0.0237**	0.0457				0.0338	**5.69**	0.00154 J	**0.460**			0.00446		
	MW-84	Apr-15		**0.116**	0.0135 J				0.00500 J	**2.54**	<0.00120	**2.83**			0.00452 J		
	MW-84	Oct-15		**0.0827**	0.0249 J				0.0220	0.397 J	<0.00240	**2.74**			0.0308		
	MW-84	Apr-16		**0.115**	0.0173 J				0.00771 J	**1.27**	<0.00120	**3.30**			0.00714 J		
	MW-84	Oct-16		**0.0981**	0.0189				0.00917	0.868	<0.000240	**2.71**			0.0110		
	MW-84	Apr-17		**0.0798**	0.0132				0.000849 J	0.439	0.000346 J	**2.28**			0.00527		
	MW-84	Oct-17		**0.151**	0.0133				0.00353	**6.03**	<0.000240	**2.90**			0.00432		
	MW-87	Apr-15		0.00635	0.0184				0.000789 J	0.194	<0.000240	0.102			0.00115 J		
	MW-87	Oct-15		0.00702	0.0322				<0.000540	**11.8**	<0.000240	**6.04**			0.00131 J		
	MW-87	Apr-16		**0.0106**	0.0200 JO1				<0.00270	**4.56**	<0.00120	**2.70** V			<0.00190		
	MW-87	Oct-16		0.00673	0.0179				<0.000540	**1.53**	<0.000240	**0.731**			<0.000380		
	MW-87	Apr-17		0.00551	0.0155				<0.000540	**1.52**	<0.000240	**1.62**			<0.000380		
	MW-87	Oct-17		0.00776 J	0.0174 J				<0.000540	**1.71**	0.00473 J	**1.48**			<0.00190		

Table 4B - Summary of Groundwater Analytical Data - Total Metals

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

	Analyte Group:			Total Metals													
	Analyte:			Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
	Units:			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	CGWSL:			0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
	CGWSL Source:			USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC Irr	WQCC HH	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
Area	Well ID	Date	Dup														
Evaporation Ponds	MW-88	Apr-15		**0.0231**	0.0132 J				<0.00270	**2.11**	<0.00120	**1.42**			<0.00190		
	MW-88	Oct-15		0.00917	0.0108				<0.000540	0.0268 J	<0.000240	**0.772**			<0.000380		
	MW-88	Apr-16		0.00976 J	0.0107 J				<0.00270	<0.0750	<0.00120	**0.844**			<0.00190		
	MW-88	Oct-16		0.00911	0.0104				0.000551 J	<0.0150	<0.000240	**0.976**			<0.000380		
	MW-88	Apr-17		0.00709	0.0101				<0.000540	<0.0150	<0.000240	**0.819**			<0.000380		
	MW-88	Oct-17		0.00742	0.0113				<0.000540	0.0458 J	0.000315 J	**0.823**			<0.000380		
	MW-120	Apr-15		0.00974 J	0.0108 J				<0.00270	**2.63**	<0.00120	**1.33**			0.0335		
	MW-120	Oct-15		**0.0101**	0.0149				<0.000540	**4.74**	<0.000240	**1.79**			0.00113 J		
	MW-120	Apr-16		**0.0138**	0.0176 J				<0.00270	**7.32**	<0.00120	**2.14**			0.00511 J		
	MW-120	Oct-16		**0.0135**	0.0194				<0.000540	**5.90**	<0.000240	**1.96**			<0.000380		
	MW-120	Apr-17		**0.0106**	0.0144				<0.000540	**4.54**	0.000345 J	**1.48**			0.00251		
	MW-120	Oct-17		**0.0112**	0.0160				0.000571 J	**4.59**	<0.000240	**1.49**			0.000531 J		
	MW-121	Apr-15		**0.0366**	0.0142				<0.00110	0.700	<0.000480	**3.85**			0.00792		
	MW-121	Oct-15		**0.0413**	0.0138				<0.000540	0.287	<0.000240	**2.70**			0.0109		
	MW-121	Apr-16		**0.0443**	0.0179 J				<0.00270	0.530	<0.00120	**3.56**			0.00777 J		
	MW-121	Oct-16		**0.0377**	0.0130				<0.000540	0.262	<0.000240	**2.33**			0.00746		
	MW-121	Apr-17		**0.0322**	0.0128				<0.000540	0.304	<0.000240	**2.66**			0.00468		
	MW-121	Oct-17		**0.0345**	0.0136				<0.000540	0.221	<0.000240	**2.40**			0.00788		
	MW-122	Apr-15		**0.0116** J	0.0273 J				<0.00540	0.606 J	<0.00240	**1.92**			0.00988 J		
	MW-122	Oct-15		0.00629	0.0251				<0.00108	**1.59**	<0.000480	**1.27**			0.00120 J		
	MW-122	Apr-16		0.00444 J	0.0291				<0.00270	0.610	<0.00120	**1.50**			<0.00190		
	MW-122	Oct-16		0.00559	0.0272				<0.000540	**5.20**	<0.000240	**1.61**			<0.000380		
	MW-122	Apr-17		0.00519	0.0300				<0.000540	**2.02**	<0.000240	**2.03**			0.000551 J		
	MW-122	Oct-17		0.00559	0.0231				<0.000540	**5.01**	<0.000240	**1.28**			<0.000380		
	MW-123	Apr-15		**0.0258**	0.0200 J				<0.00270	<0.0750	<0.00120	**2.59**			<0.00190		
	MW-123	Oct-15		**0.0250**	0.0226				<0.000540	0.0657 J	0.000254 J	**2.72**			<0.000380		
	MW-123	Apr-16		**0.0275**	0.0242 J				<0.00270	<0.0750	<0.00120	**2.92**			<0.00190		
	MW-123	Oct-16		**0.0226**	0.0236				<0.000540	0.0599 J	0.000364 JB	**2.59**			<0.000380		
	MW-123	Apr-17		**0.0231**	0.0213 O1				<0.000540	0.0684 B	<0.000240	**2.59**			0.000395 J		
	MW-123	Oct-17		**0.0221**	0.0239				<0.000540	<0.0150	<0.000240	**2.88**			<0.000380		
	MW-124	Apr-15		0.00276	0.0192				0.00126 J	**1.22**	0.000379 J	**0.816**			<0.000380		
	MW-124	Oct-15		0.00443	0.0247				<0.00108	**2.93**	<0.000480	**0.562**			<0.000760		
	MW-124	Apr-16		0.00477 J	0.0288				<0.00270	**4.08**	<0.00120	**0.749**			<0.00190		
	MW-124	Oct-16		0.00303	0.0323				0.00124 J	**4.99**	0.000546 JB	**0.469**			<0.000380		
	MW-124	Apr-17		0.00565	0.0205				<0.000540	**10.6**	<0.000240	**0.448**			<0.000380		
	MW-124	Oct-17		0.00354 J	0.0219 J				<0.000540	**5.08**	<0.00120	**0.521**			<0.00190		
	OCD-1R	Apr-15		0.00662 J	0.0176 J				<0.00540	0.238 J	<0.00240	**0.773**			0.0217		
	OCD-1R	Oct-15		0.00447	0.0184				<0.00108	0.593	<0.000480	**1.59**			0.00229 J		
	OCD-1R	Apr-16		0.00729 J	0.0141 J				**0.105**	**1.54**	<0.00120	**0.462**			0.00420 J		
	OCD-1R	Oct-16		0.00524	0.0286				0.00312	**3.04**	<0.000240	**3.92**			0.000543 J		
	OCD-1R	Apr-17		0.00319	0.0150				0.00119 J	0.275 B	<0.000240	**1.27**			0.000988 J		
	OCD-1R	Oct-17		0.00433	0.0192				0.000885 J	0.830	0.000662 J	**1.56**			0.000822 J		
	OCD-2A	Apr-15		0.00197 J	0.0193 J				<0.00270	0.965	<0.00120	**0.313**			<0.00190		
	OCD-2A	Oct-15		0.00361 J	0.0234				0.00385 J	**2.64**	<0.000480	**1.34**			<0.000760		
	OCD-2A	Apr-16		0.0064 J	0.0209 J				0.00304 J	**5.47**	<0.00120	**1.66**			<0.00190		
	OCD-2A	Oct-16		0.00234	0.0264				0.000783 J	**1.50**	0.000260 J	**0.535**			<0.000380		
	OCD-2A	Apr-17		0.00591	0.0213				<0.000540	**6.76**	<0.000240	**1.22**			<0.000380		
	OCD-2A	Oct-17		0.00323	0.0197				<0.000540	**3.74**	<0.000240	**0.966**			<0.000380		
	OCD-3	Apr-15		0.00421 J	0.0198 J				<0.00270	**1.69**	<0.00120	0.165			<0.00190		
	OCD-3	Oct-15		0.00184 J	0.0224				<0.000540	0.352	<0.000240	**0.412**			0.00113 J		
	OCD-3	Apr-16		0.00389 J	0.0214 J				<0.00270	**1.23**	<0.00120	0.0524			<0.00190		
	OCD-3	Oct-16		0.00422	0.0228				<0.000540	**2.31**	<0.000240	**0.527**			<0.000380		
	OCD-3	Apr-17		0.00141 J	0.0207				<0.000540	0.681	<0.000240	0.0337			<0.000380		
	OCD-3	Oct-17		**0.0104**	0.0255				0.000587 J	**5.44**	<0.000240	**0.770**			<0.000380		
	OCD-4	Apr-15		0.00351 J	0.0263 J				<0.00540	**4.06**	<0.00240	**0.311**			<0.00380		
	OCD-4	Oct-15		0.00701	0.0226				<0.000540	**6.61**	<0.000240	**0.233**			<0.000380		
	OCD-4	Apr-16		0.00209 J	0.0226 J				<0.00270	0.855	<0.00120	0.119			<0.00190		
	OCD-4	Oct-16		0.00374	0.0255				<0.000540	**3.46**	<0.000240	**0.285**			<0.000380		
	OCD-4	Apr-17		0.00227	0.0219				<0.000540	**2.00**	<0.000240	0.0669			<0.000380		
	OCD-4	Oct-17		**0.0105**	0.0248				<0.000540	**10.0**	<0.000240	**0.270**			<0.000380		
	OCD-5	Apr-15		0.00805 J	0.0284 J				<0.00540	**5.34**	<0.00240	**0.328**			<0.00380		
	OCD-5	Oct-15		**0.0166**	0.0272				0.00108 J	**11.3**	<0.000480	**0.306**			<0.000760		
	OCD-5	Apr-16		**0.0126**	0.0279				<0.00270	**15.4**	0.00177 J	**0.267**			<0.00190		
	OCD-5	Oct-16		0.00863	0.0288				0.000559 J	**9.09**	<0.000240	**0.295**			<0.000380		
	OCD-5	Apr-17		**0.0108**	0.0269				<0.000540	**17.0**	<0.000240	**0.343**			<0.000380		
	OCD-5	Oct-17		**0.0124**	0.0261				0.000602 J	**12.6**	<0.000240	**0.271**			<0.000380		
	OCD-6	Apr-15		**0.0141**	0.0240 J				<0.00270	**3.91**	<0.00120	**2.07**			<0.00190		
	OCD-6	Oct-15		**0.0235**	0.0254				<0.00108	**9.38**	<0.000480	**2.32**			0.00110 J		
	OCD-6	Apr-16		**0.0139**	0.0214 J				<0.00270	**2.39**	<0.00120	**2.22**			<0.00190		
	OCD-6	Oct-16		**0.0120**	0.0253				0.000759 JB	**1.82**	0.000501 JB	**2.61**			0.000900 J		
	OCD-6	Apr-17		0.00911	0.0222				<0.000540	**2.28**	<0.000240	**2.09**			0.000598 J		
	OCD-6	Oct-17		**0.0200**	0.0256				<0.000540	**11.4**	<0.000240	**2.29**			<0.000380		
	OCD-7AR	Apr-15		**0.0840**	0.0111 J				<0.00270	**1.66**	<0.00120	**2.56**			<0.00190		
	OCD-7AR	Oct-15		**0.201**	0.0162				<0.00108	**9.36**	<0.000480	**2.88**			0.00230 J		
	OCD-7AR	Apr-16		**0.150**	0.0145 J				<0.00270	**2.89**	<0.00120	**2.25**			0.00195 J		
	OCD-7AR	Oct-16		**0.169**	0.0151				0.000837 J	**10.3**	<0.000240	**2.92**			0.00178 J		
	OCD-7AR	Apr-17		**0.113**	0.0134				<0.000540	**1.77**	<0.000240	**2.14**			0.00141 J		
	OCD-7AR	Oct-17		**0.181**	0.0150				<0.000540	**10.9**	<0.000240	**2.69**			0.00160 J		
	OCD-7B	Mar-13		<0.00500	0.0160				<0.00500	<0.200	<0.00500	0.0246			<0.00500		
	OCD-7B	Apr-15		0.00294 J	0.0196 J				<0.00270	**3.52**	<0.00120	**0.710**			<0.00190		
	OCD-7B	Apr-17		0.00194 J	0.0179				<0.000540	**2.73**	<0.000240	**0.621**			<0.000380		
	OCD-8A	Apr-15		**0.0541**	0.0336				0.000836 J	**12.3**	<0.000240	**6.38**	<0.000049	0.0598	0.000802 J		0.00100 J
	OCD-8A	Oct-15		**0.0622**	0.0287				0.000787 J	**9.70**	0.000380 J	**4.11**	<0.000049 J	0.0471	0.000836 J		0.00231 J
	OCD-8A	Apr-16		**0.0618**	0.0199 J	**0.813**	<0.00500	<0.00130	<0.00270	**8.89**	<0.00120	**3.80**	<0.000049	0.0306	<0.00190	<0.00165	0.00190 J
	OCD-8A	Oct-16		**0.0616**	0.0213	**0.776**	<0.000160	0.00124 J	0.000710 J	**6.60**	0.000478 JB	**3.08**	<0.000049	0.0260	0.000984 J	0.00108 J	0.000745 J
	OCD-8A	Apr-17		**0.0632**	0.0177	**0.837**	<0.000160	0.00103 J	<0.000540	**6.72**	<0.000240	**2.91**	<0.000049	0.0246	0.000793 J	0.00102 J	0.000626 J
	OCD-8A	Oct-17		**0.0857**	0.0196	**0.888**	<0.000160	0.00180 J	0.000994 J	**7.29**	<0.000240	**3.25**	<0.000049	0.0230	0.000961 J	0.000983 J	0.00103 J
	OCD-8B	Apr-13		**<0.0250**	<0.0250				<0.0250	<1.00	**<0.0250**	**0.417**			<0.0250		
	OCD-8B	Apr-15		**0.0126**	0.0141				0.000872 J	0.239	0.000392 J	**5.98**			0.000525 J		
	OCD-8B	Apr-17		0.00912	0.0124				<0.000540	0.266	0.000256 J	**6.36**			<0.000380		
Field East of Refinery	KWB-1A	Apr-15		0.00362	0.00932				0.000649 J	0.108	0.000599 J	**0.543**	<0.000049	0.00866	0.00247		0.0236
	KWB-1A	Oct-15		0.00416	0.00949				<0.000540	0.0387 J	0.000260 J	**0.439**	<0.000049	0.00846	0.000753 J		0.0209
	KWB-1A	Apr-16		0.00401 J	0.0131 J	0.741	<0.00500	0.0122	<0.00270	<0.0750	<0.00120	**0.552**	<0.000049	0.0100	0.00528 J	0.0247 J	0.0258
	KWB-1A	Oct-16		0.00296	0.00944	0.608 O1V	<0.000160	0.0143	0.00127 JB	0.0845 JB	0.000408 J	**0.500**	<0.000049	0.00846	0.00106 J	0.0188	0.0204
	KWB-1A	Apr-17		0.00319	0.00857	0.706	<0.000160	0.00583	<0.000540	<0.0150	<0.000240	**0.447**	<0.000049	0.00881	0.00164 J	0.0232	0.0221
	KWB-1A	Oct-17		0.00342	0.00856	0.745	<0.000160	0.00612	<0.000540	<0.0150	<0.000240	**0.413**	<0.000049	0.00841	0.000912 J	0.0174	0.0237
	KWB-1C	Apr-13		<0.0100	0.0146				<0.0100	<0.400	<0.0100	<0.0100			<0.0100		
	KWB-1C	Apr-15		0.00338	0.00918				<0.000540	0.0537 J	0.000320 J	**0.462**			0.000549 J		
	KWB-1C	Apr-17		0.00303	0.00955				<0.000540	<0.0150	<0.000240	**0.501**			<0.000380		
	KWB-7	Apr-15		**0.0200**	0.0645				0.000832 J	**1.44**	0.000625 J	**5.65**	<0.000049	0.00901	<0.000380		0.00133 J
	KWB-7	Oct-15		0.00939	0.0647				<0.000540	**1.04**	<0.000240	**4.09**	<0.000049	0.00442	<0.000380		0.00182 J
	KWB-7	Apr-16		**0.0104**	0.0550	0.503	<0.00500	0.00739 J	<0.00270	**1.42**	<0.00120	**3.48**	<0.000049	0.0121	<0.00190	0.00299 J	0.00196 J
	KWB-7	Oct-16		0.00597	0.0560	0.455	<0.000160	0.00298	<0.000540	0.677	0.000441 J	**3.04**	<0.000049	0.0107	<0.000380	0.00286 J	0.000901 J
	KWB-7	Apr-17		0.00307	0.0650	0.436	<0.000160	0.00206	<0.000540	**1.47**	0.000707 J	**3.44**	<0.000049	0.00746	<0.000380	0.00159 J	0.00102 J
	KWB-7	Oct-17		0.00415	0.0915	0.460	<0.000160	0.00247	0.000670 J	**1.37**	0.000698 J	**3.22**	<0.000049	0.00875	0.00100 J	0.00142 J	0.00129 J

Table 4B - Summary of Groundwater Analytical Data - Total Metals

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Date	Dup	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
	Analyte Group:			Total Metals													
	Units:			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	CGWSL:			0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
	CGWSL Source:			USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC Irr	WQCC HH	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
Field East of Refinery	KWB-8	Oct-16		0.00109 J	0.139	0.665	<0.000160	<0.000260	0.000710 JB	0.672	0.00387	**0.997**	<0.000049 J6	0.00102 JB	0.000475 J	0.000746 J	0.00122 J
	KWB-8	Apr-17		0.00129 J	0.106	0.632	<0.000160	0.000264 J	0.000851 J	**1.07**	0.00495	**1.83**	<0.000049	0.00120 J	<0.000380	<0.00033	0.00157 J
	KWB-8	Oct-17		0.00135 J	0.130	**0.769**	<0.000160	<0.000260	0.00153 J	0.0804 J	0.00296	**0.510**	<0.000049	0.000997 J	0.0463	<0.00033	0.00112 J
	KWB-10R	Apr-15		**0.0259**	**3.50**				<0.000540	**7.48**	0.00172 J	0.149			<0.000380		
	KWB-10R	Oct-15		**0.0217**	**3.72**				<0.000540	**5.84**	0.00109 J	0.157			<0.000380		
	KWB-10R	Apr-16		**0.0226**	**4.31**				<0.00270	**7.43**	0.00131 J	0.199			<0.00190		
	KWB-10R	Oct-16		**0.0301**	0.816				0.000798 JB	**6.11**	0.00102 J	0.161			<0.000380		
	KWB-10R	Apr-17		**0.0157**	**3.82**				<0.000540	**5.21**	0.000971 J	0.157			<0.000380		
	KWB-10R	Oct-17		**0.0170**	**3.85**				<0.000540	**5.24**	0.000996 J	0.163			<0.000380		
	KWB-11A	Apr-15		0.00251 J	0.0240 J				<0.00270	<0.0750	0.00825 J	**0.294**	<0.000049	0.00675 J	0.00262 J		0.0122 J
	KWB-11A	Oct-15		0.00266	0.0267				<0.000540	<0.0150	0.00515	0.191	<0.000049	0.00461	0.00776		0.0112
	KWB-11A	Apr-16		0.00231 J	0.00508	0.502	<0.00500	0.00175 J	<0.00270	<0.0750	0.00851 J	**0.222**	<0.000049	0.00476 J	0.00852 J	**0.0326** J	0.0118 J
	KWB-11A	Oct-16		0.00220	0.0227	0.449	<0.000160	0.00194 J	<0.000540	<0.0150	0.00525	**0.212**	<0.000049 J3J6O1	0.00476 B	0.00529	0.0217	0.0102
	KWB-11A	Apr-17		0.00183 J	0.0214	0.412	<0.000160	0.00126 J	<0.000540	<0.0150	0.00281	**0.243**	<0.000049	0.00431	0.00536	0.0187	0.0113
	KWB-11A	Oct-17		0.00890	0.0190	0.502	<0.000160	0.00470	<0.000540	0.100	0.00271	**0.325**	<0.000049	0.00598	0.00200 J	0.0127	0.00608
	KWB-11B	Apr-15		0.00147 J	0.0127				0.00116 J	<0.0150	<0.000240	0.00271 J	<0.000049	<0.000350	0.00783		0.00806
	KWB-11B	Oct-15		0.00185 J	0.0134				0.000703 J	<0.0150	<0.000240	0.000257 J	<0.000049	<0.000350	0.00769		0.00812
	KWB-11B	Apr-16		<0.00125	0.0135 J	0.173 JJ6O1	<0.00500	<0.00130	<0.00270	0.121 J	<0.00120	0.00188 J	<0.000049	<0.00175	0.00949 J	0.00987 J	0.00814 J
	KWB-11B	Oct-16		0.00109 J	0.0116	0.105	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.000800 J	<0.000049 J3	0.000559 JB	0.00701	0.0101	0.00727
	KWB-11B	Apr-17		0.00126 J	0.0138	0.121	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.000954 J	<0.000049	<0.000350	0.00959	0.0113	0.00846
	KWB-11B	Oct-17		0.00133 J	0.0127	0.133 J	<0.000160	<0.000260	0.000977 J	0.0153 J	<0.000240	0.00153 J	<0.000049	0.00144 J	0.00907	0.0112	0.00864
	KWB-12A	Apr-15		0.00160 J	0.0168				0.00164 J	0.269	0.000780 J	0.00353 J	<0.000049	0.000930 J	0.00435		0.0108
	KWB-12A	Apr-15	FD	0.00145 J	0.0138				<0.000540	<0.0150	<0.000240	0.000251 J	<0.000049	0.000503 J	0.00375		0.0100
	KWB-12A	Oct-15		0.00242	0.0170				0.000659 J	0.0285 J	<0.000240	0.000862 J	<0.000049	0.000959 J	0.00368		0.0139
	KWB-12A	Apr-16		0.00162 J	0.0164 J	0.695	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	<0.00125	<0.000049	<0.00175	0.00370 J	**0.0331** J	0.0132 J
	KWB-12A	Oct-16		0.00159 J	0.0156	0.481	<0.000160	<0.000260	0.00159 JB	<0.0150	0.000256 J	<0.000250	<0.000049 J3	0.000739 J	0.00360	0.0288	0.0110
	KWB-12A	Apr-17		0.00149 J	0.0157	0.492	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.00213 J	<0.000049	<0.000350	0.00372 B	0.0260	0.0112
	KWB-12A	Oct-17		0.00142 J	0.0144	0.593	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.000334 J	<0.000049	0.000495 J	0.00334	0.0252	0.0127
	KWB-12B	Apr-15		0.00151 J	0.00823				0.000588 J	<0.0150	<0.000240	0.000826 J	<0.000049	0.000469 J	0.00348		0.0108
	KWB-12B	Oct-15		0.00182 J	0.0118				<0.000540	0.0175 J	<0.000240	0.00117 J	<0.000049	0.00120 J	0.00370		0.0129
	KWB-12B	Oct-15	FD	0.00237	0.0118				0.000599 J	0.0312 J	<0.000240	<0.000250 B	<0.000049	0.000565 J	0.00361		0.0129
	KWB-12B	Apr-16		0.00178 J	0.0130 J	0.712	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	0.00441 J	<0.000049	<0.00175	0.00307 J	**0.0302** J	0.0125 J
	KWB-12B	Apr-16	FD	0.00165 J	0.0116 J	0.651	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	0.00434 J	<0.000049	<0.00175	0.00301 J	0.0282 J	0.0117 J
	KWB-12B	Oct-16		0.00159 J	0.0101	0.464	<0.000160	<0.000260	0.00136 JB	0.0358 J	<0.000240	0.00955	<0.000049 J3	0.000824 J	0.00248	0.0263	0.0112
	KWB-12B	Oct-16	FD	0.00161 J	0.0108	0.533	<0.000160	<0.000260	0.00147 JB	0.0369 J	0.000299 J	0.0104	<0.000049 J3	0.000703 J	0.00295	0.0265	0.0114
	KWB-12B	Apr-17		0.00157 J	0.00901	0.525	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.00232 J	<0.000049	<0.000350	0.00382 B	0.0273	0.0122
	KWB-12B	Apr-17	FD	0.00167 J	0.00968	0.558	<0.000160	<0.000260	<0.000540	0.0486 J	<0.000240	0.00129 J	<0.000049	0.000513 JB	0.00356	**0.0307**	0.0127
	KWB-12B	Oct-17		0.00159 J	0.00870	0.616	<0.000160	<0.000260	0.000543 J	0.0534 J	<0.000240	0.00158 J	<0.000049	0.000457 J	0.00346	0.0264 J	0.0127
	KWB-12B	Oct-17	FD	0.00169 J	0.00878	0.629	<0.000160	<0.000260	<0.000540	0.0374 J	<0.000240	0.00122 J	<0.000049	0.000453 J	0.00298	0.0273	0.0122
	KWB-P4	Apr-13															
	KWB-P4	Apr-15															
	KWB-P4	Apr-17															
	MW-57	Apr-15		0.00495	0.0267				0.00104 J	0.658	0.000946 J	0.192			0.0300		
	MW-57	Oct-15		0.00660	0.0339				<0.000540	0.301	0.000729 J	**0.852**			0.0159		
	MW-57	Apr-16		0.00654 J	0.0344				0.00322 J	0.881	0.00266 J	**0.378**			0.0131		
	MW-57	Oct-16		0.00564	0.0253				0.000798 JB	0.559	0.000516 J	0.104			0.0169		
	MW-57	Apr-17		0.00502	0.0202				<0.000540	0.353	0.000515 J	**0.278**			0.0231		
	MW-57	Oct-17		0.00391	0.0176				0.000652 J	0.0996 J	<0.000240	0.0323			0.0171		
	MW-58	Apr-15		**0.0121**	0.819				<0.000540	**1.76**	0.00339	0.0946	<0.000049	0.00140 J	<0.000380		0.00229 J
	MW-58	Oct-15		0.00810	**1.03**				<0.000540	**1.29**	0.00190 J	0.117	<0.000049	0.00108 J	<0.000380		<0.000180 B
	MW-58	Apr-16		**0.0135**	0.744	0.518	<0.00500	<0.00130	<0.00270	**1.06**	0.00297 J	**0.391**	<0.000049	<0.00175	0.00524 J	<0.00165	0.00259 J
	MW-58	Oct-16		0.00683	0.915	0.455	<0.000160	0.000318 J	0.00108 JB	**1.01**	0.00234	0.114	<0.000049 J3	0.00133 J	<0.000380	<0.00033	0.00451 J
	MW-58	Apr-17		**0.0115**	0.716	0.453	<0.000160	<0.000260	<0.000540	0.521	0.00218	**0.333**	<0.000049	0.000637 J	<0.000380	<0.00033	0.00233 J
	MW-58	Oct-17		0.00648	**1.15**	0.471	<0.000160	<0.000260	<0.000540	0.385	0.00204	**0.319**	<0.000049	0.00129 J	<0.000380	<0.00165	0.00422 J
	MW-111	Apr-15		**0.0201**	0.147				0.00167 J	**5.03**	0.00141 J	**1.72**			<0.000380		
	MW-111	Oct-15		**0.0144**	0.127				0.00239	**7.14**	0.00205	**1.52**			<0.000380		
	MW-111	Apr-16		**0.0131**	0.0926				<0.00270	**6.67**	<0.00120	**1.66**			<0.00190		
	MW-111	Oct-16		**0.0108**	0.0757				0.000976 JB	**6.14**	0.000310 J	**1.41**			<0.000380		
	MW-111	Apr-17		**0.0127**	0.0697				<0.000540	**6.15**	<0.000240	**1.57**			<0.000380		
	MW-111	Oct-17		0.00926	0.0714				<0.000540	**7.15**	<0.000240	**1.45**			<0.000380		
	MW-113	Apr-15		0.00294	0.0330				0.00171 J	0.559	0.000733 J	**0.918**			0.00250		
	MW-113	Apr-15	FD	0.00418	0.0518				0.00221	**1.01**	0.000872 J	**0.857**			<0.000380		
	MW-113	Oct-15		0.00366	0.0242				<0.000540	0.196	<0.000240	**0.765**			<0.000380		
	MW-113	Oct-15	FD	0.00379	0.0233				<0.000540	0.203	<0.000240	**0.767**			<0.000380		
	MW-113	Apr-16		0.00282 J	0.0251				<0.00270	0.270 J	<0.00120	**0.734**			<0.00190		
	MW-113	Apr-16	FD	0.00306 J	0.0289				<0.00270	0.347 J	<0.00120	**0.823**			<0.00190		
	MW-113	Oct-16		0.00138 J	0.0249				<0.000540	**1.17** O1	<0.000240	**1.36** O1V			<0.000380		
	MW-113	Oct-16	FD	0.00125 J	0.0245				<0.000540	**1.13**	<0.000240	**1.37**			<0.000380		
	MW-113	Apr-17		0.00284	0.0257				<0.000540	0.512	<0.000240	**1.08**			<0.000380		
	MW-113	Apr-17	FD	0.00285	0.0244				<0.000540	0.480	<0.000240	**1.05**			<0.000380		
	MW-113	Oct-17		0.00138 J	0.0253				<0.000540	0.764	<0.000240	**1.14**			0.000401 J		
	MW-113	Oct-17	FD	0.00140 J	0.0235				<0.000540	0.774	0.000324 J	**1.19**			<0.000380		
	MW-125	Apr-15		0.00369	0.00961				<0.000540	<0.0150	<0.000240	**0.405**			0.00581 J		
	MW-125	Oct-15		0.00440	0.00911				<0.000540	0.0196 J	<0.000240	**0.371**			0.00409		
	MW-125	Apr-16		0.00408 J	0.00922 J				<0.00270	<0.0750	<0.00120	**0.438**			0.00410 J		
	MW-125	Oct-16		0.00383	0.00806				0.000898 JB	<0.0150	<0.000240	**0.370**			0.00253		
	MW-125	Apr-17		0.00336	0.00822				<0.000540	<0.0150	<0.000240	**0.374**			0.00962		
	MW-125	Oct-17		0.00386	0.0153				0.00253	0.0228 J	<0.000240	**0.329**			0.00635		
	MW-126A	Apr-15		0.00270	0.0185				0.00164 J	**1.02**	0.000293 J	**0.824**			<0.000380		
	MW-126A	Oct-15		0.00195 J	0.0146				<0.000540	0.786	<0.000240	**0.642**			<0.000380		
	MW-126A	Apr-16		0.00222	0.0174				<0.00270	0.803	<0.00120	**0.797**			<0.00190		
	MW-126A	Oct-16		0.00257	0.0109				<0.000540	0.299	<0.000240	**0.371**			<0.000380		
	MW-126A	Apr-17		0.00171 J	0.0157				<0.000540	0.602	<0.000240	**0.821**			<0.000380		
	MW-126A	Oct-17		0.00118 J	0.0133				<0.000540	0.485	<0.000240	**0.651**			<0.000380		
	MW-126B	Apr-15		0.00377 J	0.0110 J				<0.00270	<0.0750	<0.00120	0.0892			0.00215 J		
	MW-126B	Oct-15		0.00442	0.0116				0.000580 J	0.154	0.000342 J	0.0609			0.00206		
	MW-126B	Apr-16		0.00430 J	0.0133 J				<0.00270	0.170 J	<0.00120	0.0744			0.00285 J		
	MW-126B	Oct-16		0.00404	0.00919				<0.000540	0.0351 J	<0.000240	0.0539			0.00133 J		
	MW-126B	Apr-17		0.00367	0.0101				<0.000540	0.0356 J	<0.000240	0.0612			0.00207		
	MW-126B	Oct-17		0.00360	0.0100				0.000749 J	0.0330 J	0.000777 J	0.0547			0.00256		
	MW-127	Apr-15		0.00626	0.534				0.00241	**1.64**	0.00138 J	0.109			<0.000380		
	MW-127	Oct-15		0.00499	0.116				<0.000540	0.323	<0.000240	0.0943			<0.000380		
	MW-127	Apr-16		0.00535 J	0.137				<0.00270	0.357 J	<0.00120	0.103			<0.00190		
	MW-127	Oct-16		0.00453	0.0797				<0.000540	0.296	<0.000240	0.101			<0.000380		
	MW-127	Apr-17		0.00383	0.0718				<0.000540	0.187	<0.000240	0.0940			<0.000380		
	MW-127	Oct-17		**0.0114**	0.212				0.00109 J	**1.39**	0.000965 J	0.135			<0.000380		
	MW-128	Apr-15		**0.0520**	0.0783				0.000905 J	**2.94**	0.00246	**2.42**			<0.000380 B		
	MW-128	Oct-15		**0.0552**	0.0772				<0.000540	**2.65**	<0.000240	**2.31**			<0.000380		
	MW-128	Apr-16		**0.341**	0.372				0.00347 J	**15.4**	0.00336 J	**12.9**			<0.00190		
	MW-128	Oct-16		**0.0643**	0.0676				0.00182 JB	**3.12**	0.00222	**2.11**			<0.000380		
	MW-128	Apr-17		**0.0583**	0.0621				0.000580 J	**2.98**	0.00114 J	**2.09**			0.00973		
	MW-128	Oct-17		**0.0554**	0.0610				0.000618 J	**3.07**	0.000404 J	**2.09**			0.00122 J		

Table 4B - Summary of Groundwater Analytical Data - Total Metals

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Total Metals													
				Analyte:	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC Irr	WQCC HH	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
Field East of Refinery	MW-129	Apr-15		**0.0338**	0.498				0.00227	**6.42**	0.00277	**1.21**			<0.000380		
	MW-129	Oct-15		**0.0271**	0.546				<0.000540	**5.07**	0.000292 J	**1.09**			<0.000380		
	MW-129	Apr-16		**0.0272**	0.593				<0.00270	**5.49**	<0.00120	**1.10**			<0.00190		
	MW-129	Oct-16		**0.0236**	0.607				0.000625 JB	**4.79**	0.000529 J	**1.00**			<0.000380		
	MW-129	Apr-17		**0.0226**	0.627				<0.000540	**5.10**	<0.000240	**0.987**			<0.000380		
	MW-130	Apr-15		0.00718	0.677				0.00205	0.143 J	0.00929	**0.242**			<0.00190 B		
	MW-130	Oct-15		0.00477	0.0195				0.000567 J	0.162	0.000362 J	0.0921			0.00224		
	MW-130	Apr-16		0.00449 J	0.0228 J				<0.00270	0.451 J	<0.00120	0.105			0.00575 J		
	MW-130	Oct-16		0.00403	0.0188				0.000869 JB	0.104	<0.000240	0.0891			0.00675		
	MW-130	Apr-17		0.00391	0.0198				<0.000540	0.0756 J	<0.000240	0.0972			0.0101		
	MW-130	Oct-17		0.00374	0.0179				<0.000540	0.0360 J	<0.000240	0.0918			0.00852		
	MW-131	Apr-15		**0.0220**	**2.67**				0.000747 J	**2.34**	0.000919 J	**0.316**			<0.000380		
	MW-131	Oct-15		**0.0261**	**2.88**				0.00371	**4.71**	0.00294	**0.337**			<0.000380		
	MW-131	Apr-16		**0.0222**	**2.67**				<0.00270	**1.46**	<0.00120	**0.305**			<0.00190		
	MW-131	Oct-16		**0.0207**	**2.69**				<0.000540	**1.34**	<0.000240	**0.285**			<0.000380		
	MW-131	Apr-17		**0.0214**	**2.75**				<0.000540	**1.29**	<0.000240	**0.294**			<0.000380		
	MW-131	Oct-17		**0.0223**	**1.98**				<0.000540	**1.56**	<0.000240	**0.283**			<0.000380		
	MW-133	Nov-14		**0.0190**	0.130				0.000600 J	**3.50**	0.000800 J	**0.380**			<0.000380		
	MW-133	Apr-15		0.00897	0.157				<0.000540	**5.53**	0.00145 J	**0.312**			0.00124 J		
	MW-134	Apr-15		0.00881 J	0.0143 J				0.00285 J	0.234 J	<0.00120	0.00773 J			0.0197		
	MW-134	Apr-15	FD	0.00575	0.0107				0.00148 J	0.131	<0.000240	0.00795			0.0129		
	MW-134	Oct-15		0.00621	0.0101				0.000869 J	<0.0150	<0.000240	0.00650			0.00756		
	MW-134	Oct-15	FD	0.00630	0.00964				0.000709 J	<0.0150	<0.000240	0.00594			0.00807		
	MW-134	Apr-16		0.00566 J	0.0112 J				<0.00270	<0.0750	0.00131 J	0.0102 J			0.00812 J		
	MW-134	Apr-16	FD	0.00555 J	0.00895 J				<0.00270	0.0767 J	<0.00120	0.0110 J			0.00711 J		
	MW-134	Oct-16		0.00511	0.00827				0.00158 JB	0.0181 JB	<0.000240	0.00886			0.00647		
	MW-134	Oct-16	FD	0.00475	0.00833				0.00148 JB	0.0293 JB	0.000513 J	0.00817			0.00416		
	MW-134	Apr-17		0.00453	0.00963				<0.000540	<0.0150	<0.000240	0.00801			0.00537		
	MW-134	Apr-17	FD	0.00464	0.00877				0.000611 J	<0.0150	<0.000240	0.00808			0.00572		
	MW-134	Oct-17		0.00432	0.00942				0.000691 J	<0.0150	<0.000240	0.00999			0.00743		
	MW-134	Oct-17	FD	0.00445	0.0100				0.000840 J	0.0489 J	<0.000240	0.0109			0.00554		
	MW-135	Apr-15		0.00871 J	0.413				0.0168	**5.33**	0.0119	**0.500**			0.0337		
	MW-135	Oct-15		0.00442	0.0580				0.00319	**1.52**	0.00144 J	0.0438			0.0399		
	MW-135	Apr-16		**0.0216**	0.303				0.0130	**5.54**	0.00566 J	**0.225**			**0.128**		
	MW-135	Oct-16		0.00394	0.0397				0.00149 JB	0.598	0.000686 J	0.0324			0.0368		
	MW-135	Apr-17		0.00324	0.0221				<0.000540	0.339	0.000499 J	0.0187			0.0361		
	MW-135	Oct-17		0.00339	0.0249				0.00166 J	0.526	0.000498 J	0.0229			0.0341		
	RA-4196	Apr-15															
	RA-4196	Oct-15															
	RA-4196	Apr-16															
	RA-4196	Oct-16															
	RA-4196	Apr-17															
	RA-4196	Oct-17															
	RA-4798	Apr-15															
	RA-4798	Oct-15															
	RA-4798	Apr-16															
	RA-4798	Oct-16															
	RA-4798	Apr-17															
	RA-4798	Oct-17															
	RW-12R	Apr-16		<0.00125	0.0512				0.0453	0.213 J	0.00204 J	**0.547**			<0.00740		
	RW-12R	Apr-17		0.000503 J	0.0409				0.0359	0.241	0.00193 J	**0.398**			<0.000380		
	RW-13R	Apr-16		0.00922 J	0.0165				<0.00270	0.572	<0.00120	**1.26**					
	RW-18	Apr-14		0.00496 J	0.0137				<0.00200	0.295 J	<0.00140	0.00572 J			0.0110		
	RW-18	Apr-15		0.00379	0.0105				0.000703 J	<0.0150	<0.000240	<0.000250			0.00988		
	RW-18	Apr-16		0.00400 J	0.0124 J				<0.00270	<0.0750	<0.00120	<0.00125			0.00436 J		
	RW-18	Apr-17		0.00331	0.0107				<0.000540	<0.0150	<0.000240	0.000927 J			0.00406		
	RW-20	Apr-15		0.00375 J	0.527				<0.00270	**1.75**	0.00354 J	**0.872**			<0.00190		
	RW-22	Apr-15		0.00248	0.816				0.00320	0.140	0.00397	**0.845**			0.00234		
North Refinery	MW-23	Apr-15		**0.0164**	0.319				<0.00270	0.560	0.00336 J	**0.212**			**0.125**		
	MW-23	Oct-15		**0.0104**	**11.0**				0.00113 J	0.0742 J	0.00578	0.0890			0.00109 J		
	MW-23	Apr-16		**0.0113**	**12.8**				<0.00270	0.456 J	**0.0186**	0.105			<0.00190		
	MW-23	Oct-16		0.00776	**12.0**				0.00711	**1.89**	**0.0334**	0.184			0.00190 J		
	MW-23	Apr-17		0.00608	**9.82**				0.000789 J	0.0552 J	0.00296	0.0653			0.00287		
	MW-23	Oct-17		0.00636	**10.5**				0.00108 J	0.0413 J	**0.0172**	0.0662			0.00939		
	MW-29	Apr-15		0.000896 J	0.0170				<0.000540	0.0678 J	<0.000240	**0.382**			<0.000380		
	MW-29	Oct-15		0.00100 J	0.0161				<0.000540	<0.0150	<0.00120	**0.369**			0.00165 J		
	MW-29	Apr-16		<0.00125	0.0182 J				<0.00270	<0.0750	<0.00120	**0.485**			0.0141		
	MW-29	Oct-16		0.00165 J	0.0156				0.000619 JB	0.0168 J	0.000465 J	**0.374**			0.000713 J		
	MW-29	Apr-17		0.000518 J	0.0156				<0.000540	0.0276 J	<0.000240	**0.436** V			<0.000380		
	MW-29	Oct-17		0.00193 J	0.0161				<0.000540	0.0193 J	<0.000240	**0.382**			0.000672 J		
	MW-39	Apr-15		0.00256 J	0.0228 J				<0.00270	<0.0750	<0.00120	**0.208**			<0.00190		
	MW-39	Oct-15		0.00156 J	0.0222				<0.000540	0.0199 J	<0.00240	0.186			0.00266		
	MW-39	Apr-16		**0.0195**	0.0209 J				0.00407 J	0.0932 J	0.00124 J	0.0161 J			0.0192		
	MW-39	Oct-16		**0.0274**	0.0145				0.00128 JB	0.0160 J	0.000867 J	0.0211			0.00146 J		
	MW-39	Apr-17		**0.0135**	0.0192				0.00275	0.101	0.00157 J	0.0113			0.00268		
	MW-39	Oct-17		**0.0148**	0.0158				0.00186 J	0.0837 J	0.000906 J	0.0169			0.00410		
	MW-40	Apr-14		0.00157 J	0.0278				<0.00100	<0.0500	<0.000700	0.0451			0.00202 J		
	MW-40	Apr-15		0.00122 J	0.0336				<0.00270	0.345 J	0.00213 J	0.0398			<0.00190		
	MW-40	Apr-16		0.00154 J	0.0392				<0.00270	0.512	0.00311 J	0.0321			<0.00190		
	MW-40	Apr-17		0.000786 J	0.0249				<0.000540	0.0151 J	0.000660 J	0.0241			**0.0704**		
	MW-41	Apr-14		0.00475 J	0.0140				<0.00100	0.0729 J	<0.000700	**0.854**			0.00163 J		
	MW-41	Apr-15		0.00591 J	0.0203 J				<0.00270	0.136 J	<0.00120	**1.01**			<0.00190		
	MW-41	Apr-16		0.00578 J	0.0210 J				<0.00270	<0.0750	<0.00120	**0.888**			<0.00190		
	MW-41	Apr-17		0.00391	0.0154				<0.000540	0.0429 J	0.000578 J	**0.737**			0.00229		
	MW-42	Apr-14		**0.0120**	0.0284				<0.00100	0.527	0.000766 J	0.189			0.00168 J		
	MW-42	Apr-15		0.00935 J	0.0242 J				<0.00270	0.136 J	<0.00120	0.171			0.00393 J		
	MW-42	Apr-16		0.00814 J	0.0274				<0.00270	0.182 J	<0.00120	0.197			<0.00190		
	MW-42	Apr-17		0.00486	0.0182				<0.000540	<0.0150	0.000252 J	0.177			0.00222		
	MW-43	Apr-15		**0.0134**	0.239				<0.00270	<0.0750	<0.00120	**0.402**	<0.000049	0.00482 J	**0.0518**		<0.000900
	MW-43	Oct-15		**0.0180**	0.108				0.00111 J	0.0583 J	0.000577 J	0.157	<0.000049	0.00465	0.000853 J		0.00386 J
	MW-43	Apr-16		**0.0106**	0.251	**1.78**	<0.000800	<0.00130	<0.00270	0.163 J	0.00151 J	**0.274**	<0.000049	0.00625 J	**0.205**	<0.00165	0.00455 J
	MW-43	Oct-16		0.00946	0.0772	**1.36**	<0.000160	<0.000260	0.00121 JB	0.0890 J	0.000510 J	0.196	<0.000049 J3	0.00666	0.0211	0.000344 J	0.00328 J
	MW-43	Apr-17		0.00987	0.100	**1.21**	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.175	<0.000049	0.00534	0.00413 B	<0.00033	0.00200 J
	MW-43	Oct-17		0.00616	0.130	**1.43**	<0.000160	<0.000260	0.000981 J	0.0345 J	0.000387 J	0.142	<0.000049	0.00700	0.0447	<0.00033	0.00261 J
	MW-59	Apr-14		**0.0324**	0.0144				<0.00100	0.164 J	<0.000700	**0.464**			0.00432 J		
	MW-59	Apr-15		**0.0172**	0.0163				<0.000540	0.163	0.000394 J	**0.465**			0.00573 J		
	MW-59	Apr-16		**0.0763**	0.113				<0.00270	0.976	<0.00120	**2.34**			<0.00190		
	MW-59	Apr-17		**0.0234**	0.0202				<0.000540	0.123	<0.000240	**0.440**			<0.000380		
	MW-60	Apr-15		0.00464 J	0.0177 J				<0.000540	0.0725 J	0.000305 J	**0.340**	<0.000049	<0.000350 B	<0.00190		0.000695 J
	MW-60	Apr-15	FD	0.00850 J	0.0177				<0.000540	0.0960 J	<0.000240	**0.335**		<0.000350 B	<0.000380 B		
	MW-60	Oct-15		0.00884	0.0167				<0.000540	0.286	0.000907 J	**0.332**	<0.000049 J	0.000645 J	0.0140		0.00128 J
	MW-60	Oct-15	FD	0.00880	0.0179				<0.000540	0.291	0.000328 J	**0.342**	<0.000049	0.000516 J	<0.000380		0.00115 J
	MW-60	Apr-16		**0.0111**	0.0203 J	0.438	<0.00500	<0.00130	<0.00270	0.105 J	<0.00120	**0.364**	<0.000049	<0.00175	<0.00190	0.00235 J	0.000910 J
	MW-60	Apr-16	FD	**0.0121**	0.0193 J	0.449	<0.00500	<0.00130	<0.00270	0.165 J	<0.00120	**0.377**	<0.000049	<0.00175	<0.00190	0.00254 J	0.00110 J

Table 4B - Summary of Groundwater Analytical Data - Total Metals

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Total Metals														
				Analyte:	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC Irr	WQCC HH	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
North Refinery	MW-60	Oct-16			0.00457	0.0154	0.347	<0.000160	0.000490 J	0.00133 JB	0.151 B	0.000403 J	**0.336**	<0.000049	0.00178 JB	<0.000380	0.00252 J	0.000358 J
	MW-60	Oct-16	FD		0.00478	0.0147	0.332	<0.000160	0.000589 J	0.00129 JB	0.148 B	0.000342 J	**0.339**	<0.000049	0.00135 JB	<0.000380	0.00251 J	0.000307 J
	MW-60	Apr-17			0.00595	0.0167	0.376	<0.000160	<0.000260	<0.000540	0.0568 J	<0.000240	**0.294**	<0.000049	0.000791 J	<0.000380	0.00223 J	0.000578 BJ
	MW-60	Apr-17	FD		0.00605	0.0167	0.376	<0.000160	<0.000260	<0.000540	0.0692 J	<0.000240	**0.290**	<0.000049	0.000704 J	<0.000380	0.00222 J	0.000605 BJ
	MW-60	Oct-17			0.00682	0.0185	0.567	<0.000160	0.000302 J	<0.000540	0.0449 J	0.000355 J	**0.258**	<0.000049	0.00205	0.00188 J	0.00149 J	0.000363 J
	MW-60	Oct-17	FD		0.00299	0.0186	0.613	<0.000160	<0.000260	<0.000540	0.0330 J	0.000245 J	**0.259**	<0.000049	0.00420	<0.000380	0.00144 J	0.000347 J
	MW-61	Apr-15			0.00463 J	0.0499 J				<0.00270	<0.150	<0.00240	0.00444 J			**0.168**		
	MW-61	Oct-15			0.00107 J	0.0246				0.00119 J	0.0828 J	0.00122 J	0.0416			0.00688		
	MW-61	Apr-16			<0.00125	0.0192 J				<0.00270	<0.0750	<0.00120	0.0664			0.0101		
	MW-61	Oct-16			0.000831 J	0.0223				0.00145 JB	0.0204 J	0.000914 J	0.0746			<0.000380		
	MW-61	Apr-17			0.000981 J	0.0218				0.000618 J	0.0299 J	0.000959 J	0.0352			0.00551		
	MW-61	Oct-17			0.00125 J	0.0330				0.00316	0.0342 J	0.00128 J	0.0320			**0.0519**		
	MW-62	Apr-15			**0.0136**	**9.30**				0.00149 J	0.0542 J	0.00419	0.0677			0.0187		
	MW-62	Oct-15			0.00293	0.0235				<0.000540	0.0154 J	0.000278 J	0.00266 J			0.00587		
	MW-62	Apr-16			0.00321 J	0.0390				<0.00270	<0.0750	<0.00120	<0.00125			0.00935 J		
	MW-62	Oct-16			**0.0115**	0.0252				0.000596 JB	0.0385 J	0.000715 J	0.00213 J			<0.000380		
	MW-62	Apr-17			0.00450	0.0285				<0.000540	<0.0150	0.000317 J	0.00311 J			0.00328		
	MW-62	Oct-17			0.00366	0.0312				<0.000540	0.0375 J	0.000415 J	0.000930 J			**0.0554**		
	MW-67	Apr-15			0.00371	0.140				<0.000540	0.0384 J	0.00113 J	0.0800	<0.000049	0.00198 J	0.000386 J		0.00108 J
	MW-67	Oct-15			0.00630	0.129				0.000623 J	<0.0150	0.00100 J	0.0785	<0.000049	0.000885 J	0.000445 J		0.00164 J
	MW-67	Apr-16			**0.0101**	0.229	0.471	<0.00500	<0.00130	<0.00270	<0.0750	0.00135 J	0.117	<0.000049	<0.00175	<0.00190	<0.00165	0.00139 J
	MW-67	Oct-16			**0.0103**	0.161	0.451	<0.000160	<0.000260	0.000671 JB	0.0242 J	0.00127 J	0.104	<0.000049	0.000689 J	0.000479 J	<0.00033	0.000595 J
	MW-67	Apr-17			**0.0147**	0.137	0.435	<0.000160	<0.000260	0.000612 J	0.0312 J	0.00155 J	0.0878	<0.000049	0.000780 J	0.00230	<0.00033	0.00124 BJ
	MW-67	Oct-17			**0.0103**	0.0906	0.464	<0.000160	<0.000260	0.000639 J	0.0172 J	0.00112 J	0.0986	<0.000049	0.000648 J	<0.000380	<0.00033	0.000547 J
	MW-90	Apr-15			0.00709	0.0233				<0.000540	0.473	0.000242 J	**0.345**			0.00172 J		
	MW-90	Oct-15			0.00883	0.0126				<0.000540	**1.56**	<0.000240	0.0504			0.0334		
	MW-90	Apr-16			**0.0111**	0.0140 J				<0.00270	**1.34**	<0.00120	0.166			0.00262 J		
	MW-90	Oct-16			**0.0103**	0.00945				<0.000540	0.201	0.000244 J	0.0186			**0.0663**		
	MW-90	Apr-17			0.00894	0.0159				<0.000540	**1.53**	<0.000240	0.144			0.00359 B		
	MW-90	Oct-17			0.00392	0.0152				0.000863 J	0.223	<0.000240	0.0711			0.00150 J		
	MW-91	Apr-15			0.00509	0.0940				<0.000540	0.0957 J	0.00236	0.00502			0.0138		
	MW-91	Oct-15			0.00552	0.0824				<0.000540	0.0165 J	0.00270	0.00246 J			0.0248		
	MW-91	Apr-16			0.00660 J	0.0716				<0.00270	<0.0750	0.00376 J	0.00267 J			<0.00740		
	MW-91	Oct-16			0.00880	0.0554				<0.000540	<0.0150	0.00340	0.00304 JB			0.000630 J		
	MW-91	Apr-17			0.00780	0.0532				<0.000540	0.0336 J	0.00352	0.00138 J			0.00138 BJ		
	MW-91	Oct-17			0.00586	0.0512				0.000787 J	0.0900 J	0.00312	0.00640			0.00111 J		
	MW-92	Apr-16			0.00316 J	**3.44** O1V				<0.00270	0.328 J	<0.00120	0.0363			0.00207 J		
	MW-92	Oct-16			0.00732	**2.81**				0.00101 JB	0.0744 J	0.00183 J	0.0274			0.00172 J		
	MW-93	Apr-15			0.00687 J	0.0346				0.00442 J	**1.83**	0.00126 J	**0.227**			**0.0646**		
	MW-93	Oct-15			0.00502	0.0486				0.00365	**1.29**	0.00327	0.120			**0.0709**		
	MW-93	Apr-16			**0.0137**	0.0231 J				0.00907 J	0.858	<0.00120	0.0663			0.0242		
	MW-93	Oct-16			0.00195 JJ3J6	0.0263				0.00337 B	**1.19**	0.00112 J	**0.335**			0.0119 J3J6		
	MW-93	Apr-17			0.00456	0.0228				0.00367	0.278	0.00116 J	0.0258			0.00683		
	MW-94	Oct-15			**0.0215**	**1.57**				0.00144 J	<0.0150	<0.000240	0.00194 J			0.000935 J		
	MW-94	Apr-16			**0.0286**	0.353				<0.00270	<0.0750	<0.00120	0.00666 J			<0.00190		
	MW-94	Oct-16			**0.0115**	0.635				0.00119 JB	0.0159 J	0.000255 J	0.00631			0.000962 J		
	MW-94	Apr-17			**0.0170**	0.873				0.00141 J	0.134	0.000298 J	0.00382 J			0.00304		
	MW-95	Apr-14			<0.00100	0.126				<0.00100	0.0549 J	<0.000700	0.0419			<0.00100		
	MW-95	Apr-15			0.00133 J	0.0762				<0.000540	0.0357 J	0.000477 J	0.0247			0.000381 J		
	MW-95	Apr-16			0.00175 J	0.0736				<0.00270	<0.0750	<0.00120	0.0214 J			<0.00190		
	MW-95	Apr-17			0.00173 J	0.0612				<0.000540	<0.0150	<0.000240	0.0330			0.000407 J		
	MW-96	Apr-15			0.00421	0.126				0.000816 J	0.0338 J	0.000576 J	0.00352 J			0.000731 J		
	MW-96	Oct-15			0.00397	0.158				0.000655 J	0.132	0.000953 J	0.00236 J			0.000640 J		
	MW-96	Apr-16			0.00463 J	0.155				<0.00270	<0.0750	<0.00120	0.00174 J			0.00330 J		
	MW-96	Oct-16			0.00238	0.106				<0.000540	0.0573 J	<0.000240	0.00700			0.000695 J		
	MW-96	Apr-17			0.00314	0.124				<0.000540	<0.0150	<0.000240	0.000699 J			0.00148 BJ		
	MW-96	Oct-17			0.00241	0.0709				<0.000540	0.117	<0.000240	0.00173 J			0.000629 J		
	MW-98	Apr-15			<0.00250	0.0177 J				<0.00270	<0.0750	0.00894 J	0.0192 J			**0.108**		
	MW-98	Oct-15			0.00109 J	0.0149				0.000932 J	0.0339 J	0.00659	0.0213			0.00514		
	MW-98	Apr-16			0.00199 J	0.0204 J				<0.00270	<0.0750	0.00934 J	0.0312			<0.00190		
	MW-98	Oct-16			0.00110 J	0.0150				0.000797 JB	0.0160 J	0.00734	0.0233			0.000906 J		
	MW-98	Apr-17			0.00109 J	0.0163				<0.000540	<0.0150	0.00875	0.0261			0.00227 B		
	MW-98	Oct-17			0.00082 J	0.0159				0.000791 J	0.126	0.00929	0.0280			0.000620 J		
	MW-137	Oct-15			**0.0525**	0.127				0.00326	**1.63**	0.00596	0.120	<0.000049	0.00874	0.00218		0.00904
	MW-137	Apr-16			**0.0893**	0.0567	**0.982**	<0.00500	<0.00130	<0.00270	0.0953 J	0.00601 J	0.144	<0.000049	0.0101	0.00327 J	<0.00165	0.00840 J
	MW-137	Oct-16			**0.0345**	0.0453	**0.799**	<0.000160	<0.000260	0.000628 JB	0.0169 J	0.00436	0.120	<0.000049	0.00652	0.00368	<0.00033	0.00529
	MW-137	Apr-17			**0.0496**	0.0564	**0.752**	<0.000160	<0.000260	<0.000540	<0.0150	0.00408	0.113	<0.000049	0.00689	0.00397 B	<0.00033	0.00580
	MW-137	Oct-17			**0.0156**	0.0756	**1.03**	<0.000160	<0.000260	0.00109 J	0.260	0.00338	**0.209**	<0.000049	0.0198	0.0393	<0.00033	0.00771
	MW-138	Oct-15			0.00728	0.131				0.00218	**2.54**	0.00195 J	**0.249**	<0.000049	0.00420	0.000743 J		0.00705
	MW-138	Apr-16			0.00777 J	0.220	**1.56**	<0.00500	<0.00130	<0.00270	0.221 J	<0.00120	0.164	<0.000049	0.00598 J	<0.00190	<0.00165	0.00531 J
	MW-138	Oct-16			0.00609	0.0947	**1.01**	<0.000160	<0.000260	0.000775 JB	0.0178 J	0.000407 J	0.143	<0.000049	0.00523	0.00284	<0.00033	0.00306 J
	MW-138	Apr-17			0.00569	0.130	**1.01**	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.111	<0.000049	0.00546	0.00267 B	<0.00033	0.00269 J
	MW-138	Oct-17			0.00507	0.103	**1.11**	<0.000160	<0.000260	0.000747 J	0.0334 J	0.000271 J	0.0931	<0.000049	0.00619	0.00945	<0.00033	0.00195 J
	RW-1	Apr-15			0.00607	0.0305				0.00290	0.216	0.000495 J	0.126			0.00302 J		
	RW-1R	Apr-16			0.00695 J	0.0414				<0.00270	**17.1**	0.00149 J	**0.317**			0.00246 J		
	RW-1R	Apr-17			**0.0359**	0.0243				0.00254	**4.88**	0.00492	**0.240**			0.00573 B		
	RW-2	Apr-15			**0.0264**	0.0245 J				0.00553 J	0.381 J	0.00233 J	**0.313**			**0.0705**		
	RW-2R	Apr-16			0.00552 J	0.171				0.00750 J	**2.25**	**0.0153**	0.0705			**0.422**		
	RW-2R	Apr-17			0.00504	0.0566				0.00173 J	0.264	0.000960 J	0.0161			0.0100		
	RW-7	Apr-15			0.00239 J	0.508				<0.00270	0.0976 J	<0.00120	0.0280			<0.00190		
	RW-7R	Apr-16			**0.0154**	0.0293				<0.00270	**1.09**	<0.00120	**1.22**			<0.00190		
	RW-7R	Apr-17			0.00332	0.0198				<0.000540	0.183	<0.000240	**1.13**			<0.000380		
	RW-8	Apr-15			0.00556 J	0.0889				<0.00270	0.427 J	<0.00120	0.0556			0.00200 J		
	RW-8	Apr-17			**0.0343**	0.0593				0.00135 J	**9.50**	0.00169 J	**1.12**			<0.000380		
	RW-9	Apr-14			0.00434 J	0.0470				<0.00100	0.942	<0.000700	**0.417**			0.00250 J		
	RW-9	Apr-15			0.00392	0.0397				0.00102 J	0.257	0.000449 J	**0.460**			0.0144		
	RW-9	Apr-16			0.00476 J	0.0550				<0.00270	0.169 J	<0.00120	**0.441**			0.00735 J		
	RW-9	Apr-17			0.00338	0.0378				<0.000540	<0.0150	<0.00120	**0.784**			0.0217		
	RW-10	Apr-14			0.00174 J	0.0185				<0.00100	**5.22**	<0.000700	**0.217**			0.00143 J		
	RW-10	Apr-15			0.00171 J	0.0258				0.000561 J	0.454	<0.000240	**0.237**			0.00517		
	RW-10	Apr-16			0.00175 J	0.0372				<0.00270	**1.27**	<0.00120	**0.266**			0.0404		
	RW-10	Apr-17			0.00167 J	0.0184				<0.000540	0.0250 J	0.000433 J	0.173			<0.000380		
	RW-16	Apr-14			**0.0127**	0.0141				<0.00100	0.174 J	0.000789 J	**0.576**			0.00272 J		
	RW-16	Apr-14	FD		**0.0132**	0.0147				<0.00100	0.184 J	<0.000700	**0.596**			0.00278 J		
	RW-16	Apr-15			**0.0171**	0.0138 J				<0.00270	<0.0750	<0.00120	**0.421**			<0.00190		
	RW-16	Apr-16			**0.0115**	0.0138 J				<0.00270	<0.0750	<0.00120	**0.406**			0.0223		
	RW-16	Apr-17			**0.0129**	0.0126				0.00108 J	0.0227 J	0.00125 J	**0.263**			0.00658		
	RW-17	Apr-14			0.00888	0.0228				<0.00100	0.471	**0.0190**	**0.675**			0.00156 J		
	RW-17	Apr-15			**0.0111**	0.0274				<0.00270	0.0850 J	0.00425 J	0.121			0.0361		
	RW-17	Apr-16			**0.0522**	0.119				<0.00270	0.197 J	**0.0385**	**3.55**			**0.0714**		
	RW-17	Apr-17			**0.0113**	0.0223				0.000584 J	0.0569 J	0.0106	**0.719**			0.0106		

Table 4B - Summary of Groundwater Analytical Data - Total Metals

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Total Metals													
				Analyte:	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC Irr	WQCC HH	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
North RO Reject Field	MW-117	Apr-15		0.00249 J	0.0162 J				<0.00270	0.492 J	<0.00120	0.00809 J			0.0168		
	MW-117	Oct-15		0.00351	0.0214				0.00364	**1.42**	0.00113 J	0.0149			0.00486		
	MW-117	Apr-16		0.00266 J	0.0186 J				<0.00270	0.684	<0.00120	0.0103 J			0.00857 J		
	MW-117	Oct-16		0.00312	0.0249				0.00417 B	**1.57**	0.00137 J	0.0171			0.00403		
	MW-117	Apr-17		0.00255	0.0197				0.00209	**1.11**	0.000901 J	0.0147			0.00349 B		
	MW-117	Oct-17		0.00238	0.0177				0.00279	**1.15**	0.000777 J	0.0110			0.00982		
	MW-118	Apr-15		0.00977 J	0.0180 J				<0.00270	0.253 J	0.00175 J	0.00454 J			0.00863 J		
	MW-118	Oct-15		**0.0117**	0.0131				0.00137 J	0.155	0.000329 J	0.00223 J			0.00509		
	MW-118	Apr-16		**0.0108**	0.0139 J				<0.00270	0.426 J	<0.00120	0.00480 J			0.00645 J		
	MW-118	Oct-16		**0.0117**	0.0111				0.000649 JB	0.0658 J	<0.000240	0.000302 J			0.0156		
	MW-118	Apr-17		**0.0105**	0.00910				<0.000540	0.0337 J	<0.000240	0.000670 J			0.0222		
	MW-118	Oct-17		**0.0109**	0.00884				0.000983 J	<0.0150	<0.000240	<0.000250			0.0196		
	MW-119	Apr-15		0.00398 J	0.0156 J				<0.00270	0.309 J	<0.00120	0.0151 J			<0.00190		
	MW-119	Oct-15		0.00417	0.0105				0.000744 J	0.0886 J	<0.000240	0.00485 J			0.00189 J		
	MW-119	Apr-16		0.00315 J	0.00645 J				<0.00270	<0.0750	<0.00120	<0.00125			0.00259 J		
	MW-119	Oct-16		0.00404	0.00979				<0.000540	0.0660 J	<0.000240	0.00190 J			0.00334		
	MW-119	Apr-17		0.00376	0.00966				<0.000540	0.0438 J	<0.000240	0.00331 J			0.00442		
	MW-119	Oct-17		0.00513	0.0108				0.000757 J	0.0324 J	<0.000240	0.00324 J			0.00145 J		
NCL	MW-18	Apr-14		0.00313 J	0.0168				<0.00100	0.146 J	<0.000700	0.0203	<0.000049	0.00151 J	0.0112		0.0172
	MW-18	Apr-15		0.00321	0.0167				0.00108 J	<0.0150	<0.000240	0.00671	<0.000049	0.00120 J	0.00947		0.0147
	MW-18	Apr-16		0.00395 J	0.0207 J	**1.36**	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	0.0157 J	<0.000049	<0.00350	0.0153	**0.0480** J	0.0200 J
	MW-18	Apr-17		0.00365	0.0183	**1.71**		0.000321 J	0.00222	<0.0150	<0.000240	0.00474 JB	<0.000049	0.00120 J	0.0151	0.0250	0.0195
	MW-45	Apr-15		0.00395	0.0185				<0.000540	**1.66**	0.00527	**0.534**	<0.000049	0.00666	<0.000380		0.000411 J
	MW-45	Oct-15		0.00373	0.0216				0.000591 J	0.600	0.00667	**0.551**	<0.000049	0.00472	<0.000380		0.00118 J
	MW-45	Apr-16		0.00752 J	0.0191 J	0.671	<0.00500	<0.00130	<0.00270	**4.14**	0.00443 J	**0.633**	<0.000049	0.00631 J	<0.00190	<0.00165	0.00188 J
	MW-45	Oct-16		0.00346	0.0182	0.636	<0.000160	<0.000260	<0.000540	0.942	0.000647 J	**0.576**	<0.000049	0.00513 B	<0.000380	0.000909 J	0.000251 J
	MW-45	Apr-17		0.00404	0.0162	0.514	<0.000160	<0.000260	<0.000540	**1.29**	<0.000240	**0.582**	<0.000049	0.00558	<0.000380	0.00109 J	0.000466 J
	MW-45	Oct-17		0.00460	0.0154	0.675	<0.000160	<0.000260	<0.000540	**2.27**	0.00143 J	**0.583**	<0.000049	0.00569	<0.000380	0.000671 J	0.000377 J
	MW-53	Apr-14		0.00217 J	0.0232				<0.00100	<0.00500	<0.000700	**0.778**			0.00141 J		
	MW-53	Apr-15		0.00179 J	0.0256				<0.000540	0.0338 J	0.000252 J	**1.20**			0.00566		
	MW-53	Apr-16		0.00193 J	0.0308				<0.00270	<0.0750	<0.00120	**1.07**			0.00617 J		
	MW-53	Apr-17		0.00166 J	0.0201				<0.000540	<0.0150	<0.000240	**1.60**			0.00281		
	MW-54A	Apr-15		0.00312	0.0173				<0.000540	0.0537 J	<0.000240	**0.450**			0.000509 J		
	MW-54A	Oct-15		0.00312	0.0192				0.000898 J	<0.0150	0.00110 J	**0.488**			0.00126 J		
	MW-54A	Apr-16		0.00343 J	0.0189 J				<0.00270	<0.0750	<0.00120	**0.512**			<0.00190		
	MW-54A	Oct-16		0.00236	0.0158				<0.000540	<0.0150	<0.000240	**0.437**			0.000709 J		
	MW-54A	Apr-17		0.00464	0.0147				<0.000540	0.227	<0.000240	**0.456**			<0.000380		
	MW-54A	Oct-17		0.00375	0.0184				<0.000540	0.0535 J	<0.000240	**0.506**			0.000562 J		
	MW-54B	Apr-13		<0.00500	0.0183				<0.00500	<0.200	<0.00500	0.145			<0.00500		
	MW-54B	Apr-15		0.00220	0.0165				<0.000540	0.0520 J	<0.000240	0.165			0.000400 J		
	MW-54B	Apr-17		0.00181 J	0.0158				<0.000540	<0.0150	<0.000240	**0.253**			0.000720 J		
	MW-55	Apr-15		0.00457	0.0110				0.00108 J	0.0483 J	<0.000240	0.139	<0.000049	0.00268	0.0190		0.0147
	MW-55	Oct-15		0.00582	0.0128				0.00104 J	<0.0150	<0.000240	0.0468	<0.000049	0.00168 J	0.00934		0.0189
	MW-55	Apr-16		0.00933 J	0.0157 J	**1.31**	0.000891 J	0.00141 J	<0.00270	0.128 J	0.00168 J	0.151	5.14E-05 J	<0.00350	0.00896 J	**0.0460** J	0.0244 J
	MW-55	Oct-16		0.00543	0.0140	**1.21**	<0.000160	0.000680 J	0.00168 J	0.0587 JB	0.000582 J	0.113	5.31E-05 J	0.00314 B	0.00746	**0.0335**	0.0170
	MW-55	Apr-17		0.00565	0.0128	**0.829**	<0.000160	0.000407 J	<0.000540	0.0222 J	<0.000240	0.0682	<0.000049	0.00552	0.00436	**0.0406**	0.0192
	MW-55	Oct-17		0.00566	0.0123	**1.52**	<0.000160	0.000827 J	0.00121 J	0.0843 J	<0.000240	0.167	<0.000049	0.00562	0.00703	**0.0466**	0.0204
	MW-56	Apr-15		0.00727	0.0143				<0.000540	0.0230 J	0.000739 J	**0.293**			0.00372		
	MW-56	Oct-15		0.00731	0.0166				<0.000540	<0.0150	0.000392 J	**0.321**			0.00491		
	MW-56	Apr-16		0.00777 J	0.0203 J				<0.00270	<0.0750	<0.00120	**0.373**			0.00381 J		
	MW-56	Oct-16		0.00721	0.0138				<0.000540	<0.0150	0.000540 J	**0.282**			0.00125 J		
	MW-56	Apr-17		0.00642	0.0157				<0.000540	<0.0150	0.000467 J	**0.320**			0.00325		
	MW-108	Apr-15		0.00462	0.0387				0.00259	0.0411 J	0.00155 J	0.0256			<0.000380		
	MW-108	Oct-15		0.00399	0.0482				0.00226	0.0288 J	0.00157 J	0.0239			0.00234		
	MW-108	Apr-16		0.00454 J	0.481				<0.00270	0.206 J	0.00209 J	0.0501			<0.00190		
	MW-108	Oct-16		**0.0102**	0.0462				0.00732	**3.13**	0.0101	0.182			0.00126 J		
	MW-108	Apr-17		0.00252	0.0366				0.00124 J	0.0538 J	0.00145 J	0.0412			<0.000380		
	MW-108	Oct-17		0.00251	0.0495				0.00210	0.441	0.00199 J	0.0395			0.00201		
	NCL-31	Apr-15		0.00847	0.0224				0.000989 J	0.834	0.000803 J	**1.70**			<0.000380		
	NCL-31	Oct-15		0.00655	0.0334				0.00175 J	**1.49**	0.00140 J	**2.28**			<0.000380		
	NCL-31	Apr-16		0.00495 J	0.0241 J				<0.00270	0.838	<0.00120	**1.85**			<0.00190		
	NCL-31	Oct-16		**0.0428**	0.0220				0.000711 JB	**1.04**	0.000493 J	**2.48**			<0.000380		
	NCL-31	Apr-17		0.00975	0.0152				<0.000540	0.446	0.000330 J	**2.19**			0.000525 J		
	NCL-31	Oct-17		**0.0122**	0.0140				<0.000540	0.978	<0.000240	**2.26**			<0.000380		
	NCL-32	Apr-15		0.00446 J	0.0556				0.00960 J	**1.39**	**0.0167**	**0.968**			<0.00190		
	NCL-32	Oct-15		0.00653	0.129				0.0280	**4.57**	**0.0289**	**1.34**			0.000884 J		
	NCL-32	Apr-16		**0.0108**	0.227				**0.0660**	**9.75**	**0.0681**	**1.77**			<0.00190		
	NCL-32	Oct-16		0.00428	0.0254				0.00312	0.407 B	0.00296	**1.06**			0.00138 J		
	NCL-32	Apr-17		0.00358	0.0195				0.00114 J	0.116	0.00127 J	**0.988**			0.00124 J		
	NCL-32	Oct-17		0.00304	0.0166				<0.000540	0.0488 J	0.000454 J	**1.11**			0.00207		
	NCL-33	Apr-15		0.00407 J	0.0247 J				<0.00270	**2.26**	0.00569 J	0.108			<0.00190		
	NCL-33	Oct-15		0.00385	0.0274				<0.000540	**2.49**	0.000259 J	0.117			0.000519 J		
	NCL-33	Apr-16		0.00444 J	0.0246 J				<0.00270	0.770	<0.00120	0.188			<0.00190		
	NCL-33	Oct-16		0.00593	0.0224				0.00187 J	**1.93**	0.000459 J	0.128			0.00217		
	NCL-33	Apr-17		0.00302	0.0194				<0.000540	**1.12**	0.000288 J	0.135			0.000546 J		
	NCL-33	Oct-17		0.00325	0.0201				0.000552 J	**1.67**	<0.000240	0.138			0.000672 J		
	NCL-34A	Apr-15		<0.00120	0.547				<0.00270	<0.0750	0.00183 J	0.0369			<0.00190		
	NCL-34A	Oct-15		0.00218 J	0.382				<0.00270	<0.0750	0.00136 J	0.0420			0.00641 J		
	NCL-34A	Apr-16		0.00184 J	0.854				<0.00270	<0.0750	<0.00120	0.0185 J			<0.00190		
	NCL-34A	Oct-16		0.000745 J	0.370				<0.000540	<0.0150	<0.000240	0.0279			0.0142		
	NCL-34A	Apr-17		0.000829 J	0.458				<0.000540	<0.0150	<0.000240	0.0146			<0.000380		
	NCL-34A	Oct-17		0.000562 J	0.338				0.00104 J	0.0445 J	0.00105 J	0.0224			<0.000380		
	NCL-44	Apr-15		**0.0617**	0.0311				<0.00270	**1.47**	0.00123 J	**0.703**			<0.00190		
	NCL-44	Oct-15		**0.0700**	0.0306				0.00105 J	**2.09**	0.000414 J	**0.723**			<0.000380		
	NCL-44	Apr-16		**0.0459**	0.0371				<0.00270	**1.82**	<0.00120	**1.11**			<0.00190		
	NCL-44	Oct-16		**0.0490**	0.0276				0.00165 JB	**1.78**	0.000521 J	**0.896**			0.000394 J		
	NCL-44	Apr-17		**0.0348**	0.0269				0.00235	0.953	0.00102 J	**0.860**			<0.000380		
	NCL-44	Oct-17		**0.0479**	0.0252				0.00122 J	**1.61**	0.000413 J	**0.896**			0.000416 J		
	NCL-49	Apr-15		0.00151 J	0.0109				<0.000540	0.0232 J	0.000252 J	0.00215 J			0.00279		
	NCL-49	Apr-15	FD	0.00145 J	0.0106				<0.000540	<0.0150	<0.000240	0.00146 J			0.00281		
	NCL-49	Oct-15		0.00218	0.0118				<0.000540	<0.0150	<0.000240	0.000528 J			0.00363		
	NCL-49	Oct-15	FD	0.00208	0.0116				<0.000540	<0.0150	<0.000240	0.000279 J			0.00365		
	NCL-49	Apr-16		0.00188 J	0.0150 J				<0.00270	<0.0750	<0.00120	<0.00125			0.00518 J		
	NCL-49	Apr-16	FD	0.00178 J	0.0134 J				<0.00270	<0.0750	<0.00120	<0.00125			0.00483 J		
	NCL-49	Oct-16		0.00156 J	0.0116				<0.000540	<0.0150	<0.000240	0.000460 JB			0.00551		
	NCL-49	Oct-16	FD	0.00137 J	0.0117				<0.000540	<0.0150	<0.000240	0.000493 JB			0.00549		
	NCL-49	Apr-17		0.00151 J	0.0118				<0.000540	<0.0150	<0.000240	0.000320 J			0.00871		
	NCL-49	Apr-17	FD	0.00149 J	0.0115				<0.000540	<0.0150	<0.000240	0.000263 J			0.00924		
	NCL-49	Oct-17		0.00142 J	0.0113				0.000635 J	0.0590 J	<0.000240	<0.000250			0.0111		
	NCL-49	Oct-17	FD	0.00163 J	0.0121				0.000649 J	0.0255 J	<0.000240	<0.000250			0.0110		

Table 4B - Summary of Groundwater Analytical Data - Total Metals

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Total Metals													
				Analyte:	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC Irr	WQCC HH	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
South Refinery	KWB-2R	Apr-15			0.00281	0.274				0.000702 J	0.329	0.00468	**0.356**			<0.000380		
	KWB-2R	Oct-15			0.00390	0.259				0.000641 J	0.0295 J	0.00195 J	0.0529			<0.000380		
	KWB-2R	Apr-16			0.00401 J	0.0326				<0.00270	0.883	<0.00120	**0.898**			0.00551 J		
	KWB-2R	Oct-16			0.00325	0.0343				0.00113 JB	0.465	0.000548 J	**0.609**			<0.000380		
	KWB-2R	Apr-17			0.00152 J	0.0271				<0.000540	0.0346 J	0.000273 J	**0.564**			<0.000380		
	KWB-2R	Oct-17			0.00258	0.324				<0.000540	0.0522 J	0.00130 J	0.0596			<0.000380		
	KWB-5	Apr-15			**0.0225**	**3.42**				<0.000540	**3.39**	0.000632 J	**1.57**			<0.000380		
	KWB-5	Oct-15			**0.0209**	**3.65**				<0.000540	**3.22**	0.000340 J	**1.59**			<0.000380		
	KWB-5	Apr-16			**0.0252**	**3.63**				<0.00270	**4.28**	<0.00120	**1.82**			<0.00190		
	KWB-5	Oct-16			**0.0212**	**3.82**				<0.000540	**3.13**	<0.000240	**1.60**			<0.000380		
	KWB-5	Apr-17			**0.0219**	**3.49**				<0.000540	**4.43**	<0.000240	**1.81**			0.000511 BJ		
	KWB-5	Oct-17			**0.0202**	**5.06**				<0.000540	**2.11**	0.000287 J	**1.64**			<0.000380		
	KWB-6	Apr-15			0.00621	0.294				<0.000540	0.870	0.00182 J	**2.16**			<0.000380		
	KWB-6	Oct-15			**0.0124**	0.136				<0.000540	0.558	0.00137 J	**2.04**	<0.000049	0.00186 J	<0.000380		0.00239 J
	KWB-6	Apr-16			0.00703 J	0.327				<0.00270	0.546	0.00143 J	**2.55**			<0.00190		
	KWB-6	Oct-16			0.00915	0.0891				0.000950 JB	0.303	0.00103 J	**1.87**			<0.000380		
	KWB-6	Apr-17			0.00406	0.152				<0.000540	0.152	0.000533 J	**1.91**			<0.000380		
	KWB-6	Oct-17			0.00898	0.0998				<0.000540	0.250	0.000661 J	**2.15**			<0.000380		
	MW-28	Apr-15			0.00912 J	0.0772				0.000931 J	0.0712 J	0.0110	0.0685	<0.000049	0.00489	0.0204 J		0.00634
	MW-28	Oct-15			0.00936	0.0484				0.000931 J	0.0744 J	0.0136	0.0261	<0.000049	0.00360	0.0205		0.00557
	MW-28	Apr-16			**0.0610**	0.331	**1.23**	<0.00500	<0.00130	0.00274 J	0.342 J	**0.0520**	0.164	<0.000049	0.0226	0.00220 J	<0.00165	0.0158 J
	MW-28	Oct-16			**0.0154**	0.0424	**1.27**	<0.000160	0.000289 J	0.00213 B	0.0951 JB	**0.0168**	0.0375	<0.000049	0.00387 B	0.000605 J	<0.00033	0.00701
	MW-28	Apr-17			0.00674	0.0462	**1.21**	<0.000160	<0.000260	0.000618 J	0.0779 J	0.0130	0.0624	<0.000049	0.0484	0.0491	0.000382 J	0.00329 J
	MW-28	Oct-17			0.00777	0.0492	**1.39**	<0.000160	<0.000260	0.00947	0.0870 J	0.00855	0.0417	<0.000049	0.00719	<0.000380	<0.00033	0.00227 J
	MW-48	Apr-15			0.00400	0.0204 J				<0.000540	0.562	0.000320 J	0.0948 J			<0.000380 B		
	MW-48	Oct-15			**0.0108**	0.367				0.000690 J	0.131	0.00215	**1.24**			0.00487		
	MW-48	Apr-16			**0.0125**	**2.77**				<0.00270	0.177 J	0.00371 J	**0.390**			<0.00190		
	MW-48	Oct-16			**0.0107**	**1.18**				0.00119 JB	0.166	0.00173 J	**0.565**			0.000520 J		
	MW-48	Apr-17			0.00786	**2.54**				<0.000540	0.0884 J	0.00150 J	**0.210**			0.000838 BJ		
	MW-48	Oct-17			0.00558	**1.81**				0.000835 J	0.141	0.00166 J	**0.286**			**0.0669**		
	MW-50	Apr-15			0.00138 J	0.0226				<0.000540	0.471	0.00102 J	**1.53**			<0.000380		
	MW-50	Oct-15			0.00166 J	0.0219				<0.000540	0.0271 J	0.000889 J	**1.37**			0.000495 J		
	MW-50	Apr-16			0.00234 J	0.0141 JB				<0.00270	0.0916 J	<0.00120	**0.214**			**0.0994**		
	MW-50	Oct-16			0.00434	0.0207				<0.000540	0.160	0.000413 J	**0.295**			**0.0704**		
	MW-50	Apr-17			0.00210	0.0137				<0.000540	0.0253 J	<0.000240	**0.433**			0.0485		
	MW-50	Oct-17			0.00250	0.0142				<0.000540	0.0340 J	<0.000240	**0.494**			0.0436		
	MW-52	Apr-15			0.00318	0.00980				<0.000540	0.0256 J	<0.000240	0.0478	<0.000049	0.00625	<0.000380 B		0.0253
	MW-52	Oct-15			0.00429	0.0129				0.000582 J	0.0180 J	<0.000240	0.0446	<0.000049	0.00684	0.00187 J		0.0262
	MW-52	Apr-16			**0.0193**	0.0436	0.736	<0.00500	0.00155 J	<0.00270	0.158 J	<0.00120	**0.230**	<0.000049	0.0263	0.00545 J	**0.0438** J	**0.123**
	MW-52	Oct-16			0.00343	0.0104	0.718	<0.000160	0.000423 J	0.000547 JB	<0.0150	<0.000240	0.0484	<0.000049 J3	0.00810	0.00179 J	0.0105	0.0243
	MW-52	Apr-17			0.00368	0.0101	0.702	<0.000160	0.000503 J	<0.000540	0.0447 J	<0.000240	0.0659	<0.000049	0.00798	0.00178 J	0.00976 J	0.0269
	MW-52	Oct-17			0.00363	0.0113	**0.852**	<0.000160	0.000429 J	<0.000540	0.0245 J	<0.000240	0.0774	<0.000049	0.00817	0.00607	0.0124	0.0246
	MW-64	Apr-16			**0.0333**	**2.26**				<0.00270	<0.0750	0.00187 J	0.0599			<0.00190		
	MW-64	Oct-16			**0.0302**	**2.41**				0.000897 JB	0.0566 JB	0.00105 J	0.0480			0.000493 J		
	MW-64	Apr-17			**0.0346**	**2.00**				<0.000540	0.151	0.000997 J	0.0515			0.000642 J		
	MW-64	Oct-17			**0.0317**	**2.10**				<0.000540	0.139	0.00101 J	0.0571			0.000523 J		
	MW-65	Apr-15			**0.0186**	**3.08**				<0.000540	**2.88**	0.00153 J	**0.790**			<0.000380		
	MW-65	Apr-16			**0.0142**	**3.42** V				<0.00270	**2.09**	0.00124 J	**0.748** V			<0.00190		
	MW-65	Oct-16			**0.0120**	**2.97**				0.00121 JB	**1.66**	0.00103 J	**0.605**			<0.000380		
	MW-65	Apr-17			**0.0108**	**3.01**				<0.000540	**1.58**	0.000874 J	**0.593**			<0.000380		
	MW-65	Oct-17			**0.0113**	**3.03**				<0.000540	**2.16**	0.00128 J	**0.568**			<0.000380		
	MW-66	Apr-15			0.00298	**2.35**				<0.000540	0.635	0.000902 J	0.189	<0.000049	0.00613	<0.000380		0.000941 J
	MW-66	Oct-15			0.00370	**2.00**				<0.000540	0.792	0.000430 J	**0.220**	<0.000049	0.00743	<0.000380		0.00175 J
	MW-66	Apr-16			**0.0148**	**12.7**	0.378	<0.00500	<0.00130	0.00289 J	**4.74**	0.00659 J	**1.13**	<0.000049	0.121	<0.00190	<0.00165	0.00670 J
	MW-66	Oct-16			0.00269	**1.88**	0.283	<0.000160	<0.000260	0.000733 JB	0.717	0.000342 J	**0.216**	<0.000049 J3	0.00497	<0.000380	<0.00033	0.000342 J
	MW-66	Apr-17			0.00255	**2.22**	0.263	<0.000160	<0.000260	<0.000540	0.773	0.000592 J	0.193	<0.000049	0.00829	0.0134	<0.00033	0.000535 BJ
	MW-66	Oct-17			0.00282	**1.81**	0.314	<0.000160	<0.000260	0.00128 J	**1.02**	0.00453	**0.288**	<0.000049	0.00602	<0.000380	<0.00033	0.00169 J
	MW-99	Apr-15			0.00289	0.159				0.000639 J	0.457	0.00571	0.0802			0.000808 J		
	MW-99	Oct-15			0.00812	0.279				0.000832 J	0.382	0.00153 J	0.191			<0.000380		
	MW-99	Apr-16			**0.0491**	**5.05**				0.00682 J	**4.55**	**0.0193**	**1.20**			<0.00190		
	MW-99	Oct-16			0.00635	**1.14**				0.00128 JB	0.208	0.00150 J	**0.354**			<0.000380		
	MW-99	Apr-17			0.00772	0.297				<0.000540	0.204	0.00116 J	**0.243**			**0.0857**		
	MW-99	Oct-17			0.00865	0.221				<0.000540	0.0585 J	0.000379 J	**0.232**			<0.000380		
	MW-101	Apr-15			**0.0939**	0.0501				0.000581 J	**3.58**	<0.000240	**1.08**			<0.000380		
	MW-101	Oct-15			**0.0560**	0.0382				<0.000540	**2.59**	<0.00240	**1.13**			0.00344 J		
	MW-101	Apr-16			**0.0293**	0.0898				<0.00270	**1.38**	<0.00120	**1.34**			<0.00190		
	MW-101	Oct-16			**0.0783**	0.0366				0.00145 JB	**2.56**	0.000266 J	**1.06**			<0.000380		
	MW-101	Apr-17			**0.0659**	0.0732				<0.000540	**1.18**	<0.000240	**1.18**			<0.000380		
	MW-101	Oct-17			**0.0824**	0.0472				0.0137	**2.99**	0.000670 J	**1.21**			0.00139 J		
	MW-102	Apr-15			0.0100	**6.21**				<0.000540	0.138	0.00344	0.0431			<0.000380		
	MW-102	Oct-15			**0.0123**	0.423				0.00106 J	0.0723 J	0.00263	0.0273			0.000393 J		
	MW-102	Apr-16			**0.0117**	**7.71**				<0.00270	0.222 J	0.00339 J	0.0308			<0.00190		
	MW-102	Oct-16			**0.0132**	0.427				0.00200 B	0.0940 JB	0.00223	0.0214			<0.000380		
	MW-102	Apr-17			**0.0123**	**5.06**				<0.000540	0.201	0.00242	0.0231			0.000673 BJ		
	MW-102	Oct-17			**0.0135**	**5.52**				0.00110 J	**1.12**	0.00254	0.0176			0.000450 J		
	MW-103	Apr-14			0.00270 J	**1.47**				<0.00100 B	<0.0500	<0.000700 B	0.00278 J			<0.00100		
	MW-103	Apr-15			0.00617 J	**9.36**				<0.0110	<0.300	<0.00480	0.0125 J			**0.0607** J		
	MW-103	Apr-16			0.00594 J	**26.8**				<0.00270	<0.0750	0.00148 J	0.0262			<0.00190		
	MW-103	Apr-17			0.00848 J	**8.12**				<0.0108	<0.300	<0.00480	0.00689 J			<0.00760		
	MW-104	Apr-15			0.00041 J	0.0195				<0.000540	0.0945 J	0.000364 J	0.0228			<0.000380		
	MW-104	Apr-15	FD		0.00040 J	0.0196				<0.000540	0.0490 J	<0.000240	0.0217			<0.000380		
	MW-104	Oct-15			0.00150 J	0.0229				0.000591 J	0.0385 J	<0.000240	0.0148			<0.000380		
	MW-104	Oct-15	FD		0.00149 J	0.0218				<0.000540	<0.0150	<0.000240	0.0142			<0.000380		
	MW-104	Apr-16			0.00165 J	0.0343 O1				<0.00270	<0.0750	<0.00120	0.0113 J			<0.00190 J3J6		
	MW-104	Apr-16	FD		0.00195 J	0.0319				<0.00270	<0.0750	<0.00120	0.00995 J			<0.00190		
	MW-104	Oct-16			**0.0164**	0.0293				0.00128 JB	0.0150 JB	<0.000240	0.00278 J			<0.000380		
	MW-104	Oct-16	FD		**0.0194**	0.0290				0.00132 JB	0.0190 JB	<0.000240	0.00277 J			<0.000380		
	MW-104	Apr-17			**0.0551**	0.0438				<0.000540	0.0283 J	<0.000240	0.00109 J			<0.000380		
	MW-104	Apr-17	FD		**0.0570**	0.0451 O1				<0.000540	<0.0150	<0.000240	0.00134 J			0.00166 BJ		
	MW-104	Oct-17			**0.0584**	0.0430				<0.000540	0.0218 J	<0.000240	0.00326 J			<0.000380		
	MW-104	Oct-17	FD		**0.0602**	0.0446				0.000624 J	0.0247 J	<0.000240	0.00416 J			<0.000380		
	MW-105	Apr-15			0.00662	0.108				0.00184 J	**2.55**	0.00279	0.105			<0.000380		
	MW-105	Oct-15			0.00849	0.214				0.00221	**1.07**	0.00562	0.0917			0.0108 J		
	MW-105	Apr-16			**0.0197**	**1.31**				<0.00270	0.286 J	0.00176 J	0.195			0.00947 J		
	MW-105	Oct-16			**0.0121**	**1.15**				0.00154 JB	0.265	0.00118 J	0.117			<0.000380		
	MW-105	Apr-17			**0.0123**	**2.63**				0.00150 J	0.151	0.00143 J	0.0622			0.0357		
	MW-105	Oct-17			**0.0237**	**1.23**				0.00900	0.492	0.00112 J	0.0657			0.000624 J		
	MW-106	Apr-15			0.00491	0.0890				0.00283	**1.16**	**0.0296**	0.147			0.00957		
	MW-106	Oct-15			0.00726	0.0451				0.00385	0.650	0.00907	0.0119			0.00522		
	MW-106	Apr-16			**0.0150**	0.0379				<0.00270	<0.0750	0.00274 J	0.0113 J			<0.00190		
	MW-106	Oct-16			**0.0152**	0.0232				0.00143 JB	0.0422 JB	0.00305 B	0.00515 B			0.000476 J		
	MW-106	Apr-17			**0.0114**	0.0259				<0.000540	<0.0150	0.00133 J	0.00658			0.00216 B		
	MW-106	Oct-17			**0.0105**	0.0263				0.0111	0.119	0.00271	0.00542			0.00731		

Table 4B - Summary of Groundwater Analytical Data - Total Metals

2017 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Total Metals													
				Analyte:	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC Irr	WQCC HH	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
Area	**Well ID**	**Date**	**Dup**															
South Refinery	MW-107	Apr-15		**0.0107**	**1.75**				<0.000540	0.787	0.000331 J	0.158			<0.000380 B		
	MW-107	Oct-15		0.00883	**1.55**				0.000625 J	0.368	0.000259 J	0.178			<0.000380		
	MW-107	Apr-16		0.0100	**10.2**				0.00340 J	**1.78**	0.00200 J	**0.454**			<0.00190		
	MW-107	Oct-16		0.00388	**1.30**				0.000930 JB	0.158	0.000595 J	0.0896			<0.000380		
	MW-107	Apr-17		0.00143 J	**1.99**				<0.000540	**5.17**	0.000437 J	0.105			0.0145		
	MW-109	Apr-15		0.00554	0.101				<0.000540	0.154	<0.000240	0.140 J			<0.000380 B		
	MW-109	Oct-15		0.00134 J	0.112				0.000783 J	0.102	0.000334 J	0.127			0.00328		
	MW-109	Apr-16		**0.0331**	0.299				<0.00270	0.677	0.00147 J	**0.624**			<0.00190		
	MW-109	Oct-16		0.00269	0.0617				<0.000540	0.0900 J	<0.000240	0.0821			<0.000380		
	MW-109	Apr-17		0.00176 J	0.0479				<0.000540	0.0422 J	<0.000240	0.0425			<0.000380		
	MW-109	Oct-17		0.00146 J	0.0605				0.000611 J	0.0514 J	<0.000240	0.0413			0.000784 J		
	MW-110	Apr-15		0.00924	0.0617				0.000649 J	0.379	0.000690 J	**0.612**			<0.000380 B		
	MW-110	Oct-15		**0.0130**	0.0765				0.000557 J	0.321	0.000523 J	**0.882**			<0.000380		
	MW-110	Apr-16		**0.0854**	0.300				0.00399 J	**2.77**	0.00565 J	**6.26**			<0.00190		
	MW-110	Oct-16		**0.0344**	0.0480				<0.000540	0.730	0.000412 J	**1.67**			<0.000380		
	MW-110	Apr-17		0.00529	0.0571				<0.000540	0.229	<0.000240	**0.510**			<0.000380		
	MW-110	Oct-17		**0.0384**	0.0483				<0.000540	0.913	<0.000240	**1.78**			<0.000380		
	RA-313	Apr-14															
	RA-313	Apr-15															
	RA-313	Apr-16															
	RA-313	Apr-17															
	RW-4	Apr-15		0.00183 J	0.0521				<0.000540	0.0744 J	0.000665 J	0.104			<0.000380		
	RW-4R	Apr-16		0.00440 J	0.0623				<0.00270	0.181 J	<0.00120	0.0728			<0.00190		
	RW-4R	Apr-17		0.00340	0.0732				<0.000540	0.192	0.000419 J	0.0261			<0.000380		
	RW-5R	Apr-15		0.00136 J	0.0259				<0.000540	0.0952 J	0.000336 J	0.0177			<0.000380		
	RW-5R	Apr-16		0.00183 J	0.0282				<0.00270	<0.0750	<0.00120	0.0191 J			<0.00190		
	RW-6	Apr-15		**0.0332**	**1.66**				<0.000540	**13.8**	0.000574 J	**0.280**			<0.000380		
	RW-6R	Apr-16		**0.0712**	0.480				<0.00270	**3.70**	<0.00120	**0.553**			<0.00190		
	RW-15C	Apr-17		**0.0274**	0.885				<0.000540	0.316	0.0116	**0.358**			0.000461 BJ		
South RO Reject Field	MW-114	Apr-15		0.00279	0.0165				0.000896 J	0.361	0.000317 J	**0.927**			<0.000380 B		
	MW-114	Oct-15		0.00355	0.0134				<0.000540	0.0486 J	<0.000240	**0.905**			0.000757 J		
	MW-114	Apr-16		0.00344 J	0.0155 J				<0.00270	<0.0750	<0.00120	**1.15**			<0.00190		
	MW-114	Oct-16		0.00327	0.0119				0.00115 JB	<0.0150	0.000617 J	**0.899**			0.00839		
	MW-114	Apr-17		0.00262	0.0138				<0.000540	<0.0150	<0.000240	**0.944**			0.00129 J		
	MW-114	Oct-17		0.00262	0.0129				<0.000540	0.0208 J	<0.000240	**0.873**			0.0179		
	MW-115	Apr-15		0.00697 J	0.0118				<0.000540	0.0684 J	<0.000240	0.120			<0.000380 B		
	MW-115	Oct-15		0.00761	0.0119				0.000763 J	0.0367 J	<0.000240	0.124			0.000590 J		
	MW-115	Apr-16		**0.0230**	0.0415				<0.00270	0.134 J	0.00135 J	**0.308**			0.00217 J		
	MW-115	Oct-16		0.00838	0.00908				0.000944 JB	0.116 B	0.000381 J	0.146			<0.000380		
	MW-115	Apr-17		0.00336	0.00809				<0.000540	0.0381 J	<0.000240	0.0455			<0.000380		
	MW-115	Oct-17		0.00342	0.00796				<0.000540	0.0264 J	<0.000240	0.0553			0.000723 J		
	MW-116	Apr-15		0.00521	0.00931				<0.000540	<0.0150	<0.000240	0.00454 J			<0.000380 B		
	MW-116	Oct-15		0.00825	0.0434				0.00542	**2.45**	0.00183 J	0.0815			0.000668 J		
	MW-116	Apr-16		0.00422 J	0.0231 J				<0.00270	0.800	<0.00120	0.0396			<0.00190		
	MW-116	Oct-16		0.00720	0.0118				0.000922 JB	0.119	0.000397 J	0.0506			0.000738 J		
	MW-116	Apr-17		0.00357	0.0121				0.000560 J	0.224	0.000542 J	0.0545			0.00488		
	MW-116	Oct-17		0.00521	0.0178				0.00151 J	0.598	0.000647 J	0.0402			0.00741		
TEL	MW-49	Apr-15		0.00433	0.0514				0.00147 J	0.530	0.00133 J	**0.269**	<0.000049	0.00842	<0.000380		0.00195 J
	MW-49	Oct-15		<0.00025 B	0.0429				<0.000540	0.0195 J	0.000453 J	**0.209**	<0.000049	0.00740	0.0117		0.00145 J
	MW-49	Apr-16		0.00489 J	0.0439	0.695	<0.00500	<0.00130	<0.00270	0.0770 J	<0.00120	**0.269**	<0.000049	0.00686 J	<0.00190	<0.00165	0.00245 J
	MW-49	Oct-16		0.00505	0.0449	0.642	<0.000160	<0.000260	0.000766 JB	0.127	0.000423 J	**0.223**	<0.000049 J6	0.00867	<0.000380	<0.00033	0.000357 J
	MW-49	Apr-17		0.00426	0.0461	0.733	<0.000160	<0.000260	<0.000540	0.100	0.000499 J	**0.250**	<0.000049	0.00809	<0.000380	<0.00033	0.000515 J
	MW-49	Oct-17		0.00467	0.0480	0.747	<0.000160	<0.000260	0.000609 J	0.128	0.000563 J	0.146	<0.000049	0.0152	<0.000380	<0.00033	0.000321 J
	TEL-1	Apr-15		0.00537	0.0119				0.00501	0.0741 J	<0.000240	0.0523			<0.000380		
	TEL-1	Oct-15		<0.00025 B	<0.000360 B				0.00318	0.0506 J	<0.000240	0.103			0.00798 J		
	TEL-1	Apr-16		0.00407 J	0.0126 J				0.0269	0.104 J	<0.00120	0.199			<0.00190		
	TEL-1	Oct-16		0.00256	0.00987				0.00911 B	0.0829 J	0.000300 J	**0.216**			<0.000380		
	TEL-1	Apr-17		0.00520	0.0116				0.0260	0.382	<0.000240	0.117			<0.000380		
	TEL-1	Oct-17		**0.0139**	0.0121				0.0196	0.258	0.000341 J	0.0700			<0.000380		
	TEL-2	Apr-15		**0.0132**	0.185				0.00134 J	0.0326 J	0.00276	0.0101			0.000383 J		
	TEL-2	Oct-15		**0.0118**	0.153				0.00178 J	0.0291 J	0.00242	0.00753			0.00679		
	TEL-2	Apr-16		**0.0101**	0.127				0.00303 J	<0.0750	0.00131 J	0.0212 J			<0.00190		
	TEL-2	Oct-16		**0.0147**	0.0773				0.00209 B	0.0279 J	0.00145 J	0.0144			0.000618 J		
	TEL-2	Apr-17		**0.0123**	0.162				0.00307	0.0749 J	0.00143 J	0.0149			0.000558 J		
	TEL-2	Oct-17		**0.0140**	0.0942				0.00457	0.0896 J	0.00111 J	0.0166			0.000473 J		
	TEL-3	Apr-15		0.00354	0.0145				0.00466	0.0738 J	0.000599 J	0.00827			<0.000380		
	TEL-3	Oct-15		<0.00025 B	<0.000360 B				0.00613	0.0417 J	0.000435 J	0.0139			0.00966		
	TEL-3	Apr-16		0.00876 J	0.0208 J				0.0269	0.171 J	<0.00120	0.00661 J			<0.00190		
	TEL-3	Oct-16		0.00126 J	0.0156				**0.138**	0.456	0.000368 J	0.0133			<0.000380		
	TEL-3	Apr-17		0.00204	0.0161				**0.156**	0.473	0.000250 J	0.0121			<0.000380		
	TEL-4	Apr-15		0.00613	0.0244				**0.419**	**1.57**	0.00227	**0.872**			<0.000380		
	TEL-4	Apr-15	FD	0.00598	0.0233				**0.599**	**2.41**	0.00262	**0.860**			0.000420 J		
	TEL-4	Oct-15		**0.0106**	0.0338				**0.315**	0.107	0.00255	**0.406**			0.0201		
	TEL-4	Oct-15	FD	0.00929	0.0326				**0.281**	0.107	0.00206	**0.412**			0.0135		
	TEL-4	Apr-16		0.00710 J	0.0247 J				**0.282**	0.331 J	0.00330 J	**0.751**			<0.00190		
	TEL-4	Apr-16	FD	0.00736 J	0.0245 J				**0.306**	0.628	0.00316 J	**0.750**			<0.00190		
	TEL-4	Oct-16		0.00784	0.0190				**0.688**	**1.93**	0.00263	**0.508**			0.000883 J		
	TEL-4	Oct-16	FD	0.00700	0.0199				**0.389**	**1.07**	0.00241	**0.501**			<0.000380		
	TEL-4	Apr-17		0.00723	0.0185				**0.790**	**1.45**	0.00173 J	**0.973**			0.000535 J		
	TEL-4	Apr-17	FD	0.00707	0.0180				**0.443**	0.105	0.00110 J	**0.963**			<0.000380		
	TEL-4	Oct-17		0.00750	0.0178				**0.236**	0.952	0.00118 J	**1.05**			0.000561 J		
	TEL-4	Oct-17	FD	0.00731	0.0172				**0.273**	**1.03**	0.00125 J	**1.04**			0.000454 J		
TMD	MW-8	Apr-14		0.00884 J	0.0114				0.0212	<0.100	<0.00140	**0.557**			0.0237		
	MW-8	Apr-15		**0.0108**	0.0107				**0.234**	0.779	0.000470 J	**0.507**			0.0188		
	MW-8	Apr-16		0.00885 J	0.0117 J				**0.107**	0.397 J	<0.00120	**0.538**			0.00622 J		
	MW-8	Apr-17		0.00678	0.0102				0.0259	0.111	<0.000240	**0.467**			0.00647		
	MW-16	Apr-14		0.00470 J	0.0151				<0.00200	<0.100	<0.00140	**0.244**			0.00322 J		
	MW-16	Apr-15		0.00500 J	0.0174 J				<0.00270	<0.0750	<0.00120	0.0950 J			0.00213 J		
	MW-16	Apr-17		0.00498	0.0127				<0.000540	<0.0150	<0.000240	0.00510			0.0106		
	MW-20	Apr-14		0.00750 J	0.00905 J				<0.00200	<0.100	<0.00140	0.0906			0.0179		
	MW-20	Apr-14	FD	0.00865 J	0.0103				<0.00200	<0.100	<0.00140	0.0800			0.0170		
	MW-20	Apr-15		0.00621	0.0104				<0.000540	0.0746 J	<0.000240	0.00743			0.0289		
	MW-20	Apr-16		0.00628 J	0.0113 J				<0.00270	<0.0750	<0.00120	0.00814 J			0.0305		
	MW-20	Apr-17		0.00575	0.00980				<0.000540	<0.0150	<0.000240	0.00756			0.0188		
	MW-21	Apr-15		0.00656 J	0.0100 J				<0.00270	<0.0750	<0.00120	**0.323** J			0.0258		
	MW-21	Oct-15		0.00635	0.00939				<0.000540	<0.0150	<0.000240	**0.658**			0.0290		
	MW-21	Apr-16		0.00607 J	0.0100 J				<0.00270	<0.0750	<0.00120	**0.354**			0.0327		
	MW-21	Oct-16		0.00613	0.00790				<0.000540	<0.0150	<0.000240	**0.616**			0.0287		
	MW-21	Apr-17		0.00530	0.00817				<0.000540	<0.0150	<0.000240	**0.204**			0.0258		
	MW-21	Oct-17		0.00545	0.00860				0.000607 J	0.0290 J	<0.000240	**0.607**			0.0314		
	MW-25	Apr-14		0.00502 J	0.0265				<0.00500	<0.250	<0.00350	**1.09**			<0.00500		
	MW-25	Apr-15		0.00984 J	0.0187 J				<0.00270	<0.0750	<0.00120	**0.582** J			0.0204		
	MW-25	Apr-16		0.00582 J	0.0148 J				0.00332 J	<0.0750	<0.00120	**0.889**			<0.00190		
	MW-25	Apr-17		0.00300	0.0121				0.000842 J	0.0157 J	<0.000240	**0.507** V			0.00254		

Table 4B - Summary of Groundwater Analytical Data - Total Metals

2017 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Total Metals													
				Analyte:	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC Irr	WQCC HH	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
Area	**Well ID**	**Date**	**Dup**															
TMD	MW-26	Apr-14		0.00413 J	0.00878 J				<0.00200	<0.100	<0.00140	**0.731**			0.0241		
	MW-26	Apr-15		0.00351	0.00944				<0.000540	0.0811 J	<0.000240	**0.613**			0.0197		
	MW-26	Apr-16		0.00384 J	0.0101 J				<0.00270	<0.0750	<0.00120	**0.847**			0.0194		
	MW-26	Apr-17		0.00335	0.00916				<0.000540	<0.0150	<0.000240	**0.560**			0.0232		
	MW-27	Apr-14		0.00249 J	0.0166				<0.00100	<0.00500	<0.000700	0.00554			0.0192		
	MW-27	Apr-15		0.00239	0.0235				<0.000540	<0.0150	<0.000240	0.0318			0.0180		
	MW-27	Apr-16		0.00228 J	0.0179 J				<0.00270	<0.0750	<0.00120	0.0186 J			0.0127		
	MW-27	Apr-17		0.00216	0.0153				<0.000540	<0.0150	<0.000240	0.0158			0.00706		
	MW-46R	Nov-14		0.00420	0.0240				0.00280	**1.10**	0.000830 J	0.140			0.00340		
	MW-46R	Apr-15		0.00307	0.0188				0.00106 J	0.297	0.000608 J	0.116			0.00116 J		
	MW-46R	Apr-16		0.00317 J	0.0140 J				<0.00270	0.159 J	<0.00120	0.125			<0.00190		
	MW-46R	Oct-16		0.00314	0.0150				0.000894 JB	0.196	0.000459 J	0.137			0.00154 J		
	MW-46R	Apr-17		0.00266	0.0134				<0.000540	0.167	0.000538 J	0.162			0.00199 J		
	MW-46R	Oct-17		0.00262	0.0130				<0.000540	0.0344 J	0.000354 J	0.124			0.00135 J		
	MW-68	Apr-14		0.00325 J	0.0142				<0.00200	<0.100	<0.00140	<0.00500			0.0248		
	MW-68	Apr-15		0.00292	0.0159				<0.000540	0.0594 J	0.000524 J	0.00131 J			0.0123		
	MW-68	Apr-16		0.00314 J	0.0133 J				<0.00270	<0.0750	<0.00120	0.0393			0.00339 J		
	MW-68	Apr-17		0.00244	0.0107				<0.000540	<0.0150	<0.000240	0.0824			0.00275		
	MW-71	Apr-14		0.00458 J	0.00860				<0.00100	<0.0500	<0.000700	<0.00250	<0.000040	0.00123 J	0.0452		0.0252
	MW-71	Apr-15		0.00411	0.00897				0.000581 J	0.0373 J	<0.000240	0.000898 J	<0.000049	0.00134 J	0.0349		0.0229
	MW-71	Apr-16		0.00436 J	0.0103 J	0.689 V	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	<0.00125	<0.000049	<0.00175	0.0370	**0.0605**	0.0257
	MW-71	Apr-17		0.00387	0.00845	0.538	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.000841 J	<0.000049	0.000916 J	0.0324	**0.0587**	0.0248
	MW-89	Apr-14		**0.0128**	0.0140				<0.00100	0.195 J	<0.000700	**0.537**			0.0188		
	MW-89	Apr-15		0.00900 J	0.0144 J				<0.00270	0.120 J	<0.00120	0.0710 J			0.0275		
	MW-89	Apr-16		0.00839 J	0.0155 J				<0.00270	0.228 J	<0.00120	0.0788			0.0311	<0.00100	
	MW-89	Apr-17		0.00657	0.0145				0.00102 J	<0.0150	<0.000240	0.0420			**0.0534**		
	NP-1	Apr-15															
	NP-1	Oct-15															
	NP-1	Apr-16															
	NP-1	Oct-16															
	NP-1	Apr-17															
	NP-1	Oct-17															
	NP-2	Apr-13															
	NP-6	Apr-13															
	NP-6	Apr-15															
	NP-6	Apr-17															
Up-Gradient	UG-1	Apr-14		0.00158 J	0.0128				0.00159 J	0.0832 J	<0.000700	0.00575	<0.000040	0.00121 J	0.00728		0.0135
	UG-1	Apr-15		0.00113 J	0.0137				0.00242	0.0262 J	<0.000240	0.000764 J	<0.000049	<0.000350 B	0.0103		0.0105
	UG-1	Apr-16		<0.00125	0.0136 J	0.574	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	<0.00125	<0.000049	<0.00175	0.0140	0.0252 J	0.0107 J
	UG-1	Apr-17		0.00106 J	0.0135	0.548	<0.000160	<0.000260	0.000572 J	0.0561 J	<0.000240	0.00689	<0.000049	0.00145 J	0.0100	0.0262	0.0118
	UG-2	Apr-14		0.00385 J	0.0167				<0.00100	0.673	<0.000700	**0.488**	<0.000040	0.0256	0.00209 J		0.00820
	UG-2	Apr-15		0.00205	0.0153				<0.000540	<0.0150	<0.000240	0.0110	<0.000049	0.00527	<0.000380 B		0.0115
	UG-2	Apr-16		0.00202 J	0.0150 J	0.343	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	0.0147	<0.000049	0.00905	0.00321 J	0.0156 J	0.0123 J
	UG-2	Apr-17		0.00197 J	0.0154	0.303	<0.000160	<0.000260	<0.000540	0.0172 J	<0.000240	0.0154	<0.000049	0.00271	0.00572	0.0153	0.0154
	UG-3R	Apr-14		0.00184 J	0.0170				<0.00100	<0.0500	<0.000700	<0.00250	<0.000049	<0.00100	0.00534		0.0109
	UG-3R	Apr-14	FD	0.00167 J	0.0163				<0.00100	<0.0500	<0.000700	<0.00250	<0.000049	<0.00100	0.00640		0.0101
	UG-3R	Apr-15		0.00258	0.0595				0.00368	**2.05**	0.000626 J	0.0725	<0.000049	<0.000350 B	<0.000380 B		0.0135
	UG-3R	Apr-16		0.00182 J	0.0198 J	0.295	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	0.00141 J	<0.000049	0.00188 J	0.00386 J	0.0122 J	0.0104 J
	UG-3R	Apr-17		0.00161 J	0.0185	0.256	<0.000160	0.000465 J	<0.000540	0.0316 J	<0.000240	0.00182 J	<0.000049	0.00225	0.00325	0.0129	0.00961
	UG-4	Apr-16		<0.00125	0.0184 J	**1.19**	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	0.00752 J	<0.000049	0.00203 J	0.00634 J	**0.0364** J	0.00749 J
	UG-4	Apr-17		0.00111 J	0.0164	**1.06**	<0.000160	<0.000260	<0.000540	0.0249 J	<0.000240	0.00935	<0.000049	0.00143 J	0.0143	**0.0361**	0.00739

Definitions

X	Reported concentration, X, exceeds the CGWSL.
X	Analyte detected above the detection limit at a concentration equal to X.
<x	Analyte not detected at detection limit equal to x.
<x	Analyte not detected at detection limit equal to x, but x exceeds the CGWSL.
	Blank cell indicates a sample was collected from the well during the indicated sampling event, but the analyte was not analyzed.

Abbreviations

CGWSL	Critical Groundwater Screening Level (see Table 3)
CGWSL Source	Source for CGWSL value (see Table 3)
Dup	Duplicate sample
FD	Field duplicate sample
mg/L	Milligrams per Liter
NMED TW	NMED Risk Assessment Guidance for Site Investigations and Remediation, March 2017, Table A-1, Tap Water Screening Level
WQCC Dom	NMED Groundwater standard for domestic exposure taken from 20.6.2.3103.B NMAC
WQCC HH	NMED Groundwater standard for human health exposure, 20.6.2.3103.A NMAC
WQCC Irr	NMED Groundwater standard for irrigation exposure, 20.6.2.3103.C NMAC
USEPA MCL	United States Environmental Protection Agency Maximum Contaminant Level, "Regional Screening Levels (RSL) Summary Table", November 2017

Lab Footnote

B	Analyte was also detected in the associated method blank.
J	Indicates an estimated value.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
O1	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
V	The sample concentration is too high to evaluate accurate spike recoveries.

Table 4C - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

		Analyte Group:		Water Quality Parameters								Cyanide
		Analyte:		Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
		Units:		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		CGWSL:		---	250	1.60	---	---	600	1,000	10.0	0.200
		CGWSL Source:			WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	USEPA MCL	USEPA MCL
Area	**Well ID**	**Date**	**Dup**									
Cross-Gradient	KWB-13	Apr-14		418	158	0.580	0.724	143	**1,820**	**3,750**	**14.6**	<0.00500 H
	KWB-13	Apr-15		474	**788**	0.704	6.65	148	**1,970**	**3,060**	**15.3**	<0.00180
	KWB-13	Apr-16		626	148	0.630	2.26 J	258	**2,500**	**3,720**	**13.7**	<0.00120
	KWB-13	Apr-17		526	180	0.803	1.18	200	**2,390**	**3,600**	**16.1**	<0.00180
	MW-17	Apr-14		395	174	1.19	2.31	72.2	**1,200**	**2,340**	2.19	
	NP-5	Apr-13		465	**413**	**2.58**	<0.400	253	**3,090**	**5,980**	2.33	
	NP-5	Apr-15		448	**993**	**2.13**	0.484 J	209	**3,030**	**6,060** J	1.38	
	NP-5	Apr-17		514	**444**	**1.63**	0.422 J	212	**3,770**	**4,810**	2.22	
	RA-3156	Nov-13		537	238	0.208	3.06	169	**1,450**	**3,390**	9.09	
	RA-3156	Apr-14		<0.500	**278**	0.299	2.67		**1,800**	**3,280**	7.89	
	RA-3156	Apr-16		370	**1,140**	0.478	3.67 J	695	**1,070**	**3,050**	<0.197	
	RA-3156	Apr-17		337	**568**	0.668	2.41	292	**1,080**	**2,400**	0.330 J	
	MW-136	Oct-15		706	**265**	1.56	3.20	144	**2,740**	**4,020**	**22.1**	<0.00180
	MW-136	Apr-16		699	**336**	1.23	2.95 J	149	**2,870**	**4,250**	9.76	<0.00120
	MW-136	Oct-16		651	**355**	**1.66**	2.81	140	**2,530**	**4,400**	**12.4**	0.00188 J
	MW-136	Apr-17		643	**401**	**1.81**	2.81	140	**2,370**	**4,360**	**17.1**	<0.00180
	MW-136	Oct-17		671	**357**	1.50	2.61	148	**2,470**	**3,850**	**10.5**	<0.00180
Evaporation Ponds	MW-1R	Apr-14		540	**1,560**	0.567	4.27	1010	**1,900**	**5,740**	<0.150	
	MW-1R	Apr-15		765 J	**1,970**	0.821	4.52 J	1080 J	**2,400**	**5,020**	<0.0200	
	MW-1R	Apr-16		1030	**3,330**	0.603 J6	6.54	2090	**3,320**	**10,100**	<0.197	
	MW-1R	Apr-17		763	**2,880**	0.736	5.11	1830	**3,010**	**9,180**	0.402 J	
	MW-2A	Apr-15		944	**6,730**	1.06	7.71 J	4780	**4,830**	**14,200**	0.0404 J	
	MW-2A	Oct-15		677	**3,870**	**2.14**	5.85	2590	**3,670**	**10,500**	0.0390 J	
	MW-2A	Apr-16		933	**8,400**	1.53	7.35	5280	**7,640**	**20,700**	0.501 J	
	MW-2A	Oct-16		598	**3,290**	**3.43**	4.91	2270	**3,450**	**9,660**	0.122	
	MW-2A	Apr-17		720	**6,650**	**2.19**	6.21	4310	**6,010**	**19,000**	0.0220 J	
	MW-2A	Oct-17		323	**1,980**	**3.25**	3.65	1,350	**2,500**	**6,060**	0.0340 J	
	MW-3	Apr-15		839	33.2	**2.10**	6.16	1850	25.0	**12,200**	**24.5**	
	MW-3	Apr-15	FD	927	**3,270**	1.60	6.80	1790	**3,000**	**17,800**	**20.2**	
	MW-3	Oct-15		613	**1,950**	**1.99**	7.17	1220	**2,810**	**6,140**	0.182	
	MW-3	Oct-15	FD	636	**1,920**	**1.84**	7.11	1210	**2,730**	**6,480**	0.0580 J	
	MW-3	Apr-16		728	**1,360**	**1.87**	5.64	1160	**2,640**	**6,260**	0.404 J	
	MW-3	Apr-16	FD	690	**1,290**	**1.87**	5.47	1140	**2,530**	**6,240**	0.231 J	
	MW-3	Oct-16		574	**1,290**	**2.21**	5.69	865	**2,380**	**5,180**	0.0520 J	
	MW-3	Oct-16	FD	591	**1,270**	**2.20**	5.85	854	**2,380**	**5,040**	0.0490 J	
	MW-3	Apr-17		603	**1,330**	**1.94**	4.57	944	**2,480**	**5,080**	<0.197	
	MW-3	Apr-17	FD	599	**1,330**	**1.98**	4.57	876	**2,380**	**5,190**	<0.0197	
	MW-3	Oct-17		549	**1,340**	**2.39**	6.28	829	**2,470**	**4,640**	<0.0197	
	MW-3	Oct-17	FD	578	**1,290**	**1.99**	6.35	803	**2,430**	**4,660**	<0.0197	
	MW-4A	Apr-15		660	**1,560**	1.29	4.12 J	1080	**2,850**	**7,470**	<0.0200	
	MW-4A	Oct-15		394	**1,380**	**1.92**	5.23	1010	**2,110**	**4,290**	0.0530 J	
	MW-4A	Apr-16		507	**1,860**	**1.78**	4.03 J	1060	**2,990**	**5,090**	<0.197	
	MW-4A	Oct-16		393	**1,510**	**2.06**	4.06	890	**1,970**	**4,610**	0.0640 J	
	MW-4A	Apr-17		417	**1,480**	**1.93**	3.51	919	**2,070**	**4,550**	<0.0197	
	MW-4A	Oct-17		434	**1,470**	**1.85**	5.42	913	**2,050**	**4,500**	<0.0197	
	MW-4B	Apr-13		371	**928**	0.870	3.64	556	**1,330**	**3,660**	<1.00	
	MW-4B	Apr-15		367	**1,110**	0.963	2.32	696	**1,340**	**3,410** J	<0.0200	
	MW-4B	Apr-17		360	**1,330**	0.985	2.55	758	**1,410**	**3,690**	<0.0197	
	MW-5A	Apr-15		519	**4,100**	1.53	6.15 J	4220	**9,370**	**17,000**	<0.0200	
	MW-5A	Oct-15		513	**4,760**	**1.78**	7.27	4500	**8,480**	**17,800**	0.0450 J	
	MW-5A	Apr-16		472	**3,010**	**3.11**	7.39	2990	**5,610**	**13,700**	1.72	
	MW-5A	Oct-16		500	**3,500**	**3.43**	6.34	3880	**7,950**	**16,300**	0.0440 JJ6	
	MW-5A	Apr-17		439	**3,010**	**2.92**	7.27	3360	**5,840**	**12,500**	0.212	
	MW-5A	Oct-17		436	**2,580**	**2.83**	8.93	2,440	**4,960**	**9,500**	<0.0197	
	MW-5B	Apr-13		473	**1,840**	**2.20**	10.8	1600	**2,950**	**7,500**	2.93	
	MW-5B	Apr-15		482	**1,590**	1.41	9.01	1580	**3,510**	**5,980**	<0.0200	
	MW-5B	Apr-17		420	**1,560**	**1.73**	9.18	1650	**2,590**	**6,290**	0.0210 J	
	MW-5C	Apr-13		420	**639**	1.20	4.21	446	**1,580**	**3,620**	<1.00	
	MW-5C	Apr-15		427	**585**	0.910	3.97 J	485	**2,020**	**3,290**	<0.0200	
	MW-5C	Apr-17		383	**576**	0.971	3.90	500	**1,740**	**3,110**	<0.0197	
	MW-6A	Apr-14		762	**1,620**	1.31	2.44	998	**1,980**	**5,600**	0.245 J	
	MW-6A	Apr-15		809	**2,010**	**1.85**	2.14 J	1090	**2,240**	**6,500**	0.875	
	MW-6A	Apr-16		449	**1,300**	1.52	1.74 J	835	**2,360**	**4,290**	0.461 J	
	MW-6A	Apr-17		353	**904**	**1.62**	1.38	770	**2,080**	**4,660**	<0.197	
	MW-6B	Mar-13		530	**1,370**	0.533	4.31	710	**1,640**	**4,480**	<1.00	
	MW-6B	Mar-13	FD	478	**1,420**	0.814	4.87	753	**1,690**	**4,510**	<1.00	
	MW-6B	Apr-15		568	**1,740**	0.669 J	5.09	873	**2,280**	**4,760**	<0.0200	
	MW-6B	Apr-17		418	**1,250**	0.694	3.97	738	**1,730**	**4,150**	<0.197	
	MW-7A	Apr-15		609	**3,080**	0.693	4.18	2060	**3,620**	**9,840**	<0.0200	
	MW-7A	Apr-15	FD	593	**3,100**	0.996	4.21	2060	**3,190**	**9,300**	0.0262 J	
	MW-7A	Oct-15		403	**2,470**	1.08	3.96	1590	**4,020**	**7,100**	<0.0197	
	MW-7A	Oct-15	FD	404	**2,230**	1.12	3.95	1690	**3,150**	**7,180**	<0.0197	
	MW-7A	Apr-16		459	**2,500**	1.24	4.18 J	1810	**3,360**	**7,620**	<0.197	
	MW-7A	Apr-16	FD	423	**2,550**	1.24	3.94 J	1690	**3,710**	**7,540**	<0.197 J6	
	MW-7A	Oct-16		406	**2,790**	1.49	4.22	1600	**3,420**	**7,460**	0.0260 J	
	MW-7A	Oct-16	FD	395	**2,240**	1.45	4.01	1550 O1V	**2,790**	**7,340**	0.0470 J	
	MW-7A	Apr-17		371	**2,240**	1.31	3.79	2000	**2,700**	**6,690**	0.0360 J	
	MW-7A	Apr-17	FD	434	**2,230**	1.07	3.89 O1	1780	**2,930**	**7,810**	<0.0197	
	MW-7A	Oct-17		366	**2,300**	1.23	3.97	1,550	**2,990**	**7,100**	<0.0197	
	MW-7A	Oct-17	FD	386	**2,520**	1.24	3.94	1,650	**3,290**	**6,820**	<0.0197	
	MW-7B	Apr-13		545	**1,030**	**3.09**	6.66	540	**1,800**	**4,280**	<1.00	
	MW-7B	Apr-15		556	**1,060**	0.795	6.27	672	**2,200**	**4,640**	<0.0200	
	MW-7B	Apr-17		530	**1,060**	0.966	6.71	652	**1,750**	**4,720**	0.0670 J	
	MW-10	Apr-15		466	**1,380**	0.919	3.54 J	941	**2,110**	**5,030**	<0.0200	
	MW-10	Oct-15		518	**1,580**	0.783	3.68	1080	**2,620**	**5,340**	0.280 J	
	MW-10	Apr-16		523	**1,530**	0.826	3.83 J	1110	**2,220**	**5,120**	<0.197	
	MW-10	Oct-16		647	**2,100**	1.18	3.54	1180	**3,740**	**6,550**	0.0970 J	
	MW-10	Apr-17		460	**1,460**	0.825	3.41	996	**2,030**	**4,850**	**593**	
	MW-10	Oct-17		475	**1,370**	0.808	3.34	973	**2,060**	**4,830**	<0.0197	
	MW-11A	Apr-15		1630	**11,800**	0.0639 J	19.0 J	6090	**2,910**	**24,900** J	1.47	
	MW-11A	Oct-15		1200	**9,930**	0.152	20.3	5260	**3,780**	**18,300**	0.265	
	MW-11A	Apr-16		1280 V	**9,440**	0.414 J6	19.0	5150	**3,510**	**18,600**	0.715 JJ6	
	MW-11A	Oct-16		1230	**9,180**	0.752	20.8	4850	**3,250**	**16,600**	0.0480 JB	
	MW-11A	Apr-17		1280	**10,200**	0.683	20.1	5130	**3,290**	**19,500**	0.305 J	
	MW-11A	Oct-17		1,130	**9,650**	0.340	19.8	4,460	**3,510**	**17,900**	<0.0197	
	MW-11B	Mar-13		855	**6,560**	<0.500	35.2	3340	**3,030**	**15,100**	<1.00	
	MW-11B	Apr-15		1070	**6,000**	0.562	36.6	4040	**3,860**	**12,700**	<0.0200	
	MW-11B	Apr-17		979	**6,050**	0.825	35.2	3660	**2,890**	**14,000**	<0.197	
	MW-12	Apr-14		728	**2,460**	0.685	5.57	1280	**2,490**	**7,960**	4.10	
	MW-13	Apr-14		682	**1,780**	0.354	5.56	914	**2,180**	**6,520**	0.463 J	
	MW-15	Apr-14		849	**2,960**	**2.33**	5.68	1420	**1,770**	**19,900**	**40.2**	
	MW-15	Apr-15		565	**2,150**	**2.12**	5.01	1300	**2,000**	**5,470**	**16.0**	
	MW-15	Apr-16		487	**611**	**2.01**	5.53	795	**1,240**	**4,720**	3.99	
	MW-15	Apr-17		285	**612**	1.58	4.31	447	**1,100**	**2,640**	0.485 J	

Table 4C - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

		Analyte Group:		Water Quality Parameters								Cyanide
		Analyte:		Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
		Units:		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		CGWSL:		---	250	1.60	---	---	600	1,000	10.0	0.200
		CGWSL Source:			WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	USEPA MCL	USEPA MCL
Area	**Well ID**	**Date**	**Dup**									
Evaporation Ponds	MW-18A	Apr-15		718	**11,600**	**6.14**	56.7	7290	**9,490**	**32,600**	2.18	<0.00180
	MW-18A	Oct-15		711	**9,930**	**5.43**	51.8	6250	**10,600**	**27,400**	0.146	<0.00180
	MW-18A	Apr-16		704	**6,820**	**2.83**	46.6	4730	**6,360**	**20,500**	0.371 J	<0.00180
	MW-18A	Oct-16		662	**7,270**	**3.22**	42.4	4740	**6,870**	**20,200**	0.0300 J	<0.00180
	MW-18A	Apr-17		623	**5,790**	1.46	38.8	3940	**6,330**	**17,100**	0.0220 J	<0.00180
	MW-18A	Oct-17		713	**7,090**	1.60	40.7	4,020	**7,410**	**15,100**	<0.0197	<0.00180
	MW-18B	Apr-13		592	**803**	1.10	6.32	474	**1,870**	**4,060**	<1.00	
	MW-18B	Apr-15		581	**763**	0.931	5.91	460	**1,840**	**4,410**	0.0280 J	
	MW-18B	Apr-17		576	**860**	0.797	5.91	481	**2,070**	**4,080**	<0.0197	
	MW-22A	Apr-15		549	**2,150**	0.758	3.79 J	1450	**2,500**	**7,270**	<0.0200	
	MW-22A	Apr-15	FD	494	**2,020**	0.682	3.16 J	1240	**2,590**	**6,630**	<0.0200	
	MW-22A	Oct-15		529	**1,980**	0.621	3.64	1480	**2,660**	**6,330**	0.358 J	
	MW-22A	Oct-15	FD	527	**1,970**	0.610	3.65	1640	**2,650**	**6,090**	0.441 J	
	MW-22A	Apr-16		548	**1,890**	0.645	4.08 J	1440	**2,340**	**6,190**	<0.197	
	MW-22A	Apr-16	FD	541	**1,900**	0.660	4.04 J	1440	**2,560**	**6,160**	<0.197	
	MW-22A	Oct-16		570	**1,940**	0.752	3.96	1490	**2,380**	**6,970**	0.219 B	
	MW-22A	Oct-16	FD	563	**2,030**	0.733	3.88	1450	**2,400**	**7,220**	0.0490 JB	
	MW-22A	Apr-17		493	**2,090**	0.632	3.71	1350	**2,530**	**6,630**	<0.197	
	MW-22A	Apr-17	FD	503	**1,860**	0.743	3.73	1340	**2,160**	**4,210**	<0.0197	
	MW-22A	Oct-17		491	**1,990**	0.614	3.49	1,380	**2,450**	**6,010**	<0.0197	
	MW-22A	Oct-17	FD	505	**2,210**	0.655	3.43	1,340	**2,610**	**5,910**	<0.0197	
	MW-22B	Apr-13		530	**1,470**	0.619	4.48	932	**2,240**	**5,460**	<1.00	
	MW-22B	Apr-15		477	**1,400**	0.823	4.02 J	1150	**2,170**	**5,590**	<0.0200	
	MW-22B	Apr-17		396	**1,400**	0.771	4.15	1150	**2,080**	**5,670**	0.408 J	
	MW-70	Apr-15		695	**1,240**	0.740	4.90	774	**2,230**	**5,700**	<0.0200 J	
	MW-70	Oct-15		756			5.51	782				
	MW-70	Apr-16		720	**1,370**	0.775	5.46	908	**2,240**	**5,730**	0.416 J	
	MW-70	Oct-16										
	MW-70	Apr-17		673	**1,290**	0.626	4.87	852	**2,460**	**4,660**	<0.0197	
	MW-70	Oct-17										
	MW-72	Apr-14		795	**4,350**	**6.27**	9.87	2440	**3,020**	**10,300**	3.10	
	MW-72	Apr-15		896	**5,240**	**3.91**	13.3	3030	**3,800**	**12,900**	6.37	
	MW-72	Apr-16		700	**3,310**	**5.88**	8.82	2060	**3,400**	**9,140**	1.88	
	MW-72	Apr-17		670	**3,460**	**6.25**	9.30	2510	**2,950**	**9,140**	1.56	
	MW-73	Apr-14		590	**2,260**	**2.09**	2.54	2160	**3,510**	**9,120**	<0.150	
	MW-73	Apr-15		659	**2,480**	**1.94**	3.12 J	2200	**4,560**	**9,360**	0.757	
	MW-73	Apr-16		597	**2,790**	**1.96**	2.32 J	2240	**5,090**	**9,360**	0.501 J	
	MW-73	Apr-17		571	**2,390**	**2.11**	2.55	2690	**3,940**	**8,880**	0.313	
	MW-74	Apr-15		552	**1,170**	**6.02**	39.4	2230	**4,450**	**9,360**	**176**	
	MW-74	Oct-15		558	**1,810**	**6.19**	39.2	2330	**4,140**	**8,720**	**12.3**	
	MW-74	Apr-16		632	**1,640**	**7.44**	35.6	2080	**3,100**	**8,280**	0.796 J	
	MW-74	Oct-16		566	**1,900**	**8.61**	44.9	3120	**4,880**	**10,200**	**211**	
	MW-74	Apr-17		557	**2,030**	**7.23**	39.9	2690	**4,490**	**9,080**	**55.7**	
	MW-74	Oct-17		576	**2,050**	**7.68**	41.1	2,170	**4,470**	**9,220**	**44.7**	
	MW-75	Apr-15		372	11.8 J	**8.20**	20.3	1490	14.2 J	**4,020**	<0.200	
	MW-75	Oct-15		352	**1,550**	**7.80**	19.3	1560	**2,510**	**5,280**	0.0590 J	
	MW-75	Apr-16		374	**1,530**	**7.62**	21.5	1640	**1,940**	**5,940**	<0.197	
	MW-75	Oct-16		351	**1,400**	**7.88**	17.5	1480	**2,080**	**6,000**	0.0490 JB	
	MW-75	Apr-17		333	**1,550**	**7.16**	17.5	1510	**2,520**	**6,100**	3.35	
	MW-75	Oct-17		358	**1,490**	**7.81**	18.2	1,350	**2,240**	**5,020**	<0.0197	
	MW-76	Apr-15		558	18.1 J	**3.15**	29.7	1120	22.0 J	**4,650**	<0.200	
	MW-76	Oct-15		445	**1,370**	**3.10**	28.0	1070	**2,480**	**4,840**	0.0310 J	
	MW-76	Apr-16		531	**1,180**	**2.96**	29.4	1110	**2,250**	**5,220**	<0.197	
	MW-76	Oct-16		553	**1,200**	**3.26**	28.6	1130	**2,490**	**6,010**	0.0470 JB	
	MW-76	Apr-17		485	**1,380**	**2.54**	25.9	969	**2,850**	**5,750**	<0.197	
	MW-76	Oct-17		479	**1,300**	**3.06**	26.5	993	**2,440**	**4,630**	<0.0197	
	MW-77	Apr-15		609	10.8 J	**4.21**	72.1	1410	37.7 J	**5,350**	<0.200	
	MW-77	Oct-15		557	**433**	**2.42**	82.5	1490	**4,820**	**7,510**	0.211	
	MW-77	Apr-16		589	**378**	**3.03**	82.9	1610	**4,010**	**7,110**	0.406 J	
	MW-77	Oct-16		579	**294**	**3.14**	82.1	1380	**4,000**	**7,850**	0.0470 JB	
	MW-77	Apr-17		534	**393**	**2.43**	67.1	1280	**4,900**	**6,950**	<0.197	
	MW-78	Apr-14		542	215	**10.9**	25.2	524	**2,650**	**5,760**	<0.150	
	MW-78	Apr-15		576	63.2	0.0979 J	18.9	320	19.6 J	**2,560**	4.24	
	MW-78	Apr-16		659	72.5	**9.96**	22.9	540	**2,690**	**5,270**	<0.197	
	MW-78	Apr-17		537	98.0	**9.91**	17.4	366	**2,640**	**4,290**	0.372 J	
	MW-79	Apr-15		649	**1,570**	**5.52**	7.98	1150	**2,930**	**5,660**	1.90 J	
	MW-79	Oct-15		517	**1,440**	**6.43**	7.61	857	**2,440**	**5,210**	0.147	
	MW-79	Apr-16		603	**1,390**	**7.08**	8.43	1140	**2,040**	**5,320**	1.87	
	MW-79	Oct-16		525 V	**1,380**	**7.01**	7.28	869 V	**2,000**	**5,180**	0.0700 JB	
	MW-79	Apr-17		527 V	**1,590**	**7.33**	7.58	987	**2,330**	**5,040**	2.26	
	MW-79	Oct-17		598	**1,700**	**6.17**	6.86	871	**2,320**	**5,190**	0.188	
	MW-80	Apr-14		645	**1,470**	**3.62**	3.84	983	**2,070**	**6,080**	2.73	
	MW-80	Apr-15		693	**1,600**	**3.15**	3.08 J	1210	**2,700**	**5,600**	0.519	
	MW-80	Apr-16		875	**1,970**	**3.30**	4.07 J	1240	**2,270**	**6,340**	0.523 J	
	MW-80	Apr-17		759	**2,530**	**3.59**	3.53	1230	**2,640**	**7,920**	2.63	
	MW-81	Apr-14		111	**1,140**	**8.13**	9.51	255	**2,350**	**6,500**	**79.1**	
	MW-81	Apr-15		583	**1,110**	**6.20**	9.40	1380	**2,800**	**6,260**	**99.5**	
	MW-81	Apr-16		687	**1,120**	**5.93**	12.2	1690	**2,790**	**6,730**	**105**	
	MW-81	Apr-17		560	**1,370**	**7.55**	9.28	1260	**3,050**	**6,880**	**80.5**	
	MW-82	Apr-14		279	**2,880**	**18.2**	9.55	1800	**3,910**	**6,260**	<0.150	
	MW-82	Apr-14	FD	286	**1,510**	**18.0**	9.02	1810	**2,070**	**5,460**	<0.150	
	MW-82	Apr-15		284	**1,110**	**10.7**	9.28	1700	**2,200**	**5,770**	<0.0200	
	MW-82	Apr-16		350	**1,360**	**12.1**	9.87	1790	**2,350**	**5,410**	0.262 J	
	MW-82	Apr-17		347	**1,500**	**11.4**	8.92	1400	**2,380**	**5,630**	0.0820 J	
	MW-83	Apr-15		566	55.5	**3.96**	58.4	364	32.7 J	**4,810**	<0.200	
	MW-83	Oct-15		388	202	**7.32**	34.0	271	**3,210**	**4,530**	0.0860 J	
	MW-83	Apr-16		483	**769**	**4.80**	36.7	563	**3,770**	**4,980**	<0.197	
	MW-83	Oct-16		417	11.0	**6.99**	45.9	139	**3,300**	**4,610**	0.101	
	MW-83	Apr-17		483	45.4	**4.80**	49.4	256	**3,840**	**5,900**	<0.197	
	MW-83	Oct-17		462	**291**	**4.74**	48.2	293	**3,590**	**5,240**	<0.0197	
	MW-84	Apr-15		555	**1,460**	**4.41**	7.41	1480	**4,620**	**4,230**	<0.200	
	MW-84	Oct-15		596	**1,070**	**8.23**	17.0	1580	**7,300**	**12,400**	4.83	
	MW-84	Apr-16		643	**1,410**	**5.54**	10.2	1840	**4,550**	**9,480**	<0.197	
	MW-84	Oct-16		561	**1,230**	**5.96**	12.2	1460	**5,280**	**9,560**	0.0480 J	
	MW-84	Apr-17		573	**1,850**	**5.68**	8.06	1430	**4,690**	**9,360**	<0.197	
	MW-84	Oct-17		589	**1,860**	**5.22**	6.56	1,520	**4,670**	**8,460**	0.0570 J	
	MW-87	Apr-15		740	**4,880**	1.19	27.3	3190	**4,390**	**13,800**	0.241	
	MW-87	Oct-15		737			26.5	3250				
	MW-87	Apr-16		728 V	**4,180**	1.40	27.9 V	3230 V	**4,310**	**12,000**	<0.197	
	MW-87	Oct-16										
	MW-87	Apr-17		648	**4,340**	1.02	24.3	3560	**5,020**	**13,500**	<0.0197	
	MW-87	Oct-17										

Table 4C - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

		Analyte Group:		Water Quality Parameters								Cyanide
		Analyte:		Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
		Units:		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		CGWSL:		---	250	1.60	---	---	600	1,000	10.0	0.200
		CGWSL Source:			WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	USEPA MCL	USEPA MCL
Area	**Well ID**	**Date**	**Dup**									
Evaporation Ponds	MW-88	Apr-15		519	**3,000**	**1.80**	2.66 J	2250	**4,970**	**11,000**	<0.0200	
	MW-88	Oct-15		397			3.03	1270				
	MW-88	Apr-16		417	**1,610**	1.22	3.10 J	1220	**2,600**	**5,800**	<0.197	
	MW-88	Oct-16										
	MW-88	Apr-17		406	**1,710**	1.04	3.00	1100	**2,410**	**6,300**	<0.197	
	MW-88	Oct-17										
	MW-120	Apr-15		677	**2,480**	**2.49**	3.92 J	1620	**3,080**	**7,660**	2.49	
	MW-120	Oct-15		860 J	**3,640**	**2.38**	3.60	1790 J	**3,100**	**9,720**	0.0350 J	
	MW-120	Apr-16		939	**3,690**	**2.56**	4.25 J	1910	**2,510**	**9,100**	<0.197	
	MW-120	Oct-16		919	**3,830**	**2.68**	3.71	1520	**2,410**	**9,080**	0.0470 JJ6	
	MW-120	Apr-17		728	**3,070**	**3.15**	3.11	1600	**2,730**	**8,460**	<0.197	
	MW-120	Oct-17		671	**2,970**	**3.24**	3.33	1,240	**3,580**	**7,120**	<0.0197	
	MW-121	Apr-15		642	**1,370**	**3.69**	2.67	854	**2,740**	**6,040**	2.08	
	MW-121	Oct-15		619	**1,220**	**4.24**	3.38	942	**3,360**	**6,290**	2.96	
	MW-121	Apr-16		718	**1,520**	**4.34**	3.39 J	968	**3,790**	**5,550**	2.13	
	MW-121	Oct-16		588	**1,150**	**5.24**	3.18	834	**3,070**	**5,470**	1.69	
	MW-121	Apr-17		597	**1,210**	**4.69**	2.87	862	**2,840**	**5,100**	1.19	
	MW-121	Oct-17		610	**1,050**	**5.14**	3.19	780	**3,070**	**5,440**	1.39	
	MW-122	Apr-15		658	**2,970**	**3.38**	5.51 J	2660	**4,380**	**10,700**	0.229	
	MW-122	Oct-15		382	**1,580**	**3.29**	4.06	1090	**2,560**	**5,700**	0.0380 J	
	MW-122	Apr-16		549	**1,920**	**3.57**	4.78 J	1350	**3,430**	**6,700**	0.499 J	
	MW-122	Oct-16		491	**1,760**	**3.29**	4.31	1160	**2,270**	**5,730**	0.0280 J	
	MW-122	Apr-17		632	**2,700**	**3.71**	5.19	1770	**3,900**	**9,060**	<0.197	
	MW-122	Oct-17		397	**1,610**	**3.02**	3.93	950	**2,640**	**4,580**	<0.0197	
	MW-123	Apr-15		532	**1,560**	1.16	3.84 J	1120	**2,220**	**5,650**	<0.0200	
	MW-123	Oct-15		527	**1,710**	1.11	3.71	1190	**2,360**	**5,490**	0.270 J	
	MW-123	Apr-16		570	**1,880**	1.09	3.73 J	1320	**2,410**	**5,850**	<0.197	
	MW-123	Oct-16		510	**1,600**	1.20	3.59	1090	**2,420**	**4,990**	0.0470 J	
	MW-123	Apr-17		514 V	**1,730**	1.22	3.72	1240 V	**2,190**	**6,200**	0.0540 JP1	
	MW-123	Oct-17		516	**1,580**	1.08	3.46	1,030	**2,360**	**5,000**	<0.0197	
	MW-124	Apr-15		779	**3,240**	0.922	6.80	1970	**3,610**	**11,400**	0.0265 J	
	MW-124	Oct-15		780	**3,210**	0.915	7.41	1840	**4,120**	**10,100**	0.0310 J	
	MW-124	Apr-16		929	**1,490**	1.20	8.45	2150	**1,720**	**9,800**	0.415 J	
	MW-124	Oct-16		719	**3,270**	1.31	6.37	1670	**3,930**	**9,340**	0.0470 J	
	MW-124	Apr-17		715	**3,110**	0.739	6.44	2140	**3,950**	**9,780**	<0.0197	
	MW-124	Oct-17		781	**3,510**	0.871	6.24	1,830	**4,440**	**8,860**	<0.0197	
	OCD-1R	Apr-15		837	**5,290**	**2.50**	4.95 J	4050	**4,860**	**14,900**	1.29	
	OCD-1R	Oct-15		641	**3,100**	**2.78**	4.86	2660	**3,710**	**9,160**	0.144	
	OCD-1R	Apr-16		641	**2,570**	**2.90**	4.54 J	2220	**3,550**	**8,960**	0.928 J	
	OCD-1R	Oct-16		701	**2,560**	**3.36**	4.76	1800	**3,060**	**8,900**	0.0530 JB	
	OCD-1R	Apr-17		570	**2,490**	**3.60**	4.22	1960	**3,020**	**8,460**	0.213 J	
	OCD-1R	Oct-17		607	**2,280**	**3.08**	4.07	1,570	**3,110**	**7,220**	0.0720 J	
	OCD-2A	Apr-15		788	**2,960**	0.969	5.05	1600	**2,740**	**8,340**	0.264	
	OCD-2A	Oct-15		707			7.05	1490				
	OCD-2A	Apr-16		678	**1,800**	0.705	5.98	1340	**2,750**	**5,870**	0.417 J	
	OCD-2A	Oct-16										
	OCD-2A	Apr-17		655	**1,840**	0.800	5.49	995	**1,860**	**5,850**	<0.197	
	OCD-2A	Oct-17										
	OCD-3	Apr-15		659	**1,610**	1.02	12.6	1060	**2,240**	**6,070**	0.0878 J	
	OCD-3	Oct-15		760			14.1	904				
	OCD-3	Apr-16		746	**1,640**	0.899	14.5	1100	**3,080**	**5,890**	<0.197	
	OCD-3	Oct-16										
	OCD-3	Apr-17		733	**2,030**	0.998	14.4	1120	**2,160**	**6,440**	<0.197	
	OCD-3	Oct-17										
	OCD-4	Apr-15		1010	**5,850**	0.506	36.5	3590	**4,550**	**12,900**	<0.0200	
	OCD-4	Oct-15		833			33.2	2560				
	OCD-4	Apr-16		927	**5,320**	0.608	36.2	3400	**3,610**	**12,700**	0.446 J	
	OCD-4	Oct-16										
	OCD-4	Apr-17		809	**4,110**	0.908	33.7	2330	**2,850**	**11,000**	0.0390 JP1	
	OCD-4	Oct-17										
	OCD-5	Apr-15		901	**4,490**	0.691	39.6	2930	**3,090**	**10,800**	0.0434 J	
	OCD-5	Oct-15		836	**4,700**	0.548	39.6	3130	**3,430**	**12,000**	0.0380 J	
	OCD-5	Apr-16		900	**5,030**	0.774 J3J6	41.2	2960	**3,780**	**9,960**	0.222 J	
	OCD-5	Oct-16		851	**4,700**	0.892	39.0	2830	**3,080**	**12,700**	0.0520 JBJ6	
	OCD-5	Apr-17		829	**4,720**	0.872	40.0	2780	**2,990**	**12,100**	<0.197	
	OCD-5	Oct-17		906	**7,230**	0.669	35.5	2,710	**5,020**	**11,200**	<0.0197	
	OCD-6	Apr-15		779	**4,050**	**1.85**	15.5	2470	**3,320**	**10,300**	0.211	
	OCD-6	Oct-15		756	**4,510**	**2.09**	15.0	3380	**3,400**	**10,700**	0.0280 J	
	OCD-6	Apr-16		866	**4,440**	**2.47**	17.0	2700	**3,410**	**10,600**	1.22	
	OCD-6	Oct-16		790	**4,110**	**2.79**	14.1	2600	**2,850**	**10,200**	0.0920 J	
	OCD-6	Apr-17		834	**4,030**	**2.39**	15.8	2870	**2,570**	**11,000**	1.02	
	OCD-6	Oct-17		855	**4,770**	**2.66**	15.4	2580	**3,190**	**11,600**	<0.0197	
	OCD-7AR	Apr-15		609	**2,110**	**2.91**	5.52	2050	**3,650**	**8,260**	0.260	
	OCD-7AR	Oct-15		635	**2,490**	**2.55**	5.83	2870	**4,500**	**8,960**	0.0250 J	
	OCD-7AR	Apr-16		694	**2,550**	**2.78**	6.27	2580	**4,740**	**8,480**	1.03	
	OCD-7AR	Oct-16		596	**3,020**	**3.50**	5.78	2410	**4,870**	**8,860**	0.0430 J	
	OCD-7AR	Apr-17		600	**2,550**	**2.72**	5.59	2870	**3,970**	**8,960**	0.0420 J	
	OCD-7AR	Oct-17		618	**2,700**	**3.02**	5.71	2,450	**4,190**	**9,920**	<0.0197	
	OCD-7B	Mar-13		552	**867**	1.33	12.2	650	**2,270**	**4,670**	<1.00	
	OCD-7B	Apr-15		641	**910**	0.852	11.9	685	**2,580**	**4,520**	<0.0200	
	OCD-7B	Apr-17		564	**960**	1.05	11.0	629	**2,100**	**4,540**	<0.0197	
	OCD-8A	Apr-15		1190	**6,270**	0.826	10.8	3330	**3,620**	**13,700**	<0.0200	<0.00180
	OCD-8A	Oct-15		946	**5,140**	1.36	11.0	2870	**3,690**	**11,900**	<0.0197	<0.00180
	OCD-8A	Apr-16		762	**3,480**	**1.88**	9.09	2410	**3,630**	**11,000**	<0.197	<0.00180
	OCD-8A	Oct-16		680	**3,270**	**2.39**	9.22	2380	**3,660**	**9,600**	0.0870 J	0.00182 J
	OCD-8A	Apr-17		658	**2,870**	**2.16**	8.50	2510	**3,410**	**8,960**	0.0300 J	<0.00180
	OCD-8A	Oct-17		696	**2,960**	**2.27**	8.54	2030	**4,140**	**9,000**	<0.0197	<0.00180
	OCD-8B	Apr-13		716	**2,180**	0.980	8.75	1330	**2,880**	**7,400**	<1.00	
	OCD-8B	Apr-15		680	**2,020**	0.934	9.51	1520	**2,910**	**7,110**	0.0233 J	
	OCD-8B	Apr-17		660	**2,030**	0.925	9.07	1800	**2,620**	**7,390**	0.0320 J	
Field East of Refinery	KWB-1A	Apr-15		596	**555**	1.17	1.01	202	**3,400**	**5,320**	4.22	<0.00180
	KWB-1A	Oct-15		549	**539**	1.15	1.09	230	**2,800**	**4,580**	0.666 J	<0.00180
	KWB-1A	Apr-16		619	**575**	1.26	1.37 J	271	**3,080**	**4,990**	4.61	<0.00120
	KWB-1A	Oct-16		553	**553**	1.21	1.21	274	**2,950**	**4,600**	0.514 B	<0.00180
	KWB-1A	Apr-17		566	**530**	1.39	1.19	269	**2,940**	**4,930**	1.09	<0.00180
	KWB-1A	Oct-17		514	**387**	1.12	0.966 J	266	**2,990**	**4,520**	0.409	<0.00180
	KWB-1C	Apr-13		474	**380**	1.03	5.68	161	**2,150**	**4,420**	1.75	
	KWB-1C	Apr-15		619	**1,160**	**25.3**	1.23	210	**2,920**	**5,340**	0.180	
	KWB-1C	Apr-17		560	**508**	1.25	1.36	267	**2,860**	**5,000**	0.0350 JP1	
	KWB-7	Apr-15		279	**301**	0.754	0.209 J	238	**886**	**2,100**	<0.200	<0.00180 J
	KWB-7	Oct-15		320	**358**	0.813	0.152 J	252	**1,120**	**2,570**	0.202 J	<0.00180
	KWB-7	Apr-16		325	**281**	0.917	0.236 J	248	**953**	**2,830**	<0.197	0.00500 J
	KWB-7	Oct-16		355	**420**	0.933	0.194 J	281	**1,160**	**3,030**	0.0580 JB	<0.00180
	KWB-7	Apr-17		306	**305**	0.822	0.225 J	230	**1,070**	**2,540**	0.0600 J	<0.00180
	KWB-7	Oct-17		345	**354**	0.599	0.230 J	268	**907**	**3,080**	<0.0197	<0.00180

Table 4C - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

		Analyte Group:		Water Quality Parameters								Cyanide
		Analyte:		Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
		Units:		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		CGWSL:		---	250	1.60	---	---	600	1,000	10.0	0.200
		CGWSL Source:			WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	USEPA MCL	USEPA MCL
Area	**Well ID**	**Date**	**Dup**									
Field East of Refinery	KWB-8	Oct-16		251	**579**	0.467	0.351 J	443	**701**	**3,120**	0.0380 JB	<0.00900
	KWB-8	Apr-17		237	**574**	0.623	0.414 J	320	442	**2,400**	0.0510 J	<0.00180
	KWB-8	Oct-17		273	**913**	0.467	0.411 J	462	417	**3,270**	<0.985	<0.00180
	KWB-10R	Apr-15		132	**800**	**19.7**	0.440 J	141	1.03 J	**1,190**	<0.200	
	KWB-10R	Oct-15		132	192	1.31	0.491 J	136	0.117 J	**1,090**	0.0420 J	
	KWB-10R	Apr-16		149	190	1.42	0.573 J	153	<0.0774	**1,090**	<0.197	
	KWB-10R	Oct-16		148	189	1.28	0.548 J	135	110	**1,160**	0.364 B	
	KWB-10R	Apr-17		134	230	1.57	0.521 J	131	0.475 J	**1,130**	<0.0197	
	KWB-10R	Oct-17		138	186	1.39	0.453 J	123	3.08 J	**1,080**	0.440	
	KWB-11A	Apr-15		568	**1,270**	0.580	0.305 J	370	**2,280**	**4,020**	**15.7**	<0.00180 J
	KWB-11A	Oct-15		674	**1,620**	0.660	0.748 J	406	**1,570**	**5,320**	**49.3**	<0.00180
	KWB-11A	Apr-16		710	**1,600**	0.642	0.797 J	426	**1,570**	**5,840**	**42.4**	0.0230
	KWB-11A	Oct-16		647	**1,460**	0.742	0.719 J	450	**1,590**	**5,940**	**30.9**	<0.00180
	KWB-11A	Apr-17		607	**1,310**	0.487	0.903 J	372	**1,540**	**4,960**	**33.9**	<0.00180
	KWB-11A	Oct-17		406	**788**	0.474	0.566 J	379	**979**	**3,550**	1.95	<0.00180
	KWB-11B	Apr-15		469	**275**	0.318	2.12	93.0	**1,760**	**2,630**	2.80	<0.00180 J
	KWB-11B	Oct-15		410	247	0.467	2.07	80.6	**1,340**	**2,350**	2.17	<0.00180
	KWB-11B	Apr-16		438	218	0.441	2.11 JO1	81.3 V	**1,200**	**2,160**	2.43	<0.00120
	KWB-11B	Oct-16		408	239	0.479	2.00	81.0	**1,290**	**2,410**	2.17	<0.00180
	KWB-11B	Apr-17		479	**291**	0.369	2.37	89.5	**1,660**	**2,710**	3.48	<0.00180
	KWB-11B	Oct-17		476	230	0.280	2.13	87.5	**1,300**	**2,590**	3.54	<0.00180
	KWB-12A	Apr-15		528	**668**	**18.5**	0.723 J	128	**2,380**	**3,660**	4.31	<0.00180
	KWB-12A	Apr-15	FD	493	133	0.605	0.630 J	123	**2,110**	**3,630**	4.34	<0.00180
	KWB-12A	Oct-15		560	138	0.618	0.963 J	155	**2,730**	**3,490**	4.55	<0.00180
	KWB-12A	Apr-16		579	**539**	0.879	0.811 J	155	**2,360**	**3,670**	6.18	<0.00180
	KWB-12A	Oct-16		549	163	0.757	1.15	161	**2,400**	**3,930**	7.34	<0.00180
	KWB-12A	Apr-17		541	136	0.446	0.786 J	131	**2,280**	**4,260**	7.12	<0.00180
	KWB-12A	Oct-17		511	133	0.512	0.999 J	127	**2,230**	**3,640**	8.21	<0.00180
	KWB-12B	Apr-15		549	**689**	**20.2**	0.523 J	130	**2,520**	**3,730**	3.80	<0.00180
	KWB-12B	Oct-15		537	124	0.398	0.537 J	131	**2,580**	**3,320**	4.77	<0.00180
	KWB-12B	Oct-15	FD	538	123	0.430	0.569 J	127	**2,450**	**3,270**	4.82	<0.00180
	KWB-12B	Apr-16		528	121	0.438	0.466 J	132	**2,520**	**3,600**	6.42	<0.00120
	KWB-12B	Apr-16	FD	500	108	0.459	0.445 J	123	**1,930**	**3,930**	4.30	<0.00120
	KWB-12B	Oct-16		497	129	0.500	0.565 J	128	**2,210**	**3,620**	5.44	<0.00180
	KWB-12B	Oct-16	FD	505	116	0.474	0.584 J	129	**2,190**	**3,740**	5.56	<0.00180
	KWB-12B	Apr-17		554	144	0.419	0.641 J	135	**2,410**	**3,880**	6.87	<0.00180
	KWB-12B	Apr-17	FD	556	146	0.310	0.720 J	149	**2,980**	**3,520**	7.57	<0.00180
	KWB-12B	Oct-17		542	136	0.353	0.603 J	139	**2,370**	**3,730**	7.26	<0.00180
	KWB-12B	Oct-17	FD	526	115	0.332	0.584 J	134	**2,310**	**3,910**	6.71	<0.00180
	KWB-P4	Apr-13										
	KWB-P4	Apr-15										
	KWB-P4	Apr-17										
	MW-57	Apr-15		641	**1,430**	**22.3**	1.57	460	**2,890**	**6,010**	**16.2**	
	MW-57	Oct-15		487	**541**	**1.69**	1.16	342	**2,050**	**3,330**	**12.9**	
	MW-57	Apr-16		593	**386**	**2.02**	1.59 J	368	**2,350**	**3,660**	**11.0**	
	MW-57	Oct-16		538	210	**2.99**	2.00	387	**2,710**	**4,730**	**33.3**	
	MW-57	Apr-17		538	**336**	**2.38**	1.62	342	**2,630**	**4,530**	**13.8**	
	MW-57	Oct-17		570	179	**2.39**	1.81	402	**3,110**	**5,100**	**33.3**	
	MW-58	Apr-15		200	149	1.15	0.317 J	58.8	9.63	**1,150**	<0.200	<0.00180
	MW-58	Oct-15		234	239	1.35	0.459 J	71.5	4.80 J	**1,240**	<0.197	<0.00180
	MW-58	Apr-16		262	**278** J	1.24	0.421 J	123	134	**1,510**	0.518 J	<0.00120
	MW-58	Oct-16		210	174	1.57	0.392 J	94.2	3.77 J	**1,140**	0.0620 JB	<0.00180
	MW-58	Apr-17		229	**280**	1.40	0.370 J	123	106	**1,550**	0.0380 J	<0.00180
	MW-58	Oct-17		235	249	1.26	0.553 J	116	13.1	**1,340**	<0.0197	<0.00180
	MW-111	Apr-15		270	**427**	1.01	0.521 J	172	294	**1,600**	<0.0200	
	MW-111	Oct-15		227	**408**	1.51	0.415 J	222	473 J	**1,530**	0.0220 J	
	MW-111	Apr-16		248	**402**	1.33	<0.185	229	355	**2,130**	0.0640 J	
	MW-111	Oct-16		224	**426**	1.39	0.222 JB	192	390	**1,820**	0.0880 JB	
	MW-111	Apr-17		232	**456** J3	1.28	0.203 J	211	366 P1	**2,250**	0.266 J	
	MW-111	Oct-17		217	**392**	1.31	0.102 J	234	317	**1,880**	<0.0197	
	MW-113	Apr-15		285	194	0.606	0.526 J	151	**957**	**2,030**	<0.0200	
	MW-113	Apr-15	FD	259	191	0.607	0.622 J	132	**877**	**1,980**	<0.0200	
	MW-113	Oct-15		287	197	0.503	0.528 J	153	**1,000**	**2,020**	0.243 J	
	MW-113	Oct-15	FD	288	197	0.493	0.529 J	156	**998**	**2,140**	<0.197	
	MW-113	Apr-16		314	199	0.294 J3	0.611 J	154	**1,090**	**2,370**	0.393 J	
	MW-113	Apr-16	FD	327	207	0.389	0.612 J	167	**1,080**	**2,400**	0.0480 J	
	MW-113	Oct-16		298 V	182	0.488	0.429 J	156	**925**	**2,150**	0.0470 JB	
	MW-113	Oct-16	FD	299	195	0.594	0.408 J	160	**945**	**2,240**	0.0510 JB	
	MW-113	Apr-17		304	193	0.459	0.525 J	158	**1,070**	**2,140**	<0.197	
	MW-113	Apr-17	FD	296	208	0.525	0.514 J	151	**940**	**2,420**	<0.197	
	MW-113	Oct-17		294	148	0.331	0.405 J	150	**848**	**2,430**	0.442	
	MW-113	Oct-17	FD	301	184	0.510	0.414 J	151	**1,040**	**2,240**	<0.0197	
	MW-125	Apr-15		523 J	**329**	1.17	1.21	217	**2,680**	**4,700**	0.295	
	MW-125	Oct-15		524	**316**	1.22	1.31	224	**2,750**	**4,200**	0.348 J	
	MW-125	Apr-16		577	**342**	1.18	1.39 J	245	**2,900**	**4,440**	0.537 J	
	MW-125	Oct-16		530	**294**	1.25	1.33	220	**2,660**	**4,370**	0.247 B	
	MW-125	Apr-17		495	**310**	1.33	1.27	218	**2,810**	**4,600**	0.751 J	
	MW-125	Oct-17		573	**313**	1.39	1.78	236	**3,000**	**5,200**	0.216	
	MW-126A	Apr-15		355	**898**	0.833	0.602 J	189	**1,530**	**2,900**	<0.200	
	MW-126A	Oct-15		281	200	1.03	0.511 J	178	**1,300**	**2,500**	<0.197	
	MW-126A	Apr-16		342	245	1.02	0.465 J	124	**1,270**	**2,360**	0.258 J	
	MW-126A	Oct-16		192	78.9	1.28	0.379 J	132	**875**	**1,860**	0.139 B	
	MW-126A	Apr-17		369	**271**	0.804	0.584 J	193	**1,780**	**2,850**	0.509 J	
	MW-126A	Oct-17		294	150	0.957	0.418 J	146	**1,300**	**2,410**	<0.0197	
	MW-126B	Apr-15		548	**319**	0.658	2.10 J	196	**2,550**	**3,660**	0.684 J	
	MW-126B	Oct-15		531	**295**	0.850	2.18	201	**2,330**	**4,060**	0.438 J	
	MW-126B	Apr-16		574	**314**	0.837	2.54 J	214	**2,700**	**3,590**	0.737 JB	
	MW-126B	Oct-16		542	**286**	0.862	2.19	220	**2,210**	**3,650**	0.295 B	
	MW-126B	Apr-17		524	**308**	0.649	2.27	206	**2,550**	**3,890**	0.342 J	
	MW-126B	Oct-17		524	**290**	0.729	2.17	197	**2,410**	**3,740**	0.419	
	MW-127	Apr-15		238	209	0.902	0.579 J	147	511	**1,750**	<0.200	
	MW-127	Oct-15		234	243	1.06	0.256 J	143	**642**	**1,900**	<0.197	
	MW-127	Apr-16		244	245	1.10	0.335 J	153	552	**1,910**	<0.197	
	MW-127	Oct-16		248	237	1.14	0.282 J	146	**713**	**3,840**	0.0490 JB	
	MW-127	Apr-17		242	**251**	0.949	0.264 J	146	**799**	**2,140**	<0.197	
	MW-127	Oct-17		262	231	0.993	1.46	142	**776**	**1,970**	0.146	
	MW-128	Apr-15		214 J	**307**	1.22	0.414 J	104	290	**1,490**	<0.0200	
	MW-128	Oct-15		202	**282**	1.22	0.341 J	105	280	**1,560**	<0.197	
	MW-128	Apr-16		1010	**266**	1.22	1.92 J	560	286	**1,580**	1.28	
	MW-128	Oct-16		203	249	1.28	0.586 J	108	280	**1,470**	0.0460 JB	
	MW-128	Apr-17		182	**264**	1.27	0.536 J	106	273	**1,580**	0.0340 J	
	MW-128	Oct-17		186	200	1.29	0.354 J	107	248	**1,370**	<0.0197	

Table 4C - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Water Quality Parameters								Cyanide
				Analyte:	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	250	1.60	---	---	600	1,000	10.0	0.200
				CGWSL Source:		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	USEPA MCL	USEPA MCL
Area	**Well ID**	**Date**	**Dup**										
Field East of Refinery	MW-129	Apr-15		192	**302**	0.900	0.530 J	195	69.4	**1,330**	<0.200	
	MW-129	Oct-15		169	**313**	1.08	0.315 J	194	57.8	**1,280**	<0.197	
	MW-129	Apr-16		170	**300**	1.10	0.331 J	210	44.1	**1,520**	<0.197	
	MW-129	Oct-16		162	**293**	1.13	0.270 J	198	44.1	**1,340**	0.0770 JB	
	MW-129	Apr-17		163	**300**	1.02	0.334 J	199	44.1	**1,250**	<0.197 J5	
	MW-130	Apr-15		81.8 J	**259**	0.952	6.71	125	**1,080**	**3,710**	0.471	
	MW-130	Oct-15		261	237	0.829	0.688 J	293	**1,200**	**2,380**	0.495 J	
	MW-130	Apr-16		281	**293**	0.907	0.870 J	324	**1,030**	**2,570**	3.82 J6	
	MW-130	Oct-16		260	**253**	0.914	0.695 J	285	**1,110**	**2,600**	0.631	
	MW-130	Apr-17		263 V	**266**	0.778	0.676 J	290 V	**1,020**	**2,510**	3.26	
	MW-130	Oct-17		252	218	0.533	0.625 J	281	**880**	**2,520**	2.75	
	MW-131	Apr-15		168	**271**	0.683	0.328 J	157	9.57	**1,980**	<0.0200	
	MW-131	Oct-15		197	**295**	0.787	0.622 J	161	16.1	**1,180**	0.0380 J	
	MW-131	Apr-16		158	**288**	0.774	0.238 J	167	9.49	**1,250**	<0.197	
	MW-131	Oct-16		158	**291**	0.868	0.250 J	158	9.61	**1,270**	0.0530 JB	
	MW-131	Apr-17		151	**285**	0.773	0.275 J	153	10.3	**1,230**	<0.197	
	MW-131	Oct-17		149	**284**	0.807	0.200 J	149	15.5	**1,290**	<0.0197	
	MW-133	Nov-14		200	170	1.10	0.460 J	140 V	140	**1,300**	<0.0200	
	MW-133	Apr-15		163	174	1.19	0.323 J	122	116	**1,190**	<0.200	
	MW-134	Apr-15		840	**767**	1.24	2.21 J	454	**3,470**	**5,520**	8.15	
	MW-134	Apr-15	FD	710	**752**	1.35	1.46	307	**3,380**	**6,400**	8.04	
	MW-134	Oct-15		532	**521**	1.31	1.60	302	**2,980**	**5,040**	3.33	
	MW-134	Oct-15	FD	529	**516**	1.32	1.58	301	**3,030**	**4,690**	2.98	
	MW-134	Apr-16		576 V	**498**	1.24	1.70 J	311 V	**2,800**	**4,560**	2.79	
	MW-134	Apr-16	FD	565	**497**	1.24	1.69 J	303	**2,780**	**4,910**	2.73	
	MW-134	Oct-16		518	**460**	1.23	1.60	288	**2,980**	**5,020**	2.10	
	MW-134	Oct-16	FD	512	**473**	1.18	1.58	286	**2,910**	**4,860**	2.28	
	MW-134	Apr-17		528	**499**	0.944	1.56	247	**2,880**	**4,140**	3.37	
	MW-134	Apr-17	FD	527	**470**	0.902	1.61	269	**3,170**	**4,120**	4.03	
	MW-134	Oct-17		502	**373**	0.730	1.50	246	**2,620**	**4,480**	3.80	
	MW-134	Oct-17	FD	525	**425**	1.02	1.58	249	**2,700**	**4,960**	3.59	
	MW-135	Apr-15		848	**1,100**	0.764	1.42 J	552	**2,170**	**5,040**	**67.8**	
	MW-135	Oct-15		677	**1,380**	1.17	1.32	544	**2,460**	**5,800**	**76.9**	
	MW-135	Apr-16		2780	**1,010**	0.993	5.74	2640	**2,470**	**5,320**	**34.7**	
	MW-135	Oct-16		590	**1,310**	1.18	0.993 J	624	**2,500**	**5,980**	**58.9**	
	MW-135	Apr-17		608	**1,200**	1.23	0.979 J	626	**2,900**	**5,050**	**63.3**	
	MW-135	Oct-17		569	**1,100**	0.644	0.923 J	633	**2,810**	**5,650**	**54.5**	
	RA-4196	Apr-15		391	144	0.410	2.07	93.4	**1,400**	**2,170**	<0.0200	
	RA-4196	Oct-15		417	145	0.324	2.26	104	**1,470**	**2,290**	0.269 J	
	RA-4196	Apr-16		422	122	0.344	2.36 J	103	**1,150**	**2,800**	0.0700 J	
	RA-4196	Oct-16		382	151	0.299	2.11	103	**1,310**	**2,410**	0.0490 JBJ6	
	RA-4196	Apr-17		378	142	0.309	2.19	91.1	**1,250**	**2,220**	<0.197	
	RA-4196	Oct-17		376	109	0.242	2.10	99.4	**1,100**	**2,360**	<0.0197	
	RA-4798	Apr-15		465	183	0.415	2.21	128	**1,740**	**2,740**	0.936	
	RA-4798	Oct-15		396	142	0.335	2.12	105	**1,520**	**2,230**	1.53	
	RA-4798	Apr-16		449	142	0.347	2.40 J	117	**1,290**	**2,290**	1.28	
	RA-4798	Oct-16		437	174	0.359	2.27	129	**1,560**	**2,880**	0.930	
	RA-4798	Apr-17		305	95.1	0.359	2.03	64.6	**1,010**	**1,820**	1.55	
	RA-4798	Oct-17		378	127	0.215	2.06	99.5	**1,300**	**2,220**	1.82	
	RW-12R	Apr-16		448	174	0.334	0.437 J	181	**1,610**	**3,130**	0.326 J	
	RW-12R	Apr-17		392	189	0.623	0.293 J	152	**1,740**	**2,420** J3	<0.197	
	RW-13R	Apr-16		202	222	0.691	0.346 J	167	341	**1,190**	0.0460 J	
	RW-18	Apr-14		545	**347**	**1.78**	0.984	218	**2,860**	**5,600**	3.33	
	RW-18	Apr-15		482	232	**2.46**	1.30	230	**3,670**	**4,440**	6.55	
	RW-18	Apr-16		542	193	**2.85**	1.13 J	186	**3,800**	**4,640**	2.79	<0.00120
	RW-18	Apr-17		504	176	**2.51**	1.09	141	**2,870**	**4,400**	1.90	
	RW-20	Apr-15		228	**256**	0.530	<0.180	228	125	**1,430**	<0.200	
	RW-22	Apr-15		184	**402**	0.860	0.319 J	274	78.4	**1,680**	<0.200	
North Refinery	MW-23	Apr-15		222	**864**	**1.63**	0.562 J	577	509	**3,030**	0.0259 J	
	MW-23	Oct-15		114	**480**	**1.72**	1.92	463	29.9	**2,190**	2.70 J	
	MW-23	Apr-16		110	**500**	**1.81**	2.14 J	561	1.84 J	**1,990**	<0.197	
	MW-23	Oct-16		259	**445**	1.58	2.16	430	0.536 J	**2,140**	<0.197	
	MW-23	Apr-17		102	**517**	**1.74**	1.59	446	5.27	**2,040**	<0.197	
	MW-23	Oct-17		106	**438**	**1.64**	1.70	460	6.35	**1,800**	<0.197	
	MW-29	Apr-15		427	**283**	0.795	1.52	207	**2,100**	1,000	<0.0200	
	MW-29	Oct-15		397	115	0.722	0.823 J	167	**2,080**	**3,330**	<0.197	
	MW-29	Apr-16		465	134	1.04	1.29 J	210	**2,620**	**3,830**	0.105 J6	
	MW-29	Oct-16		398	**282**	0.919	0.964 J	227	**1,660**	**3,210**	0.502 J	
	MW-29	Apr-17		412 V	**268**	0.642	0.745 J	178 V	**1,790**	**3,670**	<0.197	
	MW-29	Oct-17		407	**278**	0.949	1.14	261	**1,600**	**3,370**	<0.0985	
	MW-39	Apr-15		509	190	**3.09**	3.62 J	179	**1,380**	**2,640**	<0.200	
	MW-39	Oct-15		432	152	**2.48**	3.14	133	**1,660**	**2,960**	0.300 J	
	MW-39	Apr-16		113	**305**	**2.68**	0.459 J	1290	**951**	**4,010**	0.530 J	
	MW-39	Oct-16		189	**334**	**2.35**	0.546 J	1510	**2,360**	**5,950**	<0.197	
	MW-39	Apr-17		84.0	**271**	**2.60**	0.347 J	1260	**957**	**3,890**	<0.197	
	MW-39	Oct-17		73.3	148	**3.06**	0.303 J	989	**953**	**3,040**	<0.0197	
	MW-40	Apr-14		386	179	1.28	1.56	124	**1,340**	**2,700**	<0.150	
	MW-40	Apr-15		571	**298**	**1.66**	1.89 J	134	**1,380**	**2,640**	<0.200	
	MW-40	Apr-16		504	146	**1.70**	1.76 J	127	**1,680**	**2,670**	<0.197	
	MW-40	Apr-17		474	156	**1.76**	1.62	110	**1,550**	**3,190**	<0.197	
	MW-41	Apr-14		242	**275**	0.747	0.444	387	**1,450**	**3,760**	<0.150	
	MW-41	Apr-15		313	**290**	1.07	0.648 J	501	**1,410**	**2,710**	<0.0200	
	MW-41	Apr-16		258	**312**	1.04	0.393 J	453	**1,180**	**2,530**	<0.197	
	MW-41	Apr-17		224	**328**	0.936	0.415 J	379	**1,200**	**2,890**	<0.197	
	MW-42	Apr-14		248	**914**	0.545	0.560	508	**954**	**3,440**	<0.150	
	MW-42	Apr-15		309	**562**	0.962	0.579 J	611	**1,110**	**3,440**	<0.0200	
	MW-42	Apr-16		295	**457**	0.867	0.617 J	601	**1,090**	**3,010**	<0.197	
	MW-42	Apr-17		222	**406**	0.831	0.421 J	462	**1,100**	**3,410**	0.416 JP1	
	MW-43	Apr-15		186	**726**	0.709	<0.180	511	122	**2,290**	<0.0200	<0.00180
	MW-43	Oct-15		241	**984**	**2.19**	1.26	658	**677**	**4,160**	<0.197 J	0.0810
	MW-43	Apr-16		178	**1,010**	**2.27**	0.956 J	812	**747**	**4,820**	0.270 J	<0.00120
	MW-43	Oct-16		212	**855**	**2.00**	1.23	664	**619**	**4,470**	<0.197	<0.0180
	MW-43	Apr-17		180	**687**	**2.10**	0.905 J	559	450 J	**3,530**	<0.197	0.0802
	MW-43	Oct-17		184	**756**	**2.17**	1.01	585	472	**3,200**	<0.394	<0.00180
	MW-59	Apr-14		514	176	0.475	0.643	156	**1,890**	**3,420**	<0.150	
	MW-59	Apr-15		489 J	178	1.23	0.489 J	139	**1,760**	**3,300**	0.0241 J	
	MW-59	Apr-16		2370	126	1.28	2.61 J	711	**1,790**	**3,300**	0.374 J	
	MW-59	Apr-17		467	184	1.13	0.519 J	134	**1,870**	**3,160**	<0.197	
	MW-60	Apr-15		411 J	198	0.968	0.558 J	190	**1,810**	**3,530**	<0.200	<0.00180
	MW-60	Apr-15	FD	403 J	241	1.07	0.541 J	186	**1,910**	**3,710**	<0.200	<0.00180
	MW-60	Oct-15		395	209	0.964	0.565 J	185	**1,910**	**3,560**	<0.197	<0.00180
	MW-60	Oct-15	FD	416	210	0.996	0.569 J	191 J	**1,990**	**3,660**	0.276 J	<0.00180
	MW-60	Apr-16		446	212	0.568	0.624 J	227	**2,090**	**3,980**	0.0410 J	<0.00120
	MW-60	Apr-16	FD	447	190	1.00	0.588 J	226	**2,140**	**3,200**	0.0650 JJ6	<0.00120

Table 4C - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

		Analyte Group:		Water Quality Parameters								Cyanide
		Analyte:		Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
		Units:		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		CGWSL:		---	250	1.60	---	---	600	1,000	10.0	0.200
		CGWSL Source:			WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	USEPA MCL	USEPA MCL
Area	**Well ID**	**Date**	**Dup**									
North Refinery	MW-60	Oct-16		408	163	1.04	0.540 J	151	**2,020**	**3,610**	0.0710 JB	<0.00180
	MW-60	Oct-16	FD	410	162	1.05	0.509 J	149	**2,050**	**3,280**	0.0660 JBJ6	<0.00180
	MW-60	Apr-17		410	201	0.835	0.606 J	196	**2,060**	**3,470**	<0.197	<0.0900
	MW-60	Apr-17	FD	409	206	0.960	0.597 J	198	**1,850**	**3,650**	<0.197	<0.0900
	MW-60	Oct-17		422	222	1.07	0.717 J	233	**2,040**	**3,720**	<0.394	<0.00180
	MW-60	Oct-17	FD	412	212	0.885	0.707 J	230	**2,000**	**3,990**	<0.197	0.00553
	MW-61	Apr-15		457	**287**	1.30	1.10 J	349	**1,280**	**2,910**	<0.200	
	MW-61	Oct-15		375	179	**2.61**	2.28	286	**2,080**	**2,520**	<0.197	
	MW-61	Apr-16		439	240	**2.65**	2.82 J	278	**2,120**	**2,680**	0.552 J	
	MW-61	Oct-16		409	115	**3.14**	3.89	226	**1,400**	**2,430**	<0.197	
	MW-61	Apr-17		322	225	**2.08**	1.85	248	**1,100**	**2,600**	<0.197	
	MW-61	Oct-17		330	**303**	**1.93**	2.61	291	**933**	**3,110**	<0.394	
	MW-62	Apr-15		126	**485**	1.52	1.72	478	21.0	**1,930**	<0.0200	
	MW-62	Oct-15		425	**273**	**1.93**	1.31	399	**1,900**	**4,050**	<0.197	
	MW-62	Apr-16		481	**276**	**1.92**	1.42 J	456	**1,850**	**3,830**	0.322 J	
	MW-62	Oct-16		371	243	**1.79**	1.15	359	**1,390**	**3,460**	<0.197	
	MW-62	Apr-17		358	**275**	**1.78**	1.20	358	**1,180**	**3,210**	<0.197	
	MW-62	Oct-17		341	**265**	**2.23**	1.92	349	**1,030**	**2,480**	<0.394	
	MW-67	Apr-15		194	208	0.698	0.531 J	160	329	**1,510**	<0.200	<0.00180
	MW-67	Oct-15		192	225	0.589	0.533 J	177	311	**1,450**	<0.197	<0.00180
	MW-67	Apr-16		202	**312**	0.548	0.427 J	218	281	**1,790**	<0.197	0.0440 J
	MW-67	Oct-16		205	**310**	0.620	0.574 J	211	303	**1,880**	<0.0197 J6	<0.0180
	MW-67	Apr-17		199	**393**	0.570	0.565 J	229	275	**2,010**	<0.197	<0.0900
	MW-67	Oct-17		207	**305**	0.568	0.500 J	200	388	**1,740**	<0.0985	<0.00180
	MW-90	Apr-15		302	104	**2.73**	1.63	286	**2,230**	**3,800**	<0.200	
	MW-90	Oct-15		481	22.7	**6.77**	2.07	135	**4,530**	**5,130**	3.44	
	MW-90	Apr-16		411	85.9	**6.25**	1.69 J	246	**3,250**	**5,180**	0.377 J	
	MW-90	Oct-16		534	74.7	**8.22**	1.84	142	**3,610**	**5,730**	**14.7**	
	MW-90	Apr-17		363	161	**3.41**	1.61	189	**2,740**	**3,880**	<0.197	
	MW-90	Oct-17		322	116	**2.74**	1.34	182	**1,930**	**3,340**	<0.0985	
	MW-91	Apr-15		355	32.8	1.40	0.523 J	30.8	**643**	**1,980**	<0.200	
	MW-91	Oct-15		361	35.7	1.34	0.686 J	35.0	**854**	**2,280**	<1.97	
	MW-91	Apr-16		379	37.1	1.37	0.464 J	36.6	**776**	**2,270**	0.320 J	
	MW-91	Oct-16		366	37.4	1.45	0.525 J	35.1	**862**	**2,260**	<0.0197	
	MW-91	Apr-17		362	74.8	1.18	0.463 J	33.8	**790**	**2,120**	<0.197	
	MW-91	Oct-17		389	115	0.897	0.620 J	39.2	**944**	**2,520**	<0.394	
	MW-92	Apr-16		130 O1	**415**	1.30	1.73 J	450 O1V	24.1	**2,310**	0.602 J	
	MW-92	Oct-16		134	**539**	**1.63**	2.02	454	14.6	**2,150**	<0.985	
	MW-93	Apr-15		579	221	**2.23**	2.58 J	126	**2,050**	**3,080**	<0.0200	
	MW-93	Oct-15		516	**251**	**2.37**	5.23	133	**3,070**	**3,080**	2.92 J	
	MW-93	Apr-16		677	206	**3.06**	1.76 J	164	**2,130**	**3,270**	<0.197	
	MW-93	Oct-16		553 V	200	**2.78**	3.45 O1	167 V	**1,630**	**3,260**	<0.197	
	MW-93	Apr-17		489	192	**2.38**	2.97	167	**1,430**	**2,930**	<0.197	
	MW-94	Oct-15		109	245	1.01	0.224 J	355	75.8	**2,530**	<0.197	
	MW-94	Apr-16		124	217	1.02	0.189 J	532	199	**2,980**	<0.197	
	MW-94	Oct-16		137	172	1.04	0.467 J	319	175	**2,530**	<0.0197	
	MW-94	Apr-17		95.6	196	0.874	0.331 J	427	85.7	**2,660**	<0.197	
	MW-95	Apr-14		177	226	0.560	0.494	143	160	**1,440**	<0.150	
	MW-95	Apr-15		178	**275**	1.02	0.655 J	177	359	**1,680**	<0.200	
	MW-95	Apr-16		191	**280**	0.805	0.518 J	180	326	**1,670**	<0.197	
	MW-95	Apr-17		203 V	**349**	0.868	0.730 J	194 V	420	**1,710**	<0.197	
	MW-96	Apr-15		208	**884**	1.19	1.03	224	**1,730**	**1,680**	0.211 J	
	MW-96	Oct-15		230	190	1.23	1.21	244	583	**1,990**	0.202 J	
	MW-96	Apr-16		187	159	1.18	1.10 J	234	255	**1,590**	0.313 J	
	MW-96	Oct-16		210	169	1.19	1.03	225	456	**1,990**	0.0230 J	
	MW-96	Apr-17		179	191	1.08	1.10	208	298	**1,600**	<0.197	
	MW-96	Oct-17		173	159	0.785	0.907 J	199	535	**1,680**	<0.0985	
	MW-98	Apr-15		497	41.6	1.29	<0.180	91.5	**2,010**	**3,040**	<0.0200	
	MW-98	Oct-15		427	55.7	1.53	0.134 J	74.9	**1,790**	**3,340**	<0.197	
	MW-98	Apr-16		539	74.2	1.43	<0.185	89.6	**1,690**	**3,040**	<0.197	
	MW-98	Oct-16		450	88.0	1.52	0.241 J	72.7	**1,610**	**3,370**	<0.197	
	MW-98	Apr-17		516	93.5	**1.68**	0.180 J	79.2	**1,850**	**3,200**	<0.197	
	MW-98	Oct-17		541	105	1.30	0.176 J	87.1	**1,890**	**3,520**	<0.394	
	MW-137	Oct-15		142	**390**	**1.97**	1.90	1320	**1,090**	**3,880**	<0.197	0.144
	MW-137	Apr-16		178	**343**	**1.87**	2.43 J	1740	**2,160**	**3,950**	<0.197	**0.348** J
	MW-137	Oct-16		142	**445**	1.32	1.23	960	**1,040**	**3,550**	<0.197	<0.0450
	MW-137	Apr-17		139	**478**	1.54	1.53	1120	**1,050**	**4,230**	<0.197	0.116
	MW-137	Oct-17		141	**548**	1.11	0.979 J	759	**683**	**2,910**	<0.394	<0.00180
	MW-138	Oct-15		139	**490**	1.08	1.75	410	154	**1,920**	<0.197	<0.00180
	MW-138	Apr-16		160	**571**	1.13	2.03 J	568	164	**2,180**	<0.197	0.0290 J
	MW-138	Oct-16		138	**527**	0.927	1.84	426	122	**2,380**	<0.197	<0.0450
	MW-138	Apr-17		121	**571**	1.14	1.81	424	72.3	**1,930**	<0.197	<0.00180
	MW-138	Oct-17		124	**453**	1.06	1.50	401	27.9	**2,100**	<0.0985	<0.00180
	RW-1	Apr-15		358	224	1.33	3.57	210	**1,330**	**2,410**	<0.200	
	RW-1R	Apr-16		505	180	1.38	6.39	203	**1,500**	**2,990**	0.422 J	
	RW-1R	Apr-17		558	246	1.41	7.37	268	**1,860**	**3,690**	<0.197	
	RW-2	Apr-15		726	**365**	**1.75**	5.55 J	383	**3,510**	**5,310**	<0.200	
	RW-2R	Apr-16		875	**430**	**2.09**	5.80	396	**2,200**	**3,810**	0.281 J	
	RW-2R	Apr-17		519	**251**	**2.35**	2.86	261	**1,200**	**3,030**	<0.197	
	RW-7	Apr-15		252	237	1.15	1.88 J	192	19.0	**1,500**	<0.200	
	RW-7R	Apr-16		262	186	0.651	0.651 J	110	**624**	878	<0.197	
	RW-7R	Apr-17		266	204	0.513	0.922 J	105	**693**	**1,740**	<0.197	
	RW-8	Apr-15		227	115	0.801	0.353 J	209	473	**1,600**	<0.200	
	RW-8	Apr-17		218	163	0.731	0.360 J	161	**665**	**1,820**	<0.197	
	RW-9	Apr-14		291	**318**	1.10	1.57	306	**1,260**	**3,380**	<0.150	
	RW-9	Apr-15		315	**313**	**1.68**	1.69	318	**1,310**	**3,150**	<0.200	
	RW-9	Apr-16		336	**313**	**1.69**	1.96 J	356	**1,440**	**3,370**	1.73	
	RW-9	Apr-17		355	**369**	**1.90**	2.26	326	**1,370**	**3,370**	<0.197	
	RW-10	Apr-14		324	231	**2.17**	5.84	227	**2,060**	**3,420**	<0.150	
	RW-10	Apr-15		494	187	**3.34**	9.04	172	**2,010**	**3,290**	0.639	
	RW-10	Apr-16		638	159	**4.28**	13.2	176	**2,040**	**3,330**	1.21	
	RW-10	Apr-17		457	88.0	**3.53**	3.24	110	**1,500**	**2,660**	<0.197	
	RW-16	Apr-14		531	**452**	**3.74**	0.799	430	**2,680**	**5,130**	<0.150	
	RW-16	Apr-14	FD	556	**429**	**3.89**	0.767	455	**2,550**	**5,150**	<0.150	
	RW-16	Apr-15		641	**534**	**4.61**	1.69 J	594	**3,220**	**5,430**	2.87	
	RW-16	Apr-16		604	**416**	**3.01**	1.15 J	502	**3,360**	**5,610**	2.45	
	RW-16	Apr-17		499	**291**	**4.90**	0.832 J	372	**2,740**	**5,030**	2.20	
	RW-17	Apr-14		585	**524**	**1.84**	3.88	405	**3,280**	**6,100**	<0.150	
	RW-17	Apr-15		683	**494**	**2.58**	9.10	631	**4,180**	**5,840**	**31.6**	
	RW-17	Apr-16		2840	**377**	**2.22**	28.7	1800	**3,400**	**5,880**	4.77	
	RW-17	Apr-17		568	**398**	**2.61**	4.02	306	**2,950**	**4,820**	3.33	

Table 4C - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Water Quality Parameters								Cyanide
				Analyte:	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	250	1.60	---	---	600	1,000	10.0	0.200
				CGWSL Source:		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	USEPA MCL	USEPA MCL
Area	**Well ID**	**Date**	**Dup**										
North RO Reject Field	MW-117	Apr-15		613	87.2	**3.79**	5.97		102	**2,220**	**3,670**	0.372 J	
	MW-117	Oct-15		478	55.4	**3.40**	6.44		109	**1,690**	**2,980**	0.779 J	
	MW-117	Apr-16		554	94.4	**3.45**	5.82		112	**2,060**	**3,390**	0.349	
	MW-117	Oct-16		592	**272**	**3.57**	6.90		115	**2,240**	**3,590**	0.137 BJ6	
	MW-117	Apr-17		548	245	**3.33**	6.50		96.7	**2,090**	**3,640**	0.266 J	
	MW-117	Oct-17		559	216	**2.05**	5.82		105	<0.0774	**3,450**	0.196	
	MW-118	Apr-15		601	**767**	**4.14**	5.30		153	**2,510**	**3,960**	1.7	
	MW-118	Oct-15		583	86.6	**5.13**	5.64		162	**2,690**	**3,960**	0.622 J	
	MW-118	Apr-16		573	189	**5.86**	4.80	J	152	**2,480**	**3,950**	1.57	
	MW-118	Oct-16		559	131	**6.47**	5.92		164	**2,640**	**4,450**	6.71	
	MW-118	Apr-17		544	175	**5.98**	5.06		139	**2,630**	**3,830**	8.51	
	MW-118	Oct-17		550	192	**4.20**	5.72		118	**2,890**	**3,780**	6.27	
	MW-119	Apr-15		590	48.2	**1.99**	0.232	J	54.5	**2,040**	**3,030**	0.292 J	
	MW-119	Oct-15		624	152	**2.65**	0.985	J	86.3	**2,290**	**3,500**	0.437 J	
	MW-119	Apr-16		595	191	**2.50**	0.614	J	101	**1,900**	**3,330**	0.518 J	
	MW-119	Oct-16		619	**280**	**2.91**	0.991	J	132	**2,010**	**3,690**	0.189 B	
	MW-119	Apr-17		587	**290**	**2.86**	0.965	J	123	**2,420**	**3,650**	<0.197	
	MW-119	Oct-17		612	**268**	**2.77**	1.27		172	**2,240**	**3,750**	<0.0197	
NCL	MW-18	Apr-14		507	159	0.954	2.89		83.2	**1,830**	**3,700**	**35.2**	<0.00500
	MW-18	Apr-15		407	185	1.45	7.18		66.7	**1,600**	**3,110** J	**36.1**	<0.00180
	MW-18	Apr-16		504	178	1.39	3.69	J	107	**1,600**	**2,920**	**42.6**	0.00200 J
	MW-18	Apr-17		486	77.5	**3.44**	13.9		65.0	**1,970**	**3,420**	**51.0**	<0.00180
	MW-45	Apr-15		605	**1,260**	1.44	4.47		346	**2,580**	**5,300** J	<0.0200	<0.00180
	MW-45	Oct-15		610	**454**	1.37	5.02		376	**2,910**	**4,660**	0.0290 J	<0.00180
	MW-45	Apr-16		689	**524**	1.51	6.33		429	**2,710**	**4,760**	<0.197	<0.00180
	MW-45	Oct-16		640	**546**	1.48 J6	5.30		392	**2,810**	**4,730**	0.377 B	0.00953
	MW-45	Apr-17		625	**545**	1.27	5.69		394	**2,840**	**5,410**	0.0270 J	<0.00180
	MW-45	Oct-17		596	**544**	1.59	4.79		369	**2,650**	**5,740**	<0.0197	<0.00180
	MW-53	Apr-14		290	95.4	0.827	0.935		87.6	**1,190**	**2,060**	<0.150	
	MW-53	Apr-15		348	**1,010**	0.922	1.16		104	**1,290**	**2,810** J	**34.5**	
	MW-53	Apr-16		459	**346**	1.06	1.42	J	161	**1,340**	**2,890**	**25.3**	
	MW-53	Apr-17		340	222	0.904	1.12		130	**1,330**	**2,290**	**15.6**	
	MW-54A	Apr-15		318	192	1.10	0.276	J	62.9	**712**	**2,080** J	0.450	
	MW-54A	Oct-15		356	210	1.10	0.330	J	70.2	**796**	**2,140**	4.32 J	
	MW-54A	Apr-16		381	176	1.12	0.303	J	69.4	**625**	**1,780**	<0.197 J6	
	MW-54A	Oct-16		331	175	0.997	0.254	J	61.5	**670**	**1,770**	0.134 J6B	
	MW-54A	Apr-17		330	193	0.987	0.289	J	59.8	**797**	**1,800**	0.0860 J	
	MW-54A	Oct-17		359	204	1.34	0.271	J	67.2	**819**	**2,060**	0.691	
	MW-54B	Apr-13		345	176	<0.500	1.16		48.8	**747**	**2,050**	<1.00	
	MW-54B	Apr-15		307	166	0.613	0.767	J	48.0	**752**	**1,890** J	0.0276 J	
	MW-54B	Apr-17		317	127	0.617	1.18		54.5	**1,040**	**1,840**	0.100 J	
	MW-55	Apr-15		627	**266**	**1.88**	0.692	J	167	**2,940**	**4,910** J	**15.5**	<0.00180
	MW-55	Oct-15		411	216	**1.85**	0.756	J	166	**2,300**	**4,000**	5.57	<0.00180
	MW-55	Apr-16		472	**442**	1.04	0.829	J	253	**2,080**	**4,200**	2.26	<0.00120
	MW-55	Oct-16		465	219	**2.09**	0.732	J	174	**2,190**	**3,810**	3.65	<0.00180
	MW-55	Apr-17		378	**446**	1.44	0.745	J	206	**1,550**	**3,580**	3.14	<0.00180
	MW-55	Oct-17		444	**435**	**2.02**	0.675	J	228	**2,020**	**3,970**	3.45	<0.00180
	MW-56	Apr-15		485	**927**	1.11	1.90		272	**1,900**	**3,640** J	1.28	
	MW-56	Oct-15		514	**399**	1.12	2.05		342	**2,490**	**4,080**	4.34	
	MW-56	Apr-16		559 V	**403**	1.10	2.32	JO1	379 V	**1,970**	**3,790**	2.76	
	MW-56	Oct-16		446 V	**263**	1.19	1.97		317 V	**1,910**	**4,110**	0.151 B	
	MW-56	Apr-17		501 V	**453**	1.00	2.10		338 V	**2,070**	**4,100**	3.93	
	MW-108	Apr-15		289	78.8	**2.52**	1.50		76.8	**962**	**2,540** J	<0.390	
	MW-108	Oct-15		298	77.5	**2.30**	1.31		88.9	**1,090**	**2,530**	<0.197	
	MW-108	Apr-16		333	79.6	**2.04**	1.28	J	92.6	**981**	**2,120**	0.304 J	
	MW-108	Oct-16		343	112	**2.75**	3.88		116	**1,340**	**2,830**	0.0460 JB	
	MW-108	Apr-17		251	80.4	**1.90**	0.893	J	81.7	**717**	**1,980**	0.0310 JJ6	
	MW-108	Oct-17		339	92.9	**1.88**	4.67		135	**1,510**	**2,660**	<0.0985	
	NCL-31	Apr-15		266	89.5	1.25	0.220	J	100	**1,240**	**2,670** J	<0.200	
	NCL-31	Oct-15		392	129	1.20	0.418	J	125	**2,100**	**3,220**	<0.197	
	NCL-31	Apr-16		340	78.9	1.14	0.272	J	109	**1,420**	**3,020**	0.385 J	
	NCL-31	Oct-16		445	67.8	1.57	0.564	J	148	**2,400**	**3,820**	0.0840 JB	
	NCL-31	Apr-17		369	65.7	1.19	0.434	J	111	**1,890**	**3,150**	0.127	
	NCL-31	Oct-17		341	53.7	1.44	0.362	J	103	**2,020**	**3,000**	<0.0197	
	NCL-32	Apr-15		446	177	**1.92**	4.15	J	92.6	**1,050**	**2,250**	<0.200	
	NCL-32	Oct-15		540	**329**	1.57	4.98		97.0	**1,430**	**2,280**	<0.197	
	NCL-32	Apr-16		697	206	**2.05**	7.60		115	**1,340**	**2,740**	<0.197	
	NCL-32	Oct-16		390	128	1.48	3.26		102	**1,220**	**2,230**	1.77	
	NCL-32	Apr-17		387	155	1.54	3.19		102	**1,310**	**2,440**	4.90	
	NCL-32	Oct-17		398	117	1.31	2.94		109	**1,490**	**2,540**	6.14	
	NCL-33	Apr-15		431	**281**	**2.58**	4.31	J	111	**800**	**2,280**	<0.0200	
	NCL-33	Oct-15		419	**404**	**2.49**	4.86		119	**847**	**2,140**	<0.197	
	NCL-33	Apr-16		622	**280**	**2.82**	7.58		113	**1,370**	**3,200**	0.367 J	
	NCL-33	Oct-16		462	**400**	**2.65**	5.28		109	**900**	**2,790**	0.0750 JB	
	NCL-33	Apr-17		514	**412**	**2.62**	5.98		101	**1,220**	**2,750**	0.0320 J	
	NCL-33	Oct-17		509	**458**	**2.77**	6.09		114	**1,150**	**2,820**	<0.0197	
	NCL-34A	Apr-15		275	249	1.36	0.570	J	117	110	**1,490**	<0.200	
	NCL-34A	Oct-15		202	182	1.43	0.877	J	103	104 J	**1,250**	0.284 J	
	NCL-34A	Apr-16		347	**416**	1.31	2.20	J	140	82.2	**1,540**	0.265 J	
	NCL-34A	Oct-16		249	238	1.43	1.27		107	95.0	**1,370**	0.0470 JB	
	NCL-34A	Apr-17		270	**313**	1.27	1.36		108	76.1	**1,440**	0.0570 JJ6	
	NCL-34A	Oct-17		214	202	1.37	1.08		111	131	**1,400**	<0.0394	
	NCL-44	Apr-15		269	161	**1.78**	1.64	J	73.4	468	**2,510**	<0.200	
	NCL-44	Oct-15		276	182	**1.69**	2.07		71.4	**633**	**1,890**	<0.197	
	NCL-44	Apr-16		414	234	1.59	2.62	J	98.3	**965**	**2,120**	<0.197	
	NCL-44	Oct-16		373	222	**1.67**	2.29		94.9	**1,030**	**2,130**	0.0810 JB	
	NCL-44	Apr-17		360	198	**1.65**	2.31		99.7	**1,070**	**2,390**	0.0470 J	
	NCL-44	Oct-17		350	158	**1.69**	2.26		119	**1,260**	**2,480**	<0.0197	
	NCL-49	Apr-15		377	109	**1.64**	0.552	J	105	**1,400**	**2,840** J	4.53	
	NCL-49	Apr-15	FD	380	**395**	0.531	0.589	J	105	**1,650**	**2,850** J	4.50	
	NCL-49	Oct-15		406	112	0.593	0.607	J	115	**1,770**	**2,830**	5.79	
	NCL-49	Oct-15	FD	407	113	0.598	0.613	J	114	**1,800**	**2,860**	5.79	
	NCL-49	Apr-16		468	119	0.685	0.749	J	136	**1,570**	**2,820**	5.71	
	NCL-49	Apr-16	FD	470	119	0.685	0.792	J	137	**1,580**	**2,790**	5.63	
	NCL-49	Oct-16		425	128	0.600	0.590	J	120	**1,700**	**2,770**	6.08	
	NCL-49	Oct-16	FD	429	130	0.600	0.597	J	122	**1,670**	**3,290**	6.01	
	NCL-49	Apr-17		451	172	0.576	0.632	J	133	**2,010**	**3,070**	9.84	
	NCL-49	Apr-17	FD	452	159	0.575	0.633	J	133	**1,970**	**2,990**	9.78	
	NCL-49	Oct-17		481	173	0.698	0.594	J	132	**2,080**	**3,200**	8.41	
	NCL-49	Oct-17	FD	458	169	0.713	0.605	J	131	**2,050**	**3,140**	8.41	

Table 4C - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

		Analyte Group:		Water Quality Parameters								Cyanide
		Analyte:		Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
		Units:		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		CGWSL:		---	250	1.60	---	---	600	1,000	10.0	0.200
		CGWSL Source:			WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	USEPA MCL	USEPA MCL
Area	**Well ID**	**Date**	**Dup**									
South Refinery	KWB-2R	Apr-15		233	**259**	0.879	0.777 J	267	**884**	**2,450**	<0.200	
	KWB-2R	Oct-15		168	228	1.21	1.23	296	418	**1,970**	<0.197	
	KWB-2R	Apr-16		322	207	0.485	0.456 J	325	**1,460**	**2,910**	0.0340 JJ6	
	KWB-2R	Oct-16		275	215	0.901	0.433 J	282	**1,150**	**2,850**	0.0740 JB	
	KWB-2R	Apr-17		280	**279**	0.904	0.460 J	286	**1,060**	**2,550**	0.0220 J	
	KWB-2R	Oct-17		139	240	1.09	1.33	283	259	**1,770**	<0.394	
	KWB-5	Apr-15		237	**518**	0.687	1.79	198	8.08	**1,500**	<0.0200	
	KWB-5	Oct-15		228	**575**	0.853	1.60	203	6.81	**1,540**	0.243 J	
	KWB-5	Apr-16		252	**5,800**	0.392	1.66 J	222	235 J	**1,760**	0.0400 J	
	KWB-5	Oct-16		228	**562**	0.910	1.34	220	6.46	**1,560**	0.0460 JBJ6	
	KWB-5	Apr-17		224	**575**	0.936	1.48	204	14.8	**1,580**	<0.197	
	KWB-5	Oct-17		220	**565**	0.877	1.41	208	21.9	**1,560**	0.0530 J	
	KWB-6	Apr-15		212	**305**	0.366	0.220 J	193	16.2	**1,460**	0.148	
	KWB-6	Oct-15		229	**265**	0.935	0.181 J	144	264	**1,410**	0.273 J	
	KWB-6	Apr-16		246	**313**	1.03	0.206 J	199	83.1	**1,410**	<0.197	
	KWB-6	Oct-16		232	**280**	0.977	0.219 JB	109	275	**1,590**	0.0770 JB	
	KWB-6	Apr-17		227	**260**	0.965	0.183 J	120	211	**1,630**	0.556 J	
	KWB-6	Oct-17		256	**290**	0.842	0.162 J	131	377	**1,890**	<0.394	
	MW-28	Apr-15		439 J	160	1.59	0.685 J	89.5	**1,080**	**2,760**	<0.390	0.0132
	MW-28	Oct-15		379	159	**1.67**	0.632 J	92.7	**1,060**	**3,000**	0.211 J	0.0108
	MW-28	Apr-16		1500	135	1.42	4.06 J	450	**672**	**3,040**	0.470 J	<0.00120
	MW-28	Oct-16		480	147	1.40	0.640 J	74.0	**1,320**	**1,900**	0.0460 JB	<0.0180
	MW-28	Apr-17		380	190	1.56	0.778 J	89.9	**1,170**	**2,420**	<0.197	<0.0900
	MW-28	Oct-17		376	146	1.51	1.37	90.3	**1,180**	**2,640**	<0.394	<0.00180
	MW-48	Apr-15		258 J	161	0.498	0.680 J	276	47.6	725	<0.200	
	MW-48	Oct-15		186	**391**	0.644	2.61	355	235	**1,940**	<0.197	
	MW-48	Apr-16		234	**1,110**	1.45	1.80 J	314	20.5	**2,950**	<0.197	
	MW-48	Oct-16		200	**580**	1.07	1.18	339	239	**2,270**	0.0300 JB	
	MW-48	Apr-17		190	**909**	1.47	1.13	255	18.2	**2,210**	0.202 J	
	MW-48	Oct-17		191	**820**	1.01	0.908 J	272	19.3	**2,280**	<0.0197	
	MW-50	Apr-15		450	**259**	0.966	2.18	178	**1,680**	**2,860**	<0.200	
	MW-50	Oct-15		403	226	0.899	2.29	175	**1,740**	**2,770**	2.61 J	
	MW-50	Apr-16		645	**491**	**3.96**	8.60	969	**4,280**	**4,580**	**150**	
	MW-50	Oct-16		546	**511**	**3.86** J6	12.4	912	**4,690**	**9,320**	0.594	
	MW-50	Apr-17		566	**463**	**2.21**	5.90	646	**3,710**	**6,840**	**155**	
	MW-50	Oct-17		572	**431**	**2.57**	5.57	620	**3,580**	**6,620**	**136**	
	MW-52	Apr-15		168 J	158	**1.88**	0.252 J	267	**832**	**3,740**	1.54	<0.00180
	MW-52	Oct-15		196	144	**1.76**	0.242 J	285	**998**	**2,040**	3.13	<0.00180
	MW-52	Apr-16		778	160	**1.79**	1.20 J	1350	**995**	**1,920**	1.73	<0.00120
	MW-52	Oct-16		194	144	**1.77**	0.262 J	278	**1,100**	**2,370**	1.04	0.00182 J
	MW-52	Apr-17		181	154	**1.65**	0.283 J	297	**1,060**	**2,260**	3.27	<0.00180
	MW-52	Oct-17		238	114	1.09	0.245 J	275	**1,270**	**2,550**	9.42	<0.00180
	MW-64	Apr-16		109	**379**	1.08	0.754 J	396	39.9	**1,510**	<0.197	
	MW-64	Oct-16		109	**356**	0.855	0.689 J	361	4.08 J	**1,650**	0.0790 JB	
	MW-64	Apr-17		99.7	**382**	1.03	0.774 J	367	3.93 J	**1,760**	0.0400 J	
	MW-64	Oct-17		96.6	**326**	0.984	0.656 J	351	7.90	**1,590**	<0.394	
	MW-65	Apr-15		147	**382**	1.21	0.783 J	257	<0.0770	**1,410**	0.0613 J	
	MW-65	Apr-16		155 V	**394**	1.28	0.691 J	311 V	0.323 J	**1,750**	0.0490 JJ6	
	MW-65	Oct-16		157	**356**	1.48	1.46	287	0.431 J	**1,380**	0.219 B	
	MW-65	Apr-17		134	**354**	1.38	1.01	279	0.822 J	**1,430**	0.0330 J	
	MW-65	Oct-17		132	**314**	1.44	1.03	267	0.470 J	**1,320**	<0.0197	
	MW-66	Apr-15		120	141	1.53	0.858 J	134	0.596 J	948	0.0292 J	<0.00180
	MW-66	Oct-15		134	201	1.34	0.742 J	163	0.110 J	**1,090**	<0.197	0.00180 J
	MW-66	Apr-16		600	134	1.36	4.83 J	740	0.591 J	942	0.363 J	<0.00120
	MW-66	Oct-16		131	174	1.42	0.770 J	155	0.327 J	**1,020**	0.0480 JB	<0.00180
	MW-66	Apr-17		115	184	1.55	0.830 J	143	0.360 J	976	0.0370 JP1	<0.00180
	MW-66	Oct-17		139	179	1.42	1.14	159	1.69 J	**1,080**	<0.0197	<0.00180
	MW-99	Apr-15		48.7	33.4	0.328	5.30	23.9	41.3	267	0.789	
	MW-99	Oct-15		176	249	0.706	0.955 J	215	127	**1,390**	<0.197	
	MW-99	Apr-16		805	208	0.866	6.37	1100	153	**1,410**	0.0330 JJ6	
	MW-99	Oct-16		137	192	0.656	3.60	168	39.0	**1,200**	0.0350 JB	
	MW-99	Apr-17		161	**284**	0.758	0.819 J	205	169	**1,370**	<0.197	
	MW-99	Oct-17		173	**256**	0.748	0.624 J	215	142	**1,430**	<0.394	
	MW-101	Apr-15		188	201	0.708	0.485 J	141	188	**1,340**	<0.200	
	MW-101	Oct-15		188	236	0.993	0.483 J	138	206	**1,470**	0.230 J	
	MW-101	Apr-16		220	239	0.940	0.522 J	169	168	**1,270**	0.197 J	
	MW-101	Oct-16		183	229	1.00	0.509 J	112	191	**1,400**	0.127 B	
	MW-101	Apr-17		197	234	0.926	0.587 J	139	160	**1,390**	<0.197	
	MW-101	Oct-17		197	229	0.998	0.853 J	142	171	**1,360**	<0.0197	
	MW-102	Apr-15		94.4	175	0.825	0.419 J	357	1.75 J	**1,470**	0.0642 J	
	MW-102	Oct-15		193	219	1.13	0.683 J	385	296	**1,750**	<0.197	
	MW-102	Apr-16		127	245	0.901	0.372 J	437	2.35 J	**1,530**	0.339 J	
	MW-102	Oct-16		176	**271**	1.28	0.772 J	418	217	**1,740**	0.0620 JBJ6	
	MW-102	Apr-17		120	**258**	1.09	0.504 J	379	11.3	**1,550**	<0.197	
	MW-102	Oct-17		124	**259**	1.16	0.507 J	373	7.70	**1,730**	<0.394	
	MW-103	Apr-14		24.5	**1,040**	**7.45**	0.831	1420	<10.0 B	**3,820**	<0.150	
	MW-103	Apr-15		192	**7,890**	**3.44**	2.46 J	6710	19.6	**12,500**	<0.0200	
	MW-103	Apr-16		193	**13,700**	**5.44**	3.73 J	7960	2.24 J	**21,100**	0.430 J	
	MW-103	Apr-17		306	**12,000**	1.39	3.12 J	10000	48.0	**22,300**	0.0530 J	
	MW-104	Apr-15		208	31.4	**1.67**	4.73	42.7	**856**	**1,070**	<0.0200	
	MW-104	Apr-15	FD	207	31.0	**2.12**	4.63	42.3	**679**	**1,130**	0.185	
	MW-104	Oct-15		169	21.0	**2.01**	4.92	38.6	510	912	<0.197	
	MW-104	Oct-15	FD	170	21.6	**2.07**	4.86	40.3	473	925	<0.197	
	MW-104	Apr-16		179 V	25.9	**2.49**	4.96 JJ5O1	43.6 V	408	819	0.455 JB	
	MW-104	Apr-16	FD	178	25.6	**2.51**	5.16	44.7	439	809	0.286 JB	
	MW-104	Oct-16		165	72.9	**1.94**	4.77	38.4	322	975	0.0640 JB	
	MW-104	Oct-16	FD	164	73.4	**1.90**	4.78	37.9	323	928	0.0820 JB	
	MW-104	Apr-17		203	209	**1.94**	5.56	50.9	217	986	0.0450 JJ6	
	MW-104	Apr-17	FD	197	230	**1.77**	5.20 O1	48.7 O1V	219	**1,010**	<0.197	
	MW-104	Oct-17		213	178	1.58	5.84	60.5	258	**1,070**	<0.394	
	MW-104	Oct-17	FD	213	201	1.19	5.73	59.2	281	**1,140**	<0.0985	
	MW-105	Apr-15		111	25.3	0.700 J	4.26	17.2	263	530	<0.200	
	MW-105	Oct-15		148	13.4	0.330	4.41	12.0	297	664	0.221 J	
	MW-105	Apr-16		257	42.0	1.48	4.55 J	52.6	278	**1,300**	0.414 J	
	MW-105	Oct-16		227	12.7	**2.06**	4.97	20.7	20.6	**1,050**	0.105 B	
	MW-105	Apr-17		212	48.2	1.60	4.45	38.3	9.54	982	<0.197	
	MW-105	Oct-17		245	101	**1.62**	6.49	89.2	132	**1,370**	<0.394	
	MW-106	Apr-15		197	**280**	**6.81**	10.4	162	559	**1,400**	**22.3**	
	MW-106	Oct-15		373	148	**1.76**	2.43	221	**1,790**	**3,420**	<0.197	
	MW-106	Apr-16		422	185	1.51	4.40 J	271	**1,380**	**3,120**	<0.197	
	MW-106	Oct-16		347	216	1.30	1.37	240	**1,410**	**3,080**	0.0530 JB	
	MW-106	Apr-17		313	**302**	1.28	2.44	236	**1,020**	**2,630**	<0.197	
	MW-106	Oct-17		313	217	0.930	1.78	265	**1,210**	**3,050**	<0.985	

Table 4C - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Water Quality Parameters								Cyanide
				Analyte:	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	250	1.60	---	---	600	1,000	10.0	0.200
				CGWSL Source:		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	USEPA MCL	USEPA MCL
Area	**Well ID**	**Date**	**Dup**										
South Refinery	MW-107	Apr-15		160 J	**291**	1.54	0.583 J	73.1	27.1	**1,220**	<0.0200		
	MW-107	Oct-15		176	**297**	**1.67**	0.880 J	76.9	102	**1,390**	<0.197		
	MW-107	Apr-16		727	**277**	**1.67**	3.22 J	381	6.07	**1,850**	0.376 J		
	MW-107	Oct-16		186	**271**	**1.82**	0.965 J	80.1	72.4	**1,480**	0.170 B		
	MW-107	Apr-17		140	**313**	**1.76**	0.655 J	75.4	<0.0774	**1,260**	<0.197		
	MW-109	Apr-15		192 J	**261**	**2.04**	0.929 J	406	**931**	**2,910**	<0.390		
	MW-109	Oct-15		181	232	**1.81**	0.862 J	438	**950**	**2,170**	<0.197		
	MW-109	Apr-16		707	204	**1.90**	4.01 J	2200	**848**	**2,190**	0.384 J		
	MW-109	Oct-16		153	226	**2.06**	0.802 J	431	**751**	**2,590**	0.0360 JB		
	MW-109	Apr-17		200	195	**1.99**	1.03	394	**1,040**	**2,700**	<0.197		
	MW-109	Oct-17		193	166	1.41	0.913 J	374	**814**	**2,710**	<0.394		
	MW-110	Apr-15		107 J	93.8	**1.64**	0.244 J	244	283	**1,420**	<0.0200		
	MW-110	Oct-15		174	136	**1.62**	0.268 J	294	**787**	**1,680**	<0.197		
	MW-110	Apr-16		555	99.0	1.53	1.19 J	1380	**2,100**	**1,360**	0.765 J		
	MW-110	Oct-16		115	97.6	1.50	0.150 J	276	555	**1,430**	0.0620 JB		
	MW-110	Apr-17		120	135	1.45	0.207 J	265	387	**1,330**	<0.197		
	MW-110	Oct-17		106	97.3	0.903	0.0756 J	267	419	**1,430**	<0.0197		
	RA-313	Apr-14		171	17.2	1.01	0.935		450	868	<0.150		
	RA-313	Apr-15		150	19.1	0.914	1.04	17.8	**605**	808	<0.0200		
	RA-313	Apr-16		175	17.6	0.893	1.02 J	17.3	501	881	0.680 J		
	RA-313	Apr-17		167	15.0	0.893	1.26	16.4	455	937	0.447 J		
	RW-4	Apr-15		202	**258**	0.845	1.67	144	468	**1,710** J	<0.0200		
	RW-4R	Apr-16		207	**351**	1.06	2.00 J	290	470	**1,810**	0.346 J		
	RW-4R	Apr-17		151	**280**	0.977	1.50	177	318	**1,510**	<0.197		
	RW-5R	Apr-15		4.82	**260**	0.965	0.461 J	189	0.376 J	565	<0.0200		
	RW-5R	Apr-16		4.61 J	**262**	0.564	0.364 J	203	0.655 J	399	0.495 J		
	RW-6	Apr-15		168	**414**	0.628	0.686 J	205	129	**1,650**	0.0335 J		
	RW-6R	Apr-16		191	**405**	0.747	0.356 J	226	104	**1,470**	0.485 J		
	RW-15C	Apr-17		160	**409**	0.774	1.59	269	19.4	**1,610**	0.442 J		
South RO Reject Field	MW-114	Apr-15		570 J	80.3	**1.95**	2.29	114	**2,140**	**3,640**	0.0752 J		
	MW-114	Oct-15		579	111	**1.89**	2.46	104	**2,250**	**2,990**	<0.197		
	MW-114	Apr-16		681	88.6	**1.87**	2.59 J	126	**1,170**	**3,710**	0.416 J		
	MW-114	Oct-16		569	231	**2.03**	2.49	89.3	**2,100**	**4,050**	4.69		
	MW-114	Apr-17		599	**266**	**1.78**	2.83	131	**2,350**	**3,480**	0.260 JJ5		
	MW-114	Oct-17		582	157	1.35	2.83	132	**1,950**	**3,700**	2.80		
	MW-115	Apr-15		546 J	**464**	**2.42**	0.425 J	385	**3,510**	**6,200**	0.0333 J		
	MW-115	Oct-15		532	**326**	**2.8**	0.578 J	320	**3,640**	**4,640**	<0.197		
	MW-115	Apr-16		2410	153	**1.93** J6	2.64 J	1290	**2,020**	**5,390**	0.375 J		
	MW-115	Oct-16		541	**382**	**2.69**	0.395 JB	144	**2,750**	**4,990**	0.113 B		
	MW-115	Apr-17		394	**304**	1.51	0.514 J	183	**2,770**	**4,190**	<0.197		
	MW-115	Oct-17		450	249	1.01	0.558 J	213	**2,910**	**4,480**	0.0420 J		
	MW-116	Apr-15		534 J	131	**2.28**	3.57	92.1	**1,800**	**3,300**	0.0753 J		
	MW-116	Oct-15		644	223	**2.80**	5.67	145	**2,280**	**3,800**	<0.197		
	MW-116	Apr-16		719	**500**	1.33	1.63 J	259	**3,300**	**4,580**	0.473 J		
	MW-116	Oct-16		569	196	**2.91**	4.26	114	**2,040**	**3,500**	0.0480 JB		
	MW-116	Apr-17		501	**270**	**2.00**	2.22	154	**2,060**	**3,450**	0.258 J		
	MW-116	Oct-17		614	233	**2.72**	4.47	147	**2,080**	**3,160**	1.4		
TEL	MW-49	Apr-15		197	**423**	1.18	2.04	309	**665**	**2,340**	<0.200		<0.00180
	MW-49	Oct-15		192	**381**	1.45	2.48	326	**621**	**2,260**	<0.197		0.00280 J
	MW-49	Apr-16		203	**368**	1.38	2.19 J	347	584	**2,270**	0.0580 J		<0.00180 J3J6
	MW-49	Oct-16		206	**364**	1.50	2.45	329	**602**	**1,860**	0.179 BJ6		<0.00900
	MW-49	Apr-17		194	**373**	1.35	2.19	328	531	**2,390**	<0.197		<0.0900
	MW-49	Oct-17		192	**373**	1.31	2.83	331	535	**2,140**	<0.0197		<0.00180
	TEL-1	Apr-15		209	**269**	**2.26**	0.962 J	434	**1,230**	**2,480**	<0.200		
	TEL-1	Oct-15		479	195	**2.54**	1.92	374	**2,060**	**3,390**	<0.197		
	TEL-1	Apr-16		389	113	**3.00**	1.72 J	373	**1,510**	**2,570**	0.0380 J		
	TEL-1	Oct-16		477	51.4	**3.39**	2.22	155	**1,710**	**3,090**	0.0730 JB		
	TEL-1	Apr-17		284	195	**2.73**	1.32	370	**1,320**	**2,940**	<0.197		
	TEL-1	Oct-17		208	243	**2.12**	0.896 J	480	**986**	**2,350**	<0.394		
	TEL-2	Apr-15		164	**949**	0.914	0.945 J	372	498 J	**2,390**	<0.200		
	TEL-2	Oct-15		188	**371**	1.18	1.10	404	**680**	**2,460**	<0.197		
	TEL-2	Apr-16		224	**344**	1.08	0.954 J	419	**825**	**2,720**	0.0460 J		
	TEL-2	Oct-16		228	**294**	1.04	1.14	406	**764**	**2,830**	0.0390 JB		
	TEL-2	Apr-17		224	**302**	1.11	1.04	411	**865**	**2,730**	<0.197		
	TEL-2	Oct-17		246	226	0.911	1.09	442	**1,160**	**3,000**	<0.0197		
	TEL-3	Apr-15		485	**829**	**2.52**	6.12	184	**1,330**	**2,750**	0.224 J		
	TEL-3	Oct-15		550	66.4	**2.95**	6.85	74.7	**1,520**	**2,960**	<0.197		
	TEL-3	Apr-16		473	**585**	**2.71**	7.31	364	**622**	**2,900**	0.0420 J		
	TEL-3	Oct-16		427	25.1	**3.43**	5.27	20.6	**1,020**	**1,850**	0.0450 JB		
	TEL-3	Apr-17		463	55.1	**3.04**	5.21	39.8	**1,070**	**1,980**	0.269 J		
	TEL-4	Apr-15		301	**1190**	0.678	0.455 J	294	**947**	**3,200**	<0.200		
	TEL-4	Apr-15	FD	289	**535**	0.690	0.411 J	281	**1,140**	**3,300**	<0.200		
	TEL-4	Oct-15		412	**347**	**2.55**	0.934 J	657	**4,000**	**7,150**	0.385 J		
	TEL-4	Oct-15	FD	417	**353**	**3.14**	0.950 J	693	**4,040**	**6,590**	<0.197		
	TEL-4	Apr-16		410	**524**	1.53	0.666 J	509	**2,070**	**4,260**	0.0440 J		
	TEL-4	Apr-16	FD	408	**519**	1.53	0.618 J	515	**1,980**	**4,040**	0.0400 JJ6		
	TEL-4	Oct-16		370	**336**	**1.69**	0.613 J	465	**2,290**	**5,350**	0.0340 JB		
	TEL-4	Oct-16	FD	370	**347**	1.58	0.608 J	454	**2,240**	**5,370**	0.0360 JB		
	TEL-4	Apr-17		432	**442**	1.36	0.587 J	542	**2,680**	**6,520**	0.404 J		
	TEL-4	Apr-17	FD	427	**436**	1.22	0.588 J	546	**2,630**	**5,570**	<0.197		
	TEL-4	Oct-17		343	**511**	0.862	0.512 J	468	**1,660**	**4,240**	<0.0985		
	TEL-4	Oct-17	FD	342	**501**	0.868	0.510 J	465	**1,520**	**3,600**	<0.0197		
TMD	MW-8	Apr-14		486	**383**	**1.78**	2.05	388	**2,710**	**5,060**	5.20		
	MW-8	Apr-15		390	**321**	1.51	1.59	328	**2,940**	**4,210**	1.1		
	MW-8	Apr-16		377	**275**	**2.02**	1.69 J	295	**2,380**	**3,690**	0.503 J		
	MW-8	Apr-17		346	**334**	**2.20**	1.44	262	**2,100**	**3,900**	1.04		
	MW-16	Apr-14		531	**422**	**2.79**	8.99	388	**2,170**	**4,020**	0.269 J		
	MW-16	Apr-15		666	**660**	**2.32**	10.2	545	**2,670**	**4,890**	0.461		
	MW-16	Apr-17		558	**936**	**2.36** J6	9.27	689	**2,900**	**4,150**	1.75		
	MW-20	Apr-14		505	**457**	**2.11**	0.416	249	**2,580**	**4,900**	6.74		
	MW-20	Apr-14	FD	487	**440**	**1.72**	0.419	247	**2,700**	**4,840**	6.50		
	MW-20	Apr-15		510	**429**	1.51	0.398 J	232	**3,490**	**4,790**	5.08		
	MW-20	Apr-16		594	**515**	**2.18**	0.370 J	274	**2,790**	**4,850**	8.09		
	MW-20	Apr-17		525	**588**	**2.27**	0.425 J	274	**2,800**	**5,650**	8.74		
	MW-21	Apr-15		542	**481**	**1.90**	1.81 J	468	**3,210**	**5,210**	**17.0**		
	MW-21	Oct-15		530	**550**	**1.75**	2.00	436	**3,520**	**5,190**	**16.5**		
	MW-21	Apr-16		590	**516**	**1.69**	2.31 J	440	**3,150**	**5,720**	**15.0**		
	MW-21	Oct-16		543	**474**	**1.74**	1.91	429	**3,150**	**4,240**	**12.0**		
	MW-21	Apr-17		507	**599**	**1.95**	1.88	423	**2,860**	**6,630**	**20.4**		
	MW-21	Oct-17		562	**574**	**1.81**	1.86	416	**3,350**	**5,000**	**17.1**		
	MW-25	Apr-14		985	**4,440**	0.635	6.80	1220	**2,060**	**11,700**	<0.150		
	MW-25	Apr-15		896	**6,780**	1.03	8.34	3710	**5,740**	**17,000**	0.0974 J		
	MW-25	Apr-16		647	**4,130**	1.13	6.61	2670	**4,100**	**11,800**	0.125		
	MW-25	Apr-17		484 V	**2,330**	1.17	5.11	1540	**2,800**	**6,240**	0.152		

Table 4C - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Water Quality Parameters								Cyanide
				Analyte:	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	250	1.60	---	---	600	1,000	10.0	0.200
				CGWSL Source:		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	USEPA MCL	USEPA MCL
Area	**Well ID**	**Date**	**Dup**										
TMD	MW-26	Apr-14		718	**953**	**2.16**	6.01	662	**4,330**	**8,280**	0.252 J	
	MW-26	Apr-15		698	**1,130**	1.15	5.42	704	**5,950**	**8,660**	0.268	
	MW-26	Apr-16		725	**1,260**	**1.86**	5.75	695	**4,520**	**8,730**	0.301	
	MW-26	Apr-17		707	**1,580**	**1.75**	5.90	760	**5,120**	**8,730**	0.580	
	MW-27	Apr-14		431	148	0.983	9.89	159	**1,600**	**2,600**	0.632 J	
	MW-27	Apr-15		607	246	0.928	11.2	128	**2,320**	**3,640**	0.703	
	MW-27	Apr-16		470	234	1.19	9.36	156	**3,950**	**3,150**	0.687	
	MW-27	Apr-17		410	138	1.29	8.43	136	**1,550**	**2,150**	1.22	
	MW-46R	Nov-14		650	**290**	**1.90**	2.30	170	**2,300**	**3,800**	<0.0200	
	MW-46R	Apr-15		599	**288**	1.24	1.82	152	**2,590**	**3,980**	0.169	
	MW-46R	Apr-16		645	**290**	1.47	1.26 J	168	**2,470**	**3,980**	0.0520 JJ6	
	MW-46R	Oct-16		605 V	**339**	**1.97**	1.83	161	**2,170**	**4,010**	0.368	
	MW-46R	Apr-17		588	**315**	**1.70**	1.30	182	**2,420**	**3,930**	0.206	
	MW-46R	Oct-17		627	**275**	**1.63**	1.27	183	**2,590**	**4,040**	0.0920 J	
	MW-68	Apr-14		375	**299**	**1.79**	4.84	207	**1,330**	**2,920**	5.10	
	MW-68	Apr-15		552	**397**	1.15	4.65	242	**2,610**	**4,460**	4.52	
	MW-68	Apr-16		489	**263**	**1.75**	5.58	206	**1,840**	**2,980**	0.510	
	MW-68	Apr-17		381	237	**1.88**	4.60	165	**1,620**	**2,890**	0.381	
	MW-71	Apr-14		558	**887**	1.39	4.15	399	**2,740**	**6,280**	**53.6**	<0.00500
	MW-71	Apr-15		642	**906**	1.09	3.59	447	**3,150**	**6,110**	**50.6**	<0.00180
	MW-71	Apr-16		669	**907**	**1.62**	3.72 J	502	**2,890**	**5,450**	**45.6**	<0.00180
	MW-71	Apr-17		601	**848**	**1.63**	3.62	491	**2,940**	**5,300**	**54.0**	<0.00180
	MW-89	Apr-14		542	248	**2.40**	10.5	188	**2,030**	**3,360**	1.34	
	MW-89	Apr-15		528	**324**	**3.61**	13.5	302	**2,200**	**3,720**	2.34	
	MW-89	Apr-16		556	**399**	**3.58**	12.0	299	**1,490**	**3,640**	3.64	
	MW-89	Apr-17		550	**394**	**3.97**	12.2	289	**2,170**	**3,600**	4.77	
	NP-1	Apr-15		473	**436**	**2.06**	3.53 J	451	**2,930**	**4,450**	8.41	
	NP-1	Oct-15										
	NP-1	Apr-16		470	**391**	**1.96**	3.12 J	403	**2,620**	**4,460**	0.494 J	
	NP-1	Oct-16										
	NP-1	Apr-17		421	**422**	**2.08**	2.73	340	**2,440**	**4,060**	9.95	
	NP-1	Oct-17										
	NP-2	Apr-13		517	**379**	**1.70**	1.63	258	**2,660**	**5,160**	1.74	
	NP-6	Apr-13										
	NP-6	Apr-15										
	NP-6	Apr-17										
Up-Gradient	UG-1	Apr-14		474	126	0.580	1.59	79.6	**1,720**	**2,960**	**10.1**	<0.00500	
	UG-1	Apr-15		455 J	133	0.865	1.11	84.6	**1,880**	**2,920**	**14.4**	<0.00180	
	UG-1	Apr-16		512	102	0.926	1.07 J	99.7	**1,920**	**4,050**	**17.0**	0.00432 J	
	UG-1	Apr-17		471	178	0.928	1.14	99.1	**1,830**	**3,390**	**15.0**	<0.00180	
	UG-2	Apr-14		403	97.1	1.14	1.75	104	**1,530**	**2,660**	3.77	<0.00500	
	UG-2	Apr-15		337 J	72.2	**1.65**	1.73	82.6	**1,080**	**1,170**	4.62	<0.00180	
	UG-2	Apr-16		402	86.5	**1.75**	2.04 J	103	**1,210**	**2,240**	5.46	0.00511	
	UG-2	Apr-17		342	78.9	**1.67**	1.60	94.0	**1,060**	**2,270**	**16.3**	<0.00180	
	UG-3R	Apr-14		422	46.8	0.492	1.65	56.9	**1,480**	**2,340**	2.26	<0.00500	
	UG-3R	Apr-14	FD	389	46.8	0.496	1.53	53.6	**1,500**	**2,400**	2.20	<0.00500	
	UG-3R	Apr-15		420 J	27.5	0.716	2.36	59.1	**1,450**	**1,420**	1.03	<0.00180	
	UG-3R	Apr-16		440	47.7	0.690	1.86	75.8	**1,350**	**2,340**	1.73	<0.00180	
	UG-3R	Apr-17		393	61.1	0.707	1.74	70.7	**1,310**	**2,140**	2.60	<0.00180 J5	
	UG-4	Apr-16		590	49.2	0.668	1.99 J	224	**2,480**	**4,140**	0.407	<0.00180	
	UG-4	Apr-17		594 V	154	0.666	1.87	202 V	**2,750**	**4,350**	0.547 J	<0.00180	

Definitions

X	Reported concentration, X, exceeds the CGWSL.
X	Analyte detected above the detection limit at a concentration equal to X.
<x	Analyte not detected at detection limit equal to x.
<x	Analyte not detected at detection limit equal to x, but x exceeds the CGWSL.
	Blank cell indicates a sample was collected from the well during the indicated sampling event, but the analyte was not analyzed.
---	No applicable CGWSL.

Abbreviations

CGWSL	Critical Groundwater Screening Level (see Table 3)
CGWSL Source	Source for CGWSL value (see Table 3)
Dup	Duplicate sample
FD	Field duplicate sample
mg/L	Milligrams per Liter
USEPA MCL	United States Environmental Protection Agency Maximum Contaminant Level, "Regional Screening Levels (RSL) Summary Table", November 2017
WQCC Dom	NMED Groundwater standard for domestic exposure, 20.6.2.3103.B NMAC
WQCC HH	NMED Groundwater standard for human health exposure, 20.6.2.3103.A NMAC

Lab Footnote

B	Analyte was also detected in the associated method blank.
H	The reported result is from a sample analyzed outside of Holding Time.
J	Indicates an estimated value.
J3	The associated batch QC was outside the established quality control range for precision.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
O1	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
P1	Relative percent difference value not applicable for sample concentrations less than 5 times the reporting limit.
V	The sample concentration is too high to evaluate accurate spike recoveries.

Table 5 - Summary of Production from Recovery Trenches and Wells

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Recovery Well	Recovery Method	Volume of Water Recovered [1] (gallons)					Volume of PSH Recovered [1] (gallons)				
		1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total 2017	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total 2017
RW-1R	Automated Pump	0	76,624	46,128	0	122,752	0	0	0	0	0
RW-2R	Automated Pump	35	71,287	88,420	0	159,742	0	0	2	0	2
RW-4R	Automated Pump	18	10	0	0	28	0	0	0	0	0
RW-5R	Automated Pump	0	15	0	0	15	0	0	0	0	0
RW-6R	Automated Pump	30	45	0	0	75					0
RW-7R	Automated Pump	568,121	1,260,610	311,314	0	2,140,045	0	0	0	0	0
RW-8R	Automated Pump	266,799	211,080	135,694	160,471	774,044	0	0	0	0	0
RW-12R	Automated Pump	0	0	0	0	0					0
RW-13R	Automated Pump	22,006	58,996	131,580	0	212,582	0	1,105	0	1	1,106
RW-14R	Automated Pump	0	132,076	181,600	4	313,680	0	141	17	489	647
RW-15	Automated Pump	0	0	0	0	0	0	0	0	0	0
RW-19	Automated Pump	2	41,876	44,509	0	86,387	1	0	2	0	3
RW-20	Automated Pump	5	0	136,567	527,316	663,888	0	10	0	1	11
RW-22	Automated Pump	169,068	543,347	3,731	0	716,146	222	1,643	20,661	197	22,723
TOTAL VOLUME RECOVERED:		1,026,084	2,395,966	1,079,543	687,791	**5,189,384**	223	2,899	20,682	688	**24,492**

[1] Volumes of recovered water and PSH are based on automated system readings, rounded to the nearest gallon

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Record of Climatological Observations

These data are quality controlled and may not be identical to the original observations.

Generated on 01/08/2018

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 3366 ft. Lat: 32.7547° N Lon: -104.3835° W

Station: **ARTESIA 6 S, NM US USC00290600**

Observation Time Temperature: 0730 Observation Time Precipitation: 0730

Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
			24 Hrs. Ending at Observation Time		At Observation	24 Hour Amounts Ending at Observation Time				At Obs. Time			4 in. Depth			8 in. Depth		
			Max.	Min.		Rain, Melted Snow, Etc. (in)	Flag	Snow, Ice Pellets, Hail (in)	Flag	Snow, Ice Pellets, Hail, Ice on Ground (in)	24 Hour Wind Movement (mi)	Amount of Evap. (in)	Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
2017	04	01	87	48	49	0.00		0.0		0		0.72	5	59	57			
2017	04	02	67	42	43	0.00		0.0		0		0.24	5	59	56			
2017	04	03	70	43	55	0.00		0.0		0		0.32	5	57	55			
2017	04	04	83	43	53	0.00		0.0		0		0.48	5	58	58			
2017	04	05	71	30	32	0.00		0.0		0		0.50	5	67	55			
2017	04	06	65	31	32	0.00		0.0		0		0.12	5	57	56			
2017	04	07	79	32	42	0.00		0.0		0		0.34	5	56	56			
2017	04	08	89	40	41	0.00		0.0		0		0.41	5	72	58			
2017	04	09	93	41	68	0.00		0.0		0		0.52	5	60	59			
2017	04	10	85	44	45	0.00		0.0		0		0.66	5	59	58			
2017	04	11	79	45	54	0.00		0.0		0		0.34	5	60	59			
2017	04	12	78	54	60	0.02		0.0		0		0.37	5	60	59			
2017	04	13	64	49	54	0.84		0.0		0		0.69	5	60	57			
2017	04	14	75	54	59	0.00		0.0		0		0.19	5	58	57			
2017	04	15	85	55	58	0.00		0.0		0		0.27	5	60	58			
2017	04	16	88	48	52	0.00		0.0		0		0.38	5	61	60			
2017	04	17	89	51	54	0.00		0.0		0		0.36	5	63	62			
2017	04	18	86	51	51	0.00		0.0		0		0.40	5	64	63			
2017	04	19	92	51	52	0.00		0.0		0		0.33	5	65	63			
2017	04	20	94	52	58	0.00		0.0		0		0.33	5	65	63			
2017	04	21	83	48	49	0.00		0.0		0		0.42	5	66	63			
2017	04	22	91	49	51	0.00		0.0		0		0.46	5	66	63			
2017	04	23	68	41	46	0.00		0.0		0		0.27	5	66	61			
2017	04	24	75	46	50	0.00		0.0		0		0.33	5	60	60			
2017	04	25	91	50	71	0.00		0.0		0		0.69	5	62	62			
2017	04	26	85	51	53	0.00		0.0		0		0.70	5	62	62			
2017	04	27	73	46	59	0.00		0.0		0		0.34	5	64	61			
2017	04	28	87	49	53	0.00		0.0		0		0.56	5	64	63			
2017	04	29	85	44	44	0.05		0.0		0		0.62	5	67	62			
2017	04	30	47	32	34	0.18		0.0		0		0.00	5	56	52			
Summary			80	45		1.09		0.0										

Empty, or blank, cells indicate that a data observation was not reported.

*Ground Cover: 1=Grass; 2=Fallow; 3=Bare Ground; 4=Brome grass; 5=Sod; 6=Straw mulch; 7=Grass muck; 8=Bare muck; 0=Unknown

"s" This data value failed one of NCDC's quality control tests.

"T" values in the Precipitation or Snow category above indicate a "trace" value was recorded.

"A" values in the Precipitation Flag or the Snow Flag column indicate a multiday total, accumulated since last measurement, is being used.

Data value inconsistency may be present due to rounding calculations during the conversion process from SI metric units to standard imperial units.

HMI
Groundwater

Hydrologic Monitoring
1654 W. Sam Houston Pkwy. N.
Houston, Texas 77043

Phone 713.464.5206
Fax 713.464.5207

May 2, 2017

Ms. Julie Speer, P.G., EIT
Associate Project Manager
TRC
505 East Huntland Drive, Suite 250
Austin, Texas 78752

Subject: April 2017 (Biennial Event) Groundwater Monitoring
Sitewide Gauging, April 25, 2017
Groundwater Sampling, April 25-27, 2017
Navajo Refining Company, Artesia, New Mexico

Dear Ms. Speer:

This document summarizes groundwater monitoring field activities conducted by Hydrologic Monitoring, LLC (HMI) on behalf of TRC at the Navajo Refining Company, Artesia Refinery, Artesia, New Mexico.

Contents

Field Activities Narrative
Table 1: (Gauging Data, Groundwater Field Parameters, Well Inspections, with Analytical Program)
Groundwater Sampling SOP Memo
Groundwater Sampling Forms and Field Instrument Calibration Log
(provided in three emails, with wells in geographic-based order shown on Table 1)
Chain-of-Custody Forms (provided in three emails)

Field Activities Narrative

1. HMI conducted the *April 2017 (Spring) Event* (Biennial event, including the "SA", "A", and "B" designations on the attached scoping table, Navajo Refinery, Artesia, New Mexico. Sitewide gauging was conducted April 25, 2017. Groundwater sampling (177 wells sampled) was conducted April 25-27, 2017.

2. Groundwater sampling was conducted in accordance with the Site Sampling and Analysis Plan, EPA guidance, and the attached Memorandum - Low-Flow Groundwater Monitoring Standard Operating Procedures, Navajo Refining Co. - Artesia, New Mexico. Per regulatory instruction, if

measured LNAPL thickness was *less than* 0.03-feet, in any well scheduled for groundwater sampling, the LNAPL was removed, and the well was sampled. And if LNAPL thickness equaled 0.03-feet or *greater*, the well was not sampled. Gauging data, groundwater field parameters, and well inspection information is summarized in Table 1. Samples were shipped overnight to ESC Lab Sciences, Mt. Juliet, TN, via FedEx. The groundwater sampling process is documented on the attached groundwater sampling forms.

3. Field QA/QC Sampling (per Refinery Area):

Evaporation Ponds

Duplicates:
Dup-EP-01 at MW-7A
Dup-EP-02 at MW-22A
Dup-EP-03 at MW-3

Equipment Blanks:
EB-EP-01 collected over decontaminated gauging probe following sampling at MW-74
EB-EP-02 collected over decontaminated gauging probe following sampling at MW-124
EB-EP-03 collected over decontaminated gauging probe following sampling at MW-5A
EB-EP-04 collected over decontaminated gauging probe following sampling at MW-79

Trip Blank-EP-01
Trip Blank-EP-02
Trip Blank-EP-03

NCL

Duplicate:
Dup-NCL-01 at NCL-49

Equipment Blank:
EB-NCL-01 collected over decontaminated gauging probe following sampling at NCL-32

Trip Blank-NCL-01

TEL

Duplicate:
Dup-TEL-01 at TEL-4

Equipment Blank:
EB-TEL-01 collected over decontaminated gauging probe following sampling at TEL-3

Trip Blank-TEL-01

TMD

Trip Blank-TMD-01
Limited TMD scope generated no additional field QA/QC samples

REST ("rest" of the site)

Duplicates:
Dup-REST-01 at MW-113
Dup-REST-02 at MW-104
Dup-REST-03 at MW-134
Dup-REST-04 at MW-60
Dup-REST-05 at KWB-12B

Equipment Blanks:
EB-REST-01 collected over decontaminated gauging probe following sampling at MW-113
EB-REST-02 collected over decontaminated gauging probe following sampling at MW-104

EB-REST-03 collected over decontaminated gauging probe following sampling at MW-134
EB-REST-04 collected over decontaminated gauging probe following sampling at MW-60
EB-REST-05 collected over decontaminated gauging probe following sampling at KWB-12B
Trip Blank-REST-01
Trip Blank-REST-02
Trip Blank-REST-03
Trip Blank-REST-04

4. Site Notes:
   Beginning 2H17, "24HFNAV HOLLYFRONTIER SITE SPECIFIC ORTIENTATION ARTESIA – NM" will be taken at HASC annually, per Navajo, 4-20-17.
   HMI's 8-person team completed annual training at the safety training trailers on 4-26-16 (compliant through end of April 2017).
   HMI's DISA backgound check/drug/alcohol requirements were approved by onsite safety-trailer personnel on 10-19-15, as reported through HASC system.
   Per Navajo, purgewater is disposed in the pad sump, just inside, and to the left of the Main Gate entrance. Alternately, North Bundle Pad sump, as previously (fenced area of drums, etc.), notifying FCC control room for entrance.
   Sitewide well and gate lock combinations are "2013" (less often "2002").
   With suggested telephone notification, FedEx pickup from locked shed (35-25-39 combination) at approximately 16:00 daily, across from Artesia Wool Co (access area from "inside" Refinery).
   North side of Hwy 82, east of site, gate with cable and combination lock (8810).
   POTW bldg, check-in as needed, to borrow a key or get gate unlocked.
   Navajo's Mr. Robert Combs or Richard Orosco for daily permits.
   Navajo-well locks have been fully-deployed as possible, as of 2H16.
   Well surface completion inspections are documented on respective well gauging and sampling forms (summarized in Table 1). Well inspection items of potential concern (i.e., "Issues") are highlighted in yellow-color in Table 1. HMI provided sitewide well completion photographs (every monitor/recovery well addressed during the biennial April 2017 event) to both TRC and Navajo.

HMI appreciates the opportunity to assist TRC with this project. If you have any questions or would like additional information please feel free to call us at 713.464.5206.

Sincerely,

HYDROLOGIC MONITORING

Scott C. Ude



Scott C. Ude, P.G.

The seal appearing on this document was authorized by Scott C. Ude, P.G. 353 on May 2, 2017.

Attachments

cc: Bryan Gilbert, P.G., TRC-Austin

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H17

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
MW-6A	Monitoring	MDB	1	EP	25-Apr	17:00	NA	12.21	0.00	19.05	26-Apr	18:10	7.69	20.2	5,600	1.3	-114.3	4.3	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-6B	Monitoring	MDB	2	EP	25-Apr	17:05	NA	12.10	0.00	52.27	26-Apr	18:50	7.58	20.4	5,770	0.7	-53.0	3.1	Clear	Yes	Closure	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
MW-85	Monitoring	MDB		EP	25-Apr	16:30	9.70	10.42	0.72	20.34			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-86	Monitoring	MDB		EP	25-Apr	16:40	9.52	9.55	0.03	19.21			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]
MW-120	Monitoring	MDB	3	EP	25-Apr	16:55	NA	12.14	0.00	28.00	26-Apr	17:25	7.41	19.7	11,940	0.4	-137.8	4.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-121	Monitoring	MDB	4	EP	25-Apr	16:50	NA	12.71	0.00	27.32	26-Apr	16:40	7.67	19.6	7,050	0.7	-31.1	9.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-84	Monitoring	MDB	5	EP	25-Apr	16:25	NA	9.22	0.00	20.56	26-Apr	14:15	7.19	19.8	10,620	0.6	-21.0	7.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-122	Monitoring	MDB	6	EP	25-Apr	13:25	NA	10.38	0.00	23.31	26-Apr	15:55	7.22	18.4	11,680	0.5	-57.1	15.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-81	Monitoring	MDB	7	EP	25-Apr	15:20	NA	10.71	0.00	18.63	26-Apr	13:30	7.32	19.2	7,990	2.5	-79.9	3.3	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-80	Monitoring	MDB	8	EP	25-Apr	15:25	NA	8.90	0.00	19.69	26-Apr	12:45	7.12	17.7	9,260	1.6	-161.1	3.1	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-79	Monitoring	MDB	9	EP	25-Apr	15:30	NA	9.84	0.00	19.25	26-Apr	11:55	7.57	17.2	7,260	1.1	-192.4	3.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-82	Monitoring	MDB	10	EP	25-Apr	15:40	NA	9.05	0.00	20.00	25-Apr	16:05	7.41	21.5	8,090	0.7	-47.2	6.2	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-74	Monitoring	MDB	11	EP	25-Apr	14:25	NA	8.81	0.00	20.19	25-Apr	14:50	7.23	21.6	11,810	0.7	-75.7	4.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-73	Monitoring	MDB	12	EP	25-Apr	13:40	NA	8.75	0.00	19.60	25-Apr	14:05	7.51	20.4	11,910	1.1	49.9	28.2	Sl. Cloudy	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-2A	Monitoring	MDB	13	EP	25-Apr	13:15	NA	10.72	0.00	17.31	26-Apr	15:00	7.05	19.0	13,680	0.7	-86.5	3.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-2B	Monitoring	MDB		EP	25-Apr	13:20	NA	10.60	0.00	52.00			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
MW-72	Monitoring	MDB	14	EP	25-Apr	12:30	NA	7.06	0.00	13.92	25-Apr	12:55	7.00	22.9	13,340	0.7	33.0	9.7	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
OCD-6	Monitoring	MDB	15	EP	25-Apr	9:40	NA	10.95	0.00	26.91	25-Apr	10:05	6.87	21.6	15,700	0.6	31.1	7.8	Clear	Yes	Closure	Cracked pad	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
OCD-7AR	Monitoring	MDB	16	EP	25-Apr	10:30	NA	9.72	0.00	21.29	25-Apr	10:55	7.05	21.7	12,610	0.7	10.4	7.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
OCD-7B	Monitoring	MDB	17	EP	25-Apr	11:15	NA	9.57	0.00	56.85	25-Apr	11:50	7.45	22.0	5,870	0.5	-148.9	4.7	Clear	Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
OCD-7C	Monitoring	MDB		EP	25-Apr	12:20	NA	8.99	0.00	71.95			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
RW-#15C [e]	Recovery [d]	MDB	18	REST	25-Apr	9:10	NA	14.74	0.00	22.30	26-Apr	10:00	6.77	20.5	2,720	2.7	-337.9	6.1	Clear	Yes	Yes	Yes	Yes		SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-48	Monitoring	MDB	19	REST	25-Apr	9:15	NA	17.03	0.00	32.00	26-Apr	9:15	6.78	21.0	4,300	1.4	-375.1	8.2	Clear	Yes	Yes	Issue	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-130	Monitoring	MDB	20	REST	25-Apr	9:20	NA	18.89	0.00	45.00	26-Apr	10:50	6.80	21.6	3,200	1.5	-241.0	6.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
KWB-4	Monitoring	MDB		REST	25-Apr	9:05	22.96	23.05	0.09	41.75			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	-	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-19	Recovery [d]	MDB		REST	25-Apr	9:00	23.16	23.19	0.03	NM			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-76	Monitoring	SCD	21	EP	25-Apr	15:45	NA	10.68	0.00	20.33	26-Apr	16:40	6.92	19.8	7,470	1.4	-89.7	5.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-77	Monitoring	SCD	22	EP	25-Apr	15:50	NA	8.92	0.00	20.52	26-Apr	17:25	6.89	19.2	8,670	2.6	-83.9	6.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-78	Monitoring	SCD	23	EP	25-Apr	15:55	NA	8.92	0.00	19.57	26-Apr	18:05	6.99	19.0	4,830	2.0	54.2	3.5	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-75	Monitoring	SCD	24	EP	25-Apr	16:00	NA	9.08	0.00	23.74	26-Apr	18:50	7.08	19.6	8,310	1.1	-106.5	6.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H17

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
MW-83	Monitoring	SCD	25	EP	25-Apr	16:05	NA	8.91	0.00	19.91	26-Apr	15:55	7.01	19.9	6,080	1.2	-123.1	7.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-3	Monitoring	SCD	26	EP	25-Apr	16:10	NA	9.06	0.00	20.18	26-Apr	14:55	7.00	22.9	6,950	1.1	-68.2	8.1	Clear	Yes	Yes	Issue	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-88	Monitoring	SCD	27	EP	25-Apr	15:00	NA	8.45	0.00	20.31	26-Apr	10:55	7.01	17.6	8,070	1.2	-70.4	8.4	Clear	Yes	Yes	Hole in pad	Yes		SA	SA	SA	SA	SA	SA	-	-	A	A	A
MW-22A	Monitoring	SCD	28	EP	25-Apr	15:10	NA	7.75	0.00	22.65	26-Apr	11:40	7.01	18.0	9,010	1.2	-35.6	23.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-22B	Monitoring	SCD	29	EP	25-Apr	15:15	NA	7.60	0.00	54.66	26-Apr	12:35	7.04	18.7	7,370	1.2	-47.9	5.8	Clear	Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
MW-10	Monitoring	SCD	30	EP	25-Apr	15:25	NA	5.20	0.00	18.45	26-Apr	13:20	6.80	19.1	7,190	1.1	-20.8	4.3	Clear	Yes	Yes	Cracked pad	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-123	Monitoring	SCD	31	EP	25-Apr	15:35	NA	5.59	0.00	25.71	26-Apr	14:05	6.99	19.2	8,160	1.3	-18.6	7.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-4A	Monitoring	SCD	32	EP	25-Apr	14:45	NA	11.59	0.00	>11.88	26-Apr	9:25	7.15	17.5	7,050	2.4	-178.9	7.1	Clear	Yes	Issue	Issue	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-4B	Monitoring	SCD	33	EP	25-Apr	14:50	NA	10.85	0.00	72.37	26-Apr	10:10	7.09	18.8	5,460	3.0	-125.4	4.7	Clear	Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
MW-5A	Monitoring	SCD	34	EP	25-Apr	12:10	NA	8.18	0.00	20.15	25-Apr	12:35	7.24	21.1	15,520	1.1	-142.1	7.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-5B	Monitoring	SCD	35	EP	25-Apr	13:05	NA	8.34	0.00	53.54	25-Apr	13:30	7.00	21.2	8,970	0.9	-96.1	2.1	Clear	Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
MW-5C	Monitoring	SCD	36	EP	25-Apr	13:50	NA	8.54	0.00	71.64	25-Apr	14:15	7.21	21.8	4,480	1.1	-93.8	34.5	Clear	Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
MW-7A	Monitoring	SCD	37	EP	25-Apr	10:30	NA	7.57	0.00	17.25	25-Apr	10:55	7.21	19.2	10,390	1.0	-81.3	9.8	Clear	Yes	Yes	Issue	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-7B	Monitoring	SCD	38	EP	25-Apr	11:25	NA	8.87	0.00	52.56	25-Apr	11:50	7.08	21.1	5,810	0.9	-9.3	3.7	Clear	Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
OCD-8A	Monitoring	SCD	39	EP	25-Apr	9:45	NA	8.61	0.00	20.74	25-Apr	10:10	7.06	21.2	13,410	1.2	-145.3	6.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
OCD-8B	Monitoring	SCD	40	EP	25-Apr	9:00	NA	8.77	0.00	56.65	25-Apr	9:25	6.92	21.3	9,820	0.8	-95.3	8.1	Clear	Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
KWB-P4	Monitoring	BRH	41	REST	25-Apr	11:10	NA	4.36	0.00	30.26	26-Apr	8:55	7.29	16.9	5,610	1.2	83.6	6.8	Clear	Yes	Yes	Yes	Yes		B	B	B	-	B	-	-	-	-	-	-
MW-25	Monitoring	BRH	42	TMD	25-Apr	11:25	NA	11.62	0.00	28.18	26-Apr	15:10	7.28	19.7	14,350	0.5	81.2	1.8	Clear	Yes	Yes	Subsidence	Yes		SA	A	A	-	A	A	-	-	A	A	A
NP-8	Monitoring	BRH		TMD	25-Apr	11:30	NA	12.65	0.00	15.20			Not in sampling program							Issue	Issue	Yes	Yes		SA	Not in samp prgm; gauged to top of protective steel casing									
MW-1R	Monitoring	BRH	43	EP	25-Apr	11:35	NA	10.95	0.00	20.63	26-Apr	16:00	7.23	18.7	12,460	0.5	-122.8	42.6	Clear	Yes	Issue	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-15	Monitoring	BRH	44	EP	25-Apr	11:40	NA	11.85	0.00	21.70	26-Apr	16:50	7.39	20.2	9,810	0.6	45.3	1.7	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
OCD-1R	Monitoring	BRH	45	EP	25-Apr	11:50	NA	12.33	0.00	23.89	26-Apr	14:25	7.22	19.0	10,140	0.7	22.4	3.9	Clear	Yes	Issue	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
OCD-2A	Monitoring	BRH	46	EP	25-Apr	11:57	NA	12.42	0.00	27.58	26-Apr	13:40	7.37	19.0	7,270	0.5	-122.8	7.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	A	A	A
OCD-2B	Monitoring	BRH		EP	25-Apr	12:00	NA	11.36	0.00	50.39			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
OCD-3	Monitoring	BRH	47	EP	25-Apr	12:05	NA	12.94	0.00	25.48	26-Apr	12:50	7.23	19.8	8,170	1.1	86.2	5.7	Clear	Yes	Yes	Pad destryd	Yes		SA	SA	SA	SA	SA	SA	-	-	A	A	A
OCD-4	Monitoring	BRH	48	EP	25-Apr	12:10	NA	12.20	0.00	25.42	26-Apr	9:50	7.33	18.8	13,230	0.6	-5.7	17.9	Clear	Yes	Yes	Subsidence	Yes		SA	SA	SA	SA	SA	SA	-	-	A	A	A
MW-11A	Monitoring	BRH	49	EP	25-Apr	12:15	NA	9.69	0.00	22.01	26-Apr	11:20	7.02	19.0	27,800	0.7	-3.4	8.1	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	SA	SA	SA
MW-11B	Monitoring	BRH	50	EP	25-Apr	12:18	NA	9.66	0.00	47.30	26-Apr	12:05	7.17	19.8	18,660	0.8	-82.7	2.2	Clear	Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
OCD-5	Monitoring	BRH	51	EP	25-Apr	12:25	NA	10.40	0.00	25.42	26-Apr	10:35	7.40	18.9	14,720	0.6	-52.6	36.1	Sl. Cloudy	Yes	Yes	Pad cracked	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-87	Monitoring	BRH	52	EP	25-Apr	12:50	NA	8.58	0.00	20.39	25-Apr	17:20	7.34	20.4	15,230	0.6	-122.9	1.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	A	A	A

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H17

Navajo Refinery Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
MW-18A	Monitoring	BRH	53	EP	25-Apr	13:00	NA	10.29	0.00	22.58	25-Apr	13:30	7.16	21.2	6,730	0.6	-152.7	1.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	SA	SA	SA	SA	SA
MW-18B	Monitoring	BRH	54	EP	25-Apr	13:50	NA	10.72	0.00	50.59	25-Apr	14:20	7.03	22.5	4,940	0.6	-5.3	0.7	Clear	Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
MW-18T	Monitoring	BRH		EP	25-Apr	12:55	NA	10.06	0.00	50.39			Not in sampling program							Issue	Issue	Issue	Yes		SA	Not in samp prgm; gauged to highest pointt of shattered PVC									
MW-70	Monitoring	BRH	55	EP	25-Apr	14:55	NA	8.10	0.00	22.05	25-Apr	15:20	7.16	21.4	6,320	0.5	-82.9	8.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	A	A	A
MW-124	Monitoring	BRH	56	EP	25-Apr	15:55	NA	9.62	0.00	22.01	25-Apr	16:20	7.20	19.6	11,660	0.6	-94.1	19.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-52	Monitoring	BRH	57	REST	25-Apr	9:09	NA	17.74	0.00	34.67	27-Apr	8:55	6.84	21.2	5,250	0.7	114.9	3.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-109	Monitoring	BRH	58	REST	25-Apr	9:04	NA	16.01	0.00	29.48	27-Apr	9:40	6.82	22.8	3,370	0.4	-369.2	4.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-110	Monitoring	BRH	59	REST	25-Apr	9:00	NA	13.99	0.00	29.74	27-Apr	10:25	7.05	22.6	1,827	0.5	-349.9	6.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-13	Monitoring	BRH		EP	25-Apr	10:16	NA	12.40	0.00	21.10			Not in sampling program							Yes	Yes	Yes	Yes		SA	No sampling due to location N. of river									
MW-69	Monitoring	BRH		EP	25-Apr	10:10	NA	11.53	0.00	22.50			Not in sampling program							Yes	Yes	Yes	Yes		SA	No sampling due to location N. of river									
MW-12	Monitoring	BRH		EP	25-Apr	10:05	NA	10.76	0.00	17.93			Not in sampling program							Yes	Yes	Yes	Yes		SA	No sampling due to location N. of river									
MW-24	Monitoring	BRH		EP	25-Apr	9:45	NA	12.46	0.00	23.51			Not in sampling program							Yes	Yes	Issue	Yes		SA	No sampling due to location E. of river									
MW-14	Monitoring	BRH		EP	25-Apr	9:55	NA	11.84	0.00	>11.93			Not in sampling program							Yes	Issue	Yes	Yes		SA	No sampling due to location N. of river									
RW-12	Recovery [d]	BTB	Field E of Refinery				Not in gauging program						Not in sampling program												-	-	-	-	-	-	-	-	-	-	-
RW-12R	Recovery [d]	BTB	60	REST	25-Apr	12:49	NA	21.04	0.00	NM	27-Apr	12:30	9.01	19.7	3,861	0.2	-210.1	8.6	Clear	Yes	Yes	Yes	Yes		SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-113	Monitoring	BTB	61	REST	25-Apr	12:59	NA	20.98	0.00	37.80	27-Apr	9:10	6.53	21.7	2,920	2.0	-49.6	5.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
KWB-8	Monitoring	BTB	62	REST	25-Apr	17:10	19.26	19.27	0.01	35.80	25-Apr	17:35	6.76	21.2	3,622	0.9	-197.7	7.4	Clear	Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	-	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]
RW-22	Recovery [d]	BTB		REST	25-Apr	16:58	26.68	29.13	2.45	NM			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
RW-20A	Recovery [d]	BTB		REST	25-Apr	16:35	>19.98	>19.98	NM	NM			NM=Unable to gauge thickness, however, LNAPL through port							NA	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
RW-20B	Recovery [d]	BTB		REST	25-Apr	16:45	20.30	>20.48	>0.18	NM			Top of pump prevented LNAPL thickness measurement							NA	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
RW-13	Recovery [d]	BTB	Field E of Refinery				Not in gauging program						Not in sampling program											Y	-	-	-	-	-	-	-	-	-	-	-
RW-13R	Recovery [d]	BTB		REST	25-Apr	13:10	19.53	19.64	0.11	NM			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
RW-14	Recovery [d]	BTB	Field E of Refinery				Not in gauging program						Not in sampling program											Y	-	-	-	-	-	-	-	-	-	-	-
RW-14R	Recovery [d]	BTB		REST	25-Apr	13:18	16.92	17.98	1.06	NM			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-133	Monitoring	BTB		REST	25-Apr	13:27	16.77	17.06	0.29	37.64			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-134	Monitoring	BTB	63	REST	25-Apr	13:45	NA	14.16	0.00	32.95	26-Apr	8:45	6.61	18.7	5,047	0.9	106.1	4.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
RA-4798	Irrigation	BTB	64	REST			Not in gauging program			NA	26-Apr	9:25	7.08	19.6	1,150	1.5	79.5	1.1	Clear	NA	NA	Yes	Yes		NA	SA	-	-	SA	-	-	-	SA	SA	SA
RA-4196	Irrigation	BTB	65	REST			Not in gauging program			NA	26-Apr	9:45	7.18	22.5	1,968	1.7	51.8	1.7	Clear	NA	NA	Yes	Yes		NA	SA	-	-	SA	-	-	-	SA	SA	SA
RA-1227	Irrigation	BTB		REST			Removed from program by Navajo, 4-13-15						Removed from program by Navajo, 4-13-15												NA	A [h]	-	-	A [h]	-	-	-	A [h]	A [h]	A [h]
RA-3156	Irrigation	BTB	66	REST			Not in gauging program			NA	26-Apr	10:15	6.84	20.5	2,862	4.2	-46.3	134.0	Cloudy	NA	NA	NA	Yes		NA	A	-	-	A	-	-	-	A	A	A

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H17

Navajo Refinery Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
RA-313	Irrigation	BTB	67	REST			Not in gauging program			NA	27-Apr	9:30	7.08	20.7	1,303	3.1	-68.4	1.2	Clear	NA	NA	NA	Yes		NA	A	-	-	A	-	-	-	A	A	A
KWB-7	Monitoring	BTB	68	REST	25-Apr	12:32	NA	18.54	0.00	34.83	25-Apr	18:20	6.77	20.2	3,389	0.8	-105.9	7.6	Clear	Yes	Yes	Needs pad	Yes		SA	SA	SA	-	SA	SA	SA	SA	SA	SA	SA
MW-135	Monitoring	BTB	69	REST	25-Apr	12:09	NA	26.53	0.00	65.55	26-Apr	16:50	6.69	18.3	7,337	3.4	157.9	66.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-20	Monitoring	BTB	70	TMD	25-Apr	15:00	NA	10.28	0.00	26.66	27-Apr	10:20	7.04	22.0	5,310	1.7	42.3	4.1	Clear	Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
NP-3	Monitoring	BTB		TMD	25-Apr	13:56	NA	11.74	0.00	21.59			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
NP-4	Monitoring	BTB		TMD	25-Apr	14:02	NA	17.79	0.00	36.98			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
NP-2	Monitoring	BTB		TMD	25-Apr	14:12	NA	12.83	0.00	21.49			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
NP-1	Monitoring	BTB	71	TMD	25-Apr	14:20	NA	13.44	0.00	21.88	26-Apr	18:20	7.76	18.2	4,726	1.1	137.1	1.7	Clear	Yes	Yes	Yes	Yes		SA	SA	-	-	SA	-	-	-	A	A	A
NP-6	Monitoring	BTB	72	TMD	25-Apr	14:29	NA	10.23	0.00	20.35	26-Apr	17:40	6.56	17.7	6,222	0.9	89.1	3.7	Clear	Yes	Yes	Yes	Yes		SA	B	-	-	B	-	-	-	-	-	-
MW-8	Monitoring	BTB	73	TMD	25-Apr	14:52	NA	9.04	0.00	20.12	27-Apr	11:50	7.21	21.4	4,170	1.4	43.1	4.1	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-21	Monitoring	BTB	74	TMD	25-Apr	14:49	NA	10.41	0.00	25.12	27-Apr	11:05	7.10	21.2	5,620	1.3	51.9	2.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-9	Monitoring	BTB		TMD	25-Apr	14:42	NA	9.51	0.00	20.19			Not in sampling program							Yes	Yes	Cracked pad	Yes		SA	Not in sampling program									
MW-71	Monitoring	BTB	75	TMD	25-Apr	14:34	NA	11.71	0.00	21.87	26-Apr	11:05	6.95	17.7	6,416	2.4	122.9	3.1	Clear	Yes	Yes	Yes	Yes		SA	A	A	-	A	A	A	A	A	A	A
MW-68	Monitoring	BTB	76	TMD	25-Apr	11:02	NA	15.46	0.00	26.52	26-Apr	11:55	6.95	19.7	3,279	0.5	121.4	5.2	Clear	Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-27	Monitoring	BTB	77	TMD	25-Apr	11:28	NA	16.06	0.00	30.28	26-Apr	15:55	6.53	20.9	2,785	0.7	87.3	5.5	Clear	Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-89	Monitoring	BTB	78	TMD	25-Apr	11:39	NA	9.78	0.00	20.28	26-Apr	14:55	6.95	17.9	4,109	1.7	52.7	7.2	Clear	Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-16	Monitoring	BTB	79	TMD	25-Apr	11:47	NA	8.18	0.00	21.24	26-Apr	14:00	6.85	17.6	7,046	0.8	117.1	5.4	Clear	Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-26	Monitoring	BTB	80	TMD	25-Apr	11:56	NA	9.39	0.00	27.58	26-Apr	12:55	6.89	17.5	9,022	0.6	101.9	3.8	Clear	Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
KWB-11A	Monitoring	BTB	81	REST	25-Apr	12:17	NA	19.14	0.00	42.27	25-Apr	19:10	6.69	19.1	6,244	0.9	-12.3	2.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
KWB-11B	Monitoring	BTB	82	REST	25-Apr	12:21	NA	19.88	0.00	72.45	25-Apr	20:00	6.88	18.6	2,962	0.8	69.2	1.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
KWB-3AR	Monitoring	BTB		REST			Removed from program by Navajo, 4-14-15 (farmer Jack Joy, 575-365-6042)																		SA	SA	SA	-	SA	SA	SA	SA	SA	SA	SA
MW-115	Monitoring	BTB	83	REST	25-Apr	10:48	NA	5.43	0.00	27.50	27-Apr	10:40	6.80	17.5	4,217	1.1	92.3	1.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-114	Monitoring	BTB	84	REST	25-Apr	10:40	NA	3.63	0.00	38.25	27-Apr	11:30	6.91	19.7	3,669	0.9	149.1	5.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-117	Monitoring	GDS	85	REST	25-Apr	17:45	NA	9.19	0.00	27.22	26-Apr	8:55	6.80	15.8	3,740	0.8	80.0	58.0	Sl. Cloudy	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-118	Monitoring	GDS	86	REST	25-Apr	17:51	NA	11.69	0.00	28.29	26-Apr	9:40	6.89	15.5	4,220	4.0	94.7	9.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
NP-9	Monitoring	GDS		TMD	25-Apr	17:58	NA	10.69	0.00	25.89			Not in sampling program							Yes	Issue	Issue	Yes		SA	Not in sampling program									
MW-119	Monitoring	GDS	87	REST	25-Apr	18:07	NA	10.41	0.00	28.11	26-Apr	10:25	6.81	16.1	3,950	0.9	82.9	8.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
NP-5	Monitoring	GDS	88	REST	25-Apr	13:45	NA	11.56	0.00	25.09	25-Apr	14:10	7.04	18.8	5,410	1.7	102.5	5.0	Clear	Yes	Yes	Yes	Yes		SA	B	B	-	B	B	-	-	B	B	B
MW-136	Monitoring	GDS	89	REST	25-Apr	12:55	NA	11.11	0.00	27.90	25-Apr	13:20	6.83	19.2	4,490	1.4	109.5	7.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-126A	Monitoring	GDS	90	REST	25-Apr	15:49	NA	12.20	0.00	37.51	27-Apr	9:20	6.62	19.4	3,550	0.9	-181.3	7.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H17

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
MW-126B	Monitoring	GDS	91	REST	25-Apr	15:52	NA	12.09	0.00	51.45	27-Apr	10:00	6.64	18.9	4,240	0.7	12.5	8.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-127	Monitoring	GDS	92	REST	25-Apr	15:41	NA	17.43	0.00	53.21	27-Apr	10:50	6.75	20.6	2,830	0.8	-276.1	5.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-129	Monitoring	GDS	93	REST	25-Apr	15:25	NA	20.80	0.00	53.08	27-Apr	11:40	6.70	22.5	2,270	1.4	-206.5	6.8	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-#18A [e]	Recovery [d]	GDS	94	REST	25-Apr	12:10	NA	10.09	0.00	17.78	25-Apr	12:35	7.08	18.7	4,400	2.0	95.2	0.9	Clear	Yes	Yes	Yes	Yes		SA	A	-	-	A	A	-	-	A	A	A
KWB-1A	Monitoring	GDS	95	REST	25-Apr	10:45	NA	12.20	0.00	33.50	25-Apr	11:15	6.71	19.7	5,390	0.8	57.3	4.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	SA	SA	SA	SA	SA
KWB-1B	Monitoring	GDS		REST	25-Apr	10:48	NA	13.85	0.00	33.92			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
KWB-1C	Monitoring	GDS	96	REST	25-Apr	10:50	NA	14.42	0.00	52.71	25-Apr	11:50	6.73	19.7	5,370	1.6	90.1	1.1	Clear	Yes	Yes	Yes	Yes		SA	B	B	-	B	B	-	-	B	B	B
KWB-10R	Monitoring	GDS	97	REST	25-Apr	10:05	NA	15.31	0.00	29.46	25-Apr	10:30	6.60	20.6	1,897	0.9	-163.2	6.2	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	-	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-131	Monitoring	GDS	98	REST	25-Apr	15:33	NA	22.00	0.00	53.35	27-Apr	11:10	6.78	22.7	2,008	0.6	-218.1	7.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
KWB-5	Monitoring	GDS	99	REST	25-Apr	15:18	NA	22.28	0.00	37.68	26-Apr	16:40	6.61	21.1	2,940	2.3	-146.0	3.6	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	-	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-111	Monitoring	GDS	100	REST	25-Apr	15:12	NA	23.40	0.00	40.83	26-Apr	15:35	6.62	21.0	2,980	2.0	-101.1	8.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
KWB-6	Monitoring	GDS	101	REST	25-Apr	14:58	NA	21.02	0.00	36.44	26-Apr	14:35	6.81	20.2	2,400	0.9	-275.6	2.8	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	-	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-112	Monitoring	GDS		REST	25-Apr	15:04	20.05	20.37	0.32	37.54			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-132	Monitoring	GDS		REST	25-Apr	14:50	18.58	18.84	0.26	42.66			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-57	Monitoring	GDS	102	REST	25-Apr	14:35	NA	19.91	0.00	34.32	26-Apr	13:45	6.71	19.2	5,040	1.0	103.6	14.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
RW-#11-0 [e]	Recovery [d]	GDS		REST	25-Apr	14:42	NA	22.08	0.00	22.20			Not sampled due to lack of water column available							Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
KWB-9	Monitoring	GDS		REST			Historically-obstructed @ 15.11'						Removed from program by Navajo, 4-26-16 (farmer Jack Joy, 575-365-6042)												SA [h]	A [h]	A [h]	-	A [h]	A [h]	A [h]	A [h]	A [h]	A [h]	A [h]
KWB-12A	Monitoring	GDS	103	REST	25-Apr	9:35	NA	22.71	0.00	25.03	26-Apr	12:10	6.79	18.9	3,770	3.5	101.1	1.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
KWB-12B	Monitoring	GDS	104	REST	25-Apr	9:39	NA	22.52	0.00	39.39	26-Apr	12:50	6.84	18.6	3,870	4.3	80.8	0.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
KWB-2R	Monitoring	GDS	105	REST	25-Apr	16:50	NA	21.13	0.00	39.41	25-Apr	17:15	6.85	21.0	3,220	1.6	-202.7	1.1	Clear	Yes	Yes	Yes	Yes		SA [h]	SA [d, h]	SA [d, h]	-	SA [d, h]	SA [d, h]	-	-	SA [d, h]	SA [d, h]	SA [d, h]
MW-58	Monitoring	GDS	106	REST	25-Apr	16:05	NA	20.12	0.00	33.06	25-Apr	16:30	6.82	20.6	2,340	1.6	-246.0	8.0	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	-	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]
KWB-13	Monitoring	GDS	107	REST	25-Apr	9:05	NA	24.51	0.00	33.10	26-Apr	11:20	6.89	18.0	3,980	3.7	102.9	>200	Cloudy	Yes	Yes	Yes	Yes		SA	A	A	-	A	A	A	A	A	A	A
MW-103	Monitoring	SCU	108	REST	25-Apr	14:20	NA	17.10	0.00	25.22	25-Apr	14:45	7.39	31.6	33,300	1.9	-329.1	2.8	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-104	Monitoring	SCU	109	REST	25-Apr	15:10	NA	16.48	0.00	21.97	25-Apr	15:35	7.14	24.5	1,750	1.5	-329.2	3.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-64	Monitoring	SCU	110	REST	25-Apr	12:35	NA	18.50	0.00	34.08	25-Apr	13:00	7.24	30.6	2,540	1.4	-375.3	3.7	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-65	Monitoring	SCU	111	REST	25-Apr	13:25	NA	14.32	0.00	28.78	25-Apr	13:50	7.06	27.3	2,120	1.5	-227.7	7.5	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-5	Recovery [d]	SCU		S Refinery			Not in gauging program						Not in sampling program											Y	-	-	-	-	-	-	-	-	-	-	-
RW-5R	Recovery [d]	SCU		REST	25-Apr	17:00	14.72	14.85	0.13	35.30			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-102	Monitoring	SCU	112	REST	25-Apr	16:35	NA	13.95	0.00	26.45	26-Apr	9:25	7.07	22.7	2,180	1.6	-320.6	6.3	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-4	Recovery [d]	SCU	113	REST	25-Apr	16:25	NA	12.48	0.00	36.62	26-Apr	13:10	7.25	24.3	2,190	1.1	-318.8	4.6	Clear	Yes	Yes	Yes	Yes		SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H17

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
RW-6	Recovery [d]	SCU		REST	25-Apr	16:50	13.55	13.62	0.07	34.90			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-99	Monitoring	SCU	114	REST	25-Apr	17:15	NA	16.02	0.00	27.80	26-Apr	10:20	6.96	22.6	2,040	1.3	-317.3	7.0	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-66	Monitoring	SCU	115	REST	25-Apr	17:20	NA	15.00	0.00	29.80	26-Apr	11:15	7.25	22.5	1,504	2.1	-224.8	4.2	Clear	Yes	Yes	Cracked pad	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-28	Monitoring	SCU	116	REST	25-Apr	15:30	NA	20.31	0.00	34.55	26-Apr	12:10	6.87	23.4	3,150	1.4	-334.1	5.0	Clear	Yes	Issue	Issue	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-59	Monitoring	SCU	117	REST	25-Apr	17:40	NA	5.85	0.00	32.72	27-Apr	9:25	6.97	24.5	3,040	1.8	-252.4	4.0	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-60	Monitoring	SCU	118	REST	25-Apr	17:50	NA	7.11	0.00	37.78	27-Apr	10:15	6.99	24.8	3,510	1.4	-307.2	3.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-107	Monitoring	SCU	119	REST	25-Apr	18:00	NA	9.91	0.00	19.05	26-Apr	15:10	7.11	23.0	1,957	1.6	-107.6	4.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-128	Monitoring	SCU	120	REST	26-Apr	13:40	NA	12.96	0.00	35.35	26-Apr	14:10	6.90	23.0	1,990	1.6	-63.2	12.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-125	Monitoring	SCU	121	REST	25-Apr	18:25	NA	6.48	0.00	28.31	26-Apr	16:00	7.09	21.1	4,130	1.3	65.3	3.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-116	Monitoring	SCU	122	REST	25-Apr	18:30	NA	7.06	0.00	27.63	26-Apr	16:55	7.27	15.8	3,480	1.2	6.7	14.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-46R	Monitoring	SCU	123	TMD	25-Apr	18:35	NA	4.29	0.00	19.36	27-Apr	11:40	7.02	24.2	3,820	2.3	40.8	13.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
UG-3R	Monitoring	SCU	124	REST	25-Apr	9:15	NA	24.62	0.00	38.58	25-Apr	9:40	7.05	23.2	2,260	5.1	175.2	3.6	Clear	Yes	Yes	Yes	Yes		A	A	A	A	A	A	A	A	A	A	A
UG-4	Monitoring	SCU	125	REST	25-Apr	10:00	NA	18.09	0.00	39.24	25-Apr	10:25	7.02	24.1	3,770	4.1	176.4	4.5	Clear	Yes	Yes	Yes	Yes		A	A	A	A	A	A	A	A	A	A	A
UG-1	Monitoring	SCU	126	REST	25-Apr	10:55	NA	13.22	0.00	24.08	25-Apr	11:20	7.35	25.9	2,940	5.5	167.3	3.9	Clear	Yes	Yes	Yes	Yes		A	A	A	A	A	A	A	A	A	A	A
UG-2	Monitoring	SCU	127	REST	25-Apr	11:45	NA	17.42	0.00	29.28	25-Apr	12:10	7.45	25.7	2,220	5.0	156.7	4.1	Clear	Yes	Yes	Yes	Yes		A	A	A	A	A	A	A	A	A	A	A
MW-101	Monitoring	TAB	128	REST	25-Apr	15:10	NA	12.27	0.00	26.85	27-Apr	9:45	6.60	22.0	2,110	1.2	-137.1	6.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-105	Monitoring	TAB	129	REST	25-Apr	15:00	NA	8.60	0.00	17.20	26-Apr	8:25	7.89	20.5	1,358	1.0	-379.3	8.8	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-2	Recovery [d]	TAB	130	REST	25-Apr	14:10	10.19	10.20	0.01	36.13	26-Apr	13:15	7.17	24.0	3,570	0.8	-388.2	4.2	Clear	Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	A [d]	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-61	Monitoring	TAB	131	REST	25-Apr	14:40	NA	10.03	0.00	29.30	26-Apr	9:35	7.58	22.9	2,650	0.9	-354.4	7.7	Clear	Yes	Yes	Cracked pad	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-62	Monitoring	TAB	132	REST	25-Apr	14:30	NA	10.84	0.00	29.50	26-Apr	10:20	7.33	22.4	3,590	0.9	-380.2	3.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-93	Monitoring	TAB	133	REST	25-Apr	14:00	NA	5.83	0.00	20.23	26-Apr	12:15	7.22	21.1	2,920	0.7	-373.2	3.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-43	Monitoring	TAB	134	REST	25-Apr	11:00	NA	7.03	0.00	19.67	25-Apr	11:25	7.41	24.0	4,620	1.0	-400.6	7.0	Clear	Yes	Issue	No pad	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-137	Monitoring	TAB	135	REST	25-Apr	13:00	NA	5.04	0.00	29.60	25-Apr	13:25	7.03	26.7	5,270	1.7	-406.9	6.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-138	Monitoring	TAB	136	REST	25-Apr	12:00	NA	6.78	0.00	24.81	25-Apr	12:25	7.01	30.9	3,160	1.0	-361.1	6.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-23	Monitoring	TAB	137	REST	25-Apr	13:50	NA	10.31	0.00	23.10	26-Apr	11:15	7.59	25.6	2,870	1.2	-342.2	7.7	Clear	Yes	Issue	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
TEL-4	Monitoring	TAB	138	TEL	25-Apr	15:40	NA	5.81	0.00	27.27	27-Apr	10:55	6.74	20.7	5,170	0.8	-383.7	5.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
TEL-3	Monitoring	TAB	139	TEL	25-Apr	15:50	NA	4.78	0.00	27.19	27-Apr	11:50	6.72	21.1	2,310	0.5	-394.9	4.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
TEL-2	Monitoring	TAB	140	TEL	25-Apr	16:00	NA	5.45	0.00	27.20	27-Apr	10:45	7.34	23.9	3,240	0.7	-359.1	4.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
TEL-1	Monitoring	TAB	141	TEL	25-Apr	16:10	NA	4.66	0.00	27.00	27-Apr	8:55	7.74	22.2	3,070	0.4	-297.9	3.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-39	Monitoring	TAB	142	REST	25-Apr	16:20	NA	5.25	0.00	25.44	26-Apr	19:20	7.68	21.8	4,430	0.9	-345.6	3.0	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H17

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
MW-98	Monitoring	TAB	143	REST	25-Apr	10:00	NA	6.48	0.00	25.60	25-Apr	10:25	7.47	23.1	3,140	1.1	-385.0	5.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
RW-10	Recovery [d]	TAB	144	REST	27-Apr	9:30	NA	4.99	0.00	22.49	27-Apr	9:55	8.16	21.8	2,530	0.2	-368.4	4.6	Clear	Yes	Yes	Issue	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-40	Monitoring	TAB	145	REST	25-Apr	16:30	NA	3.30	0.00	24.75	27-Apr	12:10	6.91	24.3	3,220	0.9	-353.8	9.8	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-41	Monitoring	TAB	146	REST	25-Apr	16:40	NA	3.41	0.00	21.56	26-Apr	18:25	7.47	21.1	3,330	0.8	-118.9	3.7	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
RW-9	Recovery [d]	TAB	147	REST	27-Apr	10:50	NA	5.74	0.00	21.83	27-Apr	11:15	6.91	23.2	3,870	1.4	-355.8	4.8	Clear	Yes	Yes	Issue	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-42	Monitoring	TAB	148	REST	25-Apr	16:50	NA	6.60	0.00	24.32	26-Apr	16:25	7.54	20.6	3,850	0.8	-293.5	1.6	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-29	Monitoring	TAB	149	REST	25-Apr	17:40	NA	7.49	0.00	22.00	26-Apr	17:25	7.62	21.2	3,400	0.7	-295.9	0.8	Clear	Yes	Yes	Issue	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
RW-#16B [e]	Recovery [d]	TAB	150	REST	25-Apr	17:20	NA	9.78	0.00	17.70	26-Apr	15:25	7.71	20.8	4,510	0.8	-226.7	1.0	Clear	Yes	Yes	Issue	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-30	Monitoring	TAB		REST	25-Apr	17:00	NA	8.30	0.00	23.50			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
MW-56	Monitoring	TAB	151	NCL	25-Apr	17:10	NA	9.55	0.00	26.50	26-Apr	14:25	7.38	21.8	4,160	1.0	-290.9	1.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
MW-49	Monitoring	TAB	152	TEL	25-Apr	15:30	NA	7.60	0.00	33.15	27-Apr	10:30	7.05	23.3	3,240	0.8	-332.1	6.3	Clear	Yes	Non-std	Bad Hinge	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-106	Monitoring	TAB	153	REST	25-Apr	9:00	NA	5.70	0.00	22.80	25-Apr	9:25	7.31	23.7	3,000	0.6	-374.2	3.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-45	Monitoring	TAB	154	NCL	25-Apr	17:50	NA	4.10	0.00	15.05	25-Apr	18:20	7.67	20.7	4,780	1.2	-200.4	22.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	SA	SA	SA	SA	SA
MW-50	Monitoring	CJH	155	REST	25-Apr	11:35	NA	14.24	0.00	28.22	25-Apr	12:00	6.89	23.1	7,040	1.0	87.4	3.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
MW-97	Monitoring	CJH		REST	25-Apr	12:20	8.20	8.23	0.03	21.20			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-92	Monitoring	CJH		REST	25-Apr	12:31	10.15	10.19	0.04	22.60			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-1	Recovery [d]	CJH	156	REST	25-Apr	12:40	NA	9.09	0.00	35.39	25-Apr	13:05	6.77	22.2	3,860	1.0	-346.1	20.2	Clear	Yes	Yes	Yes	Yes		SA	A [d]	A [d]	A [d]	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-91	Monitoring	CJH	157	REST	25-Apr	13:25	NA	9.53	0.00	25.35	25-Apr	13:50	6.72	23.0	2,320	1.0	-408.0	8.5	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-90	Monitoring	CJH	158	REST	25-Apr	14:05	NA	10.47	0.00	22.80	25-Apr	14:30	6.93	21.0	4,960	1.0	-336.0	7.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-96	Monitoring	CJH	159	REST	25-Apr	14:45	NA	10.28	0.00	25.57	25-Apr	15:10	6.75	22.2	2,130	1.5	-386.0	8.7	Clear	Yes	Closure	Issue	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-94	Monitoring	CJH	160	REST	25-Apr	15:25	NA	10.52	0.00	23.45	26-Apr	14:20	6.94	21.2	3,170	1.5	-442.0	3.9	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-8	Recovery [d]	CJH	161	REST	25-Apr	15:36	NA	9.96	0.00	37.22	26-Apr	15:05	6.69	21.8	2,220	1.0	-354.5	27.8	Clear	Yes	Yes	Yes	Yes		SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-67	Monitoring	CJH	162	REST	25-Apr	15:45	NA	8.18	0.00	27.30	26-Apr	16:15	6.89	21.3	2,560	1.4	-396.8	5.3	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]
MW-95	Monitoring	CJH	163	REST	25-Apr	15:53	NA	11.02	0.00	25.37	26-Apr	17:10	6.86	22.6	2,380	1.4	-369.0	2.9	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
RW-7	Recovery [d]	CJH	164	REST	25-Apr	16:04	NA	15.61	0.00	37.00	26-Apr	13:35	6.77	23.5	6,840	1.0	-184.5	8.8	Clear	Yes	Yes	Yes	Yes		SA	A [d]	A [d]	A [d]	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
NCL-34A	Monitoring	CJH	165	NCL	25-Apr	16:13	NA	9.81	0.00	19.31	26-Apr	12:50	6.58	21.3	2,110	1.3	-378.3	2.4	Clear	Issue	Yes	Yes	Yes		SA	SA [d]	SA [d]	-	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
NCL-33	Monitoring	CJH	166	NCL	25-Apr	16:21	NA	7.89	0.00	19.60	26-Apr	12:10	6.66	20.8	3,030	1.5	38.4	7.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
NCL-44	Monitoring	CJH	167	NCL	25-Apr	16:29	NA	8.12	0.00	21.57	26-Apr	11:25	6.63	19.6	2,560	1.5	-256.2	7.5	Clear	Issue	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
NCL-32	Monitoring	CJH	168	NCL	25-Apr	16:39	NA	8.26	0.00	20.06	26-Apr	10:35	6.97	19.2	2,440	1.8	-26.5	16.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
MW-108	Monitoring	CJH	169	NCL	25-Apr	17:10	NA	12.31	0.00	27.74	26-Apr	9:05	6.86	19.1	2,470	1.6	-383.5	7.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H17

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
NCL-31	Monitoring	CJH	170	NCL	25-Apr	16:48	NA	8.91	0.00	20.16	26-Apr	9:50	7.01	18.4	3,050	1.2	-150.5	6.4	Clear	Issue	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
MW-19	Monitoring	CJH		NCL	25-Apr	16:57	NA	9.27	0.00	22.08			Not in sampling program							Yes	Issue	Issue	Yes		SA	Not in sampling program									
MW-55	Monitoring	CJH	171	NCL	25-Apr	17:31	NA	9.73	0.00	26.58	27-Apr	10:00	6.70	20.7	3,380	1.6	-142.6	6.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
RW-#17A [e]	Recovery [d]	CJH	172	REST	25-Apr	17:40	NA	9.02	0.00	16.02	26-Apr	17:55	6.81	19.3	5,050	1.2	-237.6	6.3	Clear	Yes	Issue	Issue	Yes		SA	A	A	A	A	A	A	-	-	A	A	A
MW-18	Monitoring	CJH	173	NCL	25-Apr	17:23	NA	9.55	0.00	22.20	27-Apr	9:15	6.92	20.3	3,010	2.4	41.6	4.7	Clear	Yes	Yes	Yes	Yes		SA	A	A	-	A	A	A	A	A	A	A
MW-54A	Monitoring	CJH	174	NCL	25-Apr	10:50	NA	10.39	0.00	31.30	25-Apr	11:15	6.62	23.2	2,110	1.7	75.0	4.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
MW-54B	Monitoring	CJH	175	NCL	25-Apr	10:10	NA	10.37	0.00	46.80	25-Apr	10:35	6.76	21.8	2,040	1.2	74.1	4.5	Clear	Yes	Yes	Yes	Yes		SA	B	B	B	B	B	B	-	-	B	B	B
NCL-49	Monitoring	CJH	176	NCL	25-Apr	9:20	NA	14.03	0.00	32.18	25-Apr	9:45	6.93	21.4	3,030	1.3	76.5	4.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
MW-53	Monitoring	CJH	177	NCL	25-Apr	8:40	NA	9.54	0.00	23.60	25-Apr	9:05	6.87	21.0	2,690	1.6	79.6	2.5	Clear	Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
KWB-P3	Monitoring		Field E of Refinery				Not in gauging program						Not in sampling program												Not included in monitoring program due to distance from impacts									

Notes:

Abbreviations:

A = Annual (Mar/Apr event)
B = Biennial (starts Mar/Apr 2011)
BR = Bolton Road
DRO = Diesel Range Organics
E = East
EP = Evaporation Ponds
ft bgs = ft below ground surface
ft btoc = ft below top of casing
ft MSL = ft Mean Sea Level
GRO = Gasoline Range Organics
HR = Haldeman Road
in = inches
N = North
NA = Not accessible
NAPI = North API Separator
NCL = North Colony Landfarm
NE = Northeast
NW = Northwest
OCD = Oil Conservation District
PSH = Phase Separated Hydrocarbon
ROW = right of way
RR = Richey Road
S = South
SA = Semi-annual (Mar/Apr and Sep/Oct events)
SE = Southeast
SW = Southwest
TMD = Three Mile Ditch
TEL = Tetra Ethyl Lead Impoundment
UG = Upgradient
US285 = U.S. Highway 285
US82 = U.S. Highway 82
VOC = Volatile Organic Compounds
W = West
Y = Yes

Footnotes:

[a] Well const. info. provided where available. TOC & ground surface elevs relative to benchmark G-416. Total depth based on 4/2010 measurements.

[b] PSH was present during March 2012 gw monitoring event or a recovery pump is in place. Note that recovery wells are gauged at least monthly.

[c] Analytical Suite to include the following:

1. Purge parameters to be measured and recorded in the field will include pH, temp, spec. cond., diss. oxy., and oxidation-reduction potential.
2. DRO by Method 8015Mod.
3. GRO by Method 8015Mod.
4. VOCs by Method 8260, to include methyl tert butyl ether (MTBE).
5. Total metals by Method 6010/6020 and/or 7470. Specific metals shown in heading, abbreviations from periodic chart (incl B, Cd, Co, U, per 3-7-16 State request).
6. Dissolved metals - same list as total metals but only analyzed during April event (field filtered by HMI)
7. Cyanide by Method SM4500.
8. Cations/anions to include Calcium, Potassium, and Sodium by Method 6010 or 6020 and Sulfate, Chloride and Fluoride by Method 300.
9. Nitrates/Nitrites as Nitrogen by Method 300.
10. Total Dissolved Solids by Method 2540C.

"-" indicates parameter not required.

Note - samples will not be collected from any well where PSH is measured to be 0.03 feet thick or greater.

[d] Samples to be collected at frequency indicated only if <0.03 feet of PSH is present.

[e] Recovery trenches 11, 15, 16, 17 and 18 have multiple vertical "wells". Gauging & sampling points are: RW #11-0, RW #15C, RW #16B, RW #17A and RW #18A.

= Well with recently gauged LNAPL (light nonaqueous phase liquid)

HMI
Groundwater

Hydrologic Monitoring
1654 W. Sam Houston Pkwy. N.
Houston, Texas 77043

Phone 713.464.5206
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M E M O R A N D U M

Groundwater Monitoring Standard Operating Procedures
Navajo Refining Company – Artesia, New Mexico

HMI conducts low-flow groundwater sampling in accordance with the Site's Sampling and Analysis Plan and EPA guidance (including Puls and Barcelona, 1996 EPA Guidance on Low-Flow Groundwater Sampling, and Yeskis & Zavala, 2002, EPA/542:S-02/00, Groundwater Sampling Guidelines for Superfund and RCRA Project Managers).

Groundwater Sampling Methodology

HMI conducts low-flow groundwater sampling using a peristaltic pump and dedicated polyethylene tubing at wells with requisite depths-to-water. At limited wells with depths-to-water greater than peristaltic range, low-flow groundwater sampling is conducted using dedicated or non-dedicated bladder pumps. Sample intakes are generally set at mid-screen, when possible (and no nearer than two feet from the base of the well, when possible). Sample intake depths are permanently marked, ensuring that future sampling events consistently monitor the targeted water-bearing interval. During sampling with a peristaltic pump, the sample tube is attached to the pump using a one-foot section of dedicated, flexible silicone tubing (item #5703, Geotech Environmental Equipment, Inc.). A two-foot segment of polyethylene tubing connects the silicone tubing in the pump to the flow-through cell, using a disposable segment of silicone tubing. Purging commences through a sealed flow-through cell at EPA-recommended purge rates (generally 0.1 to 0.2 liters/minute), while drawdown is monitored in the well. Groundwater field parameter readings are collected at 0.5-liter intervals (generally the equivalent of one cell volume "turnover"). Field parameters of pH, specific conductivity, temperature, dissolved oxygen, and oxidation-reduction potential are monitored inside the cell. Turbidity is monitored outside of the cell. Groundwater field instrumentation is calibrated daily, per manufacturer specifications. The field instrument calibration log is included in the HMI deliverables package. Purging continues until a requisite volume of groundwater is purged (generally a minimum of 3,000 ml or six flow-through cell volumes), and field parameters have stabilized in accordance with EPA guidance:

Water Quality Parameters (Stabilization Parameters in Accordance with EPA (2002), Groundwater Sampling Guidelines for Superfund and RCRA Project Managers, Yeskis & Zavala, EPA/542:S-02/001)

- pH +/- 0.1 units;
- Temperature -
- Conductivity +/- 3%
- Dissolved Oxygen +/- 0.3 mg/L
- ORP +/- 10%
- Turbidity 10%

Just prior to sampling, the input tubing to the flow-through cell is disconnected from the disposable silicone receiving tubing on the input barb on the flow-through cell, and groundwater samples are collected directly into laboratory-supplied containers. Groundwater samples are placed in iced coolers, and remain in HMI's custody until delivered to ESC Lab Sciences via FedEx-overnight. Peristaltic tubes and/or downhole bladder pumps/tubing for non-dedicated bladder pumps, may be dedicated in respective wells. Alternatively, dedicated tubing may be retrieved, bagged, labeled and stored at HMI. In the unlikely event of wells with limited water columns, sampling may be conducted with disposable bailers. Grab samples are collected at operating recovery wells and irrigation wells scheduled for sampling. The purging and sampling process at each sampled well is documented on groundwater sampling field forms.

Cross-Contamination Prevention Program

Dedicated bladder pumps and/or dedicated peristaltic tubing are used as possible, minimizing potential cross-contamination issues during the groundwater monitoring process. Remaining non-dedicated equipment (e.g., non-dedicated bladder pumps, electronic gauging probe, etc.) is properly decontaminated prior to use and between wells. The decontamination procedure may include a combination of chemical and mechanical decontamination. For example, scrubbing with ethyl alcohol (isopropanol) as warranted, followed by scrubbing using an Alconox-water solution, and distilled water rinse. The decontamination procedure for non-dedicated bladder pumps consists of cycling an Alconox-water solution through the pump's bladder. Distilled water is then cycled through the pump's bladder, followed by decontaminating the exterior body of the pump, using methods above.

HMI Deliverables

HMI provides accurate field documentation of all groundwater monitoring activities, with a brief narrative, a summary table (including gauging data, field parameters, well inspection data, and scheduled analytical scope), and a Groundwater Monitoring SOP Memo. Groundwater sampling forms, field instrument calibration log, and Chain-of-Custody forms are also provided.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-6A
Event: Spring 2017 (Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MOB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1700	~~NA~~	12.21	0.0	19.05	14.05	Yes	Yes	Yes	Yes		Weather: 51. Cloudy 80's
4-26-17	1745	~~NA~~	12.23	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-26-17	1750	12.54	0.5	7.90	21.2	5840	2.8	-100.1	7.2	clear	*Low-flow groundwater sample:*
|	1752	12.55	1.0	7.88	20.7	5800	1.5	-103.2	7.0	|	(A) peristaltic pump w/ ded tubing
|	1755	12.55	1.5	7.85	20.5	5770	1.5	-105.5	6.6	|	B) ded bladder pump
|	1757	12.55	2.0	7.82	20.5	~~57~~40	1.4	-107.6	6.3	|	C) non-ded bladder pump; or
|	1800	12.55	2.5	7.80	20.5	5700	1.4	-109.8	5.2	|	*Standard groundwater sample:*
|	1802	12.55	3.0	7.76	20.5	5~~7~~0	1.4	-111.5	5.1	|	D) bailer due to limited column; or
|	1805	12.55	3.5	7.75	20.3	5650	1.3	-112.8	4.8	|	E) recovery well cycling sample
↓	1807	12.55	4.0	7.69	20.2	5600	1.3	-114.3	4.3	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-26-17	1810	MW-6A	12.55	7.69	20.2	5600	1.3	-114.3	4.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-6B
Event: Spring 2017 (Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MDB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1705	NA	12.10	0.0	52.27	47.27	Yes	unable to	Issue	Yes		Weather: Clear 80's
4-26-17	1825	NA	12.14					close				

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-26-17	1830	12.17	0.5	7.62	22.6	6180	2.2	-63.3	6.6	Clear	*Low-flow groundwater sample:*
	1832	12.17	1.0	7.61	21.5	6110	1.4	-61.8	6.5		(A) peristaltic pump w/ ded tubing
	1835	12.17	1.5	7.61	21.2	6030	1.2	-60.2	6.2		B) ded bladder pump
	1837	12.17	2.0	7.60	20.9	5928	1.0	-58.4	5.7		C) non-ded bladder pump; or
	1840	12.17	2.5	7.59	20.6	5850	0.9	-56.6	4.6		*Standard groundwater sample:*
	1842	12.17	3.0	7.58	20.5	5800	0.8	-54.6	4.2		D) bailer due to limited column; or
	1845	12.17	3.5	7.58	20.4	5780	0.8	-53.8	3.8		E) recovery well cycling sample
↓	1847	12.17	4.0	7.58	20.4	5770	0.7	-53.0	3.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-26-17	1850	MW-6B	12.17	7.58	20.4	5770	0.7	-53.0	3.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-85
Event: Spring 2017 (Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: MDB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1630	9.70	10.42	0.72	20.34	NA	Yes	Yes	Yes	Yes		Weather: Sl. Cloudy 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		Not	Sampled	due to	Presence			B) ded bladder pump
			2.0			of LNAPL ≥	0.03'				C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-85			Not	Sampled				DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-86
Event: Spring 2017 (Biennial)
Area of Concern: EP (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MOB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1640	9.52	9.55	0.03	19.21	NA	Yes	Yes	Yes	Yes		Weather: Sl. Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5			Not sampled due to presence					B) ded bladder pump
			2.0			of LNAPL ≥ 0.03'					C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-86			Not Sampled					DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~Field filtered 0.45-u~~
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-120
Event: Spring 2017 (Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: MDB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1655	NA	12.14	0.0	28.00	17.5	Yes	Yes	Yes	Yes		Weather: 51. Cloudy 80%
4-26-17	1700	NA	12.19	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-26-17	1705	12.42	0.5	7.54	21.8	11120	1.3	-129.1	6.8	Clear	*Low-flow groundwater sample:*
	1707	12.43	1.0	7.50	20.7	11680	0.9	-131.6	6.3		(A) peristaltic pump w/ ded tubing
	1710	12.43	1.5	7.48	20.1	11820	0.6	-132.6	6.0		B) ded bladder pump
	1712	12.43	2.0	7.46	20.1	11900	0.6	-133.9	5.7		C) non-ded bladder pump; or
	1715	12.43	2.5	7.45	19.9	11970	0.5	-135.2	5.2		*Standard groundwater sample:*
	1717	12.43	3.0	7.43	19.8	11980	0.4	-136.0	4.8		D) bailer due to limited column; or
	1720	12.43	3.5	7.42	19.8	11960	0.4	-137.2	4.6		E) recovery well cycling sample
	1722	12.43	4.0	7.41	19.7	11940	0.4	-137.8	4.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4-26-17	1725	MW-120	12.43	7.41	19.7	11940	0.4	-137.8	4.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-121
Event: Spring 2017 (Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials MPB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1650	NA	12.71	0.0	27.32	17.5	Yes	Yes	Yes	Yes		Weather: Sl. Cloudy 80's
4-26-17	1615	NA	12.72	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-26-17	1620	12.83	0.5	8.00	21.0	7570	1.7	-12.1	24.3	Clear	*Low-flow groundwater sample:*
"	1622	12.87	1.0	7.94	20.1	7360	1.1	-18.4	21.6	"	(A) peristaltic pump w/ ded tubing
"	1625	12.90	1.5	7.86	19.9	7210	1.0	-23.7	20.1	"	B) ded bladder pump
"	1627	12.92	2.0	7.83	19.8	7160	1.0	-26.4	18.4	"	C) non-ded bladder pump; or
"	1630	12.94	2.5	7.78	19.8	7120	0.9	-28.2	16.3	"	*Standard groundwater sample:*
"	1632	12.96	3.0	7.73	19.7	7080	0.8	-29.4	12.1	"	D) bailer due to limited column; or
"	1635	12.98	3.5	7.70	19.7	7070	0.8	-30.5	10.6	"	E) recovery well cycling sample
↓	1637	13.00	4.0	7.67	19.6	7050	0.7	-31.1	9.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4-26-17	1640	MW-121	13.00	7.67	19.6	7050	0.7	-31.1	9.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-84
Event: Spring 2017 (Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup)

Initials: MDB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1625	~~NA~~	9.22	0.0	20.56	15.2	Yes	Yes	Yes	Yes		Weather: Sl. Cloudy, 88's
4-26-17	1350	NA	9.24	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-26-17	1355	9.33	0.5	7.36	21.4	10510	1.5	-46.0	13.3	Clear w/ gold tint	*Low-flow groundwater sample:*
↓	1357	9.38	1.0	7.29	20.6	10600	1.2	-33.9	9.8	↓	(A) peristaltic pump w/ ded tubing
↓	1400	9.42	1.5	~~7.27~~	20.3	10610	1.0	-30.8	8.7	↓	B) ded bladder pump
↓	1402	9.46	2.0	7.25	20.1	10620	0.7	-27.6	8.4	↓	C) non-ded bladder pump; or
↓	1405	9.50	2.5	7.22	20.0	10630	0.7	-24.8	8.1	↓	*Standard groundwater sample:*
↓	1407	9.55	3.0	7.21	19.9	10630	0.7	-23.5	7.8	↓	D) bailer due to limited column; or
↓	1410	9.59	3.5	7.20	19.9	10620	0.6	-22.4	7.6	↓	E) recovery well cycling sample
↓	1412	9.62	4.0	7.19	19.8	~~10620~~	0.6	-21.0	7.3	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-26-17	1415	MW-84	9.62	7.19	19.8	10620	0.6	-21.0	7.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO3~~	~~6010/6020 and/or 7470~~
							~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-122
Event: Spring 2017 (Biennial)
Area of Concern: EP (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MJB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1325	NA	10.38	0.0	23.31	18.4	Yes	Yes	Yes	Yes		Weather: Sl. cloudy 80's
4-26-17	1520	NA	10.42	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-26-17	1525	11.04	0.5	7.60	19.7	12650	1.4	-93.0	26.7	Sl. Cloudy w/orange particles	Low-flow groundwater sample:
↓	1527	11.17	1.0	7.50	18.9	12140	1.0	-78.0	24.3	↓	(A) peristaltic pump w/ ded tubing
	1530	11.29	1.5	7.41	18.7	11888	0.8	-67.7	21.6	Clear w/orange particles	B) ded bladder pump
	1532	11.41	2.0	7.37	18.6	11810	0.6	-63.8	19.6	↓	C) non-ded bladder pump; or
	1535	11.52	2.5	7.34	18.4	11770	0.5	-61.2	17.8	Reduced purge	Standard groundwater sample:
	1540	11.55	3.0	7.30	18.3	11730	0.5	-58.2	17.1	rate to 0.1 L/m	D) bailer due to limited column; or
	1545	11.58	3.5	7.26	18.4	11700	0.5	-57.4	16.3	↓	E) recovery well cycling sample
↓	1550	11.61	4.0	7.22	18.4	11680	0.5	-57.1	15.4	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-26-17	1555	MW-122	11.61	7.22	18.4	11680	0.5	-57.1	15.4			Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	~~Neat~~	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-81
Event: Spring 2017 (Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: MOB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1520	NA	10.71	0.0	18.63	13.7	Yes	Yes	Yes	Yes		Weather: SI. Cloudy 80's
4-26-17	1305	NA	10.76	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-26-17	1310	10.84	0.5	7.41	21.2	8320	4.1	-100.7	7.6	Clear	*Low-flow groundwater sample:*
"	1312	10.93	1.0	7.39	20.1	8180	3.4	-91.1	6.7	"	(A) peristaltic pump w/ ded tubing
"	1315	10.97	1.5	7.37	19.6	8110	2.9	-87.3	6.1	"	B) ded bladder pump
"	1317	11.02	2.0	7.36	19.4	8050	2.7	-84.7	5.6	"	C) non-ded bladder pump; or
"	1320	11.06	2.5	7.34	19.3	8020	2.7	-83.1	4.8	"	*Standard groundwater sample:*
"	1322	11.09	3.0	7.33	19.3	8010	2.6	-81.9	4.3	"	D) bailer due to limited column; or
"	1325	11.12	3.5	7.33	19.2	8000	2.5	-80.3	3.7	"	E) recovery well cycling sample
"	1327	11.16	4.0	7.32	19.2	7990	2.5	-79.9	3.3	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-26-17	1330	MW-81	11.16	7.32	19.2	7990	2.5	-79.9	3.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-80
Event: Spring 2017 (Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: MDA

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1525	NA	8.90	0.0	14.69	14.7	Yes	Yes	Yes	Yes		Weather: Sl. Cloudy 80's
4-26-17	1220	NA	8.94	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-26-17	1225	9.03	0.5	7.29	18.5	9060	4.0	-157.8	10.6	Clear	*Low-flow groundwater sample:*
	1227	9.07	1.0	7.25	18.2	9180	3.1	-158.5	8.4		(A) peristaltic pump w/ ded tubing
	1230	9.10	1.5	7.22	18.0	9220	2.4	-159.1	7.6		B) ded bladder pump
	1232	9.11	2.0	7.19	17.8	9250	2.0	-159.3	7.0		C) non-ded bladder pump; or
	1235	9.12	2.5	7.16	17.8	9280	1.7	-159.6	4.4		*Standard groundwater sample:*
	1237	9.13	3.0	7.14	17.8	9270	1.6	-159.8	3.8		D) bailer due to limited column; or
	1240	9.14	3.5	7.12	17.7	9260	1.6	-160.1	3.6		E) recovery well cycling sample
	1242	9.15	4.0	7.12	17.7	9260	1.6	-161.1	3.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4-26-17	1245	MW-80	9.15	7.12	17.7	9260	1.6	-161.1	3.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

+ EB-EP-04 (same analysis)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-79
Event: Spring 2017 (Biennial)
Area of Concern: EP (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MDB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1530	NA	9.84	0.0	19.25	15.0	Yes	Yes	Yes	Yes		Weather: Sl. Cloudy 80's
4-26-17	1130	NA	9.90	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-26-17	1135	10.13	0.5	7.86	18.0	7050	3.3	-189.3	10.6	Clear	*Low-flow groundwater sample:*
"	1137	10.19	1.0	7.76	17.8	7220	2.4	-190.2	8.6	"	(A) peristaltic pump w/ ded tubing
"	1140	10.24	1.5	7.71	17.5	7250	1.8	-191.4	7.3	"	B) ded bladder pump
"	1142	10.28	2.0	7.67	17.4	7260	1.4	-191.9	6.4	"	C) non-ded bladder pump; or
"	1145	10.32	2.5	7.64	17.2	7260	1.2	-192.6	5.4	"	*Standard groundwater sample:*
"	1147	10.35	3.0	7.60	17.2	7260	1.2	-192.5	4.8	"	D) bailer due to limited column; or
"	1150	10.38	3.5	7.59	17.2	7260	1.2	-192.4	4.4	"	E) recovery well cycling sample
↓	1152	10.41	4.0	7.57	17.2	7260	1.1	-192.4	3.2	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4-26-17	1155	MW-79	10.41	7.57	17.2	7260	1.1	-192.4	3.2	DRO	HCL	8015M
↓										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	~~Neat~~	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
↓	1210	EB-EP-04	NA	→						Same as above	same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-82
Event: Spring 2017 (Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup)

Initials: MMB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1540	~~NA~~	9.05	0.0	20.00	15.0	Yes	Yes	Yes	Yes		Weather: Sl. Cloudy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-25-17	1542	9.39	0.5	7.65	22.9	8530	1.9	-80.4	6.5	Clear w/ orange particles	*Low-flow groundwater sample:*
	1545	9.40	1.0	7.58	22.2	8390	1.6	-67.0	6.0	↓	(A) peristaltic pump w/ ded tubing
	1547	9.40	1.5	7.54	21.8	8290	1.2	-58.3	5.4		B) ded bladder pump
	1550	9.40	2.0	7.51	21.6	8230	0.9	-49.1	4.9		C) non-ded bladder pump; or
	1552	9.40	2.5	7.47	21.6	8150	0.7	-45.3	5.2		*Standard groundwater sample:*
	1555	9.40	3.0	7.45	21.5	8110	0.7	-46.1	5.4		D) bailer due to limited column; or
	1557	9.40	3.5	7.42	21.5	8080	0.7	-46.9	5.8		E) recovery well cycling sample
↓	1600	9.40	4.0	7.41	21.5	8090	0.7	-47.2	6.2	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-25-17	1605	MW-82	9.40	7.41	21.5	8090	0.7	-47.2	6.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

+ EB-EP-01 (same analysis)

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-74
Event: Spring 2017 (Biennial)
Area of Concern: EP (4-in ; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MJB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1425	NA	8.81	0.0	20.19	14.8	Yes	Yes	Yes	Yes		Weather: Sl. Cloudy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-25-17	1430	8.90	0.5	7.54	24.1	12000	1.8	80.0	12.6	Clear	*Low-flow groundwater sample:*
	1432	8.94	1.0	7.44	22.8	11950	1.3	79.2	10.4		(A) peristaltic pump w/ ded tubing
	1435	8.95	1.5	7.39	22.3	11900	1.1	78.6	8.5		B) ded bladder pump
	1437	8.96	2.0	7.34	22.0	11860	0.9	78.0	6.4		C) non-ded bladder pump; or
	1440	8.96	2.5	7.29	21.9	11840	0.9	77.3	5.8		*Standard groundwater sample:*
	1442	8.96	3.0	7.26	21.7	11820	0.8	76.5	5.4		D) bailer due to limited column; or
	1445	8.96	3.5	7.24	21.6	11820	0.8	76.1	4.8		E) recovery well cycling sample
	1447	8.96	4.0	7.23	21.6	11810	0.7	75.7	4.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-25-17	1450	MW-74	8.96	7.23	21.6	11810	0.7	75.7	4.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1505	EB-EP-01	NA							same as above	same	Same

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

+ Trip Blank - EP-01

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-73
Event: Spring 2017 (Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup)

Initials: MDB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1340	NA	8.75	0.0	19.60	14.6	Yes	Yes	Yes	Yes		Weather: Sl. Cloudy 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-25-17	1345	8.80	0.5	7.82	23.7	12070	2.8	49.4	80.1	Sl. Cloudy	*Low-flow groundwater sample:*
	1347	8.81	1.0	7.74	22.3	12020	2.2	55.0	76.4		(A) peristaltic pump w/ ded tubing
	1350	8.82	1.5	7.68	21.3	11980	1.4	58.1	56.7		B) ded bladder pump
	1352	8.82	2.0	7.61	20.9	11930	1.2	59.6	41.2		C) non-ded bladder pump; or
	1355	8.82	2.5	7.58	20.8	11910	1.1	59.5	38.6		*Standard groundwater sample:*
	1357	8.82	3.0	7.56	20.7	11910	1.1	58.4	34.5		D) bailer due to limited column; or
	1400	8.82	3.5	7.53	20.5	11890	1.1	53.0	30.2		E) recovery well cycling sample
	1402	8.82	4.0	7.51	20.4	11910	1.1	49.9	28.6	√	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-25-17	1405	MW-73	8.82	7.51	20.4	11910	1.1	49.9	28.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-2A
Event: Spring 2017 (Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup)

Initials: mg

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1315	NA	10.72	0.0	1781	15.0	Yes	Yes	Yes	Yes		Weather: Sl. Cloudy, 80
4-26-17	1435	NA	10.73	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-26-17	1440	10.98	0.5	7.29	21.2	12,780	1.9	-83.0	5.6	Clear	*Low-flow groundwater sample:*
↓	1442	11.04	1.0	7.22	20.2	13,100	1.5	-82.8	5.3	↓	(A) peristaltic pump w/ ded tubing
	1445	11.10	1.5	7.17	19.6	13300	1.1	-84.2	5.1		B) ded bladder pump
	1447	11.14	2.0	7.14	19.3	13560	1.0	-85.8	4.8		C) non-ded bladder pump; or
	1450	11.19	2.5	7.11	19.2	13610	0.8	-86.7	4.4		*Standard groundwater sample:*
	1452	11.23	3.0	7.09	19.1	13640	0.8	-87.0	3.7		D) bailer due to limited column; or
	1455	11.26	3.5	7.07	19.0	13660	0.7	-86.9	2.8		E) recovery well cycling sample
↓	1457	11.29	4.0	7.05	19.0	13680	0.7	-86.5	3.2	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4-26-17	1500	MW-2A	11.29	7.05	19.0	13680	0.7	-86.5	3.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

(Not in "Sampling" Program)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-2B (gauge only)
Event: Spring 2017 (Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MDB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1325	NA	10.60	0.0	52.00	No Sample	Y	Y	Y	Y		Weather: SL. Cloudy, 20's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-72
Event: Spring 2017 (Biennial)
Area of Concern: EP (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MDB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1230	NA	7.06	0.0	13.92	11.9	Yes	Yes	Yes	Yes		Weather: Sl. Cloudy/ 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-25-17	1235	7.34	0.5	7.34	24.5	12700	1.0	25.7	16.0	Clear	*Low-flow groundwater sample:*
	1237	7.45	1.0	7.24	23.5	13190	0.8	35.5	13.6		(A) peristaltic pump w/ ded tubing
	1240	7.45	1.5	7.18	23.2	13280	0.8	39.4	10.8		B) ded bladder pump
	1242	7.45	2.0	7.12	23.1	13380	0.8	42.5	9.8		C) non-ded bladder pump; or
	1245	7.45	2.5	7.07	22.9	13400	0.8	41.6	9.1		*Standard groundwater sample:*
	1247	7.45	3.0	7.04	23.3	13370	0.8	38.0	9.4		D) bailer due to limited column; or
	1250	7.45	3.5	7.02	23.0	13350	0.7	35.2	10.6		E) recovery well cycling sample
	1252	7.45	4.0	7.00	22.9	13340	0.7	33.0	9.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4-25-17	1255	MW-72	7.45	7.00	22.9	13340	0.7	33.0	9.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-6
Event: Spring 2017 (Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MDB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	940	NA	10.95	0.0	26.91	21.6	YES	lid cannot close properly	YES	YES	cracked pad	Weather: Sl. Cloudy 70's

Well Purging Record

* confirmed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm) *	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-25-17	945	11.21	0.5	6.39	23.4	15620	1.4	26.6	42.1	Sl. Cloudy	*Low-flow groundwater sample:*
	947	11.21	1.0	6.54	22.7	15710	1.0	36.8	38.9		(A) peristaltic pump w/ ded tubing
	950	11.21	1.5	6.67	22.1	15750	0.8	47.4	33.3		B) ded bladder pump
	952	11.21	2.0	6.74	21.9	15730	0.7	48.8	26.7		C) non-ded bladder pump; or
	955	11.21	2.5	6.79	21.7	15710	0.7	45.0	22.4	Clear	*Standard groundwater sample:*
	957	11.21	3.0	6.82	21.5	15710	0.6	38.1	15.6		D) bailer due to limited column; or
	1000	11.21	3.5	6.85	21.6	15720	0.6	34.7	11.4		E) recovery well cycling sample
	1002	11.21	4.0	6.87	21.6	15700	0.6	31.1	7.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4-25-17	1005	OCD-6	11.21	6.87	21.6	15700	0.6	31.1	7.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD - 7AR
Event: Spring 2017 (Biennial)
Area of Concern: EP (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MMB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1030	NA	9.72	0.0	21.29	16.0	Yes	Yes	Yes	Yes		Weather: Sl. cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-25-17	1035	9.91	0.5	7.16	26.1	13100	1.1	-42.6	24.7	Clear w/ orange particles	*Low-flow groundwater sample:*
	1037	9.96	1.0	7.12	24.6	12940	0.9	-22.4	18.6		(A) peristaltic pump w/ ded tubing
	1040	10.00	1.5	7.10	23.0	12800	0.8	-7.3	16.4		B) ded bladder pump
	1042	10.04	2.0	7.08	22.5	12690	0.7	-1.0	14.7		C) non-ded bladder pump; or
	1045	10.06	2.5	7.08	22.1	12680	0.7	+2.5	12.6		*Standard groundwater sample:*
	1047	10.10	3.0	7.06	22.0	12610	0.7	+6.2	10.6		D) bailer due to limited column; or
	1050	10.12	3.5	7.06	21.8	12610	0.7	+7.3	8.4		E) recovery well cycling sample
	1052	10.15	4.0	7.05	21.7	12610	0.7	+10.4	7.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-25-17	1055	OCD-7AR	10.15	7.05	21.7	12610	0.7	10.4	7.9	DRO	HCL	Lab: ESC Lab Sciences, Mt. Juliet, TN 8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD - 7B
Event: Spring 2017 (Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MPB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1115	NA	9.57	0.0	56.85	51.9	Y	Y	Y	Y		Weather: Sl. Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-25-17	1120	10.45	0.5	7.71	23.1	6510	1.3	-155.0	24.3	clear	*Low-flow groundwater sample:*
	1122	11.03	1.0	7.65	22.4	6266	1.0	-156.4	17.6		(A) peristaltic pump w/ ded tubing
	1125	11.45	1.5	7.59	22.1	6080	0.8	-148.1	14.6		B) ded bladder pump
	1127	11.76	2.0	7.53	21.9	5950	0.6	-147.7	10.6		C) non-ded bladder pump; or
	1130	12.04	2.5	7.51	22.0	5910	0.5	-147.8	8.6	Reduced purge	*Standard groundwater sample:*
	1135	12.24	3.0	7.49	22.6	5890	0.5	-148.2	6.4	rate to 0.1 L/m	D) bailer due to limited column; or
	1140	12.36	3.5	7.47	22.0	5880	0.5	-148.7	5.3		E) recovery well cycling sample
	1145	12.52	4.0	7.45	22.0	5870	0.5	-148.9	4.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4-25-17	1150	OCD-7B	12.52	7.45	22.0	5870	0.5	-148.9	4.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Not in "Sampling" Program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-7C (gauge only)
Event: Spring 2017 (Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MDB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1220	NA	8.99	0.0	71.95	No Sample	Yes	Yes	Yes	Yes		Weather: Sl. Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Tool Company locks gate by 5:00 PM

Monitoring Well Purging and Sampling Record

(Bagged tube + device to aid tubing guidance)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-#15C
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: MDB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	910	N/A	14.74	0.0	22.30	20.0	Yes	Yes	Yes	Yes		Weather: Sl. Cloudy 70's
4-26-17	935	N/A	14.83	0.0								

Well Purging Record

Recovery well (trench-related); below-grade vault

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-26-17	940	NM *	0.5	7.05	20.8	2930	5.0	-321.6	14.6	Clear	*Low-flow groundwater sample:*
	942	NM	1.0	6.88	20.6	2870	4.4	-330.8	10.6		(A) peristaltic pump w/ ded tubing
	945	NM	1.5	6.82	20.5	2810	3.7	-337.5	8.3		B) ded bladder pump
	947	NM	2.0	6.80	20.5	2780	3.3	-338.9	7.6		C) non-ded bladder pump; or
	950	NM	2.5	6.79	20.5	2740	2.8	-339.0	7.1		*Standard groundwater sample:*
	952	NM	3.0	6.79	20.5	2730	2.8	-337.2	6.8		D) bailer due to limited column; or
	955	NM	3.5	6.78	20.5	2720	2.7	-337.5	6.4		E) recovery well cycling sample
	957	NM	4.0	6.77	20.5	2720	2.7	-337.9	6.1		F) irrigation well grab sample

Well Sampling Record

* Not enough room for both tube and gauging probe

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4-26-17	1000	RW-#15C	NM	6.77	20.5	2720	2.7	-337.9	6.1	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Tool company locks gate by 5:00 PM]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-48
Event: Spring 2017 (Biennial)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MDB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	915	NA	17.03	0.0	32.00	26.9	Yes	Yes	*Issue	Yes		Weather: Sl. Cloudy 70's
4-26-17	850	NA	17.23	0.0								

Well Purging Record

* needs new pad /at grade canister & plate installation

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-26-17	855	17.50	0.5	6.58	20.4	4510	2.1	-338.6	17.6	Clear; colorless; odor	*Low-flow groundwater sample:*
	857	17.54	1.0	6.68	20.6	4430	1.8	-351.7	14.3		(A) peristaltic pump w/ ded tubing
	900	17.58	1.5	6.72	21.0	4350	1.6	-361.7	12.7		B) ded bladder pump
	902	17.60	2.0	6.74	21.1	4330	1.5	-365.5	10.6		C) non-ded bladder pump; or
	905	17.60	2.5	6.76	21.0	4320	1.4	-369.9	9.7		*Standard groundwater sample:*
	907	17.60	3.0	6.76	21.0	4310	1.4	-371.5	9.1		D) bailer due to limited column; or
	910	17.60	3.5	6.77	21.1	4300	1.4	-373.5	8.9		E) recovery well cycling sample
	912	17.60	4.0	6.78	21.0	4300	1.4	-375.1	8.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4-26-17	915	MW-48	17.60	6.78	21.0	4300	1.4	-375.1	8.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	HNO3	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-130
Event: Spring 2017 (Biennial)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MDB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	920	NA	18.89	0.0	45.00	37.4	YES	YES	YES	Yes		Weather: Sl. Cloudy 70's
4-26-17	1025	NA	19.11	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-26-17	1030	19.19	0.5	7.12	21.4	3100	2.0	-228.8	21.4	Clear; colorless	*Low-flow groundwater sample:*
	1032	19.19	1.0	7.00	21.5	3150	1.8	-233.1	16.8		(A) peristaltic pump w/ ded tubing
	1035	19.19	1.5	6.93	21.6	3180	1.7	-236.1	13.6		B) ded bladder pump
	1037	19.19	2.0	6.87	21.6	3200	1.7	-238.9	10.4		C) non-ded bladder pump; or
	1040	19.19	2.5	6.84	21.5	3200	1.6	-239.9	9.6		*Standard groundwater sample:*
	1042	19.19	3.0	6.83	21.6	3200	1.5	-240.0	8.7		D) bailer due to limited column; or
	1045	19.19	3.5	6.82	21.6	3200	1.5	-240.7	8.3		E) recovery well cycling sample
↓	1047	19.19	4.0	6.80	21.6	3200	1.5	-241.0	6.4	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4-26-17	1050	MW-130	19.19	6.80	21.6	3200	1.5	-241.0	6.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ce,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	HNO3	Field filtered 0.45-u
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-4
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: MDB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	905	22.96	23.05	0.09	41.75	31.7	Yes	Yes	Yes	Yes		Weather: Sl. Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		Not Sampled	due	to Presence				B) ded bladder pump
			2.0		of LNAPL	>0.03'					C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		KWB-4			Not Sampled					DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Equipped as RW in above-grade vault]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-19
Event: Spring 2017 (Biennial)
Area of Concern: Rest
(Gauge to top of 1-in galvanized pipe)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: MDB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	900	23.16	23.19	0.03	NM	10' off base as needed	Yes	Yes	Yes	Yes		Weather: sl. Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		LNAPL	≥ 0.03'		No Sample			B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		RW-19								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-76
Event: Spring 2017 (Biennial)
Area of Concern: EP (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1545	NA	10.68	0.0	20.33	16.0	Yes	Yes	Yes	Yes		Weather: Clear 60's
4/26/17	1615	NA	10.74	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1620	10.79	0.5	7.21	21.6	7550	3.2	-88.1	10.1	Clear	*Low-flow groundwater sample:*
|	1622	10.79	1.0	7.12	21.0	7540	2.5	-88.2	9.6	|	(A) peristaltic pump w/ ded tubing
|	1625	10.79	1.5	7.05	20.1	7520	2.0	-88.1	8.5	|	B) ded bladder pump
|	1627	10.79	2.0	6.99	20.0	7510	1.9	-88.3	7.9	|	C) non-ded bladder pump; or
|	1630	10.79	2.5	6.96	19.9	7490	1.7	-88.8	7.4	|	*Standard groundwater sample:*
|	1632	10.79	3.0	6.94	19.9	7480	1.5	-89.2	6.8	|	D) bailer due to limited column; or
|	1635	10.79	3.5	6.93	19.8	7480	1.5	-89.5	6.3	|	E) recovery well cycling sample
↓	1637	10.79	4.0	6.92	19.8	7470	1.4	-89.7	5.9	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1640	MW-76	10.79	6.92	19.8	7470	1.4	-89.7	5.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-77
Event: Spring 2017 (Biennial)
Area of Concern: EP (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1550	NA	8.92	0.0	20.52	15.2	Yes	Yes	Yes	Yes		Weather: Clear 60's
4/26/17	1700	NA	8.98	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1705	9.12	0.5	7.32	20.6	8530	4.1	-82.7	9.8	clear; gold tint; odor	Low-flow groundwater sample:
	1707	9.14	1.0	7.20	20.0	8560	3.3	-81.0	8.7		(A) peristaltic pump w/ ded tubing
	1710	9.16	1.5	7.09	19.8	8590	3.0	-81.6	8.1		B) ded bladder pump
	1712	9.17	2.0	7.01	19.2	8610	2.8	-82.0	7.9		C) non-ded bladder pump; or
	1715	9.18	2.5	6.95	19.1	8630	2.7	-82.9	7.5		Standard groundwater sample:
	1717	9.18	3.0	6.93	19.1	8650	2.7	-83.3	6.9		D) bailer due to limited column; or
	1720	9.18	3.5	6.91	19.2	8660	2.6	-83.6	6.3		E) recovery well cycling sample
↓	1722	9.18	4.0	6.89	19.2	8670	2.6	-83.9	6.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1725	MW-77	9.18	6.89	19.2	8670	2.6	-83.9	6.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-78
Event: Spring 2017 (Biennial)
Area of Concern: EP (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1555	NA	8.92	0.0	19.57	14.6	Yes	Yes	Yes	Yes		Weather: Clear 60's
4/26/17	1740	NA	9.00	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1745	9.08	0.5	7.29	21.0	5180	3.9	-2.0	7.8	clear w/ gold tint	*Low-flow groundwater sample:*
	1747	9.15	1.0	7.21	19.7	4900	2.9	+31.3	6.9		(A) peristaltic pump w/ ded tubing
	1750	9.20	1.5	7.15	19.5	4870	2.5	+36.8	6.1		B) ded bladder pump
	1752	9.25	2.0	7.07	19.2	4850	2.3	+48.5	5.8		C) non-ded bladder pump; or
	1755	9.29	2.5	7.03	19.2	4840	2.2	+51.5	5.3		*Standard groundwater sample:*
	1757	9.33	3.0	7.00	19.1	4830	2.1	+52.8	4.3		D) bailer due to limited column; or
	1800	9.37	3.5	7.00	19.1	4830	2.1	+53.3	3.9		E) recovery well cycling sample
↓	1802	9.41	4.0	6.99	19.0	4830	2.0	+54.2	3.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1805	MW-78	9.41	6.99	19.0	4830	2.0	+54.2	3.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-75
Event: Spring 2017 (Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup)

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1600	NA	9.08	0.0	23.74	18.4	Yes	Yes	Yes	Yes		Weather: Clear 60's
4/26/17	1825	NA	9.14	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1830	9.17	0.5	7.35	20.7	8140	2.6	-98.4	9.7	Clear; gold tint;	*Low-flow groundwater sample:*
	1832	9.17	1.0	7.28	20.2	8190	2.0	-98.9	8.6	odor	(A) peristaltic pump w/ ded tubing
	1835	9.18	1.5	7.21	19.7	8230	1.7	-99.5	8.3		B) ded bladder pump
	1837	9.18	2.0	7.15	19.6	8260	1.5	-101.3	7.5		C) non-ded bladder pump; or
	1840	9.18	2.5	7.13	19.6	8280	1.3	-103.5	7.1		*Standard groundwater sample:*
	1842	9.18	3.0	7.11	19.5	8290	1.2	-105.6	6.5		D) bailer due to limited column; or
	1845	9.18	3.5	7.09	19.5	8300	1.1	-106.2	6.3		E) recovery well cycling sample
↓	1847	9.18	4.0	7.08	19.6	8310	1.1	-106.5	6.2	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1850	MW-75	9.18	7.08	19.6	8310	1.1	-106.5	6.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Meat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-83
Event: Spring 2017 (Biennial)
Area of Concern: EP (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1605	NA	8.91	0.0	19.91	15.6	Yes	Yes	Yes	Yes		Weather: Clear 60's
4/26/17	1530	NA	8.95	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1535	9.05	0.5	7.28	22.7	5840	2.5	-116.6	15.8	Clear w/ gold tint	*Low-flow groundwater sample:*
	1537	9.10	1.0	7.20	21.0	5960	1.9	-120.9	12.5		(A) peristaltic pump w/ ded tubing
	1540	9.12	1.5	7.13	20.2	6040	1.6	-121.9	10.9		B) ded bladder pump
	1542	9.14	2.0	7.09	19.9	6060	1.4	-122.0	9.7		C) non-ded bladder pump; or
	1545	9.15	2.5	7.04	19.8	6070	1.3	-122.2	9.2		*Standard groundwater sample:*
	1547	9.16	3.0	7.02	19.8	6080	1.3	-122.5	8.6		D) bailer due to limited column; or
	1550	9.16	3.5	7.01	19.9	6080	1.2	-122.8	8.3		E) recovery well cycling sample
↓	1552	9.16	4.0	7.01	19.9	6080	1.2	-123.1	7.9	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1555	MW-83	9.16	7.01	19.9	6080	1.2	-123.1	7.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

+ Dup-EP-03 (same analysis)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-3
Event: Spring 2017 (Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

Well Inspection Information

(2-in; stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1610	NA	9.06	0.0	20.18	16.1	Yes	Yes	Issue	Yes		Weather: Clear 60's
4/26/17	1430	NA	9.12	0.0								

Well Purging Record

No protective casing; stainless steel well casing with locked expandable cap; probed for pad but not found

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1435	9.17	0.5	7.35	20.4	7570	2.8	-16.6	15.5	Clear	*Low-flow groundwater sample:*
|	1437	9.19	1.0	7.29	19.8	7510	2.2	-16.5	10.7	|	(A) peristaltic pump w/ ded tubing
|	1440	9.20	1.5	7.23	19.2	7510	1.9	-16.1	9.8	|	B) ded bladder pump
|	1442	9.20	2.0	7.18	19.1	7480	1.5	-15.9	8.7	|	C) non-ded bladder pump; or
|	1445	9.20	2.5	7.15	18.9	7470	1.3	-15.7	8.1	|	*Standard groundwater sample:*
|	1447	9.20	3.0	7.13	18.8	7476	1.2	-15.4	7.3	|	D) bailer due to limited column; or
|	1450	9.20	3.5	7.12	18.8	7480	1.2	-15.1	7.0	|	E) recovery well cycling sample
↓	1452	9.20	4.0	7.11	18.9	7480	1.1	-14.9	6.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1455	MW-3	9.20	7.11	18.9	7480	1.1	-14.9	6.8	DRO	HCL	8015M
|										GRO	HCL	8015M
|										VOC	HCL	8260
|								Anions (Chloride,Fluoride,Sulfate)			Neat	300
|							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
|										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
|										TDS	Neat	2540C
|							***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
|							***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
|						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
|						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
|										~~Cyanide~~	~~NaOH~~	~~SM4500~~
↓	1000	Dup-EB-03	9.20	7.11	18.9	7480	1.1	-14.9	6.8	Same analysis	Same	same

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-88
Event: Spring 2017 (Biennial)
Area of Concern: EP (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1500	NA	8.45	0.0	20.31	14.8	Yes	Yes	Yes	Yes	Hole in pad	Weather: Clear 50's
4/26/17	1030	NA	8.51	0.0								

Well Purging Record

* Issue with pad; hole in west side of well pad well remains functional

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1035	8.58	0.5	7.19	18.6	7990	2.7	-109.8	20.2	clear w/ orange particles	*Low-flow groundwater sample:*
"	1037	8.59	1.0	7.10	18.3	8040	2.2	-100.3	15.1	"	(A) peristaltic pump w/ ded tubing
"	1040	8.60	1.5	7.05	17.9	8080	1.8	-92.4	12.5	"	B) ded bladder pump
"	1042	8.60	2.0	7.03	17.7	8080	1.5	-81.8	10.8	"	C) non-ded bladder pump; or
"	1045	8.60	2.5	7.02	17.7	8070	1.3	-78.6	9.7	"	*Standard groundwater sample:*
"	1047	8.61	3.0	7.01	17.6	8080	1.3	-74.7	9.3	"	D) bailer due to limited column; or
"	1050	8.61	3.5	7.01	17.6	8070	1.2	-72.3	8.9	"	E) recovery well cycling sample
↓	1052	8.61	4.0	7.01	17.6	8070	1.2	-70.4	8.4	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1055	MW-88	8.61	7.01	17.6	8070	1.2	-70.4	8.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ca,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ca,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

+ DUP-EP-02 (same analysis)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-22A
Event: Spring 2017 (Biennial)
Area of Concern: EP (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1510	NA	7.75	0.0	22.65	17.4	Yes	Yes	Yes	Yes		Weather: Clear 60s
4/26/17	1115	NA	7.81	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1120	7.88	0.5	7.20	18.9	8910	2.5	-10.3	32.1	Clear w/ orange	*Low-flow groundwater sample:*
	1122	7.94	1.0	7.13	18.9	8950	2.1	-16.5	30.8	particles	(A) peristaltic pump w/ ded tubing
	1125	7.97	1.5	7.06	18.6	8990	1.8	-21.3	26.5		B) ded bladder pump
	1127	8.00	2.0	7.05	18.1	9000	1.6	-25.3	25.1		C) non-ded bladder pump; or
	1130	8.03	2.5	7.03	18.1	8990	1.4	-27.5	24.2		*Standard groundwater sample:*
	1132	8.05	3.0	7.02	18.0	9000	1.3	-30.7	23.7		D) bailer due to limited column; or
	1135	8.06	3.5	7.01	18.0	9010	1.2	-33.5	23.6		E) recovery well cycling sample
↓	1137	8.07	4.0	7.01	18.0	9010	1.2	-35.6	23.7	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1140	MW-22A	8.07	7.01	18.0	9010	1.2	-35.6	23.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				~~Neat~~	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
↓	900	DUP-EP-02	8.07	7.01	18.0	9010	1.2	-35.6	23.7	Same analysis	same	same

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-22B
Event: Spring 2017 (Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1515	NA	7.60	0.0	54.66	49.7	Yes	Yes	Yes	Yes		Weather: Clear 60's
4/26/17	1210	NA	7.74	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1215	7.81	0.5	7.20	19.8	7650	2.0	-82.6	9.8	Clear	*Low-flow groundwater sample:*
	1217	7.81	1.0	7.15	19.4	7500	1.7	-70.9	8.6		(A) peristaltic pump w/ ded tubing
	1220	7.81	1.5	7.12	19.0	7420	1.5	-61.8	8.1		B) ded bladder pump
	1222	7.81	2.0	7.10	18.9	7400	1.4	-57.8	7.8		C) non-ded bladder pump; or
	1225	7.81	2.5	7.08	18.9	7390	1.3	-53.5	7.4		*Standard groundwater sample:*
	1227	7.81	3.0	7.06	18.8	7380	1.3	-50.2	6.9		D) bailer due to limited column; or
	1230	7.81	3.5	7.05	18.8	7380	1.2	-49.3	6.5		E) recovery well cycling sample
↓	1232	7.81	4.0	7.04	18.7	7370	1.2	-47.9	5.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1235	MW-22B	7.81	7.04	18.7	7370	1.2	-47.9	5.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

located approx. 15 yards off off the left side of the path ("After the "s" turn)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-10
Event: Spring 2017 (Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1525	NA	5.20	0.0	18.45	13.3	Yes	Yes	Yes	Yes	cracked pad	Weather: Clear 60's
4/26/17	1255	NA	5.26	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1300	5.27	0.5	6.65	19.4	7280	2.3	-76.2	7.8	clear w/ small	*Low-flow groundwater sample:*
	1302	5.27	1.0	6.70	19.3	7250	1.8	-63.7	6.9	orange particles	(A) peristaltic pump w/ ded tubing
	1305	5.28	1.5	6.73	19.2	7210	1.5	-56.5	6.3		B) ded bladder pump
	1307	5.28	2.0	6.76	19.1	7200	1.3	-43.2	5.8		C) non-ded bladder pump; or
	1310	5.28	2.5	6.78	19.0	7200	1.2	-30.8	5.3		*Standard groundwater sample:*
	1312	5.28	3.0	6.79	19.0	7196	1.2	-26.5	4.9		D) bailer due to limited column; or
	1315	5.28	3.5	6.80	19.0	7190	1.1	-23.1	4.7		E) recovery well cycling sample
↓	1317	5.28	4.0	6.80	19.1	7190	1.1	-20.8	4.3	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1320	MW-10	5.28	6.80	19.1	7190	1.1	-20.8	4.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	~~Neat~~	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ce,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ce,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-123
Event: Spring 2017 (Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: SCO

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1535	NA	5.59	0.0	25.71	25.0	Yes	Yes	Yes	Yes		Weather: Clear 60's
4/26/17	1340	NA	5.64	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1345	5.65	0.5	7.23	19.0	8040	2.5	-75.4	27.8	clear w/ white particles	*Low-flow groundwater sample:*
|	1347	5.66	1.0	7.15	19.6	8060	2.0	-72.6	14.5	|	(A) peristaltic pump w/ ded tubing
|	1350	5.66	1.5	7.11	19.5	8090	1.7	-61.2	10.9	|	B) ded bladder pump
|	1352	5.66	2.0	7.07	19.3	8120	1.5	-41.3	9.7	|	C) non-ded bladder pump; or
|	1355	5.66	2.5	7.03	19.1	8150	1.4	-32.3	9.5	|	*Standard groundwater sample:*
|	1357	5.66	3.0	7.01	19.2	8150	1.4	-25.6	8.7	|	D) bailer due to limited column; or
|	1400	5.66	3.5	7.00	19.2	8160	1.3	-21.3	8.3	|	E) recovery well cycling sample
↓	1402	5.66	4.0	6.99	19.2	8160	1.3	-18.6	7.9	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1405	MW-123	5.66	6.99	19.2	8160	1.3	-18.6	7.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ca,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ca,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

2 1/2 ft of subsidence under pad; Top of protective casing extends above protective casing; lock on expandable cap

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-4A
Event: Spring 2017 (Biennial)
Area of Concern: EP

[blockage @ 11.88']

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1445	NA	11.59	0.0	>11.88	11.5 *	Yes	Issue	Issue	Yes		Weather: Clear 50's
4/26/17	900	NA	11.68	0.0								

Well Purging Record

* Lowered intake as needed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	905	11.70	0.5	7.43	18.0	7020	3.3	-161.8	15.3	Clear w/ black particles	Low-flow groundwater sample:
	907	11.70	1.0	7.32	17.6	7020	2.9	-166.9	10.5		(A) peristaltic pump w/ ded tubing
	910	11.70	1.5	7.25	17.6	7030	2.7	-170.1	9.5		B) ded bladder pump
	912	11.70	2.0	7.21	17.5	7040	2.6	-174.2	8.7		C) non-ded bladder pump; or
	915	11.70	2.5	7.19	17.5	7040	2.5	-176.2	8.3		Standard groundwater sample:
	917	11.70	3.0	7.16	17.5	7050	2.5	-177.5	7.9		D) bailer due to limited column; or
	920	11.70	3.5	7.15	17.5	7050	2.4	-178.2	7.4		E) recovery well cycling sample
	922	11.70	4.0	7.15	17.5	7050	2.4	-178.9	7.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	925	MW-4A	11.70	7.15	17.5	7050	2.4	-178.9	7.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW - 4B
Event: Spring 2017 (Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1450	NA	10.85	0.0	72.37	67.4	Yes	Yes	Yes	Yes		Weather: Clear 50's
4/26/17	945	NA	10.94	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	950	11.05	0.5	7.45	18.9	5630	3.8	-129.9	12.3	Clear	*Low-flow groundwater sample:*
	952	11.05	1.0	7.34	18.9	5520	3.4	-129.4	9.8		(A) peristaltic pump w/ ded tubing
	955	11.05	1.5	7.29	18.9	5480	3.2	-129.0	7.5		B) ded bladder pump
	957	11.05	2.0	7.22	18.8	5470	3.1	-128.5	6.1		C) non-ded bladder pump; or
	1000	11.05	2.5	7.15	18.8	5470	3.1	-127.3	5.3		*Standard groundwater sample:*
	1002	11.05	3.0	7.12	18.8	5470	3.0	-126.3	5.1		D) bailer due to limited column; or
	1005	11.05	3.5	7.10	18.8	5460	3.0	-125.9	4.9		E) recovery well cycling sample
↓	1007	11.05	4.0	7.09	18.8	5460	3.0	-125.4	4.7	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1010	MW-4B	11.05	7.09	18.8	5460	3.0	-125.4	4.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

+ EB-EP-03 (same analysis)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-5A
Event: Spring 2017 (Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1210	NA	8.18	0.0	20.15	14.8	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1215	8.24	0.5	7.52	23.9	14,520	2.9	-134.1	18.3	Clear w/ orange	*Low-flow groundwater sample:*
"	1217	8.24	1.0	7.45	22.7	14,610	2.2	-136.0	13.7	particles	(A) peristaltic pump w/ ded tubing
"	1220	8.24	1.5	7.40	21.5	14,780	1.7	-138.2	10.5	"	B) ded bladder pump
"	1222	8.24	2.0	7.36	21.2	15,110	1.5	-140.4	9.7	"	C) non-ded bladder pump; or
"	1225	8.24	2.5	7.32	21.1	15,250	1.3	-141.2	8.6	"	*Standard groundwater sample:*
"	1227	8.24	3.0	7.28	21.1	15,420	1.2	-141.5	8.3	"	D) bailer due to limited column; or
"	1230	8.24	3.5	7.26	21.1	15,490	1.2	-141.8	7.9	"	E) recovery well cycling sample
↓	1232	8.24	4.0	7.24	21.1	15,520	1.1	-142.1	7.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1235	MW-5A	8.24	7.24	21.1	15,520	1.1	-142.1	7.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
↓	1250	EB-EP-03	NA	→	→	→	→	→	→	Same analysis	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-5B
Event: Spring 2017 (Biennial)
Area of Concern: EP (2-in ; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1305	NA	8.34	0.0	53.54	48.5	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1310	8.35	0.5	7.23	23.9	9090	2.3	-112.5	6.5	Clear	*Low-flow groundwater sample:*
"	1312	8.35	1.0	7.19	23.5	9030	1.9	-107.3	4.2	"	(A) peristaltic pump w/ ded tubing
"	1315	8.35	1.5	7.15	22.8	9010	1.5	-104.2	3.8	"	B) ded bladder pump
"	1317	8.35	2.0	7.13	21.9	9000	1.2	-102.3	3.4	"	C) non-ded bladder pump; or
"	1320	8.35	2.5	7.10	21.1	8990	1.0	-100.6	2.9	"	*Standard groundwater sample:*
"	1322	8.35	3.0	7.05	21.1	8980	0.9	-99.8	2.7	"	D) bailer due to limited column; or
"	1325	8.35	3.5	7.02	21.2	8980	0.9	-97.5	2.5	"	E) recovery well cycling sample
↓	1327	8.35	4.0	7.00	21.2	8970	0.9	-96.1	2.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1330	MW-5B	8.35	7.00	21.2	8970	0.9	-96.1	2.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-5C
Event: Spring 2017 (Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1350	NA	8.54	0.0	71.64	66.6	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1355	8.56	0.5	7.45	23.8	4760	1.9	-102.5	22.6	Clear w/ white particles	Low-flow groundwater sample:
	1357	8.56	1.0	7.39	23.2	4650	1.6	-101.7	25.8		(A) peristaltic pump w/ ded tubing
	1400	8.56	1.5	7.33	22.4	4580	1.4	-97.4	26.7		B) ded bladder pump
	1402	8.56	2.0	7.28	22.2	4560	1.3	-97.2	28.3		C) non-ded bladder pump; or
	1405	8.56	2.5	7.24	22.1	4540	1.2	-96.7	32.2		Standard groundwater sample:
	1407	8.56	3.0	7.22	21.9	4510	1.2	-94.3	33.9		D) bailer due to limited column; or
	1410	8.56	3.5	7.21	21.9	4490	1.1	-94.1	34.1		E) recovery well cycling sample
↓	1412	8.56	4.0	7.21	21.8	4480	1.1	-93.8	34.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/25/17	1415	MW-5C	8.56	7.21	21.8	4480	1.1	-93.8	34.5			Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

2-in stainless steel well casing extends approximately 1-foot above to top of the steel protective casing; expandable locking cap is locked

Monitoring Well Purging and Sampling Record

+ DUP-EP-01 (same analysis)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-7A
Event: Spring 2017 (Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1030	NA	7.57	0.0	17.25	12.1	Yes	Yes	Issue	Yes		Weather: Partly Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1035	7.67	0.5	7.53	21.9	10,910	2.2	-82.2	>200	cloudy; orange particles	*Low-flow groundwater sample:*
	1037	7.67	1.0	7.45	20.7	10,640	1.7	-76.2	>200	↓	(A) peristaltic pump w/ ded tubing
	1040	7.68	1.5	7.39	19.8	10,570	1.4	-75.3	165	↓	B) ded bladder pump
	1042	7.68	2.0	7.35	19.5	10,480	1.2	-77.9	52.3	sl. cloudy	C) non-ded bladder pump; or
	1045	7.69	2.5	7.29	19.3	10,470	1.1	-79.1	24.0	clear	*Standard groundwater sample:*
	1047	7.68	3.0	7.25	19.2	10,400	1.1	-79.9	11.2	↓	D) bailer due to limited column; or
	1050	7.68	3.5	7.23	19.2	10,400	1.0	-80.9	10.5	↓	E) recovery well cycling sample
↓	1052	7.68	4.0	7.21	19.2	10,390	1.0	-81.3	9.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1055	MW-7A	7.68	7.21	19.2	10,390	1.0	-81.3	9.8	DRO	HCL	8015M
↓										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
↓	1000	DUP-EP-01	7.68	7.21	19.2	10,390	1.0	-81.3	9.8	Same analysis	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-7B
Event: Spring 2017 (Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1125	NA	8.87	0.0	52.56	47.6	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1130	8.99	0.5	7.49	23.7	6310	1.9	-18.7	6.8	Clear	*Low-flow groundwater sample:*
	1132	8.99	1.0	7.32	22.7	6100	1.4	-19.7	6.2		(A) peristaltic pump w/ ded tubing
	1135	8.99	1.5	7.25	21.7	5970	1.2	-15.8	5.7		B) ded bladder pump
	1137	8.99	2.0	7.19	21.4	5910	1.1	-13.5	5.1		C) non-ded bladder pump; or
	1140	8.99	2.5	7.14	21.3	5870	1.1	-10.3	4.8		*Standard groundwater sample:*
	1142	8.99	3.0	7.11	21.2	5840	1.0	-10.1	4.2		D) bailer due to limited column; or
	1145	8.99	3.5	7.09	21.2	5820	1.0	-9.8	3.9		E) recovery well cycling sample
↓	1147	8.99	4.0	7.08	21.1	5810	0.9	-9.3	3.7	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/25/17	1150	MW-7B	8.99	7.08	21.1	5810	0.9	-9.3	3.7			Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

+ Trip Blank - EP-02

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-8A
Event: Spring 2017 (Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	945	NA	8.61	0.0	20.74	16.4	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	950	9.06	0.5	7.20	23.4	13,220	2.8	-146.1	9.8	Clear w/ orange	*Low-flow groundwater sample:*
↓	952	9.21	1.0	7.18	22.1	13,320	2.3	-142.4	9.2	particles	(A) peristaltic pump w/ ded tubing
	955	9.28	1.5	7.15	21.4	13,390	1.9	-143.7	8.6	↓	B) ded bladder pump
	957	9.33	2.0	7.10	21.1	13,400	1.5	-143.8	8.2		C) non-ded bladder pump; or
	1000	9.35	2.5	7.08	21.1	13,400	1.4	-144.2	7.7		*Standard groundwater sample:*
	1002	9.37	3.0	7.07	21.1	13,410	1.3	-144.6	7.5		D) bailer due to limited column; or
	1005	9.39	3.5	7.07	21.2	13,410	1.3	-144.9	6.9		E) recovery well cycling sample
↓	1007	9.40	4.0	7.06	21.2	13,410	1.2	-145.3	6.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1010	OCD-8A	9.40	7.06	21.2	13,410	1.2	-145.3	6.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~Field filtered 0.45-u~~
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-8B
Event: Spring 2017 (Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	900	NA	8.77	0.0	56.65	51.7	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	905	8.80	0.5	6.76	23.4	9770	1.8	-47.4	16.1	Clear	*Low-flow groundwater sample:*
	907	8.81	1.0	6.81	22.6	9850	1.4	-62.0	12.5		(A) peristaltic pump w/ ded tubing
	910	8.81	1.5	6.85	22.1	9860	1.1	-73.9	10.5		B) ded bladder pump
	912	8.81	2.0	6.87	21.7	9850	1.0	-80.9	9.8		C) non-ded bladder pump; or
	915	8.81	2.5	6.89	21.5	9840	0.9	-86.3	9.4		*Standard groundwater sample:*
	917	8.81	3.0	6.90	21.4	9830	0.9	-91.1	8.7		D) bailer due to limited column; or
	920	8.81	3.5	6.91	21.3	9820	0.8	-93.3	8.5		E) recovery well cycling sample
↓	922	8.81	4.0	6.92	21.3	9820	0.8	-95.3	8.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	925	OCD-8B	8.81	6.92	21.3	9820	0.8	-95.3	8.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB - P4
Event: Spring 2017 (Biennial)
Area of Concern: Rest (2-in; (short) stick-up) Initials: BRH

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1110	NA	4.36	0.0	30.26	22.8	Yes	Yes	Yes	Yes		Weather: Sunny, windy, 60
4-26-17	830	NA	4.37	0.0	30.26							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-26-17	835	4.67	0.5	7.80	16.6	5800	2.8	45.2	12.1	clear	*Low-flow groundwater sample:*
	838	4.84	1.0	7.72	16.7	5720	1.7	60.8	10.0		(A) peristaltic pump w/ ded tubing
	840	4.88	1.5	7.57	16.7	5690	1.2	68.1	9.3		B) ded bladder pump
	843	4.89	2.0	7.46	16.8	5670	1.2	73.2	8.6		C) non-ded bladder pump; or
	845	4.89	2.5	7.39	16.8	5640	1.3	77.1	7.9		*Standard groundwater sample:*
	848	4.90	3.0	7.34	16.8	5620	1.3	80.4	7.4		D) bailer due to limited column; or
	850	4.90	3.5	7.31	16.9	5610	1.2	81.9	7.0		E) recovery well cycling sample
	853	4.90	4.0	7.29	16.9	5610	1.2	83.6	6.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-26-17	855	KWB-P4	4.90	7.29	16.9	5610	1.2	83.6	6.8	DRO	HCL	Lab: ESC Lab Sciences, Mt. Juliet, TN 8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										~~Anions (Chloride,Fluoride,Sulfate)~~	~~Neat~~	~~300~~
										~~Cations (Ca,K,Na), taken from total metals bottle~~	~~HNO3~~	~~6010/6020~~
										~~Nitrate-Nitrite~~	~~H2SO4~~	~~per historical, ESC Lab Sciences~~
										~~TDS~~	~~Neat~~	~~2540C~~
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-25
Event: Spring 2017 (Biennial)
Area of Concern: TMD (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1125	NA	11.62	0.0	28.18	23.2	Yes	Yes	Yes	Yes	subsidence under pad	Weather: Sunny, 70s
4-26-17	1445	NA	11.65	0.0	28.18							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-26-17	1450	12.03	0.5	7.63	19.6	13,560	2.4	67.4	8.1	Clear	*Low-flow groundwater sample:*
	1453	12.07	1.0	7.56	19.6	13,930	1.3	71.3	5.5		(A) peristaltic pump w/ ded tubing
	1455	12.07	1.5	7.47	19.6	14,210	0.9	75.5	4.7		B) ded bladder pump
	1458	12.07	2.0	7.40	19.7	14,270	0.7	77.0	3.4		C) non-ded bladder pump; or
	1500	12.07	2.5	7.36	19.7	14,310	0.7	78.4	2.8		*Standard groundwater sample:*
	1503	12.07	3.0	7.33	19.7	14,320	0.6	79.8	2.3		D) bailer due to limited column; or
	1505	12.07	3.5	7.30	19.7	14,340	0.6	80.3	2.0		E) recovery well cycling sample
	1508	12.07	4.0	7.28	19.7	14,350	0.5	81.2	1.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4-26-17	1510	MW-25	12.07	7.28	19.7	14,350	0.5	81.2	1.8	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "Sampling" Program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-8 (Gauge only)
Event: Spring 2017 (Biennial)
Area of Concern: TMD (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1130	NA	12.65	0.0	15.20	Not Sampled	Issue	Issue	Yes	Yes		Weather: Sunny, windy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0		PVC well is approx 2.0' below top						A) peristaltic pump w/ ded tubing
			1.5		of metal protective casing. Unable to						B) ded bladder pump
			2.0		access top of well, so no cap is present.						C) non-ded bladder pump; or
			2.5		DTW & TD measured from top of						*Standard groundwater sample:*
			3.0		metal casing. HMI suggests metal protective						D) bailer due to limited column; or
			3.5		casing should be cut down.						E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-1R
Event: Spring 2017 (Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1135	NA	10.95	0.0	20.63	15.6	Yes	Issue	Yes	yes		Weather: Sunny, 70s
4-26-17	1535	NA	10.98	0.0	20.63			↳				

↳ Casing + lid are bent, making closure difficult. well still locks + is functional

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-26-17	1540	11.14	0.5	7.73	19.1	12,210	2.8	-109.4	67.0	clear w/ orange	*Low-flow groundwater sample:*
	1543	11.14	1.0	7.60	19.0	12,290	1.0	-111.8	87.0	algae particles	(A) peristaltic pump w/ ded tubing
	1545	11.14	1.5	7.52	18.9	12,380	0.7	-113.5	64.0		B) ded bladder pump
	1548	11.14	2.0	7.41	18.8	12,410	0.6	-116.1	51.0		C) non-ded bladder pump; or
	1550	11.14	2.5	7.32	18.8	12,420	0.6	-118.3	48.6		*Standard groundwater sample:*
	1553	11.14	3.0	7.27	18.7	12,440	0.5	-120.2	43.5		D) bailer due to limited column; or
	1555	11.14	3.5	7.25	18.7	12,450	0.5	-121.7	41.7		E) recovery well cycling sample
	1558	11.14	4.0	7.23	18.7	12,460	0.5	-122.8	42.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4-26-17	1600	MW-1R	11.14	7.23	18.7	12,460	0.5	-122.8	42.6	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-15
Event: Spring 2017 (Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1140	NA	11.85	0.0	21.70	17.7	Yes	Yes	Yes	Yes		Weather: Sunny, 70s
4-26-17	1625	NA	11.88	0.0	21.70							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-26-17	1630	11.92	0.5	7.91	21.2	10,960	3.1	44.9	6.1	clear	*Low-flow groundwater sample:*
	1633	11.92	1.0	7.80	20.8	10,610	1.2	47.3	4.6		(A) peristaltic pump w/ ded tubing
	1635	11.92	1.5	7.73	20.5	10,340	0.9	45.1	3.7		B) ded bladder pump
	1638	11.92	2.0	7.58	20.4	9,980	0.8	45.5	3.4		C) non-ded bladder pump; or
	1640	11.92	2.5	7.48	20.3	9,910	0.7	45.8	2.8		*Standard groundwater sample:*
	1643	11.92	3.0	7.44	20.3	9,850	0.6	46.1	2.3		D) bailer due to limited column; or
	1645	11.92	3.5	7.40	20.2	9,830	0.6	45.7	2.0		E) recovery well cycling sample
	1648	11.92	4.0	7.39	20.2	9,810	0.6	45.3	1.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-26-17	1650	MW-15	11.92	7.39	20.2	9810	0.6	45.3	1.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Trip Blank - EP-03

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-1R
Event: Spring 2017 (Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup)

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1150	NA	12.33	0.0	23.89	18.6	Yes	Issue	Yes	Yes		Weather: Sunny, 70
4-26-17	1400	NA	12.39	0.0	23.89			↳				

↳ Casing lid does not fully close. pvc casing needs to be cut down for full closure. well is secured w/ long-hasp lock.

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-26-17	1405	12.57	0.5	7.70	20.1	9680	3.0	12.8	10.1	clear	*Low-flow groundwater sample:*
	1408	12.59	1.0	7.59	19.6	9860	1.8	13.1	7.8		(A) peristaltic pump w/ ded tubing
	1410	12.60	1.5	7.48	19.4	9920	1.3	17.5	6.9		B) ded bladder pump
	1413	12.60	2.0	7.38	19.2	9990	1.1	20.3	6.8		C) non-ded bladder pump; or
	1415	12.60	2.5	7.30	19.1	10,080	0.9	21.8	5.1		*Standard groundwater sample:*
	1418	12.60	3.0	7.25	19.1	10,110	0.8	22.1	4.5		D) bailer due to limited column; or
	1420	12.60	3.5	7.23	19.0	10,120	0.7	22.6	4.2		E) recovery well cycling sample
	1423	12.60	4.0	7.22	19.0	10,140	0.7	22.4	3.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4-26-17	1425	OCD-1R	12.60	7.22	19.0	10,140	0.7	22.4	3.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500-~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD - 2A
Event: Spring 2017 (Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1157	NA	12.42	0.0	27.58	22.3	Yes	Yes	Yes	Yes		Weather: Sunny, 60s
4-26-17	1310	NA	12.47	0.0	27.58							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-26-17	1315	12.59	0.5	7.61	19.6	7360	2.4	-125.8	16.4	Clear w/ orange	*Low-flow groundwater sample:*
	1318	12.60	1.0	7.57	19.3	7350	1.4	-126.1	12.0	algae particles	(A) peristaltic pump w/ ded tubing
	1320	12.60	1.5	7.52	19.2	7330	1.0	-127.0	10.3		B) ded bladder pump
	1323	12.60	2.0	7.45	19.1	7320	0.7	-126.4	9.7		C) non-ded bladder pump; or
	1325	12.60	2.5	7.42	19.1	7300	0.6	-125.3	8.6		*Standard groundwater sample:*
	1328	12.60	3.0	7.40	19.0	7290	0.6	-124.2	8.4		D) bailer due to limited column; or
	1330	12.60	3.5	7.38	19.0	7280	0.5	-123.4	7.9		E) recovery well cycling sample
	1333	12.60	4.0	7.37	19.0	7270	0.5	-122.8	7.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-26-17	1340	OCD-2A	12.60	7.37	19.0	7270	0.5	-122.8	7.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "Sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-2B (Gauge only)
Event: Spring 2017 (Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1200	NA	11.36	0.0	50.39	Not Sampled	Yes	Yes	Yes	Yes		Weather: Sunny, windy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-3
Event: Spring 2017 (Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

(2-in; stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1205	NA	12.94	0.0	25.48	20.2	Yes	Yes	Yes	Yes	Pad is	Weather: Sunny, 60s
4-26-17	1225	NA	~~12.98 BRH~~ 12.98	0.0	25.48						destroyed	

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-26-17	1230	13.11	0.5	7.61	20.4	8530	2.9	80.6	12.1	clear	*Low-flow groundwater sample:*
	1233	13.12	1.0	7.58	20.0	8320	2.0	82.5	8.6		(A) peristaltic pump w/ ded tubing
	1235	13.12	1.5	7.47	19.8	8250	1.7	83.3	7.2		B) ded bladder pump
	1238	13.12	2.0	7.38	19.7	8200	1.4	84.1	6.9		C) non-ded bladder pump; or
	1240	13.12	2.5	7.31	19.7	8190	1.3	84.7	6.5		*Standard groundwater sample:*
	1243	13.12	3.0	7.27	19.7	8180	1.2	85.3	6.1		D) bailer due to limited column; or
	1245	13.12	3.5	7.24	19.8	8180	1.1	85.8	5.9		E) recovery well cycling sample
	1248	13.12	4.0	7.23	19.8	8170	1.1	86.2	5.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-26-17	1250	OCD-3	13.12	7.23	19.8	8170	1.1	86.2	5.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-4
Event: Spring 2017 (Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1210	NA	12.20	0.0	25.42	20.1	Yes	Yes	Yes	Yes	Subsidence	Weather: Sunny, windy, 60s
4-26-17	925	NA	12.25	0.0	25.42						under pad	

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-26-17	930	12.27	0.5	7.87	18.9	12,950	2.0	53.8	48.1	clear w/ orange	*Low-flow groundwater sample:*
	933	12.27	1.0	7.65	18.8	13,160	1.2	22.0	26.7	algae particles	(A) peristaltic pump w/ ded tubing
	935	12.27	1.5	7.53	18.8	13,190	0.9	9.1	21.9		B) ded bladder pump
	938	12.27	2.0	7.48	18.8	13,210	0.7	3.6	20.4		C) non-ded bladder pump; or
	940	12.27	2.5	7.41	18.7	13,220	0.7	-1.6	18.9		*Standard groundwater sample:*
	943	12.27	3.0	7.37	18.7	13,220	0.6	-4.1	18.4		D) bailer due to limited column; or
	945	12.27	3.5	7.35	18.8	13,230	0.6	-4.9	18.1		E) recovery well cycling sample
	948	12.27	4.0	7.33	18.8	13,230	0.6	-5.7	17.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-26-17	950	OCD-4	12.27	7.33	18.8	13,230	0.6	-5.7	17.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-11A
Event: Spring 2017 (Biennial)
Area of Concern: EP (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1215	NA	9.69	0.0	22.01	17.0	Yes	Yes	Yes	Yes		Weather: Sunny, 60s
4-26-17	1055	NA	9.74	0.0	22.01							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-26-17	1100	9.84	0.5	7.40	19.5	27,200	2.6	18.9	16.8	clear	*Low-flow groundwater sample:*
	1103	9.84	1.0	7.30	19.3	27,400	1.3	10.1	10.1		(A) peristaltic pump w/ ded tubing
	1105	9.84	1.5	7.22	19.2	27,500	0.9	3.6	9.4		B) ded bladder pump
	1108	9.84	2.0	7.16	19.1	27,600	0.6	-0.8	9.0		C) non-ded bladder pump; or
	1110	9.84	2.5	7.08	19.1	27,600	0.6	-1.9	8.7		*Standard groundwater sample:*
	1113	9.84	3.0	7.05	19.1	27,700	0.7	-2.4	8.4		D) bailer due to limited column; or
	1115	9.84	3.5	7.03	19.0	27,700	0.7	-3.0	8.2		E) recovery well cycling sample
	1118	9.84	4.0	7.02	19.0	27,800	0.7	-3.4	8.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-26-17	1120	MW-11A	9.84	7.02	19.0	27,800	0.7	-3.4	8.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-11B
Event: Spring 2017 (Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; Stickup)

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1218	NA	9.66	0.0	47.30	42.3	Yes	Yes	Yes	Yes		Weather: Sunny, 60s
4-26-17	1140	NA	9.68	0.0	47.30							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-26-17	1145	9.70	0.5	7.72	20.1	16,980	2.6	-89.3	10.1	clear	*Low-flow groundwater sample:*
	1148	9.70	1.0	7.60	20.0	17,420	1.6	-90.1	8.7		(A) peristaltic pump w/ ded tubing
	1150	9.70	1.5	7.48	19.9	17,840	1.2	-87.6	5.9		B) ded bladder pump
	1153	9.70	2.0	7.38	19.8	18,510	1.0	-85.8	4.3		C) non-ded bladder pump; or
	1155	9.70	2.5	7.29	19.8	18,600	0.9	-84.7	3.7		*Standard groundwater sample:*
	1158	9.70	3.0	7.22	19.8	18,620	0.9	-83.9	3.1		D) bailer due to limited column; or
	1200	9.70	3.5	7.19	19.8	18,640	0.8	-83.1	2.8		E) recovery well cycling sample
	1203	9.70	4.0	7.17	19.8	18,660	0.8	-82.7	2.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-26-17	1205	MW-11B	9.70	7.17	19.8	18,660	0.8	-82.7	2.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-5
Event: Spring 2017 (Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1225	NA	10.40	0.0	25.42	20.6	Yes	Yes	Yes	Yes	Pad	Weather: Sunny, 60s
4-26-17	1010	NA	10.45	0.0	25.42					severely cracked		

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-26-17	1015	10.52	0.5	7.76	19.0	14,610	2.8	-42.8	81.0	sl. cloudy, orange	*Low-flow groundwater sample:*
	1018	10.52	1.0	7.61	19.1	14,620	1.2	-41.0	64.0	algae particles	(A) peristaltic pump w/ ded tubing
	1020	10.52	1.5	7.58	19.1	14,650	1.0	-42.6	48.7		B) ded bladder pump
	1023	10.52	2.0	7.53	19.0	14,680	0.8	-45.4	36.9		C) non-ded bladder pump; or
	1025	10.52	2.5	7.47	19.0	14,700	0.7	-48.1	35.8		*Standard groundwater sample:*
	1028	10.52	3.0	7.42	19.0	14,710	0.7	-50.7	34.7		D) bailer due to limited column; or
	1030	10.52	3.5	7,41	18.9	14,710	0.6	-51.7	35.2		E) recovery well cycling sample
	1033	10.52	4.0	7.40	18.9	14,720	0.6	-52.6	36.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-26-17	1035	OCD-5	10.52	7.40	18.9	14,720	0.6	-52.6	36.1			Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ce,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ce,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-87
Event: Spring 2017 (Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup)

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1250	NA	8.58	0.0	20.39	15.1	Yes	Yes	Yes	Yes		Weather: Sunny, windy, 80

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-25-17	1700	8.70	0.5	7.53	21.8	14,920	2.7	-106.3	8.1	clear	*Low-flow groundwater sample:*
	1703	8.75	1.0	7.48	21.2	15,040	1.4	-112.1	5.9		(A) peristaltic pump w/ ded tubing
	1705	8.79	1.5	7.43	20.9	15,130	1.0	-117.3	4.7		B) ded bladder pump
	1708	8.82	2.0	7.41	20.7	15,180	0.8	-119.0	3.3		C) non-ded bladder pump; or
	1710	8.85	2.5	7.38	20.6	15,200	0.8	-120.6	3.0		*Standard groundwater sample:*
	1713	8.88	3.0	7.36	20.6	15,220	0.7	-121.8	2.6		D) bailer due to limited column; or
	1715	8.91	3.5	7.35	20.5	15,230	0.7	-122.4	2.1		E) recovery well cycling sample
	1718	8.94	4.0	7.34	20.4	15,230	0.6	-122.9	1.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4-25-17	1720	MW-87	8.94	7.34	20.4	15,230	0.6	-122.9	1.9			Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-18A
Event: Spring 2017 (Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1300	NA	10.29	0.0	22.55	17.9	Yes	Yes	Yes	Yes		Weather: Sunny, windy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-25-17	1305	10.51	0.5	6.60	23.3	5780	2.9	-131.2	6.1	clear	*Low-flow groundwater sample:*
	1308	10.60	1.0	6.84	23.0	5930	1.8	-127.8	4.0		(A) peristaltic pump w/ ded tubing
	1310	10.67	1.5	7.01	22.4	6190	1.3	-134.5	2.8		B) ded bladder pump
	1313	10.73	2.0	7.09	21.5	6430	1.1	-141.0	2.3		C) non-ded bladder pump; or
	1315	10.78	2.5	7.12	21.3	6680	0.9	-146.2	2.1		*Standard groundwater sample:*
	1318	10.82	3.0	7.13	21.2	6710	0.7	-149.1	1.9		D) bailer due to limited column; or
	1320	10.85	3.5	7.15	21.2	6720	0.6	-151.3	1.6		E) recovery well cycling sample
	1323	10.88	4.0	7.16	21.2	6730	0.6	-152.7	1.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-25-17	1330	MW-18A	10.88	7.16	21.2	6730	0.6	-152.7	1.4	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					Meat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-18B
Event: Spring 2017 (Biennial)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BZH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1350	NA	10.27	0.0	50.59	45.6	Yes	Yes	Yes	Yes		Weather: Sunny, windy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-25-17	1355	10.30	0.5	7.32	23.8	5730	2.8	-14.2	5.1	clear	*Low-flow groundwater sample:*
	1358	10.30	1.0	7.27	23.2	5680	1.4	-10.8	3.6		(A) peristaltic pump w/ ded tubing
	1400	10.30	1.5	7.21	23.0	5390	1.0	-9.0	2.8		B) ded bladder pump
	1403	10.30	2.0	7.16	22.9	5210	0.6	-7.2	2.1		C) non-ded bladder pump; or
	1405	10.30	2.5	7.12	22.8	5140	0.6	-6.8	1.7		*Standard groundwater sample:*
	1408	10.30	3.0	7.08	22.7	5030	0.5	-6.2	1.3		D) bailer due to limited column; or
	1410	10.30	3.5	7.05	22.6	4970	0.5	-5.9	1.0		E) recovery well cycling sample
	1413	10.30	4.0	7.04	22.6	4950	0.6	-5.5	0.8		F) irrigation well grab sample
	1415	10.30	4.5	7.03	22.5	4940	0.6	-5.3	0.7		

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-25-17	1420	MW-18B	10.30	7.03	22.5	4940	0.6	-5.3	0.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "Sampling" Program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-18T (Gauge only)
Event: Spring 2017 (Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1255	NA	10.06	0.0	50.39	Not Sampled	NO	ISSUE	ISSUE	Yes		Weather: Sunny, windy, 80s
			↳ measured from highest point on PVC				↳ Top of PVC casing shattered. Needs repairs to allow usage of a cap.	(missing lid)	(lock won't resolve issue)			

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-70
Event: Spring 2017 (Biennial)
Area of Concern: EP (4-in; Stickup)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1455	NA	8.10	0.0	22.05	16.8	Yes	Yes	Yes	Yes		Weather: Sunny, windy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-25-17	1500	8.16	0.5	7.36	22.7	6210	2.1	-88.7	61.0	Clear w/ orange	*Low-flow groundwater sample:*
	1503	8.16	1.0	7.32	22.2	6240	1.7	-87.1	39.9	algae particles	(A) peristaltic pump w/ ded tubing
	1505	8.17	1.5	7.28	21.9	6270	1.1	-86.0	28.1	↓	B) ded bladder pump
	1508	8.17	2.0	7.23	21.7	6290	0.7	-85.2	19.7	↓	C) non-ded bladder pump; or
	1510	8.17	2.5	7.20	21.6	6300	0.7	-84.5	10.5	clear	*Standard groundwater sample:*
	1513	8.17	3.0	7.18	21.5	6310	0.6	-83.9	9.6	↓	D) bailer due to limited column; or
	1515	8.17	3.5	7.17	21.5	6310	0.6	-83.5	8.4	↓	E) recovery well cycling sample
↓	1518	8.17	4.0	7.16	21.4	6320	0.5	-82.9	8.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-25-17	1520	MW-70	8.17	7.16	21.4	6320	0.5	-82.9	8.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

+EB-EP-02 (same analysis)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-124
Event: Spring 2017 (Biennial)
Area of Concern: EP (2-in ; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1555	NA	9.62	0.0	22.01	17.0	Yes	Yes	Yes	Yes		Weather: Pt.Cloudy, windy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-25-17	1600	9.65	0.5	7.39	21.4	11,130	3.1	-100.4	72.0	clear w/ orange	*Low-flow groundwater sample:*
	1603	9.65	1.0	7.38	20.8	11,290	1.5	-104.8	48.7	algae particles	(A) peristaltic pump w/ ded tubing
	1605	9.65	1.5	7.34	20.4	11,420	1.1	-101.3	31.4		B) ded bladder pump
	1608	9.65	2.0	7.29	20.0	11,490	0.8	-99.1	26.5		C) non-ded bladder pump; or
	1610	9.65	2.5	7.24	19.9	11,560	0.7	-97.0	21.8		*Standard groundwater sample:*
	1613	9.65	3.0	7.22	19.8	11,610	0.7	-95.8	20.7		D) bailer due to limited column; or
	1615	9.65	3.5	7.21	19.7	11,640	0.6	-94.9	20.2		E) recovery well cycling sample
	1618	9.65	4.0	7.20	19.6	11,660	0.6	-94.1	19.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-25-17	1620	MW-124	9.65	7.20	19.6	11,660	0.6	-94.1	19.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
							~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				HNO_3	~~Field filtered 0.45-u~~
	1640	EB-EP-02	NA							~~Cyanide~~	~~NaOH~~	~~SM4500~~
										Same analysis	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

* Driveway near bldg A/C unit

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-52
Event: Spring 2017 (Biennial)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	909	NP	17.74	0.0	34.67	29.5	Yes	Yes	Issue*	Yes		Weather: Sunny, 60s
4-27-17	830	NP	17.64	0.0	34.67				missing	9/16 bolts		

↳ Note: Bolts will not fit with current at-grade plate. holes do not line up.

Well Purging Record

*SC confirmed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-27-17	835	17.67	0.5	7.00	20.9	4980	3.6	116.7	8.3	Clear	*Low-flow groundwater sample:*
	838	17.68	1.0	6.94	20.9	5120	1.8	118.3	6.7		(A) peristaltic pump w/ ded tubing
	840	17.68	1.5	6.90	21.0	5210	1.3	117.4	5.8		B) ded bladder pump
	843	17.68	2.0	6.88	21.0	5230	1.2	117.0	5.2		C) non-ded bladder pump; or
	845	17.68	2.5	6.86	21.0	5240	0.9	116.3	4.7		*Standard groundwater sample:*
	848	17.68	3.0	6.85	21.1	5240	0.8	115.4	4.1		D) bailer due to limited column; or
	850	17.68	3.5	6.84	21.2	5250	0.7	115.1	3.9		E) recovery well cycling sample
	853	17.68	4.0	6.84	21.2	5250	0.7	114.9	3.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-27-17	855	MW-52	17.68	6.84	21.2	5250	0.7	114.9	3.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

* East side of blue bldg.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-109
Event: Spring 2017 (Biennial)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	904	NP	16.01	0.0	29.48	25.5	Yes	Yes	Yes	Yes		Weather: Sunny, 60s
4-27-17	915	NP	15.93	0.0	29.48							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-27-17	920	16.09	0.5	6.94	22.6	2750	4.0	-320.5	20.6	Clear w/ black	*Low-flow groundwater sample:*
	923	16.16	1.0	6.91	22.6	2990	1.6	-331.7	12.7	tint, odor	(A) peristaltic pump w/ ded tubing
	925	16.21	1.5	6.88	22.7	3260	1.0	-346.4	10.3		B) ded bladder pump
	928	16.23	2.0	6.85	22.7	3310	0.8	-358.7	9.1		C) non-ded bladder pump; or
	930	16.25	2.5	6.84	22.7	3340	0.6	-363.8	6.8		*Standard groundwater sample:*
	933	16.26	3.0	6.83	22.8	3350	0.5	-366.1	6.0		D) bailer due to limited column; or
	935	16.27	3.5	6.83	22.8	3360	0.5	-367.8	4.9		E) recovery well cycling sample
	938	16.28	4.0	6.82	22.8	3370	0.4	-369.2	4.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-27-17	940	MW-109	16.28	6.82	22.8	3370	0.4	-369.2	4.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Gd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Gd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

* West-side driveway of blue bldg.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-110
Event: Spring 2017 (Biennial)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	900	NA	13.99	0.0	29.74	24.7	Yes	Yes	Yes	Yes		Weather: Sunny, 60s
4-27-17	1000	NA	13.86	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-27-17	1005	14.00	0.5	7.47	22.9	1866	2.9	-313.2	18.1	clear, odor	*Low-flow groundwater sample:*
	1008	14.06	1.0	7.35	22.8	1860	1.2	-324.1	10.3		(A) peristaltic pump w/ ded tubing
	1010	14.11	1.5	7.27	22.8	1858	0.9	-331.8	8.6		B) ded bladder pump
	1013	14.14	2.0	7.16	22.8	1843	0.7	-338.6	7.4		C) non-ded bladder pump; or
	1015	14.17	2.5	7.11	22.7	1837	0.6	-343.5	7.1		*Standard groundwater sample:*
	1018	14.18	3.0	7.08	22.7	1832	0.5	-346.1	6.8		D) bailer due to limited column; or
	1020	14.19	3.5	7.06	22.6	1829	0.5	-348.7	6.3		E) recovery well cycling sample
	1023	14.20	4.0	7.05	22.6	1827	0.5	-349.9	6.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4-27-17	1025	MW-110	14.20	7.05	22.6	1827	0.5	-349.9	6.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Not in "Sampling" Program due to location N. of river

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-13 (Gauge only)
Event: Spring 2017 (Biennial)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup)

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.25-17	1016	NA	12.40	0.0	21.10	Not Sampled	Yes	Yes	Yes	Yes		Weather: Sunny, windy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "Sampling" program due to location N. of river

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-69 (Gauge only)
Event: Spring 2017 (Biennial)
Area of Concern: EP (4-in; Stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1010	NA	11.53	0.0	22.50	Not Sampled	Yes	Yes	Yes	Yes		Weather: Sunny, windy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "Sampling" program due to location N. of river

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-12 (Gauge only)
Event: Spring 2017 (Biennial)
Area of Concern: EP (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	1005	NA	10.76	0.0	17.93	Not Sampled	Yes	Yes	Yes	Yes		Weather: Clear, windy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "Sampling" program due to location E. of river

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-24 (Gauge only)
Event: Spring 2017 (Biennial)
Area of Concern: EP (4-in ; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	945	NA	12.46	0.0	23.51	Not Sampled	Yes	Yes	Issue	Yes		Weather: windy, 80s

↳ Broken hasp/hinge. well is locked but will not close securely.

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "Sampling" program due to location N. of river

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-14 (Gauge Only)
Event: Spring 2017 (Biennial)
Area of Concern: EP (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4-25-17	955	NA	11.84	0.0	211.93	NA	Yes	Issue	Yes	Yes		Weather: windy, 80s
								↳ Blockage at 11.93' TOC				

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Recently off, due to water rights issue

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-12R
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Sample part of RW is active

Above-grade recovery vault
12-in well casing diameter

Well Inspection Information Initials: AS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1249	NA	21.04	0.0	NM	Top of Pump	Yes	Yes	Yes	Yes		Weather: Sunny Windy 80's
4/27/17	1205	NA	21.23	0.0		(If not running)						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/17	1210	21.26	0.5	9.34	22.4	4269	0.8	-186.4	13.8	Clear (strong HC odor)	*Low-flow groundwater sample:*
	1213	21.26	1.0	9.18	22.1	4018	0.6	-198.2	11.6	" "	(A) peristaltic pump w/ ded tubing
	1215	21.26	1.5	9.13	19.9	3978	0.5	-202.7	10.9	" "	B) ded bladder pump
	1218	21.26	2.0	9.08	19.8	3875	0.4	-205.8	9.9	" "	C) non-ded bladder pump; or
	1220	21.26	2.5	9.05	19.7	3871	0.3	-207.3	9.4	" "	*Standard groundwater sample:*
	1223	21.26	3.0	9.02	19.7	3869	0.3	-208.4	8.9	" "	D) bailer due to limited column; or
	1225	21.26	3.5	9.02	19.7	3864	0.2	-209.6	8.7	" "	E) recovery well cycling sample
	1228	21.26	4.0	9.01	19.7	3861	0.2	-210.1	8.6	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/27/17	1230	RW-12R	21.26	9.01	19.7	3861	0.2	-210.1	8.6	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

+ EB-Rest-01
+ DUP-Rest-01
(both are same analysis)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-113
Event: Spring 2017 (Biennial)
Area of Concern: Rest (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BJ

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1259	NA	20.98	0.0	37.80	33.8	Yes	Yes	Yes	Yes		Weather: Sunny Windy 80's
4-27-17	845	NA	21.13	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-27-17	850	21.17	0.5	6.17	22.1	3120	2.5	-78.7	7.4	Clear	*Low-flow groundwater sample:*
↓	852	21.17	1.0	6.32	22.1	3060	2.3	-71.0	7.1	↓	(A) peristaltic pump w/ ded tubing
	855	21.18	1.5	6.39	22.1	3020	2.2	-66.0	6.8		B) ded bladder pump
	857	21.18	2.0	6.44	22.0	3000	2.2	-60.0	6.5		C) non-ded bladder pump; or
	900	21.18	2.5	6.47	21.9	2980	2.1	-55.7	6.3		*Standard groundwater sample:*
	902	21.18	3.0	6.49	21.9	2970	2.1	-52.9	5.8		D) bailer due to limited column; or
	905	21.18	3.5	6.51	21.8	2960	2.0	-53.2	5.4		E) recovery well cycling sample
↓	907	21.18	4.0	6.53	21.7	2920	2.0	-49.6	5.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-27-17	910	MW-113	21.18	6.53	21.7	2920	2.0	-49.6	5.1	DRO	HCL	8015M
↓										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
↓	1000	DUP-Rest-01	21.18	6.53	21.7	2920	2.0	-49.6	5.1	same analysis	same	same
	935	EB-Rest-01	NA							same analysis	same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-8
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information * (visible on probe, dark brown) (2-in; stickup) Initials: BS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1710	19.26	19.27	0.01	35.80	30.8	Yes	Yes	Yes	Yes		Weather: Sunny Windy 80's

Well Purging Record used asorbent pad tie wrapped to waterlevel probe to remove LNAPL prior to sampling

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1715	19.36	0.5	7.13	23.2	3370	2.1	-177.8	10.2	Clear (strong HC odor)	*Low-flow groundwater sample:*
|	1718	19.38	1.0	6.97	22.8	3416	1.8	-188.4	9.1	" "	(A) peristaltic pump w/ ded tubing
|	1720	19.39	1.5	6.82	22.1	3593	1.5	-191.8	8.6	" "	B) ded bladder pump
|	1723	19.39	2.0	6.78	21.3	3610	1.3	-193.1	8.3	" "	C) non-ded bladder pump; or
|	1725	19.39	2.5	6.77	21.2	3616	1.1	-195.6	7.9	" "	*Standard groundwater sample:*
|	1728	19.39	3.0	6.77	21.2	3619	1.0	-196.2	7.7	" "	D) bailer due to limited column; or
|	1730	19.39	3.5	6.77	21.2	3624	0.9	-197.1	7.6	" "	E) recovery well cycling sample
↓	1733	19.39	4.0	6.76	21.2	3622	0.9	-197.7	7.4	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1735	KWB-8	19.39	6.76	21.2	3622	0.9	-197.7	7.4	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-22
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Above-grade Recovery Vault
12-in casing diameter

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (Screen: 11.5-39) Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1658	26.68	29.13	2.45	NM	NA	Yes	Yes	Yes	Yes		Weather: Sunny Windy 80's

Well Purging Record

Sample port with active RW

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0	Not sampled due to LNAPL ≥ 0.03'							A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		RW-22								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

metal roof canopy — RW-20A ---- vault ---- RW-20B

Well: RW-20A
Event: Spring 2017 (Biennial)
Area of Concern: Rest

At-grade vault
6-in casing diameter

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/25/17	1635	~~unable to gauge~~	>19.98 top of pump	unable to determine thickness	NM	Sample Port	Yes (NA)	Yes	Yes	Yes		Weather: Sunny Windy 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5	Opened sample port only product was being discharged, therefore not sampled.							B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments: Lab: ESC Lab Sciences, Mt. Juliet, TN
		RW-20A								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Metal Roof Canopy — RW-20A — - - - - - Vault — RW-20B

Well: RW-20B
Event: Spring 2017 (Biennial)
Area of Concern: Rest

At-grade vault
6-in casing diameter

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BK

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1645	20.30	>20.48 top of pump	>0.18	NM	Sample Port	Yes (NA)	Yes	Yes	Yes		Weather: Sunny Windy 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0	Not sampled due to LNAPL ≥ 0.03'							A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		RW-20B								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ce,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-13R
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Above-grade vault
12-in casing diameter

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1310	19.53	19.64	0.11	NM	Sample	Yes	Yes	Yes	Yes		Weather: Sunny Windy 80's
					pump in well	~~Rod~~						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5	Not Sampled due to					product ≥ 0.03'		B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		RW-13R								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-14R
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Above-grade vault
12-in casing diameter

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1318	16.92	17.98	1.06	NM	Sample port	x<5	Yes	Yes	Yes		Weather: Sunny Windy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0	Not	sampled	due	to	product			A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0		0.03						C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		RW-14R								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-133
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BS

Well Inspection Information

(2-in; stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1327	16.77	17.06	0.29	37.64	27.9	Yes	Yes	Yes	Yes		Weather: Sunny Windy 80's
					Sand							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5	Not Sampled due to product							B) ded bladder pump
			2.0	greater than 0.03'							C) non-ded bladder pump; or
			2.5	(or equal to)							*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-133								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Trip Blank - Rest-01

+ DUP-Rest-03
+ EB - Rest-03
(both for same analysis)

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-134
Event: Spring 2017 (Biennial)
Area of Concern: Rest (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1345	NP	14.16	0.0	32.95	28.4	Yes	Yes	Yes	Yes		Weather: Sunny Windy 80's
4/26/17	820	NA	14.16	0.0	Soft							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	825	14.16	0.5	6.98	19.8	4450	2.4	31.7	10.1	Clear	*Low-flow groundwater sample:*
	828	14.16	1.0	6.81	19.2	5038	1.7	62.4	8.2	"	(A) peristaltic pump w/ ded tubing
	830	14.16	1.5	6.72	19.1	5043	1.4	79.8	6.8	"	B) ded bladder pump
	833	14.17	2.0	6.68	18.9	5045	1.2	91.3	5.9	"	C) non-ded bladder pump; or
	835	14.17	2.5	6.65	18.8	5045	1.1	98.6	5.1	"	*Standard groundwater sample:*
	838	14.17	3.0	6.63	18.8	5046	1.0	103.4	4.7	"	D) bailer due to limited column; or
	840	14.17	3.5	6.62	18.7	5046	0.9	105.2	4.4	"	E) recovery well cycling sample
	843	14.17	4.0	6.61	18.7	5047	0.9	106.1	4.2	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	845	MW-134	14.17	6.61	18.7	5047	0.9	106.1	4.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				~~Neat~~	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1200	DUP-Rest-03		6.61	18.7	5047	0.9	106.1	4.2	Same analysis	Same	Same
	855	EB-Rest-03	NA							Same analysis	Same	Same
	—	Trip Blank-Rest-01										

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Irrigation well
Inside green, block bldg.
No purge
Sample port (faucet)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-4798
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information Screen 840-850 ft-bgs

Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/26/17	925	NA	NA	NA	NA	NA	NA	NA	Yes	Yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5							Clear	*Low-flow groundwater sample:*
			1.0	No purge, Sample port							A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								(F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	925	RA-4798	NA	7.08	19.6	1150	1.5	79.5	1.1	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~*Short List* Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~6010/6020~~
							~~*Short List* Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~Field filtered 0.45 u~~
						~~*Long List* Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~*Long List* Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45 u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Irrigation well
Inside green, block bldg
No purge
Sample port (faucet)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-4196
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information Screen: 280-292 ft-bgs

Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/26/17	945	NA	NA	NA	NA	NA	NA	NA	Yes	Yes		Weather: Sunny 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5							Clear	*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5	No purge, active well with sample port.							B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								(F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	945	RA-4196	NA	7.18	22.5	1968	1.7	51.8	1.7	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~Field filtered 0.45-u~~
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO3~~	~~6010/6020 and/or 7470~~
							~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

[Do not address - Removed from program by Navajo, 4-13-15]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-1227
Event: Spring 2017 (Biennial)
Area of Concern: Rest

[Irrigation well Removed from program]

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information Screen: 194-246 ft-bgs

Initials:

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
												Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5			DO NOT ADDRESS					B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Irrigation well
No purge
Sample part

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-3156
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BM

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/26/17	1015	NA	NA	NA	NA	NA	NA	NA	NA	Yes		Weather: Sunny, Windy 60s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5							Cloudy with	*Low-flow groundwater sample:*
			1.0		No	purge	irrigation		well	brown particles	A) peristaltic pump w/ ded tubing
			1.5		with	sample	port				B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								(F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1015	RA-3156	NM	6.84	20.5	2862	4.2	-46.3	134	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

* This event (4/27/17) collected at well head + installed sample port.
* Across the street (East) of MW-101 Tank 105

Monitoring Well Purging and Sampling Record

Irrigation and water supply role, per Navajo shift foreman, Doug Collins, 1116

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-313
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information Screen: 904-1157 ft-bgs

Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/27/17	930	NA	NA	NA	NA	NA	NA	NA	NA	Yes		Weather Sunny 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5							Clear	*Low-flow groundwater sample:*
			1.0	Removed gauge + installed							A) peristaltic pump w/ ded tubing
			1.5	temporary sample port							B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5	Navajo plant manager turned well on.							*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5	Removed sample port + reinstalled gauge							E) recovery well cycling sample
			4.0								(F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/27/17	930	RA-313	NM	7.08	20.7	1303	3.1	-68.4	1.2	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Sock in 1H16
No Sock in 2H16

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-7
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

(2-in; Stickup) Initials: BS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1232	NA	18.54	0.0	34.83	30.6	Yes	Yes	Yes	Yes	needs new pad	Weather: Sunny Windy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1800	18.57	0.5	6.97	21.3	3346	3.4	-96.8	11.2	Clear (strong HC odor)	*Low-flow groundwater sample:*
	1803	18.57	1.0	6.89	20.7	3413	2.0	-102.7	9.8	" "	(A) peristaltic pump w/ ded tubing
	1805	18.57	1.5	6.84	20.4	3410	1.5	-104.6	9.3	" "	B) ded bladder pump
	1808	18.57	2.0	6.79	20.3	3398	1.2	-104.9	8.7	" "	C) non-ded bladder pump; or
	1810	18.57	2.5	6.78	20.2	3395	1.0	-105.2	8.2	" "	*Standard groundwater sample:*
	1813	18.57	3.0	6.78	20.2	3392	0.9	-105.4	7.8	" "	D) bailer due to limited column; or
	1815	18.57	3.5	6.77	20.2	3390	0.8	-105.6	7.6	" "	E) recovery well cycling sample
↓	1818	18.57	4.0	6.77	20.2	3389	0.8	-105.9	7.6	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1820	KWB-7	18.57	6.77	20.2	3389	0.8	-105.9	7.6	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	~~Neat~~	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

* HM1 - dedicated bladder pump

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-135
Event: Spring 2017 (Biennial)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1209	NA	26.53	0.0	65.55	50.0	Yes	Yes	Yes	Yes		Weather: Sunny Windy 90's
4/26/17	1625	NA	26.60	0.0								

Well Purging Record

(*All out of Inf. or Cell)

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity * (NTU)	Water Color / Clarity	
4/26/17	1630	26.61	0.5	7.35	19.4	6959	4.2	121.7	112	Clear (tiny white particles)	*Low-flow groundwater sample:*
	1633	26.61	1.0	6.98	19.0	7294	3.9	148.6	93.6	" "	A) peristaltic pump w/ ded tubing
	1635	26.61	1.5	6.77	18.7	7308	3.7	153.8	82.4	" "	(B) ded bladder pump
	1638	26.61	2.0	6.72	18.5	7318	3.6	155.2	74.8	" "	C) non-ded bladder pump; or
	1640	26.61	2.5	6.70	18.4	7323	3.6	156.4	69.7	" "	*Standard groundwater sample:*
	1643	26.61	3.0	6.69	18.4	7329	3.5	157.1	67.2	" "	D) bailer due to limited column; or
	1645	26.61	3.5	6.69	18.3	7333	3.4	157.4	67.1	" "	E) recovery well cycling sample
	1649	26.61	4.0	6.69	18.3	7337	3.4	157.9	66.4	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1650	MW-135	26.61	6.69	18.3	7337	3.4	157.9	66.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-20
Event: Spring 2017 (Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup)

Initials: BB/MDD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1500	NA	10.28	0.0	26.66	21.9	Yes	Yes	Yes	Yes		Weather: Sunny Windy 80's
4-27-17	955	NA	10.37	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-27-17	1000	10.41	0.5	7.26	23.2	5160	2.9	18.9	8.8	Clear	*Low-flow groundwater sample:*
	1002	10.42	1.0	7.18	22.6	5280	2.7	24.9	8.2		(A) peristaltic pump w/ ded tubing
	1005	10.42	1.5	7.15	22.4	5306	2.3	31.1	7.6		B) ded bladder pump
	1007	10.42	2.0	7.11	22.2	5310	2.0	34.8	7.1		C) non-ded bladder pump; or
	1010	10.42	2.5	7.09	22.2	5310	1.8	37.2	5.8		*Standard groundwater sample:*
	1012	10.42	3.0	7.07	22.0	5320	1.7	39.8	4.8		D) bailer due to limited column; or
	1015	10.42	3.5	7.06	22.0	5310	1.7	41.1	4.6		E) recovery well cycling sample
	1017	10.42	4.0	7.04	22.0	5310	1.7	42.3	4.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-27-17	1020	MW-20	10.42	7.04	22.0	5310	1.7	42.3	4.1	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Be,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "Sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-3 (Gauge only)
Event: Spring 2017 (Biennial)
Area of Concern: TMD (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1356	NA	11.74	0.0	21.59	Not Sampled	Yes	Yes	Yes	Yes		Weather: Sunny, Windy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "Sampling" Program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-4 (Gauge only)
Event: Spring 2017 (Biennial)
Area of Concern: TMD

(2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1402	NA	17.79	0.0	36.98	Not Sampled	Yes	Yes	Yes	Yes		Weather: Sunny Windy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "Sampling" Program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-2 (Gauge only)
Event: Spring 2017 (Biennial)
Area of Concern: TMD (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1412	NA	12.83	0.0	21.49	Not Sampled	Yes	Yes	Yes	Yes		Weather Sunny Windy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-1
Event: Spring 2017 (Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: RS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1420	NA	13.44	0.0	26.88	19.6	Yes	Yes	Yes	Yes		Weather: Sunny Windy 80's
4/26/17	1755	NA	13.45	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1800	13.47	0.5	7.94	19.0	4864	1.9	106.4	4.7	Clear	*Low-flow groundwater sample:*
	1803	13.47	1.0	7.88	18.7	4803	1.5	128.0	3.8	"	(A) peristaltic pump w/ ded tubing
	1805	13.47	1.5	7.84	18.5	4768	1.3	133.2	2.7	"	B) ded bladder pump
	1808	13.47	2.0	7.81	18.4	4742	1.2	135.1	2.3	"	C) non-ded bladder pump; or
	1810	13.47	2.5	7.79	18.3	4735	1.2	135.8	2.0	"	*Standard groundwater sample:*
	1813	13.47	3.0	7.78	18.3	4731	1.1	136.4	1.8	"	D) bailer due to limited column; or
	1815	13.47	3.5	7.77	18.2	4728	1.1	136.7	1.7	"	E) recovery well cycling sample
	1818	13.47	4.0	7.76	18.2	4726	1.1	137.1	1.7	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1820	NP-1	13.47	7.76	18.2	4726	1.1	137.1	1.7	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-6
Event: Spring 2017 (Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1429	NA	10.23	0.0	20.35	15.4	Yes	Yes	Yes	Yes		Weather: Sunny Windy 80's
4/26/17	1715	NA	10.24	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1720	10.24	0.5	6.82	18.7	6320	2.1	37.7	6.2	Clear	*Low-flow groundwater sample:*
	1723	10.24	1.0	6.73	18.1	6242	1.5	69.4	5.6	"	(A) peristaltic pump w/ ded tubing
	1725	10.24	1.5	6.67	17.9	6236	1.2	74.8	4.9	"	B) ded bladder pump
	1728	10.24	2.0	6.62	17.8	6230	1.0	79.2	4.3	"	C) non-ded bladder pump; or
	1730	10.24	2.5	6.59	17.7	6227	0.9	83.6	4.0	"	*Standard groundwater sample:*
	1733	10.24	3.0	6.57	17.7	6225	0.9	86.4	3.8	"	D) bailer due to limited column; or
	1735	10.24	3.5	6.56	17.7	6224	0.9	88.2	3.8	"	E) recovery well cycling sample
	1738	10.24	4.0	6.56	17.7	6222	0.9	89.1	3.7	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1740	NP-6	10.24	6.56	17.7	6222	0.9	89.1	3.7	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								~~Anions (Chloride,Fluoride,Sulfate)~~			~~Neat~~	~~300~~
							~~Cations (Ca,K,Na), taken from total metals bottle~~				~~HNO3~~	~~6010/6020~~
										~~Nitrate-Nitrite~~	~~H2SO4~~	~~per historical, ESC Lab Sciences~~
										~~TDS~~	~~Neat~~	~~2540C~~
							~~*Short List* Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~6010/6020~~
							~~*Short List* Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~Field filtered 0.45-u~~
						~~*Long List* Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~*Long List* Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-8
Event: Spring 2017 (Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

(2-inj stickup)

Initials: BB/MDB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1452	NA	9.04	0.0	20.12	15.3	Yes	Yes	Yes	Yes		Weather Sunny Windy 80's
4-27-17	1125	NA	9.17	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-27-17	1130	9.19	0.5	7.43	22.5	4460	2.5	26.9	6.4	Clear	*Low-flow groundwater sample:*
	1132	9.19	1.0	7.38	21.7	4350	2.1	31.7	6.0		(A) peristaltic pump w/ ded tubing
	1135	9.19	1.5	7.33	21.3	4270	1.7	35.1	5.8		B) ded bladder pump
	1137	9.19	2.0	7.29	21.2	4240	1.6	38.2	5.2		C) non-ded bladder pump; or
	1140	9.19	2.5	7.26	21.2	4210	1.5	39.9	4.7		*Standard groundwater sample:*
	1142	9.19	3.0	7.24	21.3	4190	1.5	41.5	4.6		D) bailer due to limited column; or
	1145	9.19	3.5	7.22	21.3	4180	1.4	42.4	4.4		E) recovery well cycling sample
↓	1147	9.19	4.0	7.21	21.4	4170	1.4	43.1	4.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-27-17	1156	MW-8	9.19	7.21	21.4	4170	1.4	43.1	4.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-21
Event: Spring 2017 (Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB / MDB

Well Inspection Information

(4-in; stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1449	NA	10.41	0.0	25.12	19.9	Yes	Yes	Yes	Yes		Weather: Sunny Wind, 80's
4-27-17	1040	NA	10.53									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4-27-17	1045	10.60	0.5	7.40	22.7	5630	2.4	36.3	6.4	Clear	*Low-flow groundwater sample:*
	1047	10.60	1.0	7.32	22.6	5630	2.0	41.2	6.1		(A) peristaltic pump w/ ded tubing
	1050	10.60	1.5	7.28	21.7	5638	1.7	43.4	5.3		B) ded bladder pump
	1052	10.60	2.0	7.24	21.4	5630	1.6	45.4	4.7		C) non-ded bladder pump; or
	1055	10.60	2.5	7.20	21.3	5630	1.4	47.2	4.1		*Standard groundwater sample:*
	1057	10.60	3.0	7.17	21.2	5638	1.4	48.9	3.8		D) bailer due to limited column; or
	1100	10.60	3.5	7.14	21.2	5630	1.4	49.9	3.2		E) recovery well cycling sample
	1102	10.60	4.0	7.10	21.2	5620	1.3	51.9	2.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4-27-17	1105	MW-21	10.60	7.10	21.2	5628	1.3	51.9	2.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ca,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Not in "Sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-9
Event: Spring 2017 (Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in ; stickup)

Initials: BS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1442	NA	9.51	0.0	20.19	Not Sampled	Yes	Yes	Yes	Yes	Cracked pad	Weather: Sunny Windy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+ Trip Blank - TMD-01

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-71
Event: Spring 2017 (Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

(2-in; stickup)

Initials: BJ

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1434	NA	11.71	0.0	21.87	16.9	Yes	Yes	Yes	Yes		Weather: Sunny, Windy, 80's
4/26/17	1040	NA	11.72	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1045	11.74	0.5	7.32	18.5	5844	2.9	98.6	8.7	Clear	*Low-flow groundwater sample:*
	1048	11.74	1.0	7.13	18.1	6079	2.6	109.7	6.4	"	(A) peristaltic pump w/ ded tubing
	1050	11.75	1.5	7.03	17.9	6214	2.5	114.8	5.6	"	B) ded bladder pump
	1053	11.74	2.0	6.98	17.8	6303	2.5	118.6	4.9	"	C) non-ded bladder pump; or
	1055	11.74	2.5	6.96	17.8	6378	2.4	120.2	3.8	"	*Standard groundwater sample:*
	1058	11.74	3.0	6.95	17.8	6402	2.4	121.7	3.5	"	D) bailer due to limited column; or
	1100	11.74	3.5	6.95	17.8	6412	2.4	122.3	3.2	"	E) recovery well cycling sample
↓	1103	11.74	4.0	6.95	17.7	6416	2.4	122.9	3.1	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1105	MW-71	11.74	6.95	17.7	6416	2.4	122.9	3.1	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
4/26/17	—	Trip Blanks TMD-01 ←								Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	N-cat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-68
Event: Spring 2017 (Biennial)
Area of Concern: TMD (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BJ

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1102	NA	15.46	0.0	26.52	21.5	Yes	Yes	Yes	Yes		Weather: Sunny Windy 80's
4/26/17	1130	NA	15.52	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1135	15.54	0.5	7.11	20.6	3382	1.8	116.2	9.1	Clear	*Low-flow groundwater sample:*
	1138	15.54	1.0	7.03	20.1	3337	1.3	124.6	8.0	"	(A) peristaltic pump w/ ded tubing
	1140	15.54	1.5	6.97	20.0	3303	0.9	122.4	7.3	"	B) ded bladder pump
	1143	15.54	2.0	6.96	19.9	3292	0.8	121.9	6.4	"	C) non-ded bladder pump; or
	1145	15.54	2.5	6.96	19.8	3286	0.7	121.7	5.9	"	*Standard groundwater sample:*
	1148	15.54	3.0	6.95	19.8	3285	0.6	121.7	5.5	"	D) bailer due to limited column; or
	1150	15.54	3.5	6.95	19.8	3281	0.5	121.6	5.4	"	E) recovery well cycling sample
	1153	15.54	4.0	6.95	19.7	3279	0.5	121.4	5.2	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1155	MW-68	15.54	6.95	19.7	3279	0.5	121.4	5.2	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: mw-27
Event: Spring 2017 (Biennial)
Area of Concern: TMD (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BJ

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1128	NA	16.06	0.0	30.28	25.0	Yes	Yes	Yes	Yes		Weather: Sunny, Windy 80's
4/26/17	1530	NA	16.11	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1535	16.14	0.5	6.79	21.4	2952	2.0	69.8	7.9	Clear	*Low-flow groundwater sample:*
	1538	16.14	1.0	6.64	21.2	2788	1.5	74.7	7.3	"	(A) peristaltic pump w/ ded tubing
	1540	16.14	1.5	6.60	21.1	2797	1.2	78.6	6.7	"	B) ded bladder pump
	1543	16.14	2.0	6.57	21.0	2794	1.0	81.4	6.2	"	C) non-ded bladder pump; or
	1545	16.14	2.5	6.55	21.0	2791	0.8	83.2	5.8	"	*Standard groundwater sample:*
	1548	16.14	3.0	6.54	20.9	2789	0.7	85.8	5.7	"	D) bailer due to limited column; or
	1550	16.14	3.5	6.53	20.9	2787	0.7	86.1	5.7	"	E) recovery well cycling sample
↓	1553	16.14	4.0	6.53	20.9	2785	0.7	87.3	5.5	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1555	mw-27	16.14	6.53	20.9	2785	0.7	87.3	5.5	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-89
Event: Spring 2017 (Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1139	NA	9.78	0.0	20.28	15.2	yes	yes	yes	yes		Weather: Sunny windy 80s
4/26/17	1430	NA	9.80	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1435	9.82	0.5	7.45	19.3	4144	2.8	29.6	10.3	Clear	*Low-flow groundwater sample:*
	1438	9.83	1.0	7.13	18.5	4123	2.4	42.2	9.9	"	(A) peristaltic pump w/ ded tubing
	1440	9.83	1.5	7.01	18.3	4120	2.1	46.7	8.4	"	B) ded bladder pump
	1443	9.83	2.0	6.97	18.1	4116	1.9	49.8	7.5	"	C) non-ded bladder pump; or
	1445	9.83	2.5	6.95	18.0	4113	1.9	51.2	7.6	"	*Standard groundwater sample:*
	1448	9.83	3.0	6.96	18.0	4112	1.8	51.9	7.5	"	D) bailer due to limited column; or
	1450	9.83	3.5	6.95	17.9	4110	1.8	52.3	7.3	"	E) recovery well cycling sample
✓	1453	9.83	4.0	6.95	17.9	4109	1.7	52.7	7.2	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1455	MW-89	9.83	6.95	17.9	4109	1.7	52.7	7.2	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-16
Event: Spring 2017 (Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1147	NA	8.18	0.0	21.24	16.2	Yes	Yes	yes	Yes		Weather: Sunny Windy 80's
4/26/17	1325	NA	8.25	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1340	8.25	0.5	7.21	18.1	7218	2.1	86.4	9.6	Clear	*Low-flow groundwater sample:*
	1343	8.25	1.0	7.11	18.0	7214	1.4	98.4	7.9	"	(A) peristaltic pump w/ ded tubing
	1345	8.25	1.5	7.02	17.8	7103	1.2	107.6	6.8	"	B) ded bladder pump
	1348	8.25	2.0	6.96	17.7	7058	1.0	112.8	6.2	"	C) non-ded bladder pump; or
	1350	8.25	2.5	6.90	17.7	7052	0.9	114.6	5.8	"	*Standard groundwater sample:*
	1353	8.25	3.0	6.88	17.6	7049	0.9	115.9	5.5	"	D) bailer due to limited column; or
	1355	8.25	3.5	6.86	17.6	7047	0.9	116.7	5.4	"	E) recovery well cycling sample
	1358	8.25	4.0	6.85	17.6	7046	0.8	117.1	5.4	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1400	MW-16	8.25	6.85	17.6	7046	0.8	117.1	5.4	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	HNO3	Field filtered 0.45-u
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-26
Event: Spring 2017 (Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup)

Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1156	NA	9.39	0.0	27.58	22.6	Yes	Yes	Yes	Yes		Weather: Sunny windy 80's
4/26/17	1230	NA	9.42	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1235	9.50	0.5	7.09	18.2	8530	1.5	79.2	8.2	Clear	*Low-flow groundwater sample:*
	1238	9.52	1.0	7.01	17.8	8913	1.0	94.6	7.1	"	(A) peristaltic pump w/ ded tubing
	1240	9.52	1.5	6.94	17.6	9007	0.8	97.8	5.6	"	B) ded bladder pump
	1243	9.52	2.0	6.92	17.5	9012	0.7	99.2	4.5	"	C) non-ded bladder pump; or
	1245	9.52	2.5	6.91	17.5	9015	0.7	101.0	4.2	"	*Standard groundwater sample:*
	1248	9.52	3.0	6.90	17.5	9018	0.6	101.8	3.9	"	D) bailer due to limited column; or
	1250	9.52	3.5	6.90	17.5	9020	0.6	101.9	3.8	"	E) recovery well cycling sample
	1253	9.52	4.0	6.89	17.5	9022	0.6	101.9	3.8	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1255	MW-26	9.52	6.89	17.5	9022	0.6	101.9	3.8	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Pecan grove - Access from 82 gate]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB - 11A
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

(4-in; stickup)

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1217	NA	19.17	0.0	42.27	37.0	Yes	yes	Yes	Yes		Weather: Sunny Windy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1850	19.17	0.5	7.08	19.9	6194	2.5	-13.4	5.2	Clear	*Low-flow groundwater sample:*
	1853	19.17	1.0	6.92	19.5	6216	2.1	-15.5	4.1	"	(A) peristaltic pump w/ ded tubing
	1855	19.17	1.5	6.79	19.3	6228	1.7	-14.2	3.7	"	B) ded bladder pump
	1858	19.17	2.0	6.73	19.2	6234	1.4	-13.8	3.6	"	C) non-ded bladder pump; or
	1900	19.17	2.5	6.71	19.2	6238	1.2	-13.1	3.4	"	*Standard groundwater sample:*
	1903	19.17	3.0	6.70	19.1	6241	1.0	-12.9	3.1	"	D) bailer due to limited column; or
	1905	19.17	3.5	6.70	19.1	6243	0.9	-12.7	2.9	"	E) recovery well cycling sample
	1908	19.17	4.0	6.69	19.1	6244	0.9	-12.3	2.8	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1910	KWB-11A	19.17	6.69	19.1	6244	0.9	-12.3	2.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Pecan grove - access from 82 gate]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-11B
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1221	NA	19.88	0.0	72.45	62.2	Yes	Yes	Yes	Yes		Weather: Sunny Windy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1940	19.94	0.5	6.93	19.3	3211	2.2	63.2	4.8	Clear	*Low-flow groundwater sample:*
	1943	19.96	1.0	6.90	19.1	3042	1.7	65.7	3.2	"	(A) peristaltic pump w/ ded tubing
	1945	19.96	1.5	6.89	19.0	2979	1.3	66.8	2.7	"	B) ded bladder pump
	1948	19.96	2.0	6.89	18.8	2974	1.1	67.3	2.4	"	C) non-ded bladder pump; or
	1950	19.96	2.5	6.89	18.7	2970	1.0	67.9	1.9	"	*Standard groundwater sample:*
	1953	19.96	3.0	6.88	18.7	2966	0.9	68.4	1.6	"	D) bailer due to limited column; or
	1955	19.96	3.5	6.88	18.6	2964	0.8	68.9	1.4	"	E) recovery well cycling sample
↓	1958	19.96	4.0	6.88	18.6	2962	0.8	69.2	1.3	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	2000	KWB-11B	19.96	6.88	18.6	2962	0.8	69.2	1.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Do Not Address this well, per Navajo, 4-13-15

Jack Joy (Farmer)
575-365-6042

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-3AR
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

(2-in; at-grade)

Initials:

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
												Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[ATV needed - S. Field RO-Reject water Field]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-115.
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: BJ

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1048	NA	5.43	0.0	27.50	19.8	Yes	Yes	Yes	Yes		Weather: Sunny Windy 80's
4/27/17	1015	NA	5.71	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/17	1022	5.74	0.5	6.95	18.7	4295	2.9	85.4	4.2	Clear	*Low-flow groundwater sample:*
	1023	5.75	1.0	6.92	17.9	4259	1.9	88.2	2.7	"	(A) peristaltic pump w/ ded tubing
	1025	5.75	1.5	6.88	17.7	4238	1.5	89.4	2.1	"	B) ded bladder pump
	1028	5.75	2.0	6.85	17.6	4229	1.3	90.3	1.8	"	C) non-ded bladder pump; or
	1030	5.75	2.5	6.83	17.6	4224	1.2	90.8	1.7	"	*Standard groundwater sample:*
	1033	5.75	3.0	6.81	17.5	4221	1.2	91.5	1.5	"	D) bailer due to limited column; or
	1035	5.75	3.5	6.80	17.5	4219	1.1	91.9	1.4	"	E) recovery well cycling sample
	1038	5.75	4.0	6.80	17.5	4217	1.1	92.3	1.4	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/27/17	1040	MW-115	5.75	6.80	17.5	4217	1.1	92.3	1.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	~~Neat~~	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

[ATV needed - S. Field RO-Reject Water Field]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-114
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1040	NA	3.63	0.0	58.25	30.5	Yes	Yes	Yes	Yes		Weather Sunny Windy 80's
4/27/17	1105	NA	3.61	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/17	1110	3.64	0.5	7.18	22.3	4029	2.2	134.4	9.4	Clear	*Low-flow groundwater sample:*
|	1113	3.64	1.0	7.07	22.1	3813	1.6	149.8	7.2	"	(A) peristaltic pump w/ ded tubing
|	1115	3.64	1.5	7.00	19.9	3748	1.3	153.4	6.4	"	B) ded bladder pump
|	1118	3.64	2.0	6.98	19.8	3696	1.1	151.3	6.1	"	C) non-ded bladder pump; or
|	1120	3.64	2.5	6.95	19.8	3682	1.0	150.2	5.8	"	*Standard groundwater sample:*
|	1123	3.64	3.0	6.93	19.7	3678	0.9	149.8	5.5	"	D) bailer due to limited column; or
|	1125	3.64	3.5	6.92	19.7	3673	0.9	149.5	5.3	"	E) recovery well cycling sample
√	1128	3.64	4.0	6.91	19.7	3669	0.9	149.1	5.1	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/27/17	1130	MW-114	3.64	6.91	19.7	3669	0.9	149.1	5.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-117
Event: Spring 2017 (Biennial)
Area of Concern: Rest (2-in ; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1745	NA	9.19	0.0	27.22	19.7	Yes	Yes	Yes	Yes		Weather: Sunny, 50's
4/26/17	830	NA	9.24									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	835	9.26	0.5	7.49	15.7	3810	2.8	67.9	102	Colorless / cloudy	*Low-flow groundwater sample:*
|	837	9.26	1.0	7.24	15.7	3800	1.7	72.6	105	|	(A) peristaltic pump w/ ded tubing
|	840	9.26	1.5	7.08	15.7	3790	1.2	73.8	91.2	|	B) ded bladder pump
|	843	9.26	2.0	6.98	15.7	3780	1.1	74.1	82.1	|	C) non-ded bladder pump; or
|	845	9.26	2.5	6.92	15.6	3760	0.9	78.2	66.4	sl. cloudy	*Standard groundwater sample:*
|	847	9.26	3.0	6.86	15.7	3760	0.8	78.8	59.8	|	D) bailer due to limited column; or
|	850	9.26	3.5	6.83	15.8	3750	0.8	77.9	61.1	|	E) recovery well cycling sample
↓	853	9.26	4.0	6.80	15.8	3740	0.8	80.0	58.0	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	855	MW-117	9.26	6.80	15.8	3740	0.8	80.0	58.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-118
Event: Spring 2017 (Biennial)
Area of Concern: Rest (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information Initials: GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1751	NA	11.69	0.0	28.29	21.0	Yes	Yes	Yes	Yes		Weather: Sunny, 60's
4/26/17	910	NA	11.70									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	915	11.79	0.5	7.28	15.6	4220	4.9	93.9	160	Colorless / cloudy	*Low-flow groundwater sample:*
	917	11.80	1.0	7.14	15.5	4210	4.3	96.1	92.3	↓ ↓	(A) peristaltic pump w/ ded tubing
	920	11.80	1.5	7.05	15.4	4220	4.0	96.0	65.1	Colorless / sl. cloudy	B) ded bladder pump
	923	11.80	2.0	7.01	15.4	4210	4.1	95.5	35.0	↓ ↓	C) non-ded bladder pump; or
	925	11.80	2.5	6.99	15.4	4210	4.1	94.9	27.9	Colorless / clear	*Standard groundwater sample:*
	927	11.80	3.0	6.94	15.5	4210	4.1	93.5	21.7		D) bailer due to limited column; or
	930	11.80	3.5	6.92	15.5	4210	4.0	93.5	16.8		E) recovery well cycling sample
	933	11.80	4.0	6.90	15.5	4220	4.0	94.3	11.1		F) irrigation well grab sample
↓	935	11.80	4.5	6.89	15.5	4220	4.0	94.7	9.2	↓ ↓	

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	940	MW-118	11.80	6.89	15.5	4220	4.0	94.7	9.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Not in "Sampling" Program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-9
Event: Spring 2017 (Biennial)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1758	NA	10.69	0.0	25.89	Not Sampled	Yes	#Issue	#Issue	Yes		Weather: Partly Cloudy, 80's
							by #1000 2" cap					

NEEDS NEW MONUMENT casing lid

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-119
Event: Spring 2017 (Biennial)
Area of Concern: Rest (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1807	NA	10.41	0.0	28.11	20.8	Yes	Yes	Yes	Yes		Weather: Sunny, 60's
4/26/17	1000	NA	10.37		(28.11)							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1005	10.42	0.5	7.37	16.8	3980	3.4	97.1	81.1	colorless / sl. cloudy	*Low-flow groundwater sample:*
	1007	10.44	1.0	7.17	16.6	3960	2.1	93.5	58.2		(A) peristaltic pump w/ ded tubing
	1010	10.44	1.5	7.06	16.4	3960	1.8	91.4	40.8		B) ded bladder pump
	1013	10.44	2.0	6.95	16.2	3960	1.2	88.8	24.0	clear	C) non-ded bladder pump; or
	1015	10.44	2.5	6.91	16.2	3950	1.0	87.3	18.3		*Standard groundwater sample:*
	1017	10.44	3.0	6.87	16.1	3960	0.9	86.3	12.2		D) bailer due to limited column; or
	1020	10.44	3.5	6.83	16.1	3950	0.9	84.3	9.2		E) recovery well cycling sample
	1023	10.44	4.0	6.81	16.1	3950	0.9	82.9	8.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1025	MW-119	10.44	6.81	16.1	3950	0.9	82.9	8.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-5
Event: Spring 2017 (Biennial)
Area of Concern: Rest (Cross-Gradient)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

(2-in; stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1345	NA	11.56	0.0	25.09	20.0	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1350	11.60	0.5	7.36	21.3	5330	4.3	108.7	19.4	Colorless / Clear	*Low-flow groundwater sample:*
↓	1353	11.60	1.0	7.27	20.1	5400	3.0	108.9	12.8	↓	(A) peristaltic pump w/ ded tubing
	1355	11.60	1.5	7.21	19.7	5410	2.5	108.3	12.0		B) ded bladder pump
	1357	11.60	2.0	7.16	19.2	5410	2.1	107.2	9.9		C) non-ded bladder pump; or
	1400	11.60	2.5	7.12	19.0	5410	1.9	106.1	6.9		*Standard groundwater sample:*
	1403	11.60	3.0	7.08	18.8	5420	1.8	104.8	5.3		D) bailer due to limited column; or
	1405	11.60	3.5	7.05	18.9	5400	1.8	103.2	4.8		E) recovery well cycling sample
↓	1407	11.60	4.0	7.04	18.8	5410	1.7	102.5	5.0	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1410	NP-5	11.60	7.04	18.8	5410	1.7	102.5	5.0	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[well installed 7-28-14] (cross-gradient; North of RO-Reject Field).

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-136
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1255	NA	11.11	0.0	27.90	23.0	Yes	Yes	Yes	Yes		Weather: partly cloudy, 70's
					64.0FT	BASE						

SI = 10-25' BGS

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1300	11.18	0.5	7.54	20.5	4530	3.5	113.8	45.8	Colorless / sl. cloudy	*Low-flow groundwater sample:*
	1303	11.18	1.0	7.18	19.7	4520	1.9	113.3	37.8	↓ ↓	(A) peristaltic pump w/ ded tubing
	1305	11.18	1.5	7.06	19.6	4490	1.6	111.5	28.0		B) ded bladder pump
	1307	11.18	2.0	6.95	19.3	4510	1.5	111.3	13.4	Colorless / clear	C) non-ded bladder pump; or
	1310	11.18	2.5	6.89	19.2	4500	1.5	109.9	10.0		*Standard groundwater sample:*
	1313	11.18	3.0	6.84	19.2	4490	1.5	110.2	9.1		D) bailer due to limited column; or
	1315	11.18	3.5	6.84	19.2	4490	1.4	109.8	8.6		E) recovery well cycling sample
↓	1317	11.18	4.0	6.83	19.2	4490	1.4	109.5	7.7	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1320	MW-136	11.18	6.83	19.2	4490	1.4	109.5	7.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-126A
Event: Spring 2017 (Biennial)
Area of Concern: Rest (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1549	NA	12.20	0.0	37.51	29.5	Yes	Yes	Yes	Yes		Weather: Sunny, 60's
4/27/17	855	NA	12.35									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/17	900	12.35	0.5	7.00	19.2	3220	2.9	-172.2	57.1	Colorless / sl. cloudy	*Low-flow groundwater sample:*
	903	12.35	1.0	6.75	19.2	3390	1.1	-173.9	36.1	↓ ↓	(A) peristaltic pump w/ ded tubing
	905	12.35	1.5	6.69	19.2	3460	1.0	-176.5	25.8	colorless / clear	B) ded bladder pump
	907	12.35	2.0	6.67	19.3	3480	0.9	-177.2	17.3		C) non-ded bladder pump; or
	910	12.35	2.5	6.64	19.4	3510	0.9	-180.7	12.2		*Standard groundwater sample:*
	913	12.35	3.0	6.63	19.4	3540	0.9	-180.5	9.1		D) bailer due to limited column; or
	915	12.35	3.5	6.62	19.5	3540	0.9	-180.9	7.7		E) recovery well cycling sample
↓	917	12.35	4.0	6.62	19.4	3550	0.9	-181.3	7.1	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/27/17	920	MW-126A	12.35	6.62	19.4	3550	0.9	-181.3	7.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-126B
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup)

Initials: GOS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1552	NA	12.09	0.0	51.45	48.4	Yes	Yes	Yes	Yes		Weather: Sunny, 60's
4/27/17	935	NA	12.21	0.0	49 SOFT	BOTTOM						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/17	940	12.38	0.5	7.05	19.8	4220	4.2	-24.4	14.7	colorless / clear	*Low-flow groundwater sample:*
	943	12.39	1.0	6.87	19.1	4240	1.5	-7.3	12.3		(A) peristaltic pump w/ ded tubing
	945	12.39	1.5	6.74	18.9	4230	0.9	-2.1	11.0		B) ded bladder pump
	947	12.39	2.0	6.69	18.7	4230	0.9	2.9	9.8		C) non-ded bladder pump; or
	950	12.39	2.5	6.67	18.6	4240	0.8	5.5	9.2		*Standard groundwater sample:*
	953	12.39	3.0	6.64	18.9	4230	0.8	7.8	8.4		D) bailer due to limited column; or
	955	12.39	3.5	6.63	18.9	4240	0.7	11.9	8.4		E) recovery well cycling sample
	957	12.39	4.0	6.64	18.9	4240	0.7	12.5	8.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/27/17	1000	MW-126B	12.39	6.64	18.9	4240	0.7	12.5	8.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-127
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1541	NA	17.43	0.0	53.21	38.4	Yes	Yes	Yes	Yes		Weather: Sunny, 60's
4/27/17	1025	NA	17.51									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/17	1030	17.55	0.5	6.97	21.8	3030	3.9	-241.9	79.1	colorless / sl. cloudy	*Low-flow groundwater sample:*
	1033	17.55	1.0	6.85	21.0	2940	1.2	-256.9	81.1	↓ ↓	(A) peristaltic pump w/ ded tubing
	1035	17.55	1.5	6.81	20.8	2890	1.0	-264.4	73.0	↓ ↓	B) ded bladder pump
	1037	17.55	2.0	6.78	20.5	2880	1.0	-270.7	19.9	colorless / clear	C) non-ded bladder pump; or
	1040	17.55	2.5	6.80	20.5	2860	0.9	-272.1	11.8	↓ ↓	*Standard groundwater sample:*
	1043	17.55	3.0	6.76	20.6	2850	0.8	-274.1	7.0	↓ ↓	D) bailer due to limited column; or
	1045	17.55	3.5	6.75	20.6	2840	0.8	-275.6	5.7	↓ ↓	E) recovery well cycling sample
↓	1047	17.55	4.0	6.75	20.6	2830	0.8	-276.1	5.0	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/27/17	1050	MW-127	17.55	6.75	20.6	2830	0.8	-276.1	5.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45~~-u
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-129
Event: Spring 2017 (Biennial)
Area of Concern: Rest (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1525	NP	20.80	0.0	53.08	38.2	Yes	Yes	Yes	Yes		Weather: Sunny, 60's
4/27/17	1110	* CONFIRMED NP	20.80									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/17	1115	20.84	0.5	7.09	23.8	2310	2.4	-192.6	97.0	Colorless / cloudy	*Low-flow groundwater sample:*
↓	1117	20.85	1.0	6.88	23.0	2300	2.0	-197.8	69.9	↓ ↓	(A) peristaltic pump w/ ded tubing
	1120	20.85	1.5	6.77	22.6	2270	1.8	-203.7	30.1	colorless / clear	B) ded bladder pump
	1123	20.85	2.0	6.73	22.5	2270	1.6	-204.9	23.4		C) non-ded bladder pump; or
	1125	20.85	2.5	6.73	22.5	2270	1.5	-205.0	11.0		*Standard groundwater sample:*
	1127	20.85	3.0	6.73	22.5	2270	1.5	-205.5	8.6		D) bailer due to limited column; or
	1130	20.85	3.5	6.71	22.5	2270	1.4	-206.1	7.3		E) recovery well cycling sample
↓	1133	20.85	4.0	6.70	22.5	2270	1.4	-206.5	6.8	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/27/17	1140	MW-129	20.85	6.70	22.5	2270	1.4	-206.5	6.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-#18A
Event: Spring 2017 (Biennial)
Area of Concern: Rest (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1210	NA	10.09	0.0	17.78	12.7	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1215	10.10	0.5	7.77	20.6	4460	3.7	93.8	2.4	colorless / clear	*Low-flow groundwater sample:*
↓	1217	10.10	1.0	7.55	19.5	4450	2.5	96.2	2.0	↓ ↓	(A) peristaltic pump w/ ded tubing
	1220	10.10	1.5	7.38	19.0	4440	2.1	95.5	1.8		B) ded bladder pump
	1223	10.10	2.0	7.25	18.8	4420	2.0	95.3	1.8		C) non-ded bladder pump; or
	1225	10.10	2.5	7.18	18.8	4400	2.0	95.1	1.5		*Standard groundwater sample:*
	1227	10.10	3.0	7.13	18.7	4410	2.0	94.9	1.3		D) bailer due to limited column; or
	1230	10.10	3.5	7.09	18.8	4400	2.1	95.6	1.2		E) recovery well cycling sample
↓	1233	10.10	4.0	7.08	18.7	4400	2.0	95.2	0.9	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1235	RW-#18A	10.10	7.08	18.7	4400	2.0	95.2	0.9	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
							~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB - 1A
Event: Spring 2017 (Biennial)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1045	NA	12.20	0.0	33.50	25.8	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1055	12.21	0.5	7.58	21.2	5240	3.3	49.4	4.6	Colorless | clear	*Low-flow groundwater sample:*
	1057	12.21	1.0	7.20	20.0	5370	1.5	48.5	5.2		(A) peristaltic pump w/ ded tubing
	1100	12.21	1.5	7.06	19.8	5380	1.3	49.5	5.0		B) ded bladder pump
	1103	12.21	2.0	6.89	19.6	5400	1.0	58.6	4.7		C) non-ded bladder pump; or
	1105	12.21	2.5	6.81	19.7	5390	0.9	54.2	4.3		*Standard groundwater sample:*
	1107	12.21	3.0	6.76	19.6	5390	0.9	60.6	4.1		D) bailer due to limited column; or
	1110	12.21	3.5	6.73	19.6	5400	0.9	58.9	4.4		E) recovery well cycling sample
	1113	12.21	4.0	6.71	19.7	5390	0.8	57.3	4.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1115	KWB-1A	12.21	6.71	19.7	5390	0.8	57.3	4.0	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "Sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-1B (Gauge only)
Event: Spring 2017 (Biennial)
Area of Concern: Rest (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1048	NA	13.85	0.0	33.92	Not Sampled	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB- 1C
Event: Spring 2017 (Biennial)
Area of Concern: Rest (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1050	NA	14.42	0.0	52.71	42.7	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1130	14.45	0.5	7.18	21.5	5410	3.9	86.4	4.9	colorless / clear	*Low-flow groundwater sample:*
	1133	14.45	1.0	7.04	20.8	5390	2.3	87.0	2.2		(A) peristaltic pump w/ ded tubing
	1135	14.45	1.5	6.93	20.5	5380	2.0	86.8	1.4		B) ded bladder pump
	1137	14.45	2.0	6.82	20.1	5370	1.8	86.3	1.2		C) non-ded bladder pump; or
	1140	14.45	2.5	6.78	20.0	5360	1.7	85.4	1.5		*Standard groundwater sample:*
	1143	14.45	3.0	6.80	19.9	5370	1.7	86.1	1.2		D) bailer due to limited column; or
	1145	14.45	3.5	6.74	19.8	5370	1.6	88.8	1.2		E) recovery well cycling sample
	1147	14.45	4.0	6.73	19.7	5370	1.6	90.1	1.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1150	KWB-1C	14.45	6.73	19.7	5370	1.6	90.1	1.1	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

* Located ~25' N of original KWB-10 well pad

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-10R
Event: Spring 2017 (Biennial)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1005	NA	15.31	0.00	29.46	22.0	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 70's
		*										

* CONFIRMED NO Measurable LNAPL

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1010	15.42	0.5	6.88	21.0	1970	3.0	-145.4	6.1	colorless / clear / odor	*Low-flow groundwater sample:*
↓	1013	15.45	1.0	6.71	20.7	1944	1.3	-156.2	8.0	↓	(A) peristaltic pump w/ ded tubing
	1015	15.45	1.5	6.63	20.7	1947	1.0	-152.0	9.7		B) ded bladder pump
	1017	15.45	2.0	6.61	20.7	1911	1.0	-149.1	9.0		C) non-ded bladder pump; or
	1020	15.45	2.5	6.60	20.6	1908	1.0	-150.2	8.2		*Standard groundwater sample:*
	1023	15.45	3.0	6.59	20.6	1904	0.9	-159.1	7.3		D) bailer due to limited column; or
	1025	15.45	3.5	6.59	20.7	1899	0.9	-161.9	6.8		E) recovery well cycling sample
↓	1027	15.45	4.0	6.60	20.6	1897	0.9	-163.2	6.2	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1030	KWB-10R	15.45	6.60	20.6	1897	0.9	-163.2	6.2	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	~~Neat~~	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-131
Event: Spring 2017 (Biennial)
Area of Concern: Rest (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: GDS/BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1533	NA	22.00	0.0	53.35	38.1	Yes	Yes	Yes	Yes		Weather: Sunny, 70
4/27/17	1045	NA	21.94	0.0	53.35							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/17	1050	21.95	0.5	7.18	23.8	1969	2.4	-200.5	39.7	sl. cloudy	*Low-flow groundwater sample:*
	1053	21.95	1.0	7.04	23.2	1978	1.3	-206.3	26.1	↓	(A) peristaltic pump w/ ded tubing
	1055	21.95	1.5	6.95	23.0	1985	0.9	-209.6	16.4	clear	B) ded bladder pump
	1058	21.95	2.0	6.88	22.9	1994	0.8	-211.7	10.8		C) non-ded bladder pump; or
	1100	21.95	2.5	6.84	22.9	1999	0.7	-214.6	8.7		*Standard groundwater sample:*
	1103	21.95	3.0	6.81	22.8	2003	0.7	-216.3	8.2		D) bailer due to limited column; or
	1105	21.95	3.5	6.79	22.8	2006	0.6	-217.5	7.9		E) recovery well cycling sample
	1108	21.95	4.0	6.78	22.7	2008	0.6	-218.1	7.6	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/27/17	1110	MW-131	21.95	6.78	22.7	2008	0.6	-218.1	7.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO3~~	~~6010/6020 and/or 7470~~
							~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-5
Event: Spring 2017 (Biennial)
Area of Concern: Rest (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1518	NA	22.28	0.0	37.68	30.7	Yes	Yes	Yes	Yes		Weather: Sunny, 70's
4/26/17	1610	NA	22.36									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1615	22.41	0.5	6.92	22.2	2920	4.1	-129.1	5.6	colorless / clear	*Low-flow groundwater sample:*
	1617	22.42	1.0	6.78	21.7	2940	3.1	-137.1	5.0		(A) peristaltic pump w/ ded tubing
	1620	22.42	1.5	6.72	21.7	2930	2.8	-139.9	4.4		B) ded bladder pump
	1623	22.42	2.0	6.67	21.4	2940	2.5	-146.3	4.0		C) non-ded bladder pump; or
	1625	22.42	2.5	6.63	21.3	2940	2.4	-148.8	3.7		*Standard groundwater sample:*
	1627	22.42	3.0	6.62	21.2	2940	2.4	-150.2	3.2		D) bailer due to limited column; or
	1630	22.42	3.5	6.61	21.1	2940	2.4	-147.1	3.5		E) recovery well cycling sample
	1633	22.42	4.0	6.61	21.1	2940	2.3	-146.0	3.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1640	KWB-5	22.42	6.61	21.1	2940	2.3	-146.0	3.6	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW - 111
Event: Spring 2017 (Biennial)
Area of Concern: Rest (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GPS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1512	NA	23.40	0.0	40.83	35.8	Yes	Yes	Yes	Yes		Weather: Sunny, 70's
4/26/17	1505	NA	23.50									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1510	23.59	0.5	7.07	21.9	2930	3.7	-169.9	61.0	colorless / sl. cloudy	*Low-flow groundwater sample:*
	1513	23.59	1.0	6.94	21.7	2940	2.9	-166.2	54.0	↓ ↓	(A) peristaltic pump w/ ded tubing
	1515	23.59	1.5	6.77	21.3	2950	2.4	-156.0	47.3	↓ ↓	B) ded bladder pump
	1517	23.59	2.0	6.71	21.0	2960	2.2	-145.7	25.6	colorless / clear	C) non-ded bladder pump; or
	1520	23.59	2.5	6.68	20.9	2960	2.1	-132.8	18.7	↓ ↓	*Standard groundwater sample:*
	1523	23.59	3.0	6.63	21.0	2980	2.1	-119.1	12.2	↓ ↓	D) bailer due to limited column; or
	1525	23.59	3.5	6.62	21.1	2980	2.0	-106.9	9.8	↓ ↓	E) recovery well cycling sample
↓	1527	23.59	4.0	6.62	21.0	2980	2.0	-101.1	8.4	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1535	MW-111	23.59	6.62	21.0	2980	2.0	-101.1	8.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Oil-absorbant sock in 1416
No sock in 2416

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-6
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup)

Initials: AOS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1458	NA	21.02	0.0	36.44	27.4	Yes	Yes	Yes	Yes		Weather: partly cloudy, 70's
4/26/17	1410	NA	21.06									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1415	21.11	0.5	6.98	21.7	2650	2.9	-233.3	7.6	dark tint / clear / odor	*Low-flow groundwater sample:*
	1417	21.11	1.0	6.90	21.2	2550	1.5	-244.6	5.2		(A) peristaltic pump w/ ded tubing
	1420	21.11	1.5	6.91	20.7	2480	1.2	-257.7	3.5		B) ded bladder pump
	1423	21.11	2.0	6.84	20.5	2440	1.0	-264.2	3.0		C) non-ded bladder pump; or
	1425	21.11	2.5	6.84	20.3	2420	1.1	-268.5	4.0		*Standard groundwater sample:*
	1427	21.11	3.0	6.83	20.3	2410	1.0	-272.7	3.6		D) bailer due to limited column; or
	1430	21.11	3.5	6.81	20.2	2400	1.0	-274.1	3.2		E) recovery well cycling sample
	1433	21.11	4.0	6.81	20.2	2400	0.9	-275.6	2.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1435	KWB-6	21.11	6.81	20.2	2400	0.9	-275.6	2.8	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	N.Cat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-112
Event: Spring 2017 (Biennial)
Area of Concern: Rest (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1504	20.05	20.37	0.32	37.54	32.5	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		Not Sampled due to well						B) ded bladder pump
			2.0		having LNAPL thickness						C) non-ded bladder pump; or
			2.5		≥ 0.03 ft.						*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-112								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-132
Event: Spring 2017 (Biennial)
Area of Concern: Rest (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1450	18.58	18.84	0.26	42.66	NA	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0		Not sampled due to well having LNAPL thickness ≥ 0.03 ft.						C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-132								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	~~300~~
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

*Located inside yellow vault; Furthest South

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-57
Event: Spring 2017 (Biennial)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1435	NA	19.91	0.0	34.32	32.8	Yes	Yes	Yes	Yes		Weather: Sunny, 60's
4/26/17	1320	NA	19.99									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1325	20.13	0.5	7.12	20.9	4970	4.1	101.2	57.2	Colorless / sl. Cloudy	*Low-flow groundwater sample:*
	1327	20.19	1.0	6.95	20.0	5010	2.1	105.0	39.8	↓ ↓	(A) peristaltic pump w/ ded tubing
	1330	20.24	1.5	6.83	19.3	5050	1.4	107.3	26.1	Colorless / clear	B) ded bladder pump
	1333	20.27	2.0	6.78	19.2	5060	1.2	107.7	20.2		C) non-ded bladder pump; or
	1335	20.29	2.5	6.75	19.0	5060	1.0	107.2	17.9		*Standard groundwater sample:*
	1338	20.31	3.0	6.72	19.2	5050	1.0	106.2	16.0		D) bailer due to limited column; or
	1340	20.32	3.5	6.71	19.2	5040	1.0	104.2	15.1		E) recovery well cycling sample
↓	1343	20.33	4.0	6.71	19.2	5040	1.0	103.6	14.6	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1345	MW-57	20.33	6.71	19.2	5040	1.0	103.6	14.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

~32" corrugated stickup

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW - # 11-0
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1442	NA	22.08	0-0	22.20	NA	Yes	Yes	Yes	Yes		Weather: Partly cloudy, 80's
			↓									

↳ May reflect minimal water trapped in well sump/cap to well bottom

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0		Not Sampled due to		Insufficient				C) non-ded bladder pump; or
			2.5			Water	Column				*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

* Until further notice, do not address well in any way, per Navajo, 4-26-16

Jack Joy - Farmer

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-9
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) Initials: GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17												Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0	[Historically obstructed @ 15.11 ft-TOC]							(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0	DO NOT ADDRESS							D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		KWB-9								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

~~Trip Blank~~ Rest-02 (Submitted on 4/26/17)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-12A
Event: Spring 2017 (Biennial)
Area of Concern: Rest (4-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	935	NA	22.71	0.0	25.03	24.9	Yes	Yes	Yes	Yes		Weather: Sunny, 60's
4/26/17	1145	NA	22.71									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1150	22.80	0.5	7.27	20.4	3800	4.7	92.6	30.1	colorless / clear	*Low-flow groundwater sample:*
	1153	22.82	1.0	7.07	19.7	3790	3.3	93.8	18.2		(A) peristaltic pump w/ ded tubing
	1155	22.85	1.5	6.94	19.1	3790	3.4	96.0	9.5		B) ded bladder pump
	1157	22.86	2.0	6.88	18.9	3790	3.5	97.3	5.0		C) non-ded bladder pump; or
	1200	22.87	2.5	6.84	18.8	3780	3.4	98.6	2.7		*Standard groundwater sample:*
	1203	22.88	3.0	6.82	18.9	3780	3.4	99.1	2.0		D) bailer due to limited column; or
	1205	22.89	3.5	6.80	19.0	3770	3.5	100.0	1.6		E) recovery well cycling sample
↓	1207	22.90	4.0	6.79	18.9	3770	3.5	101.1	1.9	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1210	KWB-12A	22.90	6.79	18.9	3770	3.5	101.1	1.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[* HMI - dedicated bladder pump]

Monitoring Well Purging and Sampling Record

+ DUP - Rest - 05
+ EB - Rest - 05
(both for same analysis)

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: KWB - 12 B
Event: Spring 2017 (Biennial)
Area of Concern: Rest (4-in ; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GPS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	939	NA	22.52	0.0	39.39	35.2	Yes	Yes	Yes	Yes		Weather: Sunny, 60's
4/26/17	1225	NA	22.52									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1230	22.52	0.5	7.18	20.2	3750	4.8	-90.2	2.7	colorless / clear	*Low-flow groundwater sample:*
	1233	22.52	1.0	7.02	19.2	3750	4.6	-44.9	2.0		A) peristaltic pump w/ ded tubing
	1235	22.52	1.5	6.96	18.5	3820	4.5	-1.8	1.4		(B) ded bladder pump
	1237	22.52	2.0	6.91	18.7	3850	4.5	39.3	1.1		C) non-ded bladder pump; or
	1240	22.52	2.5	6.87	18.7	3860	4.4	63.4	0.9		*Standard groundwater sample:*
	1243	22.52	3.0	6.85	18.6	3870	4.4	73.5	0.9		D) bailer due to limited column; or
	1245	22.52	3.5	6.84	18.6	3870	4.3	77.0	1.0		E) recovery well cycling sample
	1247	22.52	4.0	6.84	18.6	3870	4.3	80.8	0.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1250	KWB-12B	22.52	6.84	18.6	3870	4.3	80.8	0.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
	800	Dup-Rest-05	22.52	6.84	18.6	3870	4.3	80.8	0.8	Same as above	same	Same
	1305	EB-Rest-05	NA							Same as above	same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB - 2R
Event: Spring 2017 (Biennial)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDJ

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1650	NA	21.13	0.0	39.41	32.4	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1655	21.50	0.5	7.11	22.3	3140	3.1	-214.0	7.2	Colorless/clear/odor	*Low-flow groundwater sample:*
	1657	21.51	1.0	7.01	21.7	3160	2.4	-213.3	5.0		(A) peristaltic pump w/ ded tubing
	1700	21.52	1.5	6.93	21.3	3180	1.8	-211.0	2.3		B) ded bladder pump
	1703	21.52	2.0	6.93	21.1	3190	1.6	-208.8	1.5		C) non-ded bladder pump; or
	1705	21.52	2.5	6.90	21.0	3200	1.6	-206.5	1.0		*Standard groundwater sample:*
	1707	21.52	3.0	6.89	21.0	3210	1.6	-204.9	1.2		D) bailer due to limited column; or
	1710	21.52	3.5	6.86	21.0	3210	1.7	-203.7	1.1		E) recovery well cycling sample
	1713	21.52	4.0	6.85	21.0	3220	1.6	-202.7	1.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1715	KWB-2R	21.52	6.85	21.0	3220	1.6	-202.7	1.1	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-58
Event: Spring 2017 (Biennial)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1605	NA	20.12	0.0	33.06	25.6	Yes	Yes	Yes	Yes		Weather: Cloudy, 80's
		↓ No LNAPL/sheen confirmed										

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1610	20.20	0.5	7.03	21.9	2680	2.9	-195.4	9.6	Colorless/clear/odor	*Low-flow groundwater sample:*
↓	1613	20.21	1.0	6.96	21.0	2530	2.5	-203.3	10.0	↓	(A) peristaltic pump w/ ded tubing
	1615	20.21	1.5	6.90	20.7	2450	1.9	-210.7	9.6		B) ded bladder pump
	1617	20.21	2.0	6.86	20.5	2390	1.8	-220.5	9.2		C) non-ded bladder pump; or
	1620	20.21	2.5	6.86	20.6	2370	1.8	-225.5	8.9		*Standard groundwater sample:*
	1623	20.21	3.0	6.83	20.6	2350	1.7	-230.8	8.8		D) bailer due to limited column; or
	1625	20.21	3.5	6.84	20.6	2340	1.7	-240.1	8.4		E) recovery well cycling sample
↓	1627	20.21	4.0	6.82	20.6	2340	1.6	-246.0	8.0	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1630	MW-58	20.21	6.82	20.6	2340	1.6	-246.0	8.0	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO3~~	~~Field filtered 0.45-u~~
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[* HMI dedicated bladder pump]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB - 13
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (cross-gradient) (2-in; at-grade) Initials: GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	905	NA	24.51	0.0	33.10	30.1	Yes	Yes	Yes	Yes		Weather: SUNNY, 60's
4/26/17	1055	NA	24.52									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1100	24.53	0.5	7.31	18.5	4040	5.0	99.4	62.2	colorless / sl. cloudy	*Low-flow groundwater sample:*
	1103	24.55	1.0	7.18	18.6	4020	4.2	99.4	140.2	colorless / cloudy	A) peristaltic pump w/ ded tubing
	1105	24.55	1.5	7.11	18.6	4020	3.9	100.0	193.4		(B) ded bladder pump
	1107	24.55	2.0	6.99	18.1	4000	3.8	101.1	>200		C) non-ded bladder pump; or
	1110	24.55	2.5	6.96	18.0	4000	3.8	101.2	>200		*Standard groundwater sample:*
	1113	24.55	3.0	6.93	17.9	3990	3.7	102.1	>200		D) bailer due to limited column; or
	1115	24.55	3.5	6.91	18.0	3980	3.7	102.6	>200		E) recovery well cycling sample
	1117	24.55	4.0	6.89	18.0	3980	3.7	102.9	>200		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1120	KWB-13	24.55	6.89	18.0	3980	3.7	102.9	>200	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
							Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-103
Event: Spring 2017 (Biennial)
Area of Concern: Rest (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCM

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1420	NP	17.10	0.0	25.22	22.2	Yes	Yes	Yes	Yes		Weather: pt. cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1425	17.22	0.5	7.39	32.3	31,700	2.3	-310.3	4.4	colorless, clear	*Low-flow groundwater sample:*
↓	1427	17.28	1.0	7.38	32.1	32,200	2.1	-314.3	4.3	↓	(A) peristaltic pump w/ ded tubing
	1430	17.34	1.5	7.38	31.9	32,600	1.9	-318.6	4.2		B) ded bladder pump
	1432	17.38	2.0	7.39	31.7	33,100	1.9	-324.0	4.1		C) non-ded bladder pump; or
	1435	17.41	2.5	7.39	31.6	33,300	1.8	-328.1	3.9		*Standard groundwater sample:*
	1437	17.44	3.0	7.39	31.6	33,300	1.9	-328.6	3.9		D) bailer due to limited column; or
	1440	17.47	3.5	7.39	31.6	33,300	1.9	-328.9	3.8		E) recovery well cycling sample
↓	1442	17.50	4.0	7.39	31.6	33,300	1.9	-329.1	3.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1445	MW-103	17.50	7.39	31.6	33,300	1.9	-329.1	3.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

DUP-Rest-02 (Same analyses)
EB-Rest-02 (Same analyses)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-104
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

(4-in; stickup)

Initials: SCM

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1510	NP	16.48	0.0	21.97	19.0	Yes	Yes	Yes	Yes		Weather: pt. cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1515	16.62	0.5	7.16	26.5	3930	1.6	-326.3	3.6	colorless; clear	*Low-flow groundwater sample:*
	1517	16.68	1.0	7.14	26.1	3250	1.5	-328.9	3.6		(A) peristaltic pump w/ ded tubing
	1520	16.74	1.5	7.12	25.6	2460	1.4	-330.5	3.7		B) ded bladder pump
	1522	16.79	2.0	7.12	25.2	2110	1.4	-330.6	3.8		C) non-ded bladder pump; or
	1525	16.84	2.5	7.12	24.9	1940	1.4	-330.3	3.6		*Standard groundwater sample:*
	1527	16.87	3.0	7.13	24.7	1850	1.4	-329.7	3.4		D) bailer due to limited column; or
	1530	16.90	3.5	7.13	24.5	1770	1.4	-329.6	3.4		E) recovery well cycling sample
	1532	16.93	4.0	7.14	24.5	1750	1.5	-329.2	3.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1535	MW-104	16.93	7.14	24.5	1750	1.5	-329.2	3.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	~~HNO3~~	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
	1200	Dup-Rest-02	16.93	7.14	24.5	1750	1.5	-329.2	3.3	same as above	same	same
	1550	EB-Rest-02	NA							same as above	same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Bagged tube to stretch outside of berm

Monitoring Well Purging and Sampling Record

Absorbent sock in well ZH16
Absorbent sock in well 1H17 (started)

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-64
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup)

Initials: SCH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1235	NP	18.50	0.0	34.08	26.6	Yes	Yes	Yes	Yes		Weather: pt. cloudy, 80s

Well Purging Record

* Needed to stretch tube over berm.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	* T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1240	18.70	0.5	7.27	32.2	2520	2.2	-290.9	3.8	colorless/clear	Low-flow groundwater sample:
	1242	18.79	1.0	7.25	31.8	2530	1.7	-309.2	3.8		(A) peristaltic pump w/ ded tubing
	1245	18.83	1.5	7.25	31.6	2540	1.6	-313.9	3.8		B) ded bladder pump
	1247	18.85	2.0	7.25	31.5	2540	1.5	-317.5	3.8		C) non-ded bladder pump; or
	1250	18.86	2.5	7.24	31.3	2540	1.5	-320.1	3.8		Standard groundwater sample:
	1252	18.87	3.0	7.24	31.0	2540	1.5	-322.9	2.7		D) bailer due to limited column; or
	1255	18.88	3.5	7.25	30.6	2540	1.5	-324.8	3.7		E) recovery well cycling sample
	1257	18.89	4.0	7.24	30.6	2540	1.4	-325.3	3.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1300	MW-64	18.89	7.24	30.6	2540	1.4	-325.3	3.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Bagged tube [Located in front of storage shed]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-65
Event: Spring 2017 (Biennial)
Area of Concern: Rest (4-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCM

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1325	NP	14.32	0.0	28.78	23.8	Yes	Yes	Yes	Yes		Weather: mostly clear, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1330	14.34	0.5	7.14	28.4	2130	2.0	-212.8	12.1	colorless/clear / odor	Low-flow groundwater sample:
↓	1332	14.35	1.0	7.11	28.2	2130	2.1	-216.1	10.1	↓	(A) peristaltic pump w/ ded tubing
↓	1335	14.36	1.5	7.09	27.9	2140	1.9	-218.3	9.1	↓	B) ded bladder pump
↓	1337	14.36	2.0	7.08	27.7	2140	1.8	-220.8	8.6	↓	C) non-ded bladder pump; or
↓	1340	14.36	2.5	7.07	27.6	2130	1.6	-224.5	8.4	↓	Standard groundwater sample:
↓	1342	14.36	3.0	7.06	27.4	2130	1.6	-226.0	7.9	↓	D) bailer due to limited column; or
↓	1345	14.36	3.5	7.06	27.4	2136	1.6	-227.5	7.6	↓	E) recovery well cycling sample
↓	1347	14.36	4.0	7.06	27.3	2120	1.5	-227.7	7.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1350	MW-65	14.36	7.06	27.3	2120	1.5	-227.7	7.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	~~Neat~~	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

[gauge to top of guide pipe]

Well: RW-5R
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Active RW; above-grade vault; sampled by pump when sampled. Initials: SLG

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1700	14.72	14.85	0.13	NM (pumps in well)	24.0	Yes	Yes	Yes	Yes		Weather: pt. cloudy, 90s

Formerly reported TD = 35.30 ft-TOC

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5	NO							B) ded bladder pump
			2.0	SAMPLE							C) non-ded bladder pump; or
			2.5	DUE							*Standard groundwater sample:*
			3.0	TO							D) bailer due to limited column; or
			3.5	PRESENCE							(E) recovery well cycling sample
			4.0								F) irrigation well grab sample
								OF			
									LNAPL		

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-102
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: SCY

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1635	NP	13.95	0.0	26.45	21.3	Yes	Yes	Yes	Yes		Weather: pt cloudy, 90s
4/26/17	900	NP	14.25	0.0								clear, 60s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	905	14.28	0.5	7.12	22.6	2100	2.2	-294.9	8.4	colorless; clear	*Low-flow groundwater sample:*
|	907	14.28	1.0	7.10	22.5	2120	1.8	-304.1	7.2	|	(A) peristaltic pump w/ ded tubing
|	910	14.28	1.5	7.09	22.5	2140	1.7	-310.2	7.1	|	B) ded bladder pump
|	912	14.28	2.0	7.09	22.5	2160	1.6	-315.8	6.7	|	C) non-ded bladder pump; or
|	915	14.28	2.5	7.08	22.6	2170	1.6	-317.8	6.5	|	*Standard groundwater sample:*
|	917	14.28	3.0	7.08	22.6	2170	1.6	-318.8	6.4	|	D) bailer due to limited column; or
|	920	14.28	3.5	7.07	22.7	2180	1.6	-320.1	6.3	|	E) recovery well cycling sample
V	922	14.28	4.0	7.07	22.7	2180	1.6	-320.6	6.3	V	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	925	MW-102	14.28	7.07	22.7	2180	1.6	-320.6	6.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Bagged Tubing

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Gauge / Sample through labeled guide-pipe

Well: RW-4
Event: Spring 2017 (Biennial)
Area of Concern: Rest
(Active RW in covered doghouse)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCU

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1625	NP	12.48	0.0	36.62	31.6	Yes	Yes	Yes	Yes		Weather: pt. cloudy, 90s
4/26/17	1246	NP	12.62	0.0								clear, 70s

Well Purging Record * Drawdown not meas; narrow diam guide-tube

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1250	NM *	0.5	7.15	24.8	2250	2.0	-315.0	7.7	colorless; clear	*Low-flow groundwater sample:*
	1252		1.0	7.13	24.5	2240	1.6	-316.3	5.9		(A) peristaltic pump w/ ded tubing
	1255		1.5	7.14	24.6	2230	1.4	-317.9	5.5		B) ded bladder pump
	1257		2.0	7.16	24.5	2220	1.3	-319.3	5.2		C) non-ded bladder pump; or
	1300		2.5	7.19	24.4	2210	1.2	-319.6	4.9		*Standard groundwater sample:*
	1302		3.0	7.21	24.4	2210	1.1	-319.5	4.7		D) bailer due to limited column; or
	1305		3.5	7.24	24.3	2200	1.1	-319.1	4.6		E) recovery well cycling sample
	1307		4.0	7.25	24.3	2190	1.1	-318.8	4.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1310	RW-4	NM *	7.25	24.3	2190	1.1	-318.8	4.6	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Bagged Tubing

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Gauge / Sample through labeled garden-pipe

Well: RW-6
Event: Spring 2017 (Biennial)
Area of Concern: Rest
(Active RW in covered doghouse)

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: SCY

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1650	13.55	13.62	0.07	34.90	30.0	Yes	Yes	Yes	Yes		Weather: pt cloudy, 90s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		NO SAMPLING DUE TO PRESENCE OF LNAPL						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		RW-6								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Position marked on adjacent fence; ~4' N. of fence; tendency to be covered by silt/gravel]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-99
Event: Spring 2017 (Biennial)
Area of Concern: Rest (4-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCU

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1715	NP	16.02	0.0	27.80	22.8	Yes	Yes	Yes	Yes		Weather: pt. cloudy, 90s
4/26/17	955	NP	16.34	0.0								clear, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1000	16.42	0.5	6.99	22.4	2010	1.8	-308.7	10.4	colorless; clear	*Low-flow groundwater sample:*
"	1002	16.44	1.0	6.98	22.4	2020	1.5	-312.1	8.9		(A) peristaltic pump w/ ded tubing
"	1005	16.45	1.5	6.97	22.5	2020	1.3	-313.8	8.4		B) ded bladder pump
"	1007	16.46	2.0	6.96	22.5	2030	1.3	-314.7	7.5		C) non-ded bladder pump; or
"	1010	16.46	2.5	6.96	22.5	2030	1.3	-315.5	7.4		*Standard groundwater sample:*
"	1012	16.46	3.0	6.96	22.5	2040	1.3	-316.2	7.3		D) bailer due to limited column; or
"	1015	16.46	3.5	6.96	22.6	2040	1.3	-316.8	7.1		E) recovery well cycling sample
"	1017	16.46	4.0	6.96	22.6	2040	1.3	-317.3	7.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1020	MW-99	16.46	6.96	22.6	2040	1.3	-317.3	7.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-66
Event: Spring 2017 (Biennial)
Area of Concern: Rest (4-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCM

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1720	NP	15.00	0.0	29.80	24.6	Yes	Yes	Yes	Yes	(cracked pad)	Weather: pc cloudy 90s
4/26/17	1050	NP	15.19	0.0								clear, 60s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1055	15.34	0.5	7.31	22.9	1549	2.6	-226.1	6.3	colorless; clear	*Low-flow groundwater sample:*
	1057	15.40	1.0	7.29	22.7	1538	2.3	-225.1	5.1		(A) peristaltic pump w/ ded tubing
	1100	15.42	1.5	7.28	22.6	1534	2.2	-224.4	4.8		B) ded bladder pump
	1102	15.44	2.0	7.27	22.6	1523	2.1	-224.3	4.6		C) non-ded bladder pump; or
	1105	15.45	2.5	7.27	22.5	1511	2.1	-224.3	4.4		*Standard groundwater sample:*
	1107	15.45	3.0	7.26	22.4	1506	2.1	-224.6	4.4		D) bailer due to limited column; or
	1110	15.45	3.5	7.26	22.5	1504	2.1	-224.5	4.2		E) recovery well cycling sample
↓	1112	15.45	4.0	7.25	22.5	1504	2.1	-224.8	4.2	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1115	MW-66	15.45	7.25	22.5	1504	2.1	-224.8	4.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-28
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (6-in casing; stickup; PVC casing extends upward through a berm wall) Initials: SCG

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection (6-in PVC shattered at top w/ 0.65-ft slip collar over it)					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1530	NP	20.31	0.0	34.55	30.2	Yes	Issue	Issue	Yes		Weather: pt. cloudy, 90s
4/26/17	1145	NP	20.48	0.0								clear, 70s

No pad possible / unable to lock

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1150	20.53	0.5	6.87	23.9	2990	2.3	-319.3	6.5	colorless; clear	*Low-flow groundwater sample:*
|	1152	20.58	1.0	6.86	23.8	3050	2.0	~322.7	6.5	| |	(A) peristaltic pump w/ ded tubing
|	1155	20.62	1.5	6.86	23.7	3100	1.8	-325.4	6.4	| |	B) ded bladder pump
|	1157	20.64	2.0	6.86	23.6	3130	1.7	-327.4	5.6	| |	C) non-ded bladder pump; or
|	1200	20.68	2.5	6.86	23.4	3150	1.6	-329.8	5.4	| |	*Standard groundwater sample:*
|	1202	20.71	3.0	6.86	23.4	3160	1.5	-332.1	5.3	| |	D) bailer due to limited column; or
|	1205	20.73	3.5	6.86	23.5	3150	1.4	-333.4	5.1	| |	E) recovery well cycling sample
↓	1207	20.75	4.0	6.87	23.4	3150	1.4	-334.1	5.0	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1210	MW-28	20.75	6.87	23.4	3150	1.4	-334.1	5.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
							Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Stray 5-gal bucket w/ lid, labeled Chevron Hydraulic Oil sitting on Pad. Robert to address (4-26-17 per RC)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-59
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup)

Initials: SCM

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1740	NP	5.85	0.0	32.72	25.3	Yes	Yes	Yes	Yes	~2' fluid	Weather: pt. cloudy, 90s
4/27/17	900	NP	5.97	0.0							in a blue	pt: cloudy; 80s

Well Purging Record

5 gal bucket on pad; photographed and documented

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	(Likey Chevron Lube oil per bucket label)
4/27/17	905	5.95	0.5	6.97	24.7	2850	2.1	-193.9	4.6	colorless; clear	*Low-flow groundwater sample:*
	907	5.95	1.0	6.97	24.7	2900	2.1	-208.3	4.4		(A) peristaltic pump w/ ded tubing
	910	5.95	1.5	6.97	24.6	2960	1.9	-224.1	4.8		B) ded bladder pump
	912	5.95	2.0	6.97	24.6	3000	1.9	-236.7	5.0		C) non-ded bladder pump; or
	915	5.95	2.5	6.97	24.5	3020	1.8	-244.8	4.4		*Standard groundwater sample:*
	917	5.95	3.0	6.97	24.5	3030	1.8	-248.8	4.1		D) bailer due to limited column; or
	920	5.95	3.5	6.97	24.5	3030	1.9	-250.6	4.0		E) recovery well cycling sample
	922	5.95	4.0	6.97	24.5	3040	1.8	-252.4	4.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/27/17	925	MW-59	5.95	6.97	24.5	3040	1.8	-252.4	4.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

+ Dup-Rest-04
+ EB-Rest-04
(both for same analysis)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-60
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup)

Initials: SCM

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1750	NP	7.11	0.0	37.78	26.7	Yes	Yes	Yes	Yes		Weather: pt. cloudy, 90s
4/27/17	950	NP	7.19	0.0								pt. cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/17	955	7.36	0.5	6.99	25.4	3390	2.1	-279.9	5.4	colorless; clear	*Low-flow groundwater sample:*
	957	7.42	1.0	6.99	24.9	3460	1.7	-293.9	4.6		(A) peristaltic pump w/ ded tubing
	1000	7.47	1.5	6.99	24.9	3470	1.6	-297.1	4.4		B) ded bladder pump
	1002	7.48	2.0	6.99	25.0	3480	1.5	-300.7	4.2		C) non-ded bladder pump; or
	1005	7.49	2.5	6.99	24.9	3490	1.5	-302.1	4.1		*Standard groundwater sample:*
	1007	7.49	3.0	6.99	24.9	3500	1.5	-304.3	3.9		D) bailer due to limited column; or
	1010	7.49	3.5	6.99	24.9	3510	1.5	-305.6	3.9		E) recovery well cycling sample
	1012	7.49	4.0	6.99	24.8	3510	1.4	-307.2	3.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/27/17	1015	MW-60	7.49	6.99	24.8	3510	1.4	-307.2	3.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	~~N cont~~	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
	800	DUP-Rest-04		6.99	24.8	3510	1.4	-307.2	3.9	Same as above	Same as above	Same
	1030	EB-Rest-04	NA							~~Same as above~~	Same as above	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-107
Event: Spring 2017 (Biennial)
Area of Concern: Rest (4-in ; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1800	NP	9.91	0.0	19.05	17.1	Yes	Yes	Yes	Yes		Weather: pt. cloudy, 905
4/26/17	1440	NP	10.10	0.0								clear, 805

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1450	10.27	0.5	7.14	23.9	1953	2.3	-93.8	6.2	colorless; clear	*Low-flow groundwater sample:*
↓	1452	10.35	1.0	7.13	23.6	1955	2.0	-96.7	4.9	↓ ↓	(A) peristaltic pump w/ ded tubing
	1455	10.38	1.5	7.12	23.5	1958	1.9	-98.7	4.7		B) ded bladder pump
	1457	10.41	2.0	7.12	23.3	1960	1.8	-101.6	4.6		C) non-ded bladder pump; or
	1500	10.43	2.5	7.12	23.1	1959	1.6	-104.7	4.6		*Standard groundwater sample:*
	1502	10.45	3.0	7.12	23.1	1958	1.6	-105.8	4.6		D) bailer due to limited column; or
	1505	10.47	3.5	7.11	23.0	1956	1.6	-107.0	4.5		E) recovery well cycling sample
↓	1507	10.49	4.0	7.11	23.0	1957	1.6	-107.6	4.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1510	MW-107	10.49	7.11	23.0	1957	1.6	-107.6	4.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-128
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information Well area covered by gravel and soil, related to new construction (tank) in area (2-in; at-grade) Initials: SCH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/25/17	1805					25.4	yes	yes	yes	yes	(watch for ongoing burying by gravel)	Weather: pt. cloudy, 90s
4/26/17	1340	NP	12.96	0.0	35.35	25.4						clear, 80s

Well Purging Record Navajo (Domingo) located buried well (located 15' NE of NE corner of berm, it buried in future)

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1350	12.99	0.5	6.97	23.5	1990	2.0	-91.4	39.1	colorless, v. sl. cloudy	Low-flow groundwater sample:
↓	1352	12.99	1.0	6.94	23.3	1990	1.9	-86.2	32.6	↓	(A) peristaltic pump w/ ded tubing
	1355	12.99	1.5	6.92	23.0	1990	1.7	-74.9	23.6	clear	B) ded bladder pump
	1357	12.99	2.0	6.91	23.1	1990	1.7	-71.3	17.1	↓	C) non-ded bladder pump; or
	1400	12.99	2.5	6.90	23.1	1990	1.6	-67.8	15.9		Standard groundwater sample:
	1402	12.99	3.0	6.90	23.0	1990	1.6	-65.5	15.7		D) bailer due to limited column; or
	1405	12.99	3.5	6.90	23.0	1990	1.5	-64.4	13.1		E) recovery well cycling sample
↓	1407	12.99	4.0	6.90	23.0	1990	1.6	-63.2	12.7	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments: Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1410	MW-128	12.99	6.90	23.0	1990	1.6	-63.2	12.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-125
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup)

Initials: SLH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1825	NP	6.48	0.0	28.31	23.5	Yes	Yes	Yes	Yes	Yes	Weather: pt. cloudy, 90s
4/26/17	1535	NP	6.61	0.0								clear, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1540	6.67	0.5	7.30	21.8	3870	2.5	52.8	8.5	colorless; clear	*Low-flow groundwater sample:*
	1542	6.67	1.0	7.14	21.4	4030	1.7	55.1	5.4		(A) peristaltic pump w/ ded tubing
	1545	6.67	1.5	7.11	21.3	4080	1.5	57.5	4.3		B) ded bladder pump
	1547	6.67	2.0	7.10	21.2	4100	1.4	60.6	4.1		C) non-ded bladder pump; or
	1550	6.67	2.5	7.09	21.1	4110	1.3	62.3	4.6		*Standard groundwater sample:*
	1552	6.67	3.0	7.09	21.1	4120	1.3	63.8	4.0		D) bailer due to limited column; or
	1555	6.67	3.5	7.09	21.1	4130	1.3	65.0	3.9		E) recovery well cycling sample
↓	1557	6.67	4.0	7.09	21.1	4130	1.3	65.3	3.9	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1600	MW-125	6.67	7.09	21.1	4130	1.3	65.3	3.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	~~Neat~~	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Bagged Tubing Extension

Monitoring Well Purging and Sampling Record

✓ Trip Blank - Rest-03

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-116
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: SCM

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1830	NP	7.06	0.0	27.63	20.0	Yes	Yes	Yes	Yes		Weather: pt. cloudy, 90s
4/26/17	1630	NP	7.02	0.0								clear, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1635	7.04	0.5	7.50	18.0	3470	2.7	45.4	10.3	colorless; clear	*Low-flow groundwater sample:*
|	1637	7.04	1.0	7.37	17.1	3490	1.8	53.8	11.2	|	(A) peristaltic pump w/ ded tubing
|	1640	7.04	1.5	7.33	16.8	3490	1.6	56.6	12.1	|	B) ded bladder pump
|	1642	7.04	2.0	7.31	16.5	3490	1.5	59.1	13.2	|	C) non-ded bladder pump; or
|	1645	7.04	2.5	7.29	16.3	3490	1.3	62.9	13.5	|	*Standard groundwater sample:*
|	1647	7.04	3.0	7.28	16.0	3490	1.3	64.8	13.9	|	D) bailer due to limited column; or
|	1650	7.04	3.5	7.27	15.8	3486	1.2	66.3	14.0	|	E) recovery well cycling sample
↓	1652	7.04	4.0	7.27	15.8	3480	1.2	67.0	14.0	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1655	MW-116	7.04	7.27	15.8	3480	1.2	67.0	14.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	New	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

N. side of dirt road; in-line w/ westernmost row of pecan trees; position labeled on adjacent fence pole (12' from fenceline)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-46R
Event: Spring 2017 (Biennial)
Area of Concern: TMD (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCC

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	18:35	NA	4.29	0.0	19.36	14.1	Yes	Yes	Yes	Yes		Weather: pt. cloudy, 90s
4/27/17	1110	NP	4.43	0.0								pt. cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/17	1120	4.45	0.5	7.09	25.0	3800	2.4	31.4	1.4	clear; colorless	*Low-flow groundwater sample:*
	1122	4.45	1.0	7.05	24.6	3810	2.3	34.8	8.1		(A) peristaltic pump w/ ded tubing
	1125	4.45	1.5	7.04	24.5	3820	2.3	36.1	12.4		B) ded bladder pump
	1127	4.45	2.0	7.03	24.4	3820	2.4	37.8	16.0		C) non-ded bladder pump; or
	1130	4.45	2.5	7.02	24.4	3820	2.3	37.5	15.7		*Standard groundwater sample:*
	1132	4.45	3.0	7.02	24.3	3820	2.3	40.5	13.9		D) bailer due to limited column; or
	1135	4.45	3.5	7.02	24.2	3820	2.3	40.4	13.5		E) recovery well cycling sample
	1137	4.45	4.0	7.02	24.2	3820	2.3	40.8	13.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/27/17	1140	MW-46R	4.45	7.02	24.2	3820	2.3	40.8	13.0	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
							~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

HMI - dedicated bladder pump

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: UG-3R
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (Upgradient) (4-in ; at-grade) Initials: SCM

Date	Time	Depth to LNAPL (Ft-TOC)	~~Depth~~ to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	915	NP	24.62	0.0	38.58	35.6	Yes	Yes	Yes	Yes		Weather: pt. cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	920	24.62	0.5	6.74	23.6	2410	5.4	175.3	4.3	colorless/clear	*Low-flow groundwater sample:*
	922	24.63	1.0	6.83	23.4	2400	5.3	174.6	4.2		A) peristaltic pump w/ ded tubing
	925	24.63	1.5	6.90	23.4	2380	5.1	174.8	4.2		(B) ded bladder pump
	927	24.64	2.0	6.93	23.4	2330	5.2	175.3	4.2		C) non-ded bladder pump; or
	930	24.64	2.5	6.95	23.3	2310	5.2	175.7	4.0		*Standard groundwater sample:*
	932	24.64	3.0	7.02	23.1	2290	5.0	175.7	3.8		D) bailer due to limited column; or
	935	24.64	3.5	7.04	23.1	2270	5.0	175.5	3.6		E) recovery well cycling sample
	937	24.64	4.0	7.05	23.2	2260	5.1	175.2	3.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	940	UG-3R	24.64	7.05	23.2	2260	5.1	175.2	3.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
							Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record (Near park)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: UG-4
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; at-grade)

Initials: SCH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1060	NP	18.09	0.0	39.24	34.5	Yes	Yes	Yes	Yes		Weather: pt. cloudy, 70s

Well Purging Record Screen: 19.5-39.5 ft-bgs

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1005	18.26	0.5	7.20	25.3	3560	4.1	168.7	29.1	colorless / clear	*Low-flow groundwater sample:*
	1007	18.27	1.0	7.11	24.6	3690	3.9	170.8	19.8		(A) peristaltic pump w/ ded tubing
	1010	18.28	1.5	7.07	24.4	3730	3.9	172.2	6.8		B) ded bladder pump
	1012	18.29	2.0	7.06	24.2	3750	3.9	173.0	5.1		C) non-ded bladder pump; or
	1015	18.30	2.5	7.05	24.1	3760	4.0	173.6	4.7		*Standard groundwater sample:*
	1017	18.30	3.0	7.04	24.1	3770	4.0	174.9	4.5		D) bailer due to limited column; or
	1020	18.31	3.5	7.03	24.1	3780	4.1	176.0	4.5		E) recovery well cycling sample
	1022	18.31	4.0	7.02	24.1	3770	4.1	176.4	4.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1025	UG-4	18.31	7.02	24.1	3770	4.1	176.4	4.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
							Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

(just N. of elementary school)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: UG-1
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (Upgradient) (4-in; at-grade) Initials: SCN

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1055	NP	13.22	0.0	24.08	19.1	Yes	Yes	Yes	Yes		Weather: pt. cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1100	13.23	0.5	7.60	27.2	2940	5.5	150.6	4.6	colorless / clear	*Low-flow groundwater sample:*
"	1102	13.23	1.0	7.51	26.9	2950	5.4	154.8	4.2	"	(A) peristaltic pump w/ ded tubing
"	1105	13.23	1.5	7.43	26.3	2960	5.3	159.5	4.1	"	B) ded bladder pump
"	1107	13.23	2.0	7.38	26.1	2950	5.4	163.0	4.6	"	C) non-ded bladder pump; or
"	1110	13.23	2.5	7.38	26.1	2950	5.4	164.1	4.6	"	*Standard groundwater sample:*
"	1112	13.23	3.0	7.36	25.9	2940	5.4	166.1	3.9	"	D) bailer due to limited column; or
"	1115	13.23	3.5	7.35	25.9	2940	5.5	166.7	3.9	"	E) recovery well cycling sample
↓	1117	13.23	4.0	7.35	25.9	2940	5.5	167.3	3.9	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1120	UG-1	13.23	7.35	25.9	2940	5.5	167.3	3.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

E-W alley, immediately NW of Artesia Hotel

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: UG-2
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (Upgradient) (4-in; at-grade) Initials: SCM

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1145	NP	17.42	0.0	29.28	24.3	Yes	Yes	Yes	Yes		Weather: pt. cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1150	17.50	0.5	7.58	26.5	2240	5.1	145.0	5.3	colorless/clear	*Low-flow groundwater sample:*
↓	1152	17.50	1.0	7.54	26.4	2240	4.9	147.3	5.0	↓	(A) peristaltic pump w/ ded tubing
	1155	17.51	1.5	7.51	26.1	2240	5.0	149.5	4.7		B) ded bladder pump
	1157	17.51	2.0	7.48	25.9	2230	4.9	151.9	4.5		C) non-ded bladder pump; or
	1200	17.52	2.5	7.47	25.9	2220	5.0	154.6	4.3		*Standard groundwater sample:*
	1202	17.52	3.0	7.46	25.6	2220	5.0	156.0	4.2		D) bailer due to limited column; or
	1205	17.52	3.5	7.46	25.7	2220	5.1	156.6	4.1		E) recovery well cycling sample
↓	1207	17.52	4.0	7.45	25.7	2220	5.0	156.7	4.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1210	UG-2	17.52	7.45	25.7	2220	5.0	156.7	4.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Trip Blank - Rest - 04

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-101
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup)

Initials: TAB/SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/25/17	1510	NA	12.27	0.0	26.85	23.5	yes	yes	yes	yes		
4/27/17	920	NA	12.38	0.0								Weather: Pt Cloudy / 80°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/17	925	12.40	0.5	6.32	23.1	2480	1.9	-109.8	10.5	Clear / colorless	Low-flow groundwater sample:
	927	12.40	1.0	6.40	22.6	2280	1.6	-116.9	9.8		(A) peristaltic pump w/ ded tubing
	930	12.40	1.5	6.48	22.2	2190	1.4	-121.7	8.6		B) ded bladder pump
	932	12.40	2.0	6.51	22.1	2170	1.3	-123.5	7.9		C) non-ded bladder pump; or
	935	12.40	2.5	6.55	22.1	2140	1.3	-129.5	7.5		Standard groundwater sample:
	937	12.40	3.0	6.57	22.1	2120	1.2	-132.5	7.1		D) bailer due to limited column; or
	940	12.40	3.5	6.59	22.0	2110	1.2	-135.8	6.8		E) recovery well cycling sample
	942	12.40	4.0	6.60	22.0	2110	1.2	-137.1	6.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/27/17	945	MW-101	12.40	6.66	22.0	2110	1.2	-137.1	6.5			Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-105
Event: Spring 2017 (Biennial)
Area of Concern: Rest (4-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1500	NP	8.60	0.0	17.20	14.2	yes	yes	yes	yes		Weather: PC/cloudy 80s
4/26/17	800	NP	8.78	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	805	8.83	0.5	8.13	20.1	1473	2.1	-360.7	23.6	clear, odd, blackish	*Low-flow groundwater sample:*
	807	8.83	1.0	8.11	20.2	1419	1.5	-370.9	20.1		(A) peristaltic pump w/ ded tubing
	810	8.83	1.5	8.08	20.3	1400	1.4	-374.5	19.9		B) ded bladder pump
	813	8.83	2.0	7.98	20.3	1371	1.3	-378.2	17.3		C) non-ded bladder pump; or
	815	8.83	2.5	7.95	20.4	1365	1.2	-378.5	14.1		*Standard groundwater sample:*
	817	8.83	3.0	7.93	20.4	1360	1.2	-379.2	10.3		D) bailer due to limited column; or
	820	8.83	3.5	7.91	20.5	1359	1.1	-379.2	9.6		E) recovery well cycling sample
	823	8.83	4.0	7.89	20.5	1358	1.0	-379.3	8.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	825	MW-105	8.83	7.89	20.5	1358	1.0	-379.3	8.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Bagged tube. [Inside doghouse]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

[Gauge or Sample through labeled 1-in guide-pipe]

Well: RW-2
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1410	10.19	10.20	0.01	36.13	31.1	yes	yes	yes	yes		Weather: PT/Cloudy 80s
4/26/17	1250	10.39	10.41	0.02								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1255	NM *	0.5	7.24	24.6	3220	1.2	-386.1	28.6	Clear, black particles	Low-flow groundwater sample:
	1257		1.0	7.20	24.3	3360	1.1	-385.0	9.9	Light sheen, odor	(A) peristaltic pump w/ ded tubing
	1300		1.5	7.18	24.1	3460	1.0	-388.4	7.4		B) ded bladder pump
	1303		2.0	7.18	24.0	3530	0.9	-389.7	6.1		C) non-ded bladder pump; or
	1305		2.5	7.18	23.9	3540	0.9	-389.9	5.0		Standard groundwater sample:
	1307		3.0	7.18	23.9	3560	0.9	-389.2	4.7		D) bailer due to limited column; or
	1310		3.5	7.17	24.0	3560	0.9	-388.2	4.4		E) recovery well cycling sample
↓	1313	↓	4.0	7.17	24.0	3570	0.8	-388.2	4.2	↓	F) irrigation well grab sample

Well Sampling Record * 1-in guide-pipe

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1315	RW-2	NM	7.17	24.0	3570	0.8	-388.2	4.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-61
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; at-grade) Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1440	NP	10.03	0.0	29.30	24.30	yes	yes	yes	yes	6500/ten	Weather: PT/Cloudy 80s
4/26/17	900	NP	10.28	0.0							pAD	

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	905	10.46	0.5	7.61	22.7	2840	1.4	-356.9	13.8	clear	*Low-flow groundwater sample:*
	907	10.63	1.0	7.61	22.7	2480	1.1	-352.4	10.2		(A) peristaltic pump w/ ded tubing
	910	10.74	1.5	7.60	22.7	2530	1.1	-352.3	9.8		B) ded bladder pump
	913	10.82	2.0	7.59	22.8	2570	1.0	-353.6	8.4		C) non-ded bladder pump; or
	915	10.92	2.5	7.58	22.9	2610	1.0	-355.4	8.2	Reduced purge rate	*Standard groundwater sample:*
	920	11.02	3.0	7.58	22.9	2630	1.0	-356.7	8.0	to 0.1 L/min	D) bailer due to limited column; or
	925	11.12	3.5	7.57	22.9	2640	0.9	-356.2	7.9		E) recovery well cycling sample
↓	930	11.14	4.0	7.58	22.9	2650	0.9	-354.4	7.7	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	935	MW-61	11.14	7.58	22.9	2650	0.9	-354.4	7.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-62
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

(4-in; at-grade)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1430	NP	10.84	0.0	19.50	21.3	yes	yes	yes	yes		
4/26/17	955	NP	10.88	0.0								Weather: pt/cloudy 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1000	11.04	0.5	7.45	23.0	3550	1.7	-373.2	12.7	Clear, colorless	*Low-flow groundwater sample:*
	1003	11.14	1.0	7.42	22.8	3560	1.5	-375.6	9.0		(A) peristaltic pump w/ ded tubing
	1005	11.21	1.5	7.40	22.6	3560	1.4	-377.0	6.8		B) ded bladder pump
	1007	11.26	2.0	7.39	22.5	3580	1.2	-377.8	6.2		C) non-ded bladder pump; or
	1010	11.30	2.5	7.38	22.2	3580	1.1	-379.3	3.7		*Standard groundwater sample:*
	1013	11.34	3.0	7.37	22.5	3580	1.0	-379.6	3.6		D) bailer due to limited column; or
	1015	11.37	3.5	7.36	22.4	3580	1.0	-380.0	3.5		E) recovery well cycling sample
	1017	11.41	4.0	7.35	22.4	3590	0.9	-380.2	3.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/26/17	1020	MW-62	11.41	7.35	22.4	3590	0.9	-380.2	3.5			Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-93
Event: Spring 2017 (Biennial)
Area of Concern: Rest (4-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: AB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1400	NP	5.83	0.0	20.23	15.9	yes	yes	yes	yes		Weather: PC/Cloudy 80s
4/26/17	1150	NP	6.10	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1155	6.21	0.5	8.09	22.3	2930	1.0	-354.7	10.6	Clear; colorless	*Low-flow groundwater sample:*
	1157	6.28	1.0	7.87	21.7	2930	0.8	-363.3	8.0		(A) peristaltic pump w/ ded tubing
	1200	6.36	1.5	7.53	21.4	2920	0.7	-369.0	7.5		B) ded bladder pump
	1203	6.40	2.0	7.29	21.3	2920	0.7	-371.1	5.3		C) non-ded bladder pump; or
	1205	6.43	2.5	7.26	21.2	2920	0.7	-371.9	4.3		*Standard groundwater sample:*
	1207	6.46	3.0	7.25	21.2	2910	0.6	-372.3	4.0		D) bailer due to limited column; or
	1210	6.49	3.5	7.23	21.1	2910	0.6	-372.7	3.9		E) recovery well cycling sample
↓	1213	6.52	4.0	7.22	21.1	2920	0.7	-373.2	3.6	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1215	MW-93	6.52	7.22	21.1	2920	0.7	-373.2	3.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	~~Neat~~	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-43
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(6-in; stickup)

Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1100	NP	7.03	0.0	19.67	16.5	yes	Issue*	yes	yes	No PAD	Weather: P/C/cloudy 70°

Well Purging Record

* (NO protective outer casing)

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1105	7.08	0.5	7.46	26.3	4,510	1.6	-392.9	10.8	Clear with Black parti	Low-flow groundwater sample:
	1107	7.08	1.0	7.44	25.5	4,550	1.5	-395.1	10.0		(A) peristaltic pump w/ ded tubing
	1110	7.08	1.5	7.44	24.3	4610	1.5	-397.1	9.3		B) ded bladder pump
	1113	7.08	2.0	7.43	24.2	4620	1.3	-397.9	8.7		C) non-ded bladder pump; or
	1115	7.08	2.5	7.42	24.2	4620	1.2	-398.6	8.0		Standard groundwater sample:
	1117	7.08	3.0	7.42	24.1	4610	1.1	-400.9	7.8		D) bailer due to limited column; or
	1120	7.08	3.5	7.41	24.0	4610	1.0	-400.7	7.5		E) recovery well cycling sample
	1123	7.08	4.0	7.41	24.0	4620	1.0	-400.6	7.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1125	mw-43	7.08	7.41	24.0	4620	1.0	-400.6	7.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45 u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-137
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; at-grade) Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1300	NP	5.04	0.0	29.60	24.6	yes	yes	yes	yes		Weather: PT/Cloudy 80°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1305	5.04	0.5	7.01	29.3	4380	1.1	-394.7	11.4	clear/odor	*Low-flow groundwater sample:*
	1307	5.04	1.0	7.04	28.0	4860	1.2	-400.9	10.3		(A) peristaltic pump w/ ded tubing
	1310	5.04	1.5	7.05	27.3	5130	1.3	-403.1	10.0		B) ded bladder pump
	1313	5.04	2.0	7.04	27.1	5190	1.5	-407.6	9.8		C) non-ded bladder pump; or
	1315	5.04	2.5	7.04	27.0	5240	1.6	-408.1	9.9		*Standard groundwater sample:*
	1317	5.04	3.0	7.04	26.9	5250	1.7	-408.1	7.0		D) bailer due to limited column; or
	1320	5.04	3.5	7.03	26.7	5260	1.7	-407.8	6.8		E) recovery well cycling sample
↓	1323	5.04	4.0	7.03	26.7	5270	1.7	-406.9	6.3	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1325	MW-137	5.04	7.03	26.7	5270	1.7	-406.9	6.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-138
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; at-grade)

Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1200	n/f	6.78	0.0	24.81	19.8	yes	yes	yes	yes		Weather: M/cloudy/ 85°

Well Purging Record

Screen: 10-25 ft-bgs

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1205	6.81	0.5	7.19	32.0	3480	1.5	-369.5	25.7	clear with black particles	Low-flow groundwater sample:
	1207	6.81	1.0	7.10	31.8	3,350	1.4	-366.9	15.0		(A) peristaltic pump w/ ded tubing
	1210	6.81	1.5	7.08	31.4	3310	1.4	-366.0	13.9		B) ded bladder pump
	1213	6.81	2.0	7.04	31.2	3210	1.3	-363.8	10.0		C) non-ded bladder pump; or
	1215	6.81	2.5	7.04	31.0	3190	1.2	-363.1	9.6		Standard groundwater sample:
	1217	6.81	3.0	7.03	31.0	3180	1.1	-362.3	7.3		D) bailer due to limited column; or
	1220	6.81	3.5	7.02	30.9	3170	1.0	-362.2	6.5		E) recovery well cycling sample
↓	1223	6.81	4.0	7.01	30.9	3160	1.0	-361.1	6.4	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1225	MW-138	6.81	7.01	30.9	3160	1.0	-361.1	6.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-23
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

(6-in; stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/25/17	1350	NP	10.31	0.0	23.10	17.9	yes	Issue *	yes	yes		Weather: 90°F/cloudy 80°
4/26/17	1050	NP	10.50	0.0			yes	protective casing;				

* (but 6" Expandable locking cap is locked)

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1055	10.58	0.5	7.65	25.0	2950	1.8	-360.1	16.0	clear/odor	*Low-flow groundwater sample:*
	1057	10.62	1.0	7.64	25.8	2940	1.5	-357.8	10.8	Brown tint	Ⓐ peristaltic pump w/ ded tubing
	1100	10.66	1.5	7.63	25.7	2930	1.4	-356.2	10.7		B) ded bladder pump
	1102	10.69	2.0	7.62	25.7	2900	1.3	-350.0	9.0		C) non-ded bladder pump; or
	1105	10.72	2.5	7.61	25.6	2890	1.3	-348.2	8.7		*Standard groundwater sample:*
	1107	10.75	3.0	7.60	25.6	2880	1.3	-345.9	8.2		D) bailer due to limited column; or
	1110	10.78	3.5	7.60	25.6	2880	1.2	-343.8	7.8		E) recovery well cycling sample
	1112	10.81	4.0	7.59	25.6	2870	1.2	-342.2	7.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/26/17	1115	MW-23	10.81	7.59	25.6	2870	1.2	-342.2	7.7			Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	~~Neat~~	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

+ DUP - TEL - 01 (for same analysis)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: TEL - 4
Event: Spring 2017 (Biennial)
Area of Concern: TEL (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: TJA RB / CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1540	NP	5.81	0.0	97.27	22.2	yes	yes	yes	yes		Weather: PC/cloudy 85°
4.27.17	1030	NA	5.84	0.0	27.27	22.2						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.27.17	1035	6.01	0.5	6.70	22.1	5050	2.5	-355.1	7.1	clear, black	*Low-flow groundwater sample:*
	1037	6.01	1.0	6.70	21.1	5130	1.6	-368.2	6.4	particles, odor?	(A) peristaltic pump w/ ded tubing
	1040	6.01	1.5	6.71	20.9	5140	1.2	-372.4	6.1	sheen	B) ded bladder pump
	1042	6.01	2.0	6.72	20.8	5150	1.0	-376.5	5.9		C) non-ded bladder pump; or
	1045	6.01	2.5	6.73	20.7	5150	0.9	-379.8	5.8		*Standard groundwater sample:*
	1047	6.01	3.0	6.73	20.6	5160	0.9	-381.3	5.8		D) bailer due to limited column; or
	1050	6.01	3.5	6.74	20.7	5160	0.8	-382.9	5.5		E) recovery well cycling sample
	1052	6.01	4.0	6.74	20.7	5170	0.8	-383.7	5.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4.27.17	1055	TEL-4	6.01	6.74	20.7	5170	0.8	-383.7	5.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1100	DUP-TEL-01	6.01	6.74	20.7	5170	0.8	-383.7	5.2	Same as above	Same	Same

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

+ EB-TEL-01 (for same analysis)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: TEL-3
Event: Spring 2017 (Biennial)
Area of Concern: TEL

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAR/CJH

Well Inspection Information (2-in; stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1550	NP	4.78	0.0	27.19	22.2	yes	yes	yes	yes		Weather: PT/Cloudy 80s
4.27.17	1125	NP	4.85	0.0	27.19	22.2						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.27.17	1130	5.01	0.5	6.84	24.8	3010	1.0	-372.1	7.9	Clear, sheen,	*Low-flow groundwater sample:*
	1132	5.01	1.0	6.77	22.2	2510	0.9	-378.4	7.3	+ odor	(A) peristaltic pump w/ ded tubing
	1135	5.01	1.5	6.75	21.5	2410	0.8	-383.2	6.8		B) ded bladder pump
	1137	5.01	2.0	6.74	21.3	2370	0.7	-385.6	6.2		C) non-ded bladder pump; or
	1140	5.01	2.5	6.73	21.2	2340	0.7	-388.0	5.8		*Standard groundwater sample:*
	1142	5.01	3.0	6.73	21.2	2320	0.6	-391.1	5.3		D) bailer due to limited column; or
	1145	5.01	3.5	6.72	21.1	2310	0.5	-393.2	4.9		E) recovery well cycling sample
↓	1147	5.01	4.0	6.72	21.1	2310	0.5	-394.9	4.7	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4.27.17	1150	TEL-3	5.01	6.72	21.1	2310	0.5	-394.9	4.7	DRO	HCL	8015M
↓										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Meat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
↓	1205	EB-TEL-01	NA	→	→	→	→	→	→	Same as above	Same	Same

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: TEL-2
Event: Spring 2017 (Biennial)
Area of Concern: TEL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1600	NP	5.45	0.0	27.20	22.1	yes	yes	yes	yes		Weather: pt/cloudy 80s
4/27/17	1020	NP	5.62	0.0	(27.20)							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/17	1025	5.69	0.5	7.69	25.3	3020	0.9	-357.9	14.7	clear; colorless	*Low-flow groundwater sample:*
	1027	5.69	1.0	7.66	25.0	3050	0.7	-359.0	9.8		(A) peristaltic pump w/ ded tubing
	1030	5.69	1.5	7.54	24.3	3140	0.6	-361.1	9.2		B) ded bladder pump
	1033	5.69	2.0	7.45	24.0	3180	0.6	-361.9	8.0		C) non-ded bladder pump; or
	1035	5.69	2.5	7.37	23.9	3220	0.7	-360.0	7.2		*Standard groundwater sample:*
	1037	5.69	3.0	7.35	23.8	3220	0.7	-359.2	6.4		D) bailer due to limited column; or
	1040	5.69	3.5	7.35	23.8	3230	0.7	-359.2	4.8		E) recovery well cycling sample
↓	1043	5.69	4.0	7.34	23.9	3240	0.7	-359.1	4.4	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/27/17	1045	TEL-2	5.69	7.34	23.9	3240	0.7	-359.1	4.4			Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	~~Neat~~	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Trip Blank - TEL-01

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: TEL-1
Event: Spring 2017 (Biennial)
Area of Concern: TEL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup)

Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1610	NP	4.66	0.0	27.60	22.9	yes	yes	yes	yes		Weather: pt/cloudy 80s
4/27/17	830	NP	4.76	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/17	835	5.09	0.5	8.11	22.4	3410	1.3	-255.9	10.3	clear with black particles	*Low-flow groundwater sample:*
	837	5.09	1.0	8.05	22.3	3360	1.1	-261.4	4.8		(A) peristaltic pump w/ ded tubing
	840	5.09	1.5	7.93	22.1	3190	0.9	-278.8	6.0		B) ded bladder pump
	843	5.09	2.0	7.85	22.1	3120	0.8	-287.0	5.8		C) non-ded bladder pump; or
	845	5.09	2.5	7.80	22.0	3100	0.7	-292.1	4.6		*Standard groundwater sample:*
	847	5.09	3.0	7.78	22.0	3090	0.6	-294.4	4.1		D) bailer due to limited column; or
	850	5.09	3.5	7.76	22.1	3080	0.5	-296.1	4.0		E) recovery well cycling sample
	853	5.09	4.0	7.74	22.2	3070	0.4	-297.9	3.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/27/17	855	TEL-1	5.09	7.74	22.2	3070	0.4	-297.9	3.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-39
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in stainless steel; short stickup) Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1620	NP	5.25	0.0	25.44	20.4	yes	yes	yes	yes		
4/26/17	1855	NP	5.32	0.0								Weather: PC/cloudy 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1900	5.45	0.5	7.91	22.1	4420	1.5	-334.9	5.6	clear; colorless	Low-flow groundwater sample:
	1903	5.47	1.0	7.88	22.0	4270	1.3	-336.8	4.8		(A) peristaltic pump w/ ded tubing
	1905	5.47	1.5	7.81	21.9	4320	1.1	-341.7	4.0		B) ded bladder pump
	1907	5.47	2.0	7.75	21.8	4380	0.9	-342.5	3.6		C) non-ded bladder pump; or
	1910	5.47	2.5	7.73	21.8	4390	0.9	-343.1	3.5		Standard groundwater sample:
	1913	5.47	3.0	7.71	21.8	4410	0.9	-344.4	3.4		D) bailer due to limited column; or
	1915	5.47	3.5	7.69	21.8	4420	0.9	-344.7	3.1		E) recovery well cycling sample
	1917	5.47	4.0	7.68	21.8	4430	0.9	-345.6	3.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/26/17	1920	MW-39	5.47	7.68	21.8	4430	0.9	-345.6	3.0			Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	~~Neat~~	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Prior to 2H16 this well was a "stickup" completion; Area has since been backfilled with a couple feet of soil.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-98
Event: Spring 2017 (Biennial)
Area of Concern: Rest (4-in; At-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1000	NP	6.48	0.0	25.60	21.5	yes	yes	yes	yes		Weather: pt. cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1005	6.54	0.5	7.66	23.9	3130	1.4	-383.8	20.3	Clear; colorless	Low-flow groundwater sample:
	1007	6.54	1.0	7.59	23.5	3140	1.3	-385.2	18.4		(A) peristaltic pump w/ ded tubing
	1010	6.54	1.5	7.55	23.3	3140	1.3	-385.5	10.9		B) ded bladder pump
	1013	6.54	2.0	7.52	23.3	3140	1.3	-384.2	9.0		C) non-ded bladder pump; or
	1015	6.54	2.5	7.51	23.2	3140	1.2	-384.9	8.2		Standard groundwater sample:
	1017	6.54	3.0	7.49	23.1	3140	1.2	-385.3	7.7		D) bailer due to limited column; or
	1020	6.54	3.5	7.48	23.1	3140	1.1	-385.0	5.2		E) recovery well cycling sample
↓	1023	6.54	4.0	7.47	23.1	3140	1.1	-385.0	5.0	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1025	MW-98	6.54	7.47	23.1	3140	1.1	-385.0	5.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

(WDS - ~~Corrugated metal, large diameter stickup; gauged to top of corrugated pipe~~) * STEEL "VAULT" (33" x 33") has been placed over existing corrugated pipe. New VAULT does not allow access to well. per Robert Combs, Water level and sample point to be collected from stand pipe

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

RW-10 is permanently covered by heavy steel box

Well: RW-10
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

NEW NEW located approx. 50' South of existing well and vault. (see field photos)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/27/17	930	NA	4.99	0.0	22.49	~~18.8~~ 17.49	yes	yes	Issue *	yes		Weather: PT/Cloudy 80°

Initials:

Well Purging Record

New stick-up = 2.40 * PVC cap on standpipe, unlockable

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/17	935	5.01	0.5	8.10	22.5	2620	0.8	-355.3	6.00	clear; colorless	Low-flow groundwater sample:
	937	5.01	1.0	8.18	22.1	2590	0.6	-359.4	6.2		(A) peristaltic pump w/ ded tubing
	940	5.01	1.5	8.13	22.0	2580	0.5	-368.8	6.4		B) ded bladder pump
	943	5.01	2.0	8.14	21.9	2560	0.4	-366.8	6.5		C) non-ded bladder pump; or
	945	5.01	2.5	8.16	21.9	2550	0.3	-364.4	5.0		Standard groundwater sample:
	947	5.01	3.0	8.16	21.8	2540	0.3	-366.5	4.8		D) bailer due to limited column; or
	950	5.01	3.5	8.16	21.8	2540	0.2	-367.3	4.5		E) recovery well cycling sample
	953	5.01	4.0	8.16	21.8	2530	0.2	-368.4	4.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/27/17	955	RW-10	5.01	8.16	21.8	2530	0.2	-368.4	4.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-40
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB / SCD

Well Inspection Information

(2-in; stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1630	NP	3.30	0.0	24.75	21.8	yes	yes	yes	yes		Weather: pt/cloudy 80°
4/27/17	1146	NA	3.37	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/17	1145	3.53	0.5	7.25	25.4	3280	2.0	-314.5	56.8	Sl. Cloudy black tint	Low-flow groundwater sample:
	1147	3.53	1.0	7.18	24.9	3260	1.6	-343.8	50.8	odor	(A) peristaltic pump w/ ded tubing
	1150	3.53	1.5	7.10	24.6	3250	1.3	-349.7	43.6	↓ ↓	B) ded bladder pump
	1152	3.53	2.0	7.09	24.5	3220	1.1	-350.8	32.5		C) non-ded bladder pump; or
	1155	3.53	2.5	7.05	24.4	3210	1.0	-351.2	23.5	Clear w/ black tint	Standard groundwater sample:
	1157	3.53	3.0	6.99	24.4	3210	1.0	-351.9	18.6	odor	D) bailer due to limited column; or
	1200	3.53	3.5	6.94	24.4	3220	0.9	-353.3	14.3		E) recovery well cycling sample
	1202	3.53	4.0	6.92	24.3	3220	0.9	-353.5	10.1		F) irrigation well grab sample
↓	1205	3.53	4.5	6.91	24.3	3220	0.9	-353.8	9.8	↓ ↓	

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/27/17	1210	MW-40	3.53	6.91	24.3	3220	0.9	-353.8	9.8			Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Next	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-41
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information (2-in; stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1640	NP	3.41	0.0	21.56	18.6	yes	yes	yes	yes		Weather: pt/cloudy 80s
4/26/17	1755	NP	3.48	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1800	3.53	0.5	7.59	21.5	3370	1.7	-304.4	6.7	Clear, colorless	*Low-flow groundwater sample:*
	1803	3.53	1.0	7.56	21.3	3360	1.5	-309.4	6.9		(A) peristaltic pump w/ ded tubing
	1805	3.53	1.5	7.54	21.2	3350	1.3	-311.5	5.4		B) ded bladder pump
	1807	3.53	2.0	7.51	21.2	3350	1.2	-314.1	5.0		C) non-ded bladder pump; or
	1810	3.53	2.5	7.50	21.2	3340	1.0	-316.2	4.9		*Standard groundwater sample:*
	1813	3.53	3.0	7.48	21.1	3330	0.9	-317.5	4.9		D) bailer due to limited column; or
	1820	3.53	3.5	7.48	21.1	3330	0.8	-318.4	4.4		E) recovery well cycling sample
	1823	3.53	4.0	7.47	21.1	3330	0.8	-319.9	3.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1825	MW-41	3.53	7.47	21.1	3330	0.8	-318.9	3.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

ADS (~~Corrugated metal, large diameter RW, stickup~~)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-9 (Stand pipe)
Event: Spring 2017 (Biennial)
Area of Concern: Rest

RW-9 is permanently covered by heavy steel box

Stand pipe NEW Stand pipe NEW

* STEEL "VAULT" (33" x 33") has been placed over EXISTING corrugated pipe. New vault DOES NOT ALLOW access to well. Per Robert Combs, Hydrologic Monitoring water level and sample point for TRC to be collected from Standpipe located approx 90' East of existing well Initials: and vault. (SEE FIELD photos)

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					TAB/SCD Comments
							Cap	Casing	Well Secured	Label	Other	
4/27/17	1050	NA	5.74	0.0	21.83*	16.8	Yes	Yes	Issue**	Yes		Weather: Clear

Well Purging Record

New stick-up = 1.85 * Soft bottom **PVC Cap on standpipe; unlockable

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/17	1055	5.75	0.5	6.69	24.1	3870	2.8	-340.9	7.8	clear blank tint; odor	*Low-flow groundwater sample:*
	1057	5.75	1.0	6.74	23.8	3860	2.3	-345.6	7.0		(A) peristaltic pump w/ ded tubing
	1100	5.75	1.5	6.79	23.5	3850	1.9	-347.9	6.5		B) ded bladder pump
	1102	5.75	2.0	6.81	23.2	3870	1.7	-350.2	6.3		C) non-ded bladder pump; or
	1105	5.75	2.5	6.85	23.1	3880	1.5	-352.8	5.9		*Standard groundwater sample:*
	1107	5.75	3.0	6.89	23.1	3880	1.5	-354.5	5.4		D) bailer due to limited column; or
	1110	5.75	3.5	6.90	23.2	3870	1.4	-355.2	5.1		E) recovery well cycling sample
	1112	5.75	4.0	6.91	23.2	3870	1.4	-355.8	4.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4/27/17	1115	RW-9	5.75	6.91	23.2	3870	1.4	-355.8	4.8			Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-42
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1650	NP	6.60	0.0	24.32	21.3	yes	yes	yes	yes		Weather: PT/Cloudy 80°
4/26/17	1600	NP	6.71	0.0								11

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1605	6.73	0.5	7.71	21.0	4120	1.4	-261.6	6.9	clear; colorless	*Low-flow groundwater sample:*
	1607	6.74	1.0	7.66	20.6	4050	1.2	-269.7	4.0		(A) peristaltic pump w/ ded tubing
	1610	6.74	1.5	7.62	20.7	3960	1.1	-278.7	3.4		B) ded bladder pump
	1613	6.74	2.0	7.60	20.7	3930	0.9	-281.5	3.5		C) non-ded bladder pump; or
	1615	6.74	2.5	7.58	20.7	3880	0.8	-285.6	2.0		*Standard groundwater sample:*
	1617	6.74	3.0	7.56	20.7	3870	0.8	-289.9	1.8		D) bailer due to limited column; or
	1620	6.74	3.5	7.55	20.7	3860	0.8	-291.3	1.8		E) recovery well cycling sample
	1623	6.74	4.0	7.54	20.6	3850	0.8	-293.5	1.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1625	MW-42	6.74	7.54	20.6	3850	0.8	-293.5	1.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-29
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

(6-in PVC ; stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1740	NP	7.49	0.0	22.00	16.7	Internal	Yes	Issue	Yes	*	Weather: PT/Cloudy 80s
4/26/17	1700	NP	7.55	0.0			Threaded					" "

Cap

↳ No protective casing; unable to lock ↳ * Non standard pad

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1705	7.56	0.5	7.71	21.6	3430	1.2	-183.2	3.7	Clear; colorless	*Low-flow groundwater sample:*
	1707	7.57	1.0	7.69	21.5	3430	1.0	-185.8	3.0		(A) peristaltic pump w/ ded tubing
	1710	7.57	1.5	7.67	21.4	3420	0.9	-188.6	1.8		B) ded bladder pump
	1713	7.57	2.0	7.65	21.3	3410	0.9	-191.9	1.1		C) non-ded bladder pump; or
	1715	7.57	2.5	7.64	21.2	3410	0.8	-192.1	1.0		*Standard groundwater sample:*
	1717	7.57	3.0	7.63	21.2	3410	0.8	-194.6	0.9		D) bailer due to limited column; or
	1720	7.57	3.5	7.63	21.2	3410	0.8	-195.5	0.8		E) recovery well cycling sample
	1723	7.57	4.0	7.62	21.2	3400	0.7	-195.9	0.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1725	MW-29	7.57	7.62	21.2	3400	0.7	-195.9	0.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-#16B
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (8 3/8" OD bell-top stickup; PVC) Initials: IAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4/25/17	1710	NP	9.78	0.0	17.70	14.7	YES	YES	Issue (Capped, unable to lock)	YES	No Protective casing present	Weather: PT/Cloudy 80°
4/26/17	1500	NP	9.83	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1505	9.86	0.5	7.83	22.0	4530	1.2	-220.0	4.5	clear; colorless	*Low-flow groundwater sample:*
	1507	9.86	1.0	7.79	21.6	4530	1.1	-221.6	3.1		(A) peristaltic pump w/ ded tubing
	1510	9.86	1.5	7.77	21.2	4520	1.0	-223.3	2.3		B) ded bladder pump
	1513	9.86	2.0	7.75	21.0	4520	1.0	-224.6	2.1		C) non-ded bladder pump; or
	1515	9.86	2.5	7.74	21.0	4520	0.9	-225.2	2.0		*Standard groundwater sample:*
	1517	9.86	3.0	7.73	20.9	4520	0.8	-225.8	1.7		D) bailer due to limited column; or
	1520	9.86	3.5	7.72	20.8	4510	0.8	-226.6	1.2		E) recovery well cycling sample
	1523	9.86	4.0	7.71	20.8	4510	0.8	-226.7	1.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments: Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1525	RW-#16B	9.86	7.71	20.8	4510	0.8	-226.7	1.0	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "Sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-30
Event: Spring 2017 (Biennial)
Area of Concern: Rest

(Gauge Only)
(stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1900	NP	8.30	0.0	23.50	Not Sampled	yes	yes	yes	yes		Weather: PT/Cloudy 80°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-56
Event: Spring 2017 (Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in ; stickup) Initials: TAG

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1710	ND	9.55	0.0	26.50	21.4	yes	yes	yes	yes		Weather: pt/cloudy 80°
4/26/17	1400	ND	9.63	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/26/17	1405	9.69	0.5	7.49	22.6	4090	3.2	-312.2	3.8	clear; colorless	*Low-flow groundwater sample:*
	1407	9.69	1.0	7.46	22.2	4120	1.4	-304.0	3.4		(A) peristaltic pump w/ ded tubing
	1410	9.69	1.5	7.44	22.1	4120	1.3	-303.2	3.0		B) ded bladder pump
	1413	9.69	2.0	7.43	22.1	4130	1.1	-299.2	2.7		C) non-ded bladder pump; or
	1415	9.69	2.5	7.41	22.0	4130	1.1	-297.2	2.0		*Standard groundwater sample:*
	1417	9.69	3.0	7.40	21.9	4140	1.0	-294.3	1.8		D) bailer due to limited column; or
	1420	9.69	3.5	7.39	21.9	4150	1.0	-293.5	1.4		E) recovery well cycling sample
	1423	9.69	4.0	7.38	21.8	4160	1.0	-290.9	1.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/26/17	1425	MW-56	9.69	7.38	21.8	4160	1.0	-290.9	1.2	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	~~Neat~~	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Short protective casing stickup; only the section above hinge-line is above-grade

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

* Located under Yellow Barricade

Well: MW-49
Event: Spring 2017 (Biennial)
Area of Concern: TEL

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB/SCD

Well Inspection Information

(2-in; short stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1530	NP	7.60	0.0	33.15	27.8	yes	Non-standard	issue	yes		Weather: pt/cloudy 80s
4/27/17	1005	NA	7.75	0.0				short stickup	→ broken hinge			

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/27/17	1010	7.90	0.5	6.89	24.3	3220	1.8	-306.8	9.5	clear; black tint	*Low-flow groundwater sample:*
	1012	7.90	1.0	6.93	23.5	3240	1.5	-320.2	9.1		(A) peristaltic pump w/ ded tubing
	1015	7.90	1.5	6.97	23.5	3230	1.2	-329.6	8.6		B) ded bladder pump
	1017	7.90	2.0	7.00	23.4	3220	1.0	-331.2	8.2		C) non-ded bladder pump; or
	1020	7.90	2.5	7.02	23.4	3220	0.9	-331.4	7.9		*Standard groundwater sample:*
	1022	7.90	3.0	7.04	23.3	3230	0.9	-331.6	7.5		D) bailer due to limited column; or
	1025	7.90	3.5	7.05	23.3	3230	0.8	-331.9	6.8		E) recovery well cycling sample
↓	1027	7.90	4.0	7.05	23.3	3240	0.8	-332.1	6.3	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/27/17	1030	MW-49	7.90	7.05	23.3	3240	0.8	-332.1	6.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Gravel lot area; relocated by surveyor, 11/15]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-106
Event: Spring 2017 (Biennial)
Area of Concern: Rest (4-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	900	NP	5.70	0.0	22.80	17.5	yes	yes	yes	yes		Weather: PT/C/60s/4 70°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	905	5.74	0.5	7.48	24.1	3040	0.9	-365.6	3.2	clear, colorless	*Low-flow groundwater sample:*
	907	5.75	1.0	7.40	24.0	3020	0.8	-370.9	2.0		(A) peristaltic pump w/ ded tubing
	910	5.76	1.5	7.38	24.0	3010	0.8	-371.9	1.9		B) ded bladder pump
	913	5.77	2.0	7.36	23.9	3000	0.8	-372.9	1.8		C) non-ded bladder pump; or
	915	5.79	2.5	7.34	23.8	3000	0.8	-373.5	2.2		*Standard groundwater sample:*
	917	5.81	3.0	7.33	23.8	3010	0.7	-373.8	3.3		D) bailer due to limited column; or
	920	5.83	3.5	7.32	23.7	3010	0.6	-374.2	3.5		E) recovery well cycling sample
	923	5.84	4.0	7.31	23.7	3000	0.6	-374.2	3.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	925	MW-106	5.84	7.31	23.7	3000	0.6	-374.2	3.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-45
Event: Spring 2017 (Biennial)
Area of Concern: NCL (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4/25/17	1750	ND	4.10	0.0	15.05	12.3	yes	yes	yes	yes		Weather: Clear/Cloudy 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4/25/17	1755	4.30	0.5	7.94	21.3	4800	2.8	-202.4	43.2	Clear Brown particles	*Low-flow groundwater sample:*
"	1757	4.31	1.0	7.87	21.2	4790	3.1	-201.1	40.2		(A) peristaltic pump w/ ded tubing
	1900	4.31	1.5	7.81	21.1	4780	3.2	-200.6	36.7		B) ded bladder pump
	1803	4.31	2.0	7.73	21.0	4770	3.3	-199.3	34.5		C) non-ded bladder pump; or
	1805	4.31	2.5	7.72	20.9	4780	3.2	-199.7	30.3		*Standard groundwater sample:*
	1807	4.31	3.0	7.71	20.9	4780	2.2	-200.0	27.4		D) bailer due to limited column; or
	1810	4.31	3.5	7.70	20.8	4780	1.5	-200.3	25.1		E) recovery well cycling sample
	1813	4.31	4.0	7.69	20.8	4780	1.4	-200.4	23.0		F) irrigation well grab sample
	1815	4.31	4.5	7.68	20.8	4770	1.2	-201.1	23.1		
↓	1817	4.31	5.0	7.67	20.7	4780	1.2	-200.4	22.9	↓ ↓	

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4/25/17	1820	MW-45	4.31	7.67	20.7	4780	1.2	-200.4	22.9	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
							Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

* Located within Artesia Wool laydown yard, N. of the main warehouse

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-50
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) ✓ Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.25.17	1135	NA	14.24	0.0	28.22	24.1	yes	yes	yes	yes		Weather: Clear, 80's

Well Purging Record * SC Confirmed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	* SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.25.17	1140	14.25	0.5	7.15	24.5	6670	2.7	74.7	6.1	Clear; colorless	*Low-flow groundwater sample:*
↓	1142	14.25	1.0	6.97	23.6	6920	1.7	79.4	5.5	↓	(A) peristaltic pump w/ ded tubing
	1145	14.25	1.5	6.95	23.4	6970	1.4	81.5	4.6		B) ded bladder pump
	1147	14.25	2.0	6.93	23.3	7000	1.2	83.6	4.5		C) non-ded bladder pump; or
	1150	14.25	2.5	6.92	23.2	7020	1.1	84.8	3.9		*Standard groundwater sample:*
	1152	14.25	3.0	6.91	23.2	7030	1.1	85.7	3.5		D) bailer due to limited column; or
	1155	14.25	3.5	6.90	23.1	7030	1.0	86.9	3.2		E) recovery well cycling sample
↓	1157	14.25	4.0	6.89	23.1	7040	1.0	87.4	3.0	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.25.17	1200	MW-50	14.25	6.89	23.1	7040	1.0	87.4	3.0	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-97
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; at-grade) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.25.17	1220	8.20	8.23	0.03	21.20	(NS)	yes	yes	yes	yes		Weather: Clear, 80's
						5' off base as needed						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		Not	Sampled due to presence					B) ded bladder pump
			2.0		of	LNAPL. ≥ 0.03'					C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-97								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

10/4/16 - "Torcsill" was doing construction in area. Speak to "Jacob" for future needs.

Monitoring Well Purging and Sampling Record

Navajo Refining Company * Note no longer needed, This was for turn-around Purposes.
Artesia Refinery
Artesia, New Mexico

Well: MW-92
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) ✓ Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.25.17	1231	10.15	10.19	0.04	22.60	17.6	yes	yes	yes	yes		Weather: Partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		Not Sampled due to presence						B) ded bladder pump
			2.0		Of LNAPL ≥0.03'						C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-92								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride, Fluoride, Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	HNO3	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Bagged tubing.

Inside doghouse

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

[Gauge/Sample through 1-in guide-pipe]

Well: RW-1
Event: Spring 2017 (Biennial)
Area of Concern: Rest (inactive)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.25.17	1240	NA	9.09	0.0	35.39	30.4	yes	yes	yes	yes		Weather: Partly cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.25.17	1245	NM	0.5	6.96	24.1	4090	1.9	-316.1	26.3	Clear, black	*Low-flow groundwater sample:*
↓	1247	↓	1.0	6.83	22.9	3990	1.6	-336.4	24.1	Tint, black	(A) peristaltic pump w/ ded tubing
	1250		1.5	6.81	22.6	3940	1.4	-339.2	22.9	Particles, odor	B) ded bladder pump
	1252		2.0	6.80	22.5	3910	1.3	-341.9	21.7	↓	C) non-ded bladder pump; or
	1255		2.5	6.79	22.4	3890	1.2	-343.5	21.1		*Standard groundwater sample:*
	1257		3.0	6.78	22.3	3880	1.1	-344.3	20.5		D) bailer due to limited column; or
	1300		3.5	6.77	22.2	3870	1.0	-345.7	20.8		E) recovery well cycling sample
↓	1302	↓	4.0	6.77	22.2	3860	1.0	-346.1	20.2	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.25.17	1305	RW-1	NM	6.77	22.2	3860	1.0	-346.1	20.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-91
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup)

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.25.17	1325	NA	9.53	0.0	25.35	17.9	yes	yes	yes	yes		Weather: Clear, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.25.17	1330	9.68	0.5	6.66	23.9	2490	1.8	-380.1	14.5	Clear, black	*Low-flow groundwater sample:*
↓	1332	9.72	1.0	6.68	23.8	2410	1.5	-397.1	11.4	tint, odor	(A) peristaltic pump w/ ded tubing
	1335	9.75	1.5	6.69	23.5	2380	1.4	-401.0	10.1	↓	B) ded bladder pump
	1337	9.78	2.0	6.70	23.3	2360	1.3	-404.0	9.3		C) non-ded bladder pump; or
	1340	9.80	2.5	6.70	23.2	2350	1.2	-406.0	9.1		*Standard groundwater sample:*
	1342	9.82	3.0	6.71	23.1	2340	1.1	-407.0	8.9		D) bailer due to limited column; or
	1345	9.84	3.5	6.71	23.1	2330	1.1	-408.0	8.8		E) recovery well cycling sample
↓	1347	9.85	4.0	6.72	23.0	2320	1.0	-408.0	8.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.25.17	1350	MW-91	9.85	6.72	23.0	2320	1.0	-408.0	8.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-90
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.25.17	1405	NA	10.47	0.0	22.80	21.5	yes	yes	yes	yes		Weather: Clear, 80's

Well Purging Record * pH Confirmed * ORP Confirmed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	* pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	* Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.25.17	1410	10.57	0.5	7.16	21.9	4790	2.1	-354.1	12.1	clear, odor	*Low-flow groundwater sample:*
|	1412	10.60	1.0	7.02	21.5	4820	1.6	-349.6	10.7	↓	(A) peristaltic pump w/ ded tubing
|	1415	10.62	1.5	6.98	21.2	4860	1.4	-346.4	9.2	↓	B) ded bladder pump
|	1417	10.64	2.0	6.96	21.1	4880	1.3	-343.1	8.4	↓	C) non-ded bladder pump; or
|	1420	10.65	2.5	6.95	21.0	4910	1.2	-341.5	8.0	↓	*Standard groundwater sample:*
|	1422	10.66	3.0	6.94	20.9	4930	1.1	-339.8	7.9	↓	D) bailer due to limited column; or
|	1425	10.67	3.5	6.93	20.9	4950	1.0	-337.6	7.7	↓	E) recovery well cycling sample
↓	1427	10.67	4.0	6.93	21.0	4960	1.0	-336.0	7.4	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.25.17	1430	MW-90	10.67	6.93	21.0	4960	1.0	-336.0	7.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-96
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup)

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.25.17	1445	NA	10.28	0.0	25.57	21.2	yes	*Issue	*needs lock	yes		Weather: Clear, 80's

Well Purging Record

*Damaged hinge prevents Prot. casing from shutting properly, which results in the inability to lock the well

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.25.17	1450	10.29	0.5	6.80	23.0	2330	2.4	-370.4	16.8	Clear, white particles, odor	*Low-flow groundwater sample:*
	1452	10.29	1.0	6.79	22.8	2220	2.1	-374.1	13.7		(A) peristaltic pump w/ ded tubing
	1455	10.29	1.5	6.78	22.6	2190	1.9	-377.9	11.1		B) ded bladder pump
	1457	10.29	2.0	6.77	22.5	2170	1.8	-380.1	9.8		C) non-ded bladder pump; or
	1500	10.29	2.5	6.77	22.4	2150	1.7	-382.5	9.4		*Standard groundwater sample:*
	1502	10.29	3.0	6.76	22.3	2140	1.6	-383.5	9.3		D) bailer due to limited column; or
	1505	10.29	3.5	6.75	22.2	2140	1.5	-384.8	8.7		E) recovery well cycling sample
	1507	10.29	4.0	6.75	22.2	2130	1.5	-386.0	8.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.25.17	1510	MW-96	10.29	6.75	22.2	2130	1.5	-386.0	8.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

(Bagged tubing)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-94
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

(4-in; stickup)

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.25.17	1525	NA	10.52	0.0	23.45	16.0	yes	yes	yes	yes		Weather: Clear, 70's
4.26.17	1355	NA	10.81	0.0	23.45	16.0						

Well Purging Record

* SC Confirmed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	* SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.26.17	1400	10.94	0.5	6.96	22.2	3230	3.2	-411.0	6.1	Clear, yellow	Low-flow groundwater sample:
	1402	10.96	1.0	6.96	21.5	3220	2.2	-425.0	5.7	tint, odor	(A) peristaltic pump w/ ded tubing
	1405	10.98	1.5	6.96	21.4	3200	1.9	-430.0	5.4		B) ded bladder pump
	1407	10.99	2.0	6.95	21.4	3190	1.8	-434.0	5.2		C) non-ded bladder pump; or
	1410	11.00	2.5	6.95	21.3	3180	1.7	-437.0	4.9		Standard groundwater sample:
	1412	11.01	3.0	6.95	21.2	3180	1.6	-439.0	4.7		D) bailer due to limited column; or
	1415	11.01	3.5	6.94	21.2	3170	1.5	-441.0	4.4		E) recovery well cycling sample
	1417	11.02	4.0	6.94	21.2	3170	1.5	-442.0	3.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.26.17	1420	MW-94	11.02	6.94	21.2	3170	1.5	-442.0	3.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Inside doghouse

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Gauge/Sample through 1-in PVC guide-pipe

Well: RW-8
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.25.17	1536	NA	9.96	0.0	37.22	35.2	yes	yes	yes	yes		Weather: Clear, 70's
4.26.17	1440	NA	10.13	0.0	37.22	35.2						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.26.17	1445	NM	0.5	6.82	22.6	2340	3.1	-368.1	79.1	SI Cloudy, Black	*Low-flow groundwater sample:*
	1447		1.0	6.76	22.3	2280	1.8	-370.4	60.4	particles, odor	(A) peristaltic pump w/ ded tubing
	1450		1.5	6.74	22.1	2260	1.6	-365.5	45.7	↓ ↓	B) ded bladder pump
	1452		2.0	6.73	22.1	2250	1.4	-362.1	34.2	↓ ↓	C) non-ded bladder pump; or
	1455		2.5	6.72	22.0	2240	1.2	-360.4	30.7	Clear, Black	*Standard groundwater sample:*
	1457		3.0	6.71	21.9	2230	1.1	-358.9	28.9	particles, odor	D) bailer due to limited column; or
	1500		3.5	6.70	21.9	2220	1.0	-356.1	29.1	↓ ↓	E) recovery well cycling sample
↓	1502	↓	4.0	6.69	21.8	2220	1.0	-354.5	27.8	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.26.17	1505	RW-8	NM	6.69	21.8	2220	1.0	-354.5	27.8	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Next	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-67
Event: Spring 2017 (Biennial)
Area of Concern: Rest (4-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.25.17	1545	NA	8.18	0.0	27.30	19.9	yes	yes	yes	yes		Weather:
4.26.17	1550	NA	8.34	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.26.17	1555	8.48	0.5	6.93	21.6	2490	2.6	-370.1	9.4	clear, light	*Low-flow groundwater sample:*
|	1557	8.52	1.0	6.92	21.4	2510	2.0	-384.7	8.4	yellow tint, odor	(A) peristaltic pump w/ ded tubing
|	1600	8.54	1.5	6.92	21.3	2530	1.8	-388.6	8.1	|	B) ded bladder pump
|	1602	8.55	2.0	6.91	21.3	2540	1.7	-390.5	7.8	|	C) non-ded bladder pump; or
|	1605	8.55	2.5	6.91	21.2	2550	1.6	-392.4	7.5	|	*Standard groundwater sample:*
|	1607	8.55	3.0	6.90	21.2	2560	1.5	-394.5	7.2	|	D) bailer due to limited column; or
|	1610	8.55	3.5	6.89	21.3	2560	1.4	-395.1	6.5	|	E) recovery well cycling sample
↓	1612	8.55	4.0	6.89	21.3	2560	1.4	-396.8	5.3	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.26.17	1615	MW-67	8.55	6.89	21.3	2560	1.4	-396.8	5.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~Field filtered 0.45 u~~
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
							Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-95
Event: Spring 2017 (Biennial)
Area of Concern: Rest (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.25.17	1553	NA	11.02	0.0	25.37	20.4	yes	yes	yes	yes		Weather: Clear, 70's
4.26.17	1645	NA	11.15	0.0	25.37	20.4						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.26.17	1650	11.20	0.5	7.05	23.3	2480	2.4	-329.4	10.5	clear, odor	*Low-flow groundwater sample:*
↓	1652	11.21	1.0	6.96	23.1	2460	1.9	-345.8	7.1	↓	(A) peristaltic pump w/ ded tubing
↓	1655	11.21	1.5	6.93	22.9	2440	1.7	-355.7	6.2	↓	B) ded bladder pump
↓	1657	11.21	2.0	6.91	22.8	2420	1.6	-360.1	5.1	↓	C) non-ded bladder pump; or
↓	1700	11.21	2.5	6.89	22.7	2410	1.5	-363.2	4.0	↓	*Standard groundwater sample:*
↓	1702	11.21	3.0	6.88	22.7	2390	1.5	-365.1	3.7	↓	D) bailer due to limited column; or
↓	1705	11.21	3.5	6.87	22.6	2390	1.4	-367.5	3.3	↓	E) recovery well cycling sample
↓	1707	11.21	4.0	6.86	22.6	2380	1.4	-369.0	2.9	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4.26.17	1710	MW-95	11.21	6.86	22.6	2380	1.4	-369.0	2.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	~~Neat~~	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Bagged tubing.

Inside doghouse

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

* Gauge/Sample through 1-in PVC gutde-pipe

Well: RW-7
Event: Spring 2017 (Biennial)
Area of Concern: REST

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.25.17	1604	NA	15.61	0.0	37.00	32.0	Yes	yes	yes	yes		Weather: Clear, 70's
4.26.17	1310	NA	15.82	0.0	37.00	32.0						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.26.17	1315	NM *	0.5	6.92	24.3	6880	1.7	-257.1	13.0	Clear, small	*Low-flow groundwater sample:*
↓	1317	↓	1.0	6.82	23.6	6820	1.5	-223.4	12.1	black particles,	(A) peristaltic pump w/ ded tubing
	1320		1.5	6.80	23.5	6810	1.4	-207.6	10.6	odor	B) ded bladder pump
	1322		2.0	6.79	23.4	6820	1.3	-201.7	10.2	↑	C) non-ded bladder pump; or
	1325		2.5	6.78	23.4	6820	1.2	-195.6	9.8		*Standard groundwater sample:*
	1327		3.0	6.78	23.5	6830	1.1	-191.4	9.5		D) bailer due to limited column; or
	1330		3.5	6.77	23.5	6840	1.1	-187.8	9.1		E) recovery well cycling sample
↓	1332	↓	4.0	6.77	23.5	6840	1.0	-184.5	8.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.26.17	1335	RW-7	NM	6.77	23.5	6840	1.0	-184.5	8.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-34A
Event: Spring 2017 (Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

(2-in; stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.25.17	1613	NA	9.81	0.0	19.31	16.9	*Issue	yes	yes	yes		Weather: Clear, 70's
4.26.17	1225	NA	9.99	0.0	19.31	16.9						

Well Purging Record

*Cannot fit cap and close prot. casing lid simultaneously, PVC casing needs to be lowered, or prot casing raised. Left w/ no cap, Well Secure.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.26.17	1230	10.12	0.5	6.64	22.3	2180	2.1	-360.8	4.5	clear, odor	*Low-flow groundwater sample:*
	1232	10.15	1.0	6.62	21.9	2160	1.8	-365.1	4.3		(A) peristaltic pump w/ ded tubing
	1235	10.15	1.5	6.61	21.7	2140	1.6	-368.4	3.8		B) ded bladder pump
	1237	10.15	2.0	6.60	21.6	2130	1.5	-371.2	3.5		C) non-ded bladder pump; or
	1240	10.15	2.5	6.60	21.5	2130	1.4	-373.5	3.2		*Standard groundwater sample:*
	1242	10.15	3.0	6.59	21.4	2120	1.4	-375.0	2.9		D) bailer due to limited column; or
	1245	10.15	3.5	6.58	21.3	2120	1.3	-377.1	2.5		E) recovery well cycling sample
	1247	10.15	4.0	6.58	21.3	2110	1.3	-378.3	2.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
4.26.17	1250	NCL-34A	10.15	6.58	21.3	2110	1.3	-378.3	2.4	DRO	HCL	Lab: ESC Lab Sciences, Mt. Juliet, TN 8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-33
Event: Spring 2017 (Biennial)
Area of Concern: NCL (2-in ; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4.25.17	~~1621~~ CJH	NA	7.89	0.0	19.60	17.7	yes	yes	yes	yes		Weather: Clear, 70's
4.26.17	1145	NA	8.01	0.0	19.60	17.7						

Well Purging Record

*ORP Confirmed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	~~*~~Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.26.17	1150	8.11	0.5	6.77	21.1	3000	3.6	13.6	9.1	Clear ; colorless	*Low-flow groundwater sample:*
	1153	8.19	1.0	6.72	20.9	3000	2.4	26.4	8.7		(A) peristaltic pump w/ ded tubing
	1155	8.24	1.5	6.70	20.8	3010	2.0	31.1	8.4		B) ded bladder pump
	1158	8.27	2.0	6.69	20.8	3010	1.8	34.0	8.2		C) non-ded bladder pump; or
	1200	8.30	2.5	6.68	20.7	3020	1.7	35.9	7.9		*Standard groundwater sample:*
	1203	8.33	3.0	6.67	20.7	3030	1.6	36.7	7.5		D) bailer due to limited column; or
	1205	8.36	3.5	6.67	20.8	3030	1.5	37.5	7.7		E) recovery well cycling sample
	1208	8.39	4.0	6.66	20.8	3030	1.5	38.4	7.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments: Lab: ESC Lab Sciences, Mt. Juliet, TN
4.26.17	1210	NCL-33	8.39	6.66	20.8	3030	1.5	38.4	7.4	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-44
Event: Spring 2017 (Biennial)
Area of Concern: NCL (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4.25.17	1629	NA	8.12	0.0	21.57	17.4	*Issue	yes	yes	yes		Weather: Clear, 60's
4.26.17	1100	NA	8.23	0.0	21.57	17.4						

* Cannot fit cap and close prot. casing simultaneously. Left w/ no cap, well secured.

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.26.17	1105	8.27	0.5	6.77	20.0	2540	2.8	-208.1	12.3	Clear, light	Low-flow groundwater sample:
↓	1107	8.27	1.0	6.72	19.8	2540	2.1	-234.1	10.9	yellow tint,	(A) peristaltic pump w/ ded tubing
	1110	8.27	1.5	6.68	19.8	2550	1.8	-240.5	9.5	Sl. odor	B) ded bladder pump
	1112	8.27	2.0	6.66	19.7	2550	1.7	-244.8	9.2	↓	C) non-ded bladder pump; or
	1115	8.27	2.5	6.65	19.7	2560	1.6	-247.5	8.6		Standard groundwater sample:
	1117	8.27	3.0	6.64	19.7	2560	1.6	-250.4	8.1		D) bailer due to limited column; or
	1120	8.27	3.5	6.63	19.6	2560	1.5	-253.7	7.9		E) recovery well cycling sample
↓	1122	8.27	4.0	6.63	19.6	2560	1.5	-256.2	7.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments: Lab: ESC Lab Sciences, Mt. Juliet, TN
4.26.17	1125	NCL-44	8.27	6.63	19.6	2560	1.5	-256.2	7.5	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Redeveloped 10/4/16

Monitoring Well Purging and Sampling Record

+ EB-NCL-01 (for same analysis)

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-32
Event: Spring 2017 (Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in ; at-grade) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4.25.17	1639	NA	8.26	0.0	20.06	18.1	yes	yes	yes	yes		Weather: Clear, 60's
4.26.17	1010	NA	8.35	0.0	20.06	18.1						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.26.17	1015	8.46	0.5	7.26	18.9	2480	3.4	-45.3	26.1	Clear, small	*Low-flow groundwater sample:*
	1017	8.47	1.0	7.19	18.9	2470	2.5	-38.1	22.4	white particles	(A) peristaltic pump w/ ded tubing
	1020	8.47	1.5	7.12	19.0	2460	2.2	-35.7	19.7		B) ded bladder pump
	1022	8.47	2.0	7.07	19.0	2460	2.1	-32.5	19.0		C) non-ded bladder pump; or
	1025	8.47	2.5	7.05	19.1	2450	2.0	-30.1	18.3		*Standard groundwater sample:*
	1027	8.47	3.0	7.02	19.1	2440	1.9	-28.7	17.5		D) bailer due to limited column; or
	1030	8.47	3.5	6.99	19.2	2440	1.8	-27.2	17.2		E) recovery well cycling sample
	1032	8.47	4.0	6.97	19.2	2440	1.8	-26.5	16.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments: Lab: ESC Lab Sciences, Mt. Juliet, TN
4.26.17	1035	NCL-32	8.47	6.97	19.2	2440	1.8	-26.5	16.9	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Need	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1045	EB-NCL-01	NA							Same as above	same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

* Access by foot

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-108
Event: Spring 2017 (Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.25.17	1710	NA	12.31	0.0	27.74	22.5	yes	yes	yes	yes		Weather: Clear, 50's
4.26.17	840	NA	12.59	0.0	27.74	22.5						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.26.17	845	12.72	0.5	6.61	18.6	2360	2.2	-347.1	14.5	clear, yellow	*Low-flow groundwater sample:*
↓	847	12.80	1.0	6.72	18.6	2410	2.0	-359.7	10.8	tint, odor	(A) peristaltic pump w/ ded tubing
	850	12.84	1.5	6.77	18.7	2430	1.9	-367.4	9.5	↓	B) ded bladder pump
	852	12.88	2.0	6.80	18.8	2440	1.8	-372.5	9.1		C) non-ded bladder pump; or
	855	12.91	2.5	6.82	18.9	2450	1.8	-375.1	8.9		*Standard groundwater sample:*
	857	12.94	3.0	6.84	19.0	2460	1.7	-378.4	8.7		D) bailer due to limited column; or
	900	12.96	3.5	6.85	19.0	2470	1.6	-381.0	8.3		E) recovery well cycling sample
↓	902	12.98	4.0	6.86	19.1	2470	1.6	-383.5	7.9	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4.26.17	905	MW-108	12.98	6.86	19.1	2470	1.6	-383.5	7.9	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

* SW of NCL field

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-31
Event: Spring 2017 (Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup)

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection: Cap	Casing	Well Secured	Label	Other	Comments
4.25.17	1648	NA	8.91	0.0	20.16	17.4	*Issue	yes	yes	yes		Weather: Clear, 60's
4.26.17	925	NA	9.14	0.0	20.16	17.4						

Well Purging Record

* Cannot fit cap and close prot. casing simultaneously. Left w/ no cap; well secure.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.26.17	930	9.34	0.5	7.36	18.8	3000	2.3	-209.1	9.1	Clear, small white	Low-flow groundwater sample:
	932	9.37	1.0	7.15	18.6	3020	1.8	-182.0	8.7	particles, sl.	(A) peristaltic pump w/ ded tubing
	935	9.37	1.5	7.09	18.6	3030	1.6	-167.1	8.4	odor	B) ded bladder pump
	937	9.37	2.0	7.06	18.5	3030	1.5	-160.5	7.8		C) non-ded bladder pump; or
	940	9.37	2.5	7.04	18.5	3040	1.4	-157.2	7.3		Standard groundwater sample:
	942	9.37	3.0	7.03	18.4	3040	1.3	-154.9	6.9		D) bailer due to limited column; or
	945	9.37	3.5	7.02	18.4	3050	1.2	-152.4	6.5		E) recovery well cycling sample
	947	9.37	4.0	7.01	18.4	3050	1.2	-150.5	6.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments: Lab: ESC Lab Sciences, Mt. Juliet, TN
4.26.17	950	NCL-31	9.37	7.01	18.4	3050	1.2	-150.5	6.4	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "Sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-19 (Gauge only)
Event: Spring 2017 (Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(6-in; Stickup)

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.25.17	1657	NA	9.27	0.0	22.08	Not Sampled	yes	*Issue	*Issue	yes		Weather: pt. cloudy, 80s

Well Purging Record

* No Prot. Casing, just exposed PVC Casing, well Cannot be Secured.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	Field filtered 0.45-u
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-55
Event: Spring 2017 (Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: C JH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.25.17	1731	NA	9.73	0.0	26.58	21.7	yes	yes	yes	yes		Weather: pt. cloudy, 80s
4.27.17	935	NA	9.82									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.27.17	940	9.84	0.5	6.99	21.4	3270	3.7	-110.4	14.6	clear; colorless	*Low-flow groundwater sample:*
	942	9.84	1.0	6.89	21.0	3300	2.8	-119.6	10.9		(A) peristaltic pump w/ ded tubing
	945	9.84	1.5	6.80	20.6	3340	2.2	-124.7	9.6		B) ded bladder pump
	947	9.84	2.0	6.73	20.5	3360	2.0	-131.4	9.1		C) non-ded bladder pump; or
	950	9.84	2.5	6.72	20.6	3370	1.8	-134.8	8.7		*Standard groundwater sample:*
	952	9.84	3.0	6.71	20.6	3370	1.7	-137.5	8.2		D) bailer due to limited column; or
	955	9.84	3.5	6.71	20.7	3380	1.6	-140.0	6.9		E) recovery well cycling sample
	957	9.84	4.0	6.70	20.7	3380	1.6	-142.6	6.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.27.17	1000	MW-55	9.84	6.70	20.7	3380	1.6	-142.6	6.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
							Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-#17A
Event: Spring 2017 (Biennial)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(6-in PVC stickup w/ belled top) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.25.17	1740	NA	9.02	0.0	16.02	14.0	yes	*Issue	*Issue	yes		Weather: Clear, 60's
4.26.17	1730	NA	9.07	0.0	(soft)	14.0						

Well Purging Record

*No prot. casing, just exposed PVC, well is unable to be secured.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV) **	Turbidity (NTU)	Water Color / Clarity	** ORP Confirmed
4.26.17	1735	9.08	0.5	6.97	20.3	4850	2.0	-221.4	13.1	Clear	*Low-flow groundwater sample:*
	1737	9.08	1.0	6.90	19.9	4940	1.7	-223.5	11.8		(A) peristaltic pump w/ ded tubing
	1740	9.08	1.5	6.86	19.7	4970	1.6	-228.0	9.0		B) ded bladder pump
	1742	9.08	2.0	6.84	19.6	4990	1.5	-231.7	8.2		C) non-ded bladder pump; or
	1745	9.08	2.5	6.83	19.5	5010	1.4	-233.5	7.4		*Standard groundwater sample:*
	1747	9.08	3.0	6.82	19.4	5030	1.3	-234.7	7.2		D) bailer due to limited column; or
	1750	9.08	3.5	6.82	19.3	5040	1.2	-235.8	6.9		E) recovery well cycling sample
	1752	9.08	4.0	6.81	19.3	5050	1.2	-237.6	6.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.26.17	1755	RW-#17A	9.08	6.81	19.3	5050	1.2	-237.6	6.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	Neat	Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-18
Event: Spring 2017 (Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.25.17	1723	NA	9.55	0.0	22.20	20.2	yes	yes	yes	yes		Weather: Clear, 60's
4.27.17	850	NA	9.61	0.0	22.20	20.2						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.27.17	855	9.65	0.5	6.76	20.8	2900	3.4	17.5	6.3	Clear	*Low-flow groundwater sample:*
↓	857	9.65	1.0	6.83	20.6	2950	3.0	27.7	5.8	↓	(A) peristaltic pump w/ ded tubing
	900	9.65	1.5	6.87	20.5	2970	2.9	32.8	5.4		B) ded bladder pump
	902	9.65	2.0	6.89	20.5	2980	2.7	35.5	5.1		C) non-ded bladder pump; or
	905	9.65	2.5	6.90	20.4	2980	2.6	37.2	5.0		*Standard groundwater sample:*
	907	9.65	3.0	6.91	20.4	2990	2.5	39.2	4.9		D) bailer due to limited column; or
	910	9.65	3.5	6.92	20.3	3000	2.4	40.9	4.8		E) recovery well cycling sample
↓	912	9.65	4.0	6.92	20.3	3010	2.4	41.6	4.7	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.27.17	915	MW-18	9.65	6.92	20.3	3010	2.4	41.6	4.7	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							~~***Short List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~Field filtered 0.45-u~~
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
						Long List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					Neat	Field filtered 0.45-u
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-54A
Event: Spring 2017 (Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in ; stickup) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.25.17	1050	NA	10.39	0.0	31.30	23.6	yes	yes	yes	yes		Weather: Clear, 60's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.25.17	1055	10.42	0.5	6.81	23.8	2070	3.5	48.0	7.7	Clear, colorless	*Low-flow groundwater sample:*
↓	1057	10.42	1.0	6.69	23.6	2080	2.4	57.2	7.2	↓	(A) peristaltic pump w/ ded tubing
	1100	10.42	1.5	6.66	23.5	2080	2.1	61.5	7.0		B) ded bladder pump
	1102	10.42	2.0	6.64	23.4	2090	2.0	65.7	6.4		C) non-ded bladder pump; or
	1105	10.42	2.5	6.63	23.3	2100	1.9	68.9	5.5		*Standard groundwater sample:*
	1107	10.42	3.0	6.63	23.3	2100	1.8	71.4	5.2		D) bailer due to limited column; or
	1110	10.42	3.5	6.62	23.2	2100	1.8	73.5	4.8		E) recovery well cycling sample
↓	1112	10.42	4.0	6.62	23.2	2110	1.7	75.0	4.6	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.25.17	1115	MW-54A	10.42	6.62	23.2	2110	1.7	75.0	4.6	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-54B
Event: Spring 2017 (Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.25.17	1010	NA	10.37	0.0	46.80	41.8	yes	yes	yes	yes		Weather: Clear, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.25.17	1015	10.42	0.5	7.21	23.2	2150	2.1	37.8	7.4	Clear; colorless	*Low-flow groundwater sample:*
|	1017	10.42	1.0	7.00	22.5	2130	1.8	51.5	6.9	|	(A) peristaltic pump w/ ded tubing
|	1020	10.42	1.5	6.90	22.0	2120	1.6	62.5	6.3	|	B) ded bladder pump
|	1022	10.42	2.0	6.84	21.9	2100	1.5	65.7	6.0	|	C) non-ded bladder pump; or
|	1025	10.42	2.5	6.80	21.9	2080	1.4	68.4	5.7	|	*Standard groundwater sample:*
|	1027	10.42	3.0	6.78	21.8	2060	1.3	70.3	5.2	|	D) bailer due to limited column; or
|	1030	10.42	3.5	6.77	21.8	2050	1.2	72.6	4.9	|	E) recovery well cycling sample
↓	1032	10.42	4.0	6.76	21.8	2040	1.2	74.1	4.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.25.17	1035	MW-54B	10.42	6.76	21.8	2040	1.2	74.1	4.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Trip Blank - NCL-01

Monitoring Well Purging and Sampling Record

+ DUP-NCL-01 (for same analysis)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-49
Event: Spring 2017 (Biennial)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.25.17	920	NA	14.03	0.0	32.18	27.2	yes	yes	yes	yes		Weather: Clear, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.25.17	925	14.07	0.5	7.16	22.3	2910	2.1	34.5	10.7	Clear; colorless	Low-flow groundwater sample:
	927	14.07	1.0	7.06	21.6	2970	1.8	51.4	9.1		(A) peristaltic pump w/ ded tubing
	930	14.07	1.5	6.99	21.4	2990	1.7	62.7	8.5		B) ded bladder pump
	932	14.07	2.0	6.96	21.4	3010	1.6	67.8	8.0		C) non-ded bladder pump; or
	935	14.07	2.5	6.95	21.3	3020	1.5	71.5	7.2		Standard groundwater sample:
	937	14.07	3.0	6.94	21.3	3020	1.4	73.9	6.5		D) bailer due to limited column; or
	940	14.07	3.5	6.93	21.4	3030	1.3	75.8	5.4		E) recovery well cycling sample
↓	942	14.07	4.0	6.93	21.4	3030	1.3	76.5	4.9	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
4.25.17	945	NCL-49	14.07	6.93	21.4	3030	1.3	76.5	4.9	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				Neat	Field filtered 0.45-u
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
						~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
↓	900	DUP-NCL-01	14.07	6.93	21.4	3030	1.3	76.5	4.9	Same as above	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

* ~15' S. of 70 mile marker off 285 northbound

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-53
Event: Spring 2017 (Biennial)
Area of Concern: NCL (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
4.25.17	840	NA	9.54	0.0	23.60	19.6	yes	yes	yes	yes		Weather: Partly Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
4.25.17	845	9.67	0.5	6.66	21.4	2610	2.4	100.4	3.7	clear; colorless	*Low-flow groundwater sample:*
	847	9.69	1.0	6.74	21.3	2630	2.1	91.6	3.4		(A) peristaltic pump w/ ded tubing
	850	9.69	1.5	6.79	21.1	2650	2.0	86.1	3.5		B) ded bladder pump
	852	9.69	2.0	6.82	21.0	2660	1.9	84.2	3.2		C) non-ded bladder pump; or
	855	9.69	2.5	6.84	21.0	2670	1.8	82.5	2.9		*Standard groundwater sample:*
	857	9.69	3.0	6.85	20.9	2680	1.7	81.3	2.6		D) bailer due to limited column; or
	900	9.69	3.5	6.86	20.9	2690	1.7	80.5	2.5		E) recovery well cycling sample
	902	9.69	4.0	6.87	21.0	2690	1.6	79.6	2.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
4.25.17	905	MW-53	9.69	6.87	21.0	2690	1.6	79.6	2.5	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Short List Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se)		Field filtered 0.45-u
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~***Long List*** Dissolved Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~Field filtered 0.45-u~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Instrument Calibration Log

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Hydrologic Monitoring
for TRC
Houston, Texas

Date	Time	pH Hanna (Std. units)	Specific Conductivity Hanna (umho/cm)	Dissolved Oxygen Hanna (Slope Cal. in saturated air)	Turbidity Lamotte (NTU)	ORP Hanna HI 7020 Soln (200-275 mV)	PID Thermo Environmental 100 ppm Isobutylene	Initials / Comments
4/25/17	0630	4.01/7.00	1,000	100%	10.0	240.5	NA	SCH
4/25/17	0635	4.01/7.00	1,000	100%	10.0	251.8	NA	TAB
4/25/17	0639	4.01/7.00	1,000	100%	10.0	262.4	NA	BB
4/25/17	0644	4.01/7.00	1,000	100%	10.0	249.1	NA	GDS
4/25/17	0650	4.01/7.00	1,000	100%	10.0	233.9	NA	BRH
4.25.17	0653	4.01/7.00	1,000	100%	10.0	246.7	NA	CJH
4-25-17	0655	4.01/7.00	1,000	100%	10.0	239.4	NA	MDB
4-25-17	0658	4.01/7.00	1,000	100%	10.0	243.7	NA	SCD
4/26/17	0620	4.01/7.00	1,000	100%	10.0	238.1	NA	SCH
4/26/17	0629	4.01/7.00	1,000	100%	10.0	241.1	NA	GDS
4/26/17	0633	4.01/7.00	1,000	100%	10.0	250.3	NA	BB
4/26/17	0635	4.01/7.00	1,000	100%	10.0	248.9	NA	TAB
4-26-17	0638	4.01/7.00	1,000	100%	10.0	237.1	NA	BRH
4-26-17	0640	4.01/7.00	1,000	100%	10.0	242.3	NA	SCD
4.26.17	0642	4.01/7.00	1,000	100%	10.0	245.7	NA	CJH
4-26-17	0645	4.01/7.00	1,000	100%	10.0	231.4	NA	MDB
4/27/17	0615	4.01/7.00	1,000	100%	10.0	239.5	NA	SCH
4/27/17	0622	4.01/7.00	1,000	100%	10.0	234.0	NA	BRH
4/27/17	0626	4.01/7.00	1,000	100%	10.0	243.2	NA	BB
4-27-17	0628	4.01/7.00	1,000	100%	10.0	248.6	NA	MDB
4.27.17	0630	4.01/7.00	1,000	100%	10.0	243.7	NA	CJH
4-27-17	0633	4.01/7.00	1,000	100%	10.0	245.6	NA	SCD
4-27-17	0635	4.01/7.00	1,000	100%	10.0	251.8	NA	TAB
4/27/17	0644	4.01/7.00	1,000	100%	10.0	244.8	NA	GDS

Company Name/Address
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: speer@trcwsolutions.com
Project Description: **EP Spring 2017**
City/State Collected: NM
Phone: 512-684-3170
Fax:
Client Project #
Lab Project #
Collected by (print): Scott Ude/HMI Team
Site/Facility ID #: EP (Navajo - Artesia)
P.O. #: 107027
Collected by (signature): Scott Ude
Immediately Packed on Ice N ___ Y ✓
Rush? (Lab MUST Be Notified)
___ Same Day ... 200%
___ Next Day ... 100%
___ Two Day ... 50%
___ Three Day ... 25%
Date Results Needed
Email? ___ No ✓ Yes
FAX? ___ No ___ Yes

Analysis / Container / Preservative

Chain of Custody Page 1 of 20

ESC

Lab # 1905300
G136
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide	Sample # (lab only)
~~MW-79~~	Grab	GW					X	X	X	X	X	X	X			
MW-82	Grab	GW		4/25/17	1605	10	X	X	X	X	X	X	X			-01
MW-74	Grab	GW		4/25/17	1450	10	X	X	X	X	X	X	X			02
MW-73	Grab	GW		4/25/17	1405	10	X	X	X	X	X	X	X			03
~~MW-2A~~	Grab	GW					X	X	X	X	X	X	X			
MW-72	Grab	GW		4/25/17	1255	10	X	X	X	X	X	X	X			04
OCD-6	Grab	GW		4/25/17	1005	10	X	X	X	X	X	X	X			05
OCD-7AR	Grab	GW		4/25/17	1055	10	X	X	X	X	X	X	X			06
OCD-7B	Grab	GW		4/25/17	1150	10	X	X	X	X	X	X	X			07
	Grab	GW														

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

pH ___ Temp ___
Flow ___ Other ___

Remarks: Dissolved metals field-filtered. This COC represents shipment 1. Project is continuing. 7293 8327 4194

Hold #

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/26/17	0800	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)
			Mw

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___
Temp: 1.5 °C Bottles Received: 231
Date: 4-27-17 Time: 900

Condition: (lab use only)
COC Seal Intact: ✓ Y ___ N ___ NA
pH Checked: 2 7/2 NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com
Project Description: **EP Spring 2017**
City/State Collected: NM
Phone: 512-684-3170
Fax:
Client Project #
Lab Project #
Collected by (print): Scott Ude/HMI Team
Site/Facility ID #: EP (Navajo - Artesia)
P.O. #: 107027
Collected by (signature): Scott Ude
Immediately Packed on Ice: N ___ Y ✓
Rush? (Lab MUST Be Notified): ___ Same Day 200% ___ Next Day 100% ___ Two Day 50% ___ Three Day 25%
Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 2 of 2

ESC

Lab # L905300

Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle) (2)	Anions	NO2NO3, TDS (2)	Long List Metals (Total & Dissolved)	Cyanide (2)	Sample # (lab only)
~~MW-123~~	Grab	GW					X	X	X	X	X	X	X			
~~MW-4A~~	Grab	GW					X	X	X	X	X	X	X			
~~MW-4B~~	Grab	GW					X	X	X	X	X	X	X			
MW-5A	Grab	GW		4/25/17	1235	10	X	X	X	X	X	X	X			08
MW-5B	Grab	GW		4/25/17	1330	10	X	X	X	X	X	X	X			09
MW-5C	Grab	GW		4/25/17	1415	10	X	X	X	X	X	X	X			10
MW-7A	Grab	GW		4/25/17	1055	10	X	X	X	X	X	X	X			11
MW-7B	Grab	GW		4/25/17	1150	10	X	X	X	X	X	X	X			12
OCD-8A	Grab	GW		4/25/17	1010	11	X	X	X		X	X	X	X	X	13
OCD-8B	Grab	GW		4/25/17	925	10	X	X	X	X	X	X	X			14

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

pH ___ Temp ___
Flow ___ Other ___

Remarks: **Dissolved metals field-filtered.**

Hold #

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/26/17	0800	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)
			MW

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___
Temp: 1.3 °C Bottles Received: 231
Date: 4-27-17 Time: 900

Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcwsolutions.com

Project Description: **EP Spring 2017**

City/State Collected: NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #

Collected by (print): Scott Ude/HMI Team

Site/Facility ID #: EP (Navajo - Artesia)

P.O. # 107027

Collected by (signature): Scott Ude

Immediately Packed on Ice: N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ... 200%
___ Next Day ... 100%
___ Two Day ... 50%
___ Three Day ... 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 3 of 20

ESC LAB SCIENCES

Lab # L905300

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: Chris McCord

Cooler:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle) 2	Anions	NO2/NO3, TDS 2	Long List Metals (Total & Dissolved)	Cyanide	Remarks / Sample # (lab only)
~~MW-1R~~	Grab	GW					X	X		X	X	X	X			
~~MW-1S~~	Grab	GW					X	X	X	X	X	X	X			
~~OCD-1R~~	Grab	GW					X	X	X	X	X	X	X			
~~OCD-2A~~	Grab	GW					X	X	X	X	X	X	X			
~~OCD-3~~	Grab	GW					X	X	X	X	X	X	X			
~~OCD-4~~	Grab	GW					X	X	X	X	X	X	X			
~~MW-11A~~	Grab	GW					X	X	X	X	X	X	X			
~~MW-11B~~	Grab	GW					X	X	X	X	X	X	X			
~~OCD-5~~	Grab	GW					X	X	X	X	X	X	X			
MW-87	Grab	GW		4/25/17	1720	10	X	X	X	X	X	X	X			15

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

pH ___ Temp ___

Remarks: **Dissolved metals field-filtered.**

Flow ___ Other ___

Hold #

Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Scott Ude	4/26/17	0800	
Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Relinquished by: (Signature)	Date	Time	Received for lab by: (Signature)
			MWL

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___

Temp: 1.8 °C Bottles Received: 231

Date: 4-27-17 Time: 900

Condition: (lab use only)

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

Page 4 of 20

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report To: Julie Speer
Email To: jspeer@trcsolutions.com

Project Description: **EP Spring 2017**
City/State Collected: NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): Scott Ude/HMI Team
Site/Facility ID #: EP (Navajo - Artesia)
P.O. # 107027

Collected by (signature): Scott Ude
Immediately Packed on Ice: N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___ No ✓ Yes
FAX? ___ No ___ Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle) 12	Anions	NO2NO3, TDS 12	Long List Metals (Total & Dissolved)	Cyanide 12
MW-18A	Grab	GW		4/25/17	1330	9	X	X			X	X	X	X	X
MW-18B	Grab	GW		4/25/17	1420	10	X	X	X	X	X	X	X		
MW-70	Grab	GW		4/25/17	1520	10	X	X	X	X	X	X	X		
MW-124	Grab	GW		4/25/17	1620	10	X	X	X	X	X	X	X		
	Grab	GW													
	Grab	GW													
	Grab	GW													
	Grab	GW													
	Grab	GW													
	Grab	GW													

Analysis / Container / Preservative

Chain of Custody

ESC LAB SCIENCES
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905300

Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

Matrix/Containers	Sample # (lab only)
	16
	17
	18
	19

* Matrix: SS Soil GW Groundwater WW WasteWater DW Drinking Water OT Other ___

pH ___ Temp ___
Flow ___ Other ___

Remarks: **Dissolved metals field-filtered.**

Hold #

Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Scott Ude	4/26/17	0800	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)
			Mwl

Samples returned via: ☐ UPS ✓ FedEx ☐ Courier ☐ ___
Temp: 1.3 °C Bottles Received: 231
Date: 4-27-17 Time: 900

Condition: (lab use only)
COC Seal Intact: ___ Y ___ N ___ NA
pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com
Project Description: EP Spring 2017
City/State Collected: NM
Phone: 512-684-3170
Fax:
Client Project #
Lab Project #
Collected by (print): Scott Ude/HMI Team
Site/Facility ID #: EP (Navajo - Artesia)
P.O. #: 107027
Collected by (signature): Scott Ude
Immediately Packed on Ice: N ___ Y ✓
Rush? (Lab MUST Be Notified): Same Day 200% / Next Day 100% / Two Day 50% / Three Day 25%
Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 5 of 20

ESC LABORATORIES

L# L905300
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide	Remarks / Contaminant	Sample # (lab only)
DUP-EP-01	Grab	GW		4/25/17	1000	10	X	X	X	X	X	X	X				20
~~DUP-EP-02~~	Grab	GW					X	X	X	X	X	X	X				
~~DUP-EP-03~~	Grab	GW					X	X	X	X	X	X	X				
EB-EP-01	Grab	GW		4/25/17	1505	10	X	X	X	X	X	X	X				21
EB-EP-02	Grab	GW		4/25/17	1640	10	X	X	X	X	X	X	X				22
EB-EP-03	Grab	GW		4/25/17	1250	10	X	X	X	X	X	X	X				23
~~EB-EP-04~~	Grab	GW					X	X	X	X	X	X	X				
~~Trip Blank-EP-01~~	Grab	GW					X										
Trip Blank-EP-02	Grab	GW		4/25/17	—	1	X										24
~~Trip Blank-EP-03~~	Grab	GW					X										

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other

pH ___ Temp ___
Flow ___ Other ___

Remarks: **Dissolved metals field-filtered.**

Hold #

Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Scott Ude	4/26/17	0800	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)
			Mark

Samples returned via: ☐ UPS ✓ FedEx ☐ Courier ☐
Temp: 14 °C Bottles Received: 231
Date: 4-27-17 Time: 900

Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

TAB 4

Page 6 of 20

Chain of Custody

ESC

L# 190530 2

G137

Company Name/Address:	TRC Solutions - Austin, TX 505 E. Huntland Dr, Ste 250 Austin, TX 78752
Billing Information:	Accounts Payable 21 Griffin Road North Windsor, CT 06095
Report to:	Julie Speer
Email To:	jspeer@trcsolutions.com
Project Description:	NCL Spring 2017
City/State Collected:	NM
Phone:	512-684-3170
Fax:	
Client Project #	
Lab Project #	
Collected by (print):	Scott Ude/HMI Team
Collected by (signature):	Scott Ude
Immediately Packed on Ice:	N ___ Y ✓
Site/Facility ID #	NCL (Navajo - Artesia)
P.O. #	107027
Rush? (Lab MUST Be Notified)	___ Same Day ....200% ___ Next Day ....100% ___ Two Day ....50% ___ Three Day 25%
Date Results Needed	
Email?	___No ✓Yes
FAX?	___No ___Yes
Acctnum:	TRCATX
Template:	
Prelogin:	
TSR:	Chris McCord
Cooler:	
Shipped Via:	

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Entrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle) 12	Anions	NO2/NO3, TDS 12	Long List Metals (Total & Dissolved)	Cyanide 7T0	Remarks/Contaminant	Sample # (lab only)
~~MW-56~~	Grab	GW					X	X		X	X	X	X				
MW-45	Grab	GW		4/25/17	1820	9	X	X			X	X	X	X	X		-01
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other _____

pH _____ Temp _____

Flow _____ Other _____

7283 8527 4092

7283 8527 4107

Remarks: Dissolved metals field-filtered.

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/26/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			MW

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____

Temp: 4.6 °C Bottles Received: 52

Date: 4-27-17 Time: 900

Condition: (lab use only) OK

COC Seal Intact: ___Y ___N ___NA

pH Checked: C2,7D NCF:

2

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: NCL Spring 2017
City/State Collected: NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): Scott Ude/HMI Team
Site/Facility ID #: NCL (Navajo - Artesia)
P.O. #: 107027

Collected by (signature): Scott Ude
Immediately Packed on Ice: N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

ESC LABORATORIES

Lab # 1905302

Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Ctnrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle) 12	Anions	NO2NO3, TDS 12	Long List Metals (Total & Dissolved)	Cyanide	Sample # (lab only)
~~NCL-34A~~	Grab	GW					X	X		X	X	X	X			
~~NCL-33~~	Grab	GW					X	X		X	X	X	X			
~~NCL-44~~	Grab	GW					X	X		X	X	X	X			
~~NCL-32~~	Grab	GW					X	X		X	X	X	X			
~~MW-108~~	Grab	GW					X	X		X	X	X	X			
~~NCL-31~~	Grab	GW					X	X		X	X	X	X			
~~MW-55~~	Grab	GW					X	X	X		X	X	X	X	X	
~~MW-19~~	Grab	GW					X	X			X	X	X	X	X	
MW-54A	Grab	GW		4/25/17	1115	8	X	X		X	X	X	X			-02
MW-54B	Grab	GW		4/25/17	1035	10	X	X	X	X	X	X	X			-03

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

pH ___ Temp ___
Flow ___ Other ___

Remarks: **Dissolved metals field-filtered.**

Hold #

Relinquished By : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/26/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Mint

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___
Temp: 4.5 °C Bottles Received: 52
Date: 4-27-17 Time: 900

Condition: (lab use only) OK
COC Seal Intact: ✓ Y ___ N ___ NA
pH Checked: C2/T2 NCF:

9

CoC 4

Page 8 of 20

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: speer@trcwsolutions.com

Project Description: NCL Spring 2017

City/State Collected: NM

Phone: 512-684-3170
Fax

Client Project #

Lab Project #

Collected by (print): Scott Ude/HMI Team

Site/Facility ID #: NCL (Navajo - Artesia)

P.O. # 107027

Collected by (signature): Scott Ude

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide		Sample # (lab only)
NCL-49	Grab	GW		4/25/17	~~905~~ 945	3	X	X		X	X	X	X				-04
MW-53	Grab	GW		4/25/17	905	3	X	X		X	X	X	X				-05
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ____

pH ____ Temp ____

Flow ____ Other ____

Remarks: **Dissolved metals field-filtered.**

Hold #

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/26/17	0800	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)
			Mark

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ____

Temp: LK °C Bottles Received: 52

Date: 4-27-17 Time: 900

Condition: (lab use only) ok

COC Seal Intact: N Y ___ N ___ NA

pH Checked: ___ NCF: ___

Chain of Custody

ESC LAB SCIENCES

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905302

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: Chris McCord

Cooler:

Shipped Via:

Sent/Container/Comment

10

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcsolutions.com

Project Description: **NCL Spring 2017**
City/State Collected: NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: NCL (Navajo - Artesia)
P.O. #: 107027

Collected by (signature): Scott Ude
Immediately Packed on Ice: N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 9 of 20

ESC LAB SCIENCES
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905302
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide	Remk/Containers	Sample # (lab only)
DUP-NCL-01	Grab	GW		4/25/17	900	2	X	X		X	X	X	X				-06
~~EB-NCL-01~~	Grab	GW					X	X		X	X	X	X				
~~Trip Blank-NCL-01~~	Grab	GW				1	X										-07
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

pH ___ Temp ___
Flow ___ Other ___

Remarks: **Dissolved metals field-filtered.**

Hold #

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/26/17	0800	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___
Temp: 1.5 °C Bottles Received: 52
Date: 4-27-17 Time: 900

Condition: OK (lab use only)
COC Seal Intact: ✓Y ___N ___NA
pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: REST Spring 2017
City/State Collected: NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): Scott Ude/HMI Team
Site/Facility ID #: REST (Navajo - Artesia)
P.O. #: 107027

Collected by (signature): Scott Ude
Immediately Packed on Ice: N ___ Y ✓
Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%
Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 10 of 20

ESC LAB SCIENCES
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 1905307
G138

Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide	Remark (lab only)	Sample # (lab only)
~~RW-12R~~	Grab	GW					X	X		X	X	X	X				
~~MW-113~~	Grab	GW					X	X	X	X	X	X	X				
KWB-8	Grab	GW		4/25/17	1735	9	X	X			X	X	X	X	X		-01
~~RW-22~~	Grab	GW					X	X		X	X	X	X				
~~RW-20A~~	Grab	GW					X	X		X	X	X	X				
~~RW-20B~~	Grab	GW					X	X		X	X	X	X				
~~RW-13R~~	Grab	GW					X	X		X	X	X	X				
~~RW-14R~~	Grab	GW					X	X		X	X	X	X				
~~MW-133~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-134~~	Grab	GW					X	X	X	X	X	X	X				

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other

pH ___ Temp ___
Flow ___ Other ___

7285 8327 4173, 4057 7285 8327 3540

Remarks: Dissolved metals field-filtered.

Hold #

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/26/17	0800	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)
			Mark

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___
Temp: 1.3 °C Bottles Received: 32+TB
Date: 4-27-17 Time: 900

Condition: (lab use only)
COC Seal Intact: ✓ Y ___ N ___ NA
pH Checked: 2,12 NCF:

Pg 2

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: REST Spring 2017
City/State Collected: NM

Phone: 512-684-3170
Fax:

Client Project #
Lab Project #

Collected by (print): Scott Ude/HMI Team
Site/Facility ID #: REST (Navajo - Artesia)
P.O. #: 107027

Collected by (signature): Scott Ude
Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 1 of 2

ESC LABORATORIES
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905307
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Ctnrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide	Remark/Contaminant	Sample # (lab only)
~~RA-4798~~	Grab	GW					X				X	X	X				
~~RA-4196~~	Grab	GW					X				X	X	X				
~~RA-3456~~	Grab	GW					X				X	X	X				
~~RA-313~~	Grab	GW					X				X	X	X				
KWB-7	Grab	GW		4/25/17	1820	9	X	X			X	X	X	X	X		-02
~~MW-135~~	Grab	GW					X	X	X	X	X	X	X				
KWB-11A	Grab	GW		4/25/17	1910	10	X	X	X		X	X	X	X	X		-03
KWB-11B	Grab	GW		4/25/17	2000	11	X	X	X		X	X	X	X	X		-04
~~MW-115~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-114~~	Grab	GW					X	X	X	X	X	X	X				

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

pH ___ Temp ___
Flow ___ Other ___

Remarks: **Dissolved metals field-filtered.**

Hold #

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/26/17	0800	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)
			Mark

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___
Temp: 1.5 °C Bottles Received: 3(2+1B)
Date: 4-27-17 Time: 900

Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: 2/12 NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report To: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: REST Spring 2017
City/State Collected: NM

Phone: 512-684-3170
Fax:

Client Project #
Lab Project #

Collected by (print): Scott Ude/HMI Team
Site/Facility ID #: REST (Navajo - Artesia)
P.O. #: 107027

Collected by (signature): Scott Ude
Immediately Packed on Ice: N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day 200%
____ Next Day 100%
____ Two Day 50%
____ Three Day 25%

Date Results Needed
Email? ___ No ✓ Yes
FAX? ___ No ___ Yes

Analysis / Container / Preservative

Chain of Custody Page 1 of 2

ESC LAB SCIENCES

L#: L905807
Table #:
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide	Rem./Contaminant	Sample # (lab only)
~~MW-117~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-118~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-119~~	Grab	GW					X	X	X	X	X	X	X				
NP-5	Grab	GW		4/25/17	1410	8	X	X		X	X	X	X				-05
MW-136	Grab	GW		4/25/17	1320	11	X	X	X		X	X	X	X	X		-06
~~MW-126A~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-126B~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-127~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-129~~	Grab	GW					X	X	X	X	X	X	X				
RW-#18A	Grab	GW		4/25/17	1235	6	X			X	X	X	X				07

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ____

pH ____ Temp ____
Flow ____ Other ____

Remarks: **Dissolved metals field-filtered.**

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/26/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Mint

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ____
Temp: 1.5 °C Bottles Received: 312-FTB
Date: 4-27-17 Time: 900

Condition: (lab use only)
COC Seal Intact: ___ Y ___ N ___ NA
pH Checked: <2, 7-12 NCF:

23

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcsolutions.com

Project Description: **REST Spring 2017**
City/State Collected: NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Collected by (signature): Scott Ude
Immediately Packed on Ice N ___ Y ✓

Site/Facility ID #: REST (Navajo - Artesia)

P.O. #: 107027

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide		Sample # (lab only)
KWB-1A	Grab	GW		4/25/17	1115	9	X	X			X	X	X	X	X		08
KWB-1C	Grab	GW		4/25/17	1150	8	X	X		X	X	X	X				09
KWB-10R	Grab	GW		4/25/17	1030	8	X	X		X	X	X	X				10
~~MW-131~~	Grab	GW					X	X	X	X	X	X	X				
~~KWB-6~~	Grab	GW					X	X		X	X	X	X				
~~MW-111~~	Grab	GW					X	X	X	X	X	X	X				
~~KWB-6~~	Grab	GW					X	X		X	X	X	X				
~~MW-112~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-132~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-57~~	Grab	GW					X	X	X	X	X	X	X				

Analysis / Container / Preservative

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other_____

Remarks: **Dissolved metals field-filtered.**

pH _____ Temp _____
Flow _____ Other _____

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/26/17	0800	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)
			MWL

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____
Temp: 1.3 °C Bottles Received: 312-HTB
Date: 4-27-17 Time: 900

Hold #
Condition: (lab use only)
COC Seal Intact: ✓ Y ___N ___NA
pH Checked: C2,7/2 NCF:

Chain of Custody Page 13 of 20

ESC LAB SCIENCES

Lab# L905307
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

24

GW 3

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcsolutions.com

Project Description: **REST Spring 2017**

City/State Collected: NM

Phone: 512-684-3170
Fax

Client Project #

Lab Project #

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID #: REST (Navajo - Artesia)

P.O. # 107027

Collected by (signature): Scott Ude
Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle) L2	Anions	NO2NO3, TDS L2	Long List Metals (Total & Dissolved)	Cyanide 7/2
~~RW-#11-8~~	Grab	GW					X	X		X	X	X	X		
~~KWB-12A~~	Grab	GW					X	X	X		X	X	X	X	X
~~KWB-12B~~	Grab	GW					X	X	X		X	X	X	X	X
KWB-2R	Grab	GW		4/25/17	1715	8	X	X		X	X	X	X		
MW-58	Grab	GW		4/25/17	1630	9	X	X			X	X	X	X	X
~~KWB-13~~	Grab	GW					X	X			X	X	X	X	X
	Grab	GW													
	Grab	GW													
	Grab	GW													
	Grab	GW													

Chain of Custody

ESC

Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

L# L905307
Table #

Item #/Containment | Sample # (lab only)
11
12

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other

pH ___ Temp ___
Flow ___ Other ___

Remarks: **Dissolved metals field-filtered.**

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/26/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Mint

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___
Temp: 1.6 °C Bottles Received: 312-TB
Date: 4-27-17 Time: 900

Condition: (lab use only)
COC Seal Intact: ✓ Y ___ N ___ NA
pH Checked: L2, 7/2
NCF:

75

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: speer@trcwsolutions.com
Project Description: REST Spring 2017
City/State Collected: NM
Phone: 512-684-3170
Fax:
Client Project #
Lab Project #
Collected by (print): Scott Ude/HMI Team
Site/Facility ID #: REST (Navajo - Artesia)
P.O. #: 107027
Collected by (Signature): Scott Ude
Immediately Packed on Ice N ___ Y ✓
Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%
Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 15 of 20

ESC LAB SCIENCES

L# L905307
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle) L2	Anions	NO2NO3, TDS L2	Long List Metals (Total & Dissolved)	Cyanide	Sample # (lab only)
MW-103	Grab	GW		4/25/17	1445	10	X	X	X	X	X	X	X			13
MW-104	Grab	GW		4/25/17	1535	10	X	X	X	X	X	X	X			14
MW-64	Grab	GW		4/25/17	1300	10	X	X	X	X	X	X	X			15
MW-65	Grab	GW		4/25/17	1350	10	X	X	X	X	X	X	X			16
~~RW-5R~~	Grab	GW					X	X		X	X	X	X			
~~MW-102~~	Grab	GW					X	X	X	X	X	X	X			
~~RW-4~~	Grab	GW					X	X		X	X	X	X			
~~RW-6~~	Grab	GW					X	X		X	X	X	X			
~~MW-99~~	Grab	GW					X	X	X	X	X	X	X			
~~MW-66~~	Grab	GW					X	X	X		X	X	X	X	X	

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other _____

pH _____ Temp _____
Flow _____ Other _____

Remarks: **Dissolved metals field-filtered.**

Hold #
Condition: (lab use only)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/26/17	0800	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)
			Mwat

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____
Temp: 1.5 °C Bottles Received: 31+TB
Date: 4-27-17 Time: 900
COC Seal Intact: 1 Y ___ N ___ NA
pH Checked: L2, 2L2 NCF:

20

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: speer@trcsolutions.com

Project Description: **REST Spring 2017**

City/State Collected: NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID #: REST (Navajo - Artesia)

P.O. #: 107027

Collected by (signature): Scott Ude

Immediately Packed on Ice: N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 16 of 20

ESC LAB SCIENCES

L# L905307

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: Chris McCord

Cooler:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Ctnrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle) 12	Anions	NO2NO3, TDS 12	Long List Metals (Total & Dissolved)	Cyanide 7.12	Remarks/Contaminant	Sample # (lab only)
UG-2	Grab	GW		4/25/17	1210	11	X	X	X		X	X	X	X	X		17
UG-3R	Grab	GW		4/25/17	940	11	X	X	X		X	X	X	X	X		18
UG-1	Grab	GW		4/25/17	1120	11	X	X	X		X	X	X	X	X		19
UG-4	Grab	GW		4/25/17	1025	11	X	X	X		X	X	X	X	X		
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other _____

pH _____ Temp _____

Remarks: **Dissolved metals field-filtered.**

Flow _____ Other _____

Hold #

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/26/17	0800	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)
			Mwt

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____

Temp: 1.6 °C Bottles Received: 32 TB

Date: 4-27-17 Time: 900

Condition: (lab use only)

COC Seal Intact: ___Y ___N ___NA

pH Checked: 12, 7.12

NCF:

TAB 1

Chain of Custody Page 17 of 20

ESC LAB SCIENCES

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcsolutions.com

Project Description: **REST Spring 2017**

City/State Collected: NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #

Collected by (print): Scott Ude/HMI Team

Site/Facility ID #: REST (Navajo - Artesia)

P.O. # 107027

Collected by (signature): Scott Ude

Immediately Packed on Ice: N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day 200%
____ Next Day 100%
____ Two Day 50%
____ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle) 22	Anions	NO2NO3, TDS 22	Long List Metals (Total & Dissolved)	Cyanide 24
~~MW-101~~	Grab	GW					X	X	X	X	X	X	X		
~~MW-105~~	Grab	GW					X	X	X	X	X	X	X		
~~RW-2~~	Grab	GW					X	X	X	X	X	X	X		
~~MW-81~~	Grab	GW					X	X	X	X	X	X	X		
~~MW-82~~	Grab	GW					X	X	X	X	X	X	X		
~~MW-93~~	Grab	GW					X	X	X	X	X	X	X		
MW-43	Grab	GW		4/25/17	1125	11	X	X	X		X	X	X	X	X
MW-137	Grab	GW		4/25/17	1325	11	X	X	X		X	X	X	X	X
MW-138	Grab	GW		4/25/17	1225	11	X	X	X		X	X	X	X	X
~~MW-23~~	Grab	GW					X	X	X	X	X	X	X		

Lab Comments: Sample # (lab only)
20
21
22

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ____

pH ____ Temp ____

Remarks: **Dissolved metals field-filtered.**

Flow ____ Other ____

Hold #

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/26/17	0800	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ____

Temp: 1.6 °C Bottles Received: 32 TB

Date: 4-27-17 Time: 900

Condition: (lab use only)

COC Seal Intact: ✓ Y ___N ___NA

pH Checked: C2 712

NCF:

T 21

Page 18 of 20

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcwsolutions.com

Project Description: **REST Spring 2017**

City/State Collected: NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID #: REST (Navajo - Artesia)

P.O. #: 107027

Collected by (signature): Scott Ude

Immediately Packed on Ice: N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody

ESC LAB SCIENCES

L# L905307

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: Chris McCord

Cooler:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle) L2	Anions	NO2NO3, TDS L2	Long List Metals (Total & Dissolved)	Cyanide		Sample # (lab only)
~~MW-39~~	Grab	GW					X	X	X	X	X	X	X				
MW-98	Grab	GW		4/25/17	1025	10	X	X	X	X	X	X	X				33
~~RW-10~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-40~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-41~~	Grab	GW					X	X	X	X	X	X	X				
~~RW-9~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-42~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-29~~	Grab	GW					X	X	X	X	X	X	X				
~~RW-#16B~~	Grab	GW					X	X		X	X	X	X				
MW-106	Grab	GW		4/25/17	925	10	X	X	X	X	X	X	X				34

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

pH ___ Temp ___

Remarks: **Dissolved metals field-filtered.**

Flow ___ Other ___

Hold #

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/26/17	0800	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)
			Mwt

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___

Temp: 1.6 °C Bottles Received: 30+TB

Date: 4-27-17 Time: 900

Condition: (lab use only)

COC Seal Intact: ___Y ___N ___NA

pH Checked: C2

NCF:

C3-1

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Analysis / Container / Preservative

Chain of Custody Page 19 of 20

ESC LAB SCIENCES

Report to: Julie Speer

Email To: jspeer@trcsolutions.com

Project Description: REST Spring 2017

City/State Collected: NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #

Collected by (print): Scott Ude/HMI Team

Site/Facility ID #: REST (Navajo - Artesia)

P.O. # 107027

Collected by (signature): Scott Ude

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

L2 L2

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide		Sample # (lab only)
MW-50	Grab	GW		4/25/17	1200	8	X	X		X	X	X	X				25
~~MW-97~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-92~~	Grab	GW					X	X	X	X	X	X	X				
RW-1	Grab	GW		4/25/17	1305	10	X	X	X	X	X	X	X				26
MW-91	Grab	GW		4/25/17	1350	10	X	X	X	X	X	X	X				27
MW-90	Grab	GW		4/25/17	1430	10	X	X	X	X	X	X	X				28
MW-96	Grab	GW		4/25/17	1510	10	X	X	X	X	X	X	X				29
~~MW-94~~	Grab	GW					X	X	X	X	X	X	X				
~~RW-6~~	Grab	GW					X	X		X	X	X	X				
~~MW-67~~	Grab	GW					X	X	X		X	X	X	X	X		

MW 4-27-17

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

pH ___ Temp ___

Remarks: **Dissolved metals field-filtered.**

Flow ___ Other ___

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/26/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			MW

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___

Temp: 1.6 °C Bottles Received: 32 TB

Date: 4-27-17 Time: 900

Condition: (lab use only)

COC Seal Intact: ✓ Y ___ N ___ NA

pH Checked: L2 NCF:

31

Batch 5

Page 20 of 20

Company Name/Address: **TRC Solutions - Austin, TX** 505 E. Huntland Dr, Ste 250 Austin, TX 78752	Billing Information: **Accounts Payable** 21 Griffin Road North Windsor, CT 06095
Report to: Julie Speer	Email To: jspeer@trcsolutions.com
Project Description: **REST Spring 2017**	City/State Collected: NM
Phone: 512-684-3170 Fax:	Client Project #	Lab Project #
Collected by (print): **Scott Ude/HMI Team**	Site/Facility ID #: REST (Navajo - Artesia)	P.O. #: 107027
Collected by (signature): Scott Ude Immediately Packed on Ice N ___ Y ✓	*Rush?* (Lab MUST be Notified) ___ Same Day ..... 200% ___ Next Day ..... 100% ___ Two Day ..... 50% ___ Three Day 25%	Date Results Needed Email? ___ No ✓ Yes FAX? ___ No ___ Yes

Analysis / Container / Preservative

Chain of Custody

ESC

L# L905307

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: Chris McCord

Cooler:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide	Remarks/Contaminant	Sample # (lab only)
~~DUP-REST-01~~	Grab	GW					X	X	X	X	X	X	X				
DUP-REST-02	Grab	GW		4/25/17	1200	10	X	X	X	X	X	X	X				30
~~DUP-REST-03~~	Grab	GW					X	X	X	X	X	X	X				
~~DUP-REST-04~~	Grab	GW					X	X	X		X	X	X	X	X		
~~DUP-REST-05~~	Grab	GW					X	X	X		X	X	X	X	X		
~~EB-REST-01~~	Grab	GW					X	X	X	X	X	X	X				
EB-REST-02	Grab	GW		4/25/17	1550	10	X	X	X	X	X	X	X				31
~~EB-REST-03~~	Grab	GW					X	X	X	X	X	X	X				
~~EB-REST-04~~	Grab	GW					X	X	X		X	X	X	X	X		
~~EB-REST-05~~	Grab	GW					X	X	X		X	X	X	X	X		

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

pH ___ Temp ___

Flow ___ Other ___

Remarks: **Dissolved metals field-filtered.**

Hold #

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/26/17	0800	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)
			Mwt

Samples returned via: ☐ UPS ✓ FedEx ☐ Courier ☐ ___

Temp: 1.1 °C Bottles Received: 3 2 TTS

Date: 4-27-17 Time: 900

Condition: (lab use only)

COC Seal Intact: ✓ Y ___ N ___ NA

pH Checked: NCF:

Chain of Custody Page 1 of 38

ESC LAB SCIENCES — YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905612
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

Company Name/Address:	Billing Information:
TRC Solutions - Austin, TX **505 E. Huntland Dr, Ste 250** **Austin, TX 78752**	**Accounts Payable** **21 Griffin Road North** **Windsor, CT 06095**
Report to: Julie Speer	Email To: jspeer@trcwsolutions.com
Project Description: **EP Spring 2017**	City/State Collected: NM
Phone: 512-684-3170 Fax:	Client Project #	Lab Project #
Collected by (print): **Scott Ude/HMI Team**	Site/Facility ID # EP (Navajo - Artesia)	P.O. # 107027
Collected by (signature): Scott Ude Immediately Packed on Ice N ___ Y ✓	***Rush?*** (Lab MUST Be Notified) ___ Same Day ....200% ___ Next Day ....100% ___ Two Day ....50% ___ Three Day 25%	Date Results Needed Email? ___No ✓Yes FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle) L2	Anions	NO2NO3, TDS L2	Long List Metals (Total & Dissolved)	Cyanide		Rem./Contaminant	Sample # (lab only)
MW-6A	Grab	GW		4/26/17	1810	10	X	X	X	X	X	X	X					11
MW-6B	Grab	GW		4/26/17	1850	10	X	X	X	X	X	X	X					12
~~MW-85~~	Grab	GW					X	X	X	X	X	X	X					
~~MW-86~~	Grab	GW					X	X	X		X	X	X	X	X			
MW-120	Grab	GW		4/26/17	1725	10	X	X	X	X	X	X	X					13
MW-121	Grab	GW		4/26/17	1640	|	X	X	X	X	X	X	X					N
MW-84	Grab	GW		4/26/17	1415	|	X	X	X	X	X	X	X					15
MW-122	Grab	GW		4/26/17	1555	|	X	X	X	X	X	X	X					16
MW-81	Grab	GW		4/26/17	1330	|	X	X	X	X	X	X	X					17
MW-80	Grab	GW		4/26/17	1245	|	X	X	X	X	X	X	X					18

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other ____

Remarks: **Dissolved metals field-filtered.** This COC represents shipment 2. (Field event is continuing)

pH ____ Temp ____
Flow ____ Other ____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			MW

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ____
Temp: 2.6 °C Bottles Received: 35/349 MW
Date: 4-28-17 Time: 800

Condition: (lab use only) OK
COC Seal Intact: ✓ Y ___N ___NA
pH Checked: C2 NCF:

Company Name/Address:	Billing Information:
TRC Solutions - Austin, TX **505 E. Huntland Dr, Ste 250** **Austin, TX 78752**	**Accounts Payable** **21 Griffin Road North** **Windsor, CT 06095**
Report to: Julie Speer	Email To: jspeer@trcwsolutions.com
Project Description: **EP Spring 2017**	City/State Collected: NM
Phone: 512-684-3170 Fax:	Client Project #	Lab Project #
Collected by (print): **Scott Ude/HMI Team**	Site/Facility ID #: EP (Navajo - Artesia)	P.O. #: 107027
Collected by (signature): Scott Ude Immediately Packed on Ice N ___ Y ✓	***Rush?*** (Lab MUST Be Notified) ___ Same Day .....200% ___ Next Day .....100% ___ Two Day .....50% ___ Three Day 25%	Date Results Needed Email? ___No ✓Yes FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle) L2	Anions	NO2NO3, TDS L2	Long List Metals (Total & Dissolved)	Cyanide		Rem./Contaminant	Sample # (lab only)
MW-79	Grab	GW		4/26/17	1155	10	X	X	X	X	X	X	X					19
~~MW-82~~	Grab	GW					X	X	X	X	X	X	X					
~~MW-74~~	Grab	GW					X	X	X	X	X	X	X					
~~MW-73~~	Grab	GW					X	X	X	X	X	X	X					
MW-2A	Grab	GW		4/26/17	1500	10	X	X	X	X	X	X	X					20
~~MW-72~~	Grab	GW					X	X	X	X	X	X	X					
~~OCD-6~~	Grab	GW					X	X	X	X	X	X	X					
~~OCD-7AR~~	Grab	GW					X	X	X	X	X	X	X					
~~OCD-7B~~	Grab	GW					X	X	X	X	X	X	X					
	Grab	GW																

Analysis / Container / Preservative

Chain of Custody

ESC LABORATORIES — YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 1905562
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: **Dissolved metals field-filtered.**

pH _____ Temp _____
Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			MW

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____
Temp: 2-6 °C Bottles Received: 349
Date: 4-28-17 Time: 900

Condition: (lab use only) ✓
COC Seal Intact: ✓ Y ___N ___NA
pH Checked: L2 NCF:

Page 3 of 38

Chain of Custody

ESC LABORATORIES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905562

G169

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcwsolutions.com

Project Description: **EP Spring 2017**

City/State Collected: NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID #: EP (Navajo - Artesia)

P.O. # 107027

Collected by (signature): Scott Ude

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle) L2	Anions	NO2NO3, TDS L2	Long List Metals (Total & Dissolved)	Cyanide	Rem./Contaminant	Sample # (lab only)
MW-76	Grab	GW		4/26/17	1640	10	X	X	X	X	X	X	X				-01
MW-77	Grab	GW		4/26/17	1725		X	X	X	X	X	X	X				02
MW-78	Grab	GW		4/26/17	1805		X	X	X	X	X	X	X				03
MW-75	Grab	GW		4/26/17	1850		X	X	X	X	X	X	X				04
MW-83	Grab	GW		4/26/17	1555		X	X	X	X	X	X	X				05
MW-3	Grab	GW		4/26/17	1455		X	X	X	X	X	X	X				06
MW-88	Grab	GW		4/26/17	1055		X	X	X	X	X	X	X				07
MW-22A	Grab	GW		4/26/17	1140		X	X	X	X	X	X	X				08
MW-22B	Grab	GW		4/26/17	1235		X	X	X	X	X	X	X				09
MW-10	Grab	GW		4/26/17	1320		X	X	X	X	X	X	X				10

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other ___

Remarks: **Dissolved metals field-filtered.**

pH ___ Temp ___
Flow ___ Other ___

Hold #

Condition: (lab use only)

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✓ FedEx ☐ Courier ☐ ___ MW

Temp: 2.4 °C Bottles Received: 35+349

Date: 4-28-17 Time: 9:00

COC Seal Intact: ___Y ___N ___NA

pH Checked: L2 NCF:

Chain of Custody

ESC LABORATORIES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905612

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: Chris McCord

Cooler:

Shipped Via:

Company Name/Address:	Billing Information:
TRC Solutions - Austin, TX **505 E. Huntland Dr, Ste 250** **Austin, TX 78752**	**Accounts Payable** **21 Griffin Road North** **Windsor, CT 06095**
Report to: Julie Speer	Email To: jspeer@trcwsolutions.com
Project Description: **EP Spring 2017**	City/State Collected: NM
Phone: 512-684-3170 Fax:	Client Project #	Lab Project #
Collected by (print): **Scott Ude/HMI Team**	Site/Facility ID #: EP (Navajo - Artesia)	P.O. #: 107027
Collected by (signature): Scott Ude Immediately Packed on Ice N ___ Y ✓	***Rush?*** (Lab MUST Be Notified) ___ Same Day .....200% ___ Next Day .....100% ___ Two Day .....50% ___ Three Day 25%	Date Results Needed Email? ___No ✓Yes FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle) L2	Anions	NO2NO3, TDS L2	Long List Metals (Total & Dissolved)	Cyanide		Rem./Contaminant	Sample # (lab only)
MW-123	Grab	GW		4/26/17	1405	10	X	X	X	X	X	X	X					21
MW-4A	Grab	GW		4/26/17	925		X	X	X	X	X	X	X					22
MW-4B	Grab	GW		4/26/17	1010		X	X	X	X	X	X	X					23
~~MW-5A~~	Grab	GW					X	X	X	X	X	X	X					
~~MW-5B~~	Grab	GW					X	X	X	X	X	X	X					
~~MW-5C~~	Grab	GW					X	X	X	X	X	X	X					
~~MW-7A~~	Grab	GW					X	X	X	X	X	X	X					
~~MW-7B~~	Grab	GW					X	X	X	X	X	X	X					
~~OCD-8A~~	Grab	GW					X	X	X		X	X	X	X	X			
~~OCD-8B~~	Grab	GW					X	X	X	X	X	X	X					

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: **Dissolved metals field-filtered.**

pH _____ Temp _____

Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Mint

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____

Temp: 2.6 °C Bottles Received: 349

Date: 4-28-17 Time: 900

Condition: (lab use only) 0

COC Seal Intact: ✓ Y ___N ___NA

pH Checked: C2 NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: **EP Spring 2017**
City/State Collected: NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: EP (Navajo - Artesia)
P.O. # 107027

Collected by (signature): Scott Ude
Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Chain of Custody — Page 5 of 28

ESC LABORATORIES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905562
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle) 12	Anions	NO2NO3, TDS 12	Long List Metals (Total & Dissolved)	Cyanide		Rem./Contaminant	Sample # (lab only)
MW-1R	Grab	GW		4/26/17	1600	8	X	X		X	X	X	X					24
MW-15	Grab	GW		4/26/17	1650	10	X	X	X	X	X	X	X					25
OCD-1R	Grab	GW		4/26/17	1425		X	X	X	X	X	X	X					26
OCD-2A	Grab	GW		4/26/17	1340		X	X	X	X	X	X	X					27
OCD-3	Grab	GW		4/26/17	1250		X	X	X	X	X	X	X					28
OCD-4	Grab	GW		4/26/17	950		X	X	X	X	X	X	X					29
MW-11A	Grab	GW		4/26/17	1120		X	X	X	X	X	X	X					30
MW-11B	Grab	GW		4/26/17	1205		X	X	X	X	X	X	X					31
OCD-5	Grab	GW		4/26/17	1035		X	X	X	X	X	X	X					32
~~MW-87~~	Grab	GW					X	X	X	X	X	X	X					

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: **Dissolved metals field-filtered.**

pH _____ Temp _____
Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Mark

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____
Temp: 2.6 °C Bottles Received: 349
Date: 4-28-17 Time: 900

Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: C2 NCF:

Company Name/Address:	Billing Information:
TRC Solutions - Austin, TX **505 E. Huntland Dr, Ste 250** **Austin, TX 78752**	**Accounts Payable** **21 Griffin Road North** **Windsor, CT 06095**
Report to: Julie Speer	Email To: jspeer@trcwsolutions.com
Project Description: **EP Spring 2017**	City/State Collected: NM
Phone: 512-684-3170 Fax:	Client Project #	Lab Project #
Collected by (print): **Scott Ude/HMI Team**	Site/Facility ID #: EP (Navajo - Artesia)	P.O. #: 107027
Collected by (signature): Scott Ude Immediately Packed on Ice N ___ Y ✓	***Rush?*** (Lab MUST Be Notified) ___ Same Day .....200% ___ Next Day .....100% ___ Two Day .....50% ___ Three Day 25%	Date Results Needed Email? ___No ✓Yes FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide		Rem./Contaminant	Sample # (lab only)
~~DUP-EP-01~~	Grab	GW					X	X	X	X	X	X	X					
DUP-EP-02	Grab	GW		4/26/17	900	10	X	X	X	X	X	X	X					33
DUP-EP-03	Grab	GW		4/26/17	1000	10	X	X	X	X	X	X	X					34
~~EB-EP-01~~	Grab	GW					X	X	X	X	X	X	X					
~~EB-EP-02~~	Grab	GW					X	X	X	X	X	X	X					
~~EB-EP-03~~	Grab	GW					X	X	X	X	X	X	X					
EB-EP-04	Grab	GW		4/26/17	1210	10	X	X	X	X	X	X	X					35
~~Trip Blank-EP-01~~	Grab	GW					X											
~~Trip Blank-EP-02~~	Grab	GW					X											
Trip Blank-EP-03	Grab	GW		4/26/17	—	1	X											36

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: **Dissolved metals field-filtered.**

pH _____ Temp _____

Flow _____ Other _____

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			MWE

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____

Temp: 2.6 °C Bottles Received: 34

Date: 4-28-17 Time: 900

Hold #

Condition: (lab use only)

COC Seal Intact: ___Y ___N ___NA

pH Checked: L2 NCF:

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Phone: 800-767-5859
Fax: 615-758-5859

L# L905567

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: **Chris McCord**

Cooler:

Shipped Via:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: **NCL Spring 2017**
City/State Collected: NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: NCL (Navajo - Artesia)
P.O. # 107027

Collected by (signature): Scott Ude
Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle) L2	Anions	NO2NO3, TDS L2	Long List Metals (Total & Dissolved)	Cyanide		Rem./Contaminant	Sample # (lab only)
MW-56	Grab	GW		4/26/17	1425	8	X	X		X	X	X	X					-01
~~MW-45~~	Grab	GW					X	X			X	X	X	X	X			
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																

Chain of Custody Page 7 of 28

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Phone: 800-767-5859
Fax: 615-758-5859

L# L905651
B239

Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other ___

pH ___ Temp ___
Flow ___ Other ___

Remarks: **Dissolved metals field-filtered.**

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Mark

Samples returned via: ☐ UPS ✓ FedEx ☐ Courier ☐ ___
Temp: 2.4 °C Bottles Received: 30
Date: 4-28-17 Time: 845

Condition: (lab use only)
COC Seal Intact: ✓ Y ___N ___NA
pH Checked: L2 NCF:

Chain of Custody Page 8 of 28

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Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

Company Name/Address:	Billing Information:
TRC Solutions - Austin, TX **505 E. Huntland Dr, Ste 250** **Austin, TX 78752**	**Accounts Payable** **21 Griffin Road North** **Windsor, CT 06095**
Report to: Julie Speer	Email To: jspeer@trcwsolutions.com
Project Description: **NCL Spring 2017**	City/State Collected: NM
Phone: 512-684-3170 Fax:	Client Project #
Collected by (print): **Scott Ude/HMI Team**	Site/Facility ID # NCL (Navajo - Artesia)
Collected by (signature): Scott Ude Immediately Packed on Ice N ___ Y ✓	***Rush?*** (Lab MUST Be Notified) ___ Same Day ..... 200% ___ Next Day ..... 100% ___ Two Day ..... 50% ___ Three Day 25%

Lab Project #

P.O. # 107027

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide		Rem./Contaminant	Sample # (lab only)
NCL-34A	Grab	GW		4/26/17	1250	3	X	X		X	X	X	X					-04
NCL-33	Grab	GW		4/26/17	1210	3	X	X		X	X	X	X					
NCL-44	Grab	GW		4/26/17	1125	3	X	X		X	X	X	X					
NCL-32	Grab	GW		4/26/17	1035	3	X	X		X	X	X	X					
MW-108	Grab	GW		4/26/17	905	3	X	X		X	X	X	X					
NCL-31	Grab	GW		4/26/17	950	3	X	X		X	X	X	X					
~~MW-55~~	Grab	GW					X	X	X		X	X	X	X	X			
~~MW-18~~	Grab	GW					X	X			X	X	X	X	X			
~~MW-54A~~	Grab	GW					X	X		X	X	X	X					
~~MW-54B~~	Grab	GW					X	X	X	X	X	X	X					

Lab # 1905151
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: **Dissolved metals field-filtered.**

pH _____ Temp _____
Flow _____ Other _____

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Mark

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____
Temp: 2.6 °C Bottles Received: 38
Date: 4-28-17 Time: 845

Hold #
Condition: (lab use only)
COC Seal Intact: ✓ ___Y ___N ___NA
pH Checked: L2 NCF:

Chain of Custody Page 9 of 28

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Fax: 615-758-5859

L# L905651

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: Chris McCord

Cooler:

Shipped Via:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcwsolutions.com

Project Description: **NCL Spring 2017**

City/State Collected: NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID #: NCL (Navajo - Artesia)

P.O. # 107027

Collected by (signature): Scott Ude

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide		Rem./Contaminant	Sample # (lab only)
~~DUP-NCL-01~~	Grab	GW					X	X		X	X	X	X					
EB-NCL-01	Grab	GW		4/26/17	1045	0	X	X		X	X	X	X					
~~Trip Blank-NCL-01~~	Grab	GW					X											
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: **Dissolved metals field-filtered.**

pH _____ Temp _____

Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Mwk

Samples returned via: ☐ UPS ✓ FedEx ☐ Courier ☐ _____

Temp: 2-6 °C Bottles Received: 38

Date: 4-28-17 Time: 845

Condition: (lab use only)

COC Seal Intact: ✓ Y ___N ___NA

pH Checked: NCF:

Company Name/Address: **TRC Solutions - Austin, TX** 505 E. Huntland Dr, Ste 250 Austin, TX 78752	Billing Information: **Accounts Payable** 21 Griffin Road North Windsor, CT 06095
Report to: Julie Speer	Email To: jspeer@trcwsolutions.com
Project Description: **REST Spring 2017**	City/State Collected: NM
Phone: 512-684-3170 Fax:	Client Project #	Lab Project #
Collected by (print): **Scott Ude/HMI Team**	Site/Facility ID #: REST (Navajo - Artesia)	P.O. #: 107027
Collected by (signature): Scott Ude Immediately Packed on Ice N ___ Y ✓	***Rush?*** (Lab MUST Be Notified) ___ Same Day .....200% ___ Next Day .....100% ___ Two Day .....50% ___ Three Day 25%	Date Results Needed Email? ___No ✓Yes FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide		Rem./Contaminant	Sample # (lab only)
RW-#15C	Grab	GW		4/26/17	1000	8	X	X		X	X	X	X					-01
MW-48	Grab	GW		4/26/17	915	10	X	X	X	X	X	X	X					02
MW-130	Grab	GW		4/26/17	1050	10	X	X	X	X	X	X	X					03
~~KWB-4~~	Grab	GW					X	X		X	X	X	X					
~~RW-19~~	Grab	GW					X	X		X	X	X	X					
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: **Dissolved metals field-filtered.**

pH _____ Temp _____

Flow _____ Other _____

Relinquished by : (Signature) Scott Ude	Date: 4/27/17	Time: 0800	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____

Temp: 3.1 °C Bottles Received: 45

Date: 4.28-17 Time: 0900

Hold #

Condition: (lab use only)

COC Seal Intact: ✓ Y ___N ___NA

pH Checked: <2 NCF:

Chain of Custody

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Phone: 800-767-5859
Fax: 615-758-5859

L# ~~LO~~ L905668

Table # N/Soil

Acctnum: TRCATX

Template:

Prelogin:

TSR: **Chris McCord**

Cooler:

Shipped Via:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: **REST Spring 2017**
City/State Collected: NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: REST (Navajo - Artesia)
P.O. #: 107027

Collected by (signature): Scott Ude
Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 11 of 28

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Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905668
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide	Rem./Contaminant	Sample # (lab only)
KWB-P4	Grab	GW		4/26/17	855	4	X	X									04
~~MW-52~~	Grab	GW					X	X	X		X	X	X	X	X		
~~MW-109~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-110~~	Grab	GW					X	X	X	X	X	X	X				
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

pH _____ Temp _____
Flow _____ Other _____

Remarks: **Dissolved metals field-filtered.**

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✓ FedEx ☐ Courier ☐ _____
Temp: 3.1 °C Bottles Received: 445
Date: 4-28-17 Time: 0900

Condition: (lab use only)
COC Seal Intact: ✓ Y ___N ___NA
pH Checked: NCF:

Company Name/Address: **TRC Solutions - Austin, TX** 505 E. Huntland Dr, Ste 250 Austin, TX 78752	Billing Information: **Accounts Payable** 21 Griffin Road North Windsor, CT 06095
Report to: Julie Speer	Email To: jspeer@trcwsolutions.com
Project Description: **REST Spring 2017**	City/State Collected: NM
Phone: 512-684-3170 Fax:	Client Project #	Lab Project #
Collected by (print): **Scott Ude/HMI Team**	Site/Facility ID #: REST (Navajo - Artesia)	P.O. #: 107027
Collected by (signature): Scott Ude Immediately Packed on Ice N ___ Y ✓	***Rush?*** (Lab MUST Be Notified) ___ Same Day .....200% ___ Next Day .....100% ___ Two Day .....50% ___ Three Day 25%	Date Results Needed Email? ___No ✓Yes FAX? ___No ___Yes

Chain of Custody — ESC LABORATORY SCIENCES — YOUR LAB OF CHOICE
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Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905668
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide		Rem /Contaminant	Sample # (lab only)
~~RW-12R~~	Grab	GW					X	X		X	X	X	X					
~~MW-113~~	Grab	GW					X	X	X	X	X	X	X					
~~KWB-8~~	Grab	GW					X	X			X	X	X	X	X			
~~RW-22~~	Grab	GW					X	X		X	X	X	X					
~~RW-20A~~	Grab	GW					X	X		X	X	X	X					
~~RW-20B~~	Grab	GW					X	X		X	X	X	X					
~~RW-13R~~	Grab	GW					X	X		X	X	X	X					
~~RW-14R~~	Grab	GW					X	X		X	X	X	X					
~~MW-133~~	Grab	GW					X	X	X	X	X	X	X					
MW-134	Grab	GW		4/26/17	845	10	X	X	X	X	X	X	X					05

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

pH _____ Temp _____
Flow _____ Other _____

Remarks: **Dissolved metals field-filtered.**

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____
Temp: 3.1 °C Bottles Received: 445
Date: 4-28-17 Time: 0900

Condition: (lab use only)
COC Seal Intact: ✓ Y ___N ___NA
pH Checked: NCF:

Company Name/Address:	Billing Information:
TRC Solutions - Austin, TX **505 E. Huntland Dr, Ste 250** **Austin, TX 78752**	**Accounts Payable** **21 Griffin Road North** **Windsor, CT 06095**
Report to: Julie Speer	Email To: jspeer@trcwsolutions.com
Project Description: **REST Spring 2017**	City/State Collected: NM
Phone: 512-684-3170 Fax:	Client Project #	Lab Project #
Collected by (print): **Scott Ude/HMI Team**	Site/Facility ID #: REST (Navajo - Artesia)	P.O. #: 107027
Collected by (signature): Scott Ude Immediately Packed on Ice N ___ Y ✓	***Rush?*** (Lab MUST Be Notified) ___ Same Day .....200% ___ Next Day .....100% ___ Two Day .....50% ___ Three Day 25%	Date Results Needed Email? ___No ✓Yes FAX? ___No ___Yes

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Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905668
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide		Rem./Contaminant	Sample # (lab only)
RA-4798	Grab	GW		4/26/17	925	5	X				X	X	X					06
RA-4196	Grab	GW		4/26/17	945	5	X				X	X	X					07
RA-3156	Grab	GW		4/26/17	1015	5	X				X	X	X					08
~~RA-313~~	Grab	GW					X				X	X	X					
~~KWB-7~~	Grab	GW					X	X			X	X	X	X	X			
MW-135	Grab	GW		4/26/17	1650	10	X	X	X	X	X	X	X					09
~~KWB-11A~~	Grab	GW					X	X	X		X	X	X	X	X			
~~KWB-11B~~	Grab	GW					X	X	X		X	X	X	X	X			
~~MW-115~~	Grab	GW					X	X	X	X	X	X	X					
~~MW-114~~	Grab	GW					X	X	X	X	X	X	X					

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

pH _____ Temp _____

Remarks: **Dissolved metals field-filtered.**

Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✓ FedEx ☐ Courier ☐ _____

Temp: 3.1 °C Bottles Received: 445

Date: Time:

Condition: (lab use only)

COC Seal Intact: ✓ ___Y ___N ___NA

pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: **REST Spring 2017**
City/State Collected: NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: REST (Navajo - Artesia)
P.O. # 107027

Collected by (signature): Scott Ude
Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Chain of Custody

ESC LABS SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905668
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide		Rem./Contaminant	Sample # (lab only)
MW-117	Grab	GW		4/26/17	855	10	X	X	X	X	X	X	X					10
MW-118	Grab	GW		4/26/17	940	10	X	X	X	X	X	X	X					11
MW-119	Grab	GW		4/26/17	1025	10	X	X	X	X	X	X	X					12
~~NP-5~~	Grab	GW					X	X		X	X	X	X					
~~MW-136~~	Grab	GW					X	X	X		X	X	X	X	X			
~~MW-126A~~	Grab	GW					X	X	X	X	X	X	X					
~~MW-126B~~	Grab	GW					X	X	X	X	X	X	X					
~~MW-127~~	Grab	GW					X	X	X	X	X	X	X					
~~MW-129~~	Grab	GW					X	X	X	X	X	X	X					
~~RW-#18A~~	Grab	GW					X			X	X	X	X					

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: **Dissolved metals field-filtered.**

pH _____ Temp _____
Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Dave

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____
Temp: 3.1 °C Bottles Received: 445
Date: 4-28-17 Time: 0900

Condition: (lab use only)
COC Seal Intact: ✓ Y ___N ___NA
pH Checked: NCF:

Chain of Custody

ESC LABS — YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: **REST Spring 2017**
City/State Collected: NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: REST (Navajo - Artesia)
P.O. #: 107027

Collected by (signature): Scott Ude
Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

L# L905662
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide	Rem./Contaminant	Sample # (lab only)
~~KWB-1A~~	Grab	GW					X	X			X	X	X	X	X		
~~KWB-1C~~	Grab	GW					X	X		X	X	X	X				
~~KWB-10R~~	Grab	GW					X	X		X	X	X	X				
~~MW-131~~ ~~MW-131~~	Grab	GW					X	X	X	X	X	X	X				
KWB-5	Grab	GW		4/26/17	1640	8	X	X		X	X	X	X				13
MW-111	Grab	GW		4/26/17	1535	10	X	X	X	X	X	X	X				14
KWB-6	Grab	GW		4/26/17	1435	8	X	X		X	X	X	X				15
~~MW-112~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-132~~	Grab	GW					X	X	X	X	X	X	X				
MW-57	Grab	GW		4/26/17	1345	10	X	X	X	X	X	X	X				16

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other ___

Remarks: **Dissolved metals field-filtered.**

pH ___ Temp ___
Flow ___ Other ___

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___
Temp: 3.1 °C Bottles Received: 45
Date: 4-28-17 Time: 0900

Condition: (lab use only)
COC Seal Intact: ✓ Y ___N ___NA
pH Checked: NCF:

Chain of Custody

ESC LABS
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905668

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: Chris McCord

Cooler:

Shipped Via:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcwsolutions.com

Project Description: **REST Spring 2017**

City/State Collected: NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID #: REST (Navajo - Artesia)

P.O. #: 107027

Collected by (signature): Scott Ude
Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide	Rem./Contaminant	Sample # (lab only)
~~RW-#11-0~~	Grab	GW					X	X		X	X	X	X				
KWB-12A	Grab	GW		4/26/17	1210	11	X	X	X		X	X	X	X	X		17
KWB-12B	Grab	GW		4/26/17	1250	11	X	X	X		X	X	X	X	X		18
~~KWB-2R~~	Grab	GW					X	X		X	X	X	X				
~~MW-58~~	Grab	GW					X	X			X	X	X	X	X		
KWB-13	Grab	GW		4/26/17	1120	11	X	X			X	X	X	X	X		19
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

pH _____ Temp _____

Flow _____ Other _____

Remarks: **Dissolved metals field-filtered.**

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____

Temp: 3.1 °C Bottles Received: 445

Date: 4-28-17 Time: 0900

Condition: (lab use only)

COC Seal Intact: ✓ Y ___N ___NA

pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcwsolutions.com

Project Description: **REST Spring 2017**

City/State Collected: NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID #: REST (Navajo - Artesia)

P.O. # 107027

Collected by (signature): Scott Ude

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide	Rem./Contaminant	Sample # (lab only)
~~MW-103~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-104~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-64~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-65~~	Grab	GW					X	X	X	X	X	X	X				
~~RW-5R~~	Grab	GW					X	X		X	X	X	X				
MW-102	Grab	GW		4/26/17	925	10	X	X	X	X	X	X	X				20
RW-4	Grab	GW		4/26/17	1310	8	X	X		X	X	X	X				21
~~RW-6~~	Grab	GW					X	X		X	X	X	X				
MW-99	Grab	GW		4/26/17	1020	10	X	X	X	X	X	X	X				22
MW-66	Grab	GW		4/26/17	1115	11	X	X	X		X	X	X	X	X		23

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: **Dissolved metals field-filtered.**

pH _____ Temp _____
Flow _____ Other _____

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____
Temp: 3.1 °C Bottles Received: 445
Date: 4-28-17 Time: 0900

Hold #
Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Chain of Custody

ESC LABS
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L # 190668
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Chain of Custody

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

Company Name/Address:	Billing Information:
TRC Solutions - Austin, TX **505 E. Huntland Dr, Ste 250** **Austin, TX 78752**	**Accounts Payable** **21 Griffin Road North** **Windsor, CT 06095**
Report to: Julie Speer	Email To: jspeer@trcwsolutions.com
Project Description: **REST Spring 2017**	City/State Collected: NM
Phone: 512-684-3170 Fax:	Client Project #
Collected by (print): **Scott Ude/HMI Team**	Site/Facility ID #: REST (Navajo - Artesia)
Collected by (signature): Scott Ude Immediately Packed on Ice N ___ Y ✓	***Rush?*** (Lab MUST Be Notified) ___ Same Day .....200% ___ Next Day .....100% ___ Two Day .....50% ___ Three Day 25%

Lab Project #

P.O. #: 107027

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

L# L905668

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: **Chris McCord**

Cooler:

Shipped Via:

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide	Rem./Contaminant	Sample # (lab only)
MW-28	Grab	GW		4/26/17	1210	11	X	X	X		X	X	X	X	X		24
~~**MW-59**~~	Grab	GW					X	X	X	X	X	X	X				
~~**MW-60**~~	Grab	GW					X	X	X		X	X	X	X	X		
MW-107	Grab	GW		4/26/17	1510	10	X	X	X	X	X	X	X				25
MW-128	Grab	GW		4/26/17	1410	10	X	X	X	X	X	X	X				26
MW-125	Grab	GW		4/26/17	1600	10	X	X	X	X	X	X	X				27
MW-116	Grab	GW		4/26/17	1655	10	X	X	X	X	X	X	X				28
	Grab	GW															
	Grab	GW															
	Grab	GW															

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: **Dissolved metals field-filtered.**

pH _____ Temp _____

Flow _____ Other _____

Hold #

Relinquished by : (Signature) Scott Ude	Date: 4/27/17	Time: 0800	Received by: (Signature)	Samples returned via: ☐ UPS ✓ FedEx ☐ Courier ☐ _____
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 3.1 °C Bottles Received: 445
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4-28-17 Time: 0900

Condition: (lab use only)

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: **REST Spring 2017**
City/State Collected: NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: REST (Navajo - Artesia)
P.O. # 107027

Collected by (signature): Scott Ude
Immediately Packed on Ice: N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody

ESC LABS
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12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905668
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide	Rem./Contaminant	Sample # (lab only)
~~MW-101~~	Grab	GW					X	X	X	X	X	X	X				
MW-105	Grab	GW		4/26/17	825	10	X	X	X	X	X	X	X				29
RW-2	Grab	GW		4/26/17	1425	10	X	X	X	X	X	X	X				30
MW-61	Grab	GW		4/26/17	935	10	X	X	X	X	X	X	X				31
MW-62	Grab	GW		4/26/17	1020	10	X	X	X	X	X	X	X				32
MW-93	Grab	GW		4/26/17	1215	10	X	X	X	X	X	X	X				33
~~MW-43~~	Grab	GW					X	X	X		X	X	X	X	X		
~~MW-137~~	Grab	GW					X	X	X		X	X	X	X	X		
~~MW-138~~	Grab	GW					X	X	X		X	X	X	X	X		
MW-23	Grab	GW		4/26/17	1115	10	X	X	X	X	X	X	X				34

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: **Dissolved metals field-filtered.**

pH _____ Temp _____
Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____
Temp: 3.1 °C Bottles Received: 45
Date: 4.28.17 Time: 0900

Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Company Name/Address: **TRC Solutions - Austin, TX** **505 E. Huntland Dr, Ste 250** **Austin, TX 78752**	Billing Information: **Accounts Payable** **21 Griffin Road North** **Windsor, CT 06095**
Report to: Julie Speer	Email To: jspeer@trcwsolutions.com
Project Description: **REST Spring 2017**	City/State Collected: NM
Phone: 512-684-3170 Fax:	Client Project #	Lab Project #
Collected by (print): **Scott Ude/HMI Team**	Site/Facility ID #: REST (Navajo - Artesia)	P.O. #: 107027
Collected by (signature): Scott Ude Immediately Packed on Ice N ___ Y ✓	***Rush?*** (Lab MUST Be Notified) ___ Same Day .....200% ___ Next Day .....100% ___ Two Day .....50% ___ Three Day 25%	Date Results Needed Email? ___No ✓Yes FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide	Rem./Contaminant	Sample # (lab only)
MW-39	Grab	GW		4/26/17	1920	10	X	X	X	X	X	X	X				35
~~MW-98~~	Grab	GW					X	X	X	X	X	X	X				
~~RW-10~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-40~~	Grab	GW					X	X	X	X	X	X	X				
MW-41	Grab	GW		4/26/17	1825	10	X	X	X	X	X	X	X				36
~~RW-9~~	Grab	GW					X	X	X	X	X	X	X				
MW-42	Grab	GW		4/26/17	1625	10	X	X	X	X	X	X	X				37
MW-29	Grab	GW		4/26/17	1725	10	X	X	X	X	X	X	X				38
RW-#16B	Grab	GW		4/26/17	1525	8	X	X		X	X	X	X				39
~~MW-106~~	Grab	GW					X	X	X	X	X	X	X				

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other ___

Remarks: **Dissolved metals field-filtered.**

pH ___ Temp ___

Flow ___ Other ___

Relinquished by : (Signature) Scott Ude	Date: 4/27/17	Time: 0800	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___

Temp: 3.1 °C Bottles Received: 445

Date: 4-28-17 Time: 0900

Chain of Custody Page ___ of ___

ESC LABORATORY SCIENCES — YOUR LAB OF CHOICE

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905668

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: **Chris McCord**

Cooler:

Shipped Via:

Hold #

Condition: (lab use only)

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

Company Name/Address: **TRC Solutions - Austin, TX** **505 E. Huntland Dr, Ste 250** **Austin, TX 78752**	Billing Information: **Accounts Payable** **21 Griffin Road North** **Windsor, CT 06095**
Report to: Julie Speer	Email To: jspeer@trcwsolutions.com
Project Description: **REST Spring 2017**	City/State Collected: NM
Phone: 512-684-3170 Fax:	Client Project #
Collected by (print): **Scott Ude/HMI Team**	Site/Facility ID # REST (Navajo - Artesia)
Collected by (signature): Scott Ude Immediately Packed on Ice N ___ Y ✓	***Rush?*** (Lab MUST Be Notified) ___ Same Day .....200% ___ Next Day .....100% ___ Two Day .....50% ___ Three Day 25%

Lab Project #

P.O. # 107027

Date Results Needed

Email? ___No ✓Yes

FAX? ___No ___Yes

Chain of Custody Page 1 of 1

ESC LABORATORIES — YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L # L905668

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: **Chris McCord**

Cooler:

Shipped Via:

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide		Rem./Contaminant	Sample # (lab only)
~~MW-50~~	Grab	GW					X	X		X	X	X	X					
~~MW-97~~	Grab	GW					X	X	X	X	X	X	X					
~~MW-92~~	Grab	GW					X	X	X	X	X	X	X					
~~RW-1~~	Grab	GW					X	X	X	X	X	X	X					
~~MW-91~~	Grab	GW					X	X	X	X	X	X	X					
~~MW-90~~	Grab	GW					X	X	X	X	X	X	X					
~~MW-96~~	Grab	GW					X	X	X	X	X	X	X					
MW-94	Grab	GW		4/26/17	1420	10	X	X	X	X	X	X	X					40
RW-8	Grab	GW		4/26/17	1505	8	X	X		X	X	X	X					
MW-67	Grab	GW		4/26/17	1615	11	X	X	X		X	X	X	X	X			41

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other ___

pH ___ Temp ___

Flow ___ Other ___

Remarks: **Dissolved metals field-filtered.**

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✓ FedEx ☐ Courier ☐ ___

Temp: 3.1 °C Bottles Received: 445

Date: 4-28-17 Time: 0900

Condition: (lab use only)

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcwsolutions.com

Project Description: **REST Spring 2017**

City/State Collected: NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID #: REST (Navajo - Artesia)

P.O. #: 107027

Collected by (signature): Scott Ude

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Chain of Custody Page 22 of 28

ESC LABS
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Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905668

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: **Chris McCord**

Cooler:

Shipped Via:

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide		Rem./Contaminant	Sample # (lab only)
MW-95	Grab	GW		4/26/17	1710	10	X	X	X	X	X	X	X					42
RW-7	Grab	GW		4/26/17	1335	10	X	X	X	X	X	X	X					43
RW-#17A	Grab	GW		4/26/17	1755	10	X	X	X	X	X	X	X					44
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: **Dissolved metals field-filtered.**

pH _____ Temp _____

Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✓ FedEx ☐ Courier ☐ _____

Temp: 3.1 °C Bottles Received: 445

Date: 4-28-17 Time: 0900

Condition: (lab use only)

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: **REST Spring 2017**
City/State Collected: NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: REST (Navajo - Artesia)
P.O. #: 107027

Collected by (signature): Scott Ude
Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide	Rem./Contaminant	Sample # (lab only)
~~DUP-REST-01~~	Grab	GW					X	X	X	X	X	X	X				
~~DUP-REST-02~~	Grab	GW					X	X	X	X	X	X	X				
DUP-REST-03	Grab	GW		4/26/17	1200	10	X	X	X	X	X	X	X				45
~~DUP-REST-04~~	Grab	GW					X	X	X		X	X	X	X	X		
DUP-REST-05	Grab	GW		4/26/17	800	11	X	X	X		X	X	X	X	X		46
~~EB-REST-01~~	Grab	GW					X	X	X	X	X	X	X				
~~EB-REST-02~~	Grab	GW					X	X	X	X	X	X	X				
EB-REST-03	Grab	GW		4/26/17	855	10	X	X	X	X	X	X	X				47
~~EB-REST-04~~	Grab	GW					X	X	X		X	X	X	X	X		
EB-REST-05	Grab	GW		4/26/17	1305	11	X	X	X		X	X	X	X	X		48

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other ___

Remarks: **Dissolved metals field-filtered.**

pH ___ Temp ___
Flow ___ Other ___

Chain of Custody Page ___ of ___

ESC LABS
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905668
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Hold #
Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___
Temp: 3.1 °C Bottles Received: 445
Date: 4-28-17 Time: 0900

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcwsolutions.com

Project Description: **REST Spring 2017**

City/State Collected: NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID #: REST (Navajo - Artesia)

P.O. # 107027

Collected by (signature): Scott Ude
Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide	Rem./Contaminant	Sample # (lab only)
~~Trip Blank-REST-01~~	Grab	GW					X										
Trip Blank-REST-02	Grab	GW		4/26/17	—	1	X										49
~~Trip Blank-REST-03~~	Grab	GW					X										
~~Trip Blank-REST-04~~	Grab	GW					X										
~~Trip Blank-REST-05~~	Grab	GW					X										
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: **Dissolved metals field-filtered.**

pH _____ Temp _____
Flow _____ Other _____

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____
Temp: 3.1 °C Bottles Received: 44 S
Date: 4.28.17 Time: 0800

Chain of Custody Page ___ of ___

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L #
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Hold #
Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: **TMD Spring 2017**
City/State Collected: NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: TMD (Navajo - Artesia)
P.O. #: 107027

Collected by (signature): Scott Ude
Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle) L2	Anions	NO2NO3, TDS L2	Long List Metals (Total & Dissolved)	Cyanide		Rem./Contaminant	Sample # (lab only)
MW-25	Grab	GW		4/26/17	1510	8	X	X		X	X	X	X					-01
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

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Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 1905607
G170

Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: **Dissolved metals field-filtered.**

pH _____ Temp _____
Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Mwt

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____
Temp: 2.6 °C Bottles Received: 9
Date: 4-28-17 Time: 845

Condition: (lab use only) ok
COC Seal Intact: ✓Y ___N ___NA
pH Checked: <7 NCF:

Company Name/Address: **TRC Solutions - Austin, TX** **505 E. Huntland Dr, Ste 250** **Austin, TX 78752**	Billing Information: **Accounts Payable** **21 Griffin Road North** **Windsor, CT 06095**
Report to: Julie Speer	Email To: jspeer@trcwsolutions.com
Project Description: **TMD Spring 2017**	City/State Collected: NM
Phone: 512-684-3170 Fax:	Client Project #	Lab Project #
Collected by (print): **Scott Ude/HMI Team**	Site/Facility ID #: TMD (Navajo - Artesia)	P.O. #: 107027
Collected by (signature): Scott Ude Immediately Packed on Ice N ___ Y ✓	***Rush?*** (Lab MUST Be Notified) ___ Same Day .....200% ___ Next Day .....100% ___ Two Day .....50% ___ Three Day 25%	Date Results Needed Email? ___No ✓Yes FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

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Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905607
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide		Rem./Contaminant	Sample # (lab only)
~~MW-20~~	Grab	GW				5	X	X		X	X	X	X					
NP-1	Grab	GW		4/26/17	1820	5	X				X	X	X					05
NP-6	Grab	GW		4/26/17	1740	2	X											06
~~MW-8~~	Grab	GW					X	X	X	X	X	X	X					
~~MW-21~~	Grab	GW					X	X	X	X	X	X	X					
MW-71	Grab	GW		4/26/17	1105	9	X	X			X	X	X	X	X			07
MW-68	Grab	GW		4/26/17	1155	8	X	X		X	X	X	X					08
MW-27	Grab	GW		4/26/17	1555	8	X	X		X	X	X	X					09
MW-89	Grab	GW		4/26/17	1455	8	X	X		X	X	X	X					10
MW-16	Grab	GW		4/26/17	1400	8	X	X		X	X	X	X					11

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: **Dissolved metals field-filtered.**

pH _____ Temp _____
Flow _____ Other _____

Hold #

Relinquished by : (Signature) Scott Ude	Date: 4/27/17	Time: 0800	Received by: (Signature)	Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 2.6 °C Bottles Received: 97
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) MW	Date: 4-28-17 Time: 845

Condition: (lab use only) 0
COC Seal Intact: ___Y ___N ___NA
pH Checked: C2, 7/2 NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: **TMD Spring 2017**
City/State Collected: NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: TMD (Navajo - Artesia)
P.O. #: 107027

Collected by (signature): Scott Ude
Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle) L2	Anions	NO2NO3, TDS L2	Long List Metals (Total & Dissolved)	Cyanide		Rem./Contaminant	Sample # (lab only)
MW-26	Grab	GW		4/26/17	1255	8	X	X		X	X	X	X					12
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: **Dissolved metals field-filtered.**

pH _____ Temp _____
Flow _____ Other _____

Chain of Custody Page ___ of ___

ESC LAB SCIENCES
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Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905602
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Mint

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ____
Temp: 2.6 °C Bottles Received: 9?
Date: 4-28-17 Time: 845

Hold #
Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: L2 NCF:

Company Name/Address: **TRC Solutions - Austin, TX** **505 E. Huntland Dr, Ste 250** **Austin, TX 78752**	Billing Information: **Accounts Payable** **21 Griffin Road North** **Windsor, CT 06095**
Report to: Julie Speer	Email To: jspeer@trcwsolutions.com
Project Description: **TMD Spring 2017**	City/State Collected: NM
Phone: 512-684-3170 Fax:	Client Project #	Lab Project #
Collected by (print): **Scott Ude/HMI Team**	Site/Facility ID # TMD (Navajo - Artesia)	P.O. # 107027
Collected by (signature): Scott Ude Immediately Packed on Ice N ___ Y ✓	***Rush?*** (Lab MUST Be Notified) ___ Same Day .....200% ___ Next Day .....100% ___ Two Day .....50% ___ Three Day 25%	Date Results Needed Email? ___No ✓Yes FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide		Rem./Contaminant	Sample # (lab only)
Trip Blank-TMD-01	Grab	GW		4/26/17	—	1	X											14
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																

Chain of Custody Page ___ of ___

ESC LABORATORY SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905012

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: **Chris McCord**

Cooler:

Shipped Via:

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: **Dissolved metals field-filtered.**

pH _____ Temp _____

Flow _____ Other _____

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	0800	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✓ FedEx ☐ Courier ☐ _____

Temp: 2.6 °C Bottles Received: 97

Date: 4-28-17 Time: 845

Hold #

Condition: (lab use only) a

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: NCL Spring 2017
City/State Collected: NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): Scott Ude/HMI Team
Collected by (signature): Scott Ude
Immediately Packed on Ice N ___ Y ✓

Site/Facility ID #: NCL (Navajo - Artesia)
P.O. #: 107027

Rush? (Lab MUST Be Notified)
___ Same Day ... 200%
___ Next Day ... 100%
___ Two Day ... 50%
___ Three Day ... 25%

Date Results Needed

Email? ___ No ✓ Yes
FAX? ___ No ___ Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle) 12	Anions	NO2NO3, TDS 12	Long List Metals (Total & Dissolved)	Cyanide 7/12
~~NCL-34A~~	Grab	GW					X	X		X	X	X	X		
~~NCL-33~~	Grab	GW					X	X		X	X	X	X		
~~NCL-44~~	Grab	GW					X	X		X	X	X	X		
~~NCL-32~~	Grab	GW					X	X		X	X	X	X		
~~MW-108~~	Grab	GW					X	X		X	X	X	X		
~~NCL-31~~	Grab	GW					X	X		X	X	X	X		
MW-55	Grab	GW		4/27/17	1000	11	X	X	X		X	X	X	X	X
MW-18	Grab	GW		4/27/17	915	11	X	X			X	X	X	X	X
~~MW-54A~~	Grab	GW					X	X		X	X	X	X		
~~MW-54B~~	Grab	GW					X	X	X	X	X	X	X		

Analysis / Container / Preservative

Chain of Custody Page 9 of 34

ESC LAB SCIENCES

L # 405651
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

Remarks/Contaminant | Sample # (lab only)
-02
63

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

pH ___ Temp ___
Flow ___ Other ___

Remarks: **Dissolved metals field-filtered.**

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	1500	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)
			Mwt

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___
Temp: 2.1c °C Bottles Received: 38
Date: 4-28-17 Time: 845

Hold #
Condition: (lab use only)
COC Seal Intact: ✓ Y ___ N ___ NA
pH Checked: C2,7/12 NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcwsolutions.com

Project Description: REST Spring 2017

City/State Collected: NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #

Collected by (print): Scott Ude/HMI Team

Site/Facility ID #: REST (Navajo - Artesia)

P.O. # 107027

Collected by (signature): Scott Ude

Immediately Packed on Ice: N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___ No ✓ Yes
FAX? ___ No ___ Yes

Analysis / Container / Preservative

Chain of Custody Page 12 of 34

ESC LABORATORIES

L# L905668

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: Chris McCord

Cooler:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide	Remarks / Containment	Sample # (lab only)
~~RW-#156~~	Grab	GW					X	X		X	X	X	X				
~~MW-48~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-130~~	Grab	GW					X	X	X	X	X	X	X				
~~KWB-4~~	Grab	GW					X	X		X	X	X	X				
~~RW-19~~	Grab	GW					X	X		X	X	X	X				
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

pH ___ Temp ___

Remarks: **Dissolved metals field-filtered.**

Flow ___ Other ___

Hold #

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	1500	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___

Temp: 3.1 °C Bottles Received: 45

Date: 4-28-17 Time: 0900

Condition: (lab use only)

COC Seal Intact: ___ Y ___ N ___ NA

pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: speer@trcsolutions.com

Project Description: **REST Spring 2017**
City/State Collected: NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Collected by (Signature): Scott Ude
Immediately Packed on Ice N ___ Y ✓

Site/Facility ID #: REST (Navajo - Artesia)
P.O. #: 107027

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide	Remk Contaminant	Sample # (lab only)
~~KWB-P4~~	Grab	GW															
MW-52	Grab	GW		4/27/17	855	11	X	X	X		X	X	X	X	X		
MW-109	Grab	GW		4/27/17	940	10	X	X	X	X	X	X	X				50
MW-110	Grab	GW		4/27/17	1025	10	X	X	X	X	X	X	X				51
	Grab	GW															52
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

Remarks: **Dissolved metals field-filtered.**

pH ___ Temp ___
Flow ___ Other ___

Relinquished by: (Signature): Scott Ude — Date: 4/27/17 — Time: 1500
Relinquished by: (Signature) — Date: — Time:
Relinquished by: (Signature) — Date: — Time:

Received by: (Signature)
Received by: (Signature)
Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___
Temp: 3.1 °C Bottles Received: 45
Date: 4-28-17 Time: 0900

Hold #
Condition: (lab use only)
COC Seal Intact: ✓ Y ___ N ___ NA
pH Checked: NCF:

Chain of Custody Page 13 of 34

ESC LABORATORIES
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L # L905668
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

Chain of Custody Page 14 of 34

ESC LAB SCIENCES

Company Name/Address:	Billing Information:
TRC Solutions - Austin, TX 505 E. Huntland Dr, Ste 250 Austin, TX 78752	Accounts Payable 21 Griffin Road North Windsor, CT 06095
Report to: Julie Speer	Email To: jspeer@trcsolutions.com
Project Description: REST Spring 2017	City/State Collected: NM
Phone: 512-684-3170 Fax:	Client Project # Lab Project #
Collected by (print): Scott Ude/HMI Team	Site/Facility ID #: REST (Navajo - Artesia) P.O. #: 107027
Collected by (signature): Scott Ude Immediately Packed on Ice N ___ Y ✓	Rush? (Lab MUST Be Notified) ___ Same Day 200% ___ Next Day 100% ___ Two Day 50% ___ Three Day 25% Date Results Needed Email? ___No ✓Yes FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide		Remk/Contaminant	Sample # (lab only)
RW-12R	Grab	GW		4/27/17	1230	8	X	X		X	X	X	X					53
MW-113	Grab	GW		4/27/17	910	10	X	X	X	X	X	X	X					54
~~KWB-8~~	Grab	GW					X	X			X	X	X	X	X			
~~RW-22~~	Grab	GW					X	X		X	X	X	X					
~~RW-20A~~	Grab	GW					X	X		X	X	X	X					
~~RW-20B~~	Grab	GW					X	X		X	X	X	X					
~~RW-13R~~	Grab	GW					X	X		X	X	X	X					
~~RW-14R~~	Grab	GW					X	X		X	X	X	X					
~~MW-133~~	Grab	GW					X	X	X	X	X	X	X					
~~MW-134~~	Grab	GW					X	X	X	X	X	X	X					

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

pH ___ Temp ___

Flow ___ Other ___

Remarks: **Dissolved metals field-filtered.**

Relinquished by: (Signature) Scott Ude	Date: 4/27/17	Time: 1500	Received by: (Signature)	Samples returned via: ☐ UPS ✓ FedEx ☐ Courier ☐ ___
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: 3.1 °C Bottles Received: 445
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 4-28-17 Time: 0900

Hold #

Condition: (lab use only)

COC Seal Intact: ✓ Y ___ N ___ NA

pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcsolutions.com

Project Description: **REST Spring 2017**

City/State Collected: NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID #: REST (Navajo - Artesia)

P.O. #: 107027

Collected by (signature): Scott Ude

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Immediately Packed on Ice N ___ Y ✓

Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 15 of 34

ESC LAB SCIENCES

L# L905660

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: Chris McCord

Cooler:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide		Remarks / Contaminant	Sample # (lab only)
~~RA-4798~~	Grab	GW					X				X	X	X					
~~RA-4196~~	Grab	GW					X				X	X	X					
~~RA-3156~~	Grab	GW					X				X	X	X					
RA-313	Grab	GW		4/27/17	930	5	X				X	X	X					
~~KWB-7~~	Grab	GW					X	X			X	X	X	X	X			55
~~MW-435~~	Grab	GW					X	X	X	X	X	X	X					
~~KWB-11A~~	Grab	GW					X	X	X		X	X	X	X	X			
~~KWB-11B~~	Grab	GW					X	X	X		X	X	X	X	X			
MW-115	Grab	GW		4/27/17	1040	10	X	X	X	X	X	X	X					56
MW-114	Grab	GW		4/27/17	1130	10	X	X	X	X	X	X	X					57

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ____

pH ____ Temp ____

Remarks: **Dissolved metals field-filtered.**

Flow ____ Other ____

Hold #

Relinquished by: (Signature)	Date	Time	Received by: (Signature)
Scott Ude	4/27/17	1500	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ ____

Temp: 3.1 °C Bottles Received: 445

Date: 4-28-17 Time: 0900

Condition: (lab use only)

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: REST Spring 2017
City/State Collected: NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): Scott Ude/HMI Team
Site/Facility ID #: REST (Navajo - Artesia)
P.O. # 107027

Collected by (signature): Scott Ude
Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___ No ✓ Yes
FAX? ___ No ___ Yes

Analyses / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide		Sample # (lab only)
~~MW-117~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-118~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-119~~	Grab	GW					X	X	X	X	X	X	X				
~~NP-5~~	Grab	GW					X	X		X	X	X	X				
~~MW-136~~	Grab	GW					X	X	X		X	X	X	X	X		
MW-126A	Grab	GW		4/27/17	920	10	X	X	X	X	X	X	X				58
MW-126B	Grab	GW		4/27/17	1000	10	X	X	X	X	X	X	X				59
MW-127	Grab	GW		4/27/17	1050	10	X	X	X	X	X	X	X				60
MW-129	Grab	GW		4/27/17	1140	10	X	X	X	X	X	X	X				61
~~RW-#16A~~	Grab	GW					X			X	X	X	X				

* Matrix: SS Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

Remarks: **Dissolved metals field-filtered.**

pH ___ Temp ___
Flow ___ Other ___

Chain of Custody

ESC LAB SCIENCES
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905663
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

Sample # (lab only)

Relinquished by : (Signature)	Date	Time	Received by: (Signature)
Scott Ude	4/27/17	1500	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___
Temp: 3.9 °C Bottles Received: 445
Date: 4.28.17 Time: 0900

Hold #
Condition: (lab use only)
COC Seal Intact: ✓ Y ___ N ___ NA
pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcsolutions.com

Project Description: **REST Spring 2017**

City/State Collected: NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID #: REST (Navajo - Artesia)

P.O. #: 107027

Collected by (signature): Scott Ude

Immediately Packed on Ice: N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 75%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide	
~~KWB-1A~~	Grab	GW					X	X			X	X	X	X	X	
~~KWB-1C~~	Grab	GW					X	X		X	X	X	X			
~~KWB-10R~~	Grab	GW					X	X		X	X	X	X			
MW-131	Grab	GW		4/27/17	1110	10	X	X	X	X	X	X	X			
~~KWB-5~~	Grab	GW					X	X		X	X	X	X			
~~MW-111~~	Grab	GW					X	X	X	X	X	X	X			
~~KWB-9~~	Grab	GW					X	X		X	X	X	X			
~~MW-112~~	Grab	GW					X	X	X	X	X	X	X			
~~MW-132~~	Grab	GW					X	X	X	X	X	X	X			
~~MW-57~~	Grab	GW					X	X	X	X	X	X	X			

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

Remarks: **Dissolved metals field-filtered.**

pH ___ Temp ___
Flow ___ Other ___

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	1500	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✓ FedEx ☐ Courier ☐ ___
Temp: 3.1 °C Bottles Received: 945
Date: 4-28-17 Time: 0900

Hold #
Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Chain of Custody Page 17 of 34

ESC

Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

Sample # (lab only): 62

Page 18 of 34

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcsolutions.com

Project Description: REST Spring 2017

City/State Collected: NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #

Collected by (print): Scott Ude/HMI Team

Site/Facility ID #: REST (Navajo - Artesia)

P.O. # 107027

Collected by (signature): Scott Ude

Immediately Packed on Ice: N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ... 200%
___ Next Day ... 100%
___ Two Day ... 50%
___ Three Day ... 25%

Date Results Needed

Email? ___ No ✓ Yes
FAX? ___ No ___ Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO_2NO_3, TDS	Long List Metals (Total & Dissolved)	Cyanide
~~RW-#11-0~~	Grab	GW					X	X		X	X	X	X		
~~KWB-124~~	Grab	GW					X	X	X		X	X	X	X	X
~~KWB-128~~	Grab	GW					X	X	X		X	X	X	X	X
~~KWB-2R~~	Grab	GW					X	X		X	X	X	X		
~~MW-58~~	Grab	GW					X	X			X	X	X	X	X
~~KWB-13~~	Grab	GW					X	X			X	X	X	X	X
	Grab	GW													
	Grab	GW													
	Grab	GW													
	Grab	GW													

Analysis / Container / Preservative

Chain of Custody

ESC LABORATORIES

L# L905608

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: Chris McCord

Cooler:

Shipped Via:

Item #/Container ID | Sample # (lab only)

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

pH ___ Temp ___

Flow ___ Other ___

Remarks: **Dissolved metals field-filtered.**

Hold #

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	1500	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___

Temp: 3.1 °C Bottles Received: 44 S

Date: 4-28-17 Time: 0900

Condition: (lab use only)

COC Seal Intact: ___ Y ___ N ___ NA

pH Checked: NCF:

Chain of Custody Page 19 of 34

ESC LAB SCIENCES

Company Name/Address: **TRC Solutions - Austin, TX** 505 E. Huntland Dr, Ste 250 Austin, TX 78752	Billing Information: Accounts Payable 21 Griffin Road North Windsor, CT 06095
Report to: Julie Speer	Email To: speer@trcwsolutions.com
Project Description: REST Spring 2017	City/State Collected: NM
Phone: 512-684-3170 Fax:	Client Project # Lab Project #
Collected by (print): Scott Ude/HMI Team	Site/Facility ID #: REST (Navajo - Artesia) P.O. #: 107027
Collected by (signature): Scott Ude Immediately Packed on Ice N ___ Y ✓	Rush? (Lab MUST Be Notified) ___ Same Day 200% ___ Next Day 100% ___ Two Day 50% ___ Three Day 25% Date Results Needed Email? ___No ✓Yes FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide		Remarks/Contaminant	Sample # (lab only)
~~MW-103~~	Grab	GW					X	X	X	X	X	X	X					
~~MW-104~~	Grab	GW					X	X	X	X	X	X	X					
~~MW-04~~	Grab	GW					X	X	X	X	X	X	X					
~~MW-66~~	Grab	GW					X	X	X	X	X	X	X					
~~RW-5R~~	Grab	GW					X	X	X	X	X	X	X					
~~MW-102~~	Grab	GW					X	X		X	X	X	X					
~~RW-4~~	Grab	GW					X	X	X	X	X	X	X					
~~RW-6~~	Grab	GW					X	X		X	X	X	X					
~~MW-99~~	Grab	GW					X	X		X	X	X	X					
~~MW-68~~	Grab	GW					X	X	X	X	X	X	X					
	Grab	GW					X	X	X		X	X	X	X	X			

* Matrix: SS - Soil GW - Groundwater WW - WesteWater DW - Drinking Water OT - Other ___

Remarks: **Dissolved metals field-filtered.**

pH ___ Temp ___

Flow ___ Other ___

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	1500	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✓ FedEx ☐ Courier ☐ ___

Temp: 3.1 °C Bottles Received: 45

Date: 4-28-17 Time: 0900

Hold #

Condition: (lab use only)

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

L# L905668

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: Chris McCord

Cooler:

Shipped Via:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: **REST Spring 2017**
City/State Collected: NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): Scott Ude/HMI Team
Site/Facility ID #: REST (Navajo - Artesia)
P.O. # 107027

Collected by (signature): Scott Ude
Immediately Packed on Ice: N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day 200%
____ Next Day 100%
____ Two Day 50%
____ Three Day 25%

Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

ESC LAB SCIENCES

L # L905668
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide	Remarks / Containers #	Sample # (lab only)
~~MW-28~~	Grab	GW					X	X	X		X	X	X	X	X		
MW-59	Grab	GW		4/27/17	925	10	X	X	X	X	X	X	X				67
MW-60	Grab	GW		4/27/17	1015	11	X	X	X		X	X	X	X	X		68
~~MW-107~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-126~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-125~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-116~~	Grab	GW					X	X	X	X	X	X	X				
	Grab	GW															
	Grab	GW															
	Grab	GW															

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ____

pH ____ Temp ____
Flow ____ Other ____

Remarks: **Dissolved metals field-filtered.**

Hold #
Condition: (lab use only)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	1500	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ ____
Temp: 3.1 °C Bottles Received: 45
Date: 4-28-17 Time: 0900

COC Seal Intact: ___ Y ___ N ___ NA
pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcsolutions.com

Project Description: **REST Spring 2017**
City/State Collected: NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): Scott Ude/HMI Team
Collected by (signature): Scott Ude
Immediately Packed on Ice N ___ Y ✓

Site/Facility ID #: REST (Navajo - Artesia)
P.O. #: 107027
Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%
Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide		Rem./Contaminant	Sample # (lab only)
~~UG-2~~	Grab	GW					X	X	X		X	X	X	X	X			
~~UG-3R~~	Grab	GW					X	X	X		X	X	X	X	X			
~~UG-1~~	Grab	GW					X	X	X		X	X	X	X	X			
~~UG-4~~	Grab	GW					X	X	X		X	X	X	X	X			
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

pH ___ Temp ___
Flow ___ Other ___

Remarks: **Dissolved metals field-filtered.**

Relinquished by : (Signature): Scott Ude — Date: 4/27/17 — Time: 1500
Relinquished by : (Signature) — Date: — Time:
Relinquished by : (Signature) — Date: — Time:

Received by: (Signature)
Received by: (Signature)
Received for lab by: (Signature) — Date: 4.28.17 — Time: 0900

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___
Temp: 3.1 °C Bottles Received: 445
COC Seal Intact: ✓Y ___N ___NA
pH Checked: NCF:

Hold #
Condition: (lab use only)

Chain of Custody Page ___ of ___

ESC LAB SCIENCES
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L903668
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

22 34

Chain of Custody Page ___ of ___

ESC LAB SCIENCES

Company Name/Address: **TRC Solutions - Austin, TX** 505 E. Huntland Dr, Ste 250 Austin, TX 78752	Billing Information: **Accounts Payable** 21 Griffin Road North Windsor, CT 06095
Report to: Julie Speer	Email To: jspeer@trcwsolutions.com
Project Description: **REST Spring 2017**	City/State Collected: NM
Phone: 512-684-3170 Fax:	Client Project #	Lab Project #
Collected by (print): **Scott Ude/HMI Team**	Site/Facility ID # REST (Navajo - Artesia)	P.O. # 107027
Collected by (signature): Scott Ude Immediately Packed on Ice N ___ Y ✓	*Rush?* (Lab MUST Be Notified) ___ Same Day ....200% ___ Next Day ....100% ___ Two Day ....50% ___ Three Day 25%	Date Results Needed Email? ___No ✓Yes FAX? ___No ___Yes

Lab # L905613

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: Chris McCord

Cooler:

Shipped Via:

Remarks/Contaminant | Sample # (lab only)

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Ctnrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO_2NO_3, TDS	Long List Metals (Total & Dissolved)	Cyanide		Sample # (lab only)
MW-101	Grab	GW		4/27/17	945	0	X	X	X	X	X	X	X				-74
~~MW-105~~	Grab	GW					X	X	X	X	X	X	X				
~~RW-2~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-61~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-62~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-93~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-43~~	Grab	GW					X	X	X		X	X	X	X	X		
~~MW-137~~	Grab	GW					X	X	X		X	X	X	X	X		
~~MW-138~~	Grab	GW					X	X	X		X	X	X	X	X		
~~MW-23~~	Grab	GW					X	X	X	X	X	X	X				

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

pH ___ Temp ___

Remarks: **Dissolved metals field-filtered.**

Flow ___ Other ___

Hold #

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	1500	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___

Temp: 5.1 °C Bottles Received: 445

Date: 4.28.17 Time: 0900

Condition: (lab use only)

COC Seal Intact: ✓ Y ___ N ___ NA

pH Checked: NCF:

23 34

Company Name/Address:	Billing Information:
TRC Solutions - Austin, TX 505 E. Huntland Dr, Ste 250 Austin, TX 78752	Accounts Payable 21 Griffin Road North Windsor, CT 06095
Report To: Julie Speer	Email To: jspeer@trcwsolutions.com
Project Description: REST Spring 2017	City/State Collected: NM
Phone: 512-684-3170 Fax:	Client Project #	Lab Project #
Collected by (print): Scott Ude/HMI Team	Site/Facility ID #: REST (Navajo - Artesia)	P.O. #: 107027
Collected by (signature): Scott Ude Immediately Packed on Ice: N ___ Y ✓	Rush? (Lab MUST Be Notified) ___ Same Day ....200% ___ Next Day ....100% ___ Two Day ....50% ___ Three Day 25%	Date Results Needed Email? ___ No ✓ Yes FAX? ___ No ___ Yes

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

ESC LAB SCIENCES

L#: L905668

Table #:

Acctnum: TRCATX

Template:

Prelogin:

TSR: Chris McCord

Cooler:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO_2NO_3, TDS	Long List Metals (Total & Dissolved)	Cyanide		Remk./Contaminant	Sample # (lab only)
~~MW-39~~	Grab	GW					X	X	X	X	X	X	X					
~~MW-88~~	Grab	GW					X	X	X	X	X	X	X					
RW-10	Grab	GW		4/27/17	955	10	X	X	X	X	X	X	X					65
MW-40	Grab	GW		4/27/17	1210	0	X	X	X	X	X	X	X					-75
~~MW-41~~	Grab	GW					X	X	X	X	X	X	X					
RW-9	Grab	GW		4/27/17	1115	0	X	X	X	X	X	X	X					-76
~~MW-42~~	Grab	GW					X	X	X	X	X	X	X					
~~MW-29~~	Grab	GW					X	X	X	X	X	X	X					
~~RW-#16B~~	Grab	GW					X	X		X	X	X	X					
~~MW-106~~	Grab	GW					X	X	X	X	X	X	X					

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other _____

pH _____ Temp _____

Flow _____ Other _____

Remarks: **Dissolved metals field-filtered.**

Hold #:

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	1500	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____

Temp: 3.1 °C Bottles Received: 445

Date: 4-25-17 Time: 0900

Condition: (lab use only)

COC Seal Intact: ___ Y ___ N ___ NA

pH Checked: NCF:

24 34

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcsolutions.com

Project Description: **REST Spring 2017**
City/State Collected: NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Collected by (signature): Scott Ude
Immediately Packed on Ice N ___ Y ✓

Site/Facility ID #: REST (Navajo - Artesia)
P.O. #: 107027
Date Results Needed

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Email? ___ No ✓ Yes
FAX? ___ No ___ Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide		Sample # (lab only)
~~MW-30~~	Grab	GW					X	X		X	X	X	X				
~~MW-97~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-92~~	Grab	GW					X	X	X	X	X	X	X				
~~RW-1~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-91~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-90~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-96~~	Grab	GW					X	X	X	X	X	X	X				
~~MW-94~~	Grab	GW					X	X	X	X	X	X	X				
~~RW-8~~	Grab	GW					X	X		X	X	X	X				
~~MW-67~~	Grab	GW					X	X	X		X	X	X	X	X		

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

Remarks: **Dissolved metals field-filtered.**

pH ___ Temp ___
Flow ___ Other ___

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	1500	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ ___
Temp: 3.1 °C Bottles Received: 445
Date: 4-28-17 Time: 0900

Hold #
Condition: (lab use only)
COC Seal Intact: ___ Y ___ N ___ NA
pH Checked: NCF:

Chain of Custody Page ___ of ___

ESC LAB SCIENCES

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905668
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:
Rem./Contaminant

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcwsolutions.com

Project Description: **REST Spring 2017**

City/State Collected: NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID #: REST (Navajo - Artesia)

P.O. #: 107027

Collected by (signature): Scott Ude

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Immediately Packed on Ice N ___ Y ✓

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide			
~~MW-95~~	Grab	GW					X	X	X	X	X	X	X					
~~RW-1~~	Grab	GW					X	X	X	X	X	X	X					
~~RW-#17A~~	Grab	GW					X	X	X	X	X	X	X					
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

ESC LAB SCIENCES
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905609

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: Chris McCord

Cooler:

Shipped Via:

Sample # (lab only)

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

pH ___ Temp ___

Remarks: **Dissolved metals field-filtered.**

Flow ___ Other ___

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	1502	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___

Temp: 3.1 °C Bottles Received: 945

Date: 4-28-17 Time: 0900

Condition: (lab use only)

COC Seal Intact: ✓ Y ___ N ___ NA

pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: **REST Spring 2017**
City/State Collected: NM
Phone: 512-684-3170
Fax:
Client Project #
Lab Project #
Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: REST (Navajo - Artesia)
P.O. #: 107027
Collected by (signature): Scott Ude
Immediately Packed on Ice N ___ Y ✓
Rush? (Lab MUST be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%
Date Results Needed
Email? ___ No ✓ Yes
FAX? ___ No ___ Yes

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

ESC LAB SCIENCES

L#: L905663
Table #:
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide		Rem./Contaminant	Sample # (Lab only)
DUP-REST-01	Grab	GW		4/27/17	1000	10	X	X	X	X	X	X	X					66
~~DUP-REST-02~~	Grab	GW					X	X	X	X	X	X	X					
~~DUP-REST-03~~	Grab	GW					X	X	X	X	X	X	X					
DUP-REST-04	Grab	GW		4/27/17	800	11	X	X	X		X	X	X	X	X			67
~~DUP-REST-05~~	Grab	GW					X	X	X		X	X	X	X	X			
EB-REST-01	Grab	GW		4/27/17	935	10	X	X	X	X	X	X	X					68
~~EB-REST-02~~	Grab	GW					X	X	X	X	X	X	X					
~~EB-REST-03~~	Grab	GW					X	X	X	X	X	X	X					
EB-REST-04	Grab	GW		4/27/17	1030	11	X	X	X		X	X	X	X	X			69
~~EB-REST-05~~	Grab	GW					X	X	X		X	X	X	X	X			

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

pH ___ Temp ___
Flow ___ Other ___

Remarks: **Dissolved metals field-filtered.**

Hold #

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	1500	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ ___
Temp: 3.1 °C Bottles Received: 445
Date: 4-28-17 Time: 0900

Condition: (lab use only)
COC Seal Intact: ✓ Y ___ N ___ NA
pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: **Julie Speer**

Email To: **jspeer@trcsolutions.com**

Project Description: **REST Spring 2017**

City/State Collected: **NM**

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #

Collected by (print): **Scott Ude/HMI Team**

Site/Facility ID #: **REST (Navajo - Artesia)**

P.O. # 107027

Collected by (signature): Scott Ude

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 35%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

ESC LAB SCIENCES

L# L905668

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: **Chris McCord**

Cooler:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle)	Anions	NO2NO3, TDS	Long List Metals (Total & Dissolved)	Cyanide		Remarks/Contaminant	Sample # (lab only)
~~Trip Blank-REST-01~~	Grab	GW					X											
~~Trip Blank-REST-02~~	Grab	GW					X											
~~Trip Blank-REST-03~~	Grab	GW					X											
Trip Blank-REST-04	Grab	GW		4/27/17	—		X											70
~~Trip Blank-REST-05~~	Grab	GW					X											
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

pH ___ Temp ___

Remarks: **Dissolved metals field-filtered.**

Flow ___ Other ___

Hold #

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	1500	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___

Temp: 3.1 °C Bottles Received: 745

Date: 4-28-17 Time: 0800

Condition: (lab use only)

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

Company Name/Address:	Billing Information:
TRC Solutions - Austin, TX **505 E. Huntland Dr, Ste 250** **Austin, TX 78752**	**Accounts Payable** **21 Griffin Road North** **Windsor, CT 06095**
Report to: Julie Speer	Email To: jspeer@trcwsolutions.com
Project Description: **TEL Spring 2017**	City/State Collected: NM
Phone: 512-684-3170 Fax:	Client Project #	Lab Project #
Collected by (print): **Scott Ude/HMI Team**	Site/Facility ID #: TEL (Navajo - Artesia)	P.O. #: 107027
Collected by (signature): Scott Ude Immediately Packed on Ice N ___ Y ✓	***Rush?*** (Lab MUST Be Notified) ___ Same Day ....200% ___ Next Day ....100% ___ Two Day ....50% ___ Three Day 25%	Date Results Needed Email? ___No ✓Yes FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

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12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905645
B238

Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle) 12	Anions	NO2NO3, TDS 12	Long List Metals (Total & Dissolved)	Cyanide	Rem./Contaminant	Sample # (lab only)
TEL-4	Grab	GW		4/27/17	1055	10	X	X	X	X	X	X	X				-01
TEL-3	Grab	GW		4/27/17	1150	10	X	X	X	X	X	X	X				-02
TEL-2	Grab	GW		4/27/17	1045	10	X	X	X	X	X	X	X				-03
TEL-1	Grab	GW		4/27/17	855	10	X	X	X	X	X	X	X				DV
MW-49	Grab	GW		4/27/17	1030	9	X	X	X		X	X	X	X	X		-08
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: **Dissolved metals field-filtered.**

pH _____ Temp _____
Flow _____ Other _____

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	1500	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Matt

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____
Temp: 2.6 °C Bottles Received: 61
Date: 4-28-17 Time: 845

Hold #
Condition: (lab use only)
COC Seal Intact: ✓ Y ___ N ___ NA
pH Checked: C2 NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com

Project Description: **TEL Spring 2017**
City/State Collected: NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #

Collected by (print): **Scott Ude/HMI Team**
Site/Facility ID #: TEL (Navajo - Artesia)
P.O. #: 107027

Collected by (signature): Scott Ude
Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

ESC LABORATORIES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905645
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: **Chris McCord**
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle) L2	Anions	NO2NO3, TDS L2	Long List Metals (Total & Dissolved)	Cyanide	Rem./Contaminant	Sample # (lab only)
DUP-TEL-01	Grab	GW		4/27/17	1100	10	X	X	X	X	X	X	X				05
EB-TEL-01	Grab	GW		4/27/17	1205	10	X	X	X	X	X	X	X				06
Trip Blank-TEL-01	Grab	GW		4/27/17	—	1	X										07
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other ___

Remarks: **Dissolved metals field-filtered.**

pH ___ Temp ___
Flow ___ Other ___

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	1500	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Mwt

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___
Temp: 2.4 °C Bottles Received: 61
Date: 4-28-17 Time: 845

Hold #
Condition: (lab use only)
OK
COC Seal Intact: ___Y ___N ___NA
pH Checked: L2 NCF:

Company Name/Address:	Billing Information:
TRC Solutions - Austin, TX **505 E. Huntland Dr, Ste 250** **Austin, TX 78752**	**Accounts Payable** **21 Griffin Road North** **Windsor, CT 06095**
Report to: Julie Speer	Email To: jspeer@trcwsolutions.com
Project Description: **TMD Spring 2017**	City/State Collected: NM
Phone: 512-684-3170 Fax:	Client Project #	Lab Project #
Collected by (print): **Scott Ude/HMI Team**	Site/Facility ID #: TMD (Navajo - Artesia)	P.O. #: 107027
Collected by (signature): Scott Ude Immediately Packed on Ice N ___ Y ✓	***Rush?*** (Lab MUST Be Notified) ___ Same Day .....200% ___ Next Day .....100% ___ Two Day .....50% ___ Three Day 25%	Date Results Needed Email? ___No ✓Yes FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

ESC LABORATORY SCIENCES — YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905607

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: **Chris McCord**

Cooler:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle) 12	Anions	NO2NO3, TDS 12	Long List Metals (Total & Dissolved)	Cyanide 7 12	Rem./Contaminant	Sample # (lab only)
MW-20	Grab	GW		4/27/17	1020	8	X	X		X	X	X	X				02
~~NP-1~~	Grab	GW					X				X	X	X				
~~NP-6~~	Grab	GW					X										
MW-8	Grab	GW		4/27/17	1150	8	X	X	X	X	X	X	X				03
MW-21	Grab	GW		4/27/17	1105	8	X	X	X	X	X	X	X				04
~~MW-71~~	Grab	GW					X	X			X	X	X	X	X		
~~MW-68~~	Grab	GW					X	X		X	X	X	X				
~~MW-27~~	Grab	GW					X	X		X	X	X	X				
~~MW-89~~	Grab	GW					X	X		X	X	X	X				
~~MW-16~~	Grab	GW					X	X		X	X	X	X				

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

pH _____ Temp _____

Remarks: **Dissolved metals field-filtered.**

Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	1500	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Mat

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____

Temp: 2.6 °C Bottles Received: 97

Date: 4-28-17 Time: 845

Condition: (lab use only)

COC Seal Intact: ___Y ___N ___NA

pH Checked: C2, 7/2 NCF:

33 34

Company Name/Address:	Billing Information:
TRC Solutions - Austin, TX **505 E. Huntland Dr, Ste 250** **Austin, TX 78752**	**Accounts Payable** **21 Griffin Road North** **Windsor, CT 06095**
Report to: Julie Speer	Email To: jspeer@trcwsolutions.com
Project Description: **TMD Spring 2017**	City/State Collected: NM
Phone: 512-684-3170 Fax:	Client Project #	Lab Project #
Collected by (print): **Scott Ude/HMI Team**	Site/Facility ID #: TMD (Navajo - Artesia)	P.O. #: 107027
Collected by (signature): Scott Ude Immediately Packed on Ice N ___ Y ✓	***Rush?*** (Lab MUST Be Notified) ___ Same Day .....200% ___ Next Day .....100% ___ Two Day .....50% ___ Three Day 25%	Date Results Needed Email? ___No ✓Yes FAX? ___No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & Dissolved)	Cations (from "total metals" bottle) C2	Anions	NO2NO3, TDS C2	Long List Metals (Total & Dissolved)	Cyanide		Rem./Contaminant	Sample # (lab only)
MW-46R	Grab	GW		4/27/17	1140	8	X	X		X	X	X	X					13
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																
	Grab	GW																

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks: **Dissolved metals field-filtered.**

pH _____ Temp _____

Flow _____ Other _____

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	4/27/17	1500	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____

Temp: 2-6 °C Bottles Received: 97

Date: 4-28-17 Time: 845

Chain of Custody Page ___ of ___

ESC LABORATORY SCIENCES

YOUR LAB OF CHOICE

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L905602

Table #

Acctnum: TRCATX

Template:

Prelogin:

TSR: **Chris McCord**

Cooler:

Shipped Via:

Hold #

Condition: (lab use only)

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service

Record of Climatological Observations

These data are quality controlled and may not be identical to the original observations.

Generated on 01/08/2018

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Current Location: Elev: 3366 ft. Lat: 32.7547° N Lon: -104.3835° W

Station: **ARTESIA 6 S, NM US USC00290600**

Observation Time Temperature: 0730 Observation Time Precipitation: 0730

Year	Month	Day	Temperature (F)			Precipitation					Evaporation		Soil Temperature (F)					
			24 Hrs. Ending at Observation Time		At Observation	24 Hour Amounts Ending at Observation Time				At Obs. Time			4 in. Depth			8 in. Depth		
			Max.	Min.		Rain, Melted Snow, Etc. (in)	Flag	Snow, Ice Pellets, Hail (in)	Flag	Snow, Ice Pellets, Hail, Ice on Ground (in)	24 Hour Wind Movement (mi)	Amount of Evap. (in)	Ground Cover (see *)	Max.	Min.	Ground Cover (see *)	Max.	Min.
2017	10	01	68	60	63	0.03		0.0		0		0.09	5	62	62			
2017	10	02	79	62	64	0.00		0.0		0		0.13	5	62	61			
2017	10	03	89	64	67	0.00		0.0		0		0.29	5	63	61			
2017	10	04	85	66	67	0.00		0.0		0		0.21	5	64	62			
2017	10	05	82	67	68	0.02		0.0		0		0.28	5	64	62			
2017	10	06	82	66	67	0.00		0.0		0		0.20	5	64	63			
2017	10	07	92	46	46	0.00		0.0		0		0.25	5	69	66			
2017	10	08	79	41	42	0.00		0.0		0		0.16	5	68	64			
2017	10	09	89	41	54	0.00		0.0		0		0.17	5	65	64			
2017	10	10	80	42	42	0.00		0.0		0		0.30	5	64	62			
2017	10	11	63	39	39	0.00		0.0		0		0.16	5	66	60			
2017	10	12	77	39	50	0.00		0.0		0		0.49	5	63	61			
2017	10	13	89	48	57	0.00		0.0		0		0.35	5	65	63			
2017	10	14	91	57	62	0.00		0.0		0		0.21	5	66	65			
2017	10	15	90	47	47	0.00		0.0		0		0.33	5	67	65			
2017	10	16	68	35	36	0.00		0.0		0		0.24	5	65	61			
2017	10	17	73	35	36	0.00		0.0		0		0.29	5	64	61			
2017	10	18	83	36	43	0.00		0.0		0		0.23	5	63	61			
2017	10	19	88	36	55	0.00		0.0		0		0.13	5	64	62			
2017	10	20	77	54	54	0.33		0.0		0		0.12	5	62	61			
2017	10	21	81	53	60	0.00		0.0		0		0.20	5	62	60			
2017	10	22	82	37	40	0.00		0.0		0		0.30	5	62	60			
2017	10	23	72	40	43	0.00		0.0		0		0.22	5	62	58			
2017	10	24	85	39	40	0.00		0.0		0		0.13	5	62	59			
2017	10	25	67	35	36	0.00		0.0		0		0.09	5	62	57			
2017	10	26	75	35	56	0.00		0.0		0		0.38	5	59	56			
2017	10	27	87	41	43	0.00		0.0		0		0.25	5	59	57			
2017	10	28	56	29	31	0.00		0.0		0		0.17	5	60	55			
2017	10	29	59	30	31	0.00		0.0		0		0.23	5	59	53			
2017	10	30	79	29	46	0.00		0.0		0		0.33	5	55	53			
2017	10	31	61	40	40	0.05		0.0		0		0.24	5	54	52			
		Summary	78	45		0.43		0.0										

Empty, or blank, cells indicate that a data observation was not reported.

*Ground Cover: 1=Grass; 2=Fallow; 3=Bare Ground; 4=Brome grass; 5=Sod; 6=Straw mulch; 7=Grass muck; 8=Bare muck; 0=Unknown

"s" This data value failed one of NCDC's quality control tests.

"T" values in the Precipitation or Snow category above indicate a "trace" value was recorded.

"A" values in the Precipitation Flag or the Snow Flag column indicate a multiday total, accumulated since last measurement, is being used.

Data value inconsistency may be present due to rounding calculations during the conversion process from SI metric units to standard imperial units.

HMI
Groundwater

Hydrologic Monitoring
1654 W. Sam Houston Pkwy. N.
Houston, Texas 77043

Phone 713.464.5206
Fax 713.464.5207

October 9, 2017

Ms. Julie Speer, P.G., EIT
Associate Project Manager
TRC
505 East Huntland Drive, Suite 250
Austin, Texas 78752

Subject: October 2017 (Fall) Groundwater Monitoring
Sitewide Gauging, October 3, 2017
Groundwater Sampling, October 3-4, 2017
Navajo Refining Company, Artesia, New Mexico

Dear Ms. Speer:

This document summarizes groundwater monitoring field activities conducted by Hydrologic Monitoring, LLC (HMI) on behalf of TRC at the Navajo Refining Company, Artesia Refinery, Artesia, New Mexico.

Contents

Field Activities Narrative
Table 1: (Gauging Data, Groundwater Field Parameters, Well Inspections, with Analytical Program)
Groundwater Sampling SOP Memo
Groundwater Sampling Forms and Field Instrument Calibration Log
(provided in three emails, with wells in geographic-based order shown on Table 1)
Chain-of-Custody Forms (provided in one email)

Field Activities Narrative

1. HMI conducted the *October 2017 (Fall) Event* (including only the "SA" designation on the attached scoping table, Navajo Refinery, Artesia, New Mexico. Sitewide gauging was conducted October 3, 2017. Groundwater sampling (110 wells sampled) was conducted October 3-4, 2017. On 10-2-17, TRC notified HMI that five wells would change sampling frequency from semiannual to annual, effective 2H17 (MW-56, MW-77, MW-93, MW-107, and MW-129).

2. Groundwater sampling was conducted in accordance with the Site Sampling and Analysis Plan, EPA guidance, and the attached Memorandum - Low-Flow Groundwater Monitoring Standard

Operating Procedures, Navajo Refining Co. - Artesia, New Mexico. Per regulatory request, if measured LNAPL thickness was *less than* 0.03-feet, in any well scheduled for groundwater sampling, the LNAPL was removed, and the well was sampled. And if LNAPL thickness equaled 0.03-feet or *greater*, the well was not sampled. Gauging data, groundwater field parameters, and well inspection information is summarized in Table 1. Samples were shipped overnight FedEx to ESC Lab Sciences, Mt. Juliet, TN. The groundwater sampling process is documented on the attached groundwater sampling forms.

3. Field QA/QC Sampling (per Refinery Area):

Evaporation Ponds
Duplicates:
Dup-EP-01 at MW-7A
Dup-EP-02 at MW-22A
Dup-EP-03 at MW-3
Equipment Blanks:
EB-EP-01 collected over decontaminated gauging probe following sampling at MW-74
EB-EP-02 collected over decontaminated gauging probe following sampling at MW-124
EB-EP-03 collected over decontaminated gauging probe following sampling at MW-5A
EB-EP-04 collected over decontaminated gauging probe following sampling at MW-79
Trip Blank-EP-01
Trip Blank-EP-02
Trip Blank-EP-03

NCL
Duplicate:
Dup-NCL-01 at NCL-49
Equipment Blank:
EB-NCL-01 collected over decontaminated gauging probe following sampling at NCL-32
Trip Blank-NCL-01

TEL
Duplicate:
Dup-TEL-01 at TEL-4
Equipment Blank:
EB-TEL-01 collected over decontaminated gauging probe following sampling at TEL-3
Trip Blank-TEL-01

TMD
Trip Blank-TMD-01
Limited TMD scope generated no additional field QA/QC samples

REST ("rest" of the site)
Duplicates:
Dup-REST-01 at MW-113
Dup-REST-02 at MW-104
Dup-REST-03 at MW-134
Dup-REST-04 at MW-60
Dup-REST-05 at KWB-12B

Equipment Blanks:
EB-REST-01 collected over decontaminated gauging probe following sampling at MW-113

EB-REST-02 collected over decontaminated gauging probe following sampling at MW-104
EB-REST-03 collected over decontaminated gauging probe following sampling at MW-134
EB-REST-04 collected over decontaminated gauging probe following sampling at MW-60
EB-REST-05 collected over decontaminated gauging probe following sampling at KWB-12B
Trip Blank-REST-01
Trip Blank-REST-02
Trip Blank-REST-03
Trip Blank-REST-04

4. Site Notes:
   Beginning 2H17, "24HFNAV HOLLYFRONTIER SITE SPECIFIC ORIENTATION ARTESIA-NM" is taken at HASC annually, per Navajo. HMI team will get on a "December cycle", starting December 2017.
   HMI's DISA 2-yr backgound check/drug/alcohol requirements were approved by onsite safety-trailer personnel on 10-3-17, as reported through HASC system.
   Per Navajo, purgewater is disposed in the pad sump, just inside, and to the left of the Main Gate entrance. Alternately, North Bundle Pad sump, as previously (fenced area of drums, etc.), notifying FCC control room for entrance.
   Sitewide well and gate lock combinations are "2013" (less often "2002").
   With suggested telephone notification, FedEx pickup from locked shed (35-25-39 combination) at approximately 16:00 daily, across from Artesia Wool Co (access area from "inside" Refinery).
   North side of Hwy 82, east of site, gate with cable and combination lock (8810).
   POTW bldg, check-in as needed, to borrow a key or get gate unlocked.
   Navajo's Mr. Robert Combs or Richard Orosco for daily permits.
   Navajo-well locks have been fully-deployed as possible, as of 2H16.
   Well surface completion inspections are documented on respective well gauging and sampling forms (summarized in Table 1). Well inspection items of potential concern (i.e., "Issues") are highlighted in yellow-color in Table 1. HMI provided sitewide well completion photographs (every monitor/recovery well addressed during the biennial April 2017 event) to both TRC and Navajo.

HMI appreciates the opportunity to assist TRC with this project. If you have any questions or would like additional information please feel free to call us at 713.464.5206.

Sincerely,

HYDROLOGIC MONITORING

Scott C. Ude



Scott C. Ude, P.G.

The seal appearing on this document was authorized by Scott C. Ude, P.G. 353 on October 9, 2017.

Attachments

cc: Bryan Gilbert, P.G., TRC-Austin

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H17

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
MW-6A	Monitoring	RLR		EP	3-Oct	16:00	NA	12.61	0.00	19.05										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-6B	Monitoring	RLR		EP	3-Oct	16:05	NA	12.48	0.00	52.27										Yes	Closure	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
MW-85	Monitoring	RLR		EP	3-Oct	9:30	9.94	11.19	1.25	20.34			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-86	Monitoring	RLR		EP	3-Oct	9:40	9.69	10.03	0.34	19.21			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]
MW-120	Monitoring	RLR	1	EP	3-Oct	10:30	NA	12.23	0.00	28.00	3-Oct	10:55	7.04	21.5	10,230	0.7	-203.1	2.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-121	Monitoring	RLR	2	EP	3-Oct	11:10	NA	12.21	0.00	27.32	3-Oct	11:35	7.08	23.2	6,480	1.0	-50.2	4.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-84	Monitoring	RLR	3	EP	3-Oct	6:50	NA	9.32	0.00	20.56	3-Oct	10:15	6.79	22.2	10,590	0.8	-181.5	2.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-122	Monitoring	RLR	4	EP	3-Oct	11:55	NA	10.40	0.00	23.31	3-Oct	12:30	7.08	22.0	6,900	0.7	-125.1	9.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-81	Monitoring	RLR		EP	3-Oct	12:50	NA	10.80	0.00	18.63										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-80	Monitoring	RLR		EP	3-Oct	12:55	NA	9.04	0.00	19.69										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-79	Monitoring	RLR	5	EP	3-Oct	15:15	NA	10.17	0.00	19.25	4-Oct	8:55	6.78	20.2	7,080	1.3	-43.8	4.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-82	Monitoring	RLR		EP	3-Oct	15:55	NA	9.71	0.00	20.00										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-74	Monitoring	RLR	6	EP	3-Oct	15:40	NA	9.57	0.00	20.19	4-Oct	11:25	6.86	21.6	11,350	1.0	28.9	3.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-73	Monitoring	RLR		EP	3-Oct	15:45	NA	10.82	0.00	19.60										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-2A	Monitoring	RLR	7	EP	3-Oct	13:15	NA	10.27	0.00	17.31	3-Oct	13:40	7.04	23.4	8,220	1.0	-88.6	4.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-2B	Monitoring	RLR		EP	3-Oct	14:05	NA	11.01	0.00	52.00			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
MW-72	Monitoring	RLR		EP	3-Oct	15:50	NA	7.70	0.00	13.92										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
OCD-6	Monitoring	RLR	8	EP	3-Oct	15:20	NA	10.28	0.00	26.91	4-Oct	9:55	6.89	20.4	15,150	0.9	-114.2	9.8	Clear	Yes	Closure	Cracked pad	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
OCD-7AR	Monitoring	RLR	9	EP	3-Oct	15:25	NA	9.41	0.00	21.29	4-Oct	10:40	6.98	21.8	12,350	0.8	-156.7	2.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
OCD-7B	Monitoring	RLR		EP	3-Oct	15:30	NA	9.36	0.00	56.85										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
OCD-7C	Monitoring	RLR		EP	3-Oct	15:35	NA	9.19	0.00	71.95			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
RW-#15C [e]	Recovery [d]	RLR		REST	3-Oct	14:35	NA	14.19	0.00	22.30										Yes	Yes	Yes	Yes		SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-48	Monitoring	RLR	10	REST	3-Oct	14:30	NA	16.30	0.00	32.00	4-Oct	12:25	6.65	24.3	3,960	1.5	-413.8	7.3	Clear	Yes	Yes	Issue	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-130	Monitoring	RLR	11	REST	3-Oct	14:40	NA	17.83	0.00	45.00	4-Oct	12:45	6.66	22.8	3,060	0.8	-78.9	6.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
KWB-4	Monitoring	RLR		REST	3-Oct	14:50	21.88	22.16	0.28	41.75			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	-	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-19	Recovery [d]	RLR		REST	3-Oct	14:45	22.10	22.26	0.16	NM			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-76	Monitoring	SCD	12	EP	3-Oct	16:20	NA	11.15	0.00	20.33	3-Oct	16:45	6.76	22.8	6,400	1.3	-85.8	5.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-77	Monitoring	SCD		EP	3-Oct	17:05	NA	9.38	0.00	20.52										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-78	Monitoring	SCD		EP	3-Oct	17:10	NA	9.42	0.00	19.57										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-75	Monitoring	SCD	13	EP	3-Oct	17:20	NA	9.57	0.00	23.74	3-Oct	17:45	7.01	22.8	7,950	1.4	-94.9	6.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H17

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
MW-83	Monitoring	SCD	14	EP	3-Oct	15:35	NA	9.41	0.00	19.91	3-Oct	16:00	6.84	23.0	5,470	1.2	-135.2	7.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-3	Monitoring	SCD	15	EP	3-Oct	14:50	NA	9.45	0.00	20.18	3-Oct	15:15	7.04	23.3	7,500	1.1	-28.1	6.5	Clear	Yes	Yes	Issue	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-88	Monitoring	SCD	16	EP	3-Oct	11:30	NA	9.17	0.00	20.31	3-Oct	11:55	7.16	21.8	6,300	1.1	-73.9	8.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	A	A	A
MW-22A	Monitoring	SCD	17	EP	3-Oct	12:15	NA	8.38	0.00	22.65	3-Oct	12:40	6.95	22.8	7,540	1.3	-33.8	7.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-22B	Monitoring	SCD		EP	3-Oct	13:05	NA	8.20	0.00	54.66										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
MW-10	Monitoring	SCD	18	EP	3-Oct	13:15	NA	5.93	0.00	18.45	3-Oct	13:40	6.87	21.9	6,420	1.7	-31.8	5.8	Clear	Yes	Yes	Cracked pad	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-123	Monitoring	SCD	19	EP	3-Oct	14:00	NA	6.34	0.00	25.71	3-Oct	14:25	6.98	21.6	6,780	1.4	-30.1	8.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-4A	Monitoring	SCD	20	EP	3-Oct	10:45	NA	12.11	0.00	>12.22	3-Oct	11:10	7.14	22.7	6,030	2.4	-174.5	7.9	Clear	Yes	Issue	Issue	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-4B	Monitoring	SCD		EP	3-Oct	10:40	NA	11.35	0.00	72.37										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
MW-5A	Monitoring	SCD	21	EP	3-Oct	9:50	NA	8.94	0.00	20.15	3-Oct	10:15	7.05	21.9	9,380	1.1	-137.4	7.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-5B	Monitoring	SCD		EP	3-Oct	9:40	NA	8.85	0.00	53.54										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
MW-5C	Monitoring	SCD		EP	3-Oct	9:45	NA	9.03	0.00	71.64										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
MW-7A	Monitoring	SCD	22	EP	3-Oct	8:50	NA	7.96	0.00	17.25	3-Oct	9:15	7.16	21.3	9,220	1.2	-74.6	9.8	Clear	Yes	Yes	Issue	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-7B	Monitoring	SCD		EP	3-Oct	8:45	NA	9.27	0.00	52.56										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
OCD-8A	Monitoring	SCD	23	EP	3-Oct	7:45	NA	9.41	0.00	20.74	3-Oct	8:15	6.72	21.5	11,060	1.1	-143.3	7.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
OCD-8B	Monitoring	SCD		EP	3-Oct	8:35	NA	9.01	0.00	56.65										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
KWB-P4	Monitoring	BRH		REST																					B	B	B	-	B	-	-	-	-	-	-
MW-25	Monitoring	BRH		TMD	3-Oct	17:00	NA	13.92	0.00	28.18										Yes	Yes	Subsidence	Yes		SA	A	A	-	A	A	-	-	A	A	A
NP-8	Monitoring	BRH		TMD	3-Oct	17:05	NA	12.46	0.00	15.20			Not in sampling program							Issue	Issue	Yes	Yes		SA	Not in samp prgm; gauged to top of protective steel casing									
MW-1R	Monitoring	BRH		EP	3-Oct	17:10	NA	10.43	0.00	20.63										Yes	Issue	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-15	Monitoring	BRH		EP	3-Oct	17:15	NA	11.53	0.00	21.70										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
OCD-1R	Monitoring	BRH	24	EP	3-Oct	12:35	NA	11.70	0.00	23.89	3-Oct	13:00	7.17	22.3	10,070	0.6	-18.4	3.1	Clear	Yes	Issue	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
OCD-2A	Monitoring	BRH	25	EP	3-Oct	13:20	NA	11.61	0.00	27.58	3-Oct	16:40	7.47	22.4	6,890	0.6	-117.3	6.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	A	A	A
OCD-2B	Monitoring	BRH		EP	3-Oct	13:23	NA	11.44	0.00	50.39			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
OCD-3	Monitoring	BRH	26	EP	3-Oct	13:30	NA	12.29	0.00	25.48	3-Oct	15:25	7.24	22.0	7,990	0.8	-17.9	6.8	Clear	Yes	Issue	Pad destryd	Yes		SA	SA	SA	SA	SA	SA	-	-	A	A	A
OCD-4	Monitoring	BRH	27	EP	3-Oct	13:35	NA	11.57	0.00	25.42	3-Oct	14:50	7.13	22.3	14,610	0.5	-80.4	26.1	Clear	Yes	Yes	Subsidence	Yes		SA	SA	SA	SA	SA	SA	-	-	A	A	A
MW-11A	Monitoring	BRH	28	EP	3-Oct	13:40	NA	6.23	0.00	22.01	3-Oct	16:00	6.79	22.6	27,500	0.6	-34.5	6.9	Clear	Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	SA	SA	SA
MW-11B	Monitoring	BRH		EP	3-Oct	13:43	NA	9.18	0.00	47.30										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
OCD-5	Monitoring	BRH	29	EP	3-Oct	13:50	NA	9.70	0.00	25.42	3-Oct	14:15	7.35	21.8	16,830	0.7	-105.8	42.1	Sl. Cloudy	Yes	Yes	Pad cracked	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-87	Monitoring	BRH	30	EP	3-Oct	9:10	NA	8.65	0.00	20.39	3-Oct	9:35	7.03	21.4	17,380	0.5	-113.6	1.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	A	A	A

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H17

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
MW-18A	Monitoring	BRH	31	EP	3-Oct	10:00	NA	10.00	0.00	22.58	3-Oct	10:25	7.06	20.6	23,400	0.9	-90.3	1.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	SA	SA	SA	SA	SA
MW-18B	Monitoring	BRH		EP	3-Oct	9:58	NA	9.93	0.00	50.59										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
MW-18T	Monitoring	BRH		EP	3-Oct	9:55	NA	9.73	0.00	50.38			Not in sampling program							Issue	Issue	Issue	Yes		SA	Not in samp prgm; gauged to highest pointt of shattered PVC									
MW-70	Monitoring	BRH	32	EP	3-Oct	10:45	NA	8.29	0.00	22.05	3-Oct	11:10	7.11	21.7	6,930	0.8	-82.1	6.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	A	A	A
MW-124	Monitoring	BRH	33	EP	3-Oct	11:25	NA	8.96	0.00	22.01	3-Oct	11:50	6.94	21.7	12,780	0.9	-85.7	14.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-52	Monitoring	BRH	34	REST	3-Oct	19:20	NA	16.33	0.00	34.67	4-Oct	8:15	6.94	20.4	3,300	0.9	47.3	3.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-109	Monitoring	BRH	35	REST	3-Oct	19:24	NA	14.63	0.00	29.48	4-Oct	9:00	6.53	21.8	3,510	0.5	-361.9	6.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-110	Monitoring	BRH	36	REST	3-Oct	19:30	NA	13.26	0.00	29.74	4-Oct	9:45	6.98	21.4	2,160	0.5	-266.3	5.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-13	Monitoring	BRH		EP	3-Oct	17:55	NA	11.88	0.00	21.10			Not in sampling program							Yes	Yes	Yes	Yes		SA	No sampling due to location N. of river									
MW-69	Monitoring	BRH		EP	3-Oct	17:50	NA	10.51	0.00	22.50			Not in sampling program							Yes	Yes	Yes	Yes		SA	No sampling due to location N. of river									
MW-12	Monitoring	BRH		EP	3-Oct	18:10	NA	9.74	0.00	17.93			Not in sampling program							Yes	Yes	Yes	Yes		SA	No sampling due to location N. of river									
MW-24	Monitoring	BRH		EP	3-Oct	18:30	NA	11.48	0.00	23.51			Not in sampling program							Yes	Yes	Issue	Yes		SA	No sampling due to location E. of river									
MW-14	Monitoring	BRH		EP	3-Oct	18:35	NA	10.59	0.00	>11.93			Not in sampling program							Yes	Issue	Yes	Yes		SA	No sampling due to location N. of river									
RW-12	Recovery [d]	BTB		Field E of Refin	3-Oct		Not in gauging program						Not in sampling program												-	-	-	-	-	-	-	-	-	-	-
RW-12R	Recovery [d]	BTB		REST	3-Oct	10:48	NA	18.14	0.00	NM										Yes	Yes	Yes	Yes		SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-113	Monitoring	BTB	37	REST	3-Oct	10:45	NA	18.44	0.00	37.80	4-Oct	11:40	6.81	21.1	2,610	1.8	-167.4	5.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
KWB-8	Monitoring	BTB	38	REST	3-Oct	10:40	16.65	16.66	0.01	35.80	3-Oct	16:40	6.79	26.1	3,418	0.7	-234.6	6.7	Clear	Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	-	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]
RW-22	Recovery [d]	BTB		REST	3-Oct	10:37	16.88	17.31	0.43	NM			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
RW-20A	Recovery [d]	BTB		REST	3-Oct	10:32	19.94	20.01	0.07	NM										NA	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
RW-20B	Recovery [d]	BTB		REST	3-Oct	10:28	19.98	20.37	0.39	NM										NA	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
RW-13	Recovery [d]	BTB		Field E of Refin	3-Oct		Not in gauging program						Not in sampling program											Y	-	-	-	-	-	-	-	-	-	-	-
RW-13R	Recovery [d]	BTB		REST	3-Oct	10:53	17.05	17.28	0.23	NM										Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
RW-14	Recovery [d]	BTB		Field E of Refin	3-Oct		Not in gauging program						Not in sampling program											Y	-	-	-	-	-	-	-	-	-	-	-
RW-14R	Recovery [d]	BTB		REST	3-Oct	10:58	16.59	17.71	1.12	NM										Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-133	Monitoring	BTB		REST	3-Oct	11:02	16.89	17.16	0.27	37.64			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-134	Monitoring	BTB	39	REST	3-Oct	11:06	NA	16.52	0.00	32.95	4-Oct	11:10	6.76	19.2	5,277	1.1	67.7	3.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
RA-4798	Irrigation	BTB	40	REST			Not in gauging program			NA	3-Oct	17:00	7.03	19.1	1,189	1.7	76.4	0.9	Clear	NA	NA	Yes	Yes		NA	SA	-	-	SA	-	-	-	SA	SA	SA
RA-4196	Irrigation	BTB	41	REST			Not in gauging program			NA	4-Oct	11:45	6.91	23.8	2,581	1.9	13.8	1.5	Clear	NA	NA	Yes	Yes		NA	SA	-	-	SA	-	-	-	SA	SA	SA
RA-1227	Irrigation	BTB		REST			Removed from program by Navajo, 4-13-15						Removed from program by Navajo, 4-13-15												NA	A [h]	-	-	A [h]	-	-	-	A [h]	A [h]	A [h]
RA-3156	Irrigation	BTB		REST			Not in gauging program			NA										NA	NA	NA	Yes		NA	A	-	-	A	-	-	-	A	A	A

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H17

Navajo Refinery Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
RA-313	Irrigation	BTB		REST			Not in gauging program			NA										NA	NA	NA	Yes		NA	A	-	-	A	-	-	-	A	A	A
KWB-7	Monitoring	BTB	42	REST	3-Oct	10:20	17.77	17.78	0.01	34.83	3-Oct	13:30	6.79	19.3	3,177	0.6	-101.7	6.9	Clear	Yes	Yes	Needs pad	Yes	Y	SA	SA	SA	-	SA	SA	SA	SA	SA	SA	SA
MW-135	Monitoring	BTB	43	REST	3-Oct	10:01	NA	26.35	0.00	65.55	3-Oct	15:50	6.68	19.0	6,639	2.5	124.6	41.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-20	Monitoring	BTB		TMD	3-Oct	11:18	NA	12.24	0.00	26.66										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
NP-3	Monitoring	BTB		TMD	3-Oct	11:11	NA	19.04	0.00	21.59			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
NP-4	Monitoring	BTB		TMD	3-Oct	11:14	NA	25.10	0.00	36.98			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
NP-2	Monitoring	BTB		TMD	3-Oct	11:23	NA	15.47	0.00	21.49			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
NP-1	Monitoring	BTB	44	TMD	3-Oct	11:27	NA	15.29	0.00	21.88	4-Oct	12:45	6.90	19.4	4,896	1.3	52.7	1.0	Clear	Yes	Yes	Yes	Yes		SA	SA	-	-	SA	-	-	-	A	A	A
NP-6	Monitoring	BTB		TMD	3-Oct	11:30	NA	11.33	0.00	20.35										Yes	Yes	Yes	Yes		SA	B	-	-	B	-	-	-	-	-	-
MW-8	Monitoring	BTB		TMD	3-Oct	11:41	NA	9.80	0.00	20.12										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-21	Monitoring	BTB	45	TMD	3-Oct	11:44	NA	11.13	0.00	25.12	4-Oct	12:45	7.11	21.2	5,230	1.4	-60.3	3.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-9	Monitoring	BTB		TMD	3-Oct	11:47	NA	10.21	0.00	20.19			Not in sampling program							Yes	Yes	Cracked pad	Yes		SA	Not in sampling program									
MW-71	Monitoring	BTB		TMD	3-Oct	11:35	NA	12.43	0.00	21.87										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	A	A	A	A	A
MW-68	Monitoring	BTB		TMD	3-Oct	9:08	NA	15.81	0.00	26.52										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-27	Monitoring	BTB		TMD	3-Oct	9:20	NA	14.88	0.00	30.28										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-89	Monitoring	BTB		TMD	3-Oct	9:28	NA	8.33	0.00	20.28										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-16	Monitoring	BTB		TMD	3-Oct	9:40	NA	7.63	0.00	21.24										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-26	Monitoring	BTB		TMD	3-Oct	9:46	NA	9.38	0.00	27.58										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
KWB-11A	Monitoring	BTB	46	REST	3-Oct	10:10	NA	17.43	0.00	42.27	3-Oct	14:55	6.82	19.3	5,164	0.7	-95.4	2.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
KWB-11B	Monitoring	BTB	47	REST	3-Oct	10:15	NA	18.12	0.00	72.45	3-Oct	14:15	6.91	20.1	2,840	0.8	67.2	1.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
KWB-3AR	Monitoring	BTB		REST	3-Oct								Removed from program by Navajo, 4-13-15 (farmer Jack Joy, 575-365-6042)												SA	SA	SA	-	SA	SA	SA	SA	SA	SA	SA
MW-115	Monitoring	BTB	48	REST	3-Oct	17:45	NA	7.42	0.00	27.50	4-Oct	9:15	6.60	18.1	5,273	1.4	56.4	1.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-114	Monitoring	BTB	49	REST	3-Oct	17:50	NA	8.49	0.00	38.25	4-Oct	10:10	6.77	22.2	3,967	1.2	47.2	4.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-117	Monitoring	GDS	50	REST	3-Oct	18:10	NA	8.65	0.00	27.22	4-Oct	8:35	6.86	17.0	3,320	1.3	83.4	2.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-118	Monitoring	GDS	51	REST	3-Oct	18:16	NA	5.83	0.00	28.29	4-Oct	9:20	6.98	17.8	3,660	4.7	110.1	1.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
NP-9	Monitoring	GDS		TMD	3-Oct	18:20	NA	6.84	0.00	25.89			Not in sampling program							Yes	Issue	Issue	Yes		SA	Not in sampling program									
MW-119	Monitoring	GDS	52	REST	3-Oct	18:26	NA	10.69	0.00	28.11	4-Oct	10:05	6.76	19.7	3,620	1.8	100.5	4.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
NP-5	Monitoring	GDS		REST	3-Oct	10:20	NA	12.71	0.00	25.09										Yes	Yes	Yes	Yes		SA	B	B	-	B	B	-	-	B	B	B
MW-136	Monitoring	GDS	53	REST	3-Oct	10:29	NA	10.55	0.00	27.90	3-Oct	10:55	6.86	17.9	3,990	1.7	99.5	9.8	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-126A	Monitoring	GDS	54	REST	3-Oct	9:06	NA	15.67	0.00	37.51	3-Oct	16:25	6.90	20.2	2,530	1.8	-132.3	5.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H17

Navajo Refinery Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label	PSH Expected? [b]	Gauging Frequency	Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
							Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																			Analytical Suite and Frequency [c]										
MW-126B	Monitoring	GDS	55	REST	3-Oct	9:09	NA	15.50	0.00	51.43	3-Oct	17:05	6.76	19.9	3,650	1.3	-12.3	5.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-127	Monitoring	GDS	56	REST	3-Oct	9:00	NA	18.95	0.00	53.21	3-Oct	17:45	6.79	20.1	2,430	1.4	-198.8	3.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-129	Monitoring	GDS		REST	3-Oct	8:48	20.48	20.49	0.01	53.08										Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	A [d]	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
RW-#18A [e]	Recovery [d]	GDS		REST	3-Oct	12:48	NA	13.06	0.00	17.78										Yes	Yes	Yes	Yes		SA	A	-	-	A	A	-	-	A	A	A
KWB-1A	Monitoring	GDS	57	REST	3-Oct	12:05	NA	14.55	0.00	33.50	3-Oct	12:30	6.82	18.1	4,400	2.3	29.1	4.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	SA	SA	SA	SA	SA
KWB-1B	Monitoring	GDS		REST	3-Oct	12:40	NA	16.25	0.00	33.92			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
KWB-1C	Monitoring	GDS		REST	3-Oct	12:43	NA	16.84	0.00	52.71										Yes	Yes	Yes	Yes		SA	B	B	-	B	B	-	-	B	B	B
KWB-10R	Monitoring	GDS	58	REST	3-Oct	11:20	NA	15.65	0.00	29.46	3-Oct	11:45	6.67	18.8	1,564	1.6	-124.2	2.6	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	-	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-131	Monitoring	GDS	59	REST	3-Oct	8:53	NA	21.59	0.00	53.35	4-Oct	12:25	6.63	19.3	1,853	1.3	-128.5	8.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
KWB-5	Monitoring	GDS	60	REST	3-Oct	8:42	NA	21.09	0.00	37.68	4-Oct	11:40	6.67	19.9	2,500	2.0	-107.9	4.1	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	-	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-111	Monitoring	GDS	61	REST	3-Oct	8:35	NA	21.79	0.00	40.83	4-Oct	10:55	6.68	20.2	2,540	2.0	-69.1	2.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
KWB-6	Monitoring	GDS	62	REST	3-Oct	9:21	NA	18.81	0.00	36.44	4-Oct	11:50	6.53	21.1	2,440	0.7	-314.7	2.9	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	-	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-112	Monitoring	GDS		REST	3-Oct	9:16	18.85	19.15	0.30	37.54			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-132	Monitoring	GDS		REST	3-Oct	9:30	16.46	16.51	0.05	42.66			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-57	Monitoring	GDS	63	REST	3-Oct	13:10	NA	15.88	0.00	34.32	3-Oct	13:35	6.89	19.2	4,520	1.7	81.1	2.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
RW-#11-0 [e]	Recovery [d]	GDS		REST	3-Oct	13:45	NA	17.81	0.00	22.20										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
KWB-9	Monitoring	GDS		REST	3-Oct		Historically-obstructed @ 15.11'						Removed from program by Navajo, 4-26-16 (farmer Jack Joy, 575-365-6042)												SA [h]	A [h]	A [h]	-	A [h]	A [h]	A [h]	A [h]	A [h]	A [h]	A [h]
KWB-12A	Monitoring	GDS	64	REST	3-Oct	13:50	NA	18.48	0.00	25.03	3-Oct	14:15	6.90	19.2	3,180	3.5	84.8	2.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
KWB-12B	Monitoring	GDS	65	REST	3-Oct	14:35	NA	18.27	0.00	39.39	3-Oct	15:00	6.87	19.0	3,270	3.5	-40.0	1.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
KWB-2R	Monitoring	GDS	66	REST	3-Oct	9:53	NA	18.80	0.00	39.41	4-Oct	11:10	6.71	20.8	3,110	0.9	-347.2	1.3	Clear	Yes	Yes	Yes	Yes		SA [h]	SA [d, h]	SA [d, h]	-	SA [d, h]	SA [d, h]	-	-	SA [d, h]	SA [d, h]	SA [d, h]
MW-58	Monitoring	GDS	67	REST	3-Oct	10:00	NA	17.73	0.00	33.06	3-Oct	10:30	6.70	20.8	2,140	1.0	-298.8	8.9	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	-	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]
KWB-13	Monitoring	GDS		REST	3-Oct	9:41	NA	21.20	0.00	33.10										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	A	A	A	A	A
MW-103	Monitoring	SCU		REST	3-Oct	9:00	NA	17.00	0.00	25.22										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-104	Monitoring	SCU	68	REST	3-Oct	9:05	NA	16.10	0.00	21.97	3-Oct	9:30	6.69	23.9	1,491	0.9	-278.5	4.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-64	Monitoring	SCU	69	REST	3-Oct	10:05	NA	18.20	0.00	34.08	3-Oct	10:30	6.89	25.1	2,550	1.1	-268.0	4.8	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-65	Monitoring	SCU	70	REST	3-Oct	10:40	NA	13.95	0.00	28.78	3-Oct	11:10	6.64	26.7	2,170	1.0	-165.2	5.8	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-5	Recovery [d]	SCU		S Refinery			Not in gauging program						Not in sampling program											Y	-	-	-	-	-	-	-	-	-	-	-
RW-5R	Recovery [d]	SCU		REST	3-Oct	11:25	14.75	14.86	0.11	35.30										Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-102	Monitoring	SCU	71	REST	3-Oct	11:35	NA	14.12	0.00	26.45	3-Oct	12:00	6.79	25.2	2,380	1.2	-292.6	6.8	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-4	Recovery [d]	SCU		REST	3-Oct	12:20	NA	12.62	0.00	36.62										Yes	Yes	Yes	Yes		SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H17

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
RW-6	Recovery [d]	SCU		REST	3-Oct	12:10	13.65	13.74	0.09	34.90										Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-99	Monitoring	SCU	72	REST	3-Oct	12:30	NA	15.47	0.00	27.80	3-Oct	13:00	6.68	25.2	2,230	1.3	-295.7	5.3	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-66	Monitoring	SCU	73	REST	3-Oct	13:15	NA	14.82	0.00	29.80	3-Oct	13:40	6.75	24.6	1,724	1.7	-179.1	24.8	Clear	Yes	Yes	Cracked pad	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-28	Monitoring	SCU	74	REST	3-Oct	13:55	NA	20.74	0.00	34.55	3-Oct	14:20	6.60	27.3	3,080	2.2	-318.9	5.0	Clear	Yes	Issue	Issue	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-59	Monitoring	SCU		REST	3-Oct	15:15	NA	10.00	0.00	32.72										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-60	Monitoring	SCU	75	REST	3-Oct	15:20	NA	11.23	0.00	37.78	3-Oct	15:45	6.69	28.3	3,950	2.1	-301.3	3.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-107	Monitoring	SCU		REST	3-Oct	12:25	NA	11.68	0.00	19.05										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-128	Monitoring	SCU	76	REST	3-Oct	14:35	NA	14.01	0.00	35.35	3-Oct	15:00	6.67	24.9	2,000	1.6	-182.9	19.2	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-125	Monitoring	SCU	77	REST	3-Oct	16:20	NA	11.29	0.00	28.31	3-Oct	16:45	6.84	25.4	4,620	2.4	-146.2	5.7	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-116	Monitoring	SCU	78	REST	3-Oct	17:05	NA	8.13	0.00	27.63	3-Oct	17:30	6.94	21.0	3,710	1.5	21.4	24.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-46R	Monitoring	SCU	79	TMD	3-Oct	17:45	NA	5.18	0.00	19.36	3-Oct	18:10	6.83	24.9	4,110	1.4	-82.7	6.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
UG-3R	Monitoring	SCU		REST																					A	A	A	A	A	A	A	A	A	A	A
UG-4	Monitoring	SCU		REST																					A	A	A	A	A	A	A	A	A	A	A
UG-1	Monitoring	SCU		REST																					A	A	A	A	A	A	A	A	A	A	A
UG-2	Monitoring	SCU		REST																					A	A	A	A	A	A	A	A	A	A	A
MW-101	Monitoring	TAB	80	REST	3-Oct	12:40	NA	12.48	0.00	26.85	3-Oct	17:35	6.78	23.9	2,070	0.9	-170.7	0.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-105	Monitoring	TAB	81	REST	3-Oct	12:50	NA	9.26	0.00	17.20	4-Oct	8:25	6.99	23.8	1,731	0.8	-358.1	19.0	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-2	Recovery [d]	TAB		REST	3-Oct	13:00	NA	11.48	0.00	36.13										Yes	Yes	Yes	Yes		SA	A [d]	A [d]	A [d]	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-61	Monitoring	TAB	82	REST	3-Oct	13:10	NA	11.57	0.00	29.30	4-Oct	9:25	7.00	24.3	2,960	0.5	-363.9	2.2	Clear	Yes	Yes	Cracked pad	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-62	Monitoring	TAB	83	REST	3-Oct	13:20	NA	12.88	0.00	29.50	4-Oct	10:25	6.78	23.5	3,630	0.8	-369.0	3.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-93	Monitoring	TAB		REST	3-Oct	13:30	NA	7.37	0.00	20.23										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-43	Monitoring	TAB	84	REST	3-Oct	14:10	NA	9.75	0.00	19.67	4-Oct	9:40	7.18	22.6	4,530	1.1	-345.2	7.5	Clear	Yes	Issue	No pad	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-137	Monitoring	TAB	85	REST	3-Oct	14:00	NA	7.93	0.00	29.60	4-Oct	11:55	6.93	26.3	4,760	1.8	-373.5	7.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-138	Monitoring	TAB	86	REST	3-Oct	13:50	NA	9.49	0.00	24.81	4-Oct	11:10	6.89	29.2	2,890	1.0	-364.2	8.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-23	Monitoring	TAB	87	REST	3-Oct	13:40	NA	12.88	0.00	23.10	4-Oct	10:25	7.18	27.2	2,760	1.0	-347.0	8.9	Clear	Yes	Issue	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
TEL-4	Monitoring	TAB	88	TEL	3-Oct	9:00	NA	9.04	0.00	27.27	3-Oct	9:25	6.42	22.0	4,600	0.6	-187.3	7.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
TEL-3	Monitoring	TAB		TEL	3-Oct	9:40	8.79	8.84	0.05	27.19			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
TEL-2	Monitoring	TAB	89	TEL	3-Oct	10:10	NA	9.63	0.00	27.20	3-Oct	10:35	6.88	22.0	3,620	0.8	-312.7	1.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
TEL-1	Monitoring	TAB	90	TEL	3-Oct	11:00	NA	8.79	0.00	27.00	3-Oct	11:25	7.14	21.8	3,150	0.5	-319.2	2.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-39	Monitoring	TAB	91	REST	3-Oct	14:20	NA	9.31	0.00	25.44	4-Oct	8:55	7.27	21.7	3,890	1.2	-328.1	4.2	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H17

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)																PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
MW-98	Monitoring	TAB	92	REST	3-Oct	12:00	NA	8.73	0.00	25.60	3-Oct	12:25	6.90	24.2	3,200	0.7	-375.5	3.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
RW-10	Recovery [d]	TAB		REST	3-Oct	14:30	NA	9.14	0.00	22.49										Yes	Yes	Issue	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-40	Monitoring	TAB		REST	3-Oct	14:42	NA	7.54	0.00	24.75										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-41	Monitoring	TAB		REST	3-Oct	14:45	NA	7.10	0.00	21.56										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
RW-9	Recovery [d]	TAB		REST	3-Oct	14:40	NA	9.44	0.00	21.83										Yes	Yes	Issue	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-42	Monitoring	TAB		REST	3-Oct	14:50	NA	9.86	0.00	24.32										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-29	Monitoring	TAB	93	REST	3-Oct	15:30	NA	11.65	0.00	22.00	3-Oct	15:55	7.07	23.0	3,520	0.6	-294.4	1.0	Clear	Yes	Yes	Issue	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
RW-#16B [e]	Recovery [d]	TAB		REST	3-Oct	15:00	NA	11.72	0.00	17.70										Yes	Yes	Issue	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-30	Monitoring	TAB		REST	3-Oct	15:20	NA	9.43	0.00	23.50			Not in sampling program							Yes	Yes	Yes	Yes		SA	Not in sampling program									
MW-56	Monitoring	TAB		NCL	3-Oct	15:10	NA	10.32	0.00	26.50										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
MW-49	Monitoring	TAB	94	TEL	3-Oct	12:35	NA	8.77	0.00	33.15	4-Oct	11:25	6.81	25.0	3,200	0.7	-356.6	0.6	Clear	Yes	Non-std	Bad Hinge	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
MW-106	Monitoring	TAB	95	REST	3-Oct	12:20	NA	6.97	0.00	22.80	4-Oct	12:45	6.72	26.2	3,510	0.8	-372.1	4.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-45	Monitoring	TAB	96	NCL	3-Oct	16:20	NA	4.63	0.00	15.05	3-Oct	16:45	7.06	23.4	4,790	1.3	-200.4	1.9	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	SA	SA	SA	SA	SA
MW-50	Monitoring	CJH	97	REST	3-Oct	10:00	NA	14.34	0.00	28.22	3-Oct	10:25	6.96	22.4	7,010	1.2	97.4	4.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
MW-97	Monitoring	CJH		REST	3-Oct	10:45	9.45	10.29	0.84	21.20			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-92	Monitoring	CJH		REST	3-Oct	10:55	11.26	11.31	0.05	22.60			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-1	Recovery [d]	CJH		REST	3-Oct	11:03	NA	10.18	0.00	35.39										Yes	Yes	Yes	Yes		SA	A [d]	A [d]	A [d]	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-91	Monitoring	CJH	98	REST	3-Oct	11:15	NA	10.54	0.00	25.35	3-Oct	11:40	6.37	23.0	2,460	1.5	-376.5	7.8	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
MW-90	Monitoring	CJH	99	REST	3-Oct	11:55	NA	11.29	0.00	22.80	3-Oct	12:20	6.86	22.8	3,390	1.1	-354.0	8.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-96	Monitoring	CJH	100	REST	4-Oct	12:35	NA	10.93	0.00	25.57	4-Oct	8:50	6.71	21.8	2,110	1.9	-354.9	4.6	Clear	Yes	Closure	Issue	Yes		SA	SA	SA	SA	SA	SA	-	-	SA	SA	SA
MW-94	Monitoring	CJH		REST	3-Oct	12:45	11.73	11.80	0.07	23.45			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
RW-8	Recovery [d]	CJH		REST	3-Oct	12:53	10.70	10.74	0.04	37.22			No sampling (LNAPL 0.03' or greater)							Yes	Yes	Yes	Yes	Y	SA	A [d]	A [d]	-	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
MW-67	Monitoring	CJH	101	REST	3-Oct	13:00	NA	9.06	0.00	27.30	3-Oct	13:25	6.98	24.0	2,430	1.5	-358.1	6.3	Clear	Yes	Yes	Yes	Yes		SA	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]	SA [d]
MW-95	Monitoring	CJH		REST	3-Oct	13:40	NA	12.03	0.00	25.37										Yes	Yes	Yes	Yes		SA	A	A	A	A	A	-	-	A	A	A
RW-7	Recovery [d]	CJH		REST	3-Oct	13:49	NA	10.11	0.00	37.00										Yes	Yes	Yes	Yes		SA	A [d]	A [d]	A [d]	A [d]	A [d]	-	-	A [d]	A [d]	A [d]
NCL-34A	Monitoring	CJH	102	NCL	3-Oct	17:45	NA	9.51	0.00	19.31	4-Oct	9:30	6.66	22.5	1,923	1.6	-328.3	4.6	Clear	Issue	Yes	Yes	Yes		SA	SA [d]	SA [d]	-	SA [d]	SA [d]	-	-	SA [d]	SA [d]	SA [d]
NCL-33	Monitoring	CJH	103	NCL	3-Oct	17:10	NA	8.01	0.00	19.60	4-Oct	10:10	7.04	21.9	3,070	1.7	-219.7	7.3	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
NCL-44	Monitoring	CJH	104	NCL	3-Oct	16:30	NA	7.97	0.00	21.57	3-Oct	16:55	6.87	22.9	2,620	1.1	-237.6	4.4	Clear	Issue	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
NCL-32	Monitoring	CJH	105	NCL	3-Oct	15:40	NA	8.39	0.00	20.06	3-Oct	16:05	7.08	22.6	2,520	0.8	-131.7	13.0	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
MW-108	Monitoring	CJH	106	NCL	3-Oct	14:05	NA	10.78	0.00	27.74	3-Oct	14:30	7.02	23.5	2,620	1.5	-362.1	8.5	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA

Table 1: Gauging Data, Groundwater Field Parameters and Well Inspections, 1H17

Navajo Refining Company - Artesia Refinery, Artesia, New Mexico

Well ID	Well Type	HMI Use	HMI Use (# Samp Wells)	Location	Gauge Date	Gauge Time	Hydrologic Monitoring-Collected Data (Gauging/Groundwater Field Parameter/Well Inspection)															PSH Expected? [b]	Gauging Frequency	Analytical Suite and Frequency [c]									
							Depth to LNAPL (ft btoc)	Depth to Water (ft btoc)	LNAPL Column (ft)	Total Depth (ft btoc)	Sample Date	Sample Time	pH (S.U.)	T (C)	Spec. Cond. (umho/cm)	D. O. (mg/l)	ORP (mg/l)	Turb. (NTU)	Water Clarity	Cap	Casing	Well Secured	Label			Purge Parameters	DRO	GRO	VOC	Metals (As, Ba, Cr, Fe, Pb, Mn, Se)	Metals (Hg, Ni, V, B, Cd, Co, U)	Cyanide	Cations/Anions	Nitrates / Nitrites as Nitrogen	TDS
NCL-31	Monitoring	CJH	107	NCL	3-Oct	14:50	NA	8.11	0.00	20.16	3-Oct	15:15	7.31	25.2	2,850	0.9	-218.0	4.2	Clear	Issue	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
MW-19	Monitoring	CJH		NCL	3-Oct	15:30	NA	8.38	0.00	22.08			Not in sampling program							Yes	Issue	Issue	Yes		SA	Not in sampling program									
MW-55	Monitoring	CJH	108	NCL	3-Oct	17:27	NA	10.23	0.00	26.58	4-Oct	10:50	7.11	21.3	3,750	1.8	-235.2	7.4	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
RW-#17A [e]	Recovery [d]	CJH		REST	3-Oct	17:35	NA	10.06	0.00	16.02										Yes	Issue	Issue	Yes		SA	A	A	A	A	A	-	-	A	A	A
MW-18	Monitoring	CJH		NCL	3-Oct	17:18	NA	10.13	0.00	22.20										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	A	A	A	A	A
MW-54A	Monitoring	CJH	109	NCL	3-Oct	8:25	NA	10.83	0.00	31.30	3-Oct	8:50	6.51	21.6	2,180	1.4	76.3	5.1	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
MW-54B	Monitoring	CJH		NCL	3-Oct	9:02	NA	10.93	0.00	46.80										Yes	Yes	Yes	Yes		SA	B	B	B	B	B	-	-	B	B	B
NCL-49	Monitoring	CJH	110	NCL	3-Oct	9:10	NA	15.08	0.00	32.18	3-Oct	9:35	6.96	21.5	3,070	1.5	80.9	4.6	Clear	Yes	Yes	Yes	Yes		SA	SA	SA	-	SA	SA	-	-	SA	SA	SA
MW-53	Monitoring	CJH		NCL	3-Oct	8:15	NA	9.25	0.00	23.60										Yes	Yes	Yes	Yes		SA	A	A	-	A	A	-	-	A	A	A
KWB-P3	Monitoring		Field E of Refinery				Not in gauging program						Not in sampling program												Not included in monitoring program due to distance from impacts									

Notes:

Abbreviations:

A = Annual (Mar/Apr event)
B = Biennial (starts Mar/Apr 2011)
BR = Bolton Road
DRO = Diesel Range Organics
E = East
EP = Evaporation Ponds
ft bgs = ft below ground surface
ft btoc = ft below top of casing
ft MSL = ft Mean Sea Level
GRO = Gasoline Range Organics
HR = Haldeman Road
in = inches
N = North
NA = Not accessible
NAPI = North API Separator
NCL = North Colony Landfarm
NE = Northeast
NW = Northwest
OCD = Oil Conservation District
PSH = Phase Separated Hydrocarbon
ROW = right of way
RR = Richey Road
S = South
SA = Semi-annual (Mar/Apr and Sep/Oct events)
SE = Southeast
SW = Southwest
TMD = Three Mile Ditch
TEL = Tetra Ethyl Lead Impoundment
UG = Upgradient
US285 = U.S. Highway 285
US82 = U.S. Highway 82
VOC = Volatile Organic Compounds
W = West
Y = Yes

Footnotes:

[a] Well const. info. provided where available. TOC & ground surface elevs relative to benchmark G-416. Total depth based on 4/2010 measurements.

[b] PSH was present during March 2012 gw monitoring event or a recovery pump is in place. Note that recovery wells are gauged at least monthly.

[c] Analytical Suite to include the following:

1. Purge parameters to be measured and recorded in the field will include pH, temp, spec. cond., diss. oxy., and oxidation-reduction potential.
2. DRO by Method 8015Mod.
3. GRO by Method 8015Mod.
4. VOCs by Method 8260, to include methyl tert butyl ether (MTBE).
5. Total metals by Method 6010/6020 and/or 7470. Specific metals shown in heading, abbreviations from periodic chart (incl B, Cd, Co, U, per 3-7-16 State request).
6. Dissolved metals - same list as total metals but only analyzed during April event (field filtered by HMI)
7. Cyanide by Method SM4500.
8. Cations/anions to include Calcium, Potassium, and Sodium by Method 6010 or 6020 and Sulfate, Chloride and Fluoride by Method 300.
9. Nitrates/Nitrites as Nitrogen by Method 300.
10. Total Dissolved Solids by Method 2540C.

"-" indicates parameter not required.

Note - samples will not be collected from any well where PSH is measured to be 0.03 feet thick or greater.

[d] Samples to be collected at frequency indicated only if <0.03 feet of PSH is present.

[e] Recovery trenches 11, 15, 16, 17 and 18 have multiple vertical "wells". Gauging & sampling points are: RW #11-0, RW #15C, RW #16B, RW #17A and RW #18A.

= Well with recently gauged LNAPL (light nonaqueous phase liquid)

HMI
Groundwater

Hydrologic Monitoring
1654 W. Sam Houston Pkwy. N.
Houston, Texas 77043

Phone 713.464.5206
Fax 713.464.5207

M E M O R A N D U M

Groundwater Monitoring Standard Operating Procedures
Navajo Refining LLC – Artesia, New Mexico

HMI conducts low-flow groundwater sampling in accordance with the site Sampling and Analysis Plan and EPA guidance (including Puls and Barcelona, 1996 EPA Guidance on Low-Flow Groundwater Sampling, and Yeskis & Zavala, 2002, EPA/542:S-02/00, Groundwater Sampling Guidelines for Superfund and RCRA Project Managers).

Groundwater Sampling Methodology

HMI conducts low-flow groundwater sampling using a peristaltic pump and dedicated polyethylene tubing at wells with requisite depths-to-water. At limited wells with depths-to-water greater than peristaltic range, low-flow groundwater sampling is conducted using dedicated or non-dedicated bladder pumps. Sample intakes are set at mid-screen, when possible (generally at least two feet from the base of the well). Sample intake depths are permanently marked, ensuring future sampling events consistently monitor the targeted water-bearing interval. During sampling with a peristaltic pump, the sample tube is attached to the pump using a one-foot section of dedicated, flexible silicone tubing (item #5703, Geotech Environmental Equipment, Inc.). A two-foot segment of polyethylene tubing connects the silicone tubing in the pump to the flow-through cell, using a disposable segment of silicone tubing. Purging commences through a sealed flow-through cell at EPA-recommended purge rates (generally 0.1 to 0.2 liters/minute), and well drawdown is monitored. Groundwater field parameter readings are measured at 0.5-liter intervals (generally the equivalent of one cell-volume "turnover"). Field parameters of pH, specific conductivity, temperature, dissolved oxygen, and oxidation-reduction potential are monitored inside the cell. Turbidity is monitored outside of the cell. Groundwater field instrumentation is calibrated daily, in accordance with manufacturer specifications (recorded on a field instrument calibration log). Purging continues until a requisite volume of groundwater is purged (generally a minimum of 3,000 ml or six flow-through cell volumes), and field parameters have stabilized in accordance with EPA guidance:

Water Quality Parameters (Stabilization Parameters in Accordance with EPA (2002), Groundwater Sampling Guidelines for Superfund and RCRA Project Managers, Yeskis & Zavala, EPA/542:S-02/001)

- pH +/- 0.1 units;
- Temperature -
- Conductivity +/- 3%
- Dissolved Oxygen +/- 0.3 mg/L
- ORP +/- 10%
- Turbidity 10%

Immediately prior to sampling, the input tubing to the flow-through cell is disconnected from the disposable silicone receiving tubing on the input barb on the flow-through cell, and groundwater samples are collected directly into lab-supplied containers. Groundwater samples are placed in iced coolers, and remain in HMI's custody until delivered to ESC Lab Sciences via FedEx-overnight. Peristaltic tubes and/or dedicated bladder pumps may be dedicated in respective wells. Alternatively, dedicated tubing may be retrieved, bagged, labeled, and stored in tubs maintained at HMI. Wells with very limited water column thicknesses may be sampled with disposable bailers. Grab samples are collected at active recovery wells and irrigation wells that are scheduled for sampling. The purging and sampling process is documented on groundwater sampling field forms.

Cross-Contamination Prevention Program

Dedicated peristaltic tubing and dedicated bladder pumps are used as possible, to minimize any potential cross-contamination issues during the groundwater monitoring process. Remaining non-dedicated equipment (e.g., electronic gauging probes or non-dedicated bladder pumps, etc.) is properly decontaminated prior to use and between wells. The decontamination procedure may include a combination of chemical and mechanical decontamination. For example, scrubbing with ethyl alcohol (isopropanol) as warranted, followed by scrubbing using an Alconox-water solution, and distilled water rinse. The decontamination procedure for non-dedicated bladder pumps consists of cycling an Alconox-water solution through the pump bladder. Distilled water is cycled through the pump bladder, followed by decontaminating the exterior body of the pump, using the methods outlined above.

HMI Deliverables

HMI provides thorough field documentation of performed groundwater monitoring activities with a deliverables package including a brief narrative, summary table (with gauging data, field parameters, well inspection data, and scheduled analytical scope), groundwater sampling forms, field instrument calibration log, and chain-of-custody forms (by Refinery "Area"), and a groundwater sampling SOP memo.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-6A (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: RLR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1600	NA	12.61	0.0	19.05	14.05	yes	yes	yes	yes		Weather: Pt. Cloudy; 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-6B (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

(2-in; stickup)

Initials: RLR

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1605	NA	12.48	0.0	52.27	47.27	Yes	Does not close completely	*Issue*	yes		Weather: Pt. Cloudy, 80's

* Casing lid does not close all the way *

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-85
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup)

Initials: RLR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	930	9.94	11.19	1.25	20.34	NA	yes	yes	yes	yes		Weather: Cloudy; 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		Not	sampled	due to	presence			B) ded bladder pump
			2.0			of LNAPL	≥	0.03'			C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-85								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-86
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in ; stickup) Initials: RLL

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	940	9.69	10.03	0.34	19.21	NA	yes	yes	yes	yes		Weather: Cloudy ; 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5			Not sampled due to presence					B) ded bladder pump
			2.0			of LNAPL ≥ 0.03'					C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-86								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-120
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: RLR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1030	NA	12.23	0.0	28.00	17.5	yes	yes	yes	yes		Weather: Cloudy; 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1035	12.36	0.5	7.13	22.1	10450	1.8	-185.2	4.0	clear	*Low-flow groundwater sample:*
	1038	12.37	1.0	7.09	21.8	10440	1.6	-191.6	3.8		(A) peristaltic pump w/ ded tubing
	1040	12.37	1.5	7.07	21.7	10400	1.3	-193.2	3.5		B) ded bladder pump
	1043	12.37	2.0	7.06	21.6	10360	1.2	-195.4	3.3		C) non-ded bladder pump; or
	1045	12.37	2.5	7.05	21.5	10280	1.0	-197.7	3.0		*Standard groundwater sample:*
	1048	12.37	3.0	7.05	21.5	10240	0.8	-199.1	2.9		D) bailer due to limited column; or
	1050	12.37	3.5	7.05	21.5	10230	0.7	-201.2	2.9		E) recovery well cycling sample
	1053	12.37	4.0	7.04	21.5	10230	0.7	-203.1	2.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1055	MW-120	12.37	7.04	21.5	10230	0.7	-203.1	2.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-121
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: RLR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1110	NA	12.21	0.0	27.32	17.5	yes	yes	yes	yes		Weather: Cloudy; 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1115	12.32	0.5	7.17	23.1	7,380	2.3	-76.9	42.0	Sl. Cloudy w/	*Low-flow groundwater sample:*
	1118	12.36	1.0	7.13	23.2	6,930	2.0	-68.4	30.2	orange particles	(A) peristaltic pump w/ ded tubing
	1120	12.39	1.5	7.12	23.2	6,720	1.8	-62.1	18.9	↓	B) ded bladder pump
	1123	12.41	2.0	7.11	23.2	6,640	1.5	-59.1	10.1	Clear w/ orange	C) non-ded bladder pump; or
	1125	12.43	2.5	7.10	23.2	6,590	1.3	-57.7	6.7	particles	*Standard groundwater sample:*
	1128	12.45	3.0	7.09	23.2	6,520	1.1	-50.4	5.3		D) bailer due to limited column; or
	1130	12.47	3.5	7.08	23.2	6,500	1.0	-50.2	5.0		E) recovery well cycling sample
↓	1133	12.49	4.0	7.08	23.2	6,480	1.0	-50.2	4.9	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1135	MW-121	12.49	7.08	23.2	6,480	1.0	-50.2	4.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-84
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: RLR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	950	NA	9.32	0.0	20.56	15.2	yes	yes	yes	yes		Weather: Cloudy; 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	955	9.41	0.5	6.53	22.3	10420	2.1	-150.6	3.4	Clear w/gold tint	*Low-flow groundwater sample:*
	958	9.45	1.0	6.62	22.3	10480	1.7	-158.2	3.2		(A) peristaltic pump w/ ded tubing
	1000	9.49	1.5	6.68	22.3	10510	1.4	-170.1	3.0		B) ded bladder pump
	1003	9.55	2.0	6.73	22.2	10550	1.1	-181.4	2.8		C) non-ded bladder pump; or
	1005	9.58	2.5	6.75	22.2	10560	1.0	-181.4	2.7		*Standard groundwater sample:*
	1008	9.60	3.0	6.77	22.2	10560	0.9	-181.3	2.6		D) bailer due to limited column; or
	1010	9.63	3.5	6.78	22.2	10570	0.9	-181.3	2.6		E) recovery well cycling sample
↓	1013	9.67	4.0	6.79	22.2	10590	0.8	-181.5	2.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1015	MW-84	9.67	6.79	22.2	10590	0.8	-181.5	2.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-122
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup)

Initials: RLR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1155	NA	10.40	0.0	23.31	18.4	yes	yes	yes	yes		Weather: Pt. Cloudy; 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1200	10.89	0.5	7.19	22.0	7,430	1.9	-166.4	86.0	Sl. Cloudy w/orange	*Low-flow groundwater sample:*
	1203	11.01	1.0	7.14	22.1	7,310	1.6	-158.5	66.3	particles	(A) peristaltic pump w/ ded tubing
	1205	11.13	1.5	7.11	22.1	7,150	1.2	-143.1	48.4	↓	B) ded bladder pump
	1208	11.24	2.0	7.09	22.1	7,030	0.9	-137.7	35.3	↓	C) non-ded bladder pump; or
	1210	11.35	2.5	7.09	22.1	7,000	0.8	-133.2	24.2	↓ Reduced purge	*Standard groundwater sample:*
	1215	11.39	3.0	7.08	22.0	6,950	0.7	-131.2	16.9	Clear w/ rate to 0.1	D) bailer due to limited column; or
	1220	11.42	3.5	7.08	22.0	6,910	0.7	-128.9	12.3	orange particles L/min	E) recovery well cycling sample
↓	1225	11.45	4.0	7.08	22.0	6,900	0.7	-125.1	9.2	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1230	MW-122	11.45	7.08	22.0	6,900	0.7	-125.1	9.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-81 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: RLR

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1250	NA	10.80	0.0	18.63	13.7	yes	yes	yes	yes		Weather: Pt. Cloudy; 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-80 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: RLR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1255	NA	9.04	0.0	19.69	14.7	yes	yes	yes	yes		Weather: Pt. Cloudy; 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+EB-EP-04 (same analysis)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-79
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup)

Initials: RLR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1515	NA	10.17	0.0	19.25	15.0	yes	yes	yes	yes		Weather: Pt. Cloudy; 80's
10/4/17	830	NA	10.38	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/4/17	835	10.60	0.5	6.39	20.6	7,440	3.0	-28.1	9.0	Clear	*Low-flow groundwater sample:*
	838	10.65	1.0	6.48	20.4	7,400	2.6	-31.3	8.2		(A) peristaltic pump w/ ded tubing
	840	10.69	1.5	6.56	20.4	7,310	2.2	-35.6	7.3		B) ded bladder pump
	843	10.73	2.0	6.67	20.3	7,230	2.0	-37.2	6.5		C) non-ded bladder pump; or
	845	10.76	2.5	6.75	20.2	7,150	1.8	-39.0	5.8		*Standard groundwater sample:*
	848	10.80	3.0	6.77	20.2	7,120	1.4	-40.2	5.3		D) bailer due to limited column; or
	850	10.84	3.5	6.78	20.2	7,100	1.3	-41.9	4.8		E) recovery well cycling sample
	853	10.88	4.0	6.78	20.2	7,080	1.3	-43.8	4.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	855	MW-79	10.88	6.78	20.2	7,080	1.3	-43.8	4.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	910	EB-EP-04	NA							Same as above	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-82 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RLR

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1555	NA	9.71	0.0	20.00	15.0	yes	yes	yes	yes		Weather: Pt. Cloudy; 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

+ EB-EP-01 (same analysis)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-74
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup) Initials: RLR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1540	NA	9.57	0.0	20.19	14.8	yes	yes	yes	yes		Weather: Cloudy; 80's
10/4/17	1100	NA	9.60	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/4/17	1105	9.70	0.5	6.93	22.0	11,500	2.5	13.2	6.8	Clear	*Low-flow groundwater sample:*
	1108	9.74	1.0	6.91	22.0	11,480	2.2	16.8	6.1		(A) peristaltic pump w/ ded tubing
	1110	9.75	1.5	6.90	21.9	11,460	1.7	19.2	5.8		B) ded bladder pump
	1113	9.75	2.0	6.89	21.9	11,440	1.4	21.3	4.9		C) non-ded bladder pump; or
	1115	9.75	2.5	6.87	21.8	11,420	1.2	23.2	3.9		*Standard groundwater sample:*
	1118	9.75	3.0	6.86	21.7	11,400	1.1	24.1	3.7		D) bailer due to limited column; or
	1120	9.75	3.5	6.86	21.6	11,380	1.0	26.2	3.5		E) recovery well cycling sample
	1123	9.75	4.0	6.86	21.6	11,350	1.0	28.9	3.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	1125	MW-74	9.75	6.86	21.6	11,350	1.0	28.9	3.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1135	EB-EP-01	NA	→	→	→	→	→	→	Same as above	same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

+ Trip Blank - EP-01

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-73 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RLR

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1545	NA	10.82	0.0	19.60	14.6	yes	yes	yes	yes		Weather: Pt. Cloudy

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-2A
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: RLR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1315	NA	10.27	0.0	17.31	15.0	yes	yes	yes	yes		Weather: Pt. Cloudy

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1320	10.53	0.5	7.22	24.1	8,210	2.4	-149.4	22.4	Slightly cloudy w/	*Low-flow groundwater sample:*
|	1323	10.59	1.0	7.16	23.8	8,190	2.1	-140.1	14.3	small particles	(A) peristaltic pump w/ ded tubing
|	1325	10.65	1.5	7.10	23.6	8,150	1.9	-132.8	10.8	↓	B) ded bladder pump
|	1328	10.68	2.0	7.09	23.5	8,130	1.7	-120.2	5.1	Clear w/ small	C) non-ded bladder pump; or
|	1330	10.72	2.5	7.06	23.5	8,160	1.2	-100.1	4.8	particles	*Standard groundwater sample:*
|	1333	10.76	3.0	7.05	23.4	8,180	1.1	-93.1	4.6	↓	D) bailer due to limited column; or
|	1335	10.79	3.5	7.04	23.4	8,210	1.0	-89.0	4.6		E) recovery well cycling sample
↓	1338	10.83	4.0	7.04	23.4	8,220	1.0	-88.6	4.6	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1340	MW-2A	10.83	7.04	23.4	8,220	1.0	-88.6	4.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

(Not in "Sampling" program)

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-2B (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: RLR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1405	NA	11.01	0.0	52.00	No Sample	yes	yes	yes	yes		Weather: Pt. Cloudy; 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-72 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: RCR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1550	NA	7.70	0.0	13.92	11.9	yes	yes	yes	yes		Weather: Pt. Cloudy; 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD - 6
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) Initials: RLR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1520	NA	10.28	0.0	26.91	21.6	yes	lid cannot	yes	yes	Cracked	Weather: Pt. Cloudy; 80's
10/4/17	930	NA	10.37	0.0				close properly			pad	

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/4/17	935	10.63	0.5	6.91	21.9	14,470	2.3	-97.8	78.0	Slightly cloudy	*Low-flow groundwater sample:*
|	938	10.63	1.0	6.91	21.4	14,520	2.0	-99.2	53.6	w/ small particles	(A) peristaltic pump w/ ded tubing
|	940	10.63	1.5	6.91	21.0	14,680	1.7	-103.8	47.2	↓	B) ded bladder pump
|	943	10.63	2.0	6.90	20.8	14,800	1.4	-107.2	39.9	↓	C) non-ded bladder pump; or
|	945	10.63	2.5	6.90	20.6	14,940	1.1	-111.6	19.8	Clear w/ small	*Standard groundwater sample:*
|	948	10.63	3.0	6.89	20.4	15,010	1.0	-113.2	15.3	particles	D) bailer due to limited column; or
|	950	10.63	3.5	6.89	20.4	15,120	1.0	-113.8	11.2	↓	E) recovery well cycling sample
↓	953	10.63	4.0	6.89	20.4	15,150	0.9	-114.2	9.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	955	OCD-6	10.63	6.89	20.4	15,150	0.9	-114.2	9.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD- 7AR
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: RCR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1525	NA	9.41	0.0	21.29	16.0	yes	yes	yes	yes		Weather: PT. Cloudy; 80's
10/4/17	1015	NA	9.52	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/4/17	1020	9.72	0.5	7.04	22.2	12,790	1.8	-130.8	7.8	clear w/ orange particles	*Low-flow groundwater sample:*
|	1023	9.76	1.0	7.01	22.2	12,700	1.5	-138.2	7.0	|	(A) peristaltic pump w/ ded tubing
|	1025	9.80	1.5	7.00	22.1	12,620	1.2	-144.1	4.9	|	B) ded bladder pump
|	1028	9.83	2.0	6.99	22.0	12,530	1.0	-146.3	3.6	|	C) non-ded bladder pump; or
|	1030	9.87	2.5	6.99	21.9	12,460	0.9	-151.6	3.2	|	*Standard groundwater sample:*
|	1033	9.91	3.0	6.98	21.8	12,400	0.9	-153.2	3.0	|	D) bailer due to limited column; or
|	1035	9.95	3.5	6.98	21.8	12,380	0.8	-155.6	3.0	|	E) recovery well cycling sample
↓	1038	9.98	4.0	6.98	21.8	12,350	0.8	-156.7	2.9	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	1040	OCD-7AR	9.98	6.98	21.8	12,350	0.8	-156.7	2.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: OCD - 7B (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in ; stickup) Initials: RLR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1530	NA	9.36	0.0	56.85	51.9	yes	yes	yes	yes		Weather: Pt. Cloudy; 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "Sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-7C (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup)

Initials: RLR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1535	NA	9.19	0.0	71.95	No Sample	yes	yes	yes	yes		Weather: Pt. Cloudy; 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Tool Co. locks gate by 5:00 PM] (Bagged tube + tubing guidance aid when sampled)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-#15C (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (Trench-related RW; below-grade vault)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RLR

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1435	NA	14.19	0.0	22.30	20.0	Yes	Yes	Yes	Yes		Weather: Sl. Cloudy; 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Tool co. locks gate by 5:00 PM]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-48
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

(2-in; at-grade)

Initials: RLR

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1430	NA	16.30	0.0	32.00	26.9	yes	yes	*issue*	yes		Weather: Pt. Cloudy 80's
10/4/17	1200	NA	16.38	0.0								

*needs new pad/at grade plate & canister installation

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/4/17	1205	16.64	0.5	6.68	24.5	4,160	2.3	-403.1	9.2	Black tint/odor	*Low-flow groundwater sample:*
	1208	16.68	1.0	6.68	24.5	4,120	2.0	-406.2	8.6		(A) peristaltic pump w/ ded tubing
	1210	16.71	1.5	6.67	24.4	4,100	1.8	-408.1	8.2		B) ded bladder pump
	1213	16.71	2.0	6.67	24.4	4,050	1.7	-409.6	7.9		C) non-ded bladder pump; or
	1215	16.71	2.5	6.67	24.3	4,000	1.6	-410.8	7.6		*Standard groundwater sample:*
	1218	16.71	3.0	6.65	24.3	3990	1.5	-412.2	7.5		D) bailer due to limited column; or
	1220	16.71	3.5	6.65	24.3	3,970	1.5	-413.1	7.5		E) recovery well cycling sample
	1223	16.71	4.0	6.65	24.3	3,960	1.5	-413.8	7.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	1225	MW-48	16.71	6.65	24.3	3,960	1.5	-413.8	7.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-130
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

(2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: RLR/BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1440	NA	17.83	0.0	45.00	37.4	yes	yes	yes	yes		Weather: Pt. Cloudy; 80's
10-4-17	1220	NA	17.81	0.0	45.00	37.4						Cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-4-17	1225	17.86	0.5	7.03	24.0	2960	1.8	-76.7	16.8	clear	*Low-flow groundwater sample:*
	1228	17.86	1.0	6.89	23.6	3000	1.4	-78.1	12.1		(A) peristaltic pump w/ ded tubing
	1230	17.86	1.5	6.81	23.4	3020	1.2	-76.4	10.3		B) ded bladder pump
	1233	17.86	2.0	6.75	23.2	3030	1.0	-77.0	9.6		C) non-ded bladder pump; or
	1235	17.86	2.5	6.70	23.0	3040	0.9	-77.5	8.9		*Standard groundwater sample:*
	1238	17.86	3.0	6.68	22.9	3050	0.9	-78.2	7.4		D) bailer due to limited column; or
	1240	17.86	3.5	6.67	22.8	3050	0.8	-78.6	7.1		E) recovery well cycling sample
	1243	17.86	4.0	6.66	22.8	3060	0.8	-78.9	6.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
10-4-17	1245	MW-130	17.86	6.66	22.8	3060	0.8	-78.9	6.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-4
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in ; stickup)

Initials: RLR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1450	21.88	22.16	0.28	41.75	31.7	yes	yes	yes	yes		Weather: Pt. Cloudy; 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		Not sampled due to presence						B) ded bladder pump
			2.0		of LNAPL ≥ 0.03'						C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
		KWB-4		Not	Sampled							Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

[Equipped as RW in above-grade vault]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-19 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest
(Gauge to top of 1-in galvanized pipe)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: RLR

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1445	22.10	22.26	0.16	NM	10' off base	yes	yes	yes	yes		Weather: Pt. Cloudy; 80's
						as needed						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-76
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in ; stickup) Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1620	NA	11.15	0.0	20.33	16.0	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1625	11.20	0.5	6.98	23.6	6350	3.0	-85.1	9.9	Clear	*Low-flow groundwater sample:*
|	1627	11.20	1.0	6.91	23.4	6370	2.3	-86.3	7.9	|	(A) peristaltic pump w/ ded tubing
|	1630	11.20	1.5	6.86	23.1	6380	1.9	-86.9	7.5	|	B) ded bladder pump
|	1632	11.20	2.0	6.82	22.9	6380	1.7	-87.5	6.8	|	C) non-ded bladder pump; or
|	1635	11.20	2.5	6.79	22.8	6390	1.5	-87.9	6.3	|	*Standard groundwater sample:*
|	1637	11.20	3.0	6.77	22.8	6390	1.4	-88.2	5.4	|	D) bailer due to limited column; or
|	1640	11.20	3.5	6.76	22.8	6390	1.4	-88.6	5.2	|	E) recovery well cycling sample
↓	1642	11.20	4.0	6.76	22.8	6400	1.3	-85.8	5.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1645	MW-76	11.20	6.76	22.8	6400	1.3	-85.8	5.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~						~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-77
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Gauge only, per TRC 10/2/17
(4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1705	NA	9.38	0.0	20.52	15.2	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80's

Well Purging Record

Date	Time	Depth to ~~Water~~ (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5			Gauge Only, per TRC					B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5					10/2/17			*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17		MW-77								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-78 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1710	NA	9.42	0.0	19.57	14.6	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-75
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: SCO

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1720	NA	9.57	0.0	23.74	18.4	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1725	9.60	0.5	7.23	24.4	7920	3.0	-85.2	10.1	clear; gold tint, odor	*Low-flow groundwater sample:*
	1727	9.60	1.0	7.14	23.6	7930	2.5	-87.1	9.2		(A) peristaltic pump w/ ded tubing
	1730	9.61	1.5	7.07	23.0	7930	2.1	-89.9	8.7		B) ded bladder pump
	1732	9.61	2.0	7.05	22.8	7940	1.8	-91.2	8.1		C) non-ded bladder pump; or
	1735	9.61	2.5	7.03	22.7	7940	1.6	-92.3	7.8		*Standard groundwater sample:*
	1737	9.61	3.0	7.02	22.7	7940	1.5	-93.9	7.3		D) bailer due to limited column; or
	1740	9.61	3.5	7.02	22.7	7950	1.5	-94.5	6.9		E) recovery well cycling sample
	1742	9.61	4.0	7.01	22.8	7950	1.4	-94.9	6.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1745	MW-75	9.61	7.01	22.8	7950	1.4	-94.9	6.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-83
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1535	NA	9.41	0.0	19.91	15.6	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1540	9.51	0.5	6.96	26.1	5160	2.8	-117.5	13.2	Clear w/ gold tint	*Low-flow groundwater sample:*
	1542	9.56	1.0	6.89	24.4	5340	2.0	-122.5	10.8		(A) peristaltic pump w/ ded tubing
	1545	9.58	1.5	6.87	23.7	5400	1.7	-125.5	9.1		B) ded bladder pump
	1547	9.60	2.0	6.86	23.2	5430	1.4	-127.3	8.6		C) non-ded bladder pump; or
	1550	9.61	2.5	6.85	23.1	5450	1.3	-129.9	8.3		*Standard groundwater sample:*
	1552	9.62	3.0	6.85	23.1	5460	1.2	-131.4	7.9		D) bailer due to limited column; or
	1555	9.62	3.5	6.84	23.0	5470	1.2	-133.8	7.5		E) recovery well cycling sample
↓	1557	9.62	4.0	6.84	23.0	5470	1.2	-135.2	7.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1600	MW-83	9.62	6.84	23.0	5470	1.2	-135.2	7.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

+ DUP-EP-03 (same analysis)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-3
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup)

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1450	NA	9.45	0.0	20.18	16.1	Yes	Yes	Issue	Yes		Weather: Partly Cloudy 80's

Well Purging Record

No protective casing; Stainless steel well casing with locked expandable cap; probed for pad but not found

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1455	9.50	0.5	7.19	26.3	7310	2.5	-31.5	11.9	Clear	*Low-flow groundwater sample:*
↓	1457	9.53	1.0	7.12	25.0	7370	1.8	-30.9	10.5	↓	(A) peristaltic pump w/ ded tubing
↓	1500	9.54	1.5	7.09	24.0	7420	1.5	-29.8	8.8	↓	B) ded bladder pump
↓	1502	9.54	2.0	7.07	23.8	7450	1.3	-29.5	8.2	↓	C) non-ded bladder pump; or
↓	1505	9.54	2.5	7.05	23.5	7480	1.2	-29.1	7.9	↓	*Standard groundwater sample:*
↓	1507	9.54	3.0	7.04	23.4	7490	1.2	-28.7	7.4	↓	D) bailer due to limited column; or
↓	1510	9.54	3.5	7.04	23.4	7490	1.1	-28.2	6.9	↓	E) recovery well cycling sample
↓	1518	9.55	4.0	7.04	23.3	7500	1.1	-28.1	6.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1515	MW-3	9.55	7.04	23.7	7500	1.1	-28.1	6.5	DRO	HCL	8015M
↓										GRO	HCL	8015M
↓										VOC	HCL	8260
↓										Anions (Chloride,Fluoride,Sulfate)	Neat	300
↓										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
↓										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
↓										TDS	Neat	2540C
↓										***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
↓										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
↓										~~Cyanide~~	~~NaOH~~	~~SM4500~~
↓	1200	DUP-EP-03	9.55	7.04	23.3	7500	1.1	-28.1	6.5	Same analysis	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-88
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1130	NA	9.17	0.0	20.31	14.8	Yes	Yes	Yes	Yes	Hole in pad	Weather: Cloudy 70's

Well Purging Record

* Issue with pad; hole in west side of well pad; well remains functional

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1135	9.24	0.5	7.29	24.2	6140	2.7	-91.3	18.1	clear w/ orange particles	*Low-flow groundwater sample:*
↓	1137	9.25	1.0	7.25	22.5	6210	2.1	-87.5	14.2	↓	(A) peristaltic pump w/ ded tubing
	1140	9.26	1.5	7.22	22.3	6240	1.7	-83.2	10.9		B) ded bladder pump
	1142	9.26	2.0	7.20	22.0	6260	1.5	-79.1	10.1		C) non-ded bladder pump; or
	1145	9.26	2.5	7.18	21.9	6280	1.3	-77.6	9.7		*Standard groundwater sample:*
	1147	9.26	3.0	7.17	21.9	6290	1.2	-75.3	9.2		D) bailer due to limited column; or
	1150	9.26	3.5	7.17	21.8	6300	1.2	-74.2	8.7		E) recovery well cycling sample
↓	1152	9.26	4.0	7.16	21.8	6300	1.1	-73.9	8.4	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1155	MW-88	9.26	7.16	21.8	6300	1.1	-73.9	8.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										~~Anions (Chloride,Fluoride,Sulfate)~~	~~Neat~~	~~300~~
										~~Cations (Ca,K,Na), taken from total metals bottle~~	~~HNO3~~	~~6010/6020~~
										~~Nitrate-Nitrite~~	~~H2SO4~~	~~per historical, ESC Lab Sciences~~
										~~TDS~~	~~Neat~~	~~2540C~~
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

+ DUP-EP-02 (same analysis)

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-22A
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup)

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1215	NA	8.38	0.0	22.65	17.4	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1220	8.45	0.5	7.29	24.7	7460	2.6	-13.5	13.5	clear w/ orange particles	*Low-flow groundwater sample:*
	1222	8.51	1.0	7.16	23.4	7510	1.9	-17.5	10.9		(A) peristaltic pump w/ ded tubing
	1225	8.54	1.5	7.08	23.0	7520	1.7	-22.1	10.1		B) ded bladder pump
	1227	8.57	2.0	7.03	22.9	7520	1.5	-25.6	9.7		C) non-ded bladder pump; or
	1230	8.59	2.5	6.98	22.9	7530	1.4	-27.9	8.6		*Standard groundwater sample:*
	1232	8.60	3.0	6.96	22.9	7540	1.4	-30.2	8.5		D) bailer due to limited column; or
	1235	8.61	3.5	6.95	22.8	7540	1.3	-32.3	8.1		E) recovery well cycling sample
	1237	8.61	4.0	6.95	22.8	7540	1.3	-33.8	7.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1240	MW-22A	8.61	6.95	22.8	7540	1.3	-33.8	7.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	SM4500
	1000	DUP-EP-02	8.61	6.95	22.8	7540	1.3	-33.8	7.5	Same analysis	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-22B (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1305	NA	8.20	0.0	54.66	49.7	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

located 15 yds off of the left side of path (after the "S" turn)

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-10
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: SCO

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1315	NA	5.93	0.0	18.45	13.3	Yes	Yes	Yes	Yes	cracked pad	Weather: Cloudy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1320	5.94	0.5	7.03	22.7	6260	2.5	-41.2	9.1	clear w/ small orange	*Low-flow groundwater sample:*
	1322	5.95	1.0	6.98	22.5	6300	2.0	-38.6	8.5	particles	(A) peristaltic pump w/ ded tubing
	1325	5.95	1.5	6.94	22.3	6330	1.9	-35.4	7.9		B) ded bladder pump
	1327	5.95	2.0	6.92	22.1	6370	1.8	-33.1	7.3		C) non-ded bladder pump; or
	1330	5.95	2.5	6.90	22.0	6396	1.8	-32.9	6.9		*Standard groundwater sample:*
	1332	5.95	3.0	6.89	21.9	6400	1.7	-32.5	6.4		D) bailer due to limited column; or
	1335	5.95	3.5	6.88	21.9	6410	1.7	-32.1	6.1		E) recovery well cycling sample
↓	1337	5.95	4.0	6.87	21.9	6420	1.7	-31.8	5.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1340	MW-10	5.95	6.87	21.9	6426	1.7	-31.8	5.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-123
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1400	NA	6.34	0.0	25.71	25.0	Yes	Yes	Yes	Yes		Weather: Partly Cloudy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1405	6.35	0.5	7.14	23.0	6640	2.7	-68.3	18.5	Clear	*Low-flow groundwater sample:*
	1407	6.36	1.0	7.09	22.3	6690	2.3	-51.5	14.2		(A) peristaltic pump w/ ded tubing
	1410	6.36	1.5	7.05	21.6	6720	2.0	-45.2	12.9		B) ded bladder pump
	1412	6.36	2.0	7.02	21.5	6740	1.9	-40.7	10.8		C) non-ded bladder pump; or
	1415	6.36	2.5	7.00	21.5	6760	1.5	-38.6	9.7		*Standard groundwater sample:*
	1417	6.36	3.0	6.99	21.6	6770	1.5	-35.9	9.1		D) bailer due to limited column; or
	1420	6.36	3.5	6.99	21.6	6780	1.4	-33.2	8.6		E) recovery well cycling sample
↓	1422	6.36	4.0	6.98	21.6	6780	1.4	-30.1	8.3	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1425	MW-123	6.36	6.98	21.6	6780	1.4	-30.1	8.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

2 1/2 ft of subsidence under pad. top of protective casing extends above lock on expandable cap.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-4A (Blockage at 12.22' tube able to pass)
Event: Fall 2017 (Semiannual)
Area of Concern: EP (2-in ; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1045	NA	12.11	0.0	>12.22	11.5*	Yes	Issue	Issue	Yes		Weather: Cloudy 70's

Well Purging Record

* lowered intake as needed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1050	12.12	0.5	7.45	24.8	6550	3.5	-160.2	13.2	Clear w/ black particles	*Low-flow groundwater sample:*
	1052	12.12	1.0	7.35	24.0	6350	2.8	-162.3	10.9		(A) peristaltic pump w/ ded tubing
	1055	12.12	1.5	7.26	23.4	6190	2.6	-165.4	9.8		B) ded bladder pump
	1057	12.12	2.0	7.21	23.1	6100	2.5	-168.9	9.5		C) non-ded bladder pump; or
	1100	12.12	2.5	7.19	22.9	6060	2.5	-170.2	8.6		*Standard groundwater sample:*
	1102	12.12	3.0	7.17	22.8	6040	2.4	-171.6	8.3		D) bailer due to limited column; or
	1105	12.12	3.5	7.15	22.7	6030	2.4	-173.9	8.1		E) recovery well cycling sample
	1107	12.12	4.0	7.14	22.7	6030	2.4	-174.5	7.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1110	MW-4A	12.12	7.14	22.7	6030	2.4	-174.5	7.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cu,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-4B (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1040	NA	11.35	0.0	72.37	67.4	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+ EB-EP-03 (same analysis)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-5A
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

Well Inspection Information

(2-in; stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	950	NA	8.94	0.0	20.15	14.8	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

* Confirmed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	955	9.00	0.5	7.29	22.3	9200	3.0	-121.5	15.2	Clear w/ orange particles	Low-flow groundwater sample:
	957	9.00	1.0	7.23	22.1	9240	1.9	-125.3	11.3		(A) peristaltic pump w/ ded tubing
	1000	9.00	1.5	7.15	21.9	9270	1.5	-127.2	10.5		B) ded bladder pump
	1002	9.00	2.0	7.10	21.9	9290	1.3	-130.1	9.8		C) non-ded bladder pump; or
	1005	9.00	2.5	7.07	21.9	9350	1.2	-132.5	9.1		Standard groundwater sample:
	1007	9.00	3.0	7.06	21.9	9370	1.2	-133.9	8.6		D) bailer due to limited column; or
	1010	9.00	3.5	7.06	21.9	9380	1.1	-135.5	8.0		E) recovery well cycling sample
	1012	9.00	4.0	7.05	21.9	9380	1.1	-137.4	7.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1015	MW-5A	9.00	7.05	21.9	9380	1.1	-137.4	7.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1030	EB-EP-03	NA	→	→	→	→	→	→	Same analysis	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-5B (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	940	NA	8.85	0.0	53.54	48.5	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-5C (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP

(2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	945	NA	9.03	0.0	71.64	66.6	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

2-in stainless steel well casing extends approximately 1-foot above to top of the steel protective casing; expandable locking cap is locked

Monitoring Well Purging and Sampling Record

+ Dup-EP-01 (same analysis)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-7A
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

(2-in; stickup)

Initials: SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	8.50	NA	7.96	0.0	17.25	12.1	Yes	Yes	Issue	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	855	8.06	0.5	7.42	21.7	9110	2.5	-63.2	32.5	Clear w/ orange particles	Low-flow groundwater sample:
	857	8.07	1.0	7.31	21.5	9170	1.9	-65.2	28.7		(A) peristaltic pump w/ ded tubing
	900	8.07	1.5	7.25	21.4	9190	1.6	-68.1	20.6		B) ded bladder pump
	902	8.07	2.0	7.22	21.4	9200	1.4	-69.9	17.3		C) non-ded bladder pump; or
	905	8.07	2.5	7.20	21.4	9210	1.3	-70.2	14.2		Standard groundwater sample:
	907	8.07	3.0	7.18	21.4	9210	1.3	-72.5	11.7		D) bailer due to limited column; or
	910	8.07	3.5	7.17	21.3	9220	1.3	-73.8	10.5		E) recovery well cycling sample
↓	912	8.07	4.0	7.16	21.3	9220	1.2	-74.6	9.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	915	MW-7A	8.07	7.16	21.3	9220	1.2	-74.6	9.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Cu,U)~~				~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
↓	800	Dup-EP-01	8.07	7.16	21.3	9220	1.2	-74.6	9.8	Same analysis	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-7B (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup)

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	845	NA	9.27	0.0	52.56	47.6	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+ Trip Blank - EP-02

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD - 8A
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	745	NA	9.41	0.0	20.74	16.4	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	750	9.86	0.5	6.31	21.5	10930	3.0	-131.5	10.9	clear w/ orange particles	Low-flow groundwater sample:
	757	10.01	1.0	6.44	21.5	10,960	2.1	-135.7	10.1		(A) peristaltic pump w/ ded tubing
	800	10.08	1.5	6.52	21.5	11,000	1.7	-137.2	9.7		B) ded bladder pump
	802	10.13	2.0	6.60	21.5	11,040	1.5	-139.1	9.2		C) non-ded bladder pump; or
	805	10.15	2.5	6.65	21.5	11,050	1.3	-140.3	8.3		Standard groundwater sample:
	807	10.17	3.0	6.68	21.5	11,050	1.2	-141.5	8.1		D) bailer due to limited column; or
	810	10.19	3.5	6.70	21.5	11,050	1.2	-142.9	7.5		E) recovery well cycling sample
	812	10.20	4.0	6.72	21.5	11,060	1.1	-143.3	7.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	815	OCD-8A	10.20	6.72	21.5	11,060	1.1	-143.3	7.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-8B (Gauge Only)
Event: Fall 2017 (Semiannual)
Area of Concern:

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in ; stickup)

Initials: SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	835	NA	9.01	0.0	56.65	51.7	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Do not gauge or sample, Fall 2017]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB - P4
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; short stickup)

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/7												Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-25 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup)

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1700	NA	13.92	0.0	28.18	23.2	Yes	Yes	Yes	Yes	subsidence under pad	Weather: Pt. Cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "Sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: NP-8 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1705	NA	12.46	0.0	15.20	NS	Issue	Issue	Yes	Yes		Weather: Pt. cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0		PVC well is approx 2.0' below top						A) peristaltic pump w/ ded tubing
			1.5		of metal casing. Unable to access top						B) ded bladder pump
			2.0		of PVC well, so no cap is present.						C) non-ded bladder pump; or
			2.5		DTW + TD measured from Top of						*Standard groundwater sample:*
			3.0		metal casing. HMI suggests						D) bailer due to limited column; or
			3.5		metal protective casing should						E) recovery well cycling sample
			4.0		be cut down.						F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-1R (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in, stickup)

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1710	NA	10.43	0.0	20.63	15.6	Yes	Issue	Yes	Yes		Weather: Pt. Cloudy, 70s

↳ casing & lid are bent, making closure difficult. Well still locks & is functional.

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-15 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRA

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1715	NA	11.53	0.0	21.70	17.7	Yes	Yes	Yes	Yes		Weather: Pt. cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

(10-3-17)

+ Trip Blank - EP-03

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: OCD - 1R
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup)

Initials: BZH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1235	NA	11.70	0.0	23.89	18.6	Yes	Issue	Yes	Yes		Weather: Cloudy, 70s
								↳				

↳ casing lid does not fully close. PVC casing needs to be cut down for full closure. Well is secured w/ long-hasp lock.

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-17	1240	11.87	0.5	7.53	24.1	10,520	2.4	-39.6	9.6	Clear	*Low-flow groundwater sample:*
	1243	11.89	1.0	7.39	23.2	10,400	1.4	-31.9	7.9		(A) peristaltic pump w/ ded tubing
	1245	11.90	1.5	7.30	22.8	10,250	1.1	-28.1	7.1		B) ded bladder pump
	1248	11.90	2.0	7.24	22.6	10,170	0.9	-22.5	5.8		C) non-ded bladder pump; or
	1250	11.90	2.5	7.22	22.5	10,120	0.8	-20.3	4.7		*Standard groundwater sample:*
	1253	11.90	3.0	7.20	22.4	10,090	0.7	-19.8	4.0		D) bailer due to limited column; or
	1255	11.90	3.5	7.18	22.4	10,080	0.6	-19.1	3.6		E) recovery well cycling sample
	1258	11.90	4.0	7.17	22.3	10,070	0.6	-18.4	3.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10-3-17	1300	OCD-1R	11.90	7.17	22.3	10,070	0.6	-18.4	3.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-2A
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1320	NA	11.61	0.0	27.58	22.3	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-17	1620	11.73	0.5	7.65	24.2	7770	2.7	-118.3	20.5	Clear w/ orange	*Low-flow groundwater sample:*
	1623	11.74	1.0	7.62	23.2	7390	1.3	-117.0	16.7	algae particles	(A) peristaltic pump w/ ded tubing
	1625	11.74	1.5	7.58	23.0	7180	1.1	-116.7	10.2		B) ded bladder pump
	1628	11.74	2.0	7.53	22.8	6980	0.9	-116.1	8.9		C) non-ded bladder pump; or
	1630	11.74	2.5	7.51	22.6	6950	0.8	-115.5	7.8		*Standard groundwater sample:*
	1633	11.74	3.0	7.50	22.5	6920	0.7	-116.3	7.1		D) bailer due to limited column; or
	1635	11.74	3.5	7.48	22.4	6900	0.6	-116.9	6.8		E) recovery well cycling sample
	1638	11.74	4.0	7.47	22.4	6890	0.6	-117.3	6.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
10-3-17	1640	OCD-2A	11.74	7.47	22.4	6890	0.6	-117.3	6.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										~~Anions (Chloride,Fluoride,Sulfate)~~	~~Neat~~	~~300~~
										~~Cations (Ca,K,Na), taken from total metals bottle~~	~~HNO3~~	~~6010/6020~~
										~~Nitrate-Nitrite~~	~~H2SO4~~	per historical, ESC Lab Sciences
										~~TDS~~	~~Neat~~	~~2540C~~
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "Sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-2B (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

(2-in; stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1323	NA	11.44	0.0	50.39	NS	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-3
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(new cap added (old broke)) (2-in; stickup) Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1330	NA	12.29	0.0	25.48	20.2	Yes	~~Yes~~ Issue	Yes	Yes	Pad is destroyed	Weather: Pt. Cloudy, 70s

(PVC) ↳ well casing needs to be cut down to allow full closure of lid. long-hasp lock on well to secure

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-17	1505	12.32	0.5	7.48	24.0	8630	2.0	-27.4	13.1	Clear	*Low-flow groundwater sample:*
	1508	12.33	1.0	7.37	23.0	8380	1.4	-26.1	9.7		(A) peristaltic pump w/ ded tubing
	1510	12.33	1.5	7.31	22.6	8120	1.1	-24.9	9.0		B) ded bladder pump
	1513	12.33	2.0	7.29	22.4	8060	1.0	-22.0	8.3		C) non-ded bladder pump; or
	1515	12.33	2.5	7.26	22.3	8030	0.9	-20.7	7.9		*Standard groundwater sample:*
	1518	12.33	3.0	7.25	22.2	8010	0.8	-19.1	7.6		D) bailer due to limited column; or
	1520	12.33	3.5	7.24	22.1	8000	0.8	-18.3	7.1		E) recovery well cycling sample
	1523	12.33	4.0	7.24	22.0	7990	0.8	-17.9	6.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10-3-17	1525	OCD-3	12.33	7.24	22.0	7990	0.8	-17.9	6.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										~~Anions (Chloride,Fluoride,Sulfate)~~	~~Neat~~	~~300~~
										~~Cations (Ca,K,Na), taken from total metals bottle~~	~~HNO3~~	~~6010/6020~~
										~~Nitrate-Nitrite~~	~~H2SO4~~	~~per historical, ESC Lab Sciences~~
										~~TDS~~	~~Neat~~	~~2540C~~
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-4
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup)

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1335	NA	11.57	0.0	25.42	20.1	Yes	Yes	Yes	Yes	subsidence	Weather: Sunny, 70s
											under pad	

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-17	1430	11.60	0.5	7.21	24.5	14,870	1.9	-85.1	52.0	Clear w/ orange	*Low-flow groundwater sample:*
	1433	11.60	1.0	7.19	23.0	14,780	1.2	-85.4	44.7	algae particles	(A) peristaltic pump w/ ded tubing
	1435	11.60	1.5	7.16	22.8	14,710	0.9	-84.9	38.5		B) ded bladder pump
	1438	11.60	2.0	7.15	22.6	14,660	0.7	-84.6	30.4		C) non-ded bladder pump; or
	1440	11.60	2.5	7.14	22.5	14,640	0.7	-83.8	27.8		*Standard groundwater sample:*
	1443	11.60	3.0	7.14	22.4	14,620	0.6	-81.9	26.7		D) bailer due to limited column; or
	1445	11.60	3.5	7.13	22.4	14,610	0.6	-81.0	26.2		E) recovery well cycling sample
	1448	11.60	4.0	7.13	22.3	14,610	0.5	-80.4	26.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
10-3-17	1450	OCD-4	11.60	7.13	22.3	14,610	0.5	-80.4	26.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										~~Anions (Chloride,Fluoride,Sulfate)~~	~~Neat~~	~~300~~
										~~Cations (Ca,K,Na), taken from total metals bottle~~	~~HNO3~~	~~6010/6020~~
										~~Nitrate-Nitrite~~	~~H2SO4~~	~~per historical, ESC Lab Sciences~~
										~~TDS~~	~~Neat~~	~~2540C~~
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-11A
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; Stickup) Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1340	NA	9.23	0.0	22.01	17.0	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-17	1540	9.33	0.5	6.95	23.7	26,700	1.8	-42.8	12.7	Clear	*Low-flow groundwater sample:*
	1543	9.33	1.0	6.88	23.4	27,000	1.1	-42.2	10.1		(A) peristaltic pump w/ ded tubing
	1545	9.33	1.5	6.83	23.2	27,200	0.9	-40.1	9.6		B) ded bladder pump
	1548	9.33	2.0	6.81	23.0	27,300	0.8	-38.6	8.4		C) non-ded bladder pump; or
	1550	9.33	2.5	6.80	22.8	27,300	0.7	-35.9	7.8		*Standard groundwater sample:*
	1553	9.33	3.0	6.80	22.7	27,400	0.7	-35.2	7.3		D) bailer due to limited column; or
	1555	9.33	3.5	6.79	22.6	27,400	0.6	-34.8	7.1		E) recovery well cycling sample
	1558	9.33	4.0	6.79	22.6	27,500	0.6	-34.5	6.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10-3-17	1600	MW-11A	9.33	6.79	22.6	27,500	0.6	-34.5	6.9	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	~~HCL~~	~~8015M~~
										~~VOC~~	~~HCL~~	~~8260~~
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-11B (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRA

Well Inspection Information

(2-in; stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1343	NA	9.18	0.0	47.30	42.3	Yes	Yes	Yes	Yes		Weather: Sunny, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: OCD-5
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup)

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1350	NA	9.70	0.0	25.42	20.6	Yes	Yes	Yes	Yes	Rod severely cracked	Weather: Pt. Cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-17	1355	9.77	0.5	7.58	24.0	16,520	2.9	-111.7	83.0	sl. cloudy; orange	*Low-flow groundwater sample:*
	1358	9.77	1.0	7.51	22.8	16,610	1.3	-115.8	69.0	algae particles	(A) peristaltic pump w/ ded tubing
	1400	9.77	1.5	7.44	22.3	16,690	1.0	-113.9	56.0		B) ded bladder pump
	1403	9.77	2.0	7.41	22.1	16,740	0.9	-110.5	51.0		C) non-ded bladder pump; or
	1405	9.77	2.5	7.39	22.0	16,800	0.8	-107.6	44.8		*Standard groundwater sample:*
	1408	9.77	3.0	7.38	21.9	16,810	0.7	-107.0	42.5		D) bailer due to limited column; or
	1410	9.77	3.5	7.36	21.8	16,820	0.7	-106.3	41.8		E) recovery well cycling sample
	1413	9.77	4.0	7.35	21.8	16,830	0.7	-105.8	42.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10-3-17	1415	OCD-5	9.77	7.35	21.8	16,830	0.7	-105.8	42.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-87
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	910	NA	8.65	0.0	20.39	15.1	Yes	Yes	Yes	Yes		Weather: Cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-17	915	8.77	0.5	6.81	21.8	17,100	2.2	-106.1	8.4	clear	*Low-flow groundwater sample:*
	918	8.82	1.0	6.88	21.7	17,290	1.3	-108.0	6.0		(A) peristaltic pump w/ ded tubing
	920	8.86	1.5	6.93	21.6	17,330	1.0	-109.3	4.9		B) ded bladder pump
	923	8.89	2.0	6.98	21.6	17,350	0.9	-110.1	3.6		C) non-ded bladder pump; or
	925	8.92	2.5	7.01	21.5	17,360	0.7	-110.8	2.8		*Standard groundwater sample:*
	928	8.95	3.0	7.02	21.5	17,360	0.6	-111.3	2.1		D) bailer due to limited column; or
	930	8.98	3.5	7.02	21.4	17,370	0.6	-112.7	1.7		E) recovery well cycling sample
	933	9.01	4.0	7.03	21.4	17,380	0.5	-113.6	1.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
10-3-17	935	MW-87	9.01	7.03	21.4	17,380	0.5	-113.6	1.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										~~Anions (Chloride,Fluoride,Sulfate)~~	~~Neat~~	~~300~~
										~~Cations (Ca,K,Na), taken from total metals bottle~~	~~HNO3~~	~~6010/6020~~
										~~Nitrate-Nitrite~~	~~H2SO4~~	~~per historical, ESC Lab Sciences~~
										~~TDS~~	~~Neat~~	~~2540C~~
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-18A
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1000	NA	10.00	0.0	22.58	17.9	Yes	Yes	Yes	Yes		Weather: Cloudy, 70s

Well Purging Record *confirmed SC

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-17	1005	10.22	0.5	7.29	21.8	23,100	2.5	-94.0	6.3	Clear	*Low-flow groundwater sample:*
↓	1008	10.30	1.0	7.19	21.1	23,200	2.0	-99.1	4.1	↓	(A) peristaltic pump w/ ded tubing
	1010	10.37	1.5	7.13	20.9	23,200	1.8	-96.8	2.7		B) ded bladder pump
	1013	10.42	2.0	7.10	20.8	23,300	1.5	-92.4	2.2		C) non-ded bladder pump; or
	1015	10.47	2.5	7.08	20.7	23,300	1.2	-91.8	1.8		*Standard groundwater sample:*
	1018	10.50	3.0	7.08	20.7	23,400	1.0	-91.1	1.4		D) bailer due to limited column; or
	1020	10.53	3.5	7.07	20.6	23,400	0.9	-90.7	1.3		E) recovery well cycling sample
↓	1023	10.56	4.0	7.06	20.6	23,400	0.9	-90.3	1.3	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10-3-17	1025	MW-18A	10.56	7.06	20.6	23,400	0.9	-90.3	1.3	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-18B (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup)

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	958	NA	9.93	0.0	50.59	45.6	Yes	Yes	Yes	Yes		Weather: Cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-18T (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	955	NA	9.73	0.0	50.38	NS	NO	Issue	Issue	Yes		Weather: Cloudy, 70s
			↳measured from highest point on PVC					(missing lid)	(Lock won't resolve issue)			

↳ Top of PVC casing shattered. Needs repairs to allow usage of a cap.

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-70
Event: Fall 2017 (Semiannual)
Area of Concern: EP (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1045	NA	8.29	0.0	22.85	16.8	Yes	Yes	Yes	Yes		Weather: Cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-17	1050	8.35	0.5	7.32	23.3	8460	2.1	-79.6	47.6	clear w/ orange	*Low-flow groundwater sample:*
	1053	8.36	1.0	7.30	22.8	7860	1.8	-80.1	39.8	algae particles	(A) peristaltic pump w/ ded tubing
	1055	8.36	1.5	7.26	22.4	7390	1.3	-82.0	30.4		B) ded bladder pump
	1058	8.36	2.0	7.23	22.2	7190	1.0	-83.4	18.7		C) non-ded bladder pump; or
	1100	8.36	2.5	7.16	21.9	7020	1.0	-84.7	12.6		*Standard groundwater sample:*
	1103	8.36	3.0	7.13	21.8	6960	0.9	-83.1	9.8		D) bailer due to limited column; or
	1105	8.36	3.5	7.12	21.8	6940	0.8	-82.4	7.4		E) recovery well cycling sample
	1108	8.36	4.0	7.11	21.7	6930	0.8	-82.1	6.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10-3-17	1110	MW-70	8.36	7.11	21.7	6930	0.8	-82.1	6.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										~~Anions (Chloride,Fluoride,Sulfate)~~	~~Neat~~	~~300~~
										~~Cations (Ca,K,Na), taken from total metals bottle~~	~~HNO3~~	~~6010/6020~~
										~~Nitrate-Nitrite~~	~~H2SO4~~	~~per historical, ESC Lab Sciences~~
										~~TDS~~	~~Neat~~	~~2540C~~
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

+ EB-EP-02 (same analysis)

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-124
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup)

Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1125	NA	8.96	0.0	22.01	17.0	Yes	Yes	Yes	Yes		Weather: 87. cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-17	1130	8.99	0.5	7.16	23.4	12,910	3.2	-83.4	62.0	clear w/ orange	*Low-flow groundwater sample:*
	1133	9.00	1.0	7.09	22.6	12,920	1.4	-83.9	34.9	algae particles	(A) peristaltic pump w/ ded tubing
	1135	9.00	1.5	7.09	22.2	12,890	1.1	-84.2	22.8		B) ded bladder pump
	1138	9.00	2.0	7.00	22.0	12,840	1.0	-84.0	16.9		C) non-ded bladder pump; or
	1140	9.00	2.5	6.99	21.9	12,800	1.0	-85.2	15.7		*Standard groundwater sample:*
	1143	9.00	3.0	6.97	21.8	12,790	1.0	-86.1	15.1		D) bailer due to limited column; or
	1145	9.00	3.5	6.95	21.8	12,780	0.9	-85.5	14.6		E) recovery well cycling sample
	1148	9.00	4.0	6.94	21.7	12,780	0.9	-85.7	14.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10-3-17	1150	MW-124	9.00	6.94	21.7	12,780	0.9	-85.7	14.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~*Long List* Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1210	EB-EP-02	NA							Same analysis	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Driveway near bldg A/C unit

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-52
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in ; at-grade) Initials: BR H

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1920	NA	16.33	0.0	34.67	29.5	Yes	Yes	Issue	Yes		Weather: Cloudy, 60s
10-4-17	750	NA	16.34	0.0	34.67	29.5						

↳ missing 9/16 bolts. Holes do not line up on current at-grade plate.

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-4-17	755	16.38	0.5	7.18	20.7	3470	3.1	34.0	9.1	clear	*Low-flow groundwater sample:*
	758	16.39	1.0	7.08	20.6	3450	2.0	39.2	7.3		(A) peristaltic pump w/ ded tubing
	800	16.39	1.5	7.03	20.6	3410	1.6	40.6	5.8		B) ded bladder pump
	803	16.39	2.0	6.99	20.5	3380	1.2	43.1	4.7		C) non-ded bladder pump; or
	805	16.39	2.5	6.97	20.4	3320	1.1	45.6	4.2		*Standard groundwater sample:*
	808	16.39	3.0	6.96	20.4	3310	1.0	46.1	3.8		D) bailer due to limited column; or
	810	16.39	3.5	6.95	20.4	3300	0.9	46.8	3.3		E) recovery well cycling sample
	813	16.39	4.0	6.94	20.4	3300	0.9	47.3	3.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10-4-17	815	MW-52	16.39	6.94	20.4	3300	0.9	47.3	3.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

E. side of blue bldg.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-109
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1924	NA	14.63	0.0	29.48	25.5	Yes	Yes	Yes	Yes		Weather: Cloudy, 70s
10-4-17	835	NA	14.63	0.0	29.48	25.5						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-4-17	840	14.79	0.5	6.58	22.0	3610	2.0	-345.7	18.9	clear w/ black tint,	*Low-flow groundwater sample:*
	843	14.85	1.0	6.56	22.0	3570	1.0	-351.2	13.0	odor	(A) peristaltic pump w/ ded tubing
	845	14.90	1.5	6.55	22.0	3550	0.8	-354.5	10.3		B) ded bladder pump
	848	14.92	2.0	6.55	22.0	3530	0.7	-357.0	9.8		C) non-ded bladder pump; or
	850	14.94	2.5	6.54	21.9	3520	0.6	-359.3	8.1		*Standard groundwater sample:*
	853	14.95	3.0	6.54	21.9	3510	0.6	-360.8	7.2		D) bailer due to limited column; or
	855	14.96	3.5	6.53	21.8	3510	0.5	-361.4	6.9		E) recovery well cycling sample
	858	14.97	4.0	6.53	21.8	3510	0.5	-361.9	6.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10-4-17	900	MW-109	14.97	6.53	21.8	3510	0.5	-361.9	6.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

W. - side driveway of blue bldg.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-110
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BZH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1930	NA	13.26	0.0	29.74	24.7	Yes	Yes	Yes	Yes		Weather: Cloudy, 70s
10-4-17	920	NA	13.27	0.0	29.74	24.7						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-4-17	925	13.41	0.5	7.51	21.7	2870	2.8	-239.1	16.7	Clear, odor	*Low-flow groundwater sample:*
	928	13.47	1.0	7.22	21.6	2580	1.3	-250.7	11.2		(A) peristaltic pump w/ ded tubing
	930	13.52	1.5	7.14	21.6	2390	1.0	-255.8	9.5		B) ded bladder pump
	933	13.55	2.0	7.07	21.5	2260	0.8	-259.2	7.8		C) non-ded bladder pump; or
	935	13.57	2.5	7.03	21.5	2200	0.6	-261.9	6.9		*Standard groundwater sample:*
	938	13.58	3.0	7.01	21.4	2180	0.6	-263.4	6.4		D) bailer due to limited column; or
	940	13.59	3.5	6.99	21.4	2170	0.5	-265.0	6.1		E) recovery well cycling sample
	943	13.60	4.0	6.98	21.4	2160	0.5	-266.3	5.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10-4-17	945	MW-110	13.60	6.98	21.4	2160	0.5	-266.3	5.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

No Sampling due to location N. of river

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-13 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1755	NA	11.88	0.0	21.10	Not Sampled	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

No sampling due to location N. of river

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-69 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: BFH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1750	NA	10.51	0.0	22.50	Not Sampled	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

No sampling due to location N. of river

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-12 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP (4-in; Stickup)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: BRH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1810	NA	9.74	0.0	17.93	Not Sampled	Yes	Yes	Yes	Yes		Weather: Pt. Cloudy, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

No sampling due to location E. of river

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-24 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BZH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1830	NA	11.48	0.0	23.51	Not Sampled	Yes	Yes	Issue	Yes		Weather: Pt. Cloudy, 70s

↳ Broken hasp/hinge. well is locked but will not close securely.

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

No Sampling due to location N. of river

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-14 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: EP

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup) Initials: BRH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1835	NA	10.59	0.0	11.93	NS	Yes	Issue	Yes	Yes		Weather: Pt. Cloudy, 70s
								Blockage @ 11.93' TOC				

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Recently off, due to water rights issue

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico
Well Inspection Information (Sample port if RW is active)

Well: RW-12R (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Above-grade recovery vault
12-in well casing diameter

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: BM

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1048	NA	18.14	0.0	NM	Top of pump (If not active)	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+ EB-Rest-01
+ Dup-Rest-01
(both for same analyses)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-113
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

(2-in; stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1045	NA	18.44	0.0	37.80	33.8	Yes	Yes	Yes	Yes		Weather: Cloudy 70's
10.4.17	1115	NA	18.61	0.0	37.80	33.8						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.4.17	1120	18.65	0.5	7.12	21.7	2710	2.2	-189.4	8.1	Clear	*Low-flow groundwater sample:*
	1122	18.65	1.0	7.02	21.4	2690	2.1	-185.1	7.4		(A) peristaltic pump w/ ded tubing
	1125	18.65	1.5	6.96	21.2	2670	2.0	-179.6	7.2		B) ded bladder pump
	1127	18.66	2.0	6.90	21.1	2650	2.0	-174.5	6.9		C) non-ded bladder pump; or
	1130	18.66	2.5	6.87	21.0	2630	1.9	-172.1	6.7		*Standard groundwater sample:*
	1132	18.66	3.0	6.85	21.0	2620	1.9	-170.0	6.1		D) bailer due to limited column; or
	1135	18.66	3.5	6.83	21.1	2620	1.8	-168.9	5.9		E) recovery well cycling sample
	1137	18.66	4.0	6.81	21.1	2610	1.8	-167.4	5.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10.4.17	1140	MW-113	18.66	6.81	21.1	2610	1.8	-167.4	5.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1100	DUP-Rest-01								Same analysis	Same	Same
	1210	EB-Rest-01	NA							Same analysis	Same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-8
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: BB

Date	Time	* Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1040	16.65	16.66	0.01	35.80	30.8	Yes	Yes	Yes	Yes		Weather: Cloudy 70's
		*production probe										

Well Purging Record used absorbant pad tie wrapped to water level probe to remove LNAPL prior to sampling

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1620	16.75	0.5	7.18	28.0	3186	1.7	-179.4	11.8	Clear (strong HC odor)	Low-flow groundwater sample:
	1623	16.77	1.0	7.03	27.7	3294	1.6	-193.2	10.1	" "	(A) peristaltic pump w/ ded tubing
	1625	16.77	1.5	6.97	26.9	3368	1.4	-199.7	9.4	" "	B) ded bladder pump
	1628	16.77	2.0	6.88	26.5	3389	1.1	-216.4	8.6	" "	C) non-ded bladder pump; or
	1630	16.77	2.5	6.82	26.3	3402	0.9	-228.3	7.7	" "	Standard groundwater sample:
	1633	16.77	3.0	6.80	26.2	3411	0.8	-232.1	7.2	" "	D) bailer due to limited column; or
	1635	16.77	3.5	6.80	26.2	3415	0.7	-233.7	6.9	" "	E) recovery well cycling sample
	1638	16.77	4.0	6.79	26.1	3418	0.7	-234.6	6.7	" "	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1640	KWB-8	16.77	6.79	26.1	3418	0.7	-234.6	6.7	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-22 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (Screen: 11.5 - 39) Above-grade Recovery Vault 12-in casing diameter Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1037	16.88	17.31	0.43	NM	NA	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

NA when sampled; Sample part with active RW (RW off 10/3/17)

Well Purging Record

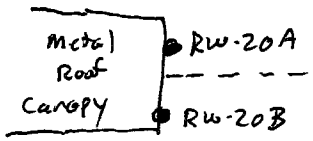
Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico



Well: RW-20A (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: RCST

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

At-grade vault
6-in casing diameter

Initials: BJ3

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/31/17	1032	19.94	20.01	0.07	NM	NA (Sample port)	Yes (NA)	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Metal Roof Canopy — RW-20A — Vault — RW-20B

Well: RW-20B (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

At-grade vault
6-in casing diameter

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information Initials: BJ

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1028	19.98	20.37	0.39	NM	NA	Yes (NA)	Yes	Yes	Yes		Weather: Cloudy 70's
						(sample part)						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-13R (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Above-grade vault
12-in casing diameter
Initials: RSB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1053	17.05	17.28	0.23	nm	Sample port	Yes	Yes	Yes	Yes		Weather Cloudy 70's
					Pump in well							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-14R (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Above-grade vault
12-in casing diameter

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1058	16.59	17.71	0.12	NM	Sample Port	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-133
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: BG

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1102	16.89	17.16	0.27	37.64	27.9	Yes	Yes	Yes	Yes		Weather: Cloudy 70's
					Spsf							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5	not sampled due to product							*Low-flow groundwater sample:*
			1.0	greater than 0.03'							(A) peristaltic pump w/ ded tubing
			1.5	(or equal to)							B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Trip Blank - Rest-01

Monitoring Well Purging and Sampling Record

+ Dup-Rest-03
+ EB-Rest-03
(both for same analyses)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-134
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup)

Initials: BS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1106	NA	16.52	0.0	32.95	28.4	Yes	Yes	Yes	Yes		Weather: Cloudy 70's
10/4/17	1045	NA	16.51	0.0	Soft							Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/4/17	1050	16.53	0.5	6.91	20.6	5275	2.9	52.7	9.2	Clear	*Low-flow groundwater sample:*
	1053	16.53	1.0	6.87	20.1	5273	2.1	56.8	8.1	"	(A) peristaltic pump w/ ded tubing
	1055	16.53	1.5	6.83	19.7	5271	1.7	60.7	7.6	"	B) ded bladder pump
	1058	16.53	2.0	6.80	19.5	5273	1.5	64.6	5.5	"	C) non-ded bladder pump; or
	1100	16.53	2.5	6.78	19.4	5275	1.3	65.8	4.0	"	*Standard groundwater sample:*
	1103	16.53	3.0	6.77	19.3	5276	1.2	66.9	3.8	"	D) bailer due to limited column; or
	1105	16.53	3.5	6.77	19.3	5271	1.1	67.2	3.7	"	E) recovery well cycling sample
	1108	16.53	4.0	6.76	19.2	5277	1.1	67.7	3.7	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	1110	MW-134	16.53	6.76	19.2	5277	1.1	67.7	3.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,Li)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1200	Dup-Rest-03	16.53	6.76	19.2	5277	1.1	67.7	3.7	same analyses	same	Same
	1120	EB-Rest-03	NA							same analyses	same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Irrigation well
Inside green, block bldg.
No purge
Sample port (faucet)

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: RA - 4798
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring for TRC
Houston, Texas

Well Inspection Information Screen 840 - 850 ft-bgs

Initials: BSR

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1700	NA	NA	NA	NA	NA	NA	NA	Yes	Yes		Weather: Sunny 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5							Clear	*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5	No purge, sample port							B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								(F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1700	RA-4798	NA	7.03	19.1	1189	1.7	76.4	0.9	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Irrigation well
Inside green, block bldg.
No purge
Sample port (faucet)

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: RA - 4196
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring for TRC
Houston, Texas

Well Inspection Information Screen 280-292 ft-bgs

Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/4/17	1145	NA	NA	NA	NA	NA	NA	NA	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5							Clear	*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5	No purge, active well with sample port							B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								(F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	1145	RA-4196	NR	6.91	23.8	2581	1.9	13.8	1.5	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	HNO_3	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Do not address - Removed from program by Navajo, 4-13-15]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-1227
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

[Irrigation well removed from program]

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information Screen 194-246 ft-bgs

Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17												Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5		DO NOT ADDRESS						B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

No activity this event.

Monitoring Well Purging and Sampling Record

Irrigation well
No purge; sample part when sampled

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: RA-3156
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17		NA	NA	NA	NA	NA						Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								(F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

East of MW-101, across the street. No activity this event.

Irrigation and water supply role, per Navajo shift foreman, Doug Collins, 1H16

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RA-313
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information Screen 904-1157 ft-bgs

Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17						*						Weather:

Well Purging Record * Historically, when sampled, Navajo turns on well; prior to this - HMI installs temporary sample port. Removed when done.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								(F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Sock installed, 1H16
No sock installed, 2H16

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-7
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: BB

Date	Time	Depth to * LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1020	17.77	17.78	0.01	34.83	30.6	Yes	Yes	Yes	Yes	needs new pad	Weather: Cloudy, 70's

Well Purging Record (* noticable product on probe, dark brown) used asorbent pad tightly wrapped to water level probe to remove LNAPL prior to sampling

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity		
10/3/17	1310	17.81	0.5	7.00	20.4	3142	3.0	-78.6	10.6	clear	(strong HC odor)	*Low-flow groundwater sample:*
	1313	17.81	1.0	6.96	19.9	3168	2.1	-89.2	9.8	"	"	(A) peristaltic pump w/ ded tubing
	1315	17.81	1.5	6.88	19.6	3183	1.6	-94.8	8.9	"	"	B) ded bladder pump
	1318	17.81	2.0	6.83	19.5	3187	1.0	-97.3	8.1	"	"	C) non-ded bladder pump; or
	1320	17.81	2.5	6.81	19.4	3184	0.8	-99.1	7.6	"	"	*Standard groundwater sample:*
	1323	17.81	3.0	6.80	19.4	3181	0.7	-100.2	7.3	"	"	D) bailer due to limited column; or
	1325	17.81	3.5	6.79	19.3	3179	0.6	-101.0	7.1	"	"	E) recovery well cycling sample
	1328	17.81	4.0	6.79	19.3	3177	0.6	-101.7	6.9	"	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1330	KWB-7	17.81	6.79	19.3	3177	0.6	-101.7	6.9	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~*Short List* Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

* HMI - dedicated bladder pump

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-135
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in ; at-grade) Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1001	NA	26.35	0.0	65.55	50.0	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record (* All out of inf. of cell)

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity * (NTU)	Water Color / Clarity	
10/3/17	1530	26.37	0.5	7.13	19.5	6216	3.8	91.8	87.2	Clear (tiny white particles)	*Low-flow groundwater sample:*
	1533	26.37	1.0	6.97	19.2	6572	2.8	109.9	64.7	"	A) peristaltic pump w/ ded tubing
	1535	26.37	1.5	6.81	19.1	6603	2.7	116.7	56.8	"	(B) ded bladder pump
	1538	26.37	2.0	6.74	19.1	6613	2.6	119.8	49.3	"	C) non-ded bladder pump; or
	1540	26.37	2.5	6.71	19.1	6621	2.6	121.2	42.8	"	*Standard groundwater sample:*
	1543	26.37	3.0	6.69	19.0	6628	2.6	123.4	42.1	"	D) bailer due to limited column; or
	1545	26.37	3.5	6.68	19.0	6634	2.5	123.9	41.7	"	E) recovery well cycling sample
	1548	26.37	4.0	6.68	19.0	6639	2.5	124.6	41.6	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1550	MW-135	26.37	6.68	19.0	6639	2.5	124.6	41.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-20 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup) Initials: SD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1178	NA	12.24	0.0	26.66	21.9	Yes	Yes	Yes	Yes		Weather: Cloudy 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in sampling program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-3 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: BS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/31/17	1511	NA	19.04	0.0	21.59	Not Sampled	Yes	Yes	Yes	Yes		Weather Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in sampling program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-4 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

(2-in; stickup)

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1114	NA	25.10	0.0	36.98	Not Sampled	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in Sampling program

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: NP-2 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) Initials: BJ

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1123	NA	15.47	0.0	21.49	not sampled	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-1
Event: Fall 2017 (Semiannual)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: BJ

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1127	NA	15.29	0.0	21.88	19.6	Yes	Yes	Yes	Yes		Weather: Cloudy 70's
10/4/17	1220	NA	15.30	0.0	(21.88)							Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/4/17	1225	15.32	0.5	7.13	20.4	4957	2.8	57.3	4.7	Clear	*Low-flow groundwater sample:*
	1228	15.32	1.0	7.01	20.0	4939	2.4	56.6	3.0	"	(A) peristaltic pump w/ ded tubing
	1230	15.32	1.5	6.96	19.8	4921	1.9	55.3	2.4	"	B) ded bladder pump
	1233	15.32	2.0	6.94	19.6	4916	1.6	54.2	1.9	"	C) non-ded bladder pump; or
	1235	15.32	2.5	6.92	19.5	4908	1.4	53.9	1.5	"	*Standard groundwater sample:*
	1238	15.32	3.0	6.91	19.5	4903	1.4	53.0	1.3	"	D) bailer due to limited column; or
	1240	15.32	3.5	6.91	19.4	4899	1.3	52.7	1.1	"	E) recovery well cycling sample
	1243	15.32	4.0	6.90	19.4	4896	1.3	52.7	1.0	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	1245	NP-1	15.32	6.90	19.4	4896	1.3	52.7	1.0	~~DRO~~	~~HCL~~	~~8015M~~
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										~~Anions (Chloride,Fluoride,Sulfate)~~	~~Neat~~	~~300~~
										~~Cations (Ca,K,Na), taken from total metals bottle~~	~~HNO3~~	~~6010/6020~~
										~~Nitrate-Nitrite~~	~~H2SO4~~	~~per historical, ESC Lab Sciences~~
										~~TDS~~	~~Neat~~	~~2540C~~
										~~*Short List* Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										~~*Long List* Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-6 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: TMD (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1130	NA	11.33	0.0	20-35	15.4	Yes	Yes	Yes	Yes		Weather Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-8 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1141	NA	9.80	0.0	20.12	15.3	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

added 10.4.17
+ Trip Blank- TMD-01

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-21
Event: Fall 2017 (Semiannual)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup)

Initials: BS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1144	NA	11.13	0.0	25.12	19.9	Yes	Yes	Yes	Yes		Weather: Cloudy, 70's
10.4.17	1220	NA	11.43	0.0	25.12	19.9						

Well Purging Record

* ORP Confirmed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	*Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.4.17	1225	11.51	0.5	7.34	22.6	5060	2.2	-41.6	8.6	clear	*Low-flow groundwater sample:*
|	1227	11.51	1.0	7.26	21.7	5110	1.8	-52.1	8.1	|	(A) peristaltic pump w/ ded tubing
|	1230	11.51	1.5	7.20	21.3	5150	1.6	-56.7	6.2	|	B) ded bladder pump
|	1232	11.51	2.0	7.16	21.1	5180	1.5	-57.3	5.9	|	C) non-ded bladder pump; or
|	1235	11.51	2.5	7.14	21.0	5190	1.5	-58.1	5.6	|	*Standard groundwater sample:*
|	1237	11.51	3.0	7.12	21.1	5210	1.4	-58.8	4.5	|	D) bailer due to limited column; or
|	1240	11.51	3.5	7.11	21.1	5220	1.4	-59.6	4.1	|	E) recovery well cycling sample
↓	1242	11.51	4.0	7.11	21.2	5230	1.4	-60.3	3.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10.4.17	1245	MW-21	11.51	7.11	21.2	5230	1.4	-60.3	3.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in sampling program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-9
Event: Fall 2017 (Semiannual)
Area of Concern: TMD (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1147	NP	10.21	0.0	20.19	not sampled	Yes	Yes	Yes	Yes	Cracked Pad	Weather Cloudy 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-71 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: TMD (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1135	NA	12.43	0.0	21.87	16.9	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-68 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: SB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	908	NA	15.81	0.0	26.52	21.5	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-27 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in ; stickup) Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	920	NA	14.88	0.0	30.28	25.0	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-89 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	928	NA	8.33	0.0	20.28	15.2	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-16 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: TMD (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	940	NA	7.63	0.0	21.24	16.2	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-26 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: TMD (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: BM

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	946	NA	9.38	0.0	27.58	22.6	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Pecan grove - Access from 82 gate]

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: KWB - 11A
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: BD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1010	NA	17.43	0.0	42.27	37.0	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1435	17.46	0.5	7.16	20.3	4142	1.9	-90.6	4.6	Clear	*Low-flow groundwater sample:*
	1438	17.46	1.0	7.01	19.7	4938	1.6	-91.4	3.7	"	(A) peristaltic pump w/ ded tubing
	1446	17.46	1.5	6.97	19.5	5122	1.1	-92.8	3.3	"	B) ded bladder pump
	1453	17.46	2.0	6.89	19.4	5146	0.9	-93.3	3.0	"	C) non-ded bladder pump; or
	1455	17.46	2.5	6.85	19.3	5153	0.8	-93.8	2.7	"	*Standard groundwater sample:*
	1458	17.46	3.0	6.83	19.3	5158	0.7	-94.1	2.4	"	D) bailer due to limited column; or
	1450	17.46	3.5	6.82	19.3	5162	0.7	-95.2	2.2	"	E) recovery well cycling sample
	1453	17.46	4.0	6.82	19.3	5164	0.7	-95.4	2.1	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1455	KWB-11A	17.46	6.82	19.3	5164	0.7	-95.4	2.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~*Short List* Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Pecan grove - access from 82 gate]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB - 11B
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: BB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1015	NA	18.12	0.0	72.45	62.2	Yes	Yes	Yes	Yes		Weather: Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1355	18.19	0.5	7.01	21.2	2,038	2.4	36.7	5.3	Clear	*Low-flow groundwater sample:*
	1358	18.20	1.0	6.97	20.7	2,634	1.6	50.3	3.8	"	(A) peristaltic pump w/ ded tubing
	1400	18.20	1.5	6.95	20.4	2,821	1.3	61.2	2.4	"	B) ded bladder pump
	1403	18.20	2.0	6.93	20.2	2,828	1.1	63.8	2.2	"	C) non-ded bladder pump; or
	1405	18.20	2.5	6.92	20.1	2832	1.0	65.2	1.9	"	*Standard groundwater sample:*
	1408	18.20	3.0	6.92	20.1	2,834	0.9	66.3	1.7	"	D) bailer due to limited column; or
	1410	18.20	3.5	6.92	20.1	2836	0.9	66.9	1.6	"	E) recovery well cycling sample
	1413	18.20	4.0	6.91	20.1	2,840	0.8	67.2	1.5	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1415	KWB-11B	18.20	6.91	20.1	2,840	0.8	67.2	1.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Historically not addressed, per Navajo, 4-13-15

Monitoring Well Purging and Sampling Record

Jack Jay (farmer)
575-365-6042

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-3AR
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17												Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

ATV - S. Field RO-Reject water field

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-115
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: BS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1745	NA	7.42	0.0	27.50	19.8	Yes	Yes	Yes	Yes		Weather: Cloudy, 80's
10/4/17	850	NA	7.44	0.0	27.50	19.8						Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/4/17	853	7.47	0.5	6.87	18.7	5362	3.2	-16.3	5.1	Clear	*Low-flow groundwater sample:*
	858	7.48	1.0	6.72	18.4	5313	1.9	+20.9	3.0	"	(A) peristaltic pump w/ ded tubing
	900	7.48	1.5	6.68	18.3	5299	1.8	35.4	2.6	"	B) ded bladder pump
	903	7.48	2.0	6.64	18.2	5284	1.8	44.6	1.7	"	C) non-ded bladder pump; or
	905	7.48	2.5	6.62	18.2	5281	1.7	51.2	1.4	"	*Standard groundwater sample:*
	908	7.48	3.0	6.62	18.2	5278	1.5	54.9	1.2	"	D) bailer due to limited column; or
	910	7.48	3.5	6.61	18.1	5275	1.4	56.0	1.1	"	E) recovery well cycling sample
	913	7.48	4.0	6.60	18.1	5273	1.4	56.4	1.1	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	915	MW-115	7.48	6.60	18.1	5273	1.4	56.4	1.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

ATV - S. Field RO- Reject water field

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-114
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: BJ

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1750	NA	8.49	0.0	38.25	30.5	Yes	Yes	Yes	Yes		Weather: cloudy 80's
10/4/17	945	NA	8.48	0.0								cloudy 90's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/4/17	950	8.51	0.5	6.92	22.5	3998	2.6	4.4	10.2	Clear	*Low-flow groundwater sample:*
	953	8.51	1.0	6.86	22.5	3987	1.9	31.2	8.8	"	(A) peristaltic pump w/ ded tubing
	955	8.51	1.5	6.81	22.4	3975	1.8	38.6	6.1	"	B) ded bladder pump
	958	8.51	2.0	6.79	22.3	3972	1.7	42.7	5.0	"	C) non-ded bladder pump; or
	1000	8.51	2.5	6.78	22.3	3970	1.5	45.3	4.7	"	*Standard groundwater sample:*
	1003	8.51	3.0	6.78	22.2	3969	1.3	46.1	4.4	"	D) bailer due to limited column; or
	1005	8.51	3.5	6.77	22.2	3968	1.2	46.9	4.2	"	E) recovery well cycling sample
	1008	8.51	4.0	6.77	22.2	3967	1.2	47.2	4.1	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	1010	MW-114	8.51	6.77	22.2	3967	1.2	47.2	4.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-117
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GAS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1810	NA	8.65	0.0	27.22	19.7	YES	YES	YES	YES		Weather: Cloudy, 70's
10/4/17	810	NA	8.61									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/4/17	815	8.67	0.5	7.54	17.6	3330	3.7	52.3	8.5	colorless / clear	*Low-flow groundwater sample:*
	817	8.69	1.0	7.31	17.3	3340	2.9	62.9	5.0		(A) peristaltic pump w/ ded tubing
	820	8.69	1.5	7.12	17.1	3330	2.1	74.3	3.2		B) ded bladder pump
	823	8.69	2.0	7.02	17.1	3320	1.9	78.4	2.9		C) non-ded bladder pump; or
	825	8.69	2.5	6.94	17.0	3320	1.7	80.1	2.6		*Standard groundwater sample:*
	827	8.69	3.0	6.89	17.0	3320	1.4	81.9	2.7		D) bailer due to limited column; or
	830	8.69	3.5	6.87	17.0	3320	1.4	82.6	2.4		E) recovery well cycling sample
	833	8.69	4.0	6.86	17.0	3320	1.3	83.4	2.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	835	MW-117	8.69	6.86	17.0	3320	1.3	83.4	2.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-118
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1816	NA	5.83	0.0	28.29	21.0	YES	YES	YES	YES		Weather: cloudy, 70's
10/4/17	855	NA	5.81									

Well Purging Record *FDTW CONFIRMED

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/4/17	900	5.90	0.5	7.25	17.9	3580	5.4	95.1	8.9	Colorless / clear	*Low-flow groundwater sample:*
	903	5.90	1.0	7.17	17.8	3620	5.0	100.0	5.0		(A) peristaltic pump w/ ded tubing
	905	5.90	1.5	7.10	17.7	3640	4.9	103.3	2.3		B) ded bladder pump
	907	5.90	2.0	7.04	17.8	3650	4.8	105.8	3.2		C) non-ded bladder pump; or
	910	5.90	2.5	7.03	17.7	3650	4.8	106.6	2.9		*Standard groundwater sample:*
	913	5.90	3.0	7.01	17.8	3650	4.7	108.3	2.1		D) bailer due to limited column; or
	915	5.90	3.5	6.99	17.8	3660	4.7	109.3	1.9		E) recovery well cycling sample
	917	5.90	4.0	6.98	17.8	3660	4.7	110.1	1.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	920	MW-118	5.90	6.98	17.8	3660	4.7	110.1	1.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Not in sampling program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-9 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: GBS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1820	NA	6.84	0.0	25.89	Not Sampled	Yes	# Issue	# Issue	Yes		Weather: Partly cloudy, 80's
								# NEEDS	NEW MONUMENT CASING lid			

Well Purging Record # DTW CONFIRMED

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-119
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) Initials: GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1826	NA	10.69	0.0	28.11	20.8	YES	YES	YES	YES		Weather: Cloudy, 70's
10/4/17	940	NA	10.72									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/4/17	945	10.75	0.5	7.22	19.7	3590	3.8	101.2	9.6	colorless / clear	*Low-flow groundwater sample:*
	947	10.75	1.0	6.98	19.6	3600	2.4	100.9	7.3		(A) peristaltic pump w/ ded tubing
	950	10.75	1.5	6.89	19.7	3590	2.2	100.7	5.0		B) ded bladder pump
	953	10.75	2.0	6.83	19.7	3600	1.9	101.0	4.2		C) non-ded bladder pump; or
	955	10.75	2.5	6.78	19.7	3610	1.8	101.3	3.9		*Standard groundwater sample:*
	957	10.75	3.0	6.77	19.7	3610	1.8	101.1	4.4		D) bailer due to limited column; or
	1000	10.75	3.5	6.77	19.7	3620	1.8	100.9	5.0		E) recovery well cycling sample
	1003	10.75	4.0	6.76	19.7	3620	1.8	100.5	4.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	1005	MW-119	10.75	6.76	19.7	3620	1.8	100.5	4.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Cross-gradient

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NP-5 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup)

Initials: GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1020	NA	12.71	0.0	25.09	20.0	Yes	Yes	Yes	Yes		Weather: Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Cross-gradient; N. of RO-Reject Field

Well installed 7-28-14

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-136
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup)

Initials: GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1029	NA	10.55	0.0	27.90	23.0	YES	YES	Yes	YES		Weather: Cloudy, 70's
					↳Soft Base							

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1035	10.61	0.5	7.51	18.4	4030	2.9	80.1	46.1	colorless / sl. cloudy	*Low-flow groundwater sample:*
↓	1037	10.61	1.0	7.22	18.1	4070	2.1	87.1	37.3	↓	(A) peristaltic pump w/ ded tubing
	1040	10.61	1.5	7.11	18.0	4060	1.7	90.8	30.8		B) ded bladder pump
	1043	10.61	2.0	6.98	17.9	4010	1.6	94.3	24.2	colorless / clear	C) non-ded bladder pump; or
	1045	10.61	2.5	6.93	17.9	4010	1.7	96.1	19.0	↓	*Standard groundwater sample:*
	1047	10.61	3.0	6.90	17.9	4010	1.7	97.4	14.0		D) bailer due to limited column; or
	1050	10.61	3.5	6.88	17.9	4000	1.7	98.1	12.9	↓	E) recovery well cycling sample
↓	1053	10.61	4.0	6.86	17.9	3990	1.7	99.5	9.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1055	MW-136	10.61	6.86	17.9	3990	1.7	99.5	9.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-126A
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) Initials: GMS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	906	NA	15.67	0.0	37.51	29.5	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 80's
10/3/17	1600	NA	15.61									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1605	15.62	0.5	7.41	22.6	2690	2.6	-133.1	97.1	colorless / sl. cloudy	*Low-flow groundwater sample:*
	1607	15.62	1.0	7.17	21.5	2640	2.0	-130.0	60.2	↓	(A) peristaltic pump w/ ded tubing
	1610	15.62	1.5	7.09	21.1	2620	1.9	-129.9	45.3		B) ded bladder pump
	1613	15.62	2.0	7.04	20.8	2600	1.9	-129.8	17.5	colorless / clear	C) non-ded bladder pump; or
	1615	15.62	2.5	6.95	20.4	2570	1.8	-131.2	11.3		*Standard groundwater sample:*
	1617	15.62	3.0	6.92	20.3	2550	1.8	-131.7	7.0		D) bailer due to limited column; or
	1620	15.62	3.5	6.91	20.2	2540	1.8	-132.0	5.9		E) recovery well cycling sample
↓	1623	15.62	4.0	6.90	20.2	2530	1.8	-132.3	5.0	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1625	MW-126A	15.62	6.90	20.2	2530	1.8	-132.3	5.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-126B
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup)

Initials: GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	909	NA	15.50	0.0	51.43	48.4	Yes	Yes	Yes	Yes		Weather: Partly cloudy, 80's
10/3/17	1640	NA	15.48		↳ SAME	BOTTOM						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1645	15.59	0.5	7.09	22.3	3430	3.4	-83.9	7.4	colorless / clear	*Low-flow groundwater sample:*
↓	1647	15.60	1.0	6.90	20.4	3600	2.0	-47.5	8.1	↓	(A) peristaltic pump w/ ded tubing
	1650	15.60	1.5	6.90	20.2	3610	1.7	-32.1	7.6		B) ded bladder pump
	1653	15.60	2.0	6.86	20.1	3630	1.5	-25.8	6.9		C) non-ded bladder pump; or
	1655	15.60	2.5	6.83	20.1	3630	1.5	-19.2	6.4		*Standard groundwater sample:*
	1657	15.60	3.0	6.81	20.0	3640	1.4	-15.6	5.8		D) bailer due to limited column; or
	1700	15.60	3.5	6.78	19.9	3640	1.3	-13.9	5.7		E) recovery well cycling sample
↓	1703	15.60	4.0	6.76	19.9	3650	1.3	-12.3	5.2	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1705	MW-126B	15.60	6.76	19.9	3650	1.3	-12.3	5.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-127
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) Initials: GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	900	NA	18.95	0.0	53.21	38.4	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 80's
10/3/17	1720	NA	18.90									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1725	18.91	0.5	7.16	22.8	2530	3.7	-166.7	2.9	Colorless / Clear	*Low-flow groundwater sample:*
↓	1727	18.92	1.0	6.93	21.4	2540	2.2	-172.9	3.2	↓	(A) peristaltic pump w/ ded tubing
	1730	18.92	1.5	6.86	20.8	2500	1.8	-180.1	4.5		B) ded bladder pump
	1733	18.92	2.0	6.83	20.6	2480	1.6	-183.7	3.9		C) non-ded bladder pump; or
	1735	18.92	2.5	6.81	20.3	2460	1.5	-190.8	3.7		*Standard groundwater sample:*
	1737	18.92	3.0	6.80	20.3	2440	1.4	-193.7	4.1		D) bailer due to limited column; or
	1740	18.92	3.5	6.79	20.2	2440	1.4	-196.0	3.6		E) recovery well cycling sample
↓	1743	18.92	4.0	6.79	20.1	2430	1.4	-198.8	3.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1745	MW-127	18.92	6.79	20.1	2430	1.4	-198.8	3.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-129 Gauge only, per TRC 10/2/17
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	848	20.48	20.49	0.01	53.08	38.2	YES	YES	YES	YES		Weather: Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5			Gauge only, per TRC					B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5					10/2/17			*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-129								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,Li)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-#18A (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GOS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1248	NA	13.06	0.0	17.78	12.7	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB - 1A
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; at-grade) Initials: AJS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1205	NA	14.55	0.0	33.50	25.8	Yes	Yes	Yes	Yes		Weather: Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1210	14.59	0.5	7.32	18.7	4270	3.2	-4.1	10.5	colorless / clear	*Low-flow groundwater sample:*
	1213	14.60	1.0	7.10	17.7	4370	2.3	14.8	7.0		(A) peristaltic pump w/ ded tubing
	1215	14.60	1.5	6.96	17.6	4380	2.4	17.3	5.9		B) ded bladder pump
	1217	14.60	2.0	6.88	17.7	4390	2.4	20.8	5.0		C) non-ded bladder pump; or
	1220	14.60	2.5	6.86	17.8	4400	2.4	22.3	4.6		*Standard groundwater sample:*
	1223	14.60	3.0	6.84	17.9	4400	2.4	22.9	4.3		D) bailer due to limited column; or
	1225	14.60	3.5	6.83	18.0	4400	2.3	24.6	4.4		E) recovery well cycling sample
	1227	14.60	4.0	6.82	18.1	4400	2.3	29.1	4.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1230	KWB-1A	14.60	6.82	18.1	4400	2.3	29.1	4.1	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in sampling program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-1B (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1240	NA	16.25	0.0	33.92	Not Sampled	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-1C (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: AJS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1243	NA	16.84	0.0	52.71	42.7	Yes	Yes	Yes	Yes		Weather: Partly Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Located ~25' N. of original KWB-10 well pad

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-10R
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GRS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1120	NA	15.65	0.0	29.46	22.0	Yes	Yes	Yes	Yes		Weather: Cloudy, 70's
		# CONFIRMED: NO Measurable LNAPL										

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1125	15.75	0.5	7.23	19.3	1586	2.9	-123.7	3.7	colorless / clear / odor	*Low-flow groundwater sample:*
	1127	15.80	1.0	6.92	18.9	1596	1.9	-122.7	4.0		(A) peristaltic pump w/ ded tubing
	1130	15.82	1.5	6.82	18.8	1589	1.7	-125.4	3.2		B) ded bladder pump
	1133	15.83	2.0	6.73	18.7	1574	1.7	-125.7	2.9		C) non-ded bladder pump; or
	1135	15.83	2.5	6.69	18.7	1567	1.7	-125.3	2.9		*Standard groundwater sample:*
	1137	15.83	3.0	6.68	18.7	1568	1.6	-124.7	2.7		D) bailer due to limited column; or
	1140	15.83	3.5	6.67	18.7	1568	1.6	-124.3	2.4		E) recovery well cycling sample
	1143	15.83	4.0	6.67	18.8	1564	1.6	-124.2	2.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1145	KWB-10R	15.83	6.67	18.8	1564	1.6	-124.2	2.6	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-13 (2-in; stickup)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	853	NA	21.59	0.0	53.35	38.1	YES	YES	Yes	YES		Weather: Partly Cloudy, 80's
10/4/17	1200	NA	21.56									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/4/17	1205	21.60	0.5	7.00	20.9	1889	2.9	-117.3	39.1	colorless / cloudy	*Low-flow groundwater sample:*
	1207	21.60	1.0	6.83	20.3	1888	2.2	-119.5	22.3	colorless / clear	(A) peristaltic pump w/ ded tubing
	1210	21.60	1.5	6.75	19.9	1879	2.0	-121.7	19.2		B) ded bladder pump
	1213	21.60	2.0	6.67	19.6	1861	1.6	-125.3	16.3		C) non-ded bladder pump; or
	1215	21.60	2.5	6.65	19.5	1853	1.4	-128.3	11.8		*Standard groundwater sample:*
	1217	21.60	3.0	6.64	19.4	1853	1.4	-129.6	9.9		D) bailer due to limited column; or
	1220	21.60	3.5	6.63	19.4	1851	1.3	-128.4	9.0		E) recovery well cycling sample
	1223	21.60	4.0	6.63	19.3	1853	1.3	-128.5	8.7		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	1225	MW-131	21.60	6.63	19.3	1853	1.3	-128.5	8.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-5
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup)

Initials: CWJ

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	842	NA	21.09	0.0	37.68	30.7	YES	YES	YES	YES		Weather: partly cloudy, 70's
10/4/17	1115	NA	21.10									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/4/17	1120	21.15	0.5	6.83	20.7	2500	3.4	-79.9	7.3	colorless / clear	*Low-flow groundwater sample:*
	1123	21.16	1.0	6.75	20.5	2490	2.6	-85.2	6.8		(A) peristaltic pump w/ ded tubing
	1125	21.16	1.5	6.72	20.2	2500	2.4	-93.2	6.1		B) ded bladder pump
	1127	21.16	2.0	6.69	20.1	2490	2.2	-99.2	5.7		C) non-ded bladder pump; or
	1130	21.16	2.5	6.67	20.0	2490	2.1	-104.9	5.3		*Standard groundwater sample:*
	1133	21.16	3.0	6.67	19.9	2500	2.1	-107.1	4.8		D) bailer due to limited column; or
	1135	21.16	3.5	6.67	19.9	2500	2.0	-107.5	4.6		E) recovery well cycling sample
	1137	21.16	4.0	6.67	19.9	2500	2.0	-107.9	4.1	V	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	1140	KWB-5	21.16	6.67	19.9	2500	2.0	-107.9	4.1	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-111
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; Stickup)

Initials: GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	835	NA	21.79	0.0	40.83	35.8	YES	YES	YES	YES		Weather: Cloudy, 70's
10/4/17	1030	NA	21.81									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/4/17	1035	21.95	0.5	7.14	20.2	2560	3.6	-93.1	6.6	Colorless / clear	*Low-flow groundwater sample:*
	1037	21.95	1.0	6.89	20.1	2570	2.7	-80.3	5.2		(A) peristaltic pump w/ ded tubing
	1040	21.95	1.5	6.79	20.2	2560	2.4	-75.2	4.5		B) ded bladder pump
	1043	21.95	2.0	6.75	20.3	2560	2.2	-72.3	4.0		C) non-ded bladder pump; or
	1045	21.95	2.5	6.72	20.3	2550	2.1	-71.4	3.7		*Standard groundwater sample:*
	1047	21.95	3.0	6.69	20.2	2550	2.1	-70.2	3.2		D) bailer due to limited column; or
	1050	21.95	3.5	6.68	20.2	2540	2.0	-69.6	2.8		E) recovery well cycling sample
	1053	21.95	4.0	6.68	20.2	2540	2.0	-69.1	2.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	1055	MW-111	21.95	6.68	20.2	2540	2.0	-69.1	2.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Absorbent sock in 1H16
No sock in 21416 or 21417

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-6
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: GDS/BFH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	921	NA	18.81	0.0	36.44	27.4	Yes	Yes	Yes	Yes		Weather: Cloudy, 70s
10-4-17	1125	NA	18.80	0.0	36.44	27.4						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-4-17	1130	18.86	0.5	6.80	22.1	2480	2.0	-307.6	6.9	clear w/ black tint,	*Low-flow groundwater sample:*
	1133	18.86	1.0	6.68	21.8	2470	1.3	-308.7	5.3	odor	(A) peristaltic pump w/ ded tubing
	1135	18.86	1.5	6.60	21.6	2470	1.0	-309.2	4.7		B) ded bladder pump
	1138	18.86	2.0	6.57	21.4	2460	1.0	-310.5	4.3		C) non-ded bladder pump; or
	1140	18.86	2.5	6.55	21.3	2460	0.9	-312.1	3.8		*Standard groundwater sample:*
	1143	18.86	3.0	6.54	21.2	2450	0.8	-313.0	3.6		D) bailer due to limited column; or
	1145	18.86	3.5	6.53	21.2	2450	0.8	-313.8	3.1		E) recovery well cycling sample
	1148	18.86	4.0	6.53	21.1	2440	0.7	-314.7	2.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10-4-17	1150	KWB-6	18.86	6.53	21.1	2440	0.7	-314.7	2.9	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-112
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	916	18.85	19.15	0.30	37.54	32.5	Yes	Yes	Yes	Yes		Weather: Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5			NOT SAMPLED due to well					B) ded bladder pump
			2.0			having LNAPL thickness					C) non-ded bladder pump; or
			2.5			≥ 0.03 ft.					*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-112								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-132
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: GDS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	930	16.46	16.51	0.05	42.66	NA	Yes	Yes	Yes	Yes		Weather: Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		NOT SAMPLED DUE TO WELL						B) ded bladder pump
			2.0		having LNAPL thickness						C) non-ded bladder pump; or
			2.5		≥ 0.03 Ft.						*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-132								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Located inside yellow vault; furthest south

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-57
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1310	NA	15.88	0.0	34.32	32.8	Yes	Yes	Yes	Yes		Weather: Partly cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1315	15.98	0.5	7.76	22.6	4520	3.3	61.6	5.0	Colorless / clear	*Low-flow groundwater sample:*
	1317	16.01	1.0	7.51	21.2	4530	2.6	66.9	5.0		(A) peristaltic pump w/ ded tubing
	1320	16.03	1.5	7.27	20.1	4530	2.2	73.8	5.7		B) ded bladder pump
	1323	16.04	2.0	7.14	19.6	4530	2.1	77.2	4.1		C) non-ded bladder pump; or
	1325	16.05	2.5	7.03	19.2	4530	1.9	79.0	3.0		*Standard groundwater sample:*
	1327	16.07	3.0	6.95	19.2	4520	1.8	79.9	2.7		D) bailer due to limited column; or
	1330	16.08	3.5	6.91	19.2	4520	1.8	81.3	2.2		E) recovery well cycling sample
	1333	16.09	4.0	6.89	19.2	4520	1.7	81.1	2.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1335	MW-57	16.09	6.89	19.2	4520	1.7	81.1	2.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

~ 32" corrugated stickup

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW - #11 - O (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GDJ

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1345	NA	17.81	0.0	22.20	NA	YES	YES	YES	YES		Weather: Partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

* Until further notice, do not address well in any way, per Navajo, 4-26-16

Jack Joy - Farmer
575-365-6042

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-9 (would be gauge-only in 2H17...)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (Historically obstructed @ 15.11') (2-in; stickup) Initials: AMS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1348	NM	NM	NM	NM	NA	NM	NM	NM	NM		Weather: partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Trip Blank-Rest-02
(+ ADDED TO COOLER ON 10/3/17)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-12A
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; at-grade) Initials: ADS

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1350	NA	18.48	0.0	25.03	24.9	YES	YES	YES	YES		Weather: partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1355	18.51	0.5	6.92	22.7	3250	4.1	73.7	3.2	colorless / clear	*Low-flow groundwater sample:*
	1357	18.51	1.0	6.95	21.0	3410	3.7	77.8	2.9		(A) peristaltic pump w/ ded tubing
	1400	18.51	1.5	6.93	20.1	3340	3.7	81.0	2.6		B) ded bladder pump
	1403	18.51	2.0	6.92	19.8	3280	3.6	82.3	2.4		C) non-ded bladder pump; or
	1405	18.51	2.5	6.91	19.5	3220	3.5	83.5	2.4		*Standard groundwater sample:*
	1407	18.51	3.0	6.91	19.3	3210	3.5	84.1	2.2		D) bailer due to limited column; or
	1410	18.51	3.5	6.90	19.2	3190	3.5	84.6	2.1		E) recovery well cycling sample
	1413	18.51	4.0	6.90	19.2	3180	3.5	84.8	2.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1415	KWB-12A	18.51	6.90	19.2	3180	3.5	84.8	2.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[* HM1 - dedicated bladder pump]

[+ Dup-Rest-05
+ EB-Rest-05
(both for same analyses)]

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-12B
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (4-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: GDS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1435	NA	18.27	0.0	39.39	35.2	YES	YES	YES	YES		Weather: Partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1440	18.30	0.5	7.03	22.0	3300	4.3	-140.2	3.0	colorless / clear	Low-flow groundwater sample:
	1443	18.30	1.0	6.98	19.8	3310	3.6	-106.7	2.6	↓	A) peristaltic pump w/ ded tubing
	1445	18.30	1.5	6.93	19.4	3280	3.7	-90.2	2.3		(B) ded bladder pump
	1447	18.30	2.0	6.92	19.1	3290	3.7	-79.4	2.9		C) non-ded bladder pump; or
	1450	18.30	2.5	6.90	19.0	3280	3.6	-62.9	2.2		Standard groundwater sample:
	1453	18.30	3.0	6.88	19.0	3280	3.6	-53.7	1.8		D) bailer due to limited column; or
	1455	18.30	3.5	6.87	19.0	3270	3.6	-43.4	1.6		E) recovery well cycling sample
	1457	18.30	4.0	6.87	19.0	3270	3.5	-40.0	1.4		F) irrigation well grab sample
									€		

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1500	KWB-12B	18.30	6.87	19.0	3270	3.5	-40.0	1.4	DRO	HCL	8015M
↓										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
	1200	DUP-REST-05	18.30	6.87	19.0	3270	3.5	-40.0	1.4	Same as above	Same	Same
↓	1515	EB-REST-05	NA	—	—	—	—	—	—	Same as above	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-2R
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: GDS/BZH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	953	NA	18.80	0.0	39.41	32.4	YES	YES	YES	YES		Weather: Cloudy, 70s
10-4-17	1045	NA	18.80	0.0	39.41	32.4						

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-4-17	1050	19.08	0.5	6.83	21.6	2840	1.9	-331.8	6.9	clear, odor	*Low-flow groundwater sample:*
	1053	19.10	1.0	6.75	21.2	2960	1.4	-337.2	3.7		(A) peristaltic pump w/ ded tubing
	1055	19.10	1.5	6.73	21.1	3010	1.2	-341.5	3.0		B) ded bladder pump
	1058	19.10	2.0	6.72	21.0	3040	1.1	-343.9	2.8		C) non-ded bladder pump; or
	1100	19.10	2.5	6.72	21.0	3060	1.0	-345.0	2.4		*Standard groundwater sample:*
	1103	19.10	3.0	6.71	20.9	3080	1.0	-346.1	1.9		D) bailer due to limited column; or
	1105	19.10	3.5	6.71	20.8	3100	0.9	-346.8	1.5		E) recovery well cycling sample
	1108	19.10	4.0	6.71	20.8	3110	0.9	-347.2	1.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10-4-17	1110	KWB-2R	19.10	6.71	20.8	3110	0.9	-347.2	1.3	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-58
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; at-grade) Initials: GOS / ~~ERH~~

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1000	NA	17.73	0.0	33.06	25.6	YES	YES	YES	YES		Weather: Cloudy, 70s
10-4-17	1005	NA	*17.73	0.0	33.06	25.6						

↳ LNAPL sheen on probe

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-4-17	1010	17.80	0.5	6.96	21.1	2150	2.8	-265.9	12.6	Clear, odor	*Low-flow groundwater sample:*
	1013	17.81	1.0	6.85	21.0	2160	1.6	-272.4	10.2		(A) peristaltic pump w/ ded tubing
	1015	17.81	1.5	6.80	21.0	2170	1.3	-279.3	9.8		B) ded bladder pump
	1018	17.81	2.0	6.74	21.0	2160	1.2	-285.1	9.3		C) non-ded bladder pump; or
	1020	17.81	2.5	6.72	20.9	2150	1.1	-290.3	9.1		*Standard groundwater sample:*
	1023	17.81	3.0	6.71	20.9	2140	1.0	-294.5	8.9		D) bailer due to limited column; or
	1025	17.81	3.5	6.70	20.9	2140	1.0	-297.1	8.8		E) recovery well cycling sample
	1028	17.81	4.0	6.70	20.8	2140	1.0	-298.8	8.9		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10-4-17	1030	MW-58	17.81	6.70	20.8	2140	1.0	-298.8	8.9	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[* HM1-dedicated bladder pump]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: KWB-13 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: GPS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	941	NA	21.20	0.0	33.10	30.1	Yes	Yes	Yes	Yes		Weather: Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								(B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

(Sign-in @ S. Crude)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-103 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: SCG

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	900	NP	17.00	0.0	25.22	22.2	Yes	Yes	Yes	Yes		Weather: Overcast, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-103								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

(Sign-in @ S. crude)

Monitoring Well Purging and Sampling Record

+ DUP-Rest-02
+ EB-Rest-02
both for same analyses

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-104
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stick-up)

Initials: SCG

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	905	NP	16.10	0.0	21.97	19.0	Yes	Yes	Yes	Yes		Weather: overcast, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	910	16.24	0.5	6.61	23.9	1470	1.5	-222.8	5.1	colorless; clear	*Low-flow groundwater sample:*
	912	16.30	1.0	6.57	23.9	1464	1.0	-254.3	5.0		(A) peristaltic pump w/ ded tubing
	915	16.36	1.5	6.60	23.8	1466	0.9	-263.9	4.8		B) ded bladder pump
	917	16.41	2.0	6.63	23.9	1474	0.9	-270.1	4.6		C) non-ded bladder pump; or
	920	16.44	2.5	6.65	23.8	1480	0.9	-273.2	4.5		*Standard groundwater sample:*
	922	16.47	3.0	6.67	23.8	1485	0.9	-275.7	4.3		D) bailer due to limited column; or
	925	16.50	3.5	6.68	23.8	1487	0.9	-277.5	4.3		E) recovery well cycling sample
↓	927	16.53	4.0	6.69	23.9	1491	0.9	-278.5	4.3	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	930	MW-104	16.53	6.69	23.9	1491	0.9	-278.5	4.3	DRO	HCL	8015M
↓										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1000	DUP-Rest-02	16.53	6.69	23.9	1491	0.9	-278.5	4.3	same as above	same	same
↓	940	EB-Rest-02	NA	→	→	→	→	→	→	same as above	same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

[Bagged tube; tube stretched to outside of berm]

(Sign-in @ S. Crucis)

Absorbent sock in well 2H16
Absorbent sock in well 1H17 (stained)
@ 2H17

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-64
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

(4-in; stickup)

Initials: SCU

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1005	NP	18.20	0.0	34.08	26.6	yes	yes	yes	yes		Weather: overcast, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1010	18.40	0.5	6.91	25.1	2510	2.4	-247.4	6.6	colorless, clear	*Low-flow groundwater sample:*
	1012	18.49	1.0	6.90	25.1	2520	1.9	-252.6	6.0		(A) peristaltic pump w/ ded tubing
	1015	18.53	1.5	6.90	25.1	2530	1.6	-257.2	5.6		B) ded bladder pump
	1017	18.55	2.0	6.89	25.1	2530	1.3	-260.6	5.4		C) non-ded bladder pump; or
	1020	18.56	2.5	6.89	25.1	2540	1.2	-262.7	5.1		*Standard groundwater sample:*
	1022	18.57	3.0	6.89	25.1	2550	1.1	-265.8	4.9		D) bailer due to limited column; or
	1025	18.58	3.5	6.88	25.1	2550	1.1	-267.6	4.8		E) recovery well cycling sample
↓	1027	18.59	4.0	6.89	25.1	2550	1.1	-268.0	4.8	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1030	MW-64	18.59	6.89	25.1	2550	1.1	-268.0	4.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Bagged tube; Located in front of Navajo storage shed area]

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-65
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; at-grade) Initials: SCG

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1040	NP	13.95	0.0	28.78	23.8	Yes	Yes	Yes	Yes		Weather: overcast, 70s

Well Purging Record *Residual staining on probe and well casing

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1050	13.97	0.5	6.75	26.5	2190	2.0	-165.5	8.6	colorless; clear; odor	Low-flow groundwater sample:
	1053	13.98	1.0	6.70	26.6	2190	1.6	-164.1	7.5		(A) peristaltic pump w/ ded tubing
	1055	13.99	1.5	6.67	26.6	2180	1.1	-164.9	7.2		B) ded bladder pump
	1057	13.99	2.0	6.65	26.6	2180	1.1	-165.2	7.0		C) non-ded bladder pump; or
	1100	13.99	2.5	6.64	26.6	2170	1.1	-165.2	6.7		Standard groundwater sample:
	1102	13.99	3.0	6.64	26.6	2170	1.1	-165.1	6.2		D) bailer due to limited column; or
	1105	13.99	3.5	6.63	26.7	2170	1.0	-165.2	5.9		E) recovery well cycling sample
	1107	13.99	4.0	6.64	26.7	2170	1.0	-165.2	5.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1110	MW-65	13.99	6.64	26.7	2170	1.0	-165.2	5.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ce,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-5R (Gauge only) (Gauge to top of guide pipe)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information Active RW; above-grade vault; sampled by port, when sampled. Initials: SCV

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1125	14.75	14.86	0.11	NM (pumps in well) Formerly reported TD = 35.30 ft-TOC	24.0	Yes	Yes	Yes	Yes		Weather: Overcast, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								(E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-102
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: SCY

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1135	NP	14.12	0.0	26.45	21.3	Yes	Yes	Yes	Yes		Weather: Overcast, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1140	14.15	0.5	6.78	25.5	2370	2.2	-274.0	7.6	colorless; clear	*Low-flow groundwater sample:*
	1142	14.15	1.0	6.81	25.4	2370	1.8	-279.7	7.4		(A) peristaltic pump w/ ded tubing
	1145	14.15	1.5	6.81	25.3	2380	1.5	-283.6	7.2		B) ded bladder pump
	1147	14.15	2.0	6.81	25.3	2380	1.3	-286.5	7.0		C) non-ded bladder pump; or
	1150	14.15	2.5	6.80	25.2	2380	1.3	-288.1	7.0		*Standard groundwater sample:*
	1152	14.15	3.0	6.80	25.2	2380	1.2	-291.8	6.9		D) bailer due to limited column; or
	1155	14.15	3.5	6.79	25.2	2380	1.2	-292.3	6.8		E) recovery well cycling sample
	1157	14.15	4.0	6.79	25.2	2380	1.2	-293.6	6.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1200	MW-102	14.15	6.79	25.2	2380	1.2	-292.6	6.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Bagged tubing

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

[Gauge/Sample through labeled guide-pipe]

Well: RW-4 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest
Active RW in covered doghouse.

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCA

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1220	NP	12.62	0.0	36.62	31.6	Yes	Yes	Yes	Yes		Weather: overcast 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Bagged tubing

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Gauge/Sample through labeled guide-pipe

Well: RW-6 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest
Active RW in covered doghouse.

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCY

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1210	13.65	13.74	0.09	34.90	30.0	Yes	Yes	Yes	Yes		Weather: overcast, 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Position is marked on adjacent fence; ~ 4' N. of fence; may be covered by silt/gravel]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-99
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; at-grade) Initials: SLG

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1230	NP	15.47	0.0	27.80	22.8	Yes	Yes	Yes	Yes		Weather: pt. cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1240	15.55	0.5	6.69	26.0	2210	1.9	-280.3	7.7	colorless; clear	*Low-flow groundwater sample:*
	1242	15.57	1.0	6.68	25.7	2220	1.6	-285.8	5.9		(A) peristaltic pump w/ ded tubing
	1245	15.58	1.5	6.68	25.5	2230	1.5	-289.1	5.7		B) ded bladder pump
	1247	15.59	2.0	6.68	25.3	2230	1.4	-292.6	5.5		C) non-ded bladder pump; or
	1250	15.59	2.5	6.68	25.2	2230	1.4	-294.2	5.4		*Standard groundwater sample:*
	1252	15.59	3.0	6.68	25.2	2230	1.4	-295.2	5.4		D) bailer due to limited column; or
	1255	15.59	3.5	6.68	25.2	2230	1.4	-295.6	5.3		E) recovery well cycling sample
	1257	15.59	4.0	6.68	25.2	2230	1.3	-295.7	5.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1300	MW-99	15.59	6.68	25.2	2230	1.3	-295.7	5.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-66
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; at-grade) Initials: SLH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1315	NP	14.82	0.0	29.80	24.6	Yes	Yes	Yes	Yes	(cracked pad)	Weather: pt. cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1320	14.97	0.5	6.79	25.5	1719	2.2	-191.2	22.0	colorless; clear	*Low-flow groundwater sample:*
	1322	15.03	1.0	6.77	25.1	1723	2.0	-186.1	25.1		(A) peristaltic pump w/ ded tubing
	1325	15.05	1.5	6.76	24.9	1725	1.9	-184.5	26.5		B) ded bladder pump
	1327	15.07	2.0	6.76	24.6	1725	1.8	-182.8	26.6		C) non-ded bladder pump; or
	1330	15.08	2.5	6.75	24.5	1724	1.8	-181.9	26.7		*Standard groundwater sample:*
	1332	15.08	3.0	6.76	24.5	1724	1.7	-180.4	25.2		D) bailer due to limited column; or
	1335	15.08	3.5	6.75	24.6	1724	1.7	-179.5	25.0		E) recovery well cycling sample
	1337	15.08	4.0	6.75	24.6	1724	1.7	-179.1	24.8		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1340	MW-66	15.08	6.75	24.6	1724	1.7	-179.1	24.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~*Short List* Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

(6-in casing; stickup; PVC casing extends upward through a berm)

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-28
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SLG

Well Inspection Information

Extends through gravel berm; no pad possible

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1355	NP	20.74	0.0	34.55	30.2	Yes	Issue (6-in PVC (shattered at top w/ 0.65-ft slip collar over it)	Issue	Yes		Weather: pt. cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1400	20.79	0.5	6.59	28.7	3110	2.5	-294.1	6.3	colorless; clear	*Low-flow groundwater sample:*
	1402	20.84	1.0	6.59	28.2	3140	2.3	-304	6.0		(A) peristaltic pump w/ ded tubing
	1405	20.88	1.5	6.59	28.0	3150	2.2	-304.3	5.7		B) ded bladder pump
	1407	20.90	2.0	6.59	27.7	3140	2.2	-308.5	5.5		C) non-ded bladder pump; or
	1410	20.92	2.5	6.59	27.5	3110	2.2	-312.9	5.2		*Standard groundwater sample:*
	1412	20.94	3.0	6.59	27.4	3090	2.2	-315.4	5.0		D) bailer due to limited column; or
	1415	20.96	3.5	6.60	27.3	3090	2.2	-315.7	5.0		E) recovery well cycling sample
	1417	20.98	4.0	6.60	27.3	3080	2.2	-315.9	5.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1420	MW-28	20.98	6.60	27.3	3080	2.2	-318.9	5.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-59 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCM

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1515	NP	10.00	0.0	32.72	25.3	Yes	Yes	Yes	Yes		Weather: pt. cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

+ Dup - Rest - 04
+ EB - Rest - 04
(both for same analyses)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-60
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup) Initials: SCH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1520	NP	11.23	0.0	37.78	26.7	Yes	Yes	Yes	Yes		Weather pt. cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1525	11.40	0.5	6.68	29.0	3800	2.6	-294.0	5.5	colorless; clear	*Low-flow groundwater sample:*
	1527	11.46	1.0	6.69	28.6	3870	2.4	-296.5	4.5		(A) peristaltic pump w/ ded tubing
	1530	11.51	1.5	6.69	28.6	3900	2.3	-298.0	4.0		B) ded bladder pump
	1532	11.52	2.0	6.69	28.5	3920	2.3	-299.0	3.8		C) non-ded bladder pump; or
	1535	11.53	2.5	6.69	28.4	3920	2.3	-299.5	3.6		*Standard groundwater sample:*
	1537	11.53	3.0	6.69	28.4	3940	2.2	-300.9	3.6		D) bailer due to limited column; or
	1540	11.53	3.5	6.69	28.3	3950	2.1	-301.1	3.6		E) recovery well cycling sample
	1542	11.53	4.0	6.69	28.3	3950	2.1	-301.3	3.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1545	MW-60	11.53	6.69	28.3	3950	2.1	-301.3	3.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
	1200	DUP-Rest-04	11.53	6.69	28.3	3950	2.1	-301.3	3.6	Same as above	Same	Same
	1550	EB-Rest-04	NA	→	→	→	→	→	→	Same as above	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

(Gauge only, per TRC 10/2/17)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-107
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (4-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCM

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1225	NP	11.68	0.0	19.05	17.1	Yes	Yes	Yes	Yes		Weather: pt. cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0			GAUGE					C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0			ONLY,	per TRC				D) bailer due to limited column; or
			3.5				10/2/17				E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-107								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Located 15' NW of NW corner of berm, if buried in future events]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-128
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; at-grade) Initials: SCG

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1435	NP	14.01	0.0	35.35	25.4	Yes	Yes	Yes	Yes		Weather: pt. cloudy, 80s

Well Purging Record

(Uncovered from road-gravel)

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1440	14.04	0.5	6.68	25.6	2020	2.1	-214.5	22.1	colorless; clear	*Low-flow groundwater sample:*
	1442	14.04	1.0	6.67	25.3	2010	1.8	-201.3	21.5		(A) peristaltic pump w/ ded tubing
	1445	14.04	1.5	6.67	25.2	2010	1.8	-199.7	20.5		B) ded bladder pump
	1447	14.04	2.0	6.67	25.1	2010	1.7	-196.2	19.8		C) non-ded bladder pump; or
	1450	14.04	2.5	6.67	25.0	2000	1.7	-191.2	19.4		*Standard groundwater sample:*
	1452	14.04	3.0	6.67	24.9	2000	1.6	~185.7	19.4		D) bailer due to limited column; or
	1455	14.04	3.5	6.67	24.9	2000	1.6	-183.9	19.2		E) recovery well cycling sample
	1457	14.04	4.0	6.67	24.9	2000	1.6	~182.9	19.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1500	MW-128	14.04	6.67	24.9	2000	1.6	-182.9	19.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-125
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: SCG

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1620	NP	11.29	0.0	28.31	23.5	Yes	Yes	Yes	Yes		Weather: pt. cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1625	11.35	0.5	6.98	26.8	4460	2.8	-178.3	18.5	Colorless; clear	*Low-flow groundwater sample:*
	1627	11.35	1.0	6.90	26.1	4560	2.5	-173.1	13.0	↓	(A) peristaltic pump w/ ded tubing
	1630	11.35	1.5	6.89	25.9	4570	2.5	-171.0	9.8	↓	B) ded bladder pump
	1632	11.35	2.0	6.87	25.7	4590	2.5	-168.3	6.9	↓	C) non-ded bladder pump; or
	1635	11.35	2.5	6.86	25.5	4600	2.4	-162.1	6.1	↓	*Standard groundwater sample:*
	1637	11.35	3.0	6.85	25.4	4620	2.4	-150.7	5.8	↓	D) bailer due to limited column; or
	1640	11.35	3.5	6.84	25.3	4620	2.4	-148.0	5.7	↓	E) recovery well cycling sample
↓	1642	11.35	4.0	6.84	25.4	4620	2.4	-146.2	5.7	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1645	MW-125	11.35	6.84	25.4	4620	2.4	-146.2	5.7	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

[Bagged tubing extension]

Monitoring Well Purging and Sampling Record

Trip Blank - Rest - 03

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-116
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup)

Initials: SCM

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1705	NP	8.13	0.0	27.63	20.0	Yes	Yes	Yes	Yes		Weather: pt. cloudy; 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1710	8.15	0.5	7.11	22.4	3690	2.4	18.0	29.1	colorless; clear	*Low-flow groundwater sample:*
	1712	8.15	1.0	7.00	21.7	3710	1.8	20.4	32.5		(A) peristaltic pump w/ ded tubing
	1715	8.15	1.5	6.98	21.6	3710	1.7	20.8	29.4		B) ded bladder pump
	1717	8.15	2.0	6.95	21.3	3710	1.6	21.3	27.1		C) non-ded bladder pump; or
	1720	8.15	2.5	6.94	21.1	3710	1.5	21.4	26.8		*Standard groundwater sample:*
	1722	8.15	3.0	6.94	21.1	3710	1.5	21.5	26.7		D) bailer due to limited column; or
	1725	8.15	3.5	6.94	21.1	3710	1.5	21.5	25.1		E) recovery well cycling sample
	1727	8.15	4.0	6.94	21.0	3710	1.5	21.4	24.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1730	MW-116	8.15	6.94	21.0	3710	1.5	21.4	24.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

N. side of dirt road; in-line w/ westernmost row of pecan trees; position labeled on fence pole (12' from fenceline)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-46R
Event: Fall 2017 (Semiannual)
Area of Concern: TMD

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; at-grade) Initials: SCY

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1745	NP	5.18	0.0	19.36	14.1	Yes	Yes	Yes	Yes		Weather: pt. cloudy; 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1750	5.20	0.5	6.96	25.7	4070	2.2	-23.5	8.0	colorless; clear	*Low-flow groundwater sample:*
	1752	5.20	1.0	6.90	25.4	4090	1.9	-33.8	7.5		(A) peristaltic pump w/ ded tubing
	1755	5.20	1.5	6.86	25.2	4100	1.7	-46.5	6.6		B) ded bladder pump
	1757	5.20	2.0	6.85	25.1	4100	1.5	-58.1	6.3		C) non-ded bladder pump; or
	1800	5.20	2.5	6.84	25.0	4110	1.5	-71.0	6.3		*Standard groundwater sample:*
	1802	5.20	3.0	6.83	24.9	4110	1.4	-78.6	6.2		D) bailer due to limited column; or
	1805	5.20	3.5	6.83	24.9	4110	1.4	-80.9	6.2		E) recovery well cycling sample
	1807	5.20	4.0	6.83	24.9	4110	1.4	-82.7	6.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1810	MW-46R	5.20	6.83	24.9	4110	1.4	-82.7	6.1	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[HMI - dedicated bladder pump]

NO ACTIVITY IN FALL 2017 EVENT

(furthest west "city well")

Upgradient

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: UG-3R
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

(4-in; at-grade)

Initials:

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
												Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								(B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

NO ACTIVITY IN FALL 2017 EVENT

(Near park)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: UG-4
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; at-grade) Initials:

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
												Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Upgradient

NO ACTIVITY IN FALL 2017 EVENT

(N. of elementary School)

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: UG-1
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

(4-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials:

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
												Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Upgradient

NO ACTIVITY IN FALL 2017 EVENT

E-W alley, immediately NW of Artesia Hotel

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: UG-2
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in ; at-grade)

Initials:

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
												Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)					HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Trip Blank - Rest - 04

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-101
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1210	ND	12.48	0.0	16.85	23.5	yes	yes	yes	yes		Weather: PT/Cloudy 80°
10/3/17	1710	ND	12.48	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1715	12.50	0.5	7.04	24.7	2220	1.7	-174.8	1.1	Clear	*Low-flow groundwater sample:*
	1717	12.50	1.0	7.00	24.6	2190	1.5	-173.7	1.2		(A) peristaltic pump w/ ded tubing
	1720	12.50	1.5	6.96	24.5	2180	1.3	-173.0	1.0		B) ded bladder pump
	1723	12.50	2.0	6.86	24.3	2120	1.2	-171.2	0.9		C) non-ded bladder pump; or
	1725	12.50	2.5	6.82	24.2	2100	1.1	-170.7	0.8		*Standard groundwater sample:*
	1727	12.50	3.0	6.80	24.0	2080	1.0	-170.6	0.7		D) bailer due to limited column; or
	1730	12.50	3.5	6.79	24.0	2080	0.9	-170.6	0.7		E) recovery well cycling sample
↓	1733	12.50	4.0	6.78	23.9	2070	0.9	170.7	0.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1735	MW-101	12.50	6.78	23.9	2070	0.9	-170.7	0.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-105
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in ; at-grade) Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1250	ND	9.26	0.0	17.20	14.2	yes	yes	yes	yes		Weather: pt/cloudy 80s
10/4/17	800	ND	9.33									

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/4/17	805	9.38	0.5	7.04	23.5	1712	1.7	-344.2	17.2	Clear/odor	*Low-flow groundwater sample:*
	807	9.38	1.0	7.03	23.7	1718	1.5	-350.7	17.4		(A) peristaltic pump w/ ded tubing
	810	9.38	1.5	7.02	23.7	1722	1.3	-351.8	17.6		B) ded bladder pump
	813	9.38	2.0	7.02	23.8	1727	1.2	-354.5	18.1		C) non-ded bladder pump; or
	815	9.38	2.5	7.01	23.8	1729	1.1	-355.8	19.6		*Standard groundwater sample:*
	817	9.38	3.0	7.00	23.8	1730	1.0	-356.1	20.1		D) bailer due to limited column; or
	820	9.38	3.5	7.00	23.8	1731	0.9	-357.4	20.7		E) recovery well cycling sample
	823	9.38	4.0	6.99	23.8	1731	0.8	-358.1	19.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	825	mw-105	9.38	6.99	23.8	1731	0.8	-358.1	19.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Bagged tube

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Gauge or sample through labeled 1-in guide-pipe

Well: RW-2 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (Inside doghouse)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1300	NP	11.48	0.0	36.13	31.1	yes	yes	yes	yes		Weather: PT/Cloudy 85

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-61
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (4-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1310	NP	11.57	0.0	29.30	29.30	yes	yes	yes	yes	Broken	Weather: PT/Cloudy 80°
10/4/17	850	NP	11.63	0.0							PAD	

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/4/17	955	11.81	0.5	7.08	24.3	2830	1.0	-351.6	8.7	Clear	*Low-flow groundwater sample:*
	957	11.98	1.0	7.08	24.4	2890	0.8	-354.6	8.2		(A) peristaltic pump w/ ded tubing
	900	12.09	1.5	7.05	24.5	2920	0.7	-356.0	6.0		B) ded bladder pump
	903	12.17	2.0	7.05	24.5	2930	0.6	-358.9	5.8		C) non-ded bladder pump; or
	905	12.27	2.5	7.02	24.4	2940	0.6	-360.7	4.0	Reduced purge	*Standard groundwater sample:*
	910	12.37	3.0	7.01	24.4	2950	0.6	-361.9	3.9	rate to 0.1 L/min	D) bailer due to limited column; or
	915	12.47	3.5	7.01	24.4	2960	0.5	-362.5	2.3	↓	E) recovery well cycling sample
↓	920	12.50	4.0	7.00	24.3	2960	0.5	-363.9	2.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv.	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	925	MW-61	12.50	7.00	24.3	2960	0.5	-363.9	2.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Ce,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-62
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (4-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAS

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1320	NP	12.88	0.0	29.30	21.5	yes	yes	yes	yes		Weather: PT/Cloudy 80s
10-4-17	1000	NP	12.95	0.0								

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-4-17	1005	13.11	0.5	6.88	23.4	3530	1.2	-359.2	3.8	clear / odor	*Low-flow groundwater sample:*
	1007	13.21	1.0	6.84	23.4	3580	1.0	-364.0	3.0		(A) peristaltic pump w/ ded tubing
	1010	13.28	1.5	6.82	23.4	3580	0.9	-366.2	2.8		B) ded bladder pump
	1013	13.33	2.0	6.81	23.4	3590	0.8	-367.3	2.8		C) non-ded bladder pump; or
	1015	13.37	2.5	6.80	23.5	3600	0.8	-368.3	2.9		*Standard groundwater sample:*
	1017	13.41	3.0	6.79	23.5	3610	0.8	-368.0	3.0		D) bailer due to limited column; or
	1020	13.44	3.5	6.79	23.5	3620	0.8	-368.6	3.7		E) recovery well cycling sample
↓	1023	13.48	4.0	6.78	23.5	3630	0.8	-369.0	3.6	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10-4-17	1025	MW-62	13.48	6.78	23.5	3630	0.8	-369.0	3.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

(Gauge only, per TRC 10/2/17)

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-93
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; at-grade) Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1330	NP	7.37	0.0	20.23	15.9	yes	yes	yes	yes		Weather: PC/Cloudy 80°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5			Gauge Only, per TRC					*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0						10/2/17		C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-93								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-43
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(6-in; stickup)

Initials: TAB/SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1410	NP	9.75	0.0	19.67	16.5	yes	Issue*	yes	yes	NO PAD	Weather: PT/Cloudy 80's
10/4/17	915	NA	9.94	0.0								Cloudy 70's

*(No protective outer casing)

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/4/17	920	9.99	0.5	6.99	22.7	4440	1.8	-329.5	13.5	clear w/ black particles	*Low-flow groundwater sample:*
	922	9.99	1.0	7.04	22.7	4480	1.5	-335.6	10.9		(A) peristaltic pump w/ ded tubing
	925	9.99	1.5	7.10	22.7	4510	1.3	-340.2	9.8		B) ded bladder pump
	927	9.99	2.0	7.14	22.6	4520	1.2	-342.8	9.1		C) non-ded bladder pump; or
	930	9.99	2.5	7.16	22.6	4520	1.2	-343.7	8.6		*Standard groundwater sample:*
	932	9.99	3.0	7.17	22.6	4530	1.1	-344.1	8.3		D) bailer due to limited column; or
	935	9.99	3.5	7.17	22.6	4530	1.1	-344.9	7.9		E) recovery well cycling sample
↓	937	9.99	4.0	7.18	22.6	4530	1.1	-345.2	7.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	940	MW-43	9.99	7.18	22.6	4530	1.1	-345.2	7.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~*Short List* Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-137
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; at-grade) Initials: TAB / SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1400	NP	7.93	0.0	29.60	24.6	yes	yes	yes	yes		Weather: Pt/cloudy 80s
10/4/17	1130	NA	8.15	0.0								cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/4/17	1135	8.15	0.5	6.78	27.3	4100	3.0	-350.2	12.1	clear; odor	*Low-flow groundwater sample:*
	1137	8.15	1.0	6.83	26.9	4520	2.5	-357.8	10.9		(A) peristaltic pump w/ ded tubing
	1140	8.15	1.5	6.87	26.5	4610	2.2	-362.9	10.1		B) ded bladder pump
	1142	8.15	2.0	6.89	26.4	4680	2.0	-365.1	9.1		C) non-ded bladder pump; or
	1145	8.15	2.5	6.91	26.4	4720	1.9	-367.5	8.7		*Standard groundwater sample:*
	1147	8.15	3.0	6.92	26.4	4740	1.9	-370.1	8.6		D) bailer due to limited column; or
	1150	8.15	3.5	6.92	26.3	4750	1.8	-372.8	7.9		E) recovery well cycling sample
↓	1152	8.15	4.0	6.93	26.3	4760	1.8	-373.5	7.5	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	1155	MW-137	8.15	6.93	26.3	4760	1.8	-373.5	7.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-138
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: TAB/SCD

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1350	NP	9.49	0.0	24.81	19.8	yes	yes	yes	yes		Weather: PC/cloudy 80s
10/4/17	1045	NA	9.71	0.0								Cloudy 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/4/17	1050	9.74	0.5	6.78	29.1	2790	1.9	-375.4	18.1	clear w/ black particles	*Low-flow groundwater sample:*
↓	1052	9.74	1.0	6.83	29.1	2820	1.6	-370.1	13.5	↓	(A) peristaltic pump w/ ded tubing
	1055	9.74	1.5	6.85	29.0	2850	1.4	-368.5	12.1		B) ded bladder pump
	1057	9.74	2.0	6.87	29.0	2870	1.2	-367.1	10.8		C) non-ded bladder pump; or
	1100	9.74	2.5	6.88	29.1	2880	1.1	-366.6	10.3		*Standard groundwater sample:*
	1102	9.74	3.0	6.88	29.2	2880	1.1	-365.4	9.7		D) bailer due to limited column; or
	1105	9.74	3.5	6.89	29.2	2890	1.0	-364.9	9.5		E) recovery well cycling sample
↓	1107	9.74	4.0	6.89	29.2	2890	1.0	-364.2	8.6	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	1110	MW-138	9.74	6.89	29.2	2890	1.0	-364.2	8.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-23
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(6-in; stickup)

Initials: TAB/SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1340	NP	12.88	0.0	23.10	17.9	YES	Tbg*	YES	YES		Weather: PT/Cloudy, 85°
10/4/17	1000	NA	13.10	0.0								

Well Purging Record

* No protective casing; but 6" Expandable locking cap is locked

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/4/17	1005	13.18	0.5	7.39	27.1	2890	2.2	-341.5	15.8	Clear; black tint odor	Low-flow groundwater sample:
	1007	13.22	1.0	7.34	27.1	2860	1.7	-343.8	13.2		(A) peristaltic pump w/ ded tubing
	1010	13.26	1.5	7.29	27.2	2820	1.5	-345.2	12.9		B) ded bladder pump
	1012	13.29	2.0	7.25	27.3	2800	1.3	-345.9	11.7		C) non-ded bladder pump; or
	1015	13.32	2.5	7.21	27.3	2780	1.1	-346.2	10.9		Standard groundwater sample:
	1017	13.35	3.0	7.20	27.2	2770	1.0	-346.8	9.8		D) bailer due to limited column; or
	1020	13.38	3.5	7.19	27.2	2760	1.0	-346.9	9.1		E) recovery well cycling sample
↓	1022	13.41	4.0	7.18	27.2	2760	1.0	-347.0	8.9	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	1025	MW-23	13.41	7.18	27.2	2760	1.0	-347.0	8.9	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cu,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

+ DUP-TEL-01 (for same analyses)

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: TEL-4
Event: Fall 2017 (Semiannual)
Area of Concern: TEL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	900	*	9.04	0.0	27.27	22.2	yes	yes	yes	yes		Weather: pt/cloudy 60°

Well Purging Record * unmeasurable Trace of LNAPL

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	905	9.20	0.5	6.08	22.0	4730	0.8	-160.4	23.1	clear/BlackTint	*Low-flow groundwater sample:*
	907	9.20	1.0	6.14	22.0	4670	0.8	-163.3	10.2	odor/Sheen	(A) peristaltic pump w/ ded tubing
	910	9.20	1.5	6.36	22.0	4660	0.8	-181.1	9.7		B) ded bladder pump
	913	9.20	2.0	6.38	22.0	4640	0.7	-182.9	8.8		C) non-ded bladder pump; or
	915	9.20	2.5	6.40	22.0	4630	0.7	-184.7	7.9		*Standard groundwater sample:*
	917	9.20	3.0	6.41	22.0	4620	0.7	-186.3	7.7		D) bailer due to limited column; or
	920	9.20	3.5	6.41	22.0	4610	0.6	-187.1	7.4		E) recovery well cycling sample
↓	923	9.20	4.0	6.42	22.0	4600	0.6	-187.3	7.0	↓ ↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	925	TEL-4	9.20	6.42	22.0	4600	0.6	-187.3	7.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
↓	1000	DUP-TEL-01	9.20	6.42	22.0	4600	0.6	-187.3	7.0	same as above	same	same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

+ EB-TEL-01 (for same analyses)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: TEL-3
Event: Fall 2017 (Semiannual)
Area of Concern: TEL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	940	8.79	8.84	0.05	27.19	22.2	yes	yes	yes	yes		Weather: pt/cloudy 78°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17			0.5								*Low-flow groundwater sample:*
			1.0	NOT	sampled	due	to	LNAPL	≥ 0.03		(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		TEL-3								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
↓	950	EB-TEL-01	NA	→						Same as above	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: TEL-2
Event: Fall 2017 (Semiannual)
Area of Concern: TEL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; Stickup)

Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1010	NP	9.63	0.0	27.20	22.1	yes	yes	yes	yes		Weather: Cloudy 78°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1015	9.70	0.5	6.91	22.3	3590	1.2	-296.2	3.8	Clear/odor	*Low-flow groundwater sample:*
	1017	9.70	1.0	6.96	22.2	3600	1.0	-299.5	3.5		(A) peristaltic pump w/ ded tubing
	1020	9.70	1.5	6.95	22.1	3600	1.0	-306.7	2.6		B) ded bladder pump
	1023	9.70	2.0	6.92	22.1	3610	0.9	-308.9	2.4		C) non-ded bladder pump; or
	1025	9.70	2.5	6.90	22.0	3620	0.8	-310.1	2.2		*Standard groundwater sample:*
	1027	9.70	3.0	6.89	22.0	3630	0.7	-311.8	1.7		D) bailer due to limited column; or
	1030	9.70	3.5	6.88	22.0	3620	0.8	-312.0	1.6		E) recovery well cycling sample
	1033	9.70	4.0	6.88	22.0	3620	0.8	-312.7	1.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1035	TEL-2	9.70	6.88	22.0	3620	0.8	-312.7	1.5	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Trip Blank - TEL-01

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: TEL-1
Event: Fall 2017 (Semiannual)
Area of Concern: TEL

Hydrologic Monitoring
for TRC
Houston, Texas

(2-in; stickup)

Initials: AB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1100	NF	8.79	0.0	27.00	22.9	yes	yes	yes	yes		Weather: Cloudy 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1105	9.03	0.5	7.23	22.2	3,170	1.1	-305.2	2.0	Clear	*Low-flow groundwater sample:*
	1107	9.03	1.0	7.21	22.2	3,160	0.9	-306.1	1.8		(A) peristaltic pump w/ ded tubing
	1110	9.03	1.5	7.20	22.1	3160	0.8	-309.9	1.6		B) ded bladder pump
	1113	9.03	2.0	7.18	22.0	3170	0.7	-312.5	1.5		C) non-ded bladder pump; or
	1115	9.03	2.5	7.17	22.0	3160	0.6	-314.1	1.4		*Standard groundwater sample:*
	1117	9.03	3.0	7.15	21.9	3160	0.6	-316.2	1.6		D) bailer due to limited column; or
	1120	9.03	3.5	7.14	21.9	3160	0.6	-317.9	1.7		E) recovery well cycling sample
	1123	9.03	4.0	7.14	21.8	3150	0.5	-319.2	2.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1125	TEL-1	9.03	7.14	21.8	3150	0.5	-319.2	2.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-39
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in stainless steel; short stickup) Initials: TAB/SCD

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1420	NP	9.31	0.0	25.44	20.4	yes	yes	yes	yes		Weather: Mt/cloudy 80s
10/4/17	830	NP	9.47	0.0	25.44	20.4						Cloudy 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/4/17	835	9.60	0.5	7.08	22.0	4090	2.1	-315.6	8.7	clear; black tint	*Low-flow groundwater sample:*
	837	9.62	1.0	7.15	21.9	4020	1.6	-320.8	7.5	odor	(A) peristaltic pump w/ ded tubing
	840	9.62	1.5	7.20	21.8	3980	1.4	-322.5	6.8		B) ded bladder pump
	842	9.62	2.0	7.23	21.7	3940	1.3	-324.1	6.3		C) non-ded bladder pump; or
	845	9.62	2.5	7.25	21.7	3910	1.3	-325.4	5.9		*Standard groundwater sample:*
	847	9.62	3.0	7.26	21.7	3900	1.2	-327.5	5.1		D) bailer due to limited column; or
	850	9.62	3.5	7.26	21.7	3890	1.2	-328.2	4.8		E) recovery well cycling sample
	852	9.62	4.0	7.27	21.7	3890	1.2	-328.1	4.2		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	855	MW-39	9.62	7.27	21.7	3890	1.2	-328.1	4.2	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Prior to 2H16, this well was an above-grade (stickup) completion; Area has since been backfilled with a couple feet of soil.

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-98
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (4-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1200	NP	8.73	0.0	25.60	21.5	yes	yes	yes	yes		Weather: PT/Cloudy 70s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17	1205	8.79	0.5	7.12	24.5	3180	0.9	-363.3	5.2	clear/odor	*Low-flow groundwater sample:*
	1207	8.79	1.0	7.01	24.4	3190	0.7	-361.9	5.0		(A) peristaltic pump w/ ded tubing
	1210	8.79	1.5	7.00	24.3	3180	0.7	-368.8	4.3		B) ded bladder pump
	1213	8.79	2.0	6.96	24.2	3180	0.7	-371.4	4.0		C) non-ded bladder pump; or
	1215	8.79	2.5	6.95	24.2	3190	0.6	-372.2	3.8		*Standard groundwater sample:*
	1217	8.79	3.0	6.94	24.2	3200	0.6	-373.1	3.6		D) bailer due to limited column; or
	1220	8.79	3.5	6.92	24.2	3200	0.6	-374.9	3.5		E) recovery well cycling sample
	1223	8.79	4.0	6.90	24.2	3200	0.7	-375.5	3.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/3/17	1225	MW-98	8.79	6.90	24.2	3200	0.7	-375.5	3.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Old RW-10 permanently covered by heavy steel box. Current RW-10 location should be the stand-pipe located ~50' S. of former RW-10 location, per Navajo.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-10 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1430	NA	9.14	0.0	22.49	17.5	Yes	Yes	Issue	Yes		Weather: PT/Cloudy 80°

↳ PVC cap on standpipe; unlockable

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-40 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas
Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1442	NP	7.54	0.0	24.75	21.8	yes	yes	yes	yes		Weather:

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-41 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: TA TB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1445	NP	7.10	0.0	21.56	18.6	yes	yes	yes	yes		Weather: PT/Cloudy 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Old RW-9 permanently covered by heavy steel box. Current RW-9 location should be the stand-pipe located ~50' E. of former RW-9 location, per Navajo.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-9 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1440	NA	9.44	0.0	21.83	16.8	Yes	Yes	Issue*	Yes		Weather: Ft/Cloudy 80s

* PVC Cap on standpipe; unlockable

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-42 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (2-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1450	NP	9.86	0.0	24.32	21.3	yes	yes	yes	yes		Weather: PT/cloudy 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-29
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (6-in PVC ; stickup) Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1530	NP	11.65	0.0	22.00	16.7	Internal Threaded cap	yes	Issue ↳ no protective casing unable to lock	yes	* ↳ Non standard Red	Weather: pt/cloudy 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-17	1535	11.66	0.5	7.30	26.1	3500	1.1	-268.0	2.8	Clear	*Low-flow groundwater sample:*
	1537	11.67	1.0	7.21	25.7	3500	0.8	-279.8	2.0		(A) peristaltic pump w/ ded tubing
	1540	11.67	1.5	7.16	25.4	3500	0.8	-285.5	1.9		B) ded bladder pump
	1543	11.67	2.0	7.14	25.3	3510	0.8	-290.1	1.6		C) non-ded bladder pump; or
	1545	11.67	2.5	7.12	25.3	3510	0.7	-290.9	1.5		*Standard groundwater sample:*
	1547	11.67	3.0	7.10	25.0	3510	0.7	-291.8	1.2		D) bailer due to limited column; or
	1550	11.67	3.5	7.08	25.0	3520	0.6	-293.4	1.2		E) recovery well cycling sample
	1553	11.67	4.0	7.07	25.0	3520	0.6	-294.4	1.0	"	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10-3-17	1555	MW-29	11.67	7.07	25.0	3520	0.6	-294.4	1.0	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO3~~	~~6010/6020 and/or 7470~~
										~~,Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW - #16B (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (8 3/8" OD bell-top stickup; PVC) Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1500	NP	11.72	0.0	17.70	14.7	yes	yes	Issue	yes	NID protective casing present	Weather: pt/cloudy 80s

Well Purging Record * outer protective post bent over and blocker well pad

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Not in "Sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-30 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: TAB

Well Inspection Information

(stickup)

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1520	NP	9.43	0.0	23.50	Not Sampled	yes	yes	yes	yes		Weather: pt/cloudy 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-17			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Gauge only, per TRC 10/2/17

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-56
Event: Fall 2017 (Semiannual)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup)

Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1510	NP	10.32	0.0	26.50	21.4	yes	yes	yes	yes		Weather: PC/cloudy 80°

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/3/17			0.5								*Low-flow groundwater sample:*
			1.0				Gauge only, per TRC				(A) peristaltic pump w/ ded tubing
			1.5						10/2/17		B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-56								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

*Located under yellow barricade; only the portion above hinge-line is above-grade.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-49
Event: Fall 2017 (Semiannual)
Area of Concern: TEL (2-in; short stickup) Initials: TAB

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10/3/17	1235	NP	8.77	0.0	33.15	27.5	Y/S	Non-Standard	Issue	Yes		Weather: PT/Cloudy 70°
6/4/17	1100	NP	5.38	0.0				Short stickup	↳ Broken Hinge			

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10/4/17	1105	9.02	0.5	6.91	25.6	3190	1.2	-345.3	2.5	Clear	*Low-flow groundwater sample:*
	1107	9.02	1.0	6.89	25.5	3210	1.1	-346.6	2.0		(A) peristaltic pump w/ ded tubing
	1110	9.02	1.5	6.88	25.4	3200	1.1	-350.8	1.8		B) ded bladder pump
	1113	9.02	2.0	6.84	25.2	3200	0.9	-352.8	1.6		C) non-ded bladder pump; or
	1115	9.02	2.5	6.83	25.2	3200	0.8	-353.7	1.2		*Standard groundwater sample:*
	1117	9.02	3.0	6.83	25.1	3200	0.8	-355.2	1.1		D) bailer due to limited column; or
	1120	9.02	3.5	6.82	25.1	3200	0.7	-356.3	1.0		E) recovery well cycling sample
↓	1123	9.02	4.0	6.81	25.0	3200	0.7	-356.6	0.6	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	1125	MW-49	9.02	6.81	25.0	3200	0.7	-356.6	0.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~				~~HNO_3~~	~~6010/6020~~
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

[Gravel lot area; relocated by surveyor, 1H15]

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

[Covered by gravel; relocated ZH17]

Well: MW-106
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; at-grade) Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-4-17	1220	NP	6.97	0.0	22.50	17.5	yes	yes	yes	yes		Weather: PC/Cloudy 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-4-17	1225	7.01	0.5	7.80	27.2	2440	1.0	-354.6	7.7	Cleared/colorless	*Low-flow groundwater sample:*
	1227	7.02	1.0	6.77	26.9	3470	0.8	-359.9	6.6		(A) peristaltic pump w/ ded tubing
	1230	7.03	1.5	6.76	26.8	3480	0.8	-365.4	6.0		B) ded bladder pump
	1233	7.04	2.0	6.75	26.5	3500	0.8	-366.6	5.8		C) non-ded bladder pump; or
	1235	7.06	2.5	6.73	26.2	3510	0.9	-369.1	5.0		*Standard groundwater sample:*
	1237	7.08	3.0	6.73	26.2	3510	0.9	-369.8	4.8		D) bailer due to limited column; or
	1240	7.10	3.5	6.72	26.2	3510	0.8	-371.0	4.5		E) recovery well cycling sample
	1243	7.12	4.0	6.72	26.2	3510	0.8	-372.1	4.1		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10/4/17	1245	MW-106	7.12	6.72	26.2	3510	0.8	-372.1	4.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-45
Event: Fall 2017 (Semiannual)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; at-grade) Initials: TAB

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10-3-17	1620	NP	4.63	0.0	15.05	12.3	yes	yes	yes	yes		Weather: PT/Cloudy 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10-3-17	1625	4.83	0.5	7.22	24.2	4700	2.8	-207.9	6.8	Clear	*Low-flow groundwater sample:*
	1627	4.84	1.0	7.17	23.8	4770	2.3	-212.5	5.4		(A) peristaltic pump w/ ded tubing
	1630	4.84	1.5	7.15	23.7	4780	2.0	-213.6	3.2		B) ded bladder pump
	1633	4.84	2.0	7.11	23.6	4780	1.8	-216.0	2.9		C) non-ded bladder pump; or
	1635	4.84	2.5	7.08	23.6	4780	1.6	-217.1	2.6		*Standard groundwater sample:*
	1637	4.84	3.0	7.06	23.4	4790	1.5	-218.0	2.3		D) bailer due to limited column; or
	1640	4.84	3.5	7.05	23.4	4790	1.4	-219.1	2.2		E) recovery well cycling sample
↓	1643	4.84	4.0	7.06	23.4	4790	1.3	-219.6	1.9	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
10-3-17	1645	MW-45	4.84	7.06	23.4	4790	1.3	-219.6	1.9	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO_3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

* located within Artesia wool laydown yard, N. of the main warehouse.

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-50
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup)

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	1000	NA	14.34	0.0	28.22	24.1	yes	yes	yes	yes		Weather: Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.3.17	1005	14.35	0.5	7.30	23.0	6460	2.3	84.9	7.3	Colorless; Clear	*Low-flow groundwater sample:*
↓	1007	14.35	1.0	7.16	22.8	6650	1.7	88.2	6.7	↓	(A) peristaltic pump w/ ded tubing
	1010	14.35	1.5	7.07	22.7	6770	1.4	91.3	6.2		B) ded bladder pump
	1012	14.35	2.0	7.03	22.7	6900	1.3	93.7	5.8		C) non-ded bladder pump; or
	1015	14.35	2.5	7.01	22.6	6940	1.3	94.9	5.2		*Standard groundwater sample:*
	1017	14.35	3.0	6.99	22.5	6970	1.2	95.8	4.9		D) bailer due to limited column; or
	1020	14.35	3.5	6.97	22.4	6990	1.2	96.7	4.3		E) recovery well cycling sample
↓	1022	14.35	4.0	6.96	22.4	7010	1.2	97.4	4.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10.3.17	1025	MW-50	14.35	6.96	22.4	7010	1.2	97.4	4.1	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-97
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; at-grade) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	1045	9.45	10.29	0.84	21.20	(NS)	yes	yes	yes	yes		Weather: Cloudy, 80's
		*		*		5' off base as needed						

Well Purging Record * Confirmed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		Not sampled to presence of						B) ded bladder pump
			2.0		≥ 0.03' LNAPL						C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-97								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					HNO_3	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-92
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	1055	11.26	11.31	0.05	22.60	17.6	yes	yes	yes	yes		Weather: Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		Not	Sampled	due to	presence of			B) ded bladder pump
			2.0	>	0.03'	LNAPL.					C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-92								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Bagged tubing

Inside doghouse

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Gauge / Sample through 1-in guide-pipe

Well: RW-1 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	1103	NA	10.18	0.0	35.39	30.4	yes	yes	yes	yes		Weather: Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-91
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	1115	NA	10.54	0.0	25.35	17.9	yes	yes	yes	yes		Weather: Cloudy, 80's

Well Purging Record *pH Confirmed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	* pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.3.17	1120	10.69	0.5	6.30	23.7	2700	2.2	-365.8	12.9	clear, black	*Low-flow groundwater sample:*
↓	1122	10.74	1.0	6.25	23.5	2580	2.0	-369.1	10.7	tint, odor	(A) peristaltic pump w/ ded tubing
	1125	10.77	1.5	6.28	23.3	2540	1.8	-369.9	10.3	↓	B) ded bladder pump
	1127	10.80	2.0	6.31	23.2	2520	1.7	-371.1	9.6		C) non-ded bladder pump; or
	1130	10.82	2.5	6.33	23.1	2500	1.6	-372.7	9.2		*Standard groundwater sample:*
	1132	10.83	3.0	6.35	23.1	2480	1.6	-374.0	8.7		D) bailer due to limited column; or
	1135	10.84	3.5	6.36	23.0	2470	1.5	-375.8	8.4		E) recovery well cycling sample
↓	1137	10.85	4.0	6.37	23.0	2460	1.5	-376.5	7.8	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10.3.17	1140	MW-91	10.85	6.37	23.0	2460	1.5	-376.5	7.8	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-90
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup)

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	1155	NA	11.29	0.0	22.80	21.5	yes	yes	yes	yes		Weather: Partly Cloudy, 80's

Well Purging Record

*SC Confirmed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	* SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.3.17	1200	11.40	0.5	7.68	23.6	3320	1.9	-334.0	11.7	Clear; Colorless;	*Low-flow groundwater sample:*
	1202	11.43	1.0	7.26	23.2	3340	1.5	-339.1	10.1	Odor	(A) peristaltic pump w/ ded tubing
	1205	11.45	1.5	7.04	23.1	3360	1.4	-343.2	9.6		B) ded bladder pump
	1207	11.46	2.0	6.98	23.1	3370	1.3	-347.1	9.2		C) non-ded bladder pump; or
	1210	11.47	2.5	6.92	23.0	3380	1.3	-349.7	8.8		*Standard groundwater sample:*
	1212	11.47	3.0	6.89	22.9	3380	1.2	-351.6	8.6		D) bailer due to limited column; or
	1215	11.48	3.5	6.87	22.9	3380	1.2	-353.1	8.4		E) recovery well cycling sample
↓	1217	11.48	4.0	6.86	22.8	3390	1.1	-354.0	8.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10.3.17	1220	MW-90	11.48	6.86	22.8	3390	1.1	-354.0	8.1	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~				~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

*10.4.17: HMI Team was able to bend back the prot. casing to allow access to well.

Well: MW-96
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	1235	NA	NM	NA	NA	21.2	yes	*Issue	*needs lock	yes		Weather: partly cloudy, 80's
10.4.17	825	NA	10.93	0.0	25.57	21.2						

10.3.17 It appears *well has been historically damaged and unable to lock due to broken hinge. the well has been struck, casing lid has completly broken off and the upper portion of the prot. casing is bent over the well cap making it unable to gauge/sample. *PVC well casing appears intact. See pictures

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	Comments
10.4.17	830	10.94	0.5	6.45	22.1	2150	2.3	-315.1	7.2	clear; colorless;	*Low-flow groundwater sample:*
|	832	10.94	1.0	6.64	22.0	2130	2.1	-331.2	6.8	white particles ↓	(A) peristaltic pump w/ ded tubing
|	835	10.94	1.5	6.66	21.9	2120	2.0	-343.2	6.1	odor	B) ded bladder pump
|	837	10.94	2.0	6.68	21.9	2120	1.9	-347.4	5.8	|	C) non-ded bladder pump; or
|	840	10.94	2.5	6.69	21.8	2120	1.9	-349.8	5.4	|	*Standard groundwater sample:*
|	842	10.94	3.0	6.70	21.8	2110	1.8	-351.6	5.2	|	D) bailer due to limited column; or
|	845	10.94	3.5	6.70	21.7	2110	1.8	-353.2	4.9	|	E) recovery well cycling sample
↓	847	10.94	4.0	6.71	21.8	2110	1.9	-354.9	4.6	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments: Lab: ESC Lab Sciences, Mt. Juliet, TN
10.4.17	850	MW-96	10.94	6.71	21.8	2110	1.9	-354.9	4.6	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Bagged tubing

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-94
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (4-in; Stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	1245	11.73	11.80	0.07	23.45	16.0	yes	yes	yes	yes		Weather: Partly cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		Not	Sampled	due	to	presence		B) ded bladder pump
			2.0		of	≥ 0.03'	LNAPL.				C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		MW-94								DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Inside doghouse

Monitoring Well Purging and Sampling Record

(Gauge only)

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Gauge/Sample through 1-in PVC guide-pipe

Well: RW-8
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	1253	10.70	10.74	0.04	37.22	35.2	yes	yes	yes	yes		Weather: Partly cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.3.17			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5		Not sampled due to presence						B) ded bladder pump
			2.0		of ≥ 0.03' LNAPL.						C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
		RW-8								DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
						~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,Ll)~~					~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-67
Event: Fall 2017 (Semiannual)
Area of Concern: Rest (4-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	1300	NA	9.06	0.0	27.30	19.9	yes	yes	yes	yes		Weather: Clear, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.3.17	1305	9.20	0.5	7.55	25.0	2540	2.2	-327.9	8.9	clear; light	*Low-flow groundwater sample:*
↓	1307	9.23	1.0	7.38	24.4	2510	1.8	-342.6	8.1	yellow tint; odor;	(A) peristaltic pump w/ ded tubing
	1310	9.25	1.5	7.25	24.1	2490	1.7	-348.0	7.6	small black particles	B) ded bladder pump
	1312	9.26	2.0	7.12	24.0	2460	1.7	-351.6	7.2	↓	C) non-ded bladder pump; or
	1315	9.27	2.5	7.04	24.0	2450	1.6	-353.8	6.8	↓	*Standard groundwater sample:*
	1317	9.28	3.0	7.01	23.9	2440	1.6	-354.6	6.4	↓	D) bailer due to limited column; or
	1320	9.28	3.5	6.98	23.9	2430	1.5	-356.2	6.2	↓	E) recovery well cycling sample
↓	1322	9.29	4.0	6.95	24.0	2430	1.5	-358.1	6.3	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10.3.17	1325	MW-67	9.29	6.95	24.0	2430	1.5	-358.1	6.3	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-95 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (4-in; stickup) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	1340	NA	12.03	0.0	25.37	20.4	yes	yes	yes	yes		Weather: partly cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
								Anions (Chloride,Fluoride,Sulfate)			Neat	300
							Cations (Ca,K,Na), taken from total metals bottle				HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
							Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)				HNO_3	6010/6020
							Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)				HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Bagged tubing. Inside "doghouse"

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

[Gauge/Sample through 1-in PVC guide-pipe]

Well: RW-7 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	1349	NA*	*10.11	0.0	37.00	32.0	yes	yes	yes	yes		Weather: partly cloudy, 80's
			Confirmed									

Well Purging Record *Trace LNAPL on Interface probe

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NCL - 34A
Event: Fall 2017 (Semiannual)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	1745	NA	9.51	0.0	19.31	16.9	* Issue	yes	yes	yes		Weather: Cloudy, 70's
10.4.17	905	NA	9.54	0.0	19.31	16.9						

Well Purging Record

* Cannot fit cap and close prot. casing simultaneously, PVC needs to be lowered, or prot. casing raised. Left with no cap, well secure.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.4.17	910	9.68	0.5	7.20	22.9	1814	2.1	-313.4	7.4	Clear; colorless;	*Low-flow groundwater sample:*
↓	912	9.71	1.0	6.86	22.7	1864	1.9	-322.1	6.9	odor ; sheen	(A) peristaltic pump w/ ded tubing
	915	9.71	1.5	6.72	22.6	1878	1.8	-324.2	6.2	↓	B) ded bladder pump
	917	9.71	2.0	6.69	22.6	1890	1.7	-326.1	5.7		C) non-ded bladder pump; or
	920	9.71	2.5	6.68	22.5	1902	1.7	-326.8	5.3		*Standard groundwater sample:*
	922	9.71	3.0	6.67	22.4	1910	1.6	-327.4	5.0		D) bailer due to limited column; or
	925	9.71	3.5	6.66	22.5	1917	1.6	-327.9	4.9		E) recovery well cycling sample
↓	927	9.71	4.0	6.66	22.5	1923	1.6	-328.3	4.6	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
10.4.17	930	NCL-34A	9.71	6.66	22.5	1923	1.6	-328.3	4.6	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-33
Event: Fall 2017 (Semiannual)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (Z-in; Stickup) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	1710	NA	8.01	0.0	19.60	17.7	yes	yes	yes	yes		Weather: Cloudy, 70's
10.4.17	945	NA	8.13	0.0	19.60	17.7						

Well Purging Record * pH Confirmed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	* pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.4.17	950	8.23	0.5	7.39	22.4	2960	2.5	-198.1	11.4	clear; colorless	*Low-flow groundwater sample:*
	952	8.30	1.0	7.24	22.1	3000	2.1	-204.6	10.3		(A) peristaltic pump w/ ded tubing
	955	8.35	1.5	7.18	22.0	3010	2.0	-209.4	9.6		B) ded bladder pump
	957	8.38	2.0	7.14	21.9	3020	1.9	-212.6	9.2		C) non-ded bladder pump; or
	1000	8.41	2.5	7.12	21.9	3030	1.9	-214.7	8.7		*Standard groundwater sample:*
	1002	8.44	3.0	7.08	21.8	3050	1.8	-216.8	8.1		D) bailer due to limited column; or
	1005	8.47	3.5	7.06	21.8	3060	1.7	-218.9	7.8		E) recovery well cycling sample
	1007	8.49	4.0	7.04	21.9	3070	1.7	-219.7	7.3		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
10.4.17	1010	NCL-33	8.49	7.04	21.9	3070	1.7	-219.7	7.3	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-44
Event: Fall 2017 (Semiannual)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	1630	NA	7.97	0.0	21.57	17.4	*Issue	yes	yes	yes		Weather: Partly Cloudy, 80's

*Cannot fit cap and close prot. casing simultaneously. Left with no cap, well secured.

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.3.17	1635	8.01	0.5	7.02	25.1	2570	2.1	-172.1	11.4	Clear; light	*Low-flow groundwater sample:*
↓	1637	8.01	1.0	6.92	23.5	2590	1.6	-202.3	8.6	yellow tint	(A) peristaltic pump w/ ded tubing
	1640	8.01	1.5	6.91	23.2	2590	1.4	-212.4	8.1	↓	B) ded bladder pump
	1642	8.01	2.0	6.90	23.1	2600	1.3	-218.7	6.7		C) non-ded bladder pump; or
	1645	8.01	2.5	6.89	23.0	2610	1.2	-224.6	5.6		*Standard groundwater sample:*
	1647	8.01	3.0	6.88	23.0	2620	1.1	-229.7	5.2		D) bailer due to limited column; or
	1650	8.01	3.5	6.87	22.9	2620	1.1	-234.1	4.8		E) recovery well cycling sample
↓	1652	8.01	4.0	6.87	22.9	2620	1.1	-237.6	4.4	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
10.3.17	1655	NCL-44	8.01	6.87	22.9	2620	1.1	-237.6	4.4	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

+ EB-NCL-01 (for same analysis)

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-32
Event: Fall 2017 (Semiannual)
Area of Concern: NCL (2-in; at-grade)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: C JH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	1540	NA	8.39	0.0	20.06	18.1	yes	yes	yes	yes		Weather: Partly Cloudy, 80's

Well Purging Record

* DO confirmed

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved *Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.3.17	1545	8.50	0.5	7.45	24.4	2480	2.4	-118.1	29.6	Clear; colorless;	*Low-flow groundwater sample:*
	1547	8.51	1.0	7.30	23.3	2500	1.6	-122.1	22.4	Small white particles	(A) peristaltic pump w/ ded tubing
	1550	8.51	1.5	7.23	22.9	2510	1.3	-124.2	18.9		B) ded bladder pump
	1552	8.51	2.0	7.19	22.7	2510	1.1	-126.4	17.1		C) non-ded bladder pump; or
	1555	8.51	2.5	7.15	22.5	2510	1.0	-128.1	15.6		*Standard groundwater sample:*
	1557	8.51	3.0	7.12	22.4	2520	0.9	-129.6	13.9		D) bailer due to limited column; or
	1600	8.51	3.5	7.10	22.5	2520	0.8	-130.9	13.6		E) recovery well cycling sample
	1602	8.51	4.0	7.08	22.6	2520	0.8	-131.7	13.0		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
10.3.17	1605	NCL-32	8.51	7.08	22.6	2520	0.8	-131.7	13.0	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~*Long List* Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	HNO_3	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	1620	EB-NCL-01	NA							Same as above	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

* Access by foot

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-108
Event: Fall 2017 (Semiannual)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(4-in; stickup) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	1405	NA	10.78	0.0	27.74	22.5	yes	yes	yes	yes		Weather: partly cloudy, 80s

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.3.17	1410	10.92	0.5	7.51	24.3	2790	1.8	-331.6	15.6	Clear; yellow tint;	Low-flow groundwater sample:
	1412	10.99	1.0	7.40	24.1	2810	1.6	-338.9	13.1	odor	(A) peristaltic pump w/ ded tubing
	1415	11.03	1.5	7.22	23.9	2690	1.7	-346.4	11.7		B) ded bladder pump
	1417	11.06	2.0	7.13	23.8	2670	1.7	-350.1	10.4		C) non-ded bladder pump; or
	1420	11.09	2.5	7.09	23.7	2650	1.6	-354.2	9.8		Standard groundwater sample:
	1422	11.11	3.0	7.06	23.6	2640	1.6	-357.7	9.3		D) bailer due to limited column; or
	1425	11.13	3.5	7.04	23.5	2630	1.5	-359.8	8.8		E) recovery well cycling sample
	1427	11.15	4.0	7.02	23.5	2620	1.5	-362.1	8.5		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
10.3.17	1430	MW-108	11.15	7.02	23.5	2620	1.5	-362.1	8.5	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

* SW of NCL field

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: NCL-31
Event: Fall 2017 (Semiannual)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; stickup) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	1450	NA	8.11	0.0	20.16	17.4	Issue	yes	yes	yes		Weather: Partly Cloudy, 80s

Well Purging Record

* Cannot fit cap and close prot. Casing simultaneously. Left with no cap, well secure.

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.3.17	1455	8.32	0.5	7.78	26.1	2940	2.0	-225.1	7.2	Clear; Colorless	*Low-flow groundwater sample:*
	1457	8.35	1.0	7.62	25.8	2920	1.7	-228.9	6.3	Small white	(A) peristaltic pump w/ ded tubing
	1500	8.35	1.5	7.55	25.6	2890	1.4	-226.1	6.1	Particles	B) ded bladder pump
	1502	8.35	2.0	7.47	25.5	2880	1.2	-224.0	5.8		C) non-ded bladder pump; or
	1505	8.35	2.5	7.40	25.4	2870	1.1	-222.6	5.3		*Standard groundwater sample:*
	1507	8.35	3.0	7.37	25.3	2860	1.0	-220.2	4.9		D) bailer due to limited column; or
	1510	8.35	3.5	7.34	25.2	2850	0.9	-219.1	4.4		E) recovery well cycling sample
↓	1512	8.35	4.0	7.31	25.2	2850	0.9	-218.0	4.2	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10.3.17	1515	NCL-31	8.35	7.31	25.2	2850	0.9	-218.0	4.2	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Not in "Sampling" program

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-19 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	1530	NA	8.38	0.0	22.08	Not Sampled	yes	*Issue	*Issue	yes		Weather: Partly Cloudy, 80's

*NO prot. casing, just exposed PVC casing, well cannot be secured.

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-55
Event: Fall 2017 (Semiannual)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	1727	NA	10.23	0.0	26.58	21.7	yes	yes	yes	yes		Weather: cloudy, 70's
10.4.17	1025	NA	10.23	0.0	26.58	21.7	yes	yes	yes	yes		

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.4.17	1030	10.25	0.5	7.21	22.1	3550	3.0	-282.4	12.7	clear; colorless	*Low-flow groundwater sample:*
	1032	10.25	1.0	7.17	21.7	3670	2.2	-274.1	10.0		(A) peristaltic pump w/ ded tubing
	1035	10.25	1.5	7.15	21.6	3700	1.9	-258.6	9.2		B) ded bladder pump
	1037	10.25	2.0	7.14	21.5	3720	1.8	-250.3	9.0		C) non-ded bladder pump; or
	1040	10.25	2.5	7.13	21.4	3730	1.7	-245.7	8.6		*Standard groundwater sample:*
	1042	10.25	3.0	7.12	21.4	3740	1.7	-241.8	8.3		D) bailer due to limited column; or
	1045	10.25	3.5	7.11	21.3	3740	1.8	-237.3	7.9		E) recovery well cycling sample
	1047	10.25	4.0	7.11	21.3	3750	1.8	-235.2	7.4		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
10.4.17	1050	MW-55	10.25	7.11	21.3	3750	1.8	-235.2	7.4	DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H2SO4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										~~***Short List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)~~	~~HNO3~~	~~6010/6020~~
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: RW-#17A (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: Rest

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(6-in PVC stickup w/ "belled" top) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	1735	NA	10.06	0.0	16.02	14.0	yes	Issue	Issue*	yes		Weather: Partly Cloudy, 80's
					(soft)							

*No Prot. Casing, just exposed PVC, well is unable to be secured.

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-18 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: NCL (4-in; stickup)

Hydrologic Monitoring
for TRC
Houston, Texas

Initials: CJH

Well Inspection Information

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	1718	NA	10.13	0.0	22.20	20.2	yes	yes	yes	yes		Weather: Partly Cloudy, 80's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-54A
Event: Fall 2017 (Semiannual)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	825	NA	10.83	0.0	31.30	23.6	yes	yes	yes	yes		Weather: Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.3.17	830	10.86	0.5	6.31	21.8	2260	3.1	53.0	8.1	Colorless, Clear	*Low-flow groundwater sample:*
	832	10.86	1.0	6.37	22.5	2240	2.1	61.4	7.6		(A) peristaltic pump w/ ded tubing
	835	10.86	1.5	6.42	22.0	2220	1.8	66.4	7.0		B) ded bladder pump
	837	10.86	2.0	6.45	21.9	2210	1.6	71.4	6.8		C) non-ded bladder pump; or
	840	10.86	2.5	6.47	21.8	2200	1.5	72.6	6.2		*Standard groundwater sample:*
	842	10.86	3.0	6.49	21.7	2190	1.5	74.1	5.9		D) bailer due to limited column; or
	845	10.86	3.5	6.50	21.7	2190	1.4	75.7	5.4		E) recovery well cycling sample
↓	847	10.86	4.0	6.51	21.6	2180	1.4	76.3	5.1	↓	F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
10.3.17	850	MW-54A	10.86	6.51	21.6	2180	1.4	76.3	5.1	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Monitoring Well Purging and Sampling Record

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Well: MW-54B (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information

(2-in; stickup) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	902	NA	10.93	0.0	46.80	41.8	yes	yes	yes	yes		Weather: Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500
										If <0.03 feet LNAPL present, remove LNAPL and sample groundwater		

Added 10.3.17
✓ + Trip Blank - NCL-01

+ Dup - NCL - 01 (for same analysis)

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: NCL - 49
Event: Fall 2017 (Semiannual)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in ; stickup) Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	910	NA	15.08	0.0	32.18	27.2	yes	yes	yes	yes		Weather: Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
10.3.17	915	15.11	0.5	7.06	22.5	3120	2.2	64.7	9.6	Colorless; clear	*Low-flow groundwater sample:*
	917	15.11	1.0	7.02	22.1	3000	1.8	71.0	8.5		(A) peristaltic pump w/ ded tubing
	920	15.11	1.5	7.00	21.9	2990	1.7	74.4	8.2		B) ded bladder pump
	922	15.11	2.0	6.98	21.8	3010	1.7	76.6	7.4		C) non-ded bladder pump; or
	925	15.11	2.5	6.97	21.7	3030	1.7	78.2	6.9		*Standard groundwater sample:*
	927	15.11	3.0	6.97	21.6	3050	1.6	79.7	5.7		D) bailer due to limited column; or
	930	15.11	3.5	6.96	21.6	3060	1.6	80.1	5.0		E) recovery well cycling sample
	932	15.11	4.0	6.96	21.5	3070	1.5	80.9	4.6		F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments
												Lab: ESC Lab Sciences, Mt. Juliet, TN
10.3.17	935	NCL-49	15.11	6.96	21.5	3070	1.5	80.9	4.6	DRO	HCL	8015M
										~~GRO~~	~~HCL~~	~~8015M~~
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										~~***Long List*** Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)~~	~~HNO_3~~	~~6010/6020 and/or 7470~~
										~~Cyanide~~	~~NaOH~~	~~SM4500~~
	900	Dup-NCL-01	15.11	6.96	21.5	3070	1.5	80.9	4.6	Same as above	Same	Same
												If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

* ~15' at 70 mile marker 285 northbound

Monitoring Well Purging and Sampling Record

Navajo Refinery Company
Artesia Refinery
Artesia, New Mexico

Well: MW-53 (Gauge only)
Event: Fall 2017 (Semiannual)
Area of Concern: NCL

Hydrologic Monitoring
for TRC
Houston, Texas

Well Inspection Information (2-in; at-grade)

Initials: CJH

Date	Time	Depth to LNAPL (Ft-TOC)	Depth to Water (Ft-TOC)	LNAPL Thickness (Ft)	Well Total Depth (Ft-TOC)	Sample Intake (Ft-TOC)	Well Inspection					Comments
							Cap	Casing	Well Secured	Label	Other	
10.3.17	815	NA	9.25	0.0	23.60	19.6	yes	yes	yes	yes		Weather: Cloudy, 70's

Well Purging Record

Date	Time	Depth to Water (Ft-TOC)	Cum. Vol. Purged (L)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Water Color / Clarity	
			0.5								*Low-flow groundwater sample:*
			1.0								(A) peristaltic pump w/ ded tubing
			1.5								B) ded bladder pump
			2.0								C) non-ded bladder pump; or
			2.5								*Standard groundwater sample:*
			3.0								D) bailer due to limited column; or
			3.5								E) recovery well cycling sample
			4.0								F) irrigation well grab sample

Well Sampling Record

Date	Time	Sample I.D.	Depth to Water (Ft-TOC)	pH (std units)	T (C)	SC (umho/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction-Potential (mV)	Turbidity (NTU)	Parameter	Preserv	Comments Lab: ESC Lab Sciences, Mt. Juliet, TN
										DRO	HCL	8015M
										GRO	HCL	8015M
										VOC	HCL	8260
										Anions (Chloride,Fluoride,Sulfate)	Neat	300
										Cations (Ca,K,Na), taken from total metals bottle	HNO_3	6010/6020
										Nitrate-Nitrite	H_2SO_4	per historical, ESC Lab Sciences
										TDS	Neat	2540C
										Short List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se)	HNO_3	6010/6020
										Long List Total Metals (As,Ba,Cr,Fe,Pb,Mn,Se,Hg,Ni,V,B,Cd,Co,U)	HNO_3	6010/6020 and/or 7470
										Cyanide	NaOH	SM4500

If <0.03 feet LNAPL present, remove LNAPL and sample groundwater

Instrument Calibration Log

Navajo Refining Company
Artesia Refinery
Artesia, New Mexico

Hydrologic Monitoring
for TRC
Houston, Texas

Date	Time	pH Hanna (Std. units)	Specific Conductivity Hanna (umho/cm)	Dissolved Oxygen Hanna (Slope Cal. in saturated air)	Turbidity Lamotte (NTU)	ORP Hanna HI 7020 Soln (200-275 mV)	PID Thermo Environmental 100 ppm Isobutylene	Initials / Comments
10/3/17	0600	4.01/7.00	1,000	100%	10.0	241.7	NA	SCH
10.3.17	0615	4.01/7.00	1,000	100%	10.0	237.4	NA	CJH
10.3-17	0618	4.01/7.00	1,000	100%	10.0	242.6	NA	RLR
10/3/17	0622	4.01/7.00	1,000	100%	10.0	237.1	NA	GDS
10/3/17	0625	4.01/7.00	1,000	100%	10.0	242.5	NA	SCD
10/3/17	0628	4.01/7.00	1,000	100%	10.0	256.8	NA	BR
10/3/17	0630	4.01/7.00	1,000	100%	10.0	257.0	NA	TAB
10-3-17	0635	4.01/7.00	1,000	100%	10.0	239.1	NA	BRH
10/4/17	0638	4.01/7.00	1,000	100%	10.0	244.9	NA	GDS
10/4/17	0641	4.01/7.00	1,000	100%	10.0	250.3	NA	BR
10.4.17	0644	4.01/7.00	1,000	100%	10.0	242.7	NA	CJH
10-4-17	0648	4.01/7.00	1,000	100%	10.0	237.1	NA	BRH
10-4-17	0650	4.01/7.00	1,000	100%	10.0	241.3	NA	RLR
10-4-17	0651	4.01/7.00	1,000	100%	10.0	251.8	NA	TAB
10-4-17	0700	4.01/7.00	1,000	100%	10.0	245.6	NA	SCD

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Spear
Email To: jspear@trcsolutions.com

Project Description: REST Fall 2017
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #: TRCATX-REST

Collected by (print): Scott Ude/HMI Team
Site/Facility ID #: REST (Navajo - Artesia)
P.O. #: 107027

Collected by (signature):
Immediately Packed on Ice: N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ... 200%
___ Next Day ... 100%
___ Two Day ... 50%
___ Three Day ... 25%

Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total only)	Long List Metals (Total only)	Cations (from "total metals" bottle)	Anions: TDS	NO2/NO3	Cyanide		
Trip Blank - Rest - 03	Grab	GW		10/3/17	—		✓										
Dup - Rest - 02	Grab	GW		10/3/17	1000		✓	✓	✓	✓		✓	✓	✓			
EB - Rest - 02	Grab	GW		10/3/17	940		✓	✓	✓	✓		✓	✓	✓			
MW - 104	Grab	GW		10/3/17	930		✓	✓	✓	✓		✓	✓	✓			
MW - 64	Grab	GW		10/3/17	1030		✓	✓	✓	✓		✓	✓	✓			
MW - 65	Grab	GW		10/3/17	1110		✓	✓	✓	✓		✓	✓	✓			
MW - 102	Grab	GW		10/3/17	1200		✓	✓	✓	✓		✓	✓	✓			
MW - 99	Grab	GW		10/3/17	1300		✓	✓	✓	✓		✓	✓	✓			
MW - 66	Grab	GW		10/3/17	1340		✓	✓	✓		✓	✓	✓	✓	✓		
MW - 28	Grab	GW		10/3/17	1420		✓	✓	✓		✓	✓	✓	✓	✓		

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - DrinkingWater OT - Other

Remarks:

Relinquished by: (Signature) — Date: 10/4/17 — Time: 1430 — Received by: (Signature)
Relinquished by: (Signature) — Date: — Time: — Received by: (Signature)
Relinquished by: (Signature) — Date: — Time: — Received for lab by: (Signature)

Analysis / Container / Preservative

Chain of Custody — Page 1 of 1

ESC LAB SCIENCES

Account: TRCATX
Project:
Template:
TSR: Chris McCord
PB:
Profile/Line:

Sample Receipt Checklist
COC Seal Present/Intact: Y ___ N ___ NA
COC Signed/Accurate:
Bottles arrive intact:
Correct bottles used:
Sufficient volume sent:
If Applicable
VOA Zero Headspace:
Preservation Correct/Checked:
pH Strips:
Lead Acetate Strips:
Sulfide Present:
Nitrate/Nitrite Present:
Ammonia Present:
Phenol Present:
Residual Chlorine Present:
Trip Blank Received:
Cooler Temp:
Temp Blank Received:
Thermometer Used:
Cooler Custody Seals Present/Intact:
Samples Received on Ice:
Cooler Custody Seals Signed/Dated:
Samples Received within Holding Time:
Comments:

pH Temp
Flow Other
Chlorine Res
Trip Blank Received: Yes / No
HCL / MeoH
TBR
Non Conformance(s):
Corrective Action:
Project Mgr. Review:
Date:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcsolutions.com

Project Description: REST Fall 2017

City/State Collected: Artesia, NM

Phone: 512-884-3170
Fax:

Client Project #

Lab Project #: TRCATX - REST

Collected by (print): Scott Ude/HMI Team

Site/Facility ID #: REST (Navajo - Artesia)

P.O. #: 107027

Collected by (signature):
Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST be Notified)
___ Same Day ... 200%
___ Next Day ... 100%
___ Two Day ... 50%
___ Three Day ... 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (TCEQ only)	Long List Metals (TCEQ only)	Cations (Diss. Total metals * bottle)	Anions TDS	NO2NO3	Cyanide
MW-128	Grab	GW		10/3/17	1520		✓	✓	✓	✓		✓	✓	✓	
Dup-Rest-04	Grab	GW		10/3/17	1200		✓	✓	✓		✓	✓	✓	✓	✓
EB-Rest-04	Grab	GW		10/3/17	1550		✓	✓	✓		✓	✓	✓	✓	✓
MW-60	Grab	GW		10/3/17	1545		✓	✓	✓		✓	✓	✓	✓	✓
MW-125	Grab	GW		10/3/17	1645		✓	✓	✓	✓		✓	✓	✓	
MW-116	Grab	GW		10/3/17	1730		✓	✓	✓	✓		✓	✓	✓	
MW-127	Grab	GW		10/3/17	1795		✓	✓	✓	✓		✓	✓	✓	
MW-126B	Grab	GW		10/3/17	1805		✓	✓	✓	✓		✓	✓	✓	
MW-126A	Grab	GW		10/3/17	1825		✓	✓	✓	✓		✓	✓	✓	
KWB-12B	Grab	GW		10/3/17	1500		✓	✓	✓		✓	✓	✓	✓	✓

* Matrix: SS - Soil GW - Groundwater WW - Wastewater DW - Drinking Water OT - Other

Remarks:

Relinquished by (Signature): Scott Ude — Date: 10/4/17 — Time: 1430 — Received by (Signature)

Relinquished by (Signature) — Date — Time — Received by (Signature)

Relinquished by (Signature) — Date — Time — Received for lab by (Signature)

Analysis / Container / Preservative

Chain of Custody — Page 2 of 17

ESC LAB SCIENCES

Lab Reference: Mount Juliet, TN 37122 Phone: 800-767-5859 Fax: 615-758-5859

Lab

Table #

Acctnum: TRCATX

Template:

Prelogin:

PM: Chris McCord

Cooler:

Shipped Via:

Sample Receipt Checklist — Temperature Blank Received

Temp: °C — Temp

Bottles Received — If preservation required by Login: Date/Time

Condition — Hold:

COC Seal Present — Y — N — NA

COC Signed/Accurate — Y — N — NA

Bottles Intact — Y — N — NA

Correct Bottles — Y — N — NA

Sufficient Volume — Y — N — NA

Samples Received via: ✓FED EX ☐Courier ☐

Cooler Temp: °C — Cooler Received

Date — Time

pH Checked — NCF

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcsolutions.com

Project Description: REST Fall 2017

City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #: TRCATX-REST

Collected by (print): Scott Ude/HMI Team

Site/Facility ID #: REST (Navajo - Artesia)

P.O. #: 107027

Collected by (signature):
Immediately Packed on Ice: N ____ Y ✔

Rush? (Lab MUST be Notified)
____ Same Day 200%
____ Next Day 100%
____ Two Day 50%
____ Three Day 25%

Date Results Needed

Email? ___No ✔Yes
FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	WQC	DRO	GRO	Short List Metals (Total only)	Long List Metals (Total only)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide		
Dup-Rest-05	Grab	GW		10/3/17	1200		✓	✓	✓		✓	✓	✓	✓	✓		
EB-Rest-05	Grab	GW		10/3/17	1315		✓	✓	✓		✓	✓	✓	✓	✓		
KWB-12A	Grab	GW		10/3/17	1415		✓	✓	✓		✓	✓	✓	✓	✓		
Trip Blank-Rest-02	Grab	GW		10/3/17	—		✓										
MW-57	Grab	GW		10/3/17	1335		✓	✓	✓	✓		✓	✓	✓			
KWB-1A	Grab	GW		10/3/17	1230		✓	✓			✓	✓	✓	✓	✓		
KWB-10R	Grab	GW		10/3/17	1145		✓	✓		✓		✓	✓	✓			
MW-136	Grab	GW		10/3/17	1055		✓	✓	✓		✓	✓	✓	✓	✓		
RA-4798	Grab	GW		10/3/17	1700		✓					✓	✓	✓			
KWB-8	Grab	GW		10/3/17	1040		✓	✓			✓	✓	✓	✓	✓		

Analysis / Container / Preservative

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other: _____

Remarks:

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	10/4/17	1430	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Sample Receipt Checklist
Samples returned via: ☐ UPS ✔ Fedex ☐ Courier ☐ _____
Temp: _____ °C Bottles Received: _____
Date: _____ Time: _____

Chain of Custody Page 3 of 17

ESC LAB SCIENCES

Account: TRCATX
Template:
Prelogin:
PM: Chris McCord
PB:
Shipped Via:

Remarks | Sample # (lab only)

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcsolutions.com

Project Description: REST Fall 2017
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project #: TRCATX - REST

Collected by (print): Scott Ude/HMI Team

Site/Facility ID #: REST (Navajo - Artesia)

P.O. #: 107027

Collected by (signature):
Immediately Packed on Ice: N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day 200%
____ Next Day 100%
____ Two Day 50%
____ Three Day 25%

Date Results Needed

Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

ESC LABORATORIES

Lancaster Laboratories
Mount Juliet, TN (615) 758-5858
Phoenix, AZ (480) 784-0043
Phoenix, AZ (800) 767-5859
Fax: 615-758-5859

PB #
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Arsenic (Total only)	Long List Metals (Total only)	Cations (from Total metals bottle)	Anions, TDS	NO2/NO3	Cr(VI)/Cr
MW-135	Grab	GW		10/3/17	1550		✓	✓	✓	✓		✓	✓	✓	
KWB-11A	Grab	GW		10/3/17	1455		✓	✓	✓		✓	✓	✓	✓	✓
KWB-11B	Grab	GW		10/3/17	1415		✓	✓	✓		✓	✓	✓	✓	✓
KWB-7	Grab	GW		10/3/17	1330		✓	✓			✓	✓	✓	✓	✓
MW-98	Grab	GW		10/3/17	1225		✓	✓	✓	✓		✓	✓	✓	
MW-101	Grab	GW		10/3/17	1735		✓	✓	✓	✓		✓	✓	✓	
Trip Blank - Rest - 04	Grab	GW		10/3/17	----		✓								
MW-29	Grab	GW		10/3/17	1555		✓	✓	✓	✓		✓	✓	✓	
MW-50	Grab	GW		10/3/17	1025		✓	✓		✓		✓	✓	✓	
MW-91	Grab	GW		10/3/17	1140		✓	✓	✓	✓		✓	✓	✓	

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other _____

pH _____ Temp _____
Flow _____ Other _____

Remarks:

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Samples returned via: ✓Fed Ex ☐ Courier
Scott Ude	10/4/17	1430		Tracking #
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:

COC Seal Present: Y N NA
COC Signed/Accurate:
Bottles arrive intact:
Correct bottles used:
Sufficient volume sent:
If Applicable
VOA Zero Headspace:
Preservation Correct/Checked:
RAD Screen <0.5 mR/hr:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com
Project Description: REST Fall 2017
City/State Collected: Artesia, NM
Phone: 512-684-3170
Fax:
Client Project #
Lab Project #: TRCATX - REST
Collected by (print): Scott Ude/HMI Team
Site/Facility ID #: REST (Navajo - Artesia)
P.O. #: 107027
Collected by (signature):
Immediately Packed on Ice N ___ Y ✓
Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%
Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 5 of 17

ESC LABORATORY SCIENCES
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L #
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total only)	Long List Metals (Total only)	Cations (from "total metals" bottle)	Anions, TDS	NO2NO3	Cyanide	Rem./Contaminant	Sample # (lab only)
MW-90	Grab	GW		10/3/17	1220		✓	✓	✓	✓		✓	✓	✓			
MW-67	Grab	GW		10/3/17	1325		✓	✓	✓		✓	✓	✓	✓	✓		
MW-137	Grab	GW		10/4/17	1155		✓	✓	✓		✓	✓	✓	✓	✓		
MW-138	Grab	GW		10/4/17	1110		✓	✓	✓		✓	✓	✓	✓	✓		
MW-23	Grab	GW		10/4/17	1025		✓	✓	✓	✓		✓	✓	✓			
MW-43	Grab	GW		10/4/17	940		✓	✓	✓		✓	✓	✓	✓	✓		
MW-39	Grab	GW		10/4/17	855		✓	✓	✓	✓		✓	✓	✓			
KWB-2R	Grab	GW		10/4/17	1110		✓	✓		✓		✓	✓	✓			
KWB-5	Grab	GW		10/4/17	1140		✓	✓		✓		✓	✓	✓			
KWB-6	Grab	GW		10/4/17	1150		✓	✓		✓		✓	✓	✓			

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

pH ___ Temp ___
Flow ___ Other ___

Remarks:

Hold #

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	10/4/17	1430	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ ___
Temp: °C Bottles Received:
Date: Time:

Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwastesolutions.com

Project Description: REST Fall 2017
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #: TRCATX - REST

Collected by (print): Scott Ude/HMI Team
Site/Facility ID #: REST (Navajo - Artesia)
P.O. #: 107027

Collected by (signature):
Immediately Packed on Ice: N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day 200%
____ Next Day 100%
____ Two Day 50%
____ Three Day 25%

Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total only)	Long List Metals (Total only)	Cations (Total metals* bottle)	Anions, TDS	NO2/NO3	Cyanide
MW-52	Grab	GW		10/4/17	915		✓	✓	✓		✓	✓	✓	✓	✓
MW-53	Grab	GW		10/4/17	1030		✓	✓			✓	✓	✓	✓	✓
MW-109	Grab	GW		10/4/17	900		✓	✓	✓	✓		✓	✓	✓	
MW-110	Grab	GW		10/4/17	945		✓	✓	✓	✓		✓	✓	✓	
MW-111	Grab	GW		10/4/17	1055		✓	✓	✓	✓		✓	✓	✓	
MW-117	Grab	GW		10/4/17	835		✓	✓	✓	✓		✓	✓	✓	
MW-118	Grab	GW		10/4/17	920		✓	✓	✓	✓		✓	✓	✓	
MW-119	Grab	GW		10/4/17	1005		✓	✓	✓	✓		✓	✓	✓	
MW-131	Grab	GW		10/4/17	1125		✓	✓	✓	✓		✓	✓	✓	
MW-106	Grab	GW		10/4/17	1245		✓	✓	✓	✓		✓	✓	✓	

Analysis / Container / Preservative

Chain of Custody Page 6 of 11

ESC LAB SCIENCES

ESC Reference #:
Account: TRCATX
Project:
Collected:
PWSID:
Sampler: Chris McCord
PO #:
Shipped Via:
Sample Condition / Cooler Temp

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other

Remarks:

pH ____ Temp ____
Flow ____ Other ____

Relinquished by: (Signature) Scott Ude — Date: 10/4/17 — Time: 1430 — Received by: (Signature)
Relinquished by: (Signature) — Date: — Time: — Received by: (Signature)
Relinquished by: (Signature) — Date: — Time: — Received for lab by: (Signature)

Samples returned via: ☐ UPS ✓ FedEx ☐ Courier ☐
Temp ____ °C Bottles Received
Date ____ Time ____

Lab # / Table #
Acctnum / Template / Prelogin / TSR / PB
Shipping Info / Tracking #

Condition / Cooler Temp (lab use only)
COC Seal Intact: Y N N/A
pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcsolutions.com

Project Description: REST Fall 2017
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #: TPCATX-REST

Collected by (print): Scott Ude/HMI Team
Site/Facility ID #: REST (Navajo - Artesia)
P.O. #: 107027

Collected by (signature):
Immediately Packed on Ice N ___ Y ✓
Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%
Date Results Needed
Email? ___No ✓Yes
Fax? ___No ___Yes
No. of Cntrs

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total only)	Long List Metals (Total only)	Cations (Ca,Mg,Na,K "total metals" Bottle)	Anions, TDS	NO2/NO3	Cyanide
MW-62	Grab	GW		10/14/17	1025		✓	✓	✓	✓		✓	✓	✓	
MW-61	Grab	GW		10/4/17	925		✓	✓	✓	✓		✓	✓	✓	
MW-105	Grab	GW		10/4/17	825		✓	✓	✓	✓		✓	✓	✓	
MW-130	Grab	GW		10/4/17	1245		✓	✓	✓	✓		✓	✓	✓	
MW-48	Grab	GW		10/4/17	1225		✓	✓	✓	✓		✓	✓	✓	
MW-96	Grab	GW		10/4/17	850		✓	✓	✓	✓		✓	✓	✓	
MW-113	Grab	GW		10/4/17	1140		✓	✓	✓	✓		✓	✓	✓	
Dup-Rest-01	Grab	GW		10/4/17	1100		✓	✓	✓	✓		✓	✓	✓	
EB-Rest-01	Grab	GW		10/4/17	1210		✓	✓	✓	✓		✓	✓	✓	
Trip Blank-Rest-01	Grab	GW		10/4/17	—		✓								

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other

Remarks:

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	10/14/17	1430	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

pH ___ Temp ___
Flow ___ Other ___
Sample(s) received via: ✓Fedex ☐Courier ☐
COC Seal Present: ___ Y ___ N ___ NA
COC Signed/Accurate: ___ Y ___ N ___ NA
Bottles arrive intact: ___ Y ___ N ___ NA
Correct bottles used: ___ Y ___ N ___ NA
Sufficient volume sent: ___ Y ___ N ___ NA
If Applicable: VOA Zero Headspace: ___ Y ___ N ___ NA
Preservation Correct/Checked: ___ Y ___ N ___ NA
RAD Screen <0.5 mR/hr: ___ Y ___ N ___ NA

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

ESC LAB SCIENCES

Lab MUST be notified of analysis before samples are received
Phone: 800-767-5859
Fax: 615-758-5859

Report to: Julie Speer
Email To: jspeer@trcsolutions.com
Project Description: REST Fall 2017
Phone: 512-684-3170
Collected by (print): Scott Ude/HMI Team
Collected by (signature):
Immediately Packed on Ice N ___ Y ✓
Sample ID | Comp/Grab | Matrix * | Depth | Date | Time
MW-62 | Grab | GW | | 10/14/17 | 1025
MW-61 | Grab | GW | | 10/4/17 | 925
MW-105 | Grab | GW | | 10/4/17 | 825
MW-130 | Grab | GW | | 10/4/17 | 1245
MW-48 | Grab | GW | | 10/4/17 | 1225
MW-96 | Grab | GW | | 10/4/17 | 850
MW-113 | Grab | GW | | 10/4/17 | 1140
Dup-Rest-01 | Grab | GW | | 10/4/17 | 1100
EB-Rest-01 | Grab | GW | | 10/4/17 | 1210
Trip Blank-Rest-01 | Grab | GW | | 10/4/17 | —
Remarks:
Relinquished by: (Signature) Scott Ude 10/14/17 1430
Relinquished by: (Signature)
Relinquished by: (Signature)
Received by: (Signature)
Received by: (Signature)
Received for lab by: (Signature)
Date: Time:
pH ___ Temp ___
Flow ___ Other ___
Sample(s) received via: ✓Fedex ☐Courier ☐
COC Seal Present: ___ Y ___ N ___ NA
COC Signed/Accurate: ___ Y ___ N ___ NA
Bottles arrive intact: ___ Y ___ N ___ NA
Correct bottles used: ___ Y ___ N ___ NA
Sufficient volume sent: ___ Y ___ N ___ NA
If Applicable: VOA Zero Headspace: ___ Y ___ N ___ NA
Preservation Correct/Checked: ___ Y ___ N ___ NA
RAD Screen <0.5 mR/hr: ___ Y ___ N ___ NA
Analysis / Container / Preservative
Chain of Custody Page 1 of 1
ESC LAB SCIENCES
Lab MUST be notified of analysis before samples are received
Phone: 800-767-5859
Fax: 615-758-5859
Report to: Julie Speer
Email To: jspeer@trcsolutions.com
Project Description: REST Fall 2017
Phone: 512-684-3170
Collected by (print): Scott Ude/HMI Team
Collected by (signature):
Immediately Packed on Ice N ___ Y ✓
Sample ID | Comp/Grab | Matrix * | Depth | Date | Time
MW-62 | Grab | GW | | 10/14/17 | 1025
MW-61 | Grab | GW | | 10/4/17 | 925
MW-105 | Grab | GW | | 10/4/17 | 825
MW-130 | Grab | GW | | 10/4/17 | 1245
MW-48 | Grab | GW | | 10/4/17 | 1225
MW-96 | Grab | GW | | 10/4/17 | 850
MW-113 | Grab | GW | | 10/4/17 | 1140
Dup-Rest-01 | Grab | GW | | 10/4/17 | 1100
EB-Rest-01 | Grab | GW | | 10/4/17 | 1210
Trip Blank-Rest-01 | Grab | GW | | 10/4/17 | —
Remarks:
Relinquished by: (Signature) Scott Ude 10/14/17 1430
Relinquished by: (Signature)
Relinquished by: (Signature)
Received by: (Signature)
Received by: (Signature)
Received for lab by: (Signature)
Date: Time:
pH ___ Temp ___
Flow ___ Other ___
Sample(s) received via: ✓Fedex ☐Courier ☐
COC Seal Present: ___ Y ___ N ___ NA
COC Signed/Accurate: ___ Y ___ N ___ NA
Bottles arrive intact: ___ Y ___ N ___ NA
Correct bottles used: ___ Y ___ N ___ NA
Sufficient volume sent: ___ Y ___ N ___ NA
If Applicable: VOA Zero Headspace: ___ Y ___ N ___ NA
Preservation Correct/Checked: ___ Y ___ N ___ NA
RAD Screen <0.5 mR/hr: ___ Y ___ N ___ NA

Company Name/Address:

Company Name/Address:	Billing Information:
TRC Solutions - Austin, TX 505 E. Huntland Dr, Ste 250 Austin, TX 78752	Accounts Payable 21 Griffin Road North Windsor, CT 06095
Report to: Julie Speer	Email To: jspeer@trcsolutions.com
Project Description: REST Fall 2017	City/State Collected: Artesia, NM
Phone: 512-684-3170 Fax:	Client Project #	Lab Project # TRCATX - REST
Collected by (print): Scott Ude/HMI Team	Site/Facility ID #: REST (Navajo - Artesia)	P.O. #: 107027
Collected by (signature): Immediately Packed on Ice: N ___ Y ✓	Rush? (Lab MUST be Notified): ___ Same Day 200% ___ Next Day 100% ___ Two Day 50% ___ Three Day 25%	Date Results Needed: Email? ___No ✓Yes FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix*	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total only)	Long List Metals (Total only)	Cations (from "total metals" bottle)	Anions, TDS	NO2/NO3	Gyanides
Dup-Rest-03	Grab	GW		10/4/17	1200		✓	✓	✓	✓		✓	✓	✓	
EB-Rest-03	Grab	GW		10/4/17	1120		✓	✓	✓	✓		✓	✓	✓	
mw-134	Grab	GW		10/4/17	1110		✓	✓	✓	✓		✓	✓	✓	
RA-4196	Grab	GW		10/4/17	1145		✓					✓	✓	✓	
mw-115	Grab	GW		10/4/17	915		✓	✓	✓	✓		✓	✓	✓	
mw-114	Grab	GW		10/4/17	1010		✓	✓	✓	✓		✓	✓	✓	
	Grab	GW													
	Grab	GW													
	Grab	GW													
	Grab	GW													

* Matrix: SS - Soil GW - Groundwater WW - Wastewater DW - Drinking Water OT - Other

Remarks:

Relinquished by: (Signature)	Date: 10/4/17	Time: 1430	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Sample Receipt Checklist: ✓Temp ☐Blue Ice ☐Dry Ice ☐None ☐Custody Seals Intact ☐Cooler ☐Bottles Received

Temp: ___ Time: ___ Date: ___ Time: ___

Analysis / Container / Preservative

Chain of Custody Page 6 of 17

ESC LAB SCIENCES

Account: TRCATX
Project:
Profile:
PO: Chris McCord
Quote:
Subject: TRC
Sampler: Scott Ude

Lab Use Only: Lab Sample Temperature Info: Received on Ice: Y / N; Custody Seals Intact: Y / N / NA; Correct Containers Used: Y / N; Sufficient Volume Sent: Y / N; Pres. Correct/Checked: Y / N / NA; RAD Screen <0.5 mR/hr: Y / N

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcsolutions.com

Project Description: TMD Fall 2017
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:
Client Project #:
Lab Project #: TRCATX - TMD

Collected by (print): Scott Lide/HMI Team
Site/Facility ID #: TMD (Navajo - Artesia)
P.O. #: 107027

Collected by (signature):
Immediately Packed on Ice N ___ Y ✔

Rush? (Lab MUST be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed:
Email? ___No ✔Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 2 of 2

ESC LAB SCIENCES

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total only)	Long List Metals (Total only)	Cations (From "total metals" bottle)	Anions TDS	NO2/NO3	Cyanide		
MW-46R	Grab	GW		10/3/17	1810		✓	✓		✓		✓	✓	✓			
MW-21	Grab	GW		10/4/17	1245		✓	✓	✓	✓		✓	✓	✓			
Trip Blank-TMD-01	Grab	GW		10/4/17	—		✓										
NP-1	Grab	GW		10/4/17	1245		✓										
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other: _____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Relinquished by: (Signature) Scott Lide — Date: 10/4/17 — Time: 1430 — Received by: (Signature)
Relinquished by: (Signature) — Date: — Time: — Received by: (Signature)
Relinquished by: (Signature) — Date: — Time: — Received for lab by: (Signature)

Samples returned via: ✔ FedEx ☐ Courier ☐ _____
Temp _____ °C Bottles Received
Date _____ Time _____
COC Seal Present: ___ Y ___ N/A
COC Signed/Accurate: ___ Y ___ N

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcsolutions.com

Project Description: TEL Fall 2017
City/State Collected: Artesia, NM

Phone: 512-694-3170
Fax:
Client Project #
Lab Project # TRCATX - TEL

Collected by (print): Scott Ude/HMI Team
Site/Facility ID #: TEL (Navajo - Artesia)
P.O. # 107027

Collected by (signature):
Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✓Yes
FAX ___No ___Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Arsenic (Total only)	Long List Metals (Total only)	Cations (Total Arsenic Soluble)	Anions TDS	NO2NO3	Cyanide		
TEL-1	Grab	GW		10/3/17	1125		✓	✓	✓	✓		✓	✓	✓			
Trip Blank - TEL-01	Grab	GW		10/3/17	—		✓										
TEL-2	Grab	GW		10/3/17	1035		✓	✓	✓	✓		✓	✓	✓			
EB-TEL-01	Grab	GW		10/3/17	950		✓	✓	✓	✓		✓	✓	✓			
TEL-4	Grab	GW		10/3/17	925		✓	✓	✓	✓		✓	✓	✓			
Dup-TEL-01	Grab	GW		10/3/17	1000		✓	✓	✓	✓		✓	✓	✓			
MW-49	Grab	GW		10/4/17	1125		✓	✓	✓		✓	✓	✓	✓	✓		
	Grab	GW															
	Grab	GW															
	Grab	GW															

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other

Remarks:

Relinquished by: (Signature) Scott Ude — Date: 10/4/17 — Time: 1430 — Received by: (Signature)
Relinquished by: (Signature) — Date: — Time: — Received by: (Signature)
Relinquished by: (Signature) — Date: — Time: — Received for lab by: (Signature)

Sample Receipt Checklist
Temp: ___ °C Received on Ice: ___
Custody Seals Intact: ___
Cooler Temp: ___ °C Correct Containers Used: ___
pH Checked: ___ pH Adjusted: ___

Analysis / Container / Preservatives

Chain of Custody — Page 10 of 17

ESC LAB SCIENCES
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

Lab #
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:
Rec. Temperature | Sample Receipt pH

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: speer@trcwsolutions.com

Project Description: EP Fall 2017
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #: TRCATX-EP

Collected by (print): Scott Ude/HMI Team
Site/Facility ID #: EP (Navajo - Artesia)
P.O. #: 107027

Collected by (signature):
Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 11 of 17

ESC LAB SCIENCES
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L#
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total only)	Long List Metals (Total only)	Cations (from "total metals" bottle)	Anions TDS	NO2NO3	Cyanide	Rem./Contaminant	Sample # (lab only)
Trip Blank - EP-01	Grab	GW		10/3/17	—		✓										
MW-2A	Grab	GW		10/3/17	1340		✓	✓	✓	✓		✓	✓	✓			
MW-122	Grab	GW		10/3/17	1230		✓	✓	✓	✓		✓	✓	✓			
MW-121	Grab	GW		10/3/17	1135		✓	✓	✓	✓		✓	✓	✓			
MW-120	Grab	GW		10/3/17	1055		✓	✓	✓	✓		✓	✓	✓			
MW-84	Grab	GW		10/3/17	1015		✓	✓	✓	✓		✓	✓	✓			
MW-75	Grab	GW		10/3/17	1745		✓	✓	✓	✓		✓	✓	✓			
MW-76	Grab	GW		10/3/17	1645		✓	✓	✓	✓		✓	✓	✓			
MW-83	Grab	GW		10/3/17	1600		✓	✓	✓	✓		✓	✓	✓			
MW-3	Grab	GW		10/3/17	1515		✓	✓	✓	✓		✓	✓	✓			

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other _____

pH _____ Temp _____
Flow _____ Other _____

Remarks:

Hold #
Condition: (lab use only)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	10/4/17	1430	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____
Temp: °C Bottles Received:
Date: Time:

COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcwsolutions.com
Project Description: EP Fall 2017
City/State Collected: Artesia, NM
Phone: 512-684-3170
Fax:
Client Project #
Lab Project #: TRCATX-EP
Collected by (print): Scott Ude/HMI Team
Site/Facility ID #: EP (Navajo - Artesia)
P.O. #: 107027
Collected by (signature):
Immediately Packed on Ice N ___ Y ✓
Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%
Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page 12 of 17

ESC LABORATORIES
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L #
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Cooler:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total only)	Long List Metals (Total only)	Cations (from "total metals" bottle)	Anions: TDS	NO2NO3	Cyanide	Rem./Contaminant	Sample # (lab only)
Dup-EP-03	Grab	GW		10/3/17	1200		✓	✓	✓	✓		✓	✓	✓			
MW-123	Grab	GW		10/3/17	1425		✓	✓	✓	✓		✓	✓	✓			
MW-10	Grab	GW		10/3/17	1340		✓	✓	✓	✓		✓	✓	✓			
Dup-EP-02	Grab	GW		10/3/17	1000		✓	✓	✓	✓		✓	✓	✓			
MW-22A	Grab	GW		10/3/17	1240		✓	✓	✓	✓		✓	✓	✓			
MW-88	Grab	GW		10/3/17	1155		✓	✓	✓	✓							
MW-4A	Grab	GW		10/3/17	1110		✓	✓	✓	✓		✓	✓	✓			
EB-EP-03	Grab	GW		10/3/17	1030		✓	✓	✓	✓		✓	✓	✓			
MW-5A	Grab	GW		10/3/17	1015		✓	✓	✓	✓		✓	✓	✓			
Dup-EP-01	Grab	GW		10/3/17	800		✓	✓	✓	✓		✓	✓	✓			

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

pH ___ Temp ___
Flow ___ Other ___

Remarks:

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	10/4/17	1430	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✓ FedEx ☐ Courier ☐ ___
Temp: °C Bottles Received:
Date: Time:

Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
pH Checked: NCF:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcsolutions.com

Project Description: EP Fall 2017

City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:

Client Project #

Lab Project # TRCATX-EP

Collected by (print): Scott Uda/HMI Team

Site/Facility ID #: EP (Navajo - Artesia)

P.O. # 107027

Collected by (signature):
Immediately Packed on Ice N ____ Y ✔

Rush? (Lab MUST Be Notified)
____ Same Day 100%
____ Next Day 100%
____ Two Day 50%
____ Three Day 25%

Date Results Needed

Email? ___No ✔Yes
FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	# of Cntrs	VOC	DRO	GRO	Short List Metals (Total only)	Long List Metals (Total only)	Cations (from "total metals" bottles)	Anions - TDS	NO2/NO3	Cyanide		
MW-7A	Grab	GW		10/3/17	915		✓	✓	✓	✓		✓	✓	✓			
OCD-8A	Grab	GW		10/3/17	815		✓	✓	✓		✓	✓	✓	✓	✓		
Trip Blank-EP-02	Grab	GW		10/3/17	—		✓										
OCD-2A	Grab	GW		10/5/17	1640		✓	✓	✓	✓							
MW-11A	Grab	GW		10/3/17	1600							✓	✓	✓			
OCD-3	Grab	GW		10/3/17	1525		✓	✓	✓	✓							
OCD-4	Grab	GW		10/3/17	1450		✓	✓	✓	✓							
Trip Blank-EP-03	Grab	GW		10/3/17	—		✓										
OCD-1R	Grab	GW		10/3/17	1300		✓	✓	✓	✓		✓	✓	✓			
OCD-5	Grab	GW		10/3/17	1415		✓	✓	✓	✓		✓	✓	✓			

* Matrix: SS - Soil GW - Groundwater WW - Wastewater DW - Drinking Water OT - Other

Remarks:

Relinquished by: (Signature) Scott Uda — Date: 10/4/17 — Time: 14:30
Relinquished by: (Signature) — Date: — Time:
Relinquished by: (Signature) — Date: — Time:

Received by: (Signature)
Received by: (Signature)
Received for lab by: (Signature)

Sample Receipt Checklist
Temp: °C
Received on Ice: Y / N
Custody Seals Intact: Y / N / NA
Bottles Received: For Analysis: Y / N / NA
Sufficient Volume: Y / N / NA
Correct Containers Used: Y / N / NA
-Pace Analytical: Y / N / NA
Field Data Required: Y / N / NA
Lab Sample Temperature Info:
Thermometer ID:
Temp Blank Received: Y / N / NA
Samples Received via: ✔Fedex ☐Courier ☐ _____
Cooler Custody Seals Intact: Y / N / NA
Cooler Temperature:
Temperature Blank Received: Y / N / NA
Comments:

Chain of Custody Page 3 of 17

ESC LAB SCIENCES

Account: TRCATX
Project:
Pace Profile #:
Site: Chris McCord
PO #:
Shipped Via:
Pace Comments:
Client Comments:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcsolutions.com

Project Description: EP Fall 2017
City/State Collected: Artesia, NM

Phone: 512-684-3170
Fax:
Client Project #
Lab Project #: TRCATX - EP

Collected by (print): Scott Ude/HMI Team
Site/Facility ID #: EP (Navajo - Artesia)
P.O. #: 107027

Collected by (signature):
Immediately Packed on Ice: N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ... 200%
___ Next Day ... 100%
___ Two Day ... 50%
___ Three Day ... 25%

Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total only)	Long List Metals (Total only)	Cations (from "total metals" bottle)	Anions, TDS	NO3NO2	Cyanide
EB-EP-02	Grab	GW		10/3/17	1210		✓	✓	✓	✓		✓	✓	✓	
MW-124	Grab	GW		10/3/17	1150		✓	✓	✓	✓		✓	✓	✓	
MW-70	Grab	GW		10/3/17	1110		✓	✓	✓	✓					
MW-18A	Grab	GW		10/3/17	1025		✓	✓			✓	✓	✓	✓	✓
MW-87	Grab	GW		10/3/17	935		✓	✓	✓	✓					
MW-74	Grab	GW		10/4/17	1125		✓	✓	✓	✓		✓	✓	✓	
EB-EP-01	Grab	GW		10/4/17	1135		✓	✓	✓	✓		✓	✓	✓	
OCD-7AR	Grab	GW		10/4/17	1040		✓	✓	✓	✓		✓	✓	✓	
OCD-6	Grab	GW		10/4/17	955		✓	✓	✓	✓		✓	✓	✓	
MW-79	Grab	GW		10/4/17	855		✓	✓	✓	✓		✓	✓	✓	

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other:

Remarks:

Relinquished by: (Signature) Scott Ude — Date: 10/4/17 — Time: 1430 — Received by: (Signature)
Relinquished by: (Signature) — Date: — Time: — Received by: (Signature)
Relinquished by: (Signature) — Date: — Time: — Received for lab by: (Signature)

Analysis / Container / Preservative

Chain of Custody Page 14 of 17

ESC LAB SCIENCES

Lab MUST Be Notified
Account: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Shipped Via:

Sample # (lab only)

Temp: ___
Bottles Received:
Condition:
pH: ___ Flow: ___ Other: ___
Correct Bottles:
Sufficient Volume:
VOA Zero Headspace:
Preservation Correct/Checked:
RAD Screen <0.5 mR/hr:

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer
Email To: jspeer@trcsolutions.com

Project Description: EP Fall 2017
City/State Collected: Artesia, NM

Phone: 512-884-3170
Fax:
Client Project #
Lab Project #: TRCATX-EP

Collected by (print): Scott Ude/HMI Team
Site/Facility ID #: EP (Navajo - Artesia)
P.O. #: 107027

Collected by (signature):
Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No ✓Yes
FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total only)	Long List Metals (Total only)	Cations (from "total metals" bottle)	Anions, TDS	NO2/NO3	Cyanide		
EB-EP-04	Grab	GW		10/4/17	910		✓	✓	✓	✓		✓	✓	✓			
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															
	Grab	GW															

* Matrix: SS - Soil GW - Groundwater WW - Wastewater DW - Drinking Water OT - Other

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

ESC LAB SCIENCES

Lab Reference: 1941 Reagent Rd, Mt. Juliet, TN 37122 Phone: 615-758-5858 Phone: 800-767-5859 Fax: 615-758-5859

Lab MUST be notified of any pH, Temp, Flow, Other, Correct, Volatile Headspace, Chlorine, Residual Chlorine, Sufficient volume sent, Received on Ice, Custody Seals, Cooler Temperature, Correct bottles, Sufficient volume, Preservation Correct/Checked, VOA Zero Headspace

Lab #
Table #
Acctnum: TRCATX
Template:
Prelogin:
TSR: Chris McCord
Shipped Via:

Remarks Contaminant	Sample # (lab only)

Remarks:

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	10/4/17	1030	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ✓ Fedex ☐ Courier ☐

Condition: (lab use only)

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Spear
Email to: jspeer@trcsolutions.com

Project Description: NCL Fall 2017
City/State Collected: Artesia, NM

Phone: 512-884-3170
Fax:
Client Project #
Lab Project # TRCATX - NCL

Collected by (print): Scott Ude/HMI Team
Site/Facility ID #: NCL (Navajo - Artesia)
P.O. #: 107027

Collected by (signature):
Immediately Packed on Ice: N ____ Y ✔

Rush? (Lab MUST Be Notified)
____ Same Day 200%
____ Next Day 100%
____ Two Day 50%
____ Three Day 25%

Date Results Needed
Email? ___No ✔Yes
FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VOC	DRO	GRO	Short List Metals (Total & only)	Long List Metals (Total only)	Cations (from "total metals" bottles)	Anions TDS	NO2NO3	Cyanide				
MW-45	Grab	GW		10/3/17	1645		✓	✓			✓	✓	✓	✓	✓				
MW-54A	Grab	GW		10/3/17	850		✓	✓		✓		✓	✓	✓					
NCL-49	Grab	GW		10/3/17	935		✓	✓		✓		✓	✓	✓					
Dup-NCL-01	Grab	GW		10/3/17	940		✓	✓		✓		✓	✓	✓					
Trip Blank-NCL-01	Grab	GW		10/3/17	—		✓												
MW-108	Grab	GW		10/3/17	1430		✓	✓		✓		✓	✓	✓					
NCL-31	Grab	GW		10/3/17	1515		✓	✓		✓		✓	✓	✓					
NCL-32	Grab	GW		10/3/17	1605		✓	✓		✓		✓	✓	✓					
EB-NCL-01	Grab	GW		10/3/17	1620		✓	✓		✓		✓	✓	✓					
NCL-44	Grab	GW		10/3/17	1655		✓	✓		✓		✓	✓	✓					

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other_____

Remarks:

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Scott Ude	10/4/17	1430	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

ESC LAB SCIENCES
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

Lab #: TRCATX
Table #:
Acctnum: TRCATX
Template:
Prelogin:
PM: Chris McCord
PB:
Shipped Via:

Remarks / Sample Specific Notes | Sample # (lab only)

pH _____ Temp _____
Flow _____ Other _____

Sample Receipt Checklist
Samples returned via: ☐ UPS ✔ FedEx ☐ Courier ☐ _____
Tracking #
Custody Seals Intact? ___Y ___N ___NA
Cooler Temp (°C)
Received on Ice: ___Y ___N
Correct Containers Used: ___Y ___N
Sufficient Volume Sent: ___Y ___N

Company Name/Address:
TRC Solutions - Austin, TX
505 E. Huntland Dr, Ste 250
Austin, TX 78752

Billing Information:
Accounts Payable
21 Griffin Road North
Windsor, CT 06095

Report to: Julie Speer

Email To: jspeer@trcsolutions.com

Project Description: NCL Fall 2017

City/State Collected: Artesia, NM

Phone: 512-694-3170
Fax:

Client Project #

Lab Project # TRCATX - NCL

Collected by (print): Scott Ude/HMI Team

Site/Facility ID #: NCL (Navajo - Artesia)

P.O. #: 107027

Collected by (signature):
Immediately Packed on Ice N ___ Y ✔

Rush? (Lab MUST be Notified)
___ Same Day ____100%
___ Next Day ____50%
___ Two Day ____25%
___ Three Day ____15%

Date Results Needed

Email? ___No ✔Yes
FAX? ___No ___Yes

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	# of Cntrs	VOC	DRO	GRO	Short List Metals (Total & only)	Long List Metals (Total only)	Cations (from "total metals" bottle)	Anions, TDS	NO2/NO3	Cyanide				
NCL-34A	Grab	GW		10/4/17	930		✓	✓		✓		✓	✓	✓					
NCL-33	Grab	GW		10/4/17	1010		✓	✓		✓		✓	✓	✓					
MW-55	Grab	GW		10/4/17	1050		✓	✓	✓		✓	✓	✓	✓	✓				
	Grab	GW																	
	Grab	GW																	
	Grab	GW																	
	Grab	GW																	
	Grab	GW																	
	Grab	GW																	
	Grab	GW																	

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other: _____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Relinquished by: (Signature) Scott Ude — Date: 10/4/17 — Time: 1430
Received by: (Signature)

Relinquished by: (Signature) — Date: — Time:
Received by: (Signature)

Relinquished by: (Signature) — Date: — Time:
Received by (lab): (Signature)

Samples returned via: ☐ UPS ✔ Fedex ☐ Courier ☐
Temp: ___°C Bottles Received:
Date: — Time:

Hold #:
Condition: (lab use only)
COC Seal Present: Y N NA
COC Signed/Accurate:
Bottles Arrive Intact:

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

ESC LAB SCIENCES
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

A
Table #
Acctnum: TRCATX
Template:
Prelogin:
PM: Chris McCord
Cooler:
Shipped Via:

Remarks/Contaminant | Sample # (lab only)

Appendix B, Table B.1 - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Date	Dup	Analyte Group: TPH Analyte: GRO	Analyte Group: TPH Analyte: DRO	Analyte Group: TPH Analyte: DRO - EP
				Units: mg/L	Units: mg/L	Units: mg/L
				CGWSL: ---	CGWSL: 0.0398	CGWSL: 0.0473
				CGWSL Source:	CGWSL Source: NMED TPH	CGWSL Source: NMED TPH
Cross-Gradient	KWB-13	Apr-14			<0.0200	
	KWB-13	Apr-15			**0.0630** J	
	KWB-13	Apr-16			**0.0505** J	
	KWB-13	Apr-17			0.0370 J	
	MW-17	Apr-14			0.0380 J	
	NP-5	Apr-13			**<0.0530**	
	NP-5	Apr-15			0.0387 J	
	NP-5	Apr-17			<0.0247	
	RA-3156	Nov-13				
	RA-3156	Apr-14				
	RA-3156	Apr-16				
	RA-3156	Apr-17				
	MW-136	Oct-15		<0.0314	**0.0721** J	
	MW-136	Apr-16		<0.0314	**0.162**	
	MW-136	Oct-16		<0.0314	**0.118**	
	MW-136	Apr-17		<0.0314	**0.0731** J	
	MW-136	Oct-17		<0.0314	**0.0937** J	
Evaporation Ponds	MW-1R	Apr-14				<0.0200
	MW-1R	Apr-15				**0.124**
	MW-1R	Apr-16				**0.163**
	MW-1R	Apr-17				**0.0583** J
	MW-2A	Apr-15		<0.0310		**0.295**
	MW-2A	Oct-15		0.0363 J		**0.260**
	MW-2A	Apr-16		<0.0314		**0.212**
	MW-2A	Oct-16		0.0435 JB		**0.195**
	MW-2A	Apr-17		<0.0314		**0.164**
	MW-2A	Oct-17		0.0354 J		**0.265**
	MW-3	Apr-15		0.134		**8.50**
	MW-3	Apr-15	FD	0.151 J		**8.60**
	MW-3	Oct-15		3.59		**11.2**
	MW-3	Oct-15	FD	0.839		**10.2**
	MW-3	Apr-16		0.499		**10.2**
	MW-3	Apr-16	FD	0.490		**9.97**
	MW-3	Oct-16		0.611		**11.0**
	MW-3	Oct-16	FD	0.571		**10.5**
	MW-3	Apr-17		0.205		**8.09**
	MW-3	Apr-17	FD	0.263		**7.74**
	MW-3	Oct-17		0.602		**13.1**
	MW-3	Oct-17	FD	0.834		**4.17**
	MW-4A	Apr-15		0.130		**5.60**
	MW-4A	Oct-15		3.44		**9.81**
	MW-4A	Apr-16		0.402		**8.76**
	MW-4A	Oct-16		0.396		**5.84**
	MW-4A	Apr-17		0.607		**8.15**
	MW-4A	Oct-17		0.730		**7.49**
	MW-4B	Apr-13		0.102		**0.360**
	MW-4B	Apr-15		0.119		**1.31**
	MW-4B	Apr-17		0.318		**1.21**
	MW-5A	Apr-15		1.19		**4.30**
	MW-5A	Oct-15		1.72		**2.31**
	MW-5A	Apr-16		2.09		**8.92**
	MW-5A	Oct-16		1.17		**3.08**
	MW-5A	Apr-17		3.00		**7.60**
	MW-5A	Oct-17		2.75		**7.16**
	MW-5B	Apr-13		1.78		**7.10**
	MW-5B	Apr-15		1.14		**11.0**
	MW-5B	Apr-17		2.08		**11.2**
	MW-5C	Apr-13		0.0652		**0.220**
	MW-5C	Apr-15		<0.0310		**0.580**
	MW-5C	Apr-17		<0.0314		**0.500**
	MW-6A	Apr-14		0.238		**1.50**
	MW-6A	Apr-15		<0.0310		**4.50**
	MW-6A	Apr-16		<0.0314		**4.81**
	MW-6A	Apr-17		0.335		**14.2**
	MW-6B	Mar-13		<0.0500		**<0.0530**
	MW-6B	Mar-13	FD	<0.0500		**<0.0540**
	MW-6B	Apr-15		<0.0310		**0.386**
	MW-6B	Apr-17		<0.0314		**0.276**
	MW-7A	Apr-15		0.201		**1.20**
	MW-7A	Apr-15	FD	0.190 J		**1.20**
	MW-7A	Oct-15		0.347		**1.06**
	MW-7A	Oct-15	FD	0.417		**1.13**
	MW-7A	Apr-16		0.251		**1.22**
	MW-7A	Apr-16	FD	0.269		**1.32**
	MW-7A	Oct-16		0.235		**1.21**
	MW-7A	Oct-16	FD	0.212		**1.25**
	MW-7A	Apr-17		0.501		**1.12**
	MW-7A	Apr-17	FD	0.402		**1.24**
	MW-7A	Oct-17		0.473		**1.30**
	MW-7A	Oct-17	FD	0.523		**1.39**
	MW-7B	Apr-13		<0.0500		**<0.0530**
	MW-7B	Apr-15		<0.0310		**0.120**
	MW-7B	Apr-17		<0.0314		**0.0845** J
	MW-10	Apr-15		0.410 J		**2.60**
	MW-10	Oct-15		0.730		**1.79**
	MW-10	Apr-16		1.06		**3.19**
	MW-10	Oct-16		1.05		**2.65**
	MW-10	Apr-17		0.877		**2.75**
	MW-10	Oct-17		1.11		**2.51**
	MW-11A	Apr-15		<0.0310		**0.0558** J
	MW-11A	Oct-15				
	MW-11A	Apr-16		<0.0314		<0.0247
	MW-11A	Oct-16				
	MW-11A	Apr-17		<0.0314		<0.0247
	MW-11A	Oct-17				
	MW-11B	Mar-13		<0.0500		**<0.0520**
	MW-11B	Apr-15		<0.0310		<0.0250
	MW-11B	Apr-17		<0.0314		<0.0247
	MW-12	Apr-14				<0.0200
	MW-13	Apr-14				<0.0200
	MW-15	Apr-14		0.149		**0.570**
	MW-15	Apr-15		<0.160		**1.01**
	MW-15	Apr-16		0.203		**0.549**
	MW-15	Apr-17		0.0940 J		**0.251**
Evaporation Ponds	MW-18A	Apr-15				**0.0770** J
	MW-18A	Oct-15				**0.215**
	MW-18A	Apr-16				**0.460**
	MW-18A	Oct-16				**0.424**
	MW-18A	Apr-17				**0.516**
	MW-18A	Oct-17				**0.520**
	MW-18B	Apr-13		0.0995		**<0.0520**
	MW-18B	Apr-15		<0.0310		**0.280**
	MW-18B	Apr-17		0.0932 J		**0.287**
	MW-22A	Apr-15		2.57		**5.80**
	MW-22A	Apr-15	FD	3.80		**6.39**
	MW-22A	Oct-15		3.63		**4.56**
	MW-22A	Oct-15	FD	3.31		**4.46**
	MW-22A	Apr-16		3.53		**7.43**
	MW-22A	Apr-16	FD	4.02		**7.66**
	MW-22A	Oct-16		3.48		**5.73**
	MW-22A	Oct-16	FD	3.25		**6.18**
	MW-22A	Apr-17		3.63		**6.65**
	MW-22A	Apr-17	FD	4.22		**6.63**
	MW-22A	Oct-17		4.51		**6.03**
	MW-22A	Oct-17	FD	4.42		**6.50**
	MW-22B	Apr-13		1.99		**3.00**
	MW-22B	Apr-15		2.34		**5.60**
	MW-22B	Apr-17		1.76		**5.25**
	MW-70	Apr-15		1.27 J		**0.790**
	MW-70	Oct-15		1.37		**0.599**
	MW-70	Apr-16		1.46		**0.896**
	MW-70	Oct-16		1.32		**0.772**
	MW-70	Apr-17		2.35		**0.899**
	MW-70	Oct-17		1.78		**0.865**
	MW-72	Apr-14		0.0920		**0.760**
	MW-72	Apr-15		<0.0310		**1.30**
	MW-72	Apr-16		<0.0314		**0.950**
	MW-72	Apr-17		0.118		**1.03**
	MW-73	Apr-14		0.985		**4.80**
	MW-73	Apr-15		0.378		**4.00**
	MW-73	Apr-16		0.925		**5.17**
	MW-73	Apr-17		0.367		**3.68**
	MW-74	Apr-15		0.0910 J		**38.0**
	MW-74	Oct-15		3.23		**18.9**
	MW-74	Apr-16		1.20		**18.4**
	MW-74	Oct-16		0.135		**64.3**
	MW-74	Apr-17		1.01		**31.5**
	MW-74	Oct-17		1.18		**36.5**
	MW-75	Apr-15		2.31		**22.0**
	MW-75	Oct-15		10.9		**19.6**
	MW-75	Apr-16		1.39		**18.2**
	MW-75	Oct-16		2.46		**16.6**
	MW-75	Apr-17		1.46		**16.7**
	MW-75	Oct-17		2.52		**20.6**
	MW-76	Apr-15		0.356 J		**21.0**
	MW-76	Oct-15		0.773		**25.2**
	MW-76	Apr-16		0.759		**24.1**
	MW-76	Oct-16		2.19		**43.7**
	MW-76	Apr-17		1.02		**31.1**
	MW-76	Oct-17		1.92		**45.5**
	MW-77	Apr-15		0.893		**140**
	MW-77	Oct-15		2.68		**173**
	MW-77	Apr-16		0.968		**101**
	MW-77	Oct-16		1.53 J		**86.1**
	MW-77	Apr-17		1.11		**57.5**
	MW-78	Apr-14		0.333 J		**29.0**
	MW-78	Apr-15		0.279		**67.0**
	MW-78	Apr-16		0.269		**63.2**
	MW-78	Apr-17		<0.314		**59.1**
	MW-79	Apr-15		<0.0310		**0.560**
	MW-79	Oct-15		0.0383 J		**0.575**
	MW-79	Apr-16		<0.0314		**0.516**
	MW-79	Oct-16		0.0513 J		**0.413**
	MW-79	Apr-17		<0.0314		**0.498**
	MW-79	Oct-17		0.0568 J		**0.454**
	MW-80	Apr-14		0.0489 J		**0.200**
	MW-80	Apr-15		<0.0310		**0.750**
	MW-80	Apr-16		<0.0314		**0.317**
	MW-80	Apr-17		<0.0314		**0.680**
	MW-81	Apr-14		0.0318 J		**3.60**
	MW-81	Apr-15		<0.0310		**8.00**
	MW-81	Apr-16		0.0339 J		**8.64**
	MW-81	Apr-17		<0.0314		**4.84**
	MW-82	Apr-14		0.611		**4.20**
	MW-82	Apr-14	FD	0.649		**4.20**
	MW-82	Apr-15		0.361		**14.0**
	MW-82	Apr-16		0.334		**8.41**
	MW-82	Apr-17		0.660		**6.40**
	MW-83	Apr-15		0.278		**31.0**
	MW-83	Oct-15		6.26		**40.3**
	MW-83	Apr-16		0.310		**26.0**
	MW-83	Oct-16		0.234		**28.9**
	MW-83	Apr-17		0.305		**29.8**
	MW-83	Oct-17		0.805		**36.2**
	MW-84	Apr-15		0.613		**62.0**
	MW-84	Oct-15		1.96		**82.1**
	MW-84	Apr-16		0.519		**83.8**
	MW-84	Oct-16		1.58 J		**95.3**
	MW-84	Apr-17		<0.314		**4.92**
	MW-84	Oct-17		1.16		**67.0**
	MW-87	Apr-15		<0.0310		**0.390**
	MW-87	Oct-15		0.0451 J		**0.251**
	MW-87	Apr-16		0.0421 J		**0.449**
	MW-87	Oct-16		<0.0314		**0.405**
	MW-87	Apr-17		<0.0314		**0.356**
	MW-87	Oct-17		0.0463 J		**0.399**

Appendix B, Table B.1 - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	TPH		
				Analyte:	GRO	DRO	DRO - EP
				Units:	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473
				CGWSL Source:		NMED TPH	NMED TPH
Area	Well ID	Date	Dup				
Evaporation Ponds	MW-88	Apr-15		<0.0310		**0.610**	
	MW-88	Oct-15		<0.0314		**0.455**	
	MW-88	Apr-16		<0.0314		**0.636**	
	MW-88	Oct-16		0.0848 J		**0.635**	
	MW-88	Apr-17		<0.0314		**0.516**	
	MW-88	Oct-17		0.0514 J		**0.627**	
	MW-120	Apr-15		<0.0310		**3.09**	
	MW-120	Oct-15		0.181		**1.30**	
	MW-120	Apr-16		0.0845 J		**1.82**	
	MW-120	Oct-16		<0.0314		**0.920**	
	MW-120	Apr-17		0.0584 J		**0.813**	
	MW-120	Oct-17		0.150		**0.737**	
	MW-121	Apr-15		<0.0310		**0.565**	
	MW-121	Oct-15		<0.0314		**0.460**	
	MW-121	Apr-16		<0.0314		**0.456**	
	MW-121	Oct-16		0.0514 JB		**0.593**	
	MW-121	Apr-17		<0.0314		**0.428**	
	MW-121	Oct-17		<0.0314		**0.567**	
	MW-122	Apr-15		<0.0310		**4.79**	
	MW-122	Oct-15		0.0340 J		**6.06**	
	MW-122	Apr-16		<0.0314		**0.824**	
	MW-122	Oct-16		0.0443 JB		**0.412**	
	MW-122	Apr-17		<0.0314		**0.850**	
	MW-122	Oct-17		0.0385 J		**0.429**	
	MW-123	Apr-15		1.90		**3.60**	
	MW-123	Oct-15		1.24		**2.13**	
	MW-123	Apr-16		1.83		**3.82**	
	MW-123	Oct-16		1.50		**3.53**	
	MW-123	Apr-17		1.96		**3.36**	
	MW-123	Oct-17		1.96		**3.08**	
	MW-124	Apr-15		<0.0310 J		**0.0550** J	
	MW-124	Oct-15		<0.0314		0.0298 J	
	MW-124	Apr-16		<0.0314		<0.0247	
	MW-124	Oct-16		<0.0314		<0.0247	
	MW-124	Apr-17		<0.0314		0.0365 J	
	MW-124	Oct-17		<0.0314		**0.0643** J	
	OCD-1R	Apr-15		<0.0310		**0.242**	
	OCD-1R	Oct-15		<0.0314		**0.266**	
	OCD-1R	Apr-16		<0.0314		**0.241**	
	OCD-1R	Oct-16		0.0450 J		**0.267**	
	OCD-1R	Apr-17		<0.0314		**0.255**	
	OCD-1R	Oct-17		0.0377 J		**0.268**	
	OCD-2A	Apr-15		<0.0310		**0.104**	
	OCD-2A	Oct-15		<0.0314		0.0455 J	
	OCD-2A	Apr-16		<0.0314		**0.0682** J	
	OCD-2A	Oct-16		0.0333 J		**0.0722** J	
	OCD-2A	Apr-17		<0.0314		**0.0497** J	
	OCD-2A	Oct-17		<0.0314		**0.123**	
	OCD-3	Apr-15		<0.0310		**0.0484** J	
	OCD-3	Oct-15		<0.0314		0.0251 J	
	OCD-3	Apr-16		<0.0314		<0.0247	
	OCD-3	Oct-16		<0.0314		<0.0247	
	OCD-3	Apr-17		<0.0314		<0.0247	
	OCD-3	Oct-17		<0.0314		**0.173**	
	OCD-4	Apr-15		<0.0310		0.0464 J	
	OCD-4	Oct-15		<0.0314		<0.0247	
	OCD-4	Apr-16		<0.0314		<0.0247	
	OCD-4	Oct-16		<0.0314		<0.0247	
	OCD-4	Apr-17		<0.0314		<0.0247	
	OCD-4	Oct-17		<0.0314		**0.0981** J	
	OCD-5	Apr-15		<0.0310		**0.218**	
	OCD-5	Oct-15		0.0402 J		**0.0951** J	
	OCD-5	Apr-16		<0.0314		**0.0576** J	
	OCD-5	Oct-16		0.0391 J		0.0423 J	
	OCD-5	Apr-17		0.0353 J		**0.102**	
	OCD-5	Oct-17		0.255		**0.331**	
	OCD-6	Apr-15		0.0819 J		**1.00**	
	OCD-6	Oct-15		1.88		**1.09**	
	OCD-6	Apr-16		0.0939		**1.11**	
	OCD-6	Oct-16		0.242		**1.11**	
	OCD-6	Apr-17		0.199		**0.858**	
	OCD-6	Oct-17		0.294		**1.04**	
	OCD-7AR	Apr-15		0.715		**4.29**	
	OCD-7AR	Oct-15		1.20		**4.12**	
	OCD-7AR	Apr-16		0.443		**5.24**	
	OCD-7AR	Oct-16		1.08		**5.28**	
	OCD-7AR	Apr-17		0.710		**4.43**	
	OCD-7AR	Oct-17		1.29		**4.52**	
	OCD-7B	Mar-13		<0.0500		**<0.0520**	
	OCD-7B	Apr-15		<0.0310		**0.120**	
	OCD-7B	Apr-17		<0.0314		**0.0746** J	
	OCD-8A	Apr-15		0.491		**2.60**	
	OCD-8A	Oct-15		0.648		**2.74**	
	OCD-8A	Apr-16		0.726		**3.26**	
	OCD-8A	Oct-16		0.714		**3.23**	
	OCD-8A	Apr-17		1.23		**3.46**	
	OCD-8A	Oct-17		1.34		**3.49**	
	OCD-8B	Apr-13		0.298		**0.890**	
	OCD-8B	Apr-15		<0.0310		**0.840**	
	OCD-8B	Apr-17		<0.0314		**0.585**	
Field East of Refinery	KWB-1A	Apr-15			**0.0932** J		
	KWB-1A	Oct-15			**0.114**		
	KWB-1A	Apr-16			**0.127**		
	KWB-1A	Oct-16			**0.166**		
	KWB-1A	Apr-17			**0.102**		
	KWB-1A	Oct-17			**0.158**		
	KWB-1C	Apr-13			**<0.0440**		
	KWB-1C	Apr-15			**0.113**		
	KWB-1C	Apr-17			**0.140**		
	KWB-7	Apr-15			**1.43**		
	KWB-7	Oct-15			**0.721**		
	KWB-7	Apr-16			**1.22**		
	KWB-7	Oct-16			**1.06**		
	KWB-7	Apr-17			**1.40**		
	KWB-7	Oct-17			**1.69**		

				Analyte Group:	TPH		
				Analyte:	GRO	DRO	DRO - EP
				Units:	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473
				CGWSL Source:		NMED TPH	NMED TPH
Area	Well ID	Date	Dup				
Field East of Refinery	KWB-8	Oct-16				**3.02**	
	KWB-8	Apr-17				**3.41**	
	KWB-8	Oct-17				**3.30**	
	KWB-10R	Apr-15				**9.16**	
	KWB-10R	Oct-15				**4.65**	
	KWB-10R	Apr-16				**5.24**	
	KWB-10R	Oct-16				**7.50**	
	KWB-10R	Apr-17				**4.01**	
	KWB-10R	Oct-17				**5.18**	
	KWB-11A	Apr-15		0.339		**1.87**	
	KWB-11A	Oct-15		0.217		**0.646**	
	KWB-11A	Apr-16		0.267		**3.74**	
	KWB-11A	Oct-16		0.223 B		**1.36**	
	KWB-11A	Apr-17		0.155		**0.511**	
	KWB-11A	Oct-17		0.371		**12.2**	
	KWB-11B	Apr-15		<0.0310		0.0365 J	
	KWB-11B	Oct-15		<0.0314		<0.0247	
	KWB-11B	Apr-16		<0.0314		<0.0247	
	KWB-11B	Oct-16		0.0565 JB		0.0388 J	
	KWB-11B	Apr-17		<0.0314		0.0339 J	
	KWB-11B	Oct-17		<0.0314		**0.203**	
	KWB-12A	Apr-15		<0.0310		0.0310 J	
	KWB-12A	Apr-15	FD	<0.0310		**0.305**	
	KWB-12A	Oct-15		<0.0314		<0.0247	
	KWB-12A	Apr-16		<0.0314		0.0377 J	
	KWB-12A	Oct-16		0.0348 JB		0.0329 J	
	KWB-12A	Apr-17		<0.0314		0.0359 J	
	KWB-12A	Oct-17		0.0318 J		**0.0474** J	
	KWB-12B	Apr-15		<0.0310		**0.0740** J	
	KWB-12B	Oct-15		<0.0314		<0.0247	
	KWB-12B	Oct-15	FD	<0.0314		0.0372 J	
	KWB-12B	Apr-16		<0.0314		<0.0247	
	KWB-12B	Apr-16	FD	<0.0314		<0.0247	
	KWB-12B	Oct-16		0.0581 JB		0.0351 J	
	KWB-12B	Oct-16	FD	0.0416 JB		**0.0806** J	
	KWB-12B	Apr-17		<0.0314		<0.0247	
	KWB-12B	Apr-17	FD	<0.0314		<0.0247	
	KWB-12B	Oct-17		<0.0314		**0.0424** J	
	KWB-12B	Oct-17	FD	<0.0314		**0.0765** J	
	KWB-P4	Apr-13				**<0.0520**	
	KWB-P4	Apr-15				**0.0820** J	
	KWB-P4	Apr-17				**0.0526** J	
	MW-57	Apr-15		<0.0310		**0.200**	
	MW-57	Oct-15		<0.0314		**0.242**	
	MW-57	Apr-16		<0.0314		**0.198**	
	MW-57	Oct-16		0.0467 JB		**0.103**	
	MW-57	Apr-17		<0.0314		**0.195**	
	MW-57	Oct-17		<0.0314		**0.0940** J	
	MW-58	Apr-15				**9.00**	
	MW-58	Oct-15				**5.11**	
	MW-58	Apr-16				**6.27**	
	MW-58	Oct-16				**7.78**	
	MW-58	Apr-17				**7.23**	
	MW-58	Oct-17				**9.77**	
	MW-111	Apr-15		1.37		**1.90**	
	MW-111	Oct-15		0.674		**2.10**	
	MW-111	Apr-16		1.31		**2.04**	
	MW-111	Oct-16		1.13		**2.04**	
	MW-111	Apr-17		1.27		**2.08**	
	MW-111	Oct-17		1.28		**2.39**	
	MW-113	Apr-15		<0.0310		**0.330**	
	MW-113	Apr-15	FD	<0.0310		**0.241**	
	MW-113	Oct-15		<0.0314		**0.115**	
	MW-113	Oct-15	FD	<0.0314		**0.0917** J	
	MW-113	Apr-16		0.581		**0.156**	
	MW-113	Apr-16	FD	0.627		**0.180**	
	MW-113	Oct-16		0.215 B		**0.236**	
	MW-113	Oct-16	FD	0.218 B		**0.188**	
	MW-113	Apr-17		0.984		**0.169**	
	MW-113	Apr-17	FD	1.03		**0.214**	
	MW-113	Oct-17		0.444		**0.335**	
	MW-113	Oct-17	FD	0.368		**0.355**	
	MW-125	Apr-15		<0.0310 J		<0.0250 B	
	MW-125	Oct-15		<0.0314		**0.0523** J	
	MW-125	Apr-16		<0.0314		**0.0578** J	
	MW-125	Oct-16		<0.0314		**0.0756** J	
	MW-125	Apr-17		<0.0314		**0.0964** J	
	MW-125	Oct-17		<0.0314		**0.0631** J	
	MW-126A	Apr-15		<0.0310		**0.757**	
	MW-126A	Oct-15		0.640		**0.569**	
	MW-126A	Apr-16		0.202		**0.751**	
	MW-126A	Oct-16		0.702		**0.924**	
	MW-126A	Apr-17		0.209		**0.665**	
	MW-126A	Oct-17		0.223		**0.793**	
	MW-126B	Apr-15		<0.0310		**0.392**	
	MW-126B	Oct-15		<0.0314		**0.140**	
	MW-126B	Apr-16		<0.0314		**0.361**	
	MW-126B	Oct-16		0.0546 JB		**0.346**	
	MW-126B	Apr-17		<0.0314		**0.245**	
	MW-126B	Oct-17		<0.0314		**0.329**	
	MW-127	Apr-15		9.73		**1.68**	
	MW-127	Oct-15		6.54		**0.585**	
	MW-127	Apr-16		6.40		**1.43**	
	MW-127	Oct-16		3.81 B		**1.22**	
	MW-127	Apr-17		4.45		**1.38**	
	MW-127	Oct-17		1.68		**1.41**	
	MW-128	Apr-15		1.23 J		**3.00**	
	MW-128	Oct-15		0.644		**1.78**	
	MW-128	Apr-16		0.620		**2.45**	
	MW-128	Oct-16		0.907		**2.75**	
	MW-128	Apr-17		1.09		**2.42**	
	MW-128	Oct-17		1.14		**2.37**	

Appendix B, Table B.1 - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	TPH		
				Analyte:	GRO	DRO	DRO - EP
				Units:	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473
				CGWSL Source:		NMED TPH	NMED TPH
Area	Well ID	Date	Dup				
Field East of Refinery	MW-129	Apr-15		3.29	**2.45**	
	MW-129	Oct-15		4.11 J	**1.31**	
	MW-129	Apr-16		2.70	**1.68**	
	MW-129	Oct-16		2.17	**1.68**	
	MW-129	Apr-17		1.79	**2.13**	
	MW-130	Apr-15		<0.0310 J	**0.960**	
	MW-130	Oct-15		<0.0314	**0.508**	
	MW-130	Apr-16		<0.0314	**1.08**	
	MW-130	Oct-16		0.200	**1.09**	
	MW-130	Apr-17		<0.0314	**1.08**	
	MW-130	Oct-17		<0.0314	**1.22**	
	MW-131	Apr-15		7.68	**2.80**	
	MW-131	Oct-15		6.76	**4.00**	
	MW-131	Apr-16		9.16	**2.12**	
	MW-131	Oct-16		6.31	**1.86**	
	MW-131	Apr-17		6.81	**1.77**	
	MW-131	Oct-17		4.95	**1.58**	
	MW-133	Nov-14		9.40	**2.80**	
	MW-133	Apr-15		11.3	**3.10**	
	MW-134	Apr-15		<0.0310	**0.100**	
	MW-134	Apr-15	FD	<0.0310	**0.0886** J	
	MW-134	Oct-15		<0.0314	**0.0503** J	
	MW-134	Oct-15	FD	<0.0314	**0.0457** J	
	MW-134	Apr-16		0.0420 J	**0.0971** J	
	MW-134	Apr-16	FD	<0.0314	**0.0774** J	
	MW-134	Oct-16		<0.0314	**0.184**	
	MW-134	Oct-16	FD	<0.0314	**0.135**	
	MW-134	Apr-17		<0.0314	**0.0894** J	
	MW-134	Apr-17	FD	<0.0314	**0.0738** J	
	MW-134	Oct-17		<0.0314	**0.109**	
	MW-134	Oct-17	FD	<0.0314	**0.250**	
	MW-135	Apr-15		<0.0310	**0.0823** J	
	MW-135	Oct-15		<0.0314	**0.0571** J	
	MW-135	Apr-16		<0.0314	**0.162**	
	MW-135	Oct-16		0.0638 JB	**0.147**	
	MW-135	Apr-17		<0.0314	**0.0767** J	
	MW-135	Oct-17		<0.0314	**0.102**	
	RA-4196	Apr-15				
	RA-4196	Oct-15				
	RA-4196	Apr-16				
	RA-4196	Oct-16				
	RA-4196	Apr-17				
	RA-4196	Oct-17				
	RA-4798	Apr-15				
	RA-4798	Oct-15				
	RA-4798	Apr-16				
	RA-4798	Oct-16				
	RA-4798	Apr-17				
	RA-4798	Oct-17				
	RW-12R	Apr-16			**1.38**	
	RW-12R	Apr-17			**1.61**	
	RW-13R	Apr-16			**0.808**	
	RW-18	Apr-14				
	RW-18	Apr-15				
	RW-18	Apr-16				
	RW-18	Apr-17				
	RW-20	Apr-15			**2.10**	
	RW-22	Apr-15			**5.40**	
North Refinery	MW-23	Apr-15		31.1	**6.79**	
	MW-23	Oct-15		34.0	**41.8**	
	MW-23	Apr-16		34.7	**28.7**	
	MW-23	Oct-16		37.1	**21.2**	
	MW-23	Apr-17		29.1	**2.78**	
	MW-23	Oct-17		17.6	**32.0**	
	MW-29	Apr-15		<0.0310	**1.20**	
	MW-29	Oct-15		0.0738 J	**0.658**	
	MW-29	Apr-16		<0.0314	**1.27**	
	MW-29	Oct-16		<0.0314	**1.04**	
	MW-29	Apr-17		<0.0314	**0.857**	
	MW-29	Oct-17		<0.0314	**4.44**	
	MW-39	Apr-15		0.147	**5.20**	
	MW-39	Oct-15		0.0759 J	**3.83**	
	MW-39	Apr-16		5.16	**12.5**	
	MW-39	Oct-16		7.24	**9.26**	
	MW-39	Apr-17		5.20	**9.81**	
	MW-39	Oct-17		2.66	**9.16**	
	MW-40	Apr-14		1.01	**0.880**	
	MW-40	Apr-15		0.735	**4.50**	
	MW-40	Apr-16		1.03	**4.92**	
	MW-40	Apr-17		1.29	**4.15**	
	MW-41	Apr-14		0.233	**0.300**	
	MW-41	Apr-15		0.103	**1.60**	
	MW-41	Apr-16		0.171	**2.26**	
	MW-41	Apr-17		0.249	**1.58**	
	MW-42	Apr-14		2.90	**1.40**	
	MW-42	Apr-15		1.37	**7.00**	
	MW-42	Apr-16		0.737	**5.88**	
	MW-42	Apr-17		0.262	**3.41**	
	MW-43	Apr-15		2.65	**8.04**	
	MW-43	Oct-15		30.5	**9.95**	
	MW-43	Apr-16		31.6	**6.24**	
	MW-43	Oct-16		38.0	**6.51**	
	MW-43	Apr-17		29.6	**6.53**	
	MW-43	Oct-17		28.0	**6.03**	
	MW-59	Apr-14		0.247	**0.0680**	
	MW-59	Apr-15		<0.0310	**0.860**	
	MW-59	Apr-16		<0.0314	**0.919**	
	MW-59	Apr-17		0.163	**0.835**	
	MW-60	Apr-15		0.238	**1.10**	
	MW-60	Apr-15	FD	0.228	**1.00**	
	MW-60	Oct-15		0.241	**0.803**	
	MW-60	Oct-15	FD	0.249	**0.627**	
	MW-60	Apr-16		0.575	**1.21**	
	MW-60	Apr-16	FD	0.396	**1.19**	

				Analyte Group:	TPH		
				Analyte:	GRO	DRO	DRO - EP
				Units:	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473
				CGWSL Source:		NMED TPH	NMED TPH
Area	Well ID	Date	Dup				
North Refinery	MW-60	Oct-16		0.331	**0.628**	
	MW-60	Oct-16	FD	0.251	**0.573**	
	MW-60	Apr-17		0.309	**0.923**	
	MW-60	Apr-17	FD	0.343	**0.947**	
	MW-60	Oct-17		0.479	**1.07**	
	MW-60	Oct-17	FD	0.469	**1.54**	
	MW-61	Apr-15		6.77	**9.40**	
	MW-61	Oct-15		5.13	**3.32**	
	MW-61	Apr-16		2.60	**3.59**	
	MW-61	Oct-16		4.21	**3.55**	
	MW-61	Apr-17		6.48	**2.70**	
	MW-61	Oct-17		7.01	**4.21**	
	MW-62	Apr-15		21.1	**36.9**	
	MW-62	Oct-15		18.5	**7.62**	
	MW-62	Apr-16		7.81	**7.54**	
	MW-62	Oct-16		11.3	**4.72**	
	MW-62	Apr-17		8.61	**5.93**	
	MW-62	Oct-17		9.55	**8.69**	
	MW-67	Apr-15		0.784	**8.40**	
	MW-67	Oct-15		2.16	**5.18**	
	MW-67	Apr-16		1.29	**11.1**	
	MW-67	Oct-16		1.03	**9.36**	
	MW-67	Apr-17		1.77	**9.40**	
	MW-67	Oct-17		0.649	**8.48**	
	MW-90	Apr-15		0.242	**7.68**	
	MW-90	Oct-15		0.166	**0.992**	
	MW-90	Apr-16		0.119	**4.03**	
	MW-90	Oct-16		<0.0314	**1.11**	
	MW-90	Apr-17		0.217	**4.20**	
	MW-90	Oct-17		0.160	**4.63**	
	MW-91	Apr-15		14.7	**15.9**	
	MW-91	Oct-15		12.2	**20.3**	
	MW-91	Apr-16		22.1	**22.2**	
	MW-91	Oct-16		20.6	**16.3**	
	MW-91	Apr-17		17.0	**19.8**	
	MW-91	Oct-17		13.6	**17.9**	
	MW-92	Apr-16		5.50	**20.4**	
	MW-92	Oct-16		6.05	**22.8**	
	MW-93	Apr-15		3.67	**15.3**	
	MW-93	Oct-15		5.14	**16.5**	
	MW-93	Apr-16		1.06	**7.83**	
	MW-93	Oct-16		2.57	**8.66**	
	MW-93	Apr-17		3.73	**7.89**	
	MW-94	Oct-15		6.12	**25.6**	
	MW-94	Apr-16		7.91	**8.69**	
	MW-94	Oct-16		6.83	**9.76**	
	MW-94	Apr-17		10.2	**9.96**	
	MW-95	Apr-14		0.0926	**1.10**	
	MW-95	Apr-15		<0.0310	**7.58**	
	MW-95	Apr-16		0.129	**8.06**	
	MW-95	Apr-17		0.0826 J	**6.96**	
	MW-96	Apr-15		45.1	**12.0**	
	MW-96	Oct-15		24.3	**9.23**	
	MW-96	Apr-16		25.3	**10.8**	
	MW-96	Oct-16		20.0	**7.74**	
	MW-96	Apr-17		25.1	**9.02**	
	MW-96	Oct-17		13.9	**7.85**	
	MW-98	Apr-15		19.3	**7.06**	
	MW-98	Oct-15		18.6	**6.38**	
	MW-98	Apr-16		14.7	**6.88**	
	MW-98	Oct-16		20.0	**4.97**	
	MW-98	Apr-17		15.9	**5.94**	
	MW-98	Oct-17		20.1	**5.92**	
	MW-137	Oct-15		30.0	**20.1**	
	MW-137	Apr-16		33.8	**11.8**	
	MW-137	Oct-16		30.9	**9.65**	
	MW-137	Apr-17		14.1 J	**12.6**	
	MW-137	Oct-17		33.1	**11.3**	
	MW-138	Oct-15		5.08	**6.73**	
	MW-138	Apr-16		4.86	**15.5**	
	MW-138	Oct-16		2.28	**10.3**	
	MW-138	Apr-17		1.00	**14.6**	
	MW-138	Oct-17		2.20	**15.0**	
	RW-1	Apr-15		2.95 J	**12.0**	
	RW-1R	Apr-16		2.13	**8.54**	
	RW-1R	Apr-17		2.20	**21.5**	
	RW-2	Apr-15		18.3	**19.7**	
	RW-2R	Apr-16		20.8	**17.3**	
	RW-2R	Apr-17		17.2	**11.6**	
	RW-7	Apr-15		1.05	**9.70**	
	RW-7R	Apr-16		0.0588 J	**1.97**	
	RW-7R	Apr-17		<0.0314	**1.15**	
	RW-8	Apr-15			**7.30**	
	RW-8	Apr-17			**11.6**	
	RW-9	Apr-14		3.26	**0.480**	
	RW-9	Apr-15		2.55	**3.20**	
	RW-9	Apr-16		0.492 J	**3.44**	
	RW-9	Apr-17		2.36	**3.21**	
	RW-10	Apr-14		<0.0100	**0.150**	
	RW-10	Apr-15		<0.0310	**4.80**	
	RW-10	Apr-16		<0.157	**3.66**	
	RW-10	Apr-17		0.207	**2.90**	
	RW-16	Apr-14			**0.110**	
	RW-16	Apr-14	FD		**0.230**	
	RW-16	Apr-15			**1.90**	
	RW-16	Apr-16			**2.29**	
	RW-16	Apr-17			**1.08**	
	RW-17	Apr-14		<0.0100	**0.110**	
	RW-17	Apr-15		<0.0310	**1.20**	
	RW-17	Apr-16		<0.0314	**1.75**	
	RW-17	Apr-17		0.0622 J	**2.57**	

Appendix B, Table B.1 - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	TPH		
				Analyte:	GRO	DRO	DRO - EP
				Units:	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473
				CGWSL Source:		NMED TPH	NMED TPH
Area	**Well ID**	**Date**	**Dup**				
North RO Reject Field	MW-117	Apr-15		<0.0310	0.0323 J		
	MW-117	Oct-15		<0.0314	<0.0247		
	MW-117	Apr-16		<0.0314	<0.0247		
	MW-117	Oct-16		<0.0314	0.0265 J		
	MW-117	Apr-17		<0.0314	<0.0247		
	MW-117	Oct-17		<0.0314	**0.385**		
	MW-118	Apr-15		<0.0310	0.0307 J		
	MW-118	Oct-15		<0.0314	<0.0247		
	MW-118	Apr-16		<0.0314	0.0248 J		
	MW-118	Oct-16		<0.0314	<0.0247		
	MW-118	Apr-17		<0.0314	<0.0247		
	MW-118	Oct-17		<0.0314	**0.0524** J		
	MW-119	Apr-15		<0.0310	0.0353 J		
	MW-119	Oct-15		<0.0314	<0.0247		
	MW-119	Apr-16		<0.0314	<0.0247		
	MW-119	Oct-16		0.0557 JB	**0.0570** J		
	MW-119	Apr-17		<0.0314	**0.0622** J		
	MW-119	Oct-17		<0.0314	**0.0805** J		
NCL	MW-18	Apr-14			**0.280**		
	MW-18	Apr-15			**2.41**		
	MW-18	Apr-16			**2.02**		
	MW-18	Apr-17			**0.960**		
	MW-45	Apr-15			**1.10**		
	MW-45	Oct-15			**0.874**		
	MW-45	Apr-16			**1.11**		
	MW-45	Oct-16			**1.15**		
	MW-45	Apr-17			**0.857**		
	MW-45	Oct-17			**0.864**		
	MW-53	Apr-14			<0.0210		
	MW-53	Apr-15			**0.296**		
	MW-53	Apr-16			**0.316**		
	MW-53	Apr-17			**0.258**		
	MW-54A	Apr-15			**2.93**		
	MW-54A	Oct-15			**3.29**		
	MW-54A	Apr-16			**3.34**		
	MW-54A	Oct-16			**3.24**		
	MW-54A	Apr-17			**2.55**		
	MW-54A	Oct-17			**2.38**		
	MW-54B	Apr-13		<0.0500	**0.630**		
	MW-54B	Apr-15		<0.0310	**2.47**		
	MW-54B	Apr-17		<0.0314	**0.881**		
	MW-55	Apr-15		<0.0310	**0.227**		
	MW-55	Oct-15		<0.0314	**0.300**		
	MW-55	Apr-16		<0.0314	**0.691**		
	MW-55	Oct-16		<0.0314	**0.354**		
	MW-55	Apr-17		<0.0314	**1.08**		
	MW-55	Oct-17		0.0634 J	**0.697**		
	MW-56	Apr-15			**1.62**		
	MW-56	Oct-15			**0.680**		
	MW-56	Apr-16			**1.07**		
	MW-56	Oct-16			**1.18**		
	MW-56	Apr-17			**1.15**		
	MW-108	Apr-15			**9.03**		
	MW-108	Oct-15			**7.89**		
	MW-108	Apr-16			**9.20**		
	MW-108	Oct-16			**15.2**		
	MW-108	Apr-17			**6.80**		
	MW-108	Oct-17			**7.93**		
	NCL-31	Apr-15			**2.38**		
	NCL-31	Oct-15			**2.10**		
	NCL-31	Apr-16			**1.87**		
	NCL-31	Oct-16			**24.2**		
	NCL-31	Apr-17			**1.37**		
	NCL-31	Oct-17			**1.16**		
	NCL-32	Apr-15			**2.80**		
	NCL-32	Oct-15			**7.50**		
	NCL-32	Apr-16			**4.05**		
	NCL-32	Oct-16			**2.70**		
	NCL-32	Apr-17			**1.88**		
	NCL-32	Oct-17			**1.27**		
	NCL-33	Apr-15			**4.60**		
	NCL-33	Oct-15			**5.30**		
	NCL-33	Apr-16			**4.53**		
	NCL-33	Oct-16			**6.55**		
	NCL-33	Apr-17			**4.80**		
	NCL-33	Oct-17			**4.78**		
	NCL-34A	Apr-15			**10.0**		
	NCL-34A	Oct-15			**5.11**		
	NCL-34A	Apr-16			**19.2**		
	NCL-34A	Oct-16			**10.8**		
	NCL-34A	Apr-17			**11.4**		
	NCL-34A	Oct-17			**6.04**		
	NCL-44	Apr-15			**5.50**		
	NCL-44	Oct-15			**6.17**		
	NCL-44	Apr-16			**7.59**		
	NCL-44	Oct-16			**8.88**		
	NCL-44	Apr-17			**7.97**		
	NCL-44	Oct-17			**6.69**		
	NCL-49	Apr-15			**0.0967** J		
	NCL-49	Apr-15	FD		**0.0832** J		
	NCL-49	Oct-15			**0.0770** J		
	NCL-49	Oct-15	FD		**0.0960** J		
	NCL-49	Apr-16			**0.0890** J		
	NCL-49	Apr-16	FD		**0.0664** J		
	NCL-49	Oct-16			**0.0712** J		
	NCL-49	Oct-16	FD		**0.0626** J		
	NCL-49	Apr-17			**0.0515** J		
	NCL-49	Apr-17	FD		**0.0582** J		
	NCL-49	Oct-17			0.0373 J		
	NCL-49	Oct-17	FD		0.0355 J		

				Analyte Group:	TPH		
				Analyte:	GRO	DRO	DRO - EP
				Units:	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473
				CGWSL Source:		NMED TPH	NMED TPH
Area	**Well ID**	**Date**	**Dup**				
South Refinery	KWB-2R	Apr-15				**5.20**	
	KWB-2R	Oct-15				**3.95**	
	KWB-2R	Apr-16				**1.49**	
	KWB-2R	Oct-16				**1.84**	
	KWB-2R	Apr-17				**1.35**	
	KWB-2R	Oct-17				**4.84**	
	KWB-5	Apr-15				**2.30**	
	KWB-5	Oct-15				**1.39**	
	KWB-5	Apr-16				**2.36**	
	KWB-5	Oct-16				**1.89**	
	KWB-5	Apr-17				**1.98**	
	KWB-5	Oct-17				**1.55**	
	KWB-6	Apr-15				**4.50**	
	KWB-6	Oct-15				**1.41**	
	KWB-6	Apr-16				**3.75**	
	KWB-6	Oct-16				**1.78**	
	KWB-6	Apr-17				**2.04**	
	KWB-6	Oct-17				**2.16**	
	MW-28	Apr-15		7.85 J		**13.0**	
	MW-28	Oct-15		9.88		**16.2**	
	MW-28	Apr-16		4.83		**17.0**	
	MW-28	Oct-16		6.13		**22.2**	
	MW-28	Apr-17		9.38		**14.4**	
	MW-28	Oct-17		7.24		**7.51**	
	MW-48	Apr-15		3.65 J		**3.90**	
	MW-48	Oct-15		2.99		**2.97**	
	MW-48	Apr-16		23.3		**15.3**	
	MW-48	Oct-16		15.8		**7.81**	
	MW-48	Apr-17		31.5		**10.6**	
	MW-48	Oct-17		28.7		**18.5**	
	MW-50	Apr-15				**0.902**	
	MW-50	Oct-15				**0.642**	
	MW-50	Apr-16				**1.10**	
	MW-50	Oct-16				**1.02**	
	MW-50	Apr-17				**0.835**	
	MW-50	Oct-17				**1.12**	
	MW-52	Apr-15		<0.0310 J		**0.370**	
	MW-52	Oct-15		<0.0314		**0.158**	
	MW-52	Apr-16		<0.0314		**0.324**	
	MW-52	Oct-16		0.0386 J		**0.367**	
	MW-52	Apr-17		<0.0314		**0.271**	
	MW-52	Oct-17		<0.0314		**0.380**	
	MW-64	Apr-16		136		**12.3**	
	MW-64	Oct-16		90.7		**12.0**	
	MW-64	Apr-17		109		**9.88**	
	MW-64	Oct-17		88.3		**12.6**	
	MW-65	Apr-15		33.1		**12.4**	
	MW-65	Apr-16		19.6		**10.6**	
	MW-65	Oct-16		19.2		**7.99**	
	MW-65	Apr-17		18.5		**8.30**	
	MW-65	Oct-17		17.1		**7.44**	
	MW-66	Apr-15		8.18		**4.51**	
	MW-66	Oct-15		8.74		**1.40**	
	MW-66	Apr-16		6.09		**4.19**	
	MW-66	Oct-16		7.32		**4.24**	
	MW-66	Apr-17		6.04		**4.18**	
	MW-66	Oct-17		9.46		**3.58**	
	MW-99	Apr-15		6.76		**1.94**	
	MW-99	Oct-15		19.4		**1.87**	
	MW-99	Apr-16		18.1		**4.29**	
	MW-99	Oct-16		17.8 B		**2.26**	
	MW-99	Apr-17		14.4		**2.06**	
	MW-99	Oct-17		10.4		**2.23**	
	MW-101	Apr-15		0.180		**6.00**	
	MW-101	Oct-15		0.0803 J		**5.08**	
	MW-101	Apr-16		0.614		**5.84**	
	MW-101	Oct-16		0.208		**2.95**	
	MW-101	Apr-17		0.311		**3.72**	
	MW-101	Oct-17		0.377		**5.50**	
	MW-102	Apr-15		24.5		**9.96**	
	MW-102	Oct-15		31.4		**11.4**	
	MW-102	Apr-16		26.2		**9.69**	
	MW-102	Oct-16		31.5		**14.8**	
	MW-102	Apr-17		26.4		**11.9**	
	MW-102	Oct-17		335		**18.1**	
	MW-103	Apr-14		1.43 J		**5.9**	
	MW-103	Apr-15		4.15		**8.66**	
	MW-103	Apr-16		3.55		**7.35**	
	MW-103	Apr-17		3.46		**6.94**	
	MW-104	Apr-15		0.783		**0.813**	
	MW-104	Apr-15	FD	0.878		**0.790**	
	MW-104	Oct-15		1.05		**1.06**	
	MW-104	Oct-15	FD	1.18		**3.00**	
	MW-104	Apr-16		0.797		**2.23**	
	MW-104	Apr-16	FD	0.775		**2.19**	
	MW-104	Oct-16		1.35		**2.55**	
	MW-104	Oct-16	FD	1.26		**2.68**	
	MW-104	Apr-17		1.66		**5.36**	
	MW-104	Apr-17	FD	2.41		**4.91**	
	MW-104	Oct-17		1.52		**5.42**	
	MW-104	Oct-17	FD	1.36		**4.95**	
	MW-105	Apr-15		6.50		**3.74**	
	MW-105	Oct-15		4.37		**2.31**	
	MW-105	Apr-16		33.6		**21.2**	
	MW-105	Oct-16		43.7		**8.66**	
	MW-105	Apr-17		33.9		**13.8**	
	MW-105	Oct-17		24.0		**19.0**	
	MW-106	Apr-15		1.52		**3.40**	
	MW-106	Oct-15		23.8		**19.6**	
	MW-106	Apr-16		23.9		**19.5**	
	MW-106	Oct-16		27.1		**21.8**	
	MW-106	Apr-17		21.4		**17.9**	
	MW-106	Oct-17		21.9		**22.2**	

Appendix B, Table B.1 - Summary of Groundwater Analytical Data - Total Petroleum Hydrocarbons

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	TPH		
				Analyte:	GRO	DRO	DRO - EP
				Units:	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473
				CGWSL Source:		NMED TPH	NMED TPH
Area	**Well ID**	**Date**	**Dup**				
South Refinery	MW-107	Apr-15		9.85		**7.20**	
	MW-107	Oct-15		14.9	J	**4.72**	
	MW-107	Apr-16		4.89		**6.80**	
	MW-107	Oct-16		17.7		**7.24**	
	MW-107	Apr-17		6.67		**7.91**	
	MW-109	Apr-15		2.36		**8.10**	
	MW-109	Oct-15		1.46		**0.842**	
	MW-109	Apr-16		1.93		**5.92**	
	MW-109	Oct-16		2.12		**3.19**	
	MW-109	Apr-17		5.26		**5.78**	
	MW-109	Oct-17		4.62		**6.74**	
	MW-110	Apr-15		1.12		**2.20**	
	MW-110	Oct-15		1.48		<0.0247	
	MW-110	Apr-16		0.735		**1.55**	
	MW-110	Oct-16		0.503		**1.00**	
	MW-110	Apr-17		2.69		**2.53**	
	MW-110	Oct-17		0.379		**1.01**	
	RA-313	Apr-14					
	RA-313	Apr-15					
	RA-313	Apr-16					
	RA-313	Apr-17					
	RW-4	Apr-15				**3.72**	
	RW-4R	Apr-16				**5.03**	
	RW-4R	Apr-17				**2.35**	
	RW-5R	Apr-15				**6.42**	
	RW-5R	Apr-16				**7.39**	
	RW-6	Apr-15				**11.4**	
	RW-6R	Apr-16				**4.20**	
	RW-15C	Apr-17				**9.74**	
South RO Reject Field	MW-114	Apr-15		<0.0310	J	<0.0250	B
	MW-114	Oct-15		<0.0314		<0.0247	
	MW-114	Apr-16		<0.0314		0.0317	J
	MW-114	Oct-16		<0.0314		**0.0410**	J
	MW-114	Apr-17		<0.0314		<0.0247	
	MW-114	Oct-17		<0.0314		**0.0650**	J
	MW-115	Apr-15		<0.0310	J	<0.0250	B
	MW-115	Oct-15		0.0324	J	**0.103**	
	MW-115	Apr-16		<0.0314		**0.0616**	J
	MW-115	Oct-16		<0.0314		**0.0582**	J
	MW-115	Apr-17		<0.0314		**0.0657**	J
	MW-115	Oct-17		<0.0314		**0.109**	
	MW-116	Apr-15		<0.0310	J	<0.0250	B
	MW-116	Oct-15		<0.0314		**0.0607**	J
	MW-116	Apr-16		<0.0314		**0.112**	
	MW-116	Oct-16		<0.0314		**0.0868**	J
	MW-116	Apr-17		<0.0314		**0.0549**	J
	MW-116	Oct-17		<0.0314		<0.0247	
TEL	MW-49	Apr-15		0.654		**8.60**	
	MW-49	Oct-15		1.58		**7.66**	
	MW-49	Apr-16		1.75		**8.63**	
	MW-49	Oct-16		2.82		**9.26**	
	MW-49	Apr-17		2.65		**7.62**	
	MW-49	Oct-17		3.45		**8.36**	
	TEL-1	Apr-15		0.181		**9.80**	
	TEL-1	Oct-15		0.148		**7.46**	
	TEL-1	Apr-16		0.153		**8.51**	
	TEL-1	Oct-16		0.193		**3.58**	
	TEL-1	Apr-17		0.285		**9.45**	
	TEL-1	Oct-17		0.467		**12.7**	
	TEL-2	Apr-15		5.12		**20.0**	
	TEL-2	Oct-15		2.86		**18.7**	J
	TEL-2	Apr-16		3.12		**18.1**	
	TEL-2	Oct-16		3.08		**17.0**	
	TEL-2	Apr-17		3.02		**14.8**	
	TEL-2	Oct-17		2.51		**22.8**	
	TEL-3	Apr-15		0.666		**9.40**	
	TEL-3	Oct-15		0.633		**5.86**	
	TEL-3	Apr-16		1.05		**14.1**	
	TEL-3	Oct-16		0.589		**4.22**	
	TEL-3	Apr-17		0.716		**5.32**	
	TEL-4	Apr-15		2.09		**8.40**	
	TEL-4	Apr-15	FD	2.26		**8.50**	
	TEL-4	Oct-15		2.77		**4.98**	
	TEL-4	Oct-15	FD	2.70		**5.73**	
	TEL-4	Apr-16		2.36		**9.13**	
	TEL-4	Apr-16	FD	2.65		**8.65**	
	TEL-4	Oct-16		2.52		**6.36**	
	TEL-4	Oct-16	FD	2.72		**6.66**	
	TEL-4	Apr-17		1.25		**8.44**	
	TEL-4	Apr-17	FD	1.29		**8.00**	
	TEL-4	Oct-17		1.53		**10.0**	
	TEL-4	Oct-17	FD	1.77		**9.67**	
TMD	MW-8	Apr-14		<0.0100		<0.0210	
	MW-8	Apr-15		<0.0310		**0.380**	
	MW-8	Apr-16		<0.0314		**0.230**	
	MW-8	Apr-17		0.585		**0.238**	
	MW-16	Apr-14				**0.0580**	
	MW-16	Apr-15				**0.340**	
	MW-16	Apr-17				**0.275**	
	MW-20	Apr-14				<0.0200	
	MW-20	Apr-14	FD			<0.0200	
	MW-20	Apr-15				**0.150**	
	MW-20	Apr-16				**0.149**	
	MW-20	Apr-17				**0.280**	
	MW-21	Apr-15		<0.0310		**0.180**	
	MW-21	Oct-15		<0.0314		**0.194**	
	MW-21	Apr-16		<0.0314		**0.190**	
	MW-21	Oct-16		<0.0314		**0.132**	
	MW-21	Apr-17		0.0721	J	**0.169**	
	MW-21	Oct-17		0.0416	J	**0.106**	
	MW-25	Apr-14				<0.0200	
	MW-25	Apr-15				**0.690**	
	MW-25	Apr-16				**0.348**	
	MW-25	Apr-17				**0.107**	

				Analyte Group:	TPH		
				Analyte:	GRO	DRO	DRO - EP
				Units:	mg/L	mg/L	mg/L
				CGWSL:	---	0.0398	0.0473
				CGWSL Source:		NMED TPH	NMED TPH
Area	**Well ID**	**Date**	**Dup**				
TMD	MW-26	Apr-14				<0.0200	
	MW-26	Apr-15				**0.0530**	J
	MW-26	Apr-16				**0.103**	
	MW-26	Apr-17				**0.0773**	J
	MW-27	Apr-14				<0.0210	
	MW-27	Apr-15				**0.110**	
	MW-27	Apr-16				**0.134**	
	MW-27	Apr-17				**0.0992**	J
	MW-46R	Nov-14				**0.0420**	J
	MW-46R	Apr-15				**0.0540**	J
	MW-46R	Apr-16				**0.0622**	J
	MW-46R	Oct-16				**0.0459**	J
	MW-46R	Apr-17				**0.0889**	J
	MW-46R	Oct-17				0.0327	J
	MW-68	Apr-14				<0.0200	
	MW-68	Apr-15				**0.130**	
	MW-68	Apr-16				**0.162**	
	MW-68	Apr-17				**0.138**	
	MW-71	Apr-14				<0.0210	
	MW-71	Apr-15				**0.0930**	J
	MW-71	Apr-16				0.0252	J
	MW-71	Apr-17				**0.0947**	J
	MW-89	Apr-14				**0.210**	
	MW-89	Apr-15				**2.40**	
	MW-89	Apr-16				**3.38**	
	MW-89	Apr-17				**2.15**	
	NP-1	Apr-15					
	NP-1	Oct-15					
	NP-1	Apr-16					
	NP-1	Oct-16					
	NP-1	Apr-17					
	NP-1	Oct-17					
	NP-2	Apr-13		<0.0500		**<0.0520**	
	NP-6	Apr-13					
	NP-6	Apr-15					
	NP-6	Apr-17					
Up-Gradient	UG-1	Apr-14		<0.0100		<0.0210	
	UG-1	Apr-15		<0.0310		<0.0250	B
	UG-1	Apr-16		<0.0314		0.0302	J
	UG-1	Apr-17		<0.0314		**0.0484**	J
	UG-2	Apr-14		<0.0100		<0.0200	
	UG-2	Apr-15		<0.0310		<0.0250	B
	UG-2	Apr-16		<0.0314		**0.0692**	J
	UG-2	Apr-17		<0.0314		**0.0818**	J
	UG-3R	Apr-14		<0.0100		<0.0200	
	UG-3R	Apr-14	FD	<0.0100		<0.0200	
	UG-3R	Apr-15		<0.0310		<0.0250	B
	UG-3R	Apr-16		<0.0314		<0.0247	
	UG-3R	Apr-17		<0.0314		**0.0517**	J
	UG-4	Apr-16		<0.0314		0.0349	J
	UG-4	Apr-17		<0.0314		**0.0463**	J

Definitions

X	Reported concentration, X, exceeds the CGWSL.
X	Analyte detected above the detection limit at a concentration equal to X.
<x	Analyte not detected at detection limit equal to x.
<x	Analyte not detected at detection limit equal to x, but x exceeds the CGWSL.
---	No applicable CGWSL.
	Blank cell indicates a sample was collected from the well during the indicated sampling event, but the analyte was not analyzed.

Abbreviations

CGWSL	Critical Groundwater Screening Level (see Table 3)
CGWSL Source	Source for CGWSL value (see Table 3)
DRO	Diesel Range Organics
DRO-EP	Diesel Range Organics data from wells located in the Evaporation Ponds area
Dup	Duplicate sample
FD	Field duplicate sample
GRO	Gasoline Range Organics
mg/L	Milligrams per Liter
TPH	Total Petroleum Hydrocarbons
NMED TPH	NMED Risk Assessment Guidance for Site Investigations and Remediation, March 2017, Table 6-4 TPH Groundwater Screening Levels

Lab Footnote

B	Analyte was also detected in the associated method blank.
J	Indicates an estimated value.

Appendix B, Table B.2 - Summary of Groundwater Analytical Data - Total Metals

2017 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Total Metals													
				Analyte:	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC Irr	WQCC HH	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
Area	**Well ID**	**Date**	**Dup**															
Cross-Gradient	KWB-13	Apr-14		0.00259 J	0.0145				0.00121 J	<0.00500	<0.000700	<0.00250	<0.000040	<0.00100	0.0126		0.0172
	KWB-13	Apr-15		**0.0118**	0.122				0.0182	**12.3**	**0.0190**	**0.399**	<0.000049	0.0144	0.0110		0.0426
	KWB-13	Apr-16		0.00484 J	0.0459	0.384	<0.00500	0.00161 J	0.00621 J	**4.00**	0.00403 J	0.0747	<0.000049	<0.00175	0.0188	0.0261 J	0.0304
	KWB-13	Apr-17		0.00286	0.0229	0.294	<0.000160	0.000487 J	0.00148 J	**1.02**	0.00107 J	0.0234	<0.000049	0.00119 J	0.0130	0.0227	0.0213
	MW-17	Apr-14		<0.00200	0.0152				<0.00200	<0.100	0.00724 J	<0.00500			0.0104		
	NP-5	Apr-13		<0.0100	<0.0100				<0.0100	<0.400	<0.0100	<0.0100			0.0135		
	NP-5	Apr-15		0.00288	0.0159				0.00109 J	0.437	0.000415 J	0.00318 J			0.0125		
	NP-5	Apr-17		0.00305	0.00938				<0.000540	0.0632 J	<0.000240	0.000586 J			0.0124		
	RA-3156	Nov-13															
	RA-3156	Apr-14												<0.00500			
	RA-3156	Apr-16															
	RA-3156	Apr-17															
	MW-136	Oct-15		0.00381	0.103				0.00365	**1.18**	0.00218	**0.204**	<0.000049	0.00425	0.00463		0.0212
	MW-136	Apr-16		0.00280 J	0.0270	0.695	<0.00500	0.00132 J	<0.00270	0.599	<0.00120	0.0591	<0.000049	<0.00350	0.0112	**0.0702**	0.0197 J
	MW-136	Oct-16		0.00284	0.0134	0.512	<0.000160	0.000279 J	0.00118 JB	0.0892 JB	0.000940 JB	0.0112 B	<0.000049	0.00184 JB	0.00562	**0.0720**	0.0176
	MW-136	Apr-17		0.00237	0.0117	0.588	<0.000160	<0.000260	<0.000540	0.0262 J	<0.000240	0.00602	<0.000049	0.00102 J	0.00563	**0.0664**	0.0171
	MW-136	Oct-17		0.00239	0.0144	0.724	<0.000160	0.000362 J	0.000794 J	0.193	0.000313 J	0.0209	<0.000049	0.00157 J	0.00608	**0.0729**	0.0181
Evaporation Ponds	MW-1R	Apr-14		0.00335 J	0.0214				<0.00200	**2.39**	<0.00140	**1.38**			<0.00200		
	MW-1R	Apr-15		0.00366 J	0.0240 J				<0.00270	**3.49**	<0.00120	**2.14** J			<0.00190		
	MW-1R	Apr-16		0.00917 J	0.0301				0.0188	**9.67**	<0.00120	**2.94**			<0.00190		
	MW-1R	Apr-17		0.00221	0.0258				<0.000540	**4.50**	<0.000240	**2.38**			<0.000380		
	MW-2A	Apr-15		**0.0155** J	0.0255 J				<0.00540	0.571 J	<0.00240	**1.98**			<0.00380		
	MW-2A	Oct-15		0.00962	0.0241				<0.00108	0.588	<0.000480	**2.88**			0.00153 J		
	MW-2A	Apr-16		**0.0154**	0.0228 J				<0.00270	**3.37**	<0.00120	**2.50**			0.00432 J		
	MW-2A	Oct-16		0.00798	0.0208				0.00105 J	0.146	<0.000240	**1.43**			0.000560 J		
	MW-2A	Apr-17		0.00923	0.0188				0.000757 J	**3.02**	<0.000240	**1.43**			0.00105 J		
	MW-2A	Oct-17		0.00731	0.0164				<0.000540	0.578	<0.000240	**0.788**			0.00128 J		
	MW-3	Apr-15		**0.0288**	0.0186 J				<0.00270	<0.0750	<0.00120	**1.55**			**0.108**		
	MW-3	Apr-15	FD	**0.0346**	0.0215				0.00198 J	0.0806 J	0.000346 J	**1.85**			**0.112**		
	MW-3	Oct-15		**0.0248**	0.0157				<0.000540	0.366	0.000298 J	**1.29**			0.00892		
	MW-3	Oct-15	FD	**0.0281**	0.0158				0.00107 J	0.559	0.000371 J	**1.33**			0.00804		
	MW-3	Apr-16		**0.0388**	0.0175 J				<0.00270	0.677	<0.00120	**2.61**			0.00580 J		
	MW-3	Apr-16	FD	**0.0348**	0.0168 J				<0.00270	0.612	<0.00120	**2.62**			0.00575 J		
	MW-3	Oct-16		**0.0550**	0.0152				0.000868 J	**1.82**	0.000241 JB	**1.60**			0.00258		
	MW-3	Oct-16	FD	**0.0553**	0.0152				0.000869 J	**1.75**	0.000692 JB	**1.60**			0.00263		
	MW-3	Apr-17		**0.0213**	0.0140				<0.000540	0.532	0.000306 J	**0.945**			0.00303		
	MW-3	Apr-17	FD	**0.0228**	0.0148				0.000571 J	0.718	0.000272 J	**1.10**			0.00386		
	MW-3	Oct-17		**0.0520**	0.0153				0.000568 J	**2.00**	0.000425 J	**1.15**			0.00335		
	MW-3	Oct-17	FD	**0.0519**	0.0148				0.00107 J	**1.99**	0.000243 J	**1.20**			0.00399		
	MW-4A	Apr-15		**0.108** J	0.0139 J				0.00570 J	**3.15**	<0.00120	**2.96**			<0.00190		
	MW-4A	Oct-15		**0.112**	0.0140				0.00126 J	**2.09**	<0.000240	**1.75**			0.000588 J		
	MW-4A	Apr-16		**0.188**	0.0125 J				<0.00270	**3.21**	<0.00120	**2.39**			<0.00190		
	MW-4A	Oct-16		**0.172**	0.0121				0.000815 J	**1.08**	0.000566 JB	**1.69**			0.000608 J		
	MW-4A	Apr-17		**0.172**	0.0123				<0.000540	**2.34**	0.000274 J	**1.91**			0.000665 J		
	MW-4A	Oct-17		**0.100**	0.0143				<0.000540	**2.22**	<0.000240	**1.95**			0.000494 J		
	MW-4B	Apr-13		**0.0371**	<0.0250				<0.0250	<1.00	**<0.0250**	**1.30**			<0.0250		
	MW-4B	Apr-15		**0.101**	0.0349				<0.00110	**3.60**	0.00189 J	**8.68**			<0.000760		
	MW-4B	Apr-17		**0.0371**	0.0182				<0.000540	**3.42**	<0.000240	**7.35**			<0.000380		
	MW-5A	Apr-15		**0.0938**	0.0128 J				<0.00540	**5.62**	<0.00240	**1.84**			<0.00380		
	MW-5A	Oct-15		**0.0705**	0.0143				0.000685 J	**5.34**	<0.000240	**1.82**			0.000954 J		
	MW-5A	Apr-16		**0.213**	0.0149 J				<0.00270	**8.10**	<0.00120	**1.34**			<0.00190		
	MW-5A	Oct-16		**0.0638**	0.0117				<0.000540	**4.19**	0.000445 JB	**1.73**			0.000606 J		
	MW-5A	Apr-17		**0.149**	0.0135				<0.000540	**6.69**	<0.000240	**1.15**			0.000824 J		
	MW-5A	Oct-17		**0.216**	0.0153				<0.000540	**8.41**	<0.000240	**0.811**			0.00119 J		
	MW-5B	Apr-13		**0.122**	<0.0250				<0.0250	<1.00	**<0.0250**	**2.44**			<0.0250		
	MW-5B	Apr-15		**0.201**	0.0112 J				0.00277 J	**6.11**	<0.00120	**3.87**			0.00197 J		
	MW-5B	Apr-17		**0.154**	0.0115				<0.000540	**4.61**	<0.000240	**3.32**			0.00139 J		
	MW-5C	Apr-13		**0.0139**	0.0166				<0.0100	**1.04**	<0.0100	**0.943**			<0.0100		
	MW-5C	Apr-15		**0.0145**	0.0200 J				<0.00270	**1.15**	<0.00120	**0.975**			<0.00190		
	MW-5C	Apr-17		**0.0113**	0.0237				<0.000540	**1.09**	0.000287 J	**0.918**			<0.000380		
	MW-6A	Apr-14		**0.0113**	0.0287				0.00234 J	<0.100	<0.00140	**1.37**			0.0192		
	MW-6A	Apr-15		**0.0129**	0.0308				<0.00270	0.155 J	<0.00120	**1.40**			0.0308		
	MW-6A	Apr-16		0.00953 J	0.0158 J				<0.00270	0.0787 J	<0.00120	**0.505**			<0.00190		
	MW-6A	Apr-17		**0.0105**	0.0135				<0.000540	0.193	0.000366 J	**0.385**			0.000910 J		
	MW-6B	Mar-13		**0.0493**	0.0139				<0.00500	**1.54**	<0.00500	**2.39**			<0.00500		
	MW-6B	Mar-13	FD	**0.0537**	0.0163				<0.00500	**1.69**	<0.00500	**2.43**			<0.00500		
	MW-6B	Apr-15		**0.0333**	0.0164				<0.00110	**1.37**	<0.000480	**3.45**			<0.000760		
	MW-6B	Apr-17		**0.0115**	0.0134				<0.000540	0.149	<0.000240	**0.889**			<0.000380		
	MW-7A	Apr-15		**0.0190**	0.0149				0.000895 J	0.984	<0.000240	**1.11**			0.000620 J		
	MW-7A	Apr-15	FD	**0.0194**	0.0156				0.00131 J	0.996	0.000288 J	**1.06**			0.000570 J		
	MW-7A	Oct-15		**0.0255**	0.0155				0.00116 J	**2.86**	0.000494 J	**0.632**			0.000638 J		
	MW-7A	Oct-15	FD	**0.0253**	0.0159				0.00114 J	**2.86**	0.000524 J	**0.629**			0.000647 J		
	MW-7A	Apr-16		**0.0382**	0.0170 J				0.00370 J	**6.35**	<0.00120	**0.682**			<0.00190		
	MW-7A	Apr-16	FD	**0.0305**	0.0158 J				<0.00270	**4.43**	<0.00120	**0.588**			<0.00190		
	MW-7A	Oct-16		**0.0181**	0.0173				0.00184 J	**1.66**	0.000527 JB	**0.563**			0.000402 J		
	MW-7A	Oct-16	FD	**0.0186**	0.0159				0.00184 J	**1.66**	0.000618 JB	**0.563**			0.000507 J		
	MW-7A	Apr-17		**0.0182**	0.0148				0.000819 J	**3.20**	<0.000240	**0.530**			0.000425 J		
	MW-7A	Apr-17	FD	**0.0195**	0.0154				0.000720 J	**3.07**	<0.000240	**0.521** V			<0.000380		
	MW-7A	Oct-17		**0.0278**	0.0211				0.00136 J	**4.76**	0.000335 J	**0.509**			<0.000380		
	MW-7A	Oct-17	FD	**0.0286**	0.0168				0.00128 J	**4.82**	<0.000240	**0.522**			<0.000380		
	MW-7B	Apr-13		**<0.0250**	<0.0250				<0.0250	<1.00	**<0.0250**	**0.397**			<0.0250		
	MW-7B	Apr-15		0.00588	0.0111				0.000702 J	0.188	<0.000240	**0.580**			<0.000380		
	MW-7B	Apr-17		0.00397	0.0111				<0.000540	0.146	<0.000240	**0.472**			<0.000380		
	MW-10	Apr-15		**0.0200**	0.0128 J				<0.00270	<0.0750	<0.00120	**2.43**			<0.00190		
	MW-10	Oct-15		**0.0173**	0.0124				<0.000540	0.0570 J	<0.000240	**2.55**			<0.000380		
	MW-10	Apr-16		**0.0196**	0.0123 J				<0.00270	<0.0750	<0.00120	**2.83**			<0.00190		
	MW-10	Oct-16		**0.0191**	0.0184				<0.000540	0.589	0.000399 JB	**2.21**			<0.000380		
	MW-10	Apr-17		**0.0156**	0.0118				<0.000540	0.0992 J	0.000290 J	**2.24**			0.000483 J		
	MW-10	Oct-17		**0.0156**	0.0110				<0.000540	0.147	<0.000240	**2.74**			<0.000380		
	MW-11A	Apr-15		<0.00500	0.0410 J				<0.0100	<0.300	<0.00480	**0.912**			<0.00760		
	MW-11A	Oct-15															
	MW-11A	Apr-16		<0.00125	0.0301				0.00353 J	0.416 J	<0.00120	**0.876** V			<0.00190		
	MW-11A	Oct-16															
	MW-11A	Apr-17		0.00056 J	0.0306				0.00121 J	0.804	<0.000240	**0.758**			<0.000380		
	MW-11A	Oct-17															
	MW-11B	Mar-13		**<0.0250**	<0.0250				<0.0250	**3.25**	**<0.0250**	**0.316**			<0.0250		
	MW-11B	Apr-15		0.00453 J	0.0189 J				<0.00540	**4.38**	<0.00240	**0.427**			<0.00380		
	MW-11B	Apr-17		0.00420	0.0189				<0.000540	**4.59**	<0.000240	**0.374**			<0.000380		
	MW-12	Apr-14		<0.00500	0.0194				<0.00500	0.441 J	<0.00140	0.200			0.0172 J		
	MW-13	Apr-14		0.00205 J	0.0310				<0.00200	<0.100	<0.00140	0.192			<0.00200		
	MW-15	Apr-14		**0.0605**	0.0217				0.00381 J	<0.100	<0.00140	**0.363**			0.00535 J		
	MW-15	Apr-15		**0.0279**	0.0236 J				<0.00270	<0.0750	<0.00120	**0.861**			0.0195		
	MW-15	Apr-16		**0.0216**	0.0203 J				<0.00270	<0.0750	<0.00120	**0.887**			0.00201 J		
	MW-15	Apr-17		**0.0130**	0.0180				<0.000540	0.0239 B	<0.000240	0.173			0.000518 J		

Appendix B, Table B.2 - Summary of Groundwater Analytical Data - Total Metals

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Total Metals													
				Analyte:	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC Irr	WQCC HH	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
Evaporation Ponds	MW-18A	Apr-15			0.00410	0.0129				0.000794 J	0.379	<0.00480	0.0221	<0.000049	0.00225	**0.0503**		0.00652
	MW-18A	Oct-15			0.00485	0.0173				0.00184 J	0.572	0.000262 J	**0.363**	<0.000049	0.00330	0.00108 J		0.00360 J
	MW-18A	Apr-16			0.00644 J	0.0155 J	**3.14**	<0.00500	<0.00130	<0.00270	0.358 J	<0.00120	**0.366**	<0.000049	0.0121 J	<0.00190	**0.0417** J	0.00258 J
	MW-18A	Oct-16			0.00411	0.0166	**2.73**	<0.000160	<0.000260	<0.000540	0.722	<0.000240	**0.576**	<0.000049	0.00618	0.000448 J	**0.0375**	0.00128 J
	MW-18A	Apr-17			0.00466	0.0152	**2.04**	<0.000160	<0.000260	<0.000540	0.637	<0.000240	**0.723**	<0.000049	0.00762	0.000491 J	**0.0305**	0.000435 J
	MW-18A	Oct-17			0.00600 J	0.0173 J	**2.53**	<0.000800	0.00282 J	<0.000540	**1.47**	<0.00120	**2.05**	<0.000049	0.00793 J	<0.00190	**0.0302** J	<0.000900
	MW-18B	Apr-13			<0.0100	0.0126				<0.0100	<0.400	<0.0100	**0.572**			<0.0100		
	MW-18B	Apr-15			**0.0120**	0.0125				0.000942 J	0.139	0.000814 J	**0.789**			<0.000380		
	MW-18B	Apr-17			0.00883	0.0137				<0.000540	0.0793 J	0.00104 J	**0.803**			<0.000380		
	MW-22A	Apr-15			**0.0545**	0.0179 J				<0.00270	**2.34**	<0.00120	**5.18**			<0.00190		
	MW-22A	Apr-15	FD		**0.0362**	0.0147 J				<0.00270	**2.89**	<0.00120	**4.36**			<0.00190		
	MW-22A	Oct-15			**0.0482**	0.0166				<0.000540	**4.62**	<0.000240	**5.86**			0.000966 J		
	MW-22A	Oct-15	FD		**0.0479**	0.0165				<0.000540	**4.54**	<0.000240	**5.81**			0.000979 J		
	MW-22A	Apr-16			**0.0449**	0.0174 J				<0.00270	**4.42**	<0.00120	**6.06**			<0.00190		
	MW-22A	Apr-16	FD		**0.0455**	0.0167				<0.00270	**4.46**	<0.00120	**6.20**			<0.00190		
	MW-22A	Oct-16			**0.0452**	0.0179				0.000678 J	**5.41**	<0.000240	**7.28**			0.000938 J		
	MW-22A	Oct-16	FD		**0.0447**	0.0183				0.000633 J	**5.26**	<0.000240	**7.15**			0.000874 J		
	MW-22A	Apr-17			**0.0411**	0.0161				<0.000540	**6.07**	0.000354 J	**5.82**			0.000886 J		
	MW-22A	Apr-17	FD		**0.0412**	0.0155				0.000813 J	**6.33**	<0.000240	**6.41**			0.000774 J		
	MW-22A	Oct-17			**0.0427**	0.0167				0.0233	**4.91**	0.000434 J	**6.34**			0.000800 J		
	MW-22A	Oct-17	FD		**0.0432**	0.0158				0.000695 J	**4.94**	<0.000240	**6.52**			0.000858 J		
	MW-22B	Apr-13			**0.0343**	<0.0250				<0.0250	**1.78**	**<0.0250**	**3.37**			<0.0250		
	MW-22B	Apr-15			**0.0389**	0.0160 J				<0.00270	**2.32**	0.00134 J	**4.32**			<0.00190		
	MW-22B	Apr-17			**0.0255**	0.0116				<0.000540	**1.03**	0.000313 J	**3.35**			0.000603 J		
	MW-70	Apr-15			**0.0252**	0.0151				0.000653 J	**3.29**	<0.000240	**0.222**			<0.000380		
	MW-70	Oct-15			**0.0163**	0.0166				<0.000540	**2.99**	<0.000240	**0.227**			<0.000380		
	MW-70	Apr-16			**0.0238**	0.0147 J				<0.00270	**6.19**	<0.00120	**0.543**			<0.00190		
	MW-70	Oct-16			**0.0189**	0.0162				<0.000540	**4.69**	<0.000240	**0.381**			<0.000380		
	MW-70	Apr-17			**0.0156**	0.0149				<0.000540	**2.19**	<0.000240	**0.440**			<0.000380		
	MW-70	Oct-17			**0.0180**	0.0159 J				<0.000540	**4.58**	<0.00120	**0.272**			<0.00190		
	MW-72	Apr-14			**0.0480**	0.0154				<0.00100	**7.13**	<0.000700	**5.69**			<0.00100		
	MW-72	Apr-15			**0.149**	0.0321				<0.00270	**32.3**	<0.00120	**3.05**			0.0155		
	MW-72	Apr-16			**0.0318**	0.0195 J				<0.00270	**7.20**	<0.00120	**4.86**			<0.00190		
	MW-72	Apr-17			**0.0164**	0.0213				<0.000540	**1.62**	<0.000240	**3.88**			0.00210		
	MW-73	Apr-14			**0.0982**	0.0132 J				<0.00500	**5.71**	<0.00350	**2.77**			<0.00500		
	MW-73	Apr-15			**0.0757**	0.00999 J				<0.00270	**2.4**	<0.00120	**2.61**			0.00233 J		
	MW-73	Apr-16			**0.0990**	0.0114 J				<0.00270	**8.28**	<0.00120	**3.17**			0.00201 J		
	MW-73	Apr-17			**0.0650**	0.00734				<0.000540	**1.92**	<0.000240	0.187			0.00184 J		
	MW-74	Apr-15			**0.0549**	0.00894 J				<0.00270	0.175 J	<0.00120	**0.406**			**0.480**		
	MW-74	Oct-15			**0.0733**	0.0127				<0.00108	<0.0300	<0.000480	**1.17**			**0.0608**		
	MW-74	Apr-16			**0.136**	0.0151 J				<0.00270	0.756	<0.00120	**2.19**			0.0150		
	MW-74	Oct-16			**0.0699**	0.0147				0.00120 J	0.203 B	<0.000240	0.0907			**0.585**		
	MW-74	Apr-17			**0.0672**	0.0132				<0.000540	0.0369 J	<0.000240	**1.04**			**0.156**		
	MW-74	Oct-17			**0.0696**	0.0146				<0.000540	0.0463 J	<0.000240	**1.05**			**0.144**		
	MW-75	Apr-15			**0.400**	0.0183 J				0.00396 J	**10.7**	<0.00120	**0.901**			0.00311 J		
	MW-75	Oct-15			**0.328**	0.0149				0.00155 J	**3.75**	<0.000240	**0.821**			0.00248		
	MW-75	Apr-16			**0.183**	0.0218 J				<0.00270	**2.52**	<0.00120	**1.01**			0.00310 J		
	MW-75	Oct-16			**0.275**	0.0150				0.00156 J	**3.29**	<0.000240	**0.916**			0.00245		
	MW-75	Apr-17			**0.220**	0.0174				<0.000540	**3.39**	<0.000240	**0.828**			0.00229		
	MW-75	Oct-17			**0.296**	0.0159				0.00133 J	**3.58**	0.000323 J	**0.834**			0.00196 J		
	MW-76	Apr-15			**0.0777**	0.0127 J				<0.00270	**4.04**	<0.00120	**1.10**			0.00258 J		
	MW-76	Oct-15			**0.0582**	0.0143				0.00126 J	**3.75**	0.000242 J	**0.753**			0.00250		
	MW-76	Apr-16			**0.0610**	0.0140 J				<0.00270	**4.68**	<0.00120	**1.07**			0.00298 J		
	MW-76	Oct-16			**0.0818**	0.0163				0.00266	**6.79**	<0.000240	**1.25**			0.00582		
	MW-76	Apr-17			**0.0561**	0.0120				<0.000540	**4.06**	<0.000240	**0.780**			0.00327		
	MW-76	Oct-17			**0.0594**	0.0134				0.00185 J	**3.93**	<0.000240	**0.741**			0.00399		
	MW-77	Apr-15			**0.0928**	0.0158 J				0.0144	**14.9**	<0.00120	**0.666**			0.0135		
	MW-77	Oct-15			**0.0500**	0.0132 J				0.0098 J	**8.54**	<0.00120	**0.703**			0.0119		
	MW-77	Apr-16			**0.0749**	0.0136 J				0.0132	**12.2**	<0.00120	**0.687**			0.0137		
	MW-77	Oct-16			**0.0505**	0.0120 JB				0.00899 J	**7.87**	<0.00120	**0.706**			0.00996 J		
	MW-77	Apr-17			**0.0466**	0.0100				0.00752	**7.88**	<0.000240	**0.521**			0.0106		
	MW-78	Apr-14			**0.0217**	0.0388				0.0476	**7.58**	0.00107 J	**1.46**			0.0105		
	MW-78	Apr-15			**0.0211**	0.0318				**0.133**	**12.3**	<0.00120	**1.29**			0.0156		
	MW-78	Apr-16			**0.0210**	0.0445				**0.0761**	**14.8**	<0.00120	**0.946**			0.0141		
	MW-78	Apr-17			0.00820	0.0388				0.0422	0.469	<0.000240	**0.435**			0.00957		
	MW-79	Apr-15			0.00807 J	0.0154 J				<0.00270	0.276 J	<0.00120	**1.46**			<0.00190		
	MW-79	Oct-15			**0.0126**	0.0165				<0.00108	**3.03**	<0.000480	**3.76**			0.00144 J		
	MW-79	Apr-16			**0.0113**	0.0181 J				<0.00270	0.882	<0.00120	**3.00**			<0.00190		
	MW-79	Oct-16			**0.0208**	0.0184				<0.000540	**5.37**	<0.000240	**3.68** V			<0.000380		
	MW-79	Apr-17			0.00521	0.0166				<0.000540	0.150	<0.000240	**1.11** V			0.000569 J		
	MW-79	Oct-17			0.00441	0.0178				<0.000540	0.751	<0.000240	**3.82**			<0.000380		
	MW-80	Apr-14			**0.0143**	0.0160				<0.00200	**2.10**	<0.00140	**0.703**			<0.00200		
	MW-80	Apr-15			**0.0187**	0.0151 J				<0.00270	**1.73**	<0.00120	**0.555**			<0.00190		
	MW-80	Apr-16			0.00788 J	0.0185 J				0.0465	**1.34**	<0.00120	**0.234**			<0.00190		
	MW-80	Apr-17			0.00643	0.0173				0.00138 J	0.160	<0.000240	**0.598**			0.00218		
	MW-81	Apr-14			**0.0188**	0.0162				<0.00200	<0.100	<0.00140	0.137			0.00757 J		
	MW-81	Apr-15			**0.0220**	0.0131 J				<0.00270	0.183 J	<0.00120	0.132			0.0235		
	MW-81	Apr-16			**0.0300**	0.0212 J				<0.00270	0.136 J	<0.00120	0.106			0.0467		
	MW-81	Apr-17			**0.0157**	0.0144				<0.000540	<0.0150	0.000248 J	0.0117			0.0182		
	MW-82	Apr-14			**0.133**	0.0210				<0.00200	**3.06**	0.000773 J	**1.33**			<0.00200		
	MW-82	Apr-14	FD		**0.126**	0.0210				<0.00200	**2.73**	<0.00140	**1.36**			<0.00200		
	MW-82	Apr-15			**0.0929**	0.0302				0.00570 J	**1.68**	<0.00120	**1.38**			0.00302 J		
	MW-82	Apr-16			**0.0510**	0.0387				<0.00270	0.414 J	<0.00120	**1.76**			0.00199 J		
	MW-82	Apr-17			**0.0468**	0.0273				0.00182 J	0.792	0.000744 J	**2.02**			0.00137 J		
	MW-83	Apr-15			**0.0304**	0.0116 J				0.0115	**8.98**	<0.00120	**0.863**			0.00376 J		
	MW-83	Oct-15			**0.0215**	0.0403				0.00791	**1.87**	0.000860 J	0.170			0.00806		
	MW-83	Apr-16			**0.0313**	0.0248 J				0.0153	**5.63**	<0.00120	**0.573**			0.00364 J		
	MW-83	Oct-16			**0.0131**	0.121				0.00973	**1.85**	0.00141 JB	**0.434**			0.00925		
	MW-83	Apr-17			**0.0236**	0.0387				0.0224	**8.80**	0.00153 J	**0.570**			0.00556		
	MW-83	Oct-17			**0.0237**	0.0457				0.0338	**5.69**	0.00154 J	**0.460**			0.00446		
	MW-84	Apr-15			**0.116**	0.0135 J				0.00500 J	**2.54**	<0.00120	**2.83**			0.00452 J		
	MW-84	Oct-15			**0.0827**	0.0249 J				0.0220	0.397 J	<0.00240	**2.74**			0.0308		
	MW-84	Apr-16			**0.115**	0.0173 J				0.00771 J	**1.27**	<0.00120	**3.30**			0.00714 J		
	MW-84	Oct-16			**0.0981**	0.0189				0.00917	0.868	<0.000240	**2.71**			0.0110		
	MW-84	Apr-17			**0.0798**	0.0132				0.000849 J	0.439	0.000346 J	**2.28**			0.00527		
	MW-84	Oct-17			**0.151**	0.0133				0.00353	**6.03**	<0.000240	**2.90**			0.00432		
	MW-87	Apr-15			0.00635	0.0184				0.000789 J	0.194	<0.000240	0.102			0.00115 J		
	MW-87	Oct-15			0.00702	0.0322				<0.000540	**11.8**	<0.000240	**6.04**			0.00131 J		
	MW-87	Apr-16			**0.0106**	0.0200 JO1				<0.00270	**4.56**	<0.00120	**2.70** V			<0.00190		
	MW-87	Oct-16			0.00673	0.0179				<0.000540	**1.53**	<0.000240	**0.731**			<0.000380		
	MW-87	Apr-17			0.00551	0.0155				<0.000540	**1.52**	<0.000240	**1.62**			<0.000380		
	MW-87	Oct-17			0.00776 J	0.0174 J				<0.000540	**1.71**	0.00473 J	**1.48**			<0.00190		

Appendix B, Table B.2 - Summary of Groundwater Analytical Data - Total Metals

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Total Metals													
				Analyte:	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC Irr	WQCC HH	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
Evaporation Ponds	MW-88	Apr-15		**0.0231**	0.0132 J				<0.00270	**2.11**	<0.00120	**1.42**			<0.00190		
	MW-88	Oct-15		0.00917	0.0108				<0.000540	0.0268 J	<0.000240	**0.772**			<0.000380		
	MW-88	Apr-16		0.00976 J	0.0107 J				<0.00270	<0.0750	<0.00120	**0.844**			<0.00190		
	MW-88	Oct-16		0.00911	0.0104				0.000551 J	<0.0150	<0.000240	**0.976**			<0.000380		
	MW-88	Apr-17		0.00709	0.0101				<0.000540	<0.0150	<0.000240	**0.819**			<0.000380		
	MW-88	Oct-17		0.00742	0.0113				<0.000540	0.0458 J	0.000315 J	**0.823**			<0.000380		
	MW-120	Apr-15		0.00974 J	0.0108 J				<0.00270	**2.63**	<0.00120	**1.33**			0.0335		
	MW-120	Oct-15		**0.0101**	0.0149				<0.000540	**4.74**	<0.000240	**1.79**			0.00113 J		
	MW-120	Apr-16		**0.0138**	0.0176 J				<0.00270	**7.32**	<0.00120	**2.14**			0.00511 J		
	MW-120	Oct-16		**0.0135**	0.0194				<0.000540	**5.90**	<0.000240	**1.96**			<0.000380		
	MW-120	Apr-17		**0.0106**	0.0144				<0.000540	**4.54**	0.000345 J	**1.48**			0.00251		
	MW-120	Oct-17		**0.0112**	0.0160				0.000571 J	**4.59**	<0.000240	**1.49**			0.000531 J		
	MW-121	Apr-15		**0.0366**	0.0142				<0.00110	0.700	<0.000480	**3.85**			0.00792		
	MW-121	Oct-15		**0.0413**	0.0138				<0.000540	0.287	<0.000240	**2.70**			0.0109		
	MW-121	Apr-16		**0.0443**	0.0179 J				<0.00270	0.530	<0.00120	**3.56**			0.00777 J		
	MW-121	Oct-16		**0.0377**	0.0130				<0.000540	0.262	<0.000240	**2.33**			0.00746		
	MW-121	Apr-17		**0.0322**	0.0128				<0.000540	0.304	<0.000240	**2.66**			0.00468		
	MW-121	Oct-17		**0.0345**	0.0136				<0.000540	0.221	<0.000240	**2.40**			0.00788		
	MW-122	Apr-15		**0.0116** J	0.0273 J				<0.00540	0.606 J	<0.00240	**1.92**			0.00988 J		
	MW-122	Oct-15		0.00629	0.0251				<0.00108	**1.59**	<0.000480	**1.27**			0.00120 J		
	MW-122	Apr-16		0.00444 J	0.0291				<0.00270	0.610	<0.00120	**1.50**			<0.00190		
	MW-122	Oct-16		0.00559	0.0272				<0.000540	**5.20**	<0.000240	**1.61**			<0.000380		
	MW-122	Apr-17		0.00519	0.0300				<0.000540	**2.02**	<0.000240	**2.03**			0.000551 J		
	MW-122	Oct-17		0.00559	0.0231				<0.000540	**5.01**	<0.000240	**1.28**			<0.000380		
	MW-123	Apr-15		**0.0258**	0.0200 J				<0.00270	<0.0750	<0.00120	**2.59**			<0.00190		
	MW-123	Oct-15		**0.0250**	0.0226				<0.000540	0.0657 J	0.000254 J	**2.72**			<0.000380		
	MW-123	Apr-16		**0.0275**	0.0242 J				<0.00270	<0.0750	<0.00120	**2.92**			<0.00190		
	MW-123	Oct-16		**0.0226**	0.0236				<0.000540	0.0599 J	0.000364 JB	**2.59**			<0.000380		
	MW-123	Apr-17		**0.0231**	0.0213 O1				<0.000540	0.0684 B	<0.000240	**2.59**			0.000395 J		
	MW-123	Oct-17		**0.0221**	0.0239				<0.000540	<0.0150	<0.000240	**2.88**			<0.000380		
	MW-124	Apr-15		0.00276	0.0192				0.00126 J	**1.22**	0.000379 J	**0.816**			<0.000380		
	MW-124	Oct-15		0.00443	0.0247				<0.00108	**2.93**	<0.000480	**0.562**			<0.000760		
	MW-124	Apr-16		0.00477 J	0.0288				<0.00270	**4.08**	<0.00120	**0.749**			<0.00190		
	MW-124	Oct-16		0.00303	0.0323				0.00124 J	**4.99**	0.000546 JB	**0.469**			<0.000380		
	MW-124	Apr-17		0.00565	0.0205				<0.000540	**10.6**	<0.000240	**0.448**			<0.000380		
	MW-124	Oct-17		0.00354 J	0.0219 J				<0.000540	**5.08**	<0.00120	**0.521**			<0.00190		
	OCD-1R	Apr-15		0.00662 J	0.0176 J				<0.00540	0.238 J	<0.00240	**0.773**			0.0217		
	OCD-1R	Oct-15		0.00447	0.0184				<0.00108	0.593	<0.000480	**1.59**			0.00229 J		
	OCD-1R	Apr-16		0.00729 J	0.0141 J				**0.105**	**1.54**	<0.00120	**0.462**			0.00420 J		
	OCD-1R	Oct-16		0.00524	0.0286				0.00312	**3.04**	<0.000240	**3.92**			0.000543 J		
	OCD-1R	Apr-17		0.00319	0.0150				0.00119 J	0.275 B	<0.000240	**1.27**			0.000988 J		
	OCD-1R	Oct-17		0.00433	0.0192				0.000885 J	0.830	0.000662 J	**1.56**			0.000822 J		
	OCD-2A	Apr-15		0.00197 J	0.0193 J				<0.00270	0.965	<0.00120	**0.313**			<0.00190		
	OCD-2A	Oct-15		0.00361 J	0.0234				0.00385 J	**2.64**	<0.000480	**1.34**			<0.000760		
	OCD-2A	Apr-16		0.0064 J	0.0209 J				0.00304 J	**5.47**	<0.00120	**1.66**			<0.00190		
	OCD-2A	Oct-16		0.00234	0.0264				0.000783 J	**1.50**	0.000260 J	**0.535**			<0.000380		
	OCD-2A	Apr-17		0.00591	0.0213				<0.000540	**6.76**	<0.000240	**1.22**			<0.000380		
	OCD-2A	Oct-17		0.00323	0.0197				<0.000540	**3.74**	<0.000240	**0.966**			<0.000380		
	OCD-3	Apr-15		0.00421 J	0.0198 J				<0.00270	**1.69**	<0.00120	0.165			<0.00190		
	OCD-3	Oct-15		0.00184 J	0.0224				<0.000540	0.352	<0.000240	**0.412**			0.00113 J		
	OCD-3	Apr-16		0.00389 J	0.0214 J				<0.00270	**1.23**	<0.00120	0.0524			<0.00190		
	OCD-3	Oct-16		0.00422	0.0228				<0.000540	**2.31**	<0.000240	**0.527**			<0.000380		
	OCD-3	Apr-17		0.00141 J	0.0207				<0.000540	0.681	<0.000240	0.0337			<0.000380		
	OCD-3	Oct-17		**0.0104**	0.0255				0.000587 J	**5.44**	<0.000240	**0.770**			<0.000380		
	OCD-4	Apr-15		0.00351 J	0.0263 J				<0.00540	**4.06**	<0.00240	**0.311**			<0.00380		
	OCD-4	Oct-15		0.00701	0.0226				<0.000540	**6.61**	<0.000240	**0.233**			<0.000380		
	OCD-4	Apr-16		0.00209 J	0.0226 J				<0.00270	0.855	<0.00120	0.119			<0.00190		
	OCD-4	Oct-16		0.00374	0.0255				<0.000540	**3.46**	<0.000240	**0.285**			<0.000380		
	OCD-4	Apr-17		0.00227	0.0219				<0.000540	**2.00**	<0.000240	0.0669			<0.000380		
	OCD-4	Oct-17		**0.0105**	0.0248				<0.000540	**10.0**	<0.000240	**0.270**			<0.000380		
	OCD-5	Apr-15		0.00805 J	0.0284 J				<0.00540	**5.34**	<0.00240	**0.328**			<0.00380		
	OCD-5	Oct-15		**0.0166**	0.0272				0.00108 J	**11.3**	<0.000480	**0.306**			<0.000760		
	OCD-5	Apr-16		**0.0126**	0.0279				<0.00270	**15.4**	0.00177 J	**0.267**			<0.00190		
	OCD-5	Oct-16		0.00863	0.0288				0.000559 J	**9.09**	<0.000240	**0.295**			<0.000380		
	OCD-5	Apr-17		**0.0108**	0.0269				<0.000540	**17.0**	<0.000240	**0.343**			<0.000380		
	OCD-5	Oct-17		**0.0124**	0.0261				0.000602 J	**12.6**	<0.000240	**0.271**			<0.000380		
	OCD-6	Apr-15		**0.0141**	0.0240 J				<0.00270	**3.91**	<0.00120	**2.07**			<0.00190		
	OCD-6	Oct-15		**0.0235**	0.0254				<0.00108	**9.38**	<0.000480	**2.32**			0.00110 J		
	OCD-6	Apr-16		**0.0139**	0.0214 J				<0.00270	**2.39**	<0.00120	**2.22**			<0.00190		
	OCD-6	Oct-16		**0.0120**	0.0253				0.000759 JB	**1.82**	0.000501 JB	**2.61**			0.000900 J		
	OCD-6	Apr-17		0.00911	0.0222				<0.000540	**2.28**	<0.000240	**2.09**			0.000598 J		
	OCD-6	Oct-17		**0.0200**	0.0256				<0.000540	**11.4**	<0.000240	**2.29**			<0.000380		
	OCD-7AR	Apr-15		**0.0840**	0.0111 J				<0.00270	**1.66**	<0.00120	**2.56**			<0.00190		
	OCD-7AR	Oct-15		**0.201**	0.0162				<0.00108	**9.36**	<0.000480	**2.88**			0.00230 J		
	OCD-7AR	Apr-16		**0.150**	0.0145 J				<0.00270	**2.89**	<0.00120	**2.25**			0.00195 J		
	OCD-7AR	Oct-16		**0.169**	0.0151				0.000837 J	**10.3**	<0.000240	**2.92**			0.00178 J		
	OCD-7AR	Apr-17		**0.113**	0.0134				<0.000540	**1.77**	<0.000240	**2.14**			0.00141 J		
	OCD-7AR	Oct-17		**0.181**	0.0150				<0.000540	**10.9**	<0.000240	**2.69**			0.00160 J		
	OCD-7B	Mar-13		<0.00500	0.0160				<0.00500	<0.200	<0.00500	0.0246			<0.00500		
	OCD-7B	Apr-15		0.00294 J	0.0196 J				<0.00270	**3.52**	<0.00120	**0.710**			<0.00190		
	OCD-7B	Apr-17		0.00194 J	0.0179				<0.000540	**2.73**	<0.000240	**0.621**			<0.000380		
	OCD-8A	Apr-15		**0.0541**	0.0336				0.000836 J	**12.3**	<0.000240	**6.38**	<0.000049	0.0598	0.000802 J		0.00100 J
	OCD-8A	Oct-15		**0.0622**	0.0287				0.000787 J	**9.70**	0.000380 J	**4.11**	<0.000049 J	0.0471	0.000836 J		0.00231 J
	OCD-8A	Apr-16		**0.0618**	0.0199 J	**0.813**	<0.00500	<0.00130	<0.00270	**8.89**	<0.00120	**3.80**	<0.000049	0.0306	<0.00190	<0.00165	0.00190 J
	OCD-8A	Oct-16		**0.0616**	0.0213	**0.776**	<0.000160	0.00124 J	0.000710 J	**6.60**	0.000478 JB	**3.08**	<0.000049	0.0260	0.000984 J	0.00108 J	0.000745 J
	OCD-8A	Apr-17		**0.0632**	0.0177	**0.837**	<0.000160	0.00103 J	<0.000540	**6.72**	<0.000240	**2.91**	<0.000049	0.0246	0.000793 J	0.00102 J	0.000626 J
	OCD-8A	Oct-17		**0.0857**	0.0196	**0.888**	<0.000160	0.00180 J	0.000994 J	**7.29**	<0.000240	**3.25**	<0.000049	0.0230	0.000961 J	0.000983 J	0.00103 J
	OCD-8B	Apr-13		**<0.0250**	<0.0250				<0.0250	<1.00	**<0.0250**	**0.417**			<0.0250		
	OCD-8B	Apr-15		**0.0126**	0.0141				0.000872 J	0.239	0.000392 J	**5.98**			0.000525 J		
	OCD-8B	Apr-17		0.00912	0.0124				<0.000540	0.266	0.000256 J	**6.36**			<0.000380		
Field East of Refinery	KWB-1A	Apr-15		0.00362	0.00932				0.000649 J	0.108	0.000599 J	**0.543**	<0.000049	0.00866	0.00247		0.0236
	KWB-1A	Oct-15		0.00416	0.00949				<0.000540	0.0387 J	0.000260 J	**0.439**	<0.000049	0.00846	0.000753 J		0.0209
	KWB-1A	Apr-16		0.00401 J	0.0131 J	0.741	<0.00500	0.0122	<0.00270	<0.0750	<0.00120	**0.552**	<0.000049	0.0100	0.00528 J	0.0247 J	0.0258
	KWB-1A	Oct-16		0.00296	0.00944	0.608 O1V	<0.000160	0.0143	0.00127 JB	0.0845 JB	0.000408 J	**0.500**	<0.000049	0.00846	0.00106 J	0.0188	0.0204
	KWB-1A	Apr-17		0.00319	0.00857	0.706	<0.000160	0.00583	<0.000540	<0.0150	<0.000240	**0.447**	<0.000049	0.00881	0.00164 J	0.0232	0.0221
	KWB-1A	Oct-17		0.00342	0.00856	0.745	<0.000160	0.00612	<0.000540	<0.0150	<0.000240	**0.413**	<0.000049	0.00841	0.000912 J	0.0174	0.0237
	KWB-1C	Apr-13		<0.0100	0.0146				<0.0100	<0.400	<0.0100	<0.0100			<0.0100		
	KWB-1C	Apr-15		0.00338	0.00918				<0.000540	0.0537 J	0.000320 J	**0.462**			0.000549 J		
	KWB-1C	Apr-17		0.00303	0.00955				<0.000540	<0.0150	<0.000240	**0.501**			<0.000380		
	KWB-7	Apr-15		**0.0200**	0.0645				0.000832 J	**1.44**	0.000625 J	**5.65**	<0.000049	0.00901	<0.000380		0.00133 J
	KWB-7	Oct-15		0.00939	0.0647				<0.000540	**1.04**	<0.000240	**4.09**	<0.000049	0.00442	<0.000380		0.00182 J
	KWB-7	Apr-16		**0.0104**	0.0550	0.503	<0.00500	0.00739 J	<0.00270	**1.42**	<0.00120	**3.48**	<0.000049	0.0121	<0.00190	0.00299 J	0.00196 J
	KWB-7	Oct-16		0.00597	0.0560	0.455	<0.000160	0.00298	<0.000540	0.677	0.000441 J	**3.04**	<0.000049	0.0107	<0.000380	0.00286 J	0.000901 J
	KWB-7	Apr-17		0.00307	0.0650	0.436	<0.000160	0.00206	<0.000540	**1.47**	0.000707 J	**3.44**	<0.000049	0.00746	<0.000380	0.00159 J	0.00102 J
	KWB-7	Oct-17		0.00415	0.0915	0.460	<0.000160	0.00247	0.000670 J	**1.37**	0.000698 J	**3.22**	<0.000049	0.00875	0.00100 J	0.00142 J	0.00129 J

Appendix B, Table B.2 - Summary of Groundwater Analytical Data - Total Metals

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Date	Dup	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
	Analyte Group:			Total Metals													
	Units:			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	CGWSL:			0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
	CGWSL Source:			USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC Irr	WQCC HH	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
Field East of Refinery	KWB-8	Oct-16		0.00109 J	0.139	0.665	<0.000160	<0.000260	0.000710 JB	0.672	0.00387	**0.997**	<0.000049 J6	0.00102 JB	0.000475 J	0.000746 J	0.00122 J
	KWB-8	Apr-17		0.00129 J	0.106	0.632	<0.000160	0.000264 J	0.000851 J	**1.07**	0.00495	**1.83**	<0.000049	0.00120 J	<0.000380	<0.00033	0.00157 J
	KWB-8	Oct-17		0.00135 J	0.130	**0.769**	<0.000160	<0.000260	0.00153 J	0.0804 J	0.00296	**0.510**	<0.000049	0.000997 J	0.0463	<0.00033	0.00112 J
	KWB-10R	Apr-15		**0.0259**	**3.50**				<0.000540	**7.48**	0.00172 J	0.149			<0.000380		
	KWB-10R	Oct-15		**0.0217**	**3.72**				<0.000540	**5.84**	0.00109 J	0.157			<0.000380		
	KWB-10R	Apr-16		**0.0226**	**4.31**				<0.00270	**7.43**	0.00131 J	0.199			<0.00190		
	KWB-10R	Oct-16		**0.0301**	0.816				0.000798 JB	**6.11**	0.00102 J	0.161			<0.000380		
	KWB-10R	Apr-17		**0.0157**	**3.82**				<0.000540	**5.21**	0.000971 J	0.157			<0.000380		
	KWB-10R	Oct-17		**0.0170**	**3.85**				<0.000540	**5.24**	0.000996 J	0.163			<0.000380		
	KWB-11A	Apr-15		0.00251 J	0.0240 J				<0.00270	<0.0750	0.00825 J	**0.294**	<0.000049	0.00675 J	0.00262 J		0.0122 J
	KWB-11A	Oct-15		0.00266	0.0267				<0.000540	<0.0150	0.00515	0.191	<0.000049	0.00461	0.00776		0.0112
	KWB-11A	Apr-16		0.00231 J	0.00508	0.502	<0.00500	0.00175 J	<0.00270	<0.0750	0.00851 J	**0.222**	<0.000049	0.00476 J	0.00852 J	**0.0326** J	0.0118 J
	KWB-11A	Oct-16		0.00220	0.0227	0.449	<0.000160	0.00194 J	<0.000540	<0.0150	0.00525	**0.212**	<0.000049 J3J6O1	0.00476 B	0.00529	0.0217	0.0102
	KWB-11A	Apr-17		0.00183 J	0.0214	0.412	<0.000160	0.00126 J	<0.000540	<0.0150	0.00281	**0.243**	<0.000049	0.00431	0.00536	0.0187	0.0113
	KWB-11A	Oct-17		0.00890	0.0190	0.502	<0.000160	0.00470	<0.000540	0.100	0.00271	**0.325**	<0.000049	0.00598	0.00200 J	0.0127	0.00608
	KWB-11B	Apr-15		0.00147 J	0.0127				0.00116 J	<0.0150	<0.000240	0.00271 J	<0.000049	<0.000350	0.00783		0.00806
	KWB-11B	Oct-15		0.00185 J	0.0134				0.000703 J	<0.0150	<0.000240	0.000257 J	<0.000049	<0.000350	0.00769		0.00812
	KWB-11B	Apr-16		<0.00125	0.0135 J	0.173 JJ6O1	<0.00500	<0.00130	<0.00270	0.121 J	<0.00120	0.00188 J	<0.000049	<0.00175	0.00949 J	0.00987 J	0.00814 J
	KWB-11B	Oct-16		0.00109 J	0.0116	0.105	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.000800 J	<0.000049 J3	0.000559 JB	0.00701	0.0101	0.00727
	KWB-11B	Apr-17		0.00126 J	0.0138	0.121	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.000954 J	<0.000049	<0.000350	0.00959	0.0113	0.00846
	KWB-11B	Oct-17		0.00133 J	0.0127	0.133 J	<0.000160	<0.000260	0.000977 J	0.0153 J	<0.000240	0.00153 J	<0.000049	0.00144 J	0.00907	0.0112	0.00864
	KWB-12A	Apr-15		0.00160 J	0.0168				0.00164 J	0.269	0.000780 J	0.00353 J	<0.000049	0.000930 J	0.00435		0.0108
	KWB-12A	Apr-15	FD	0.00145 J	0.0138				<0.000540	<0.0150	<0.000240	0.000251 J	<0.000049	0.000503 J	0.00375		0.0100
	KWB-12A	Oct-15		0.00242	0.0170				0.000659 J	0.0285 J	<0.000240	0.000862 J	<0.000049	0.000959 J	0.00368		0.0139
	KWB-12A	Apr-16		0.00162 J	0.0164 J	0.695	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	<0.00125	<0.000049	<0.00175	0.00370 J	**0.0331** J	0.0132 J
	KWB-12A	Oct-16		0.00159 J	0.0156	0.481	<0.000160	<0.000260	0.00159 JB	<0.0150	0.000256 J	<0.000250	<0.000049 J3	0.000739 J	0.00360	0.0288	0.0110
	KWB-12A	Apr-17		0.00149 J	0.0157	0.492	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.00213 J	<0.000049	<0.000350	0.00372 B	0.0260	0.0112
	KWB-12A	Oct-17		0.00142 J	0.0144	0.593	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.000334 J	<0.000049	0.000495 J	0.00334	0.0252	0.0127
	KWB-12B	Apr-15		0.00151 J	0.00823				0.000588 J	<0.0150	<0.000240	0.000826 J	<0.000049	0.000469 J	0.00348		0.0108
	KWB-12B	Oct-15		0.00182 J	0.0118				<0.000540	0.0175 J	<0.000240	0.00117 J	<0.000049	0.00120 J	0.00370		0.0129
	KWB-12B	Oct-15	FD	0.00237	0.0118				0.000599 J	0.0312 J	<0.000240	<0.000250 B	<0.000049	0.000565 J	0.00361		0.0129
	KWB-12B	Apr-16		0.00178 J	0.0130 J	0.712	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	0.00441 J	<0.000049	<0.00175	0.00307 J	**0.0302** J	0.0125 J
	KWB-12B	Apr-16	FD	0.00165 J	0.0116 J	0.651	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	0.00434 J	<0.000049	<0.00175	0.00301 J	0.0282 J	0.0117 J
	KWB-12B	Oct-16		0.00159 J	0.0101	0.464	<0.000160	<0.000260	0.00136 JB	0.0358 J	<0.000240	0.00955	<0.000049 J3	0.000824 J	0.00248	0.0263	0.0112
	KWB-12B	Oct-16	FD	0.00161 J	0.0108	0.533	<0.000160	<0.000260	0.00147 JB	0.0369 J	0.000299 J	0.0104	<0.000049 J3	0.000703 J	0.00295	0.0265	0.0114
	KWB-12B	Apr-17		0.00157 J	0.00901	0.525	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.00232 J	<0.000049	<0.000350	0.00382 B	0.0273	0.0122
	KWB-12B	Apr-17	FD	0.00167 J	0.00968	0.558	<0.000160	<0.000260	<0.000540	0.0486 J	<0.000240	0.00129 J	<0.000049	0.000513 JB	0.00356	**0.0307**	0.0127
	KWB-12B	Oct-17		0.00159 J	0.00870	0.616	<0.000160	<0.000260	0.000543 J	0.0534 J	<0.000240	0.00158 J	<0.000049	0.000457 J	0.00346	0.0264 J	0.0127
	KWB-12B	Oct-17	FD	0.00169 J	0.00878	0.629	<0.000160	<0.000260	<0.000540	0.0374 J	<0.000240	0.00122 J	<0.000049	0.000453 J	0.00298	0.0273	0.0122
	KWB-P4	Apr-13															
	KWB-P4	Apr-15															
	KWB-P4	Apr-17															
	MW-57	Apr-15		0.00495	0.0267				0.00104 J	0.658	0.000946 J	0.192			0.0300		
	MW-57	Oct-15		0.00660	0.0339				<0.000540	0.301	0.000729 J	**0.852**			0.0159		
	MW-57	Apr-16		0.00654 J	0.0344				0.00322 J	0.881	0.00266 J	**0.378**			0.0131		
	MW-57	Oct-16		0.00564	0.0253				0.000798 JB	0.559	0.000516 J	0.104			0.0169		
	MW-57	Apr-17		0.00502	0.0202				<0.000540	0.353	0.000515 J	**0.278**			0.0231		
	MW-57	Oct-17		0.00391	0.0176				0.000652 J	0.0996 J	<0.000240	0.0323			0.0171		
	MW-58	Apr-15		**0.0121**	0.819				<0.000540	**1.76**	0.00339	0.0946	<0.000049	0.00140 J	<0.000380		0.00229 J
	MW-58	Oct-15		0.00810	**1.03**				<0.000540	**1.29**	0.00190 J	0.117	<0.000049	0.00108 J	<0.000380		<0.000180 B
	MW-58	Apr-16		**0.0135**	0.744	0.518	<0.00500	<0.00130	<0.00270	**1.06**	0.00297 J	**0.391**	<0.000049	<0.00175	0.00524 J	<0.00165	0.00259 J
	MW-58	Oct-16		0.00683	0.915	0.455	<0.000160	0.000318 J	0.00108 JB	**1.01**	0.00234	0.114	<0.000049 J3	0.00133 J	<0.000380	<0.00033	0.00451 J
	MW-58	Apr-17		**0.0115**	0.716	0.453	<0.000160	<0.000260	<0.000540	0.521	0.00218	**0.333**	<0.000049	0.000637 J	<0.000380	<0.00033	0.00233 J
	MW-58	Oct-17		0.00648	**1.15**	0.471	<0.000160	<0.000260	<0.000540	0.385	0.00204	**0.319**	<0.000049	0.00129 J	<0.000380	<0.00165	0.00422 J
	MW-111	Apr-15		**0.0201**	0.147				0.00167 J	**5.03**	0.00141 J	**1.72**			<0.000380		
	MW-111	Oct-15		**0.0144**	0.127				0.00239	**7.14**	0.00205	**1.52**			<0.000380		
	MW-111	Apr-16		**0.0131**	0.0926				<0.00270	**6.67**	<0.00120	**1.66**			<0.00190		
	MW-111	Oct-16		**0.0108**	0.0757				0.000976 JB	**6.14**	0.000310 J	**1.41**			<0.000380		
	MW-111	Apr-17		**0.0127**	0.0697				<0.000540	**6.15**	<0.000240	**1.57**			<0.000380		
	MW-111	Oct-17		0.00926	0.0714				<0.000540	**7.15**	<0.000240	**1.45**			<0.000380		
	MW-113	Apr-15		0.00294	0.0330				0.00171 J	0.559	0.000733 J	**0.918**			0.00250		
	MW-113	Apr-15	FD	0.00418	0.0518				0.00221	**1.01**	0.000872 J	**0.857**			<0.000380		
	MW-113	Oct-15		0.00366	0.0242				<0.000540	0.196	<0.000240	**0.765**			<0.000380		
	MW-113	Oct-15	FD	0.00379	0.0233				<0.000540	0.203	<0.000240	**0.767**			<0.000380		
	MW-113	Apr-16		0.00282 J	0.0251				<0.00270	0.270 J	<0.00120	**0.734**			<0.00190		
	MW-113	Apr-16	FD	0.00306 J	0.0289				<0.00270	0.347 J	<0.00120	**0.823**			<0.00190		
	MW-113	Oct-16		0.00138 J	0.0249				<0.000540	**1.17** O1	<0.000240	**1.36** O1V			<0.000380		
	MW-113	Oct-16	FD	0.00125 J	0.0245				<0.000540	**1.13**	<0.000240	**1.37**			<0.000380		
	MW-113	Apr-17		0.00284	0.0257				<0.000540	0.512	<0.000240	**1.08**			<0.000380		
	MW-113	Apr-17	FD	0.00285	0.0244				<0.000540	0.480	<0.000240	**1.05**			<0.000380		
	MW-113	Oct-17		0.00138 J	0.0253				<0.000540	0.764	<0.000240	**1.14**			0.000401 J		
	MW-113	Oct-17	FD	0.00140 J	0.0235				<0.000540	0.774	0.000324 J	**1.19**			<0.000380		
	MW-125	Apr-15		0.00369	0.00961				<0.000540	<0.0150	<0.000240	**0.405**			0.00581 J		
	MW-125	Oct-15		0.00440	0.00911				<0.000540	0.0196 J	<0.000240	**0.371**			0.00409		
	MW-125	Apr-16		0.00408 J	0.00922 J				<0.00270	<0.0750	<0.00120	**0.438**			0.00410 J		
	MW-125	Oct-16		0.00383	0.00806				0.000898 JB	<0.0150	<0.000240	**0.370**			0.00253		
	MW-125	Apr-17		0.00336	0.00822				<0.000540	<0.0150	<0.000240	**0.374**			0.00962		
	MW-125	Oct-17		0.00386	0.0153				0.00253	0.0228 J	<0.000240	**0.329**			0.00635		
	MW-126A	Apr-15		0.00270	0.0185				0.00164 J	**1.02**	0.000293 J	**0.824**			<0.000380		
	MW-126A	Oct-15		0.00195 J	0.0146				<0.000540	0.786	<0.000240	**0.642**			<0.000380		
	MW-126A	Apr-16		0.00222	0.0174				<0.00270	0.803	<0.00120	**0.797**			<0.00190		
	MW-126A	Oct-16		0.00257	0.0109				<0.000540	0.299	<0.000240	**0.371**			<0.000380		
	MW-126A	Apr-17		0.00171 J	0.0157				<0.000540	0.602	<0.000240	**0.821**			<0.000380		
	MW-126A	Oct-17		0.00118 J	0.0133				<0.000540	0.485	<0.000240	**0.651**			<0.000380		
	MW-126B	Apr-15		0.00377 J	0.0110 J				<0.00270	<0.0750	<0.00120	0.0892			0.00215 J		
	MW-126B	Oct-15		0.00442	0.0116				0.000580 J	0.154	0.000342 J	0.0609			0.00206		
	MW-126B	Apr-16		0.00430 J	0.0133 J				<0.00270	0.170 J	<0.00120	0.0744			0.00285 J		
	MW-126B	Oct-16		0.00404	0.00919				<0.000540	0.0351 J	<0.000240	0.0539			0.00133 J		
	MW-126B	Apr-17		0.00367	0.0101				<0.000540	0.0356 J	<0.000240	0.0612			0.00207		
	MW-126B	Oct-17		0.00360	0.0100				0.000749 J	0.0330 J	0.000777 J	0.0547			0.00256		
	MW-127	Apr-15		0.00626	0.534				0.00241	**1.64**	0.00138 J	0.109			<0.000380		
	MW-127	Oct-15		0.00499	0.116				<0.000540	0.323	<0.000240	0.0943			<0.000380		
	MW-127	Apr-16		0.00535 J	0.137				<0.00270	0.357 J	<0.00120	0.103			<0.00190		
	MW-127	Oct-16		0.00453	0.0797				<0.000540	0.296	<0.000240	0.101			<0.000380		
	MW-127	Apr-17		0.00383	0.0718				<0.000540	0.187	<0.000240	0.0940			<0.000380		
	MW-127	Oct-17		**0.0114**	0.212				0.00109 J	**1.39**	0.000965 J	0.135			<0.000380		
	MW-128	Apr-15		**0.0520**	0.0783				0.000905 J	**2.94**	0.00246	**2.42**			<0.000380 B		
	MW-128	Oct-15		**0.0552**	0.0772				<0.000540	**2.65**	<0.000240	**2.31**			<0.000380		
	MW-128	Apr-16		**0.341**	0.372				0.00347 J	**15.4**	0.00336 J	**12.9**			<0.00190		
	MW-128	Oct-16		**0.0643**	0.0676				0.00182 JB	**3.12**	0.00222	**2.11**			<0.000380		
	MW-128	Apr-17		**0.0583**	0.0621				0.000580 J	**2.98**	0.00114 J	**2.09**			0.00973		
	MW-128	Oct-17		**0.0554**	0.0610				0.000618 J	**3.07**	0.000404 J	**2.09**			0.00122 J		

Appendix B, Table B.2 - Summary of Groundwater Analytical Data - Total Metals

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Total Metals													
				Analyte:	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC Irr	WQCC HH	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
Field East of Refinery	MW-129	Apr-15		**0.0338**	0.498				0.00227	**6.42**	0.00277	**1.21**			<0.000380		
	MW-129	Oct-15		**0.0271**	0.546				<0.000540	**5.07**	0.000292 J	**1.09**			<0.000380		
	MW-129	Apr-16		**0.0272**	0.593				<0.00270	**5.49**	<0.00120	**1.10**			<0.00190		
	MW-129	Oct-16		**0.0236**	0.607				0.000625 JB	**4.79**	0.000529 J	**1.00**			<0.000380		
	MW-129	Apr-17		**0.0226**	0.627				<0.000540	**5.10**	<0.000240	**0.987**			<0.000380		
	MW-130	Apr-15		0.00718	0.677				0.00205	0.143 J	0.00929	**0.242**			<0.00190 B		
	MW-130	Oct-15		0.00477	0.0195				0.000567 J	0.162	0.000362 J	0.0921			0.00224		
	MW-130	Apr-16		0.00449 J	0.0228 J				<0.00270	0.451 J	<0.00120	0.105			0.00575 J		
	MW-130	Oct-16		0.00403	0.0188				0.000869 JB	0.104	<0.000240	0.0891			0.00675		
	MW-130	Apr-17		0.00391	0.0198				<0.000540	0.0756 J	<0.000240	0.0972			0.0101		
	MW-130	Oct-17		0.00374	0.0179				<0.000540	0.0360 J	<0.000240	0.0918			0.00852		
	MW-131	Apr-15		**0.0220**	**2.67**				0.000747 J	**2.34**	0.000919 J	**0.316**			<0.000380		
	MW-131	Oct-15		**0.0261**	**2.88**				0.00371	**4.71**	0.00294	**0.337**			<0.000380		
	MW-131	Apr-16		**0.0222**	**2.67**				<0.00270	**1.46**	<0.00120	**0.305**			<0.00190		
	MW-131	Oct-16		**0.0207**	**2.69**				<0.000540	**1.34**	<0.000240	**0.285**			<0.000380		
	MW-131	Apr-17		**0.0214**	**2.75**				<0.000540	**1.29**	<0.000240	**0.294**			<0.000380		
	MW-131	Oct-17		**0.0223**	**1.98**				<0.000540	**1.56**	<0.000240	**0.283**			<0.000380		
	MW-133	Nov-14		**0.0190**	0.130				0.000600 J	**3.50**	0.000800 J	**0.380**			<0.000380		
	MW-133	Apr-15		0.00897	0.157				<0.000540	**5.53**	0.00145 J	**0.312**			0.00124 J		
	MW-134	Apr-15		0.00881 J	0.0143 J				0.00285 J	0.234 J	<0.00120	0.00773 J			0.0197		
	MW-134	Apr-15	FD	0.00575	0.0107				0.00148 J	0.131	<0.000240	0.00795			0.0129		
	MW-134	Oct-15		0.00621	0.0101				0.000869 J	<0.0150	<0.000240	0.00650			0.00756		
	MW-134	Oct-15	FD	0.00630	0.00964				0.000709 J	<0.0150	<0.000240	0.00594			0.00807		
	MW-134	Apr-16		0.00566 J	0.0112 J				<0.00270	<0.0750	0.00131 J	0.0102 J			0.00812 J		
	MW-134	Apr-16	FD	0.00555 J	0.00895 J				<0.00270	0.0767 J	<0.00120	0.0110 J			0.00711 J		
	MW-134	Oct-16		0.00511	0.00827				0.00158 JB	0.0181 JB	<0.000240	0.00886			0.00647		
	MW-134	Oct-16	FD	0.00475	0.00833				0.00148 JB	0.0293 JB	0.000513 J	0.00817			0.00416		
	MW-134	Apr-17		0.00453	0.00963				<0.000540	<0.0150	<0.000240	0.00801			0.00537		
	MW-134	Apr-17	FD	0.00464	0.00877				0.000611 J	<0.0150	<0.000240	0.00808			0.00572		
	MW-134	Oct-17		0.00432	0.00942				0.000691 J	<0.0150	<0.000240	0.00999			0.00743		
	MW-134	Oct-17	FD	0.00445	0.0100				0.000840 J	0.0489 J	<0.000240	0.0109			0.00554		
	MW-135	Apr-15		0.00871 J	0.413				0.0168	**5.33**	0.0119	**0.500**			0.0337		
	MW-135	Oct-15		0.00442	0.0580				0.00319	**1.52**	0.00144 J	0.0438			0.0399		
	MW-135	Apr-16		**0.0216**	0.303				0.0130	**5.54**	0.00566 J	**0.225**			**0.128**		
	MW-135	Oct-16		0.00394	0.0397				0.00149 JB	0.598	0.000686 J	0.0324			0.0368		
	MW-135	Apr-17		0.00324	0.0221				<0.000540	0.339	0.000499 J	0.0187			0.0361		
	MW-135	Oct-17		0.00339	0.0249				0.00166 J	0.526	0.000498 J	0.0229			0.0341		
	RA-4196	Apr-15															
	RA-4196	Oct-15															
	RA-4196	Apr-16															
	RA-4196	Oct-16															
	RA-4196	Apr-17															
	RA-4196	Oct-17															
	RA-4798	Apr-15															
	RA-4798	Oct-15															
	RA-4798	Apr-16															
	RA-4798	Oct-16															
	RA-4798	Apr-17															
	RA-4798	Oct-17															
	RW-12R	Apr-16		<0.00125	0.0512				0.0453	0.213 J	0.00204 J	**0.547**			<0.00740		
	RW-12R	Apr-17		0.000503 J	0.0409				0.0359	0.241	0.00193 J	**0.398**			<0.000380		
	RW-13R	Apr-16		0.00922 J	0.0165				<0.00270	0.572	<0.00120	**1.26**					
	RW-18	Apr-14		0.00496 J	0.0137				<0.00200	0.295 J	<0.00140	0.00572 J			0.0110		
	RW-18	Apr-15		0.00379	0.0105				0.000703 J	<0.0150	<0.000240	<0.000250			0.00988		
	RW-18	Apr-16		0.00400 J	0.0124 J				<0.00270	<0.0750	<0.00120	<0.00125			0.00436 J		
	RW-18	Apr-17		0.00331	0.0107				<0.000540	<0.0150	<0.000240	0.000927 J			0.00406		
	RW-20	Apr-15		0.00375 J	0.527				<0.00270	**1.75**	0.00354 J	**0.872**			<0.00190		
	RW-22	Apr-15		0.00248	0.816				0.00320	0.140	0.00397	**0.845**			0.00234		
North Refinery	MW-23	Apr-15		**0.0164**	0.319				<0.00270	0.560	0.00336 J	**0.212**			**0.125**		
	MW-23	Oct-15		**0.0104**	**11.0**				0.00113 J	0.0742 J	0.00578	0.0890			0.00109 J		
	MW-23	Apr-16		**0.0113**	**12.8**				<0.00270	0.456 J	**0.0186**	0.105			<0.00190		
	MW-23	Oct-16		0.00776	**12.0**				0.00711	**1.89**	**0.0334**	0.184			0.00190 J		
	MW-23	Apr-17		0.00608	**9.82**				0.000789 J	0.0552 J	0.00296	0.0653			0.00287		
	MW-23	Oct-17		0.00636	**10.5**				0.00108 J	0.0413 J	**0.0172**	0.0662			0.00939		
	MW-29	Apr-15		0.000896 J	0.0170				<0.000540	0.0678 J	<0.000240	**0.382**			<0.000380		
	MW-29	Oct-15		0.00100 J	0.0161				<0.000540	<0.0150	<0.00120	**0.369**			0.00165 J		
	MW-29	Apr-16		<0.00125	0.0182 J				<0.00270	<0.0750	<0.00120	**0.485**			0.0141		
	MW-29	Oct-16		0.00165 J	0.0156				0.000619 JB	0.0168 J	0.000465 J	**0.374**			0.000713 J		
	MW-29	Apr-17		0.000518 J	0.0156				<0.000540	0.0276 J	<0.000240	**0.436** V			<0.000380		
	MW-29	Oct-17		0.00193 J	0.0161				<0.000540	0.0193 J	<0.000240	**0.382**			0.000672 J		
	MW-39	Apr-15		0.00256 J	0.0228 J				<0.00270	<0.0750	<0.00120	**0.208**			<0.00190		
	MW-39	Oct-15		0.00156 J	0.0222				<0.000540	0.0199 J	<0.00240	0.186			0.00266		
	MW-39	Apr-16		**0.0195**	0.0209 J				0.00407 J	0.0932 J	0.00124 J	0.0161 J			0.0192		
	MW-39	Oct-16		**0.0274**	0.0145				0.00128 JB	0.0160 J	0.000867 J	0.0211			0.00146 J		
	MW-39	Apr-17		**0.0135**	0.0192				0.00275	0.101	0.00157 J	0.0113			0.00268		
	MW-39	Oct-17		**0.0148**	0.0158				0.00186 J	0.0837 J	0.000906 J	0.0169			0.00410		
	MW-40	Apr-14		0.00157 J	0.0278				<0.00100	<0.0500	<0.000700	0.0451			0.00202 J		
	MW-40	Apr-15		0.00122 J	0.0336				<0.00270	0.345 J	0.00213 J	0.0398			<0.00190		
	MW-40	Apr-16		0.00154 J	0.0392				<0.00270	0.512	0.00311 J	0.0321			<0.00190		
	MW-40	Apr-17		0.000786 J	0.0249				<0.000540	0.0151 J	0.000660 J	0.0241			**0.0704**		
	MW-41	Apr-14		0.00475 J	0.0140				<0.00100	0.0729 J	<0.000700	**0.854**			0.00163 J		
	MW-41	Apr-15		0.00591 J	0.0203 J				<0.00270	0.136 J	<0.00120	**1.01**			<0.00190		
	MW-41	Apr-16		0.00578 J	0.0210 J				<0.00270	<0.0750	<0.00120	**0.888**			<0.00190		
	MW-41	Apr-17		0.00391	0.0154				<0.000540	0.0429 J	0.000578 J	**0.737**			0.00229		
	MW-42	Apr-14		**0.0120**	0.0284				<0.00100	0.527	0.000766 J	0.189			0.00168 J		
	MW-42	Apr-15		0.00935 J	0.0242 J				<0.00270	0.136 J	<0.00120	0.171			0.00393 J		
	MW-42	Apr-16		0.00814 J	0.0274				<0.00270	0.182 J	<0.00120	0.197			<0.00190		
	MW-42	Apr-17		0.00486	0.0182				<0.000540	<0.0150	0.000252 J	0.177			0.00222		
	MW-43	Apr-15		**0.0134**	0.239				<0.00270	<0.0750	<0.00120	**0.402**	<0.000049	0.00482 J	**0.0518**		<0.000900
	MW-43	Oct-15		**0.0180**	0.108				0.00111 J	0.0583 J	0.000577 J	0.157	<0.000049	0.00465	0.000853 J		0.00386 J
	MW-43	Apr-16		**0.0106**	0.251	**1.78**	<0.000800	<0.00130	<0.00270	0.163 J	0.00151 J	**0.274**	<0.000049	0.00625 J	**0.205**	<0.00165	0.00455 J
	MW-43	Oct-16		0.00946	0.0772	**1.36**	<0.000160	<0.000260	0.00121 JB	0.0890 J	0.000510 J	0.196	<0.000049 J3	0.00666	0.0211	0.000344 J	0.00328 J
	MW-43	Apr-17		0.00987	0.100	**1.21**	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.175	<0.000049	0.00534	0.00413 B	<0.00033	0.00200 J
	MW-43	Oct-17		0.00616	0.130	**1.43**	<0.000160	<0.000260	0.000981 J	0.0345 J	0.000387 J	0.142	<0.000049	0.00700	0.0447	<0.00033	0.00261 J
	MW-59	Apr-14		**0.0324**	0.0144				<0.00100	0.164 J	<0.000700	**0.464**			0.00432 J		
	MW-59	Apr-15		**0.0172**	0.0163				<0.000540	0.163	0.000394 J	**0.465**			0.00573 J		
	MW-59	Apr-16		**0.0763**	0.113				<0.00270	0.976	<0.00120	**2.34**			<0.00190		
	MW-59	Apr-17		**0.0234**	0.0202				<0.000540	0.123	<0.000240	**0.440**			<0.000380		
	MW-60	Apr-15		0.00464 J	0.0177 J				<0.000540	0.0725 J	0.000305 J	**0.340**	<0.000049	<0.000350 B	<0.00190		0.000695 J
	MW-60	Apr-15	FD	0.00850 J	0.0177				<0.000540	0.0960 J	<0.000240	**0.335**		<0.000350 B	<0.000380 B		
	MW-60	Oct-15		0.00884	0.0167				<0.000540	0.286	0.000907 J	**0.332**	<0.000049 J	0.000645 J	0.0140		0.00128 J
	MW-60	Oct-15	FD	0.00880	0.0179				<0.000540	0.291	0.000328 J	**0.342**	<0.000049	0.000516 J	<0.000380		0.00115 J
	MW-60	Apr-16		**0.0111**	0.0203 J	0.438	<0.00500	<0.00130	<0.00270	0.105 J	<0.00120	**0.364**	<0.000049	<0.00175	<0.00190	0.00235 J	0.000910 J
	MW-60	Apr-16	FD	**0.0121**	0.0193 J	0.449	<0.00500	<0.00130	<0.00270	0.165 J	<0.00120	**0.377**	<0.000049	<0.00175	<0.00190	0.00254 J	0.00110 J

Appendix B, Table B.2 - Summary of Groundwater Analytical Data - Total Metals

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Date	Dup	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
	Analyte Group:			Total Metals													
	Units:			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	CGWSL:			0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
	CGWSL Source:			USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC Irr	WQCC HH	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
North Refinery	MW-60	Oct-16		0.00457	0.0154	0.347	<0.000160	0.000490 J	0.00133 JB	0.151 B	0.000403 J	**0.336**	<0.000049	0.00178 JB	<0.000380	0.00252 J	0.000358 J
	MW-60	Oct-16	FD	0.00478	0.0147	0.332	<0.000160	0.000589 J	0.00129 JB	0.148 B	0.000342 J	**0.339**	<0.000049	0.00135 JB	<0.000380	0.00251 J	0.000307 J
	MW-60	Apr-17		0.00595	0.0167	0.376	<0.000160	<0.000260	<0.000540	0.0568 J	<0.000240	**0.294**	<0.000049	0.000791 J	<0.000380	0.00223 J	0.000578 BJ
	MW-60	Apr-17	FD	0.00605	0.0167	0.376	<0.000160	<0.000260	<0.000540	0.0692 J	<0.000240	**0.290**	<0.000049	0.000704 J	<0.000380	0.00222 J	0.000605 BJ
	MW-60	Oct-17		0.00682	0.0185	0.567	<0.000160	0.000302 J	<0.000540	0.0449 J	0.000355 J	**0.258**	<0.000049	0.00205	0.00188 J	0.00149 J	0.000363 J
	MW-60	Oct-17	FD	0.00299	0.0186	0.613	<0.000160	<0.000260	<0.000540	0.0330 J	0.000245 J	**0.259**	<0.000049	0.00420	<0.000380	0.00144 J	0.000347 J
	MW-61	Apr-15		0.00463 J	0.0499 J				<0.00270	<0.150	<0.00240	0.00444 J			**0.168**		
	MW-61	Oct-15		0.00107 J	0.0246				0.00119 J	0.0828 J	0.00122 J	0.0416			0.00688		
	MW-61	Apr-16		<0.00125	0.0192 J				<0.00270	<0.0750	<0.00120	0.0664			0.0101		
	MW-61	Oct-16		0.000831 J	0.0223				0.00145 JB	0.0204 J	0.000914 J	0.0746			<0.000380		
	MW-61	Apr-17		0.000981 J	0.0218				0.000618 J	0.0299 J	0.000959 J	0.0352			0.00551		
	MW-61	Oct-17		0.00125 J	0.0330				0.00316	0.0342 J	0.00128 J	0.0320			**0.0519**		
	MW-62	Apr-15		**0.0136**	**9.30**				0.00149 J	0.0542 J	0.00419	0.0677			0.0187		
	MW-62	Oct-15		0.00293	0.0235				<0.000540	0.0154 J	0.000278 J	0.00266 J			0.00587		
	MW-62	Apr-16		0.00321 J	0.0390				<0.00270	<0.0750	<0.00120	<0.00125			0.00935 J		
	MW-62	Oct-16		**0.0115**	0.0252				0.000596 JB	0.0385 J	0.000715 J	0.00213 J			<0.000380		
	MW-62	Apr-17		0.00450	0.0285				<0.000540	<0.0150	0.000317 J	0.00311 J			0.00328		
	MW-62	Oct-17		0.00366	0.0312				<0.000540	0.0375 J	0.000415 J	0.000930 J			**0.0554**		
	MW-67	Apr-15		0.00371	0.140				<0.000540	0.0384 J	0.00113 J	0.0800	<0.000049	0.00198 J	0.000386 J		0.00108 J
	MW-67	Oct-15		0.00630	0.129				0.000623 J	<0.0150	0.00100 J	0.0785	<0.000049	0.000885 J	0.000445 J		0.00164 J
	MW-67	Apr-16		**0.0101**	0.229	0.471	<0.00500	<0.00130	<0.00270	<0.0750	0.00135 J	0.117	<0.000049	<0.00175	<0.00190	<0.00165	0.00139 J
	MW-67	Oct-16		**0.0103**	0.161	0.451	<0.000160	<0.000260	0.000671 JB	0.0242 J	0.00127 J	0.104	<0.000049	0.000689 J	0.000479 J	<0.00033	0.000595 J
	MW-67	Apr-17		**0.0147**	0.137	0.435	<0.000160	<0.000260	0.000612 J	0.0312 J	0.00155 J	0.0878	<0.000049	0.000780 J	0.00230	<0.00033	0.00124 BJ
	MW-67	Oct-17		**0.0103**	0.0906	0.464	<0.000160	<0.000260	0.000639 J	0.0172 J	0.00112 J	0.0986	<0.000049	0.000648 J	<0.000380	<0.00033	0.000547 J
	MW-90	Apr-15		0.00709	0.0233				<0.000540	0.473	0.000242 J	**0.345**			0.00172 J		
	MW-90	Oct-15		0.00883	0.0126				<0.000540	**1.56**	<0.000240	0.0504			0.0334		
	MW-90	Apr-16		**0.0111**	0.0140 J				<0.00270	**1.34**	<0.00120	0.166			0.00262 J		
	MW-90	Oct-16		**0.0103**	0.00945				<0.000540	0.201	0.000244 J	0.0186			**0.0663**		
	MW-90	Apr-17		0.00894	0.0159				<0.000540	**1.53**	<0.000240	0.144			0.00359 B		
	MW-90	Oct-17		0.00392	0.0152				0.000863 J	0.223	<0.000240	0.0711			0.00150 J		
	MW-91	Apr-15		0.00509	0.0940				<0.000540	0.0957 J	0.00236	0.00502			0.0138		
	MW-91	Oct-15		0.00552	0.0824				<0.000540	0.0165 J	0.00270	0.00246 J			0.0248		
	MW-91	Apr-16		0.00660 J	0.0716				<0.00270	<0.0750	0.00376 J	0.00267 J			<0.00740		
	MW-91	Oct-16		0.00880	0.0554				<0.000540	<0.0150	0.00340	0.00304 JB			0.000630 J		
	MW-91	Apr-17		0.00780	0.0532				<0.000540	0.0336 J	0.00352	0.00138 J			0.00138 BJ		
	MW-91	Oct-17		0.00586	0.0512				0.000787 J	0.0900 J	0.00312	0.00640			0.00111 J		
	MW-92	Apr-16		0.00316 J	**3.44** O1V				<0.00270	0.328 J	<0.00120	0.0363			0.00207 J		
	MW-92	Oct-16		0.00732	**2.81**				0.00101 JB	0.0744 J	0.00183 J	0.0274			0.00172 J		
	MW-93	Apr-15		0.00687 J	0.0346				0.00442 J	**1.83**	0.00126 J	**0.227**			**0.0646**		
	MW-93	Oct-15		0.00502	0.0486				0.00365	**1.29**	0.00327	0.120			**0.0709**		
	MW-93	Apr-16		**0.0137**	0.0231 J				0.00907 J	0.858	<0.00120	0.0663			0.0242		
	MW-93	Oct-16		0.00195 JJ3J6	0.0263				0.00337 B	**1.19**	0.00112 J	**0.335**			0.0119 J3J6		
	MW-93	Apr-17		0.00456	0.0228				0.00367	0.278	0.00116 J	0.0258			0.00683		
	MW-94	Oct-15		**0.0215**	**1.57**				0.00144 J	<0.0150	<0.000240	0.00194 J			0.000935 J		
	MW-94	Apr-16		**0.0286**	0.353				<0.00270	<0.0750	<0.00120	0.00666 J			<0.00190		
	MW-94	Oct-16		**0.0115**	0.635				0.00119 JB	0.0159 J	0.000255 J	0.00631			0.000962 J		
	MW-94	Apr-17		**0.0170**	0.873				0.00141 J	0.134	0.000298 J	0.00382 J			0.00304		
	MW-95	Apr-14		<0.00100	0.126				<0.00100	0.0549 J	<0.000700	0.0419			<0.00100		
	MW-95	Apr-15		0.00133 J	0.0762				<0.000540	0.0357 J	0.000477 J	0.0247			0.000381 J		
	MW-95	Apr-16		0.00175 J	0.0736				<0.00270	<0.0750	<0.00120	0.0214 J			<0.00190		
	MW-95	Apr-17		0.00173 J	0.0612				<0.000540	<0.0150	<0.000240	0.0330			0.000407 J		
	MW-96	Apr-15		0.00421	0.126				0.000816 J	0.0338 J	0.000576 J	0.00352 J			0.000731 J		
	MW-96	Oct-15		0.00397	0.158				0.000655 J	0.132	0.000953 J	0.00236 J			0.000640 J		
	MW-96	Apr-16		0.00463 J	0.155				<0.00270	<0.0750	<0.00120	0.00174 J			0.00330 J		
	MW-96	Oct-16		0.00238	0.106				<0.000540	0.0573 J	<0.000240	0.00700			0.000695 J		
	MW-96	Apr-17		0.00314	0.124				<0.000540	<0.0150	<0.000240	0.000699 J			0.00148 BJ		
	MW-96	Oct-17		0.00241	0.0709				<0.000540	0.117	<0.000240	0.00173 J			0.000629 J		
	MW-98	Apr-15		<0.00250	0.0177 J				<0.00270	<0.0750	0.00894 J	0.0192 J			**0.108**		
	MW-98	Oct-15		0.00109 J	0.0149				0.000932 J	0.0339 J	0.00659	0.0213			0.00514		
	MW-98	Apr-16		0.00199 J	0.0204 J				<0.00270	<0.0750	0.00934 J	0.0312			<0.00190		
	MW-98	Oct-16		0.00110 J	0.0150				0.000797 JB	0.0160 J	0.00734	0.0233			0.000906 J		
	MW-98	Apr-17		0.00109 J	0.0163				<0.000540	<0.0150	0.00875	0.0261			0.00227 B		
	MW-98	Oct-17		0.00082 J	0.0159				0.000791 J	0.126	0.00929	0.0280			0.000620 J		
	MW-137	Oct-15		**0.0525**	0.127				0.00326	**1.63**	0.00596	0.120	<0.000049	0.00874	0.00218		0.00904
	MW-137	Apr-16		**0.0893**	0.0567	**0.982**	<0.00500	<0.00130	<0.00270	0.0953 J	0.00601 J	0.144	<0.000049	0.0101	0.00327 J	<0.00165	0.00840 J
	MW-137	Oct-16		**0.0345**	0.0453	**0.799**	<0.000160	<0.000260	0.000628 JB	0.0169 J	0.00436	0.120	<0.000049	0.00652	0.00368	<0.00033	0.00529
	MW-137	Apr-17		**0.0496**	0.0564	**0.752**	<0.000160	<0.000260	<0.000540	<0.0150	0.00408	0.113	<0.000049	0.00689	0.00397 B	<0.00033	0.00580
	MW-137	Oct-17		**0.0156**	0.0756	**1.03**	<0.000160	<0.000260	0.00109 J	0.260	0.00338	**0.209**	<0.000049	0.0198	0.0393	<0.00033	0.00771
	MW-138	Oct-15		0.00728	0.131				0.00218	**2.54**	0.00195 J	**0.249**	<0.000049	0.00420	0.000743 J		0.00705
	MW-138	Apr-16		0.00777 J	0.220	**1.56**	<0.00500	<0.00130	<0.00270	0.221 J	<0.00120	0.164	<0.000049	0.00598 J	<0.00190	<0.00165	0.00531 J
	MW-138	Oct-16		0.00609	0.0947	**1.01**	<0.000160	<0.000260	0.000775 JB	0.0178 J	0.000407 J	0.143	<0.000049	0.00523	0.00284	<0.00033	0.00306 J
	MW-138	Apr-17		0.00569	0.130	**1.01**	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.111	<0.000049	0.00546	0.00267 B	<0.00033	0.00269 J
	MW-138	Oct-17		0.00507	0.103	**1.11**	<0.000160	<0.000260	0.000747 J	0.0334 J	0.000271 J	0.0931	<0.000049	0.00619	0.00945	<0.00033	0.00195 J
	RW-1	Apr-15		0.00607	0.0305				0.00290	0.216	0.000495 J	0.126			0.00302 J		
	RW-1R	Apr-16		0.00695 J	0.0414				<0.00270	**17.1**	0.00149 J	**0.317**			0.00246 J		
	RW-1R	Apr-17		**0.0359**	0.0243				0.00254	**4.88**	0.00492	**0.240**			0.00573 B		
	RW-2	Apr-15		**0.0264**	0.0245 J				0.00553 J	0.381 J	0.00233 J	**0.313**			**0.0705**		
	RW-2R	Apr-16		0.00552 J	0.171				0.00750 J	**2.25**	**0.0153**	0.0705			**0.422**		
	RW-2R	Apr-17		0.00504	0.0566				0.00173 J	0.264	0.000960 J	0.0161			0.0100		
	RW-7	Apr-15		0.00239 J	0.508				<0.00270	0.0976 J	<0.00120	0.0280			<0.00190		
	RW-7R	Apr-16		**0.0154**	0.0293				<0.00270	**1.09**	<0.00120	**1.22**			<0.00190		
	RW-7R	Apr-17		0.00332	0.0198				<0.000540	0.183	<0.000240	**1.13**			<0.000380		
	RW-8	Apr-15		0.00556 J	0.0889				<0.00270	0.427 J	<0.00120	0.0556			0.00200 J		
	RW-8	Apr-17		**0.0343**	0.0593				0.00135 J	**9.50**	0.00169 J	**1.12**			<0.000380		
	RW-9	Apr-14		0.00434 J	0.0470				<0.00100	0.942	<0.000700	**0.417**			0.00250 J		
	RW-9	Apr-15		0.00392	0.0397				0.00102 J	0.257	0.000449 J	**0.460**			0.0144		
	RW-9	Apr-16		0.00476 J	0.0550				<0.00270	0.169 J	<0.00120	**0.441**			0.00735 J		
	RW-9	Apr-17		0.00338	0.0378				<0.000540	<0.0150	<0.00120	**0.784**			0.0217		
	RW-10	Apr-14		0.00174 J	0.0185				<0.00100	**5.22**	<0.000700	**0.217**			0.00143 J		
	RW-10	Apr-15		0.00171 J	0.0258				0.000561 J	0.454	<0.000240	**0.237**			0.00517		
	RW-10	Apr-16		0.00175 J	0.0372				<0.00270	**1.27**	<0.00120	**0.266**			0.0404		
	RW-10	Apr-17		0.00167 J	0.0184				<0.000540	0.0250 J	0.000433 J	0.173			<0.000380		
	RW-16	Apr-14		**0.0127**	0.0141				<0.00100	0.174 J	0.000789 J	**0.576**			0.00272 J		
	RW-16	Apr-14	FD	**0.0132**	0.0147				<0.00100	0.184 J	<0.000700	**0.596**			0.00278 J		
	RW-16	Apr-15		**0.0171**	0.0138 J				<0.00270	<0.0750	<0.00120	**0.421**			<0.00190		
	RW-16	Apr-16		**0.0115**	0.0138 J				<0.00270	<0.0750	<0.00120	**0.406**			0.0223		
	RW-16	Apr-17		**0.0129**	0.0126				0.00108 J	0.0227 J	0.00125 J	**0.263**			0.00658		
	RW-17	Apr-14		0.00888	0.0228				<0.00100	0.471	**0.0190**	**0.675**			0.00156 J		
	RW-17	Apr-15		**0.0111**	0.0274				<0.00270	0.0850 J	0.00425 J	0.121			0.0361		
	RW-17	Apr-16		**0.0522**	0.119				<0.00270	0.197 J	**0.0385**	**3.55**			**0.0714**		
	RW-17	Apr-17		**0.0113**	0.0223				0.000584 J	0.0569 J	0.0106	**0.719**			0.0106		

Appendix B, Table B.2 - Summary of Groundwater Analytical Data - Total Metals

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Total Metals													
				Analyte:	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC Irr	WQCC HH	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
North RO Reject Field	MW-117	Apr-15		0.00249 J	0.0162 J				<0.00270	0.492 J	<0.00120	0.00809 J			0.0168		
	MW-117	Oct-15		0.00351	0.0214				0.00364	**1.42**	0.00113 J	0.0149			0.00486		
	MW-117	Apr-16		0.00266 J	0.0186 J				<0.00270	0.684	<0.00120	0.0103 J			0.00857 J		
	MW-117	Oct-16		0.00312	0.0249				0.00417 B	**1.57**	0.00137 J	0.0171			0.00403		
	MW-117	Apr-17		0.00255	0.0197				0.00209	**1.11**	0.000901 J	0.0147			0.00349 B		
	MW-117	Oct-17		0.00238	0.0177				0.00279	**1.15**	0.000777 J	0.0110			0.00982		
	MW-118	Apr-15		0.00977 J	0.0180 J				<0.00270	0.253 J	0.00175 J	0.00454 J			0.00863 J		
	MW-118	Oct-15		**0.0117**	0.0131				0.00137 J	0.155	0.000329 J	0.00223 J			0.00509		
	MW-118	Apr-16		**0.0108**	0.0139 J				<0.00270	0.426 J	<0.00120	0.00480 J			0.00645 J		
	MW-118	Oct-16		**0.0117**	0.0111				0.000649 JB	0.0658 J	<0.000240	0.000302 J			0.0156		
	MW-118	Apr-17		**0.0105**	0.00910				<0.000540	0.0337 J	<0.000240	0.000670 J			0.0222		
	MW-118	Oct-17		**0.0109**	0.00884				0.000983 J	<0.0150	<0.000240	<0.000250			0.0196		
	MW-119	Apr-15		0.00398 J	0.0156 J				<0.00270	0.309 J	<0.00120	0.0151 J			<0.00190		
	MW-119	Oct-15		0.00417	0.0105				0.000744 J	0.0886 J	<0.000240	0.00485 J			0.00189 J		
	MW-119	Apr-16		0.00315 J	0.00645 J				<0.00270	<0.0750	<0.00120	<0.00125			0.00259 J		
	MW-119	Oct-16		0.00404	0.00979				<0.000540	0.0660 J	<0.000240	0.00190 J			0.00334		
	MW-119	Apr-17		0.00376	0.00966				<0.000540	0.0438 J	<0.000240	0.00331 J			0.00442		
	MW-119	Oct-17		0.00513	0.0108				0.000757 J	0.0324 J	<0.000240	0.00324 J			0.00145 J		
NCL	MW-18	Apr-14		0.00313 J	0.0168				<0.00100	0.146 J	<0.000700	0.0203	<0.000049	0.00151 J	0.0112		0.0172
	MW-18	Apr-15		0.00321	0.0167				0.00108 J	<0.0150	<0.000240	0.00671	<0.000049	0.00120 J	0.00947		0.0147
	MW-18	Apr-16		0.00395 J	0.0207 J	**1.36**	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	0.0157 J	<0.000049	<0.00350	0.0153	**0.0480** J	0.0200 J
	MW-18	Apr-17		0.00365	0.0183	**1.71**		0.000321 J	0.00222	<0.0150	<0.000240	0.00474 JB	<0.000049	0.00120 J	0.0151	0.0250	0.0195
	MW-45	Apr-15		0.00395	0.0185				<0.000540	**1.66**	0.00527	**0.534**	<0.000049	0.00666	<0.000380		0.000411 J
	MW-45	Oct-15		0.00373	0.0216				0.000591 J	0.600	0.00667	**0.551**	<0.000049	0.00472	<0.000380		0.00118 J
	MW-45	Apr-16		0.00752 J	0.0191 J	0.671	<0.00500	<0.00130	<0.00270	**4.14**	0.00443 J	**0.633**	<0.000049	0.00631 J	<0.00190	<0.00165	0.00188 J
	MW-45	Oct-16		0.00346	0.0182	0.636	<0.000160	<0.000260	<0.000540	0.942	0.000647 J	**0.576**	<0.000049	0.00513 B	<0.000380	0.000909 J	0.000251 J
	MW-45	Apr-17		0.00404	0.0162	0.514	<0.000160	<0.000260	<0.000540	**1.29**	<0.000240	**0.582**	<0.000049	0.00558	<0.000380	0.00109 J	0.000466 J
	MW-45	Oct-17		0.00460	0.0154	0.675	<0.000160	<0.000260	<0.000540	**2.27**	0.00143 J	**0.583**	<0.000049	0.00569	<0.000380	0.000671 J	0.000377 J
	MW-53	Apr-14		0.00217 J	0.0232				<0.00100	<0.00500	<0.000700	**0.778**			0.00141 J		
	MW-53	Apr-15		0.00179 J	0.0256				<0.000540	0.0338 J	0.000252 J	**1.20**			0.00566		
	MW-53	Apr-16		0.00193 J	0.0308				<0.00270	<0.0750	<0.00120	**1.07**			0.00617 J		
	MW-53	Apr-17		0.00166 J	0.0201				<0.000540	<0.0150	<0.000240	**1.60**			0.00281		
	MW-54A	Apr-15		0.00312	0.0173				<0.000540	0.0537 J	<0.000240	**0.450**			0.000509 J		
	MW-54A	Oct-15		0.00312	0.0192				0.000898 J	<0.0150	0.00110 J	**0.488**			0.00126 J		
	MW-54A	Apr-16		0.00343 J	0.0189 J				<0.00270	<0.0750	<0.00120	**0.512**			<0.00190		
	MW-54A	Oct-16		0.00236	0.0158				<0.000540	<0.0150	<0.000240	**0.437**			0.000709 J		
	MW-54A	Apr-17		0.00464	0.0147				<0.000540	0.227	<0.000240	**0.456**			<0.000380		
	MW-54A	Oct-17		0.00375	0.0184				<0.000540	0.0535 J	<0.000240	**0.506**			0.000562 J		
	MW-54B	Apr-13		<0.00500	0.0183				<0.00500	<0.200	<0.00500	0.145			<0.00500		
	MW-54B	Apr-15		0.00220	0.0165				<0.000540	0.0520 J	<0.000240	0.165			0.000400 J		
	MW-54B	Apr-17		0.00181 J	0.0158				<0.000540	<0.0150	<0.000240	**0.253**			0.000720 J		
	MW-55	Apr-15		0.00457	0.0110				0.00108 J	0.0483 J	<0.000240	0.139	<0.000049	0.00268	0.0190		0.0147
	MW-55	Oct-15		0.00582	0.0128				0.00104 J	<0.0150	<0.000240	0.0468	<0.000049	0.00168 J	0.00934		0.0189
	MW-55	Apr-16		0.00933 J	0.0157 J	**1.31**	0.000891 J	0.00141 J	<0.00270	0.128 J	0.00168 J	0.151	5.14E-05 J	<0.00350	0.00896 J	**0.0460** J	0.0244 J
	MW-55	Oct-16		0.00543	0.0140	**1.21**	<0.000160	0.000680 J	0.00168 J	0.0587 JB	0.000582 J	0.113	5.31E-05 J	0.00314 B	0.00746	**0.0335**	0.0170
	MW-55	Apr-17		0.00565	0.0128	**0.829**	<0.000160	0.000407 J	<0.000540	0.0222 J	<0.000240	0.0682	<0.000049	0.00552	0.00436	**0.0406**	0.0192
	MW-55	Oct-17		0.00566	0.0123	**1.52**	<0.000160	0.000827 J	0.00121 J	0.0843 J	<0.000240	0.167	<0.000049	0.00562	0.00703	**0.0466**	0.0204
	MW-56	Apr-15		0.00727	0.0143				<0.000540	0.0230 J	0.000739 J	**0.293**			0.00372		
	MW-56	Oct-15		0.00731	0.0166				<0.000540	<0.0150	0.000392 J	**0.321**			0.00491		
	MW-56	Apr-16		0.00777 J	0.0203 J				<0.00270	<0.0750	<0.00120	**0.373**			0.00381 J		
	MW-56	Oct-16		0.00721	0.0138				<0.000540	<0.0150	0.000540 J	**0.282**			0.00125 J		
	MW-56	Apr-17		0.00642	0.0157				<0.000540	<0.0150	0.000467 J	**0.320**			0.00325		
	MW-108	Apr-15		0.00462	0.0387				0.00259	0.0411 J	0.00155 J	0.0256			<0.000380		
	MW-108	Oct-15		0.00399	0.0482				0.00226	0.0288 J	0.00157 J	0.0239			0.00234		
	MW-108	Apr-16		0.00454 J	0.481				<0.00270	0.206 J	0.00209 J	0.0501			<0.00190		
	MW-108	Oct-16		**0.0102**	0.0462				0.00732	**3.13**	0.0101	0.182			0.00126 J		
	MW-108	Apr-17		0.00252	0.0366				0.00124 J	0.0538 J	0.00145 J	0.0412			<0.000380		
	MW-108	Oct-17		0.00251	0.0495				0.00210	0.441	0.00199 J	0.0395			0.00201		
	NCL-31	Apr-15		0.00847	0.0224				0.000989 J	0.834	0.000803 J	**1.70**			<0.000380		
	NCL-31	Oct-15		0.00655	0.0334				0.00175 J	**1.49**	0.00140 J	**2.28**			<0.000380		
	NCL-31	Apr-16		0.00495 J	0.0241 J				<0.00270	0.838	<0.00120	**1.85**			<0.00190		
	NCL-31	Oct-16		**0.0428**	0.0220				0.000711 JB	**1.04**	0.000493 J	**2.48**			<0.000380		
	NCL-31	Apr-17		0.00975	0.0152				<0.000540	0.446	0.000330 J	**2.19**			0.000525 J		
	NCL-31	Oct-17		**0.0122**	0.0140				<0.000540	0.978	<0.000240	**2.26**			<0.000380		
	NCL-32	Apr-15		0.00446 J	0.0556				0.00960 J	**1.39**	**0.0167**	**0.968**			<0.00190		
	NCL-32	Oct-15		0.00653	0.129				0.0280	**4.57**	**0.0289**	**1.34**			0.000884 J		
	NCL-32	Apr-16		**0.0108**	0.227				**0.0660**	**9.75**	**0.0681**	**1.77**			<0.00190		
	NCL-32	Oct-16		0.00428	0.0254				0.00312	0.407 B	0.00296	**1.06**			0.00138 J		
	NCL-32	Apr-17		0.00358	0.0195				0.00114 J	0.116	0.00127 J	**0.988**			0.00124 J		
	NCL-32	Oct-17		0.00304	0.0166				<0.000540	0.0488 J	0.000454 J	**1.11**			0.00207		
	NCL-33	Apr-15		0.00407 J	0.0247 J				<0.00270	**2.26**	0.00569 J	0.108			<0.00190		
	NCL-33	Oct-15		0.00385	0.0274				<0.000540	**2.49**	0.000259 J	0.117			0.000519 J		
	NCL-33	Apr-16		0.00444 J	0.0246 J				<0.00270	0.770	<0.00120	0.188			<0.00190		
	NCL-33	Oct-16		0.00593	0.0224				0.00187 J	**1.93**	0.000459 J	0.128			0.00217		
	NCL-33	Apr-17		0.00302	0.0194				<0.000540	**1.12**	0.000288 J	0.135			0.000546 J		
	NCL-33	Oct-17		0.00325	0.0201				0.000552 J	**1.67**	<0.000240	0.138			0.000672 J		
	NCL-34A	Apr-15		<0.00120	0.547				<0.00270	<0.0750	0.00183 J	0.0369			<0.00190		
	NCL-34A	Oct-15		0.00218 J	0.382				<0.00270	<0.0750	0.00136 J	0.0420			0.00641 J		
	NCL-34A	Apr-16		0.00184 J	0.854				<0.00270	<0.0750	<0.00120	0.0185 J			<0.00190		
	NCL-34A	Oct-16		0.000745 J	0.370				<0.000540	<0.0150	<0.000240	0.0279			0.0142		
	NCL-34A	Apr-17		0.000829 J	0.458				<0.000540	<0.0150	<0.000240	0.0146			<0.000380		
	NCL-34A	Oct-17		0.000562 J	0.338				0.00104 J	0.0445 J	0.00105 J	0.0224			<0.000380		
	NCL-44	Apr-15		**0.0617**	0.0311				<0.00270	**1.47**	0.00123 J	**0.703**			<0.00190		
	NCL-44	Oct-15		**0.0700**	0.0306				0.00105 J	**2.09**	0.000414 J	**0.723**			<0.000380		
	NCL-44	Apr-16		**0.0459**	0.0371				<0.00270	**1.82**	<0.00120	**1.11**			<0.00190		
	NCL-44	Oct-16		**0.0490**	0.0276				0.00165 JB	**1.78**	0.000521 J	**0.896**			0.000394 J		
	NCL-44	Apr-17		**0.0348**	0.0269				0.00235	0.953	0.00102 J	**0.860**			<0.000380		
	NCL-44	Oct-17		**0.0479**	0.0252				0.00122 J	**1.61**	0.000413 J	**0.896**			0.000416 J		
	NCL-49	Apr-15		0.00151 J	0.0109				<0.000540	0.0232 J	0.000252 J	0.00215 J			0.00279		
	NCL-49	Apr-15	FD	0.00145 J	0.0106				<0.000540	<0.0150	<0.000240	0.00146 J			0.00281		
	NCL-49	Oct-15		0.00218	0.0118				<0.000540	<0.0150	<0.000240	0.000528 J			0.00363		
	NCL-49	Oct-15	FD	0.00208	0.0116				<0.000540	<0.0150	<0.000240	0.000279 J			0.00365		
	NCL-49	Apr-16		0.00188 J	0.0150 J				<0.00270	<0.0750	<0.00120	<0.00125			0.00518 J		
	NCL-49	Apr-16	FD	0.00178 J	0.0134 J				<0.00270	<0.0750	<0.00120	<0.00125			0.00483 J		
	NCL-49	Oct-16		0.00156 J	0.0116				<0.000540	<0.0150	<0.000240	0.000460 JB			0.00551		
	NCL-49	Oct-16	FD	0.00137 J	0.0117				<0.000540	<0.0150	<0.000240	0.000493 JB			0.00549		
	NCL-49	Apr-17		0.00151 J	0.0118				<0.000540	<0.0150	<0.000240	0.000320 J			0.00871		
	NCL-49	Apr-17	FD	0.00149 J	0.0115				<0.000540	<0.0150	<0.000240	0.000263 J			0.00924		
	NCL-49	Oct-17		0.00142 J	0.0113				0.000635 J	0.0590 J	<0.000240	<0.000250			0.0111		
	NCL-49	Oct-17	FD	0.00163 J	0.0121				0.000649 J	0.0255 J	<0.000240	<0.000250			0.0110		

Appendix B, Table B.2 - Summary of Groundwater Analytical Data - Total Metals

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Total Metals													
				Analyte:	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC Irr	WQCC HH	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
South Refinery	KWB-2R	Apr-15		0.00281	0.274				0.000702 J	0.329	0.00468	**0.356**			<0.000380		
	KWB-2R	Oct-15		0.00390	0.259				0.000641 J	0.0295 J	0.00195 J	0.0529			<0.000380		
	KWB-2R	Apr-16		0.00401 J	0.0326				<0.00270	0.883	<0.00120	**0.898**			0.00551 J		
	KWB-2R	Oct-16		0.00325	0.0343				0.00113 JB	0.465	0.000548 J	**0.609**			<0.000380		
	KWB-2R	Apr-17		0.00152 J	0.0271				<0.000540	0.0346 J	0.000273 J	**0.564**			<0.000380		
	KWB-2R	Oct-17		0.00258	0.324				<0.000540	0.0522 J	0.00130 J	0.0596			<0.000380		
	KWB-5	Apr-15		**0.0225**	**3.42**				<0.000540	**3.39**	0.000632 J	**1.57**			<0.000380		
	KWB-5	Oct-15		**0.0209**	**3.65**				<0.000540	**3.22**	0.000340 J	**1.59**			<0.000380		
	KWB-5	Apr-16		**0.0252**	**3.63**				<0.00270	**4.28**	<0.00120	**1.82**			<0.00190		
	KWB-5	Oct-16		**0.0212**	**3.82**				<0.000540	**3.13**	<0.000240	**1.60**			<0.000380		
	KWB-5	Apr-17		**0.0219**	**3.49**				<0.000540	**4.43**	<0.000240	**1.81**			0.000511 BJ		
	KWB-5	Oct-17		**0.0202**	**5.06**				<0.000540	**2.11**	0.000287 J	**1.64**			<0.000380		
	KWB-6	Apr-15		0.00621	0.294				<0.000540	0.870	0.00182 J	**2.16**			<0.000380		
	KWB-6	Oct-15		**0.0124**	0.136				<0.000540	0.558	0.00137 J	**2.04**	<0.000049	0.00186 J	<0.000380		0.00239 J
	KWB-6	Apr-16		0.00703 J	0.327				<0.00270	0.546	0.00143 J	**2.55**			<0.00190		
	KWB-6	Oct-16		0.00915	0.0891				0.000950 JB	0.303	0.00103 J	**1.87**			<0.000380		
	KWB-6	Apr-17		0.00406	0.152				<0.000540	0.152	0.000533 J	**1.91**			<0.000380		
	KWB-6	Oct-17		0.00898	0.0998				<0.000540	0.250	0.000661 J	**2.15**			<0.000380		
	MW-28	Apr-15		0.00912 J	0.0772				0.000931 J	0.0712 J	0.0110	0.0685	<0.000049	0.00489	0.0204 J		0.00634
	MW-28	Oct-15		0.00936	0.0484				0.000931 J	0.0744 J	0.0136	0.0261	<0.000049	0.00360	0.0205		0.00557
	MW-28	Apr-16		**0.0610**	0.331	**1.23**	<0.00500	<0.00130	0.00274 J	0.342 J	**0.0520**	0.164	<0.000049	0.0226	0.00220 J	<0.00165	0.0158 J
	MW-28	Oct-16		**0.0154**	0.0424	**1.27**	<0.000160	0.000289 J	0.00213 B	0.0951 JB	**0.0168**	0.0375	<0.000049	0.00387 B	0.000605 J	<0.00033	0.00701
	MW-28	Apr-17		0.00674	0.0462	**1.21**	<0.000160	<0.000260	0.000618 J	0.0779 J	0.0130	0.0624	<0.000049	0.0484	0.0491	0.000382 J	0.00329 J
	MW-28	Oct-17		0.00777	0.0492	**1.39**	<0.000160	<0.000260	0.00947	0.0870 J	0.00855	0.0417	<0.000049	0.00719	<0.000380	<0.00033	0.00227 J
	MW-48	Apr-15		0.00400	0.0204 J				<0.000540	0.562	0.000320 J	0.0948 J			<0.000380 B		
	MW-48	Oct-15		**0.0108**	0.367				0.000690 J	0.131	0.00215	**1.24**			0.00487		
	MW-48	Apr-16		**0.0125**	**2.77**				<0.00270	0.177 J	0.00371 J	**0.390**			<0.00190		
	MW-48	Oct-16		**0.0107**	**1.18**				0.00119 JB	0.166	0.00173 J	**0.565**			0.000520 J		
	MW-48	Apr-17		0.00786	**2.54**				<0.000540	0.0884 J	0.00150 J	**0.210**			0.000838 BJ		
	MW-48	Oct-17		0.00558	**1.81**				0.000835 J	0.141	0.00166 J	**0.286**			**0.0669**		
	MW-50	Apr-15		0.00138 J	0.0226				<0.000540	0.471	0.00102 J	**1.53**			<0.000380		
	MW-50	Oct-15		0.00166 J	0.0219				<0.000540	0.0271 J	0.000889 J	**1.37**			0.000495 J		
	MW-50	Apr-16		0.00234 J	0.0141 JB				<0.00270	0.0916 J	<0.00120	**0.214**			**0.0994**		
	MW-50	Oct-16		0.00434	0.0207				<0.000540	0.160	0.000413 J	**0.295**			**0.0704**		
	MW-50	Apr-17		0.00210	0.0137				<0.000540	0.0253 J	<0.000240	**0.433**			0.0485		
	MW-50	Oct-17		0.00250	0.0142				<0.000540	0.0340 J	<0.000240	**0.494**			0.0436		
	MW-52	Apr-15		0.00318	0.00980				<0.000540	0.0256 J	<0.000240	0.0478	<0.000049	0.00625	<0.000380 B		0.0253
	MW-52	Oct-15		0.00429	0.0129				0.000582 J	0.0180 J	<0.000240	0.0446	<0.000049	0.00684	0.00187 J		0.0262
	MW-52	Apr-16		**0.0193**	0.0436	0.736	<0.00500	0.00155 J	<0.00270	0.158 J	<0.00120	**0.230**	<0.000049	0.0263	0.00545 J	**0.0438** J	**0.123**
	MW-52	Oct-16		0.00343	0.0104	0.718	<0.000160	0.000423 J	0.000547 JB	<0.0150	<0.000240	0.0484	<0.000049 J3	0.00810	0.00179 J	0.0105	0.0243
	MW-52	Apr-17		0.00368	0.0101	0.702	<0.000160	0.000503 J	<0.000540	0.0447 J	<0.000240	0.0659	<0.000049	0.00798	0.00178 J	0.00976 J	0.0269
	MW-52	Oct-17		0.00363	0.0113	**0.852**	<0.000160	0.000429 J	<0.000540	0.0245 J	<0.000240	0.0774	<0.000049	0.00817	0.00607	0.0124	0.0246
	MW-64	Apr-16		**0.0333**	**2.26**				<0.00270	<0.0750	0.00187 J	0.0599			<0.00190		
	MW-64	Oct-16		**0.0302**	**2.41**				0.000897 JB	0.0566 JB	0.00105 J	0.0480			0.000493 J		
	MW-64	Apr-17		**0.0346**	**2.00**				<0.000540	0.151	0.000997 J	0.0515			0.000642 J		
	MW-64	Oct-17		**0.0317**	**2.10**				<0.000540	0.139	0.00101 J	0.0571			0.000523 J		
	MW-65	Apr-15		**0.0186**	**3.08**				<0.000540	**2.88**	0.00153 J	**0.790**			<0.000380		
	MW-65	Apr-16		**0.0142**	**3.42** V				<0.00270	**2.09**	0.00124 J	**0.748** V			<0.00190		
	MW-65	Oct-16		**0.0120**	**2.97**				0.00121 JB	**1.66**	0.00103 J	**0.605**			<0.000380		
	MW-65	Apr-17		**0.0108**	**3.01**				<0.000540	**1.58**	0.000874 J	**0.593**			<0.000380		
	MW-65	Oct-17		**0.0113**	**3.03**				<0.000540	**2.16**	0.00128 J	**0.568**			<0.000380		
	MW-66	Apr-15		0.00298	**2.35**				<0.000540	0.635	0.000902 J	0.189	<0.000049	0.00613	<0.000380		0.000941 J
	MW-66	Oct-15		0.00370	**2.00**				<0.000540	0.792	0.000430 J	**0.220**	<0.000049	0.00743	<0.000380		0.00175 J
	MW-66	Apr-16		**0.0148**	**12.7**	0.378	<0.00500	<0.00130	0.00289 J	**4.74**	0.00659 J	**1.13**	<0.000049	0.121	<0.00190	<0.00165	0.00670 J
	MW-66	Oct-16		0.00269	**1.88**	0.283	<0.000160	<0.000260	0.000733 JB	0.717	0.000342 J	**0.216**	<0.000049 J3	0.00497	<0.000380	<0.00033	0.000342 J
	MW-66	Apr-17		0.00255	**2.22**	0.263	<0.000160	<0.000260	<0.000540	0.773	0.000592 J	0.193	<0.000049	0.00829	0.0134	<0.00033	0.000535 BJ
	MW-66	Oct-17		0.00282	**1.81**	0.314	<0.000160	<0.000260	0.00128 J	**1.02**	0.00453	**0.288**	<0.000049	0.00602	<0.000380	<0.00033	0.00169 J
	MW-99	Apr-15		0.00289	0.159				0.000639 J	0.457	0.00571	0.0802			0.000808 J		
	MW-99	Oct-15		0.00812	0.279				0.000832 J	0.382	0.00153 J	0.191			<0.000380		
	MW-99	Apr-16		**0.0491**	**5.05**				0.00682 J	**4.55**	**0.0193**	**1.20**			<0.00190		
	MW-99	Oct-16		0.00635	**1.14**				0.00128 JB	0.208	0.00150 J	**0.354**			<0.000380		
	MW-99	Apr-17		0.00772	0.297				<0.000540	0.204	0.00116 J	**0.243**			**0.0857**		
	MW-99	Oct-17		0.00865	0.221				<0.000540	0.0585 J	0.000379 J	**0.232**			<0.000380		
	MW-101	Apr-15		**0.0939**	0.0501				0.000581 J	**3.58**	<0.000240	**1.08**			<0.000380		
	MW-101	Oct-15		**0.0560**	0.0382				<0.000540	**2.59**	<0.00240	**1.13**			0.00344 J		
	MW-101	Apr-16		**0.0293**	0.0898				<0.00270	**1.38**	<0.00120	**1.34**			<0.00190		
	MW-101	Oct-16		**0.0783**	0.0366				0.00145 JB	**2.56**	0.000266 J	**1.06**			<0.000380		
	MW-101	Apr-17		**0.0659**	0.0732				<0.000540	**1.18**	<0.000240	**1.18**			<0.000380		
	MW-101	Oct-17		**0.0824**	0.0472				0.0137	**2.99**	0.000670 J	**1.21**			0.00139 J		
	MW-102	Apr-15		0.0100	**6.21**				<0.000540	0.138	0.00344	0.0431			<0.000380		
	MW-102	Oct-15		**0.0123**	0.423				0.00106 J	0.0723 J	0.00263	0.0273			0.000393 J		
	MW-102	Apr-16		**0.0117**	**7.71**				<0.00270	0.222 J	0.00339 J	0.0308			<0.00190		
	MW-102	Oct-16		**0.0132**	0.427				0.00200 B	0.0940 JB	0.00223	0.0214			<0.000380		
	MW-102	Apr-17		**0.0123**	**5.06**				<0.000540	0.201	0.00242	0.0231			0.000673 BJ		
	MW-102	Oct-17		**0.0135**	**5.52**				0.00110 J	**1.12**	0.00254	0.0176			0.000450 J		
	MW-103	Apr-14		0.00270 J	**1.47**				<0.00100 B	<0.0500	<0.000700 B	0.00278 J			<0.00100		
	MW-103	Apr-15		0.00617 J	**9.36**				<0.0110	<0.300	<0.00480	0.0125 J			**0.0607** J		
	MW-103	Apr-16		0.00594 J	**26.8**				<0.00270	<0.0750	0.00148 J	0.0262			<0.00190		
	MW-103	Apr-17		0.00848 J	**8.12**				<0.0108	<0.300	<0.00480	0.00689 J			<0.00760		
	MW-104	Apr-15		0.00041 J	0.0195				<0.000540	0.0945 J	0.000364 J	0.0228			<0.000380		
	MW-104	Apr-15	FD	0.00040 J	0.0196				<0.000540	0.0490 J	<0.000240	0.0217			<0.000380		
	MW-104	Oct-15		0.00150 J	0.0229				0.000591 J	0.0385 J	<0.000240	0.0148			<0.000380		
	MW-104	Oct-15	FD	0.00149 J	0.0218				<0.000540	<0.0150	<0.000240	0.0142			<0.000380		
	MW-104	Apr-16		0.00165 J	0.0343 O1				<0.00270	<0.0750	<0.00120	0.0113 J			<0.00190 J3J6		
	MW-104	Apr-16	FD	0.00195 J	0.0319				<0.00270	<0.0750	<0.00120	0.00995 J			<0.00190		
	MW-104	Oct-16		**0.0164**	0.0293				0.00128 JB	0.0150 JB	<0.000240	0.00278 J			<0.000380		
	MW-104	Oct-16	FD	**0.0194**	0.0290				0.00132 JB	0.0190 JB	<0.000240	0.00277 J			<0.000380		
	MW-104	Apr-17		**0.0551**	0.0438				<0.000540	0.0283 J	<0.000240	0.00109 J			<0.000380		
	MW-104	Apr-17	FD	**0.0570**	0.0451 O1				<0.000540	<0.0150	<0.000240	0.00134 J			0.00166 BJ		
	MW-104	Oct-17		**0.0584**	0.0430				<0.000540	0.0218 J	<0.000240	0.00326 J			<0.000380		
	MW-104	Oct-17	FD	**0.0602**	0.0446				0.000624 J	0.0247 J	<0.000240	0.00416 J			<0.000380		
	MW-105	Apr-15		0.00662	0.108				0.00184 J	**2.55**	0.00279	0.105			<0.000380		
	MW-105	Oct-15		0.00849	0.214				0.00221	**1.07**	0.00562	0.0917			0.0108 J		
	MW-105	Apr-16		**0.0197**	**1.31**				<0.00270	0.286 J	0.00176 J	0.195			0.00947 J		
	MW-105	Oct-16		**0.0121**	**1.15**				0.00154 JB	0.265	0.00118 J	0.117			<0.000380		
	MW-105	Apr-17		**0.0123**	**2.63**				0.00150 J	0.151	0.00143 J	0.0622			0.0357		
	MW-105	Oct-17		**0.0237**	**1.23**				0.00900	0.492	0.00112 J	0.0657			0.000624 J		
	MW-106	Apr-15		0.00491	0.0890				0.00283	**1.16**	**0.0296**	0.147			0.00957		
	MW-106	Oct-15		0.00726	0.0451				0.00385	0.650	0.00907	0.0119			0.00522		
	MW-106	Apr-16		**0.0150**	0.0379				<0.00270	<0.0750	0.00274 J	0.0113 J			<0.00190		
	MW-106	Oct-16		**0.0152**	0.0232				0.00143 JB	0.0422 JB	0.00305 B	0.00515 B			0.000476 J		
	MW-106	Apr-17		**0.0114**	0.0259				<0.000540	<0.0150	0.00133 J	0.00658			0.00216 B		
	MW-106	Oct-17		**0.0105**	0.0263				0.0111	0.119	0.00271	0.00542			0.00731		

Appendix B, Table B.2 - Summary of Groundwater Analytical Data - Total Metals

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Total Metals													
				Analyte:	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC Irr	WQCC HH	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
Area	**Well ID**	**Date**	**Dup**															
South Refinery	MW-107	Apr-15		**0.0107**	**1.75**				<0.000540	0.787	0.000331 J	0.158			<0.000380 B		
	MW-107	Oct-15		0.00883	**1.55**				0.000625 J	0.368	0.000259 J	0.178			<0.000380		
	MW-107	Apr-16		0.0100	**10.2**				0.00340 J	**1.78**	0.00200 J	**0.454**			<0.00190		
	MW-107	Oct-16		0.00388	**1.30**				0.000930 JB	0.158	0.000595 J	0.0896			<0.000380		
	MW-107	Apr-17		0.00143 J	**1.99**				<0.000540	**5.17**	0.000437 J	0.105			0.0145		
	MW-109	Apr-15		0.00554	0.101				<0.000540	0.154	<0.000240	0.140 J			<0.000380 B		
	MW-109	Oct-15		0.00134 J	0.112				0.000783 J	0.102	0.000334 J	0.127			0.00328		
	MW-109	Apr-16		**0.0331**	0.299				<0.00270	0.677	0.00147 J	**0.624**			<0.00190		
	MW-109	Oct-16		0.00269	0.0617				<0.000540	0.0900 J	<0.000240	0.0821			<0.000380		
	MW-109	Apr-17		0.00176 J	0.0479				<0.000540	0.0422 J	<0.000240	0.0425			<0.000380		
	MW-109	Oct-17		0.00146 J	0.0605				0.000611 J	0.0514 J	<0.000240	0.0413			0.000784 J		
	MW-110	Apr-15		0.00924	0.0617				0.000649 J	0.379	0.000690 J	**0.612**			<0.000380 B		
	MW-110	Oct-15		**0.0130**	0.0765				0.000557 J	0.321	0.000523 J	**0.882**			<0.000380		
	MW-110	Apr-16		**0.0854**	0.300				0.00399 J	**2.77**	0.00565 J	**6.26**			<0.00190		
	MW-110	Oct-16		**0.0344**	0.0480				<0.000540	0.730	0.000412 J	**1.67**			<0.000380		
	MW-110	Apr-17		0.00529	0.0571				<0.000540	0.229	<0.000240	**0.510**			<0.000380		
	MW-110	Oct-17		**0.0384**	0.0483				<0.000540	0.913	<0.000240	**1.78**			<0.000380		
	RA-313	Apr-14															
	RA-313	Apr-15															
	RA-313	Apr-16															
	RA-313	Apr-17															
	RW-4	Apr-15		0.00183 J	0.0521				<0.000540	0.0744 J	0.000665 J	0.104			<0.000380		
	RW-4R	Apr-16		0.00440 J	0.0623				<0.00270	0.181 J	<0.00120	0.0728			<0.00190		
	RW-4R	Apr-17		0.00340	0.0732				<0.000540	0.192	0.000419 J	0.0261			<0.000380		
	RW-5R	Apr-15		0.00136 J	0.0259				<0.000540	0.0952 J	0.000336 J	0.0177			<0.000380		
	RW-5R	Apr-16		0.00183 J	0.0282				<0.00270	<0.0750	<0.00120	0.0191 J			<0.00190		
	RW-6	Apr-15		**0.0332**	**1.66**				<0.000540	**13.8**	0.000574 J	**0.280**			<0.000380		
	RW-6R	Apr-16		**0.0712**	0.480				<0.00270	**3.70**	<0.00120	**0.553**			<0.00190		
	RW-15C	Apr-17		**0.0274**	0.885				<0.000540	0.316	0.0116	**0.358**			0.000461 BJ		
South RO Reject Field	MW-114	Apr-15		0.00279	0.0165				0.000896 J	0.361	0.000317 J	**0.927**			<0.000380 B		
	MW-114	Oct-15		0.00355	0.0134				<0.000540	0.0486 J	<0.000240	**0.905**			0.000757 J		
	MW-114	Apr-16		0.00344 J	0.0155 J				<0.00270	<0.0750	<0.00120	**1.15**			<0.00190		
	MW-114	Oct-16		0.00327	0.0119				0.00115 JB	<0.0150	0.000617 J	**0.899**			0.00839		
	MW-114	Apr-17		0.00262	0.0138				<0.000540	<0.0150	<0.000240	**0.944**			0.00129 J		
	MW-114	Oct-17		0.00262	0.0129				<0.000540	0.0208 J	<0.000240	**0.873**			0.0179		
	MW-115	Apr-15		0.00697 J	0.0118				<0.000540	0.0684 J	<0.000240	0.120			<0.000380 B		
	MW-115	Oct-15		0.00761	0.0119				0.000763 J	0.0367 J	<0.000240	0.124			0.000590 J		
	MW-115	Apr-16		**0.0230**	0.0415				<0.00270	0.134 J	0.00135 J	**0.308**			0.00217 J		
	MW-115	Oct-16		0.00838	0.00908				0.000944 JB	0.116 B	0.000381 J	0.146			<0.000380		
	MW-115	Apr-17		0.00336	0.00809				<0.000540	0.0381 J	<0.000240	0.0455			<0.000380		
	MW-115	Oct-17		0.00342	0.00796				<0.000540	0.0264 J	<0.000240	0.0553			0.000723 J		
	MW-116	Apr-15		0.00521	0.00931				<0.000540	<0.0150	<0.000240	0.00454 J			<0.000380 B		
	MW-116	Oct-15		0.00825	0.0434				0.00542	**2.45**	0.00183 J	0.0815			0.000668 J		
	MW-116	Apr-16		0.00422 J	0.0231 J				<0.00270	0.800	<0.00120	0.0396			<0.00190		
	MW-116	Oct-16		0.00720	0.0118				0.000922 JB	0.119	0.000397 J	0.0506			0.000738 J		
	MW-116	Apr-17		0.00357	0.0121				0.000560 J	0.224	0.000542 J	0.0545			0.00488		
	MW-116	Oct-17		0.00521	0.0178				0.00151 J	0.598	0.000647 J	0.0402			0.00741		
TEL	MW-49	Apr-15		0.00433	0.0514				0.00147 J	0.530	0.00133 J	**0.269**	<0.000049	0.00842	<0.000380		0.00195 J
	MW-49	Oct-15		<0.00025 B	0.0429				<0.000540	0.0195 J	0.000453 J	**0.209**	<0.000049	0.00740	0.0117		0.00145 J
	MW-49	Apr-16		0.00489 J	0.0439	0.695	<0.00500	<0.00130	<0.00270	0.0770 J	<0.00120	**0.269**	<0.000049	0.00686 J	<0.00190	<0.00165	0.00245 J
	MW-49	Oct-16		0.00505	0.0449	0.642	<0.000160	<0.000260	0.000766 JB	0.127	0.000423 J	**0.223**	<0.000049 J6	0.00867	<0.000380	<0.00033	0.000357 J
	MW-49	Apr-17		0.00426	0.0461	0.733	<0.000160	<0.000260	<0.000540	0.100	0.000499 J	**0.250**	<0.000049	0.00809	<0.000380	<0.00033	0.000515 J
	MW-49	Oct-17		0.00467	0.0480	0.747	<0.000160	<0.000260	0.000609 J	0.128	0.000563 J	0.146	<0.000049	0.0152	<0.000380	<0.00033	0.000321 J
	TEL-1	Apr-15		0.00537	0.0119				0.00501	0.0741 J	<0.000240	0.0523			<0.000380		
	TEL-1	Oct-15		<0.00025 B	<0.000360 B				0.00318	0.0506 J	<0.000240	0.103			0.00798 J		
	TEL-1	Apr-16		0.00407 J	0.0126 J				0.0269	0.104 J	<0.00120	0.199			<0.00190		
	TEL-1	Oct-16		0.00256	0.00987				0.00911 B	0.0829 J	0.000300 J	**0.216**			<0.000380		
	TEL-1	Apr-17		0.00520	0.0116				0.0260	0.382	<0.000240	0.117			<0.000380		
	TEL-1	Oct-17		**0.0139**	0.0121				0.0196	0.258	0.000341 J	0.0700			<0.000380		
	TEL-2	Apr-15		**0.0132**	0.185				0.00134 J	0.0326 J	0.00276	0.0101			0.000383 J		
	TEL-2	Oct-15		**0.0118**	0.153				0.00178 J	0.0291 J	0.00242	0.00753			0.00679		
	TEL-2	Apr-16		**0.0101**	0.127				0.00303 J	<0.0750	0.00131 J	0.0212 J			<0.00190		
	TEL-2	Oct-16		**0.0147**	0.0773				0.00209 B	0.0279 J	0.00145 J	0.0144			0.000618 J		
	TEL-2	Apr-17		**0.0123**	0.162				0.00307	0.0749 J	0.00143 J	0.0149			0.000558 J		
	TEL-2	Oct-17		**0.0140**	0.0942				0.00457	0.0896 J	0.00111 J	0.0166			0.000473 J		
	TEL-3	Apr-15		0.00354	0.0145				0.00466	0.0738 J	0.000599 J	0.00827			<0.000380		
	TEL-3	Oct-15		<0.00025 B	<0.000360 B				0.00613	0.0417 J	0.000435 J	0.0139			0.00966		
	TEL-3	Apr-16		0.00876 J	0.0208 J				0.0269	0.171 J	<0.00120	0.00661 J			<0.00190		
	TEL-3	Oct-16		0.00126 J	0.0156				**0.138**	0.456	0.000368 J	0.0133			<0.000380		
	TEL-3	Apr-17		0.00204	0.0161				**0.156**	0.473	0.000250 J	0.0121			<0.000380		
	TEL-4	Apr-15		0.00613	0.0244				**0.419**	**1.57**	0.00227	**0.872**			<0.000380		
	TEL-4	Apr-15	FD	0.00598	0.0233				**0.599**	**2.41**	0.00262	**0.860**			0.000420 J		
	TEL-4	Oct-15		**0.0106**	0.0338				**0.315**	0.107	0.00255	**0.406**			0.0201		
	TEL-4	Oct-15	FD	0.00929	0.0326				**0.281**	0.107	0.00206	**0.412**			0.0135		
	TEL-4	Apr-16		0.00710 J	0.0247 J				**0.282**	0.331 J	0.00330 J	**0.751**			<0.00190		
	TEL-4	Apr-16	FD	0.00736 J	0.0245 J				**0.306**	0.628	0.00316 J	**0.750**			<0.00190		
	TEL-4	Oct-16		0.00784	0.0190				**0.688**	**1.93**	0.00263	**0.508**			0.000883 J		
	TEL-4	Oct-16	FD	0.00700	0.0199				**0.389**	**1.07**	0.00241	**0.501**			<0.000380		
	TEL-4	Apr-17		0.00723	0.0185				**0.790**	**1.45**	0.00173 J	**0.973**			0.000535 J		
	TEL-4	Apr-17	FD	0.00707	0.0180				**0.443**	0.105	0.00110 J	**0.963**			<0.000380		
	TEL-4	Oct-17		0.00750	0.0178				**0.236**	0.952	0.00118 J	**1.05**			0.000561 J		
	TEL-4	Oct-17	FD	0.00731	0.0172				**0.273**	**1.03**	0.00125 J	**1.04**			0.000454 J		
TMD	MW-8	Apr-14		0.00884 J	0.0114				0.0212	<0.100	<0.00140	**0.557**			0.0237		
	MW-8	Apr-15		**0.0108**	0.0107				**0.234**	0.779	0.000470 J	**0.507**			0.0188		
	MW-8	Apr-16		0.00885 J	0.0117 J				**0.107**	0.397 J	<0.00120	**0.538**			0.00622 J		
	MW-8	Apr-17		0.00678	0.0102				0.0259	0.111	<0.000240	**0.467**			0.00647		
	MW-16	Apr-14		0.00470 J	0.0151				<0.00200	<0.100	<0.00140	**0.244**			0.00322 J		
	MW-16	Apr-15		0.00500 J	0.0174 J				<0.00270	<0.0750	<0.00120	0.0950 J			0.00213 J		
	MW-16	Apr-17		0.00498	0.0127				<0.000540	<0.0150	<0.000240	0.00510			0.0106		
	MW-20	Apr-14		0.00750 J	0.00905 J				<0.00200	<0.100	<0.00140	0.0906			0.0179		
	MW-20	Apr-14	FD	0.00865 J	0.0103				<0.00200	<0.100	<0.00140	0.0800			0.0170		
	MW-20	Apr-15		0.00621	0.0104				<0.000540	0.0746 J	<0.000240	0.00743			0.0289		
	MW-20	Apr-16		0.00628 J	0.0113 J				<0.00270	<0.0750	<0.00120	0.00814 J			0.0305		
	MW-20	Apr-17		0.00575	0.00980				<0.000540	<0.0150	<0.000240	0.00756			0.0188		
	MW-21	Apr-15		0.00656 J	0.0100 J				<0.00270	<0.0750	<0.00120	**0.323** J			0.0258		
	MW-21	Oct-15		0.00635	0.00939				<0.000540	<0.0150	<0.000240	**0.658**			0.0290		
	MW-21	Apr-16		0.00607 J	0.0100 J				<0.00270	<0.0750	<0.00120	**0.354**			0.0327		
	MW-21	Oct-16		0.00613	0.00790				<0.000540	<0.0150	<0.000240	**0.616**			0.0287		
	MW-21	Apr-17		0.00530	0.00817				<0.000540	<0.0150	<0.000240	**0.204**			0.0258		
	MW-21	Oct-17		0.00545	0.00860				0.000607 J	0.0290 J	<0.000240	**0.607**			0.0314		
	MW-25	Apr-14		0.00502 J	0.0265				<0.00500	<0.250	<0.00350	**1.09**			<0.00500		
	MW-25	Apr-15		0.00984 J	0.0187 J				<0.00270	<0.0750	<0.00120	**0.582** J			0.0204		
	MW-25	Apr-16		0.00582 J	0.0148 J				0.00332 J	<0.0750	<0.00120	**0.889**			<0.00190		
	MW-25	Apr-17		0.00300	0.0121				0.000842 J	0.0157 J	<0.000240	**0.507** V			0.00254		

Appendix B, Table B.2 - Summary of Groundwater Analytical Data - Total Metals

2017 Annual Groundwater Monitoring Report
HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Total Metals													
				Analyte:	Arsenic	Barium	Boron	Cadmium	Cobalt	Chromium	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC Irr	WQCC HH	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
Area	**Well ID**	**Date**	**Dup**															
TMD	MW-26	Apr-14		0.00413 J	0.00878 J				<0.00200	<0.100	<0.00140	**0.731**			0.0241		
	MW-26	Apr-15		0.00351	0.00944				<0.000540	0.0811 J	<0.000240	**0.613**			0.0197		
	MW-26	Apr-16		0.00384 J	0.0101 J				<0.00270	<0.0750	<0.00120	**0.847**			0.0194		
	MW-26	Apr-17		0.00335	0.00916				<0.000540	<0.0150	<0.000240	**0.560**			0.0232		
	MW-27	Apr-14		0.00249 J	0.0166				<0.00100	<0.00500	<0.000700	0.00554			0.0192		
	MW-27	Apr-15		0.00239	0.0235				<0.000540	<0.0150	<0.000240	0.0318			0.0180		
	MW-27	Apr-16		0.00228 J	0.0179 J				<0.00270	<0.0750	<0.00120	0.0186 J			0.0127		
	MW-27	Apr-17		0.00216	0.0153				<0.000540	<0.0150	<0.000240	0.0158			0.00706		
	MW-46R	Nov-14		0.00420	0.0240				0.00280	**1.10**	0.000830 J	0.140			0.00340		
	MW-46R	Apr-15		0.00307	0.0188				0.00106 J	0.297	0.000608 J	0.116			0.00116 J		
	MW-46R	Apr-16		0.00317 J	0.0140 J				<0.00270	0.159 J	<0.00120	0.125			<0.00190		
	MW-46R	Oct-16		0.00314	0.0150				0.000894 JB	0.196	0.000459 J	0.137			0.00154 J		
	MW-46R	Apr-17		0.00266	0.0134				<0.000540	0.167	0.000538 J	0.162			0.00199 J		
	MW-46R	Oct-17		0.00262	0.0130				<0.000540	0.0344 J	0.000354 J	0.124			0.00135 J		
	MW-68	Apr-14		0.00325 J	0.0142				<0.00200	<0.100	<0.00140	<0.00500			0.0248		
	MW-68	Apr-15		0.00292	0.0159				<0.000540	0.0594 J	0.000524 J	0.00131 J			0.0123		
	MW-68	Apr-16		0.00314 J	0.0133 J				<0.00270	<0.0750	<0.00120	0.0393			0.00339 J		
	MW-68	Apr-17		0.00244	0.0107				<0.000540	<0.0150	<0.000240	0.0824			0.00275		
	MW-71	Apr-14		0.00458 J	0.00860				<0.00100	<0.0500	<0.000700	<0.00250	<0.000040	0.00123 J	0.0452		0.0252
	MW-71	Apr-15		0.00411	0.00897				0.000581 J	0.0373 J	<0.000240	0.000898 J	<0.000049	0.00134 J	0.0349		0.0229
	MW-71	Apr-16		0.00436 J	0.0103 J	0.689 V	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	<0.00125	<0.000049	<0.00175	0.0370	**0.0605**	0.0257
	MW-71	Apr-17		0.00387	0.00845	0.538	<0.000160	<0.000260	<0.000540	<0.0150	<0.000240	0.000841 J	<0.000049	0.000916 J	0.0324	**0.0587**	0.0248
	MW-89	Apr-14		**0.0128**	0.0140				<0.00100	0.195 J	<0.000700	**0.537**			0.0188		
	MW-89	Apr-15		0.00900 J	0.0144 J				<0.00270	0.120 J	<0.00120	0.0710 J			0.0275		
	MW-89	Apr-16		0.00839 J	0.0155 J				<0.00270	0.228 J	<0.00120	0.0788			0.0311	<0.00100	
	MW-89	Apr-17		0.00657	0.0145				0.00102 J	<0.0150	<0.000240	0.0420			**0.0534**		
	NP-1	Apr-15															
	NP-1	Oct-15															
	NP-1	Apr-16															
	NP-1	Oct-16															
	NP-1	Apr-17															
	NP-1	Oct-17															
	NP-2	Apr-13															
	NP-6	Apr-13															
	NP-6	Apr-15															
	NP-6	Apr-17															
Up-Gradient	UG-1	Apr-14		0.00158 J	0.0128				0.00159 J	0.0832 J	<0.000700	0.00575	<0.000040	0.00121 J	0.00728		0.0135
	UG-1	Apr-15		0.00113 J	0.0137				0.00242	0.0262 J	<0.000240	0.000764 J	<0.000049	<0.000350 B	0.0103		0.0105
	UG-1	Apr-16		<0.00125	0.0136 J	0.574	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	<0.00125	<0.000049	<0.00175	0.0140	0.0252 J	0.0107 J
	UG-1	Apr-17		0.00106 J	0.0135	0.548	<0.000160	<0.000260	0.000572 J	0.0561 J	<0.000240	0.00689	<0.000049	0.00145 J	0.0100	0.0262	0.0118
	UG-2	Apr-14		0.00385 J	0.0167				<0.00100	0.673	<0.000700	**0.488**	<0.000040	0.0256	0.00209 J		0.00820
	UG-2	Apr-15		0.00205	0.0153				<0.000540	<0.0150	<0.000240	0.0110	<0.000049	0.00527	<0.000380 B		0.0115
	UG-2	Apr-16		0.00202 J	0.0150 J	0.343	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	0.0147	<0.000049	0.00905	0.00321 J	0.0156 J	0.0123 J
	UG-2	Apr-17		0.00197 J	0.0154	0.303	<0.000160	<0.000260	<0.000540	0.0172 J	<0.000240	0.0154	<0.000049	0.00271	0.00572	0.0153	0.0154
	UG-3R	Apr-14		0.00184 J	0.0170				<0.00100	<0.0500	<0.000700	<0.00250	<0.000049	<0.00100	0.00534		0.0109
	UG-3R	Apr-14	FD	0.00167 J	0.0163				<0.00100	<0.0500	<0.000700	<0.00250	<0.000049	<0.00100	0.00640		0.0101
	UG-3R	Apr-15		0.00258	0.0595				0.00368	**2.05**	0.000626 J	0.0725	<0.000049	<0.000350 B	<0.000380 B		0.0135
	UG-3R	Apr-16		0.00182 J	0.0198 J	0.295	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	0.00141 J	<0.000049	0.00188 J	0.00386 J	0.0122 J	0.0104 J
	UG-3R	Apr-17		0.00161 J	0.0185	0.256	<0.000160	0.000465 J	<0.000540	0.0316 J	<0.000240	0.00182 J	<0.000049	0.00225	0.00325	0.0129	0.00961
	UG-4	Apr-16		<0.00125	0.0184 J	**1.19**	<0.00500	<0.00130	<0.00270	<0.0750	<0.00120	0.00752 J	<0.000049	0.00203 J	0.00634 J	**0.0364** J	0.00749 J
	UG-4	Apr-17		0.00111 J	0.0164	**1.06**	<0.000160	<0.000260	<0.000540	0.0249 J	<0.000240	0.00935	<0.000049	0.00143 J	0.0143	**0.0361**	0.00739

Definitions

X	Reported concentration, X, exceeds the CGWSL.
X	Analyte detected above the detection limit at a concentration equal to X.
<x	Analyte not detected at detection limit equal to x.
<x	Analyte not detected at detection limit equal to x, but x exceeds the CGWSL.
	Blank cell indicates a sample was collected from the well during the indicated sampling event, but the analyte was not analyzed.

Abbreviations

CGWSL	Critical Groundwater Screening Level (see Table 3)
CGWSL Source	Source for CGWSL value (see Table 3)
Dup	Duplicate sample
FD	Field duplicate sample
mg/L	Milligrams per Liter
NMED TW	NMED Risk Assessment Guidance for Site Investigations and Remediation, March 2017, Table A-1, Tap Water Screening Level
WQCC Dom	NMED Groundwater standard for domestic exposure taken from 20.6.2.3103.B NMAC
WQCC HH	NMED Groundwater standard for human health exposure, 20.6.2.3103.A NMAC
WQCC Irr	NMED Groundwater standard for irrigation exposure, 20.6.2.3103.C NMAC
USEPA MCL	United States Environmental Protection Agency Maximum Contaminant Level, "Regional Screening Levels (RSL) Summary Table", November 2017

Lab Footnote

B	Analyte was also detected in the associated method blank.
J	Indicates an estimated value.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
O1	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
V	The sample concentration is too high to evaluate accurate spike recoveries.

Appendix B, Table B.3 - Summary of Groundwater Analytical Data - Dissolved Metals

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Dissolved Metals													
				Analyte:	Arsenic	Barium	Boron	Cadmium	Chromium	Cobalt	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC HH	WQCC Irr	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
Cross-Gradient	KWB-13	Apr-14		0.00276 J	0.0156			0.00107 J		<0.0780	<0.00070	<0.00250	<4.2E-05	<0.00100	0.0136		0.0188	
	KWB-13	Apr-15		0.00376	0.0439			0.00125 J		0.337	0.00143 J	0.0462		0.00136 J	0.0117		0.0173	
	KWB-13	Apr-16		0.0029 J	0.021 J	0.416	<0.00080	<0.00270	<0.0013	0.483 J	<0.00120	0.00842 JB	<4.9E-05	<0.00175	0.014	0.0245 J	0.0201 J	
	KWB-13	Apr-17		0.00251	0.0181	0.348	0.000738 J	0.000961 J	<0.002	<0.1	0.000617 J	0.0007 JB	<0.0002	0.00154 JB	0.0126	0.0254	0.0197	
	MW-17	Apr-14		0.00217 J	0.0139			0.00184 J		<0.0780	<0.00070	<0.00250			0.00918			
	NP-5	Apr-13		<0.0100	<0.0100			<0.0100		<0.400	<0.0100	<0.0100			0.0148			
	NP-5	Apr-15		0.00306	0.0076			<0.00054		<0.0150	<0.00024	0.000511 J			0.0128			
	NP-5	Apr-17		0.00315	0.00738			<0.002		<0.1	<0.002	<0.005			0.0125			
	MW-136	Apr-15		0.00283	0.0107		<0.00016	<0.00054		0.0239 J	<0.00024	0.00574		0.0011 J	0.00362		0.0158	
	MW-136	Apr-16		0.00242 J	0.0113 J	0.661	<0.00080	<0.00270	<0.0013	<0.075	<0.00120	0.00291 JB	<4.9E-05	0.00772 JB	0.00664 J	**0.0698**	0.0188 J	
	MW-136	Apr-17		0.00248	0.0101	0.558	<0.001	<0.002	<0.002	<0.1	<0.002	0.00136 J	<0.0002	0.00109 J	0.00472	**0.0684**	0.0176	
Evaporation Ponds	MW-1R	Apr-14		<0.00200	0.0194			<0.00200		**1.31**	<0.00140	**1.22**			<0.00200			
	MW-1R	Apr-15		0.00264 J	0.0229 J			<0.00270		**2.58**	<0.00120	**2.14**			<0.00190			
	MW-1R	Apr-16		0.00311 J	0.0252			<0.00270		**3.72**	<0.00120	**2.64**			0.00216 J			
	MW-1R	Apr-17		0.00088 J	0.0254			0.000638 J		0.0387 J	<0.002	**2.34**			<0.002			
	MW-2A	Apr-14		**0.0148** J	0.021 J			<0.00500		<0.390	0.00423 J	**1.27**			0.00624 J			
	MW-2A	Apr-15		**0.0116**	0.0216			<0.00054		0.201	<0.00024	**1.83**			0.00186 J			
	MW-2A	Apr-16		**0.014**	0.0223 J			<0.00270		**2.64**	<0.00120	**2.31**			0.00347 J			
	MW-2A	Apr-17		0.00354	0.0175			<0.002		<0.1	<0.002	**1.49**			0.000949 J			
	MW-3	Apr-14		**0.0285**	0.0178			<0.00200		<0.156	<0.00140	**0.325**			0.0429			
	MW-3	Apr-15	FD	**0.0253**	0.0171			<0.00054		<0.0150	<0.00024	**1.30**			**0.0955**			
	MW-3	Apr-15		**0.0269**	0.018			<0.00054		<0.0150	<0.00024	**1.37**			**0.095**			
	MW-3	Apr-16	FD	**0.0246**	0.0141 J			<0.00270		0.401 J	<0.00120	**2.13**			0.00615 J			
	MW-3	Apr-16		**0.0299**	0.0146			0.00103 J		0.388	0.0003 J	**2.49**			0.00429			
	MW-3	Apr-17	FD	**0.0172**	0.0152			<0.002		0.0247 J	<0.002	**1.12**			0.00293			
	MW-3	Apr-17		**0.0179**	0.0138			<0.002		<0.1	<0.002	**1.08**			0.00281			
	MW-4A	Apr-14		**0.0786**	0.0121			<0.00200		0.614	<0.00140	**2.36**			<0.00200			
	MW-4A	Apr-15		**0.104**	0.0113			0.000987 J		**1.89**	<0.00024	**2.73**			0.000614 J			
	MW-4A	Apr-16		**0.174**	0.0128 J			<0.00270		**2.99**	<0.00120	**2.29**			0.00269 J			
	MW-4A	Apr-17		**0.147**	0.0123			<0.002		0.104	<0.002	**1.94**			0.000498 J			
	MW-4B	Apr-17		**0.0471**	0.0188			<0.002		0.0449 J	<0.002	**9.32**			<0.002			
	MW-5A	Apr-14		**0.0796**	0.0106 J			<0.00500		**5.40**	<0.00350	**1.62**			<0.00500			
	MW-5A	Apr-15		**0.0848**	0.0107			0.000957 J		**4.50**	<0.00024	**1.58**			0.00086 J			
	MW-5A	Apr-16		**0.179**	0.0128 J			<0.00270		**6.87**	<0.00120	**1.33**			0.00262 J			
	MW-5A	Apr-17		**0.0861**	0.0133			<0.002		0.0208 J	<0.002	**1.23**			0.000895 J			
	MW-5B	Apr-13		**0.109**	<0.0100			<0.0100		0.618	<0.0100	**2.17**			<0.0100			
	MW-5B	Apr-15		**0.198**	0.0104			0.000978 J		**4.71**	<0.00024	**3.49**			0.00197 J			
	MW-5B	Apr-17		**0.127**	0.0111			<0.002		0.0226 J	<0.002	**3.51**			0.00155 J			
	MW-5C	Apr-13		**0.0137**	0.014			<0.00500		**1.08**	<0.00500	**0.900**			<0.00500			
	MW-5C	Apr-15		**0.0124**	0.0172			0.00115 J		0.77	0.000449 J	**0.687**			<0.00038			
	MW-5C	Apr-17		0.00981	0.014			<0.002		<0.1	<0.002	**0.906**			<0.002			
	MW-6A	Apr-14		**0.0102**	0.0252			<0.00200		<0.156	<0.00140	**1.20**			0.0157			
	MW-6A	Apr-15		**0.0114**	0.0331			<0.00054		0.0527 J	0.0004 J	**1.40**			0.0318			
	MW-6A	Apr-16		0.00932 J	0.0156 J			<0.00270		<0.075	<0.00120	**0.491**			<0.00190			
	MW-6A	Apr-17		0.00999	0.0137			<0.002		<0.1	<0.002	**0.416**			0.000824 J			
	MW-6B	Mar-13	FD	**0.0336**	0.0173			<0.00500		**1.23**	<0.00500	**3.03**			<0.00500			
	MW-6B	Mar-13		**0.032**	0.0145			<0.00500		**1.24**	<0.00500	**2.84**			<0.00500			
	MW-6B	Apr-15		**0.0319**	0.0186			<0.00054		**1.21**	<0.00024	**3.52**			<0.00038			
	MW-6B	Apr-17		0.00863	0.0141			<0.002		<0.1	<0.002	**1.01**			<0.002			
	MW-7A	Apr-14		**0.0239**	0.0167			<0.00200		**2.34**	<0.00140	**0.541**			<0.00200			
	MW-7A	Apr-15	FD	**0.0141**	0.0149			0.000544 J		<0.0150	<0.00024	**0.997**			0.000601 J			
	MW-7A	Apr-15		**0.0172**	0.0148			0.00089 J		0.676	<0.00024	**0.994**			0.000532 J			
	MW-7A	Apr-16	FD	**0.0226**	0.0174 J			<0.00270		**2.56**	<0.00120	**0.642**			0.00207 J			
	MW-7A	Apr-16		**0.0224**	0.017 J			<0.00270		**2.63**	<0.00120	**0.634**			<0.00190			
	MW-7A	Apr-17	FD	**0.0131**	0.015			<0.002		0.0169 J	<0.002	**0.541**			<0.002			
	MW-7A	Apr-17		**0.0124**	0.015			<0.002		0.0171 J	<0.002	**0.570**			<0.002			
	MW-7B	Apr-13		<0.0100	0.0114			<0.0100		<0.400	<0.0100	**0.358**			<0.0100			
	MW-7B	Apr-15		0.00529	0.011			<0.00054		0.0879 J	<0.00024	**0.541** J			<0.00038			
	MW-7B	Apr-17		0.00373	0.0118			<0.002		<0.1	<0.002	**0.493**			<0.002			
	MW-10	Apr-14		**0.0195**	0.0114			<0.00200		<0.156	<0.00140	**2.75**			<0.00200			
	MW-10	Apr-15		**0.0191**	0.013 J			<0.00270		<0.0750	<0.00120	**2.53**			<0.00190			
	MW-10	Apr-16		**0.0247**	0.0174 J			<0.00270		<0.075	<0.00120	**2.60**			0.00211 J			
	MW-10	Apr-17		**0.0154**	0.0115			<0.002		<0.1	<0.002	**2.46**			<0.002			
	MW-11A	Apr-14		<0.00500	0.037			<0.00500		0.924 J	<0.00350	**1.84**			<0.00500			
	MW-11A	Apr-15		<0.00250	0.0338 J			<0.00540		<0.150	<0.00240	**0.846**			<0.00380			
	MW-11A	Apr-16		0.00133 J	0.0321			<0.00270		0.887	<0.00120	**0.903**			<0.00190			
	MW-11A	Apr-17		0.000295 J	0.0329			<0.002		0.0408 J	<0.002	**0.773**			<0.002			
	MW-11B	Mar-13		**<0.0250**	<0.0250			<0.0250		**3.62**	**<0.0250**	**0.365**			<0.0250			
	MW-11B	Apr-15		0.00458 J	0.0187			<0.00270		**3.59**	<0.00120	**0.376**			<0.00190			
	MW-11B	Apr-17		0.00103 J	0.0188			<0.002		0.0826 J	<0.002	**0.370**			<0.002			
	MW-12	Apr-14		<0.00200	0.0204			<0.00200		<0.156	<0.00140	0.183			0.0208			
	MW-13	Apr-14		<0.00200	0.0334			<0.00200		<0.156	<0.00140	0.173			<0.00200			
	MW-15	Apr-14		**0.0589**	0.0186			0.0144		<0.156	<0.00140	**0.332**			0.00547 J			
	MW-15	Apr-15		**0.0268**	0.0219 J			<0.00270		0.0762 J	<0.00120	**0.814**			0.0211			
	MW-15	Apr-16		**0.0204**	0.0217 J			<0.00270		<0.075	<0.00120	**0.874**			<0.00190			
	MW-15	Apr-17		**0.0132**	0.0182			0.000671 J		<0.1	0.000257 J	0.18			0.000506 J			
	MW-18A	Apr-14		<0.0100	0.0166 J			<0.0100		<0.780	<0.00700	0.176	<4.2E-05	<0.0100	0.0323		<0.00900	
	MW-18A	Apr-15		0.00341	0.0116			<0.00054		<0.0150	<0.00024	0.00939		0.00194 J	0.0464		0.0042 J	
	MW-18A	Apr-16		0.00629 J	0.0157 J	**2.87**	<0.00080	<0.00270	<0.0013	0.333 JB	<0.00120	**0.335**	<4.9E-05	0.00835 J	<0.00190	**0.041** J	0.00163 J	
	MW-18A	Apr-17		0.00465	0.017	**2.38**	<0.001	<0.002	0.00031 J	0.382	<0.002	**0.776**	<0.0002	0.00693	0.000553 J	**0.0309**	0.000553	
	MW-18B	Apr-13		0.00781	0.0119			<0.00500		<0.200	<0.00500	**0.657**			<0.00500			
	MW-18B	Apr-15		**0.0104**	0.0116			<0.00054		0.0398 J	<0.00024	**0.723**			<0.00038			
	MW-18B	Apr-17		0.00962	0.013			<0.002		<0.1	<0.002	**0.897**			<0.002			
	MW-22A	Apr-14		**0.0418**	0.0154			<0.00200		0.271 J	<0.00140	**3.58**			0.00322 J			
	MW-22A	Apr-15	FD	**0.0369**	0.0171			<0.00054		0.901	<0.00024	**5.08**			0.00105 J			
	MW-22A	Apr-15		**0.0376**	0.0162 J			<0.00270		0.537	<0.00120	**5.37**			<0.00190			
	MW-22A	Apr-16	FD	**0.037**	0.0171 J			<0.00270		**2.39**	<0.00120	**5.87**			0.00218 J			
	MW-22A	Apr-16		**0.0383**	0.0157 J			<0.00270		**2.37**	<0.00120	**5.83**			0.00242 J			
	MW-22A	Apr-17	FD	**0.0314**	0.0155			0.000775 J		0.0154 J	<0.002	**6.70**			0.000846 J			
	MW-22A	Apr-17		**0.0325**	0.0145			<0.002		<0.1	<0.002	**6.25**			0.000797 J			
	MW-22B	Apr-13		**0.0288**	<0.0250			<0.0250		**1.98**	**<0.0250**	**3.41**			<0.0250			
	MW-22B	Apr-15		**0.0383**	0.0154 J			<0.00270		**2.20**	<0.00120	**4.64**			<0.00190			
	MW-22B	Apr-17		**0.0242**	0.0109			<0.002		<0.1	<0.002	**3.53**			0.000555 J			
	MW-70	Apr-14		**0.024**	0.0154			<0.00100		0.922	<0.00070	**0.302**			<0.00100			
	MW-70	Apr-15		**0.0196**	0.0139			<0.00054		**1.57**	<0.00024	**0.213**			<0.00038			
	MW-70	Apr-16		**0.0228**	0.0147 J			<0.00270		**5.40**	<0.00120	**0.513**			<0.00190			
	MW-70	Apr-17		**0.0156**	0.0156			<0.002		0.419	<0.002	**0.244**			<0.002			
	MW-72	Apr-14		**0.0258**	0.0146 J			<0.00500		**3.89**	<0.00350	**5.16**			<0.00500			
	MW-72	Apr-15		**0.0306**	0.0226			0.000575 J		**1.19**	<0.00024	**2.89**			0.0117			
	MW-72	Apr-16		**0.0269**	0.0185 J			<0.00270		**5.04**	<0.00120	**4.98**			<0.00190			
	MW-72	Apr-17		**0.0151**	0.0217			<0.002		<0.1	<0.002	**4.20**			0.0018 J			
	MW-73	Apr-14		**0.0986**	0.0102 J			<0.00500		**4.67**	<0.00350	**2.62**			<0.00500			
	MW-73	Apr-15		**0.064**	0.0109			0.000772 J		0.058 J	<0.00024	**2.36**			0.00193 J			
	MW-73	Apr-16		**0.0843**	0.0109 J			<0.00270		**3.67**	<0.00120	**3.00**			0.00314 J			
	MW-73	Apr-17		**0.0642**	0.0074			<0.002		0.0403 J	<0.002	**0.222**			0.00189 J			

Appendix B, Table B.3 - Summary of Groundwater Analytical Data - Dissolved Metals

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Date	Dup	Arsenic	Barium	Boron	Cadmium	Chromium	Cobalt	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
Analyte Group:				**Dissolved Metals**													
Analyte:				**Arsenic**	**Barium**	**Boron**	**Cadmium**	**Chromium**	**Cobalt**	**Iron**	**Lead**	**Manganese**	**Mercury**	**Nickel**	**Selenium**	**Uranium**	**Vanadium**
Units:				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
CGWSL:				0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
CGWSL Source:				USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC HH	WQCC Irr	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
Evaporation Ponds	MW-74	Apr-14		**0.0606**	0.0121 J			<0.00500		<0.390	<0.00350	**1.07**			**0.162**		
	MW-74	Apr-15		**0.0515**	0.0103			<0.00054		0.065 J	<0.00024	**0.392**			**0.480**		
	MW-74	Apr-16		**0.135**	0.0133 J			<0.00270		<0.075	<0.00120	**2.20**			0.0155		
	MW-74	Apr-17		**0.0689**	0.0136			<0.002		<0.1	<0.002	**1.07**			**0.165**		
	MW-75	Apr-14		**0.152**	0.0155			<0.00200		0.719	<0.00140	**1.03**			0.00292 J		
	MW-75	Apr-15		**0.355**	0.0186			0.003		**9.82**	<0.00024	**0.861**			0.00261		
	MW-75	Apr-16		**0.125**	0.0176 J			<0.00270		**1.08**	<0.00120	**0.907**			0.00374 J		
	MW-75	Apr-17		**0.114**	0.017			<0.002		0.0351 J	<0.002	**0.882**			0.00182 J		
	MW-76	Apr-14		**0.0521**	0.0128			0.00128 J		**2.95**	<0.00070	**1.00**			0.00139 J		
	MW-76	Apr-15		**0.0628**	0.012			0.00133 J		**3.53**	<0.00024	**0.977**			0.00214		
	MW-76	Apr-16		**0.0455**	0.012 J			<0.00270		**3.62**	<0.00120	**0.856**			0.00464 J		
	MW-76	Apr-17		**0.0458**	0.0116			<0.002		0.0501 J	<0.002	**0.824**			0.00325		
	MW-77	Apr-14		**0.067**	0.011			0.00747 J		**7.09**	0.00176 J	**0.909**			0.0123		
	MW-77	Apr-15		**0.0921**	0.0144 J			0.0116		**13.6**	<0.00120	**0.644**			0.0127		
	MW-77	Apr-16		**0.0594**	0.00881 J			0.0122 J		**10.7**	<0.00240	**0.599**			0.0110		
	MW-77	Apr-17		**0.0336**	0.0101			0.00772		0.158	<0.002	**0.563**			0.0101		
	MW-78	Apr-14		**0.0145**	0.0278			0.0363		**4.70**	<0.00070	**1.60**			0.00708		
	MW-78	Apr-15		**0.0117**	0.032			0.0342		**10.7**	<0.00120	**1.26**			0.0122		
	MW-78	Apr-16		**0.0116**	0.0382			0.049		**11.2**	<0.00120	**0.773**			0.0124		
	MW-78	Apr-17		0.00661	0.0411			0.0388		0.0653 J	<0.002	**0.473**			0.00868		
	MW-79	Apr-14		**0.0183**	0.0134			<0.00200		<0.156	<0.00140	**1.30**			0.00861 J		
	MW-79	Apr-15		0.0063	0.0161			<0.00054		<0.0150	<0.00024	**1.34**			0.0012 J		
	MW-79	Apr-16		0.00557 J	0.0166 J			<0.00270		0.13 J	<0.00120	**2.91**			<0.00190		
	MW-79	Apr-17		0.00433	0.0162			<0.002		<0.1	<0.002	**1.21**			0.000456 J		
	MW-80	Apr-14		0.0072 J	0.0155			<0.00200		<0.156	0.0017 J	**0.403**			0.00238 J		
	MW-80	Apr-15		**0.0109**	0.0153			<0.00054		0.0598 J	<0.00024	**0.381**			0.000949 J		
	MW-80	Apr-16		0.00359 J	0.0171 J			<0.00270		0.173 J	<0.00120	0.162			0.00232 J		
	MW-80	Apr-17		0.00597	0.0166			<0.002		<0.1	<0.002	**0.587**			0.00205		
	MW-81	Apr-14		**0.0188**	0.0151			<0.00200		<0.156	0.00152 J	0.124			0.00945 J		
	MW-81	Apr-15		**0.0188**	0.0144			0.000736 J		0.019 J	<0.00024	0.0128			0.0229		
	MW-81	Apr-16		**0.0226**	0.0137 J			<0.00270		<0.075	<0.00120	0.00553 J			0.0426		
	MW-81	Apr-17		**0.016**	0.0144			<0.002		<0.1	<0.002	0.0025 J			0.0169		
	MW-82	Apr-14	FD	**0.071**	0.0183			<0.00200		0.543	<0.00140	**1.39**			<0.00200		
	MW-82	Apr-14		**0.0684**	0.0181			<0.00200		0.493	<0.00140	**1.35**			<0.00200		
	MW-82	Apr-15		**0.0761**	0.0303			0.0032		0.765	<0.00024	**1.25**			0.00265		
	MW-82	Apr-16		**0.04**	0.0326			<0.00270		0.121 J	<0.00120	**1.64**			0.00331 J		
	MW-82	Apr-17		**0.0326**	0.026			<0.002		0.0479 J	<0.002	**1.97** V			0.00125 J		
	MW-83	Apr-14		**0.0292**	0.0171			0.00271 J		**2.6**	<0.00070	**0.977**			0.00741		
	MW-83	Apr-15		**0.0253**	0.0129			0.00766		**6.99**	<0.00024	**0.741**			0.00376		
	MW-83	Apr-16		**0.0282**	0.0207 J			0.00814 J		**3.77**	<0.00120	**0.532**			0.0052 J		
	MW-83	Apr-17		**0.0183**	0.0357			0.00753		0.0258 J	<0.002	**0.606**			0.00339		
	MW-84	Apr-14		**0.0779**	0.0127			0.00293 J		0.324 J	<0.00140	**3.28**			0.0069 J		
	MW-84	Apr-15		**0.0885**	0.0139			0.00335		0.265	<0.00024	**2.90**			0.005		
	MW-84	Apr-16		**0.0867**	0.0146 J			0.00527 J		0.682	<0.00120	**2.98**			0.00813 J		
	MW-84	Apr-17		**0.074**	0.013			0.00227		0.0725 J	<0.002	**2.46**			0.00472		
	MW-87	Apr-14		0.0066 J	0.016 J			<0.00500		<0.390	<0.00350	0.0205 J			<0.00500		
	MW-87	Apr-15		0.00565	0.0186			0.000544 J		<0.0150	0.000455 J	0.0419			0.0011 J		
	MW-87	Apr-16		0.00841 J	0.0178 J			<0.00270		**3.82** O1	<0.00120	**2.39** V			0.00215 J		
	MW-87	Apr-17		0.00522	0.0162			<0.002		0.617	<0.002	**1.71**			<0.002		
	MW-88	Apr-14		**0.0106**	0.013			<0.00200		<0.156	<0.00140	**0.914**			<0.00200		
	MW-88	Apr-15		**0.0106**	0.0139 J			<0.00270		0.0753 J	<0.00120	**1.31**			<0.00190		
	MW-88	Apr-16		0.00969 J	0.0111 J			<0.00270		<0.075	<0.00120	**0.852**			<0.00190		
	MW-88	Apr-17		0.00761	0.0104			<0.002		<0.1	<0.002	**0.901** V			0.000412 J		
	MW-120	Apr-14		**0.0152**	0.00984 J			<0.00200		**3.76**	0.00156 J	**1.27**			<0.00200		
	MW-120	Apr-15		0.00704	0.0113			<0.00054		**1.35**	<0.00024	**1.28**			0.0324		
	MW-120	Apr-16		0.00838 J	0.0155 J			<0.00270		**3.28**	<0.00120	**1.85**			0.00538 J		
	MW-120	Apr-17		0.00532	0.0129			<0.002		<0.1	<0.002	**1.52**			<0.002		
	MW-121	Apr-14		**0.0339**	0.017			<0.00200		0.415	0.0015 J	**4.37**			0.00511 J		
	MW-121	Apr-15		**0.0337**	0.0138			<0.00054		0.567	<0.00024	**3.86**			0.00764		
	MW-121	Apr-16		**0.0369**	0.0134 J			<0.00270		0.174 JB	<0.00120	**2.92**			0.00792 J		
	MW-121	Apr-17		**0.0244**	0.0128			<0.002		<0.1	<0.002	**2.60**			0.0056		
	MW-122	Apr-14		0.00897 J	0.0337			<0.00200		**4.81**	0.00167 J	**2.00**			<0.00200		
	MW-122	Apr-15		**0.0108**	0.025			<0.00054		0.224	<0.00024	**1.85**			0.00914		
	MW-122	Apr-16		0.00405 J	0.028			<0.00270		0.541 B	<0.00120	**1.39**			<0.00190		
	MW-122	Apr-17		0.00436	0.0292			<0.002		<0.1	<0.002	**2.16**			0.000462 J		
	MW-123	Apr-14		**0.0276**	0.0207			<0.00200		<0.156	<0.00140	**2.94**			<0.00200		
	MW-123	Apr-15		**0.0274**	0.021 J			<0.00270		<0.0750	<0.00120	**2.67**			<0.00190		
	MW-123	Apr-16		**0.0254**	0.0211 J			<0.00270		<0.075	<0.00120	**2.85**			0.0022 J		
	MW-123	Apr-17		**0.0224**	0.0206			<0.002		<0.1	<0.002	**1.73**			<0.002		
	MW-124	Apr-14		0.00439 J	0.0241			<0.00200		0.613	<0.00140	**0.518**			<0.00200		
	MW-124	Apr-15		0.00199 J	0.017			<0.00054		0.961	<0.00024	**0.703**			<0.00038		
	MW-124	Apr-16		0.00255 J	0.0198 J			<0.00270		**2.70**	<0.00120	**0.601**			<0.00190		
	MW-124	Apr-17		0.00047 J	0.0192			<0.002		<0.1	<0.002	**0.463**			<0.002		
	OCD-1R	Apr-14		0.00705 J	0.0156			<0.00200		<0.156	<0.00140	**1.31**			0.00716 J		
	OCD-1R	Apr-15		0.00669 J	0.0184 J			<0.00270		<0.0750	<0.00120	**0.690**			0.0204		
	OCD-1R	Apr-16		0.00566 J	0.0159 J			**0.0508**		0.905	<0.00120	**0.599**			0.00328 J		
	OCD-1R	Apr-17		0.00284	0.0174			<0.002		<0.1	<0.002	**1.22**			0.000904 J		
	OCD-2A	Apr-14		<0.00200	0.0203			<0.00200		<0.156	<0.00140	**0.440**			<0.00200		
	OCD-2A	Apr-15		0.00138 J	0.0188 J			<0.00270		<0.0750	<0.00120	**0.296**			<0.00190		
	OCD-2A	Apr-16		0.0046 J	0.0237 J			0.00345 J		**4.22**	<0.00120	**1.41**			<0.00190		
	OCD-2A	Apr-17		0.000769 J	0.0228			<0.002		<0.1	<0.002	**1.21**			<0.002		
	OCD-3	Apr-14		<0.00200	0.0187			<0.00200		<0.156	<0.00140	0.0572			<0.00200		
	OCD-3	Apr-15		<0.00120	0.018 J			<0.00270		0.341 J	<0.00120	0.105			<0.00190		
	OCD-3	Apr-16		0.00135 J	0.0219 J			<0.00270		0.0865 JB	<0.00120	0.0382			<0.00190		
	OCD-3	Apr-17		0.000537 J	0.0222			<0.002		<0.1	<0.002	0.0565			<0.002		
	OCD-4	Apr-14		<0.00500	0.0212 J			<0.00500		**3.10**	<0.00350	**0.287**			<0.00500		
	OCD-4	Apr-15		0.00246 J	0.0228 J			<0.00270		**1.89**	<0.00120	**0.290**			<0.00190		
	OCD-4	Apr-16		0.00176 J	0.0263			<0.00270		0.8	0.00146 J	0.149			<0.00190		
	OCD-4	Apr-17		0.000607 J	0.0235			<0.002		0.419	<0.002	0.066			<0.002		
	OCD-5	Apr-14	FD	<0.00500	0.0241 J			<0.00500		**1.62**	<0.00350	**0.386**			<0.00500		
	OCD-5	Apr-14		0.0055 J	0.0243 J			<0.00500		**1.61**	<0.00350	**0.375**			<0.00500		
	OCD-5	Apr-15		0.00721 J	0.0265			<0.00270		**3.41**	<0.00120	**0.312**			<0.00190		
	OCD-5	Apr-16		0.00259 J	0.024 J			<0.00270		**1.16**	<0.00120	**0.216**			<0.00190		
	OCD-5	Apr-17		0.00197 J	0.0245			<0.002		0.357	<0.002	**0.290**			<0.002		
	OCD-6	Apr-14		**0.0161** J	0.0194 J			<0.00500		**1.75**	<0.00350	**2.20**			<0.00500		
	OCD-6	Apr-15		**0.0124**	0.0209			0.000915 J		**2.91**	0.000267 J	**1.98**			0.000955 J		
	OCD-6	Apr-16		**0.0118**	0.0208 J			<0.00270		**2.00**	<0.00120	**2.14** V			0.00282 J		
	OCD-6	Apr-17		0.00705	0.0224			<0.002		<0.1	<0.002	**2.20**			0.000614 J		
	OCD-7AR	Apr-14	FD	**0.131**	0.0125			<0.00200		**1.57**	<0.00140	**2.62**			0.00271 J		
	OCD-7AR	Apr-14		**0.13**	0.0119			0.00204 J		**1.73**	<0.00140	**2.77**			0.00234 J		
	OCD-7AR	Apr-15		**0.0732**	0.0122			<0.00054		0.237	0.0003 J	**2.70**			0.00179 J		
	OCD-7AR	Apr-16		**0.127**	0.0133 J			<0.00270		0.217 J	<0.00120	**2.20**			0.0036 J		
	OCD-7AR	Apr-17		**0.105**	0.0135			<0.002		0.0872 J	<0.002	**2.22**			0.00167 J		

Appendix B, Table B.3 - Summary of Groundwater Analytical Data - Dissolved Metals

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

			Analyte Group:	**Dissolved Metals**													
			Analyte:	**Arsenic**	**Barium**	**Boron**	**Cadmium**	**Chromium**	**Cobalt**	**Iron**	**Lead**	**Manganese**	**Mercury**	**Nickel**	**Selenium**	**Uranium**	**Vanadium**
			Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
			CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
			CGWSL Source:	USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC HH	WQCC Irr	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
Area	**Well ID**	**Date**	**Dup**														
Evaporation Ponds	OCD-7B	Mar-13		<0.00500	0.0155			<0.00500		<0.200	<0.00500	<0.00500			<0.00500		
	OCD-7B	Apr-15		0.00304	0.0178			0.000838 J		**2.72**	<0.00024	**0.626**			<0.00038		
	OCD-7B	Apr-17		0.00131 J	0.0195			<0.002		<0.1	<0.002	**0.667**			<0.002		
	OCD-8A	Apr-14	FD	**0.0735**	0.0235			<0.00200		**8.13**	<0.00140	**3.38**	0.0017	0.0295	<0.00200		0.00193 J
	OCD-8A	Apr-14		**0.0791**	0.024			<0.00200		**8.18**	<0.00140	**3.45**	0.00008	0.0285	<0.00200		0.00185 J
	OCD-8A	Apr-15		**0.0543**	0.0315			0.000744 J		**11.0**	<0.00024	**6.40**		0.0562	0.000889 J		0.000737 J
	OCD-8A	Apr-16		**0.0651**	0.0222 J	**0.816**	<0.00080	<0.00270	<0.0013	**9.02**	<0.00120	**3.89**	<4.9E-05	0.0331	0.00226 J	<0.00165	0.00186 J
	OCD-8A	Apr-17		**0.0533**	0.0163	0.745	<0.001	<0.002	0.00105 J	0.0677 J	<0.002	**3.01**	<0.0002	0.0227	0.00106 J	0.00102 J	0.000283
	OCD-8B	Apr-13		**<0.0250**	<0.0250			<0.0250		<1.00	**<0.0250**	**0.617**			<0.0250		
	OCD-8B	Apr-15		**0.0113**	0.012			0.000653 J		0.2	<0.00024	**5.18**			0.000497 J		
	OCD-8B	Apr-17		0.0091	0.0127			<0.002		0.0155 J	<0.002	**6.46**			<0.002		
Field East of Refinery	KWB-1A	Apr-14		0.0042 J	0.00811 J			<0.00200		<0.156	<0.00140	**0.406**		0.00847 J	<0.00200		0.0197
	KWB-1A	Apr-15		0.00328	0.0084			<0.00054		<0.0150	<0.00024	**0.371**		0.00773	0.00336		0.0226
	KWB-1A	Apr-16		0.00279	0.00849	0.647	<0.000160	<0.00054	0.00479	<0.0150	0.000318 J	**0.398**	<4.9E-05	0.00956	0.00669 B	0.0217	0.0217
	KWB-1A	Apr-17		0.00344	0.00795	0.681	<0.001	<0.002	0.00545	<0.1	<0.002	**0.409**	<0.0002	0.00948	0.0013 J	0.0243	0.0223
	KWB-1C	Apr-13		<0.0100	0.0131			<0.0100		<0.400	<0.0100	<0.0100			<0.0100		
	KWB-1C	Apr-15		0.00297	0.0087			<0.00054		<0.0150	0.000528 J	**0.451**			0.00155 J		
	KWB-1C	Apr-17		0.00303	0.00839			<0.002		<0.1	<0.002	**0.472**			<0.002		
	KWB-7	Apr-13		<0.00500	0.0429			<0.00500		<0.200	<0.00500	**1.72**	<0.000200	0.0201	<0.00500		0.0116
	KWB-7	Apr-15		**0.0191**	0.0628			<0.00054		**1.51**	<0.00024	**5.86**		0.00784	0.000486 J		0.00111 J
	KWB-7	Apr-16		0.00997 J	0.0544	0.472	<0.00080	<0.00270	0.00568	**1.40**	<0.00120	**3.66**	<4.9E-05	0.00777 J	<0.00190	0.00299 J	0.00229 J
	KWB-7	Apr-17		0.00204	0.044	0.405	<0.001	<0.002	<0.002	<0.1	<0.002	**3.25**	<0.0002	0.00101 J	<0.002	0.00167 J	0.00093 J
	KWB-8	Apr-17		0.000904 J	0.087	0.6	<0.001	<0.002	<0.002	0.0772 J	0.000556 J	**1.77**	<0.0002	0.000663 J	<0.002	<0.01	0.00112 J
	KWB-10R	Apr-15		**0.0247**	**3.15**			<0.00054		**7.25**	0.00142 J	0.151			0.000839 J		
	KWB-10R	Apr-16		**0.0156**	**3.93**			<0.00054		**5.93**	0.000669 J	0.165			0.00194 JB		
	KWB-10R	Apr-17		**0.0115**	**3.39**			<0.002		0.281	0.000478 J	0.145			<0.002		
	KWB-11A	Apr-13		<0.00500	0.0209			<0.00500		<0.200	<0.00500	0.0115	<0.000200	<0.00500	0.00781		0.0126
	KWB-11A	Apr-15		0.00241	0.0217			<0.00054		<0.0150	0.00817	**0.265**		0.00442	0.0026		0.0123
	KWB-11A	Apr-16		0.00234 J	0.0283	0.477	<0.00080	<0.00270	0.00202	<0.075	0.00533 J	**0.240**	<4.9E-05	0.00547 J	0.00847 J	0.0209 J	0.0134 J
	KWB-11A	Apr-17		0.00194 J	0.0205	0.386	<0.001	<0.002	0.0014 J	<0.1	0.00294	**0.240**	<0.0002	0.00478	0.00483	0.0196	0.0119
	KWB-11B	Apr-14		0.00165 J	0.0142			<0.00100		<0.0780	<0.00070	<0.00250	<4.2E-05	<0.00100	0.00946		0.0079
	KWB-11B	Apr-15		0.00139 J	0.0135			0.000786 J		<0.0150	<0.00024			0.000504 J	0.00972		0.00811
	KWB-11B	Apr-16		0.00144 J	0.0119 J	0.154	<0.00080	<0.00270	<0.0013	<0.075	<0.00120	<0.00125	<4.9E-05	<0.00175	0.00845 J	0.00958 J	0.00947 J
	KWB-11B	Apr-17		0.0013 J	0.0123	0.0995	<0.001	0.000579 J	<0.002	<0.1	<0.002	0.000589 J	<0.0002	<0.002	0.00905	0.0114	0.00855
	KWB-12A	Apr-15	FD	0.0015 J	0.0128			<0.00054		<0.0150	<0.00024	0.000359 J		0.000473 J	0.00374		0.00955
	KWB-12A	Apr-15		0.00167 J	0.016			<0.00054		0.0156 J	<0.00024	<0.000250		0.000471 J	0.00445		0.0112
	KWB-12A	Apr-16		0.00191 J	0.0184 J	0.621	<0.00080	<0.00270	<0.0013	<0.075	<0.00120	<0.00125	<4.9E-05	<0.00175	0.00383 J	**0.0337** J	0.0143 J
	KWB-12A	Apr-17		0.00145 J	0.0155	0.56	<0.001	<0.002	<0.002	<0.1	<0.002	0.00171 JB	<0.0002	0.000403 JB	0.00361	0.029	0.0121
	KWB-12B	Apr-14	FD	0.00222 J	0.0101			<0.00200		<0.156	<0.00140	<0.00500	<4.2E-05	<0.00200	0.00341 J		0.0134
	KWB-12B	Apr-14		0.00336 J	0.00906			<0.00100		<0.0780	<0.00070	<0.00250	<4.2E-05	<0.00100	0.0046 J		0.0133
	KWB-12B	Apr-15		0.00169 J	0.00905			<0.00054		<0.0150	<0.00024	0.000656		0.000442 J	0.00404		0.0112
	KWB-12B	Apr-16	FD	0.00196 J	0.0132 J	0.625	<0.00080	<0.00270	<0.0013	<0.075	<0.00120	0.0047 J	<4.9E-05	<0.00175	0.00397 J	**0.0322** J	0.0141 J
	KWB-12B	Apr-16		0.00196 J	0.0159 J	0.625	<0.00080	<0.00270	<0.0013	<0.075	<0.00120	0.00501 J	<4.9E-05	<0.00175	0.00398 J	**0.0325** J	0.0152 J
	KWB-12B	Apr-17	FD	0.00152 J	0.00889	0.507	<0.001	<0.002	<0.002	<0.1	<0.002	0.00235 J	<0.0002	<0.002	0.00405 B	0.029	0.0124
	KWB-12B	Apr-17		0.00158 J	0.0101	0.603	<0.001	<0.002	<0.002	<0.1	<0.002	0.000491 JB	<0.0002	0.00061 JB	0.00354	**0.0307**	0.0120
	MW-57	Apr-14		**0.056**	0.065			<0.00100		**2.67**	0.000734 J	**1.98**			<0.00100		
	MW-57	Apr-15		0.00508	0.0171			<0.00054		0.385	<0.00024	0.188			0.0331		
	MW-57	Apr-16		0.00424 J	0.0144 J			<0.00270		<0.075	<0.00120	**0.388**			0.0116		
	MW-57	Apr-17		0.00348	0.0154			<0.002		<0.1	<0.002	**0.283**			0.0231		
	MW-58	Apr-15		**0.0116**	0.89			<0.00054		**1.33**	0.00259	0.0974		0.000747 J	0.000588 J		0.00237 J
	MW-58	Apr-16		**0.0109**	0.632	0.519	<0.00080	<0.00270	<0.0013	0.429 J	0.00166 J	**0.357**	<4.9E-05	0.00864 JB	<0.00190	<0.00165	0.00201 J
	MW-58	Apr-17		**0.0118**	0.68	0.395	<0.001	<0.002	<0.002	0.123	0.00131 J	**0.319**	<0.0002	0.000589 J	<0.002	<0.01	0.00242 J
	MW-111	Apr-14		**0.0126**	0.222			<0.00100		**6.74**	<0.00070	**1.68**			0.00119 J		
	MW-111	Apr-15		**0.0123**	0.239			<0.00054		**5.92**	<0.00024	**1.60**			<0.00038		
	MW-111	Apr-16		**0.0137**	0.0935			<0.00270		**6.54**	<0.00120	**1.68**			<0.00190		
	MW-111	Apr-17		0.00967	0.0596			<0.002		<0.1	<0.002	**1.59**			0.000586 J		
	MW-113	Apr-14		0.00267 J	0.018			<0.00100		0.0871 J	<0.00070	**0.387**			<0.00100		
	MW-113	Apr-15	FD	0.00413	0.0254			<0.00054		0.35	<0.00024	**0.946**			0.000388 J		
	MW-113	Apr-15		0.00445	0.0248			<0.00054		0.341	<0.00024	**0.917**			0.00328		
	MW-113	Apr-16	FD	0.00251 J	0.0233 J			<0.00270		0.191 J	<0.00120	**0.675**			<0.00190		
	MW-113	Apr-16		0.00282 J	0.0218 J			<0.00270		0.178 J	<0.00120	**0.723** V			<0.00190		
	MW-113	Apr-17	FD	0.00271	0.0262			<0.002		<0.1	<0.002	**1.12**			0.000537 JB		
	MW-113	Apr-17		0.00264	0.0251			<0.002		<0.1	<0.002	**1.14**			0.000664 JB		
	MW-125	Apr-14		0.00406 J	0.00914			<0.00100		<0.0780	<0.00070	**0.395**			0.00773		
	MW-125	Apr-15		0.00367	0.00842 J			<0.00054		<0.0150	<0.00024	**0.385**			0.00797 J		
	MW-125	Apr-16		0.00391 J	0.0101 J			<0.00270		<0.075	<0.00120	**0.412**			0.00379 J		
	MW-125	Apr-17		0.0035	0.00884			<0.002		<0.1	<0.002	**0.393**			0.00331		
	MW-126A	Apr-14		0.00366 J	0.0136			<0.00100		<0.0780	<0.00070	0.174			0.0027 J		
	MW-126A	Apr-15		0.00257	0.0159			0.000604 J		**1.17**	<0.00024	**0.829**			<0.00038		
	MW-126A	Apr-16		0.00221 J	0.0178 J			<0.00270		0.714	<0.00120	**0.820**			0.00299 J		
	MW-126A	Apr-17		0.0016 J	0.0171			<0.002		<0.1	<0.002	**0.880**			0.000761 JB		
	MW-126B	Apr-14		0.00344 J	0.0168			0.00379 J		**1.17**	<0.00070	**0.930**			0.00115 J		
	MW-126B	Apr-15		0.00384	0.0102			0.000682 J		0.032 J	<0.00024	0.0807			0.00222		
	MW-126B	Apr-16		0.0035 J	0.00925			0.00119 J		<0.0150	<0.00024	0.0661			0.00538 JB		
	MW-126B	Apr-17		0.00361	0.0101			<0.002		<0.1	0.000513 J	0.0652			0.00284 JB		
	MW-127	Apr-14		0.004 J	0.191			<0.00100		0.685	<0.00070	0.155			0.00106 J		
	MW-127	Apr-15		0.00374	0.204			0.000841 J		0.486	0.000441 J	0.0919			<0.00038		
	MW-127	Apr-16		0.00441 J	0.115			<0.00270		0.258 J	<0.00120	0.103			0.00298 J		
	MW-127	Apr-17		0.00321	0.0692			<0.002		0.0152 J	<0.002	0.103			0.000512 JB		
	MW-128	Apr-14		**0.0563**	0.0808			<0.00100		**2.92**	<0.00070	**2.29**			<0.00100		
	MW-128	Apr-15		**0.045**	0.0674 J			<0.00054		**2.23**	<0.00024	**2.20**			0.00455 J		
	MW-128	Apr-16		**0.0646**	0.0812			<0.00270		**2.77**	<0.00120	**2.52**			<0.00190		
	MW-128	Apr-17		**0.0464**	0.0573			<0.002		0.0239 J	<0.002	**2.16**			<0.002		
	MW-129	Apr-15		**0.0279**	0.536			<0.00054		**4.93**	<0.00024	**1.11**			<0.00038		
	MW-129	Apr-16		**0.0256**	0.614			<0.00270		**5.58**	<0.00120	**1.17**			0.00253 J		
	MW-129	Apr-17		**0.0152**	0.585			<0.002		<0.1	<0.002	**1.03**			0.000611 JB		
	MW-130	Apr-14		0.00434 J	0.0238			<0.00100		0.0912 J	<0.00070	0.13			0.00713		
	MW-130	Apr-15		0.00464	0.0233			0.00155 J		0.446 J	0.00165 J	0.119			0.00337 J		
	MW-130	Apr-16		0.0045 J	0.0198 J			<0.00270		0.116 J	<0.00120	0.103			0.0126		
	MW-130	Apr-17		0.00386	0.0173			<0.002		<0.1	<0.002	0.0967			0.0164		
	MW-131	Apr-14		**0.0205**	**2.21**			<0.00100		**1.56**	<0.00070	**0.384**			0.00118 J		
	MW-131	Apr-15		**0.0219**	**2.82**			<0.00054		**1.84**	0.000414 J	**0.323**			<0.00038		
	MW-131	Apr-16		**0.0218**	**2.76**			<0.00270		**1.46**	<0.00120	**0.322**			0.00271 J		
	MW-131	Apr-17		**0.0183**	**2.48**			<0.002		<0.1	<0.002	**0.309**			0.000632 JB		
	MW-133	Apr-15		**0.0102**	0.138			<0.00054		**2.59**	0.000513 J	**0.290**			0.00325		
	MW-134	Apr-14		0.00761 J	0.00947 J			<0.00200		<0.156	<0.00140	0.0169			0.00508 J		
	MW-134	Apr-15	FD	0.00571	0.00941			0.00147 J		0.182	<0.00024	0.00509			0.0134		
	MW-134	Apr-15		0.00634 J	0.0115 J			<0.00270		<0.0750	<0.00120	0.00504 J			0.0180		
	MW-134	Apr-16	FD	0.00504 J	0.00916 J			<0.00270		<0.075	<0.00120	0.00888 J			0.00888 J		
	MW-134	Apr-16		0.00551 J	0.0107 J			<0.00270		<0.075	<0.00120	0.00802 J			0.00963 J		
	MW-134	Apr-17	FD	0.00466	0.00895			<0.002		<0.1	<0.002	0.00835			0.00588 B		
	MW-134	Apr-17		0.00441	0.0101			<0.002		<0.1	0.000467 J	0.00881			0.0106		

Appendix B, Table B.3 - Summary of Groundwater Analytical Data - Dissolved Metals

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Dissolved Metals													
				Analyte:	Arsenic	Barium	Boron	Cadmium	Chromium	Cobalt	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC HH	WQCC Irr	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
Field East of Refinery	MW-135	Apr-14		0.00316 J	0.0122			<0.00100		<0.0780	<0.00070	0.0111			0.0349		
	MW-135	Apr-15		0.00291	0.0106			0.000881 J		<0.0150	<0.00024	0.00329 J			0.0345		
	MW-135	Apr-16		0.00339 J	0.0105 J			<0.00270		0.149 J	<0.00120	0.00261 J			0.0244		
	MW-135	Apr-17		0.003	0.00994			0.000633 J		<0.1	0.00027 J	0.000848 JB			0.0402		
	RW-12R	Apr-16		<0.00250	0.0398 J			0.0149 JB		<0.150	0.0031 J	**0.489**			<0.00740		
	RW-12R	Apr-17		0.000617 J	0.041			0.023		<0.1	0.000776 J	**0.425**			0.00072 JB		
	RW-13R	Apr-16		0.0089 J	0.0888			<0.00270		0.47 J	<0.00120	**1.36**			<0.00190		
	RW-18	Apr-13		**<0.0250**	<0.0250			<0.0250		<1.00	**<0.0250**	<0.0250			<0.0250		
	RW-18	Apr-14		0.00353 J	0.0108			<0.00200		<0.156	<0.00140	<0.00500			0.00964 J		
	RW-18	Apr-16		0.00399	0.00975			0.000707 J		<0.0150	<0.00024	0.00112 J			0.00511 B		
	RW-18	Apr-17		0.00331	0.0105			<0.002		0.02 J	<0.002	0.00103 J			0.0034		
	RW-20	Apr-15		0.00171 J	0.464			<0.00054		0.27	<0.00024	**0.717**			0.00488		
	RW-22	Apr-15		<0.00250	0.802			<0.00540		0.394 J	0.00305 J	**0.886**			0.0326		
North Refinery	MW-23	Apr-13		0.0089	**8.59**			<0.00500		<0.200	<0.00500	0.0924			<0.00500		
	MW-23	Apr-14		**0.0101**	**9.40**			<0.00100		<0.0780	0.0107	0.091			<0.00100		
	MW-23	Apr-15		**0.0206**	0.215			0.000653 J		0.156	0.000295 J	**0.203**			0.000997 J		
	MW-23	Apr-16		0.00911	**10.9**			0.000955 J		0.0206 J	0.000319 J	0.0697			0.00164 JB		
	MW-23	Apr-17		0.00644	**9.68**			0.000654 J		<0.1	0.000731 J	0.0673			0.0033		
	MW-29	Apr-14		0.00753	0.0141			<0.00100		0.241	<0.00070	**0.624** J			<0.00100		
	MW-29	Apr-15		0.000886 J	0.0185			<0.00054		<0.0150	<0.00024	**0.378**			0.00432		
	MW-29	Apr-16		<0.00125	0.021 J			<0.00270		0.185 J	<0.00120	**0.487**			<0.00190		
	MW-29	Apr-17		0.000531 J	0.0173			<0.002		<0.1	<0.002	**0.451** V			<0.002		
	MW-39	Apr-15		0.00174 J	0.0226			<0.00054		<0.0150	0.000389 J	0.191			0.00533		
	MW-39	Apr-16		**0.0176**	0.0192 J			<0.00270		<0.075	<0.00120	0.0166 J			0.00222 J		
	MW-39	Apr-17		**0.0134**	0.0206			0.000959 J		<0.1	0.000354 J	0.012			0.00316		
	MW-40	Apr-14		0.00257 J	0.0271			<0.00100		<0.0780	<0.00070	0.0424			0.0027 J		
	MW-40	Apr-15		0.000999 J	0.027			<0.00054		0.2	<0.00024	0.0375			0.000388 J		
	MW-40	Apr-16		0.000937 J	0.0253			<0.00054		<0.0150	<0.00024	0.0214			0.00176 JB		
	MW-40	Apr-17		0.00103 J	0.0255			<0.002		<0.1	<0.002	0.0249			<0.002		
	MW-41	Apr-14		0.0064	0.0141			<0.00100		<0.0780	<0.00070	**0.847**			0.00316 J		
	MW-41	Apr-15		0.00448	0.0152			<0.00054		0.0163 J	<0.00024	**0.791**			<0.00038		
	MW-41	Apr-16		0.00459	0.0177			<0.00054		0.0198 J	<0.00024	**0.740**			0.00129 JB		
	MW-41	Apr-17		0.00393	0.0145			<0.002		<0.1	<0.002	**0.790**			0.00126 J		
	MW-42	Apr-14		**0.0135**	0.027			<0.00100		0.332	<0.00070	0.189			0.00429 J		
	MW-42	Apr-15		0.0074	0.023			0.00079 J		0.142	0.000322 J	0.152			0.000534 J		
	MW-42	Apr-16		0.00492	0.0204			<0.00054		0.0401 J	<0.00024	0.137			0.00121 JB		
	MW-42	Apr-17		0.00487	0.0179			<0.002		0.0328 J	0.000254 J	0.18			0.00156 J		
	MW-43	Apr-14		**0.0102**	0.0931			<0.00100		<0.0780	<0.00070	**0.439**		0.00357 J	<0.00100		0.00397 J
	MW-43	Apr-15		**0.0114**	0.25			<0.00054		<0.0150	<0.00024	**0.374**		0.00384	0.000428 J		0.000695 J
	MW-43	Apr-16		**0.0128**	0.0745	**1.65**	<0.00080	<0.00270	<0.0013	<0.075	<0.00120	**0.290**	<4.9E-05	0.00561 JB	0.0067 J	<0.00165	0.00283 J
	MW-43	Apr-17		**0.0107**	0.0928	**1.20**	<0.001	<0.002	<0.002	0.017 J	<0.002	0.191	<0.0002	0.00955	0.00152 J	<0.01	0.00185 JB
	MW-59	Apr-14		**0.0324**	0.0145			<0.00100		0.152 J	<0.00070	**0.480**			0.00267 J		
	MW-59	Apr-15		**0.0177**	0.0137 J			<0.00054		0.126	<0.00120	**0.427**			0.00859 J		
	MW-59	Apr-16		**0.0145**	0.0221 J			<0.00270		0.121 J	<0.00120	**0.466**			<0.00190		
	MW-59	Apr-17		**0.0260**	0.021			<0.002		0.0343 J	<0.002	**0.468**			0.000557 JB		
	MW-60	Apr-14		0.00796	0.02			<0.00100		0.136 J	<0.00070	**0.334**		<0.00100	0.00214 J		<0.00090
	MW-60	Apr-15	FD	0.0016 J	0.0177			<0.00054		0.127	0.000283 J	**0.349**		0.000977 J			
	MW-60	Apr-15		**0.0171** J	0.026 J			<0.00054		0.116 J	0.000316 J	**0.321**		0.000587 J	0.047 J		0.000471 J
	MW-60	Apr-16	FD	0.00871 J	0.0169 J	0.431	<0.00080	<0.00270	<0.0013	0.17 J	<0.00120	**0.339**	<4.9E-05	<0.00175	<0.00190	0.00239 J	0.00129 J
	MW-60	Apr-16		0.00902 J	0.0184 J	0.439	<0.00080	<0.00270	<0.0013	0.139 J	<0.00120	**0.333**	<4.9E-05	<0.00175	<0.00190	0.00241 J	<0.00090
	MW-60	Apr-17	FD	0.00763	0.0183	0.352	<0.001	<0.002	<0.002	0.027 J	<0.002	**0.308**	<0.0002	<0.002	<0.002	0.00218 J	0.000755 JB
	MW-60	Apr-17		0.00888	0.0171	0.378	<0.001	<0.002	<0.002	0.0207 J	<0.002	**0.310**	<0.0002	<0.002	0.000813 JB	0.00218 J	0.000538 JB
	MW-61	Apr-14		0.00159 J	0.031			<0.00100		<0.0780	0.00173 J	0.0235			<0.00100		
	MW-61	Apr-15		0.00381	0.0442			<0.00054		<0.0150	<0.00024	0.0047 J			0.000496 J		
	MW-61	Apr-16		<0.00125	0.0205 J			<0.00270		0.103 J	<0.00120	0.062			<0.00190		
	MW-61	Apr-17		0.000757 J	0.0204			<0.002		<0.1	0.000747 J	0.0367			0.0188		
	MW-62	Apr-14		0.00406 J	0.0689			<0.00100		<0.0780	<0.00070	0.0039 J			0.00135 J		
	MW-62	Apr-15		**0.0110**	**9.93**			0.000662 J		<0.0150	0.000487 J	0.0688			0.000755 J		
	MW-62	Apr-16		0.00286 J	0.0329			<0.00270		0.152 J	<0.00120	0.00388 JB			0.00392 J		
	MW-62	Apr-17		0.00302	0.0239			<0.002		<0.1	<0.002	0.00371 J			0.0172		
	MW-67	Apr-15		0.00402	0.129			<0.00054		0.0443 J	0.00062 J	0.0816		0.00369	<0.00038		0.000753 J
	MW-67	Apr-16		**0.0110**	0.231	0.458	<0.00080	<0.00270	<0.0013	0.156 J	<0.00120	0.133	<4.9E-05	0.00267 J	0.00609 J	<0.00165	0.002830 J
	MW-67	Apr-17		**0.0163**	0.118	0.436	<0.001	0.000587 J	<0.002	<0.1	0.000542 J	0.091	<0.0002	0.00158 J	0.00205	<0.01	0.000929 JB
	MW-90	Apr-14		0.00379 J	0.0166			<0.00100		<0.0780	0.000729 J	0.0754			<0.00100		
	MW-90	Apr-15		0.00775	0.0207			0.000646 J		0.187	<0.00024	**0.338**			0.00101 J		
	MW-90	Apr-16		0.00739 J	0.0116 J			<0.00270		<0.075	<0.00120	0.158			0.00584 J		
	MW-90	Apr-17		0.00507	0.0148			<0.002		0.0528 J	<0.002	0.144			0.000711 J		
	MW-91	Apr-14		0.00323 J	0.115			<0.00100		<0.0780	0.00144 J	<0.00250			<0.00100		
	MW-91	Apr-15		0.00974	0.0899			<0.00054		0.0216 J	0.00281	0.00489 J			<0.00038		
	MW-91	Apr-16		0.00741 J	0.065 O1			<0.00270		<0.075	0.00386 J	0.00359 J			<0.00740 J3J6		
	MW-91	Apr-17		0.00818	0.0523			<0.00054		<0.015	0.00238	0.00165 J			<0.0038		
	MW-92	Apr-16		0.00285 J	**3.57**			<0.00270		0.217 J	<0.00120	0.0349			<0.00190		
	MW-92	Apr-17		0.00818	0.0523			<0.002		<0.1	0.00238	0.00165 J			<0.002		
	MW-93	Apr-14		0.00718	0.085			0.00207 J		<0.0780	0.00113 J	0.0408			0.00186 J		
	MW-93	Apr-15		**0.0124**	0.0327			0.00341		0.0375 J	0.000293 J	**0.215**			0.00468		
	MW-93	Apr-16		0.01	0.0197			0.00692		0.219	0.000301 J	0.054			0.018		
	MW-93	Apr-17		0.00375	0.021			0.00235		0.0197 J	0.000486 J	0.0255			0.0145		
	MW-94	Apr-16		**0.0163**	0.356			<0.00270		<0.075	<0.00120	0.00601 J			0.0334		
	MW-94	Apr-17		**0.0106**	0.771			0.00124 J		<0.1	0.000343 J	0.00235 J			0.00973		
	MW-95	Apr-14		<0.00100	0.118			<0.00100		<0.0780	<0.00070	0.0413			<0.00100		
	MW-95	Apr-15		0.00134 J	0.0681			<0.00054		0.0255 J	<0.00024	0.0368			<0.00038		
	MW-95	Apr-16		0.00164 J	0.0732			<0.00270		<0.075	<0.00120	0.0269			0.00486 J		
	MW-95	Apr-17		0.00162 J	0.0592			<0.002		<0.1	0.000323 J	0.0285			0.00164 J		
	MW-96	Apr-14		0.00477 J	0.114			<0.00100		<0.0780	<0.00070	<0.00250			<0.00100		
	MW-96	Apr-15		0.00499	0.113			0.000705 J		0.0345 J	<0.00024	0.00338 J			0.000787 J		
	MW-96	Apr-16		0.00429 J	0.141			<0.00270		<0.075	<0.00120	0.00127 J			0.0033 J		
	MW-96	Apr-17		0.00326	0.119			<0.002		<0.1	<0.002	0.00148 J			0.000546 J		
	MW-98	Apr-14	FD	0.00239 J	0.016			0.00142 J		<0.0780	0.00986	0.0274			0.002 J		
	MW-98	Apr-14		0.00226 J	0.0145			<0.00100		<0.0780	0.00912	0.0273			0.00155 J		
	MW-98	Apr-15		0.00139 J	0.0151			<0.00054		<0.0150	0.00908	0.0259			0.000446 J		
	MW-98	Apr-16		0.00153 J	0.0164			0.00107 J		<0.0150	0.00629	0.0222			0.00216 B		
	MW-98	Apr-17		0.00164 J	0.0157			<0.002		<0.1	0.00758	0.0242			<0.002		
	MW-137	Apr-16		**0.0671**	0.0397	**0.76**	<0.000160	0.00081 J	<0.00026	<0.0150	0.00429	0.103	<4.9E-05	0.00729	0.00345 B	<0.00033	0.00646
	MW-137	Apr-17		**0.052**	0.0518	0.7	<0.001	<0.002	<0.002	<0.1	0.00355	0.124	<0.0002	0.0079	0.00196 J	<0.01	0.00537
	MW-138	Apr-16		0.0062	0.169	**1.08**	<0.000160	<0.00054	<0.00026	0.0158 J	<0.00024	0.128	<4.9E-05	0.00484	0.00157 JB	<0.00033	0.00403 J
	MW-138	Apr-17		0.00553	0.129	**0.945**	<0.001	<0.002	<0.002	<0.1	<0.002	0.105	<0.0002	0.00484	0.000432 J	<0.01	0.00246 J
	RW-1	Apr-15		0.00426	0.0301			0.00131 J		0.0744 J	0.000323 J	0.118			0.00136 J		
	RW-1R	Apr-16		0.00435 J	0.0367			<0.00270		**11.3**	<0.00120	**0.301**			<0.00190		
	RW-1R	Apr-17		**0.0234**	0.0229			0.00338		0.184	<0.002	**0.218**			0.00286		
	RW-2	Apr-15		**0.0194**	0.0174			0.00494		0.0471 J	0.000546 J	**0.285**			0.00133 J		
	RW-2R	Apr-16		0.00883 J	0.0206 J			0.004 JB		0.770	<0.00120	0.0466			0.00516 J		
	RW-2R	Apr-17		0.0023	0.053			0.00131 J		0.020 J	0.000647 J	0.0157			0.0364		
	RW-7	Apr-15		0.00249	0.404			0.000879 J		<0.0150	0.000482 J	0.0266			0.0165		
	RW-7R	Apr-16		**0.0136**	0.0303			<0.00270		0.509	<0.00120	**1.25**			0.00396 J		
	RW-7R	Apr-17		0.00273	0.0191			<0.002		0.0228 J	<0.002	**1.12**			0.00142 J		

Appendix B, Table B.3 - Summary of Groundwater Analytical Data - Dissolved Metals

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Dissolved Metals														
				Analyte:	Arsenic	Barium	Boron	Cadmium	Chromium	Cobalt	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC HH	WQCC Irr	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
Area	Well ID	Date	Dup															
North Refinery	RW-8	Apr-15		0.00521	0.0797			<0.00054		0.163	0.000591 J	0.0744			<0.00038		
	RW-8	Apr-17		**0.0346**	0.0661			<0.002		**2.13**	<0.002	**1.14**			<0.002		
	RW-9	Apr-14		0.0061	0.0494			<0.00100		<0.0780	<0.00070	**0.404**			0.00393 J		
	RW-9	Apr-15		0.00358	0.0468			<0.00054		0.179	0.000454 J	**0.501**			0.000418 J		
	RW-9	Apr-16		0.00328 J	0.0453			<0.00270		<0.075	<0.00120	**0.397**			<0.00190		
	RW-9	Apr-17		0.00324	0.0415			<0.002		<0.1	0.000371 J	**0.745**			<0.002		
	RW-10	Apr-14		0.00273 J	0.0186			<0.00100		0.132 J	<0.00070	**0.212**			0.00268 J		
	RW-10	Apr-15		0.00177 J	0.0275			<0.00054		0.0573 J	<0.00024	**0.250**			0.00598		
	RW-10	Apr-16		<0.00125	0.0324			<0.00270		0.0776 J	<0.00120	**0.237**			0.0121		
	RW-10	Apr-17		0.0018 J	0.0184			<0.002		<0.1	<0.002	0.18			0.000631 JB		
	RW-16	Apr-14	FD	**0.0127**	0.0141			<0.00100		0.139 J	<0.00070	**0.611**			0.003 J		
	RW-16	Apr-14		**0.0126**	0.0139			<0.00100		0.125 J	<0.00070	**0.601**			0.00304 J		
	RW-16	Apr-15		**0.0133**	0.0143			0.00101 J		0.0234 J	0.000255 J	**0.400**			0.00931		
	RW-16	Apr-16		**0.0122**	0.0126 J			<0.00270		<0.075	<0.00120	**0.379**			0.00842 J		
	RW-16	Apr-17		**0.0133**	0.0126			0.000989 J		<0.1	<0.002	**0.264**			0.00535		
	RW-17	Apr-14		**0.0104**	0.0219			<0.00200		0.540	0.00417 J	**0.743**			<0.00200		
	RW-17	Apr-15		0.00838	0.0211			0.000835 J		<0.0150	0.00228	0.0992			0.0393		
	RW-17	Apr-16		0.00847 J	0.0228 J			<0.00270		<0.075	0.0065 J	**0.652**			0.0133		
	RW-17	Apr-17		**0.0109**	0.0213			<0.002		<0.1	0.00763	**0.711**			0.00945		
North RO Reject Field	MW-117	Apr-14		0.00328 J	<0.000900 B			<0.00100		<0.0780	<0.00070	0.0204			0.00425 J		
	MW-117	Apr-15		0.00241	0.00887			0.000697 J		0.0963 J	<0.00024	0.0016 J			0.0166		
	MW-117	Apr-16		0.0026 J	0.00993 J			<0.00270		<0.075	<0.00120	<0.00125			0.00912 J		
	MW-117	Apr-17		0.0024	0.0095 B			<0.002		<0.1	0.00033 J	0.0026 JB			0.00439		
	MW-118	Apr-14		0.00974	<0.000900 B			<0.00100		<0.0780	<0.00070	0.0121			0.00108 J		
	MW-118	Apr-15		0.00984	0.00952			0.00131 J		0.0698 J	<0.00024	0.00169 J			0.00799		
	MW-118	Apr-16		**0.011**	0.00885 J			<0.00270		<0.075	<0.00120	<0.00125			0.00607 J		
	MW-118	Apr-17		**0.0104**	0.0091 B			<0.002		<0.1	0.000324 J	<0.005			0.0236		
	MW-119	Apr-14	FD	0.00461 J	<0.000900 B			<0.00100		<0.0780	<0.00070	<0.00250			0.00402 J		
	MW-119	Apr-14		0.00468 J	<0.000900 B			<0.00100		<0.0780	<0.00070	<0.00250			0.00393 J		
	MW-119	Apr-15		0.00374	0.00758			0.000834 J		0.262	<0.00024	0.00863			<0.00038		
	MW-119	Apr-16		0.00338 J	0.00748 J			<0.00270		<0.075	<0.00120	<0.00125			0.00271 J		
	MW-119	Apr-17		0.00382	0.0103			<0.002		<0.1	<0.002	0.00177 JB			0.00434		
NCL	MW-18	Apr-14		0.00488 J	0.0183			0.0017 J		<0.0780	0.000942 J	0.011	<4.2E-05	0.00102 J	0.0136		0.0161
	MW-18	Apr-15		0.0035	0.0171			0.00131 J		0.0182 J	<0.00024	0.00643		0.00135 J	0.0129		0.0157
	MW-18	Apr-16		0.00307 J	0.0146 J	**1.35**	<0.00080	<0.00270	<0.0013	<0.075	<0.00120	0.00725 J	<4.9E-05	<0.00175	0.02	**0.0405** J	0.0177 J
	MW-18	Apr-17		0.00373	0.0211	**1.50**	<0.001	0.00176 JB	0.00036 J	<0.1	<0.002	0.00248 J	<0.0002	0.00198 JB	0.0155	0.0242	0.0198
	MW-45	Apr-14		0.00354 J	0.0163			<0.00100		0.690	<0.00070	**0.535**	<4.2E-05	0.00756	0.00198 J		<0.0009
	MW-45	Apr-15		0.00359	0.0174			<0.00054		0.790	<0.00024	**0.526**		0.00635	0.000904 J		0.00028 J
	MW-45	Apr-16		0.00368 J	0.0185 J	0.596	<0.00080	<0.00270	<0.0013	**1.25**	<0.00120	**0.561**	<4.9E-05	0.00391 J	<0.00190	<0.00165	0.0010 J
	MW-45	Apr-17		0.00343	0.0174	0.549	<0.001	<0.002	<0.002	0.153	<0.002	**0.572**	<0.0002	0.00333	0.000382 J	0.0011 J	0.0003 J
	MW-53	Apr-14		0.00316 J	0.0213			<0.00100		<0.0780	<0.00070	**0.532**			0.00135 J		
	MW-53	Apr-15		0.00167 J	0.0212			<0.00054		<0.0150	<0.00024	**0.797**			0.00627		
	MW-53	Apr-16		0.00166 J	0.0246 J			<0.00270		<0.075	<0.00120	**0.605**			0.00498 J		
	MW-53	Apr-17		0.00162 J	0.021			<0.002		<0.1	<0.002	**1.50**			0.00293		
	MW-54A	Apr-14		0.0062	0.0182			<0.00100		<0.0780	<0.00070	**0.491**			0.00228 J		
	MW-54A	Apr-15		0.00289	0.0178			<0.00054		<0.0150	<0.00024	**0.461**			0.0029		
	MW-53	Apr-16		0.00314 J	0.0175 J			<0.00270		0.354 J	<0.00120	**0.477**			<0.00190		
	MW-53	Apr-17		0.00274	0.0164			<0.002		<0.1	<0.002	**0.45**			<0.002		
	MW-54B	Apr-13		<0.00500	0.0157			<0.00500		<0.200	<0.00500	0.138			<0.00500		
	MW-54B	Apr-15		0.00205	0.015			<0.00054		0.0456 J	<0.00024	0.164			0.00289		
	MW-54B	Apr-17		0.00173 J	0.0168			<0.002		<0.1	<0.002	**0.246**			0.000795 J		
	MW-55	Apr-14	FD	0.00659	0.00871			<0.00100		<0.0780	<0.00070	0.0596	<4.2E-05	0.00345 J	0.0272		0.0156
	MW-55	Apr-14		0.00641	0.00965			<0.00100		<0.0780	<0.00070	0.0595	<4.2E-05	0.004 J	0.0253		0.0156
	MW-55	Apr-15		0.00452	0.00832			0.00119 J		<0.0150	<0.00024	0.0421		0.00209	0.023		0.0141
	MW-55	Apr-16		0.00504 J	0.011 J	**1.26**	<0.00080	<0.00270	<0.0013	<0.075	<0.00120	0.0251	<4.9E-05	0.00242 J	0.0134	**0.0445** J	0.0187 J
	MW-55	Apr-17		0.0056	0.0136	**0.756**	<0.001	<0.002	<0.002	<0.1	<0.002	0.0235	<0.0002	0.0054	0.00494	**0.0395**	0.0190
	MW-56	Apr-14		0.00883	0.0136			<0.00100		<0.0780	<0.00070	**0.336**			0.00579		
	MW-56	Apr-15		0.00709	0.0136			<0.00054		<0.0150	0.000483 J	**0.286**			0.00334		
	MW-56	Apr-16		0.00737 J	0.0158 J			<0.00270		0.112 J	0.00132 J	**0.331**			0.00369 J		
	MW-56	Apr-17		0.00665	0.0174			<0.002		<0.1	0.000369 J	**0.339**			0.00306		
	MW-108	Apr-14		0.00326 J	0.0457			0.00207 J		<0.0780	0.000952 J	0.029			<0.00100		
	MW-108	Apr-15		0.00343	0.0299			0.00223		<0.0150	0.00105 J	0.0224			0.0184		
	MW-108	Apr-16		0.00281 J	0.0408			<0.00270		0.154 J	0.00173 J	0.0367			<0.00190		
	MW-108	Apr-17		0.00283	0.0428			0.000655 JB		<0.1	0.000859 J	0.0443			<0.002		
	NCL-31	Apr-14		**0.0112**	0.0194			<0.00100		0.940	<0.00070	**1.59**			<0.00100		
	NCL-31	Apr-15		0.00908	0.0141			<0.00054		0.731	0.000439 J	**1.59**			0.00311		
	NCL-31	Apr-16		0.00599 J	0.0178 J			<0.00270		0.866	<0.00120	**1.90**			<0.00190		
	NCL-31	Apr-17		0.00727	0.017			<0.002		<0.1	<0.002	**2.35**			0.000414 J		
	NCL-32	Apr-15		0.00262	0.0355			0.0012 J		0.42	0.000769 J	**0.878**			<0.00038		
	NCL-32	Apr-16		0.00412 J	0.0632			0.00772 J		**1.65**	0.00736 J	**1.32**			<0.00190		
	NCL-32	Apr-17		0.00306	0.019			<0.002		<0.1	<0.002	**0.994**			0.00116 J		
	NCL-33	Apr-14		0.00264 J	0.0247			<0.00100		**2.68**	<0.00070	0.0855			0.00104 J		
	NCL-33	Apr-15		0.00311	0.0223			<0.00054		**1.49**	<0.00024	0.104			0.000538 J		
	NCL-33	Apr-16		0.00228 J	0.0202 J			<0.00270		0.134 J	<0.00120	0.146			0.0156		
	NCL-33	Apr-17		0.00153 J	0.0217			<0.002		0.0173 J	<0.002	0.141			0.000812 J		
	NCL-34A	Apr-15		0.000947 J	0.492			<0.00054		<0.0150	<0.00024	0.0338			<0.00038		
	NCL-34A	Apr-16		<0.00125	0.616			<0.00270		<0.075	<0.00120	0.0172 J			0.00268 J		
	NCL-34A	Apr-17		0.000865 J	0.493			<0.002		<0.1	<0.002	0.0171			0.000444 J		
	NCL-44	Apr-14		**0.0372**	0.0289			<0.00100		**1.21**	<0.00070	**0.661**			<0.00100		
	NCL-44	Apr-15		**0.0536**	0.0256			<0.00054		**1.37**	<0.00024	**0.663**			<0.00038		
	NCL-44	Apr-16		**0.0362**	0.0257			<0.00270		**1.33**	<0.00120	**0.938**			<0.00190		
	NCL-44	Apr-17		**0.0279**	0.0281			<0.002		0.0169 J	<0.002	**0.895**			<0.002		
	NCL-49	Apr-14		0.00338 J	0.0112			<0.00100		<0.0780	<0.00070	<0.00250			0.00503		
	NCL-49	Apr-15	FD	0.00152 J	0.0102			<0.00054		<0.0150	<0.00024	<0.000250			0.00364		
	NCL-49	Apr-15		0.00145 J	0.0104			<0.00054		0.0227 J	<0.00024	0.000312 J			0.00471		
	NCL-49	Apr-16	FD	0.00155 J	0.0143 J			<0.00270		<0.075	<0.00120	<0.00125			0.00471 J		
	NCL-49	Apr-16		0.00163 J	0.0136 J			<0.00270		0.204 J	<0.00120	0.00168 J			0.00498 J		
	NCL-49	Apr-17	FD	0.00145 J	0.0133			<0.002		<0.1	<0.002	<0.005			0.00921		
	NCL-49	Apr-17		0.00143 J	0.0123			<0.002		<0.1	<0.002	<0.005			0.00904		
South Refinery	KWB-2R	Apr-15		0.00249	0.273			<0.00054		0.216	0.000989 J	**0.419**			0.000612 J		
	KWB-2R	Apr-16		0.00506 J	0.0278			<0.00270		**1.17**	<0.00120	**0.863**			<0.00190		
	KWB-2R	Apr-17		0.00326	0.0234			<0.002		0.517	0.000733 J	**0.665**			<0.002		
	KWB-5	Apr-15		**0.0227**	**3.64**			<0.00054		**3.64**	0.000353 J	**1.74**			<0.00038		
	KWB-5	Apr-16		**0.0237**	**3.61**			<0.00270		**4.22**	<0.00120	**1.85**			<0.00190		
	KWB-5	Apr-17		**0.0214**	**3.27**			<0.002		<0.1	<0.002	**1.89**			0.000873 J		
	KWB-6	Apr-15		0.00581	0.293			<0.00054		0.629	0.00116 J	**2.18**			<0.00038		
	KWB-6	Apr-16		0.00454	0.245			<0.00054		0.332	0.000729 J	**2.13**			0.00226 B		
	KWB-6	Apr-17		0.00449	0.14			<0.002		<0.1	<0.002	**1.98**			0.00045 J		
	MW-28	Apr-14		0.00396 J	0.131			<0.00100		<0.0780	0.00126 J	0.0374	<4.2E-05	0.00839	<0.00100		<0.0009
	MW-28	Apr-15		**0.013** J	0.0644 J			0.000923 J		0.0283 J	0.012	0.0647		0.00417	**0.0699** J		0.00527
	MW-28	Apr-16		**0.0116**	0.0685	**1.15**	<0.00080	<0.00270	<0.0013	<0.075	0.00812 J	0.0342	<4.9E-05	0.00599 J	<0.00190	<0.00165	0.00371 J
	MW-28	Apr-17		**0.0137**	0.0543	**1.38**	<0.001	<0.002	<0.002	<0.1	0.00539	0.0603	<0.0002	0.00259	0.000569 J	0.000332 J	0.00198 J

Appendix B, Table B.3 - Summary of Groundwater Analytical Data - Dissolved Metals

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Date	Dup	Arsenic	Barium	Boron	Cadmium	Chromium	Cobalt	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
Analyte Group:				Dissolved Metals													
Units:				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
CGWSL:				0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
CGWSL Source:				USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC HH	WQCC Irr	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
South Refinery	MW-48	Apr-15		0.00412	0.58 J			0.000777 J		0.255	0.00139 J	**0.242** J			0.00302 J		
	MW-48	Apr-16		0.00857 J	**2.64**			<0.00270		<0.075	0.00134 J	**0.402**			0.00321 J		
	MW-48	Apr-17		0.00737	**2.54**			0.000562 J		<0.1	0.000434 J	**0.214**			**0.0553**		
	MW-50	Apr-14		<0.00100	0.0202			<0.00100		<0.0780	0.00077 J	**1.38**			<0.00100		
	MW-50	Apr-15		0.00146 J	0.0223			<0.00054		0.0396 J	0.00067 J	**1.62**			<0.00038		
	MW-50	Apr-16		0.00273 J	0.0143 J			<0.00270		0.104 J	<0.00120	**0.276**			**0.0837**		
	MW-50	Apr-17		0.00213	0.013			<0.002		<0.1	<0.002	**0.549**			0.0427		
	MW-52	Apr-14	FD	0.00352 J	0.00895			<0.00100		<0.0780	<0.00070	0.0339	<4.2E-05	0.00416 J	0.00225 J		0.025
	MW-52	Apr-14		0.00375 J	0.00869			<0.00100		<0.0780	<0.00070	0.0328	<4.2E-05	0.00448 J	0.00265 J		0.0256
	MW-52	Apr-15		0.00397	0.00909			<0.00054		<0.0150	<0.00024	0.0341		0.00635	0.00124 J		0.0268
	MW-52	Apr-16		0.0037 J	0.00904 J	0.749	<0.00080	<0.00270	<0.0013	<0.075	<0.00120	0.035	<4.9E-05	0.00641 J	<0.00190	0.00809 J	0.026
	MW-52	Apr-17		0.00361	0.0106	0.639	<0.001	<0.002	0.00038 J	<0.1	<0.002	0.042	<0.0002	0.00519	0.00222 B	0.00963 J	0.0269
	MW-64	Apr-16		**0.0321**	**2.24**			<0.00270		<0.075	<0.00120	0.0624			0.00232 J		
	MW-64	Apr-17		**0.0382**	**1.88**			<0.002		<0.1	<0.002	0.0479			0.000431 J		
	MW-65	Apr-15		**0.0202**	**3.38**			<0.00054		**2.64**	0.000681 J	**0.814**			0.000425 J		
	MW-65	Apr-16		**0.0128**	**3.3**			<0.00270		**2.03**	<0.00120	**0.750**			0.00698 J		
	MW-65	Apr-17		**0.0107**	**2.81**			<0.002		0.124	<0.002	**0.547**			<0.002		
	MW-66	Apr-14		0.00139 J	**1.47**			<0.00100		0.48 J	<0.00070	**0.294**	<4.2E-05	0.00861	<0.00100		<0.00090
	MW-66	Apr-15		0.00297	**2.17**			<0.00054		0.549	<0.00024	**0.201**		0.00565	<0.00038		0.000494 J
	MW-66	Apr-16		0.00279 J	**2.37**	0.321	<0.00080	<0.00270	<0.0013	0.715	<0.00120	**0.224**	<4.9E-05	0.00421 J	<0.00190	<0.00165	0.00166 J
	MW-66	Apr-17		0.0024	**2.49**	0.287	<0.001	<0.002	<0.002	0.117	<0.002	**0.202**	<0.0002	0.00386	<0.002	<0.01	0.000408 J
	MW-99	Apr-15		0.00305	0.155			<0.00054		0.317	0.002 J	0.0828			0.000714 J		
	MW-99	Apr-16		0.00883 J	0.981			<0.00270		<0.075	<0.00120	**0.236**			<0.00190		
	MW-99	Apr-17		0.00811	0.339			<0.002		<0.1	<0.002	**0.262**			0.000416 J		
	MW-101	Apr-14		**0.0378** J	0.0718			0.00404 J		**1.64** J	<0.00070	**1.16**			<0.00100		
	MW-101	Apr-15		**0.0767**	0.0565			<0.00054		**2.20**	<0.00024	**1.13**			0.000395 J		
	MW-101	Apr-16		**0.021**	0.0758			0.000621 J		**1.11**	<0.00024	**1.09**			0.00105 JB		
	MW-101	Apr-17		**0.0509**	0.0725			<0.002		0.0151 J	<0.002	**1.14**			<0.002		
	MW-102	Apr-15		**0.0102**	**6.52**			<0.00054		0.078 J	0.00273	0.0433			0.0031		
	MW-102	Apr-16		**0.0109**	**7.68**			<0.00270		0.100 J	0.00205 J	0.0321			0.00549 J		
	MW-102	Apr-17		**0.0130**	**5.01**			0.000792 J		0.0205 J	0.00177 J	0.0252			0.000638 J		
	MW-103	Apr-14		<0.00100	0.988			<0.00100		<0.0780	0.00106 J	<0.00250			<0.00100		
	MW-103	Apr-15		0.00491	**8.03**			<0.00054		<0.0150	0.000809 J	0.00848			0.000642 J		
	MW-103	Apr-16		0.00489 J	**21.4**			<0.00270		<0.075	<0.00120	0.0227 J			<0.00190		
	MW-103	Apr-17		0.00797	**6.62**			<0.002		<0.1	**<0.2**	0.00621			<0.002		
	MW-104	Apr-14	FD	<0.00100	0.019			<0.00100		<0.0780	<0.00070	0.0215			<0.00100		
	MW-104	Apr-14		<0.00100	0.0195			<0.00100		<0.0780	<0.00070	0.0236			<0.00100		
	MW-104	Apr-15	FD	0.000422 J	0.0182			<0.00054		<0.0150	<0.00024	0.0213			<0.00038		
	MW-104	Apr-15		0.000481 J	0.0212			<0.00054		0.0279 J	<0.00024	0.0222			0.000603 J		
	MW-104	Apr-16	FD	0.00158 J	0.0241			0.000672 J		<0.0150	<0.00024	0.00789			0.00352 B		
	MW-104	Apr-16		0.00181 J	0.0242			0.000747 J		<0.0150	0.00482	0.00779			**0.156** O1		
	MW-104	Apr-17	FD	**0.0578**	0.0448			<0.002		<0.1	<0.002	0.000952 J		<0.002			
	MW-104	Apr-17		**0.054**	0.044			<0.002		<0.1	<0.002	0.00112 J		<0.002			
	MW-105	Apr-15		0.00829	0.114			0.000786 J		**2.07**	0.00032 J	0.111			0.00103 J		
	MW-105	Apr-16		**0.0139**	**1.22**			<0.00270		<0.075	<0.00120	0.188			0.00327 J		
	MW-105	Apr-17		**0.0142**	**2.85**			0.00138 J		0.0193 J	0.000346 J	0.0622			**0.0563**		
	MW-106	Apr-14		0.0092	0.0328			0.00126 J		<0.0780	0.00309 J	0.0125			0.00137 J		
	MW-106	Apr-15		0.00361	0.0936			<0.00054		0.172	0.00129 J	0.146			0.00795		
	MW-106	Apr-16		**0.0112**	0.0323			<0.00270		<0.075	0.00207 J	0.00654 J			0.0103		
	MW-106	Apr-17		**0.012**	0.0269			0.00107 J		<0.1	0.0011	0.00711			0.000512 J		
	MW-107	Apr-14		0.00681	**2.58**			<0.00100		**10.8**	<0.00070	**0.289**			<0.00100		
	MW-107	Apr-15		0.01	**1.53** J			0.000581 J		0.59	<0.00120	0.15			0.00457 J		
	MW-107	Apr-16		0.00187 J	**2.06**			<0.00270		0.278 J	<0.00120	0.0956			<0.00190		
	MW-107	Apr-17		0.00128 J	**2.01**			<0.002		0.0388 J	<0.002	0.107			<0.002		
	MW-109	Apr-14		**0.0226**	0.396			<0.00100		0.603	<0.00070	**0.332**			0.00138 J		
	MW-109	Apr-15		0.00369	0.0313			<0.00054		0.155	<0.00024	0.162 J			0.00235 J		
	MW-109	Apr-16		0.00707 J	0.0472			<0.00270		0.0876 J	<0.00120	0.147			<0.00190		
	MW-109	Apr-17		0.00306	0.0336			<0.002		<0.1	<0.002	0.0728			0.000878 JB		
	MW-110	Apr-14		**0.0307**	0.0633			<0.00100		**1.08**	<0.00070	**1.60**			0.00133 J		
	MW-110	Apr-15		0.00892	0.0573			<0.00054		0.117	<0.00024	**0.667**					
	MW-110	Apr-16		**0.0178**	0.0519			<0.00270		0.33 J	<0.00120	**1.25**			<0.00190		
	MW-110	Apr-17		0.00401	0.0567			<0.002		0.0716 J	<0.002	**0.545**			0.000559 JB		
	RW-4	Apr-15		0.00189 J	0.0573			<0.00054		0.0571 J	<0.00024	0.11			0.000503 J		
	RW-4R	Apr-16		0.00323 J	0.0564			<0.00270		0.119 J	<0.00120	0.0702			0.00236 J		
	RW-4R	Apr-17		0.00381	0.0709			0.00069 J		<0.1	<0.002	0.0245 O1			<0.002		
	RW-5R	Apr-15		0.00136 J	0.0275			<0.00054		0.0247 J	<0.00024	0.0167			<0.00038		
	RW-5R	Apr-16		0.00182 J	0.0307			<0.00270		0.146 J	<0.00120	0.0193 J			0.00542 J		
	RW-6	Apr-15		**0.0354**	0.857			0.000677 J		**17.5**	0.00129 J	**0.284**			<0.00038		
	RW-6R	Apr-16		**0.0615**	0.384			<0.00270		**3.37**	<0.00120	**0.537**			0.00213 J		
	RW-15	Apr-17		**0.0306**	0.896			<0.002		0.137	0.000501 J	**0.376**			<0.002		
South RO Reject Field	MW-114	Apr-14		0.00297 J	0.0136			<0.00100		<0.0780	<0.00070	**1.13**			<0.00100		
	MW-114	Apr-15		0.00273	0.0127 J			<0.00054		<0.0150	<0.00024	**0.894**			0.0018 J		
	MW-114	Apr-16		0.00298 J	0.0148 J			<0.00270		<0.075	<0.00120	**1.00**			<0.00190		
	MW-114	Apr-17		0.00252	0.0147			<0.002		<0.1	<0.002	**1.01**			0.00152 JB		
	MW-115	Apr-14		0.00368 J	0.0087			<0.00100		<0.0780	<0.00070	0.0216			0.00166 J		
	MW-115	Apr-15		0.00797 J	0.00965 J			0.000735 J		0.0283 J	<0.00024	0.102			0.00313		
	MW-115	Apr-16		0.00477 J	0.00839 J			<0.00270		<0.075	<0.00120	0.06			<0.00190		
	MW-115	Apr-17		0.00303	0.00816			<0.002		<0.1	<0.002	0.0436			0.00108 JB		
	MW-116	Apr-14		0.00348 J	0.0095			<0.00100		<0.0780	<0.00070	<0.00250			0.00563		
	MW-116	Apr-15		0.00507	0.00904 J			0.000586 J		<0.0150	<0.00024	0.00316 J			0.00417 J		
	MW-116	Apr-16		0.00339 J	0.00902 J			<0.00270		<0.075	<0.00120	0.00791 J			0.00564 J		
	MW-116	Apr-17		0.00347	0.008 B			<0.002		<0.1	<0.002	0.0449			<0.002		
TEL	MW-49	Apr-14		0.0046 J	0.0376			<0.00100		<0.0780	<0.00070	**0.333**	<4.2E-05	0.00825	<0.00100		<0.00090
	MW-49	Apr-15		0.00329	0.0394			<0.00054		0.0291 J	0.000467 J	**0.240**		0.00656	0.00302 J		0.000493 J
	MW-49	Apr-16		0.00578 J	0.0492	0.708	<0.00080	<0.00270	<0.0013	<0.075	<0.00120	**0.300**	<4.9E-05	0.00842 J	<0.00190	<0.00165	0.00123 J
	MW-49	Apr-17		0.00441	0.0471	0.591	<0.001	<0.002	<0.002	0.0602 J	<0.002	**0.248**	<0.0002	0.00535	<0.002	<0.01	0.000883 J
	TEL-1	Apr-14	FD	0.00428 J	0.0131 J			<0.00100		<0.0780	<0.00070	0.0909 J			0.0011 J		
	TEL-1	Apr-14		0.004 J	0.0127			<0.00100		<0.0780	<0.00070	0.0837			<0.00100		
	TEL-1	Apr-15		0.0048	0.0113			0.00301		0.0488 J	<0.00120	0.052			0.00161 J		
	TEL-1	Apr-16		0.00441 J	0.0119 J			0.014		0.075 J	<0.00120	**0.204**			<0.00190		
	TEL-1	Apr-17		0.00533	0.013			0.00782		0.0488 J	<0.002	0.125			<0.002		
	TEL-2	Apr-14		**0.0119**	0.0745			<0.00100		<0.0780	0.00246 J	0.0107			<0.00100		
	TEL-2	Apr-15		**0.0173**	0.0887			0.00111 J		0.0269 J	0.00254	0.00915			0.0136		
	TEL-2	Apr-16		**0.012**	0.0483			<0.00270		<0.075	0.00137 J	0.0224 J			<0.00190		
	TEL-2	Apr-17		**0.0124**	0.0717			0.001 JB		<0.1	0.00148 J	0.015			<0.002		
	TEL-3	Apr-14		0.00303 J	0.0129			0.00193 J		<0.0780	<0.00070	0.0105			<0.00100		
	TEL-3	Apr-15		0.00639	0.0123			0.00235		0.0316 J	0.000406 J	0.00717			0.0219		
	TEL-3	Apr-16		0.00979 J	0.0234 J			0.0035 J		<0.075	<0.00120	0.00813 J			<0.00190		
	TEL-3	Apr-17		0.00225	0.0173			0.00158 JB		<0.1	<0.002	0.0115			<0.002		

Appendix B, Table B.3 - Summary of Groundwater Analytical Data - Dissolved Metals

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Date	Dup	Analyte Group: Dissolved Metals														
				Analyte:	Arsenic	Barium	Boron	Cadmium	Chromium	Cobalt	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Uranium	Vanadium
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.010	1.00	0.75	0.005	0.050	0.050	1.00	0.015	0.200	0.002	0.200	0.050	0.030	0.0631
				CGWSL Source:	USEPA MCL	WQCC HH	WQCC Irr	USEPA MCL	WQCC HH	WQCC Irr	WQCC Dom	USEPA MCL	WQCC Dom	USEPA MCL	WQCC Irr	USEPA MCL	WQCC HH	NMED TW
TEL	TEL-4	Apr-14		**0.0125**	0.0349			0.00884		<0.0780	0.00196 J	**0.444**			<0.00100		
	TEL-4	Apr-15	FD	0.00568	0.022			0.0298		0.149	0.00143 J	**0.835**			<0.00038		
	TEL-4	Apr-15		0.00563	0.0208			0.0139		0.0279 J	0.00114 J	**0.792**			0.000882 J		
	TEL-4	Apr-16	FD	0.00836 J	0.0249 J			0.0272		<0.075	0.00377 J	**0.808**			<0.00190		
	TEL-4	Apr-16		0.00738 J	0.0263			0.0266		<0.075	0.00351 J	**0.776**			<0.00190		
	TEL-4	Apr-17	FD	0.00692	0.0199			0.0101		<0.1	0.00051 J	**1.07**			0.000522 J		
	TEL-4	Apr-17		0.0066	0.0188			0.0114		<0.1	0.000416 J	**1.04**			0.000623 J		
TMD	MW-8	Apr-13		<0.0100	0.0114			<0.0100		<0.400	<0.0100	**0.584**			0.0213		
	MW-8	Apr-14		0.00898	0.0116			<0.00100		<0.0780	<0.00070	**0.587**			0.0295		
	MW-8	Apr-15		0.00679	0.01			0.000644 J		<0.0150	<0.00024	**0.464**			0.0174		
	MW-8	Apr-17		0.00606	0.0119			<0.002		<0.1	<0.002	**0.494**			0.00637		
	MW-16	Apr-13		<0.0100	0.0167			<0.0100		<0.400	<0.0100	0.0509			<0.0100		
	MW-16	Apr-14		0.00546	0.0144			<0.00100		<0.0780	<0.00070	0.125			<0.00100		
	MW-16	Apr-15		0.00465 J	0.0151 J			<0.00270		<0.0750	<0.00120	0.0513			0.00213 J		
	MW-16	Apr-17		0.00513	0.0164			<0.002		0.0333 J	<0.002	0.00335 J			0.0116		
	MW-20	Apr-14	FD	0.00848	0.0103			<0.00100		<0.0780	<0.00070	0.0647			0.022		
	MW-20	Apr-14		0.00931	0.00977			<0.00100		<0.0780	<0.00070	0.0645			0.0205		
	MW-20	Apr-15		0.00586	0.00926			<0.00054		0.0359 J	<0.00024	0.00169 J			0.0254		
	MW-20	Apr-16		0.00646 J	0.0112 J			<0.00270		<0.075	<0.00120	0.00432 J			0.0266		
	MW-20	Apr-17		0.00614	0.0124			<0.002		<0.1	<0.002	0.00845			0.0192		
	MW-21	Apr-13		<0.0100	<0.0100			<0.0100		<0.400	<0.0100	**0.272**			0.0319		
	MW-21	Apr-14		0.00845	0.00996			<0.00100		<0.0780	<0.00070	**0.422**			0.0368		
	MW-21	Apr-15		0.00681 J	0.00852 J			<0.00270		<0.0750	<0.00120	**0.252**			0.0269		
	MW-21	Apr-17		0.00536	0.00969			<0.002		<0.1	<0.002	0.191			0.0266		
	MW-25	Apr-14		0.00575 J	0.0277			<0.00200		<0.156	<0.00140	0.121			0.00885 J		
	MW-25	Apr-15		**0.0104**	0.0196 J			<0.00270		<0.0750	<0.00120	**0.218**			0.0204		
	MW-25	Apr-16		0.00646 J	0.0161 J			<0.00270		<0.075	<0.00120	**0.319** V			0.00234 J		
	MW-25	Apr-17		0.00306	0.0129			<0.002		<0.1	<0.002	**0.290**			0.00234		
	MW-26	Apr-14		0.00617 J	0.00866 J			<0.00200		<0.156	<0.00140	**0.520**			0.0309		
	MW-26	Apr-15		0.00338	0.00842			<0.00054		<0.0150	<0.00024	**0.470**			0.0184		
	MW-26	Apr-16		0.00363 J	0.00913 J			<0.00270		<0.075	<0.00120	**0.534**			0.0186		
	MW-26	Apr-17		0.0033	0.00987			<0.002		0.0359 J	<0.002	**0.635**			0.0251		
	MW-27	Apr-14		0.00355 J	0.015			<0.00100		<0.0780	<0.00070	0.00617			0.0193		
	MW-27	Apr-15		0.00259	0.0218			<0.00054		<0.0150	<0.00024	0.029			0.0173		
	MW-27	Apr-16		0.00249 J	0.0185 J			<0.00270		<0.075	<0.00120	0.0164 J			0.0132		
	MW-27	Apr-17		0.00212	0.0182			<0.002		<0.1	0.000708 J	0.0173			0.00708		
	MW-46R	Apr-13		<0.00500	0.0121			<0.00500		<0.200	<0.00500	0.0424			0.006		
	MW-46R	Apr-14		0.00348 J	0.012			<0.00100		0.0908 J	<0.00070	0.0925			0.00666		
	MW-46R	Apr-15		0.00293	0.0127			<0.00054		0.0873 J	<0.00024	0.102			0.00102 J		
	MW-46R	Apr-17		0.00247	0.0124			<0.002		<0.1	<0.002	0.131			0.00193 J		
	MW-68	Apr-14		0.00413 J	0.0135			<0.00100		<0.0780	<0.00070	<0.00250			0.0302		
	MW-68	Apr-15		0.00272	0.0154			<0.00054		0.0904 J	<0.00024	0.00126 J			0.0115		
	MW-68	Apr-16		0.00267 J	0.0122 J			<0.00270		<0.075	<0.00120	0.0388			0.002 J		
	MW-68	Apr-17		0.0025	0.0125			<0.002		<0.1	<0.002	0.0929			0.00331		
	MW-71	Apr-14		0.00573	0.0102			<0.00100		<0.0780	<0.00070	<0.00250	<4.2E-05	0.00155 J	0.0499		0.0255
	MW-71	Apr-15		0.00387	0.00817			<0.00054		<0.0150	<0.00024	0.000487 J		0.00116 J	0.0336		0.0215
	MW-71	Apr-16		0.00436 J	0.00939 J	0.649	<0.00080	<0.00270	<0.0013	<0.075	<0.00120	<0.00125	<4.9E-05	<0.00175	0.0345	**0.0588**	0.0244 J
	MW-71	Apr-17		0.00408	0.00978	0.606	<0.001	<0.002	<0.002	<0.1	<0.002	0.000265 J	<0.0002	0.000892 J	0.0331	**0.0617**	0.026
	MW-89	Apr-14		0.00959	0.0135			<0.00100		<0.0780	<0.00070	**0.528**			0.0182		
	MW-89	Apr-15		0.00928 J	0.0167 J			<0.00270		<0.0750	<0.00120	0.0732			0.0291		
	MW-89	Apr-16		0.0078 J	0.0143 J			<0.00270		0.165 J	<0.00120	0.0917			0.0332		
	MW-89	Apr-17		0.00684	0.016			<0.002		<0.1	<0.002	0.0452			**0.0559**		
Up-Gradient	UG-1	Apr-14		0.00288 J	0.012			0.00187 J		<0.0780	<0.00070	<0.00250	<4.2E-05	<0.00100	0.00635		0.0107
	UG-1	Apr-15		0.00124 J	0.0133			0.000833 J		<0.0150	<0.00024	0.000689 J		0.00139 J	0.0101 J		0.0109
	UG-1	Apr-16		<0.00125	0.0144 J	0.525	<0.00080	<0.00270	<0.00130	<0.075	<0.00120	<0.00125	<4.9E-05	0.00179 J	0.0133	0.0264 J	0.0114 J
	UG-1	Apr-17		0.00113 J	0.0118	0.502	<0.001	0.000688 J	<0.002	<0.1	<0.002	0.00476	<0.0002	0.00225	0.00938	0.0273	0.012
	UG-2	Apr-14		0.00625	0.0147			<0.00100		0.334	<0.00070	**0.346**	<4.2E-05	0.0537	0.00369 J		0.0142
	UG-2	Apr-15		0.00205	0.015			<0.00054		<0.0150	<0.00024	0.00934		0.00543	0.00373 J		0.0116
	UG-2	Apr-16		0.00226 J	0.0153 J	0.315	<0.00080	<0.00270	<0.00130	<0.075	<0.00120	0.0142 J	<4.9E-05	0.00595 J	0.00342 J	0.0156 J	0.0129 J
	UG-2	Apr-17		0.00206	0.0137	0.265	<0.001	<0.002	<0.002	<0.1	<0.002	0.0039	<0.0002	0.00342	0.00522	0.0155	0.0159
	UG-3R	Apr-14	FD	0.0031 J	0.0172			<0.00100		<0.0780	<0.00070	<0.00250	<4.2E-05	<0.00100	0.0046 J		0.00834
	UG-3R	Apr-14		0.00253 J	0.0175			<0.00100		<0.0780	<0.00070	<0.00250	<4.2E-05	<0.00100	0.00422 J		0.00799
	UG-3R	Apr-15		0.00157 J	0.0193			<0.00054		0.0534 J	<0.00024	0.00492 J		0.00114 J	0.00375 J		0.00934
	UG-3R	Apr-16		0.00171 J	0.0187 J	0.278	<0.00080	<0.00270	<0.00130	<0.075	<0.00120	0.00182 J	<4.9E-05	<0.00175	0.00406 J	0.0126 J	0.0102 J
	UG-3R	Apr-17		0.00165 J	0.0167	0.219	<0.001	0.000573 J	0.00042 J	<0.1	<0.002	0.00217	<0.0002	0.00316	0.00371	0.0132	0.00992
	UG-4	Apr-16		0.00144 J	0.021 J	**1.21**	<0.00080	<0.00270	<0.00130	<0.075	<0.00120	<0.00125	<4.9E-05	<0.00175	0.00673 J	**0.0365** J	0.00794 J
	UG-4	Apr-17		0.00103 J	0.0149	**0.958** O1V	<0.001	<0.002	<0.002	<0.1	<0.002	0.0062	<0.0002	0.00255	0.0142	**0.0373**	0.00736

Definitions

X	Reported concentration, X, exceeds the CGWSL.
X	Analyte detected above the detection limit at a concentration equal to X.
<x	Analyte not detected at detection limit equal to x.
<x	Analyte not detected at detection limit equal to x, but x exceeds the CGWSL.
	Blank cell indicates a sample was collected from the well during the indicated sampling event, but the analyte was not analyzed.

Abbreviations

CGWSL	Critical Groundwater Screening Level (see Table 3)
CGWSL Source	Source for CGWSL value (see Table 3)
Dup	Duplicate sample
FD	Field duplicate sample
mg/L	Milligrams per Liter
NMED TW	NMED Risk Assessment Guidance for Site Investigations and Remediation, March 2017, Table A-1, Tap Water Screening Level
WQCC Dom	NMED Groundwater standard for domestic exposure taken from 20.6.2.3103.B NMAC
WQCC HH	NMED Groundwater standard for human health exposure, 20.6.2.3103.A NMAC
WQCC Irr	NMED Groundwater standard for irrigation exposure, 20.6.2.3103.C NMAC
USEPA MCL	United States Environmental Protection Agency Maximum Contaminant Level, "Regional Screening Levels (RSL) Summary Table", November 2017

Lab Footnote

B	Analyte was also detected in the associated method blank.
J	Indicates an estimated value.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
O1	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
V	The sample concentration is too high to evaluate accurate spike recoveries.

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	1,1,1-Tri-chloroethane	1,1,2,2-Tetra-chloroethane	1,1,2-Tri-chloroethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,2,4-Trimethyl-benzene	1,2-Dibromo-ethane	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,3,5-Trimethyl-benzene	2-Butanone	2-Phenyl-butane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.06	0.01	0.005	0.025	0.007	0.015	0.00005	0.005	0.005	0.12	5.56	---
				CGWSL Source:	WQCC HH	WQCC HH	USEPA MCL	WQCC HH	USEPA MCL	USEPA TW	USEPA MCL	USEPA MCL	USEPA MCL	USEPA TW	NMED TW	
Area	**Well ID**	**Date**	**Dup**													
Cross-Gradient	KWB-13	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	KWB-13	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.00302	**<0.000380**	<0.000360	<0.000310	0.000456 J	<0.00390	<0.000360
	KWB-13	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-13	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-17	Apr-14														
	NP-5	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500
	NP-5	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.000804 J	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	NP-5	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	RA-3156	Nov-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500
	RA-3156	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	RA-3156	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	RA-3156	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-136	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-136	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-136	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-136	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-136	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
Evaporation Ponds	MW-1R	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	MW-1R	Apr-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000360
	MW-1R	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-1R	Apr-17		<0.000319	<0.000130	<0.000383 J4	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-2A	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-2A	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-2A	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-2A	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-2A	Apr-17		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	<0.00373	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	<0.00365
	MW-2A	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-3	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-3	Apr-15	FD	<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-3	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-3	Oct-15	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-3	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-3	Apr-16	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-3	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-3	Oct-16	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000367 J
	MW-3	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-3	Apr-17	FD	<0.000319	<0.000130	<0.000383 J4	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-3	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-3	Oct-17	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-4A	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-4A	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000502 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000502 J
	MW-4A	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-4A	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000553 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000607 J
	MW-4A	Apr-17		<0.000319	<0.000130	<0.000383 J4	<0.000259	<0.000398	0.000390 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000375 J
	MW-4A	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000369 J
	MW-4B	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500
	MW-4B	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-4B	Apr-17		<0.000319	<0.000130	<0.000383 J4	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-5A	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-5A	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-5A	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-5A	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-5A	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000425 J
	MW-5A	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000456 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000693 J
	MW-5B	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500
	MW-5B	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.000976 J	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-5B	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000499 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-5C	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500
	MW-5C	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-5C	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-6A	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	MW-6A	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-6A	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-6A	Apr-17		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	<0.00373	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	<0.00365
	MW-6B	Mar-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500
	MW-6B	Mar-13	FD	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500
	MW-6B	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-6B	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-7A	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-7A	Apr-15	FD	<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-7A	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-7A	Oct-15	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-7A	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-7A	Apr-16	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-7A	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-7A	Oct-16	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-7A	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-7A	Apr-17	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-7A	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-7A	Oct-17	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-7B	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500
	MW-7B	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-7B	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-10	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-10	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-10	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-10	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-10	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-10	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-11A	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-11A	Oct-15														
	MW-11A	Apr-16		<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	**<0.00100**	<0.00100	<0.00100	<0.00100	<0.0100	<0.000365
	MW-11A	Oct-16														
	MW-11A	Apr-17		<0.000319	<0.000130	<0.000383 J4	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-11A	Oct-17														
	MW-11B	Mar-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500
	MW-11B	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-11B	Apr-17		<0.000319	<0.000130	<0.000383 J4	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-12	Apr-14														
	MW-13	Apr-14														
	MW-15	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	MW-15	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-15	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-15	Apr-17		<0.000319	<0.000130	<0.000383 J4	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

	Analyte Group:			Volatile Organic Compounds												
			Analyte:	1,1,1-Tri-chloroethane	1,1,2,2-Tetra-chloroethane	1,1,2-Tri-chloroethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,2,4-Trimethyl-benzene	1,2-Dibromo-ethane	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,3,5-Trimethyl-benzene	2-Butanone	2-Phenyl-butane
			Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
			CGWSL:	0.06	0.01	0.005	0.025	0.007	0.015	0.00005	0.005	0.005	0.12	5.56	---
			CGWSL Source:	WQCC HH	WQCC HH	USEPA MCL	WQCC HH	USEPA MCL	USEPA TW	USEPA MCL	USEPA MCL	USEPA MCL	USEPA TW	NMED TW	
Area	Well ID	Date	Dup												
Evaporation Ponds	MW-18A	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-18A	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-18A	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-18A	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-18A	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-18A	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-18B	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500
	MW-18B	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-18B	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-22A	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-22A	Apr-15	FD	<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-22A	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000428 J
	MW-22A	Oct-15	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000479 J
	MW-22A	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-22A	Apr-16	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-22A	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00066 J
	MW-22A	Oct-16	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-22A	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000625 J
	MW-22A	Apr-17	FD	<0.000319	<0.000130	<0.000383 J4	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000401 J
	MW-22A	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000625 J
	MW-22A	Oct-17	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000887 J
	MW-22B	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500
	MW-22B	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	0.000381 J
	MW-22B	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-70	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-70	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-70	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-70	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-70	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-70	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-72	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	MW-72	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-72	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-72	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-73	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	0.00210 J	**<0.000400**	<0.000500	<0.000700	<0.000600	0.0028 J	
	MW-73	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.00171	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-73	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-73	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-74	Apr-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000360
	MW-74	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-74	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-74	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000718 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-74	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000893 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-74	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00124	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-75	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.000710 J	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-75	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00252	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-75	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-75	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000631 J	**<0.000381**	<0.000361	<0.000306	0.00103	0.00429 J	0.00138
	MW-75	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000433 J
	MW-75	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000387 J	**<0.000381**	<0.000361	<0.000306	0.000912 J	<0.00393	0.00107
	MW-76	Apr-15		<0.000319	0.000308 J	0.000384 J	<0.000260	<0.000400	0.000699 J	**<0.000380**	<0.000360	<0.000310	0.000697 J	<0.00390	0.000429 J
	MW-76	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000531 J	**<0.000381**	<0.000361	<0.000306	0.000499 J	<0.00393	0.000493 J
	MW-76	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-76	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00187	**<0.000381**	<0.000361	<0.000306	0.00166	<0.00393	0.00055 J
	MW-76	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-76	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000428 J	**<0.000381**	<0.000361	<0.000306	0.000827 J	<0.00393	0.000521 J
	MW-77	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.00333	**<0.000380**	<0.000360	<0.000310	0.00239	<0.00390	0.0039
	MW-77	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00348	**<0.000381**	<0.000361	<0.000306	0.00223	<0.00393	0.00394
	MW-77	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	0.00161	<0.00393	0.00348
	MW-77	Oct-16		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	0.00432 J	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	0.00392 J
	MW-77	Apr-17		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	0.00384 J	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	0.00382 J
	MW-78	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	0.011	
	MW-78	Apr-15		<0.000319	0.000305 J	<0.000380	<0.000260	<0.000400	0.00132	**<0.000380**	<0.000360	<0.000310	0.000829 J	<0.00390	0.000558 J
	MW-78	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-78	Apr-17		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	<0.00373	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	<0.00365
	MW-79	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-79	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-79	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-79	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-79	Apr-17		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	<0.00373	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	<0.00365
	MW-79	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-80	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	MW-80	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-80	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-80	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-81	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	MW-81	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-81	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-81	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-82	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	0.0037 J	
	MW-82	Apr-14	FD	<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	0.0031 J	
	MW-82	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-82	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-82	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-83	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-83	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-83	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-83	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-83	Apr-17		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	<0.00373	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	<0.00365
	MW-83	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000411 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-84	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-84	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-84	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-84	Oct-16		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	<0.00373	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	<0.00365
	MW-84	Apr-17		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	<0.00373	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	<0.00365
	MW-84	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-87	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-87	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-87	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-87	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-87	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-87	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	1,1,1-Tri-chloroethane	1,1,2,2-Tetra-chloroethane	1,1,2-Tri-chloroethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,2,4-Trimethyl-benzene	1,2-Dibromo-ethane	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,3,5-Trimethyl-benzene	2-Butanone	2-Phenyl-butane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.06	0.01	0.005	0.025	0.007	0.015	0.00005	0.005	0.005	0.12	5.56	---
				CGWSL Source:	WQCC HH	WQCC HH	USEPA MCL	WQCC HH	USEPA MCL	USEPA TW	USEPA MCL	USEPA MCL	USEPA MCL	USEPA TW	NMED TW	
Area	**Well ID**	**Date**	**Dup**													
Evaporation Ponds	MW-88	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-88	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-88	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-88	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-88	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-88	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-120	Apr-15		<0.000320	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.000390	
	MW-120	Oct-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-120	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-120	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-120	Apr-17		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	<0.00373	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	<0.00365
	MW-120	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-121	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-121	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-121	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-121	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-121	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-121	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-122	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-122	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-122	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-122	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-122	Apr-17		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	<0.00373	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	<0.00365
	MW-122	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-123	Apr-15		<0.000319	<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	**<0.000370**	<0.000380	<0.000360	<0.000310	<0.000390	<0.00390
	MW-123	Oct-15		<0.000319	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**<0.000373**	<0.000381	<0.000361	<0.000306	<0.000387	<0.00393
	MW-123	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-123	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-123	Apr-17		<0.000319	<0.000130	<0.000383 J4	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-123	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-124	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-124	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-124	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-124	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-124	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-124	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-1R	Apr-15		<0.000320	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.000390	
	OCD-1R	Oct-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	OCD-1R	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-1R	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-1R	Apr-17		<0.000319	<0.000130	<0.000383 J4	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-1R	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-2A	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	OCD-2A	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-2A	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-2A	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-2A	Apr-17		<0.000319	<0.000130	<0.000383 J4	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-2A	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-3	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	OCD-3	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-3	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-3	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-3	Apr-17		<0.000319	<0.000130	<0.000383 J4	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-3	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-4	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	OCD-4	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-4	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-4	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-4	Apr-17		<0.000319	<0.000130	<0.000383 J4	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-4	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-5	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	OCD-5	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-5	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-5	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-5	Apr-17		<0.000319	<0.000130	<0.000383 J4	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-5	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-6	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	OCD-6	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-6	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-6	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-6	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-6	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-7AR	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.000760 J	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	OCD-7AR	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00129	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	
	OCD-7AR	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-7AR	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00172	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-7AR	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000840 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-7AR	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00109	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-7B	Mar-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500
	OCD-7B	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	OCD-7B	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-8A	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.000370 J	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	OCD-8A	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000454 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-8A	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000482 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-8A	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00108	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-8A	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000518 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-8A	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000832 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	OCD-8B	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500
	OCD-8B	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	OCD-8B	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
Field East of Refinery	KWB-1A	Apr-15		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	KWB-1A	Oct-15		<0.000320	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.000390	
	KWB-1A	Apr-16		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	KWB-1A	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-1A	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-1A	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-1C	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500
	KWB-1C	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	KWB-1C	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-7	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	**0.0766**	**<0.000380**	<0.000360	<0.000310	0.000982 J	<0.00390	0.0104
	KWB-7	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00557	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00808
	KWB-7	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0482**	**<0.000381**	<0.000361	<0.000306	0.00903	<0.00393 J4	0.00607
	KWB-7	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00700	**<0.000381**	<0.000361	<0.000306	0.000877 J	<0.00393	0.00691
	KWB-7	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.0115	**<0.000381**	<0.000361	<0.000306	<0.000387	0.0161	0.00714
	KWB-7	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0258**	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00591

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	1,1,1-Tri-chloroethane	1,1,2,2-Tetra-chloroethane	1,1,2-Tri-chloroethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,2,4-Trimethyl-benzene	1,2-Dibromo-ethane	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,3,5-Trimethyl-benzene	2-Butanone	2-Phenyl-butane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.06	0.01	0.005	0.025	0.007	0.015	0.00005	0.005	0.005	0.12	5.56	---
				CGWSL Source:	WQCC HH	WQCC HH	USEPA MCL	WQCC HH	USEPA MCL	USEPA TW	USEPA MCL	USEPA MCL	USEPA MCL	USEPA TW	NMED TW	
Area	Well ID	Date	Dup													
Field East of Refinery	KWB-8	Oct-16		<0.0638	<0.0260	<0.0766	<0.0518	<0.0796	**0.170** J	**<0.0762**	**<0.0722**	<0.0612	<0.0774	<0.786	<0.0730
	KWB-8	Apr-17		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**0.380**	**<0.0381**	**<0.0361**	<0.0306	0.0863 J	<0.393	<0.0365
	KWB-8	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.114**	**<0.000381**	<0.000361	<0.000306	0.0225	0.0885	<0.000365
	KWB-10R	Apr-15		<0.00319	<0.00130	<0.00380	<0.00260	<0.00400	**0.457**	**<0.00380**	<0.00360	<0.00310	**0.136**	<0.0390	0.0122
	KWB-10R	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.358**	**<0.000381**	<0.000361	<0.000306	0.100	<0.00393	0.00927
	KWB-10R	Apr-16		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**0.323**	**<0.0190**	**<0.0180**	<0.0153	0.0886	<0.196	<0.0182
	KWB-10R	Oct-16		<0.00638	<0.00260	<0.00766	<0.00518	<0.00796	**0.307**	**<0.00762**	**<0.00722**	<0.00612	0.0765	0.234	0.00903 J
	KWB-10R	Apr-17		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**0.360**	**<0.0190**	**<0.0180**	<0.0153	0.0907	<0.196	<0.0182
	KWB-10R	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.302**	**<0.000381**	<0.000361	<0.000306	0.0759	<0.00393	0.0126
	KWB-11A	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	**0.0658**	**<0.000380**	<0.000360	<0.000310	0.00168	<0.00390	0.000636 J
	KWB-11A	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0528**	**<0.000381**	<0.000361	<0.000306	0.00117	<0.00393	0.00457
	KWB-11A	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0256**	**<0.000381**	<0.000361	<0.000306	0.00122	<0.00393	0.00353
	KWB-11A	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0341**	**<0.000381**	<0.000361	<0.000306	0.000945 J	<0.00393	0.00474
	KWB-11A	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.0142	**<0.000381**	0.000409 J	<0.000306	<0.000387	<0.00393	0.00419
	KWB-11A	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0230**	**<0.000381**	<0.000361	<0.000306	0.00129	<0.00393	<0.000365
	KWB-11B	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	KWB-11B	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000489 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-11B	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-11B	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000394 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-11B	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-11B	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-12A	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.000452 J	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	KWB-12A	Apr-15	FD	<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	KWB-12A	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-12A	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-12A	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-12A	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-12A	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-12B	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	KWB-12B	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-12B	Oct-15	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000895 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-12B	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-12B	Apr-16	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-12B	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-12B	Oct-16	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-12B	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-12B	Apr-17	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-12B	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-12B	Oct-17	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	KWB-P4	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500
	KWB-P4	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	KWB-P4	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-57	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.00163	**<0.000380**	<0.000360	<0.000310	0.000463 J	<0.00390	<0.000360
	MW-57	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-57	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-57	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-57	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-57	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-58	Apr-15		<0.00319	<0.00130	<0.00380	<0.00260	<0.00400	**1.04**	**<0.00380**	<0.00360	<0.00310	**0.195**	<0.0390	0.0119
	MW-58	Oct-15		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**0.893**	**<0.0381**	**<0.0361**	<0.0306	0.0651 J	<0.393	<0.0365
	MW-58	Apr-16		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	**0.753**	**<0.00381**	<0.00361	<0.00306	0.0179	<0.0393	0.0112
	MW-58	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.387**	**<0.000381**	<0.000361	<0.000306	0.00321	<0.00393	0.00811
	MW-58	Apr-17		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**0.517**	**<0.0381**	**<0.0361**	<0.0306	<0.0387	<0.393	<0.0365
	MW-58	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.166**	**<0.000381**	<0.000361	<0.000306	0.00130	<0.00393	0.00872
	MW-111	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.00256	**<0.000380**	0.000724 J	<0.000310	0.000567 J	<0.00390	<0.000360
	MW-111	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00122	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-111	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	0.000539 J	<0.000306	<0.000387	<0.00393	<0.000365
	MW-111	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00215	**<0.000381**	0.000729 J	<0.000306	<0.000387	<0.00393	<0.000365
	MW-111	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00219	**<0.000381**	0.000698	<0.000306	<0.000387	<0.00393	<0.000365
	MW-111	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00188	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-113	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	0.000497 J	<0.000310	<0.000390	<0.00390	<0.000360
	MW-113	Apr-15	FD	<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.000538 J	**<0.000380**	0.000383 J	<0.000310	<0.000390	<0.00390	<0.000360
	MW-113	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	0.000455 J	<0.000306	<0.000387	<0.00393	<0.000365
	MW-113	Oct-15	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-113	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000753 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-113	Apr-16	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000813 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-113	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00977	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000418 J
	MW-113	Oct-16	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00933	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000379 J
	MW-113	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00389	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000379 J
	MW-113	Apr-17	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00448	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000417 J
	MW-113	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0229**	**<0.000381**	<0.000361	<0.000306	0.000442 J	<0.00393	0.000988 J
	MW-113	Oct-17	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0212**	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00088 J
	MW-125	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-125	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-125	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-125	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-125	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-125	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-126A	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.000397 J	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-126A	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00251	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00415
	MW-126A	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393 J4	<0.000365
	MW-126A	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.0113
	MW-126A	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000715 J
	MW-126A	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000746 J
	MW-126B	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.000409 J	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-126B	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-126B	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-126B	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-126B	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-126B	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-127	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	**0.126**	**<0.000380**	0.000418 J	<0.000310	0.00854	<0.00390	0.00324
	MW-127	Oct-15		<0.00638	<0.00260	<0.00766	<0.00518	<0.00796	**0.0980**	**<0.00762**	**<0.00722**	<0.00612	<0.00774	<0.0786	<0.00730
	MW-127	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0941**	**<0.000381**	<0.000361	<0.000306	0.00632	<0.00393 J4	0.00334
	MW-127	Oct-16		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	**0.0332**	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	<0.00365
	MW-127	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0562**	**<0.000381**	<0.000361	<0.000306	0.00490	<0.00393	0.00427
	MW-127	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0327**	**<0.000381**	<0.000361	<0.000306	0.00452	<0.00393	0.00319
	MW-128	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.00374	**<0.000380**	<0.000360	<0.000310	0.000551 J	<0.00390	0.000814 J
	MW-128	Oct-15		<0.00638	<0.00260	<0.00766	<0.00518	<0.00796	<0.00746	**<0.00762**	**<0.00722**	<0.00612	<0.00774	<0.0786	<0.00730
	MW-128	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00209	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-128	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00197	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-128	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00276	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000391 J
	MW-128	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00233	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00038 J

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	1,1,1-Tri-chloroethane	1,1,2,2-Tetra-chloroethane	1,1,2-Tri-chloroethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,2,4-Trimethyl-benzene	1,2-Dibromo-ethane	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,3,5-Trimethyl-benzene	2-Butanone	2-Phenyl-butane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.06	0.01	0.005	0.025	0.007	0.015	0.00005	0.005	0.005	0.12	5.56	---
				CGWSL Source:	WQCC HH	WQCC HH	USEPA MCL	WQCC HH	USEPA MCL	USEPA TW	USEPA MCL	USEPA MCL	USEPA MCL	USEPA TW	NMED TW	
Area	**Well ID**	**Date**	**Dup**													
Field East of Refinery	MW-129	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.00286	**<0.000380**	<0.000360	<0.000310	0.000679 J	<0.00390	0.00102	
	MW-129	Oct-15		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**<0.0373**	**<0.0381**	**<0.0361**	<0.0306	<0.0387	<0.393	<0.0365	
	MW-129	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00382	**<0.000381**	<0.000361	<0.000306	0.000880 J	<0.00393 J4	0.00103	
	MW-129	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00143	**<0.000381**	<0.000361	<0.000306	0.000479 J	<0.00393	0.00105	
	MW-129	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00101	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000928 J	
	MW-130	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360	
	MW-130	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-130	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-130	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-130	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-130	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-131	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	**0.0486**	**<0.000380**	<0.000360	<0.000310	0.0119	<0.00390	0.00366	
	MW-131	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0231**	**<0.000381**	<0.000361	<0.000306	0.00694	<0.00393	0.00437	
	MW-131	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0212**	**<0.000381**	<0.000361	<0.000306	0.00562	<0.00393 J4	0.00318	
	MW-131	Oct-16		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	0.0133	**<0.00190**	<0.00180	<0.00153	0.00398 J	<0.0196	0.00269 J	
	MW-131	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.0137	**<0.000381**	<0.000361	<0.000306	0.00348	<0.00393	0.00331	
	MW-131	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**<0.0932**	**<0.000381**	<0.000361	<0.000306	0.00174	<0.00393	0.00286	
	MW-133	Nov-14		<0.0320	<0.0130	<0.0380	<0.0260	<0.0400	**0.280**	**<0.0380**	**<0.0360**	<0.0310	0.0530 J	<0.390 J4J3		
	MW-133	Apr-15		<0.0319	<0.0130	<0.0380	<0.0260	<0.0400	**0.138**	**<0.0380**	**<0.0360**	<0.0310	<0.0390	<0.390	<0.0360	
	MW-134	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360	
	MW-134	Apr-15	FD	<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360	
	MW-134	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-134	Oct-15	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-134	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393 J4	<0.000365	
	MW-134	Apr-16	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393 J4	<0.000365	
	MW-134	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-134	Oct-16	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-134	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-134	Apr-17	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-134	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-134	Oct-17	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-135	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.000793 J	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360	
	MW-135	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-135	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-135	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-135	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-135	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	RA-4196	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360	
	RA-4196	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	RA-4196	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	RA-4196	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	RA-4196	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	RA-4196	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	RA-4798	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	0.00311	<0.000310	<0.000390	<0.00390	<0.000360	
	RA-4798	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	0.00154	<0.000306	<0.000387	<0.00393	<0.000365	
	RA-4798	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	0.00221	<0.000306	<0.000387	<0.00393	<0.000365	
	RA-4798	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	0.00232	<0.000306	<0.000387	<0.00393	<0.000365	
	RA-4798	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	0.000793 J	<0.000306	<0.000387	<0.00393	<0.000365	
	RA-4798	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	0.00141	<0.000306	<0.000387	<0.00393	<0.000365	
	RW-12R	Apr-16		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	0.0145	**<0.00190**	<0.00180	<0.00153	<0.00194	<0.0196	0.00471 J	
	RW-12R	Apr-17		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	**0.0338**	**<0.00190**	<0.00180	<0.00153	<0.00194	<0.0196	0.0104	
	RW-13R	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0443**	**<0.000381**	0.000758 J	<0.000306	0.00539	<0.00393	0.0027	
	RW-18	Apr-14		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100		
	RW-18	Apr-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360	
	RW-18	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	RW-18	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	RW-20	Apr-15		<0.00319	<0.00130	<0.00380	<0.00260	<0.00400	**0.539**	**<0.00380**	<0.00360	<0.00310	0.113	<0.0390	0.00931 J	
	RW-22	Apr-15		<0.00319	<0.00130	<0.00380	<0.00260	<0.00400	**0.575**	**<0.00380**	<0.00360	<0.00310	0.0853	<0.0390	0.00967 J	
North Refinery	MW-23	Apr-15		<0.00798	<0.00320	<0.00960	<0.00650	<0.0100	**0.473**	**<0.00950** J	**<0.00900** J	<0.00760	0.0997	<0.0980 J	<0.00910	
	MW-23	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	0.00126	0.000677 J	**<0.000381**	<0.000361	0.00206	<0.000387	<0.00393	0.0152	
	MW-23	Apr-16		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	<0.00186	**<0.00190**	<0.00180	<0.00153	<0.00194	<0.0196	0.0225	
	MW-23	Oct-16		<0.00798	<0.00325	<0.00958	<0.00648	<0.00995	<0.00932	**<0.00952**	**<0.00902**	<0.00765	<0.00968	<0.0982	0.0201 J	
	MW-23	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	0.00103	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.019	
	MW-23	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000578 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.0154	
	MW-29	Apr-15		<0.000319	<0.000130	0.000819 J	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	0.00075 J	
	MW-29	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000791 J	
	MW-29	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-29	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-29	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-29	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-39	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	0.000987 J	
	MW-39	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000527 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000697 J	
	MW-39	Apr-16		<0.00798	<0.00325	<0.00958	<0.00648	<0.00995	**0.0526**	**<0.00952**	**<0.00902**	<0.00765	<0.00968	<0.0982	<0.00912	
	MW-39	Oct-16		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**0.0673** J	**<0.0381**	**<0.0361**	<0.0306	<0.0387	<0.393	<0.0365	
	MW-39	Apr-17		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	**0.0710**	**<0.00381**	<0.00361	<0.00306	0.00534 J	<0.0393	0.00878 J	
	MW-39	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0599**	**<0.000381**	<0.000361	<0.000306	0.00604	<0.00393	0.00851	
	MW-40	Apr-14		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393		
	MW-40	Apr-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.0046	
	MW-40	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000760 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.0146	
	MW-40	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000538 J	**<0.000381**	<0.000361	0.000706 J	<0.000387	<0.00393	0.0167	
	MW-41	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100		
	MW-41	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	0.0022	
	MW-41	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00444	
	MW-41	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00499	
	MW-42	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	**0.0630**	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100		
	MW-42	Apr-15		<0.00319	<0.00130	<0.00380	<0.00260	<0.00400	**0.0247**	**<0.00380**	<0.00360	<0.00310	<0.00390	<0.0390	0.00592 J	
	MW-42	Apr-16		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	**0.0169**	**<0.00190**	<0.00180	<0.00153	<0.00194	<0.0196	0.00562	
	MW-42	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00352	**<0.000381**	<0.000361	0.000951 J	<0.000387	<0.00393	0.00553	
	MW-43	Apr-15		<0.00319	<0.00130	<0.00380	<0.00260	<0.00400	**0.0576**	**<0.00380** J	<0.00360 J	0.00376 J	0.00448 J	<0.0390 J	0.00912 J	
	MW-43	Oct-15		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	**0.477**	**<0.00381**	<0.00361	0.00782 J	0.101	<0.0393	0.00763 J	
	MW-43	Apr-16		<0.0798	<0.0325	<0.0958	<0.0648	<0.0995	**0.502**	**<0.0952**	**<0.0902**	<0.0765	0.112 J	<0.982	<0.0912	
	MW-43	Oct-16		<0.0798	<0.0325	<0.0958	<0.0648	<0.0995	**0.433**	**<0.0952**	**<0.0902**	<0.0765	<0.0968	<0.982	<0.0912	
	MW-43	Apr-17		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**0.497**	**<0.0190**	**<0.0180**	<0.0153	0.108	<0.196	<0.0182	
	MW-43	Oct-17		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**0.839**	**<0.0190**	**<0.0180**	<0.0153	**0.182**	<0.196	0.0204 J	
	MW-59	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100		
	MW-59	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	0.00132	
	MW-59	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00186	
	MW-59	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00297	
	MW-60	Apr-15		<0.000319	0.000307 J	<0.000380	<0.000260	<0.000400	0.000879 J	**<0.000380**	0.000376 J	<0.000310	<0.000390	<0.00390	0.00249	
	MW-60	Apr-15	FD	<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.000430 J	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	0.00112	
	MW-60	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00287	
	MW-60	Oct-15	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00293	
	MW-60	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00309	
	MW-60	Apr-16	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000402 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00268	

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	1,1,1-Tri-chloroethane	1,1,2,2-Tetra-chloroethane	1,1,2-Tri-chloroethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,2,4-Trimethyl-benzene	1,2-Dibromo-ethane	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,3,5-Trimethyl-benzene	2-Butanone	2-Phenyl-butane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.06	0.01	0.005	0.025	0.007	0.015	0.00005	0.005	0.005	0.12	5.56	---
				CGWSL Source:	WQCC HH	WQCC HH	USEPA MCL	WQCC HH	USEPA MCL	USEPA TW	USEPA MCL	USEPA MCL	USEPA MCL	USEPA TW	NMED TW	
Area	**Well ID**	**Date**	**Dup**													
North Refinery	MW-60	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000948 J	**<0.000381**	<0.000361	<0.000306	<0.000387	0.00609 J	0.00328
	MW-60	Oct-16	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000618 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00312
	MW-60	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00293
	MW-60	Apr-17	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00274
	MW-60	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000685 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00319
	MW-60	Oct-17	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000753 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00322
	MW-61	Apr-15		<0.00319	<0.00130	<0.00380	<0.00260	<0.00400	**0.531**	**<0.00380** J	<0.00360 J	<0.00310	**0.130**	<0.0390 J	0.0168
	MW-61	Oct-15		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	**0.233**	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	0.0115
	MW-61	Apr-16		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	**0.139**	**<0.00190**	<0.00180	<0.00153	<0.00194	<0.0196	0.0073
	MW-61	Oct-16		<0.00798	<0.00325	<0.00958	<0.00648	<0.00995	**0.119**	**<0.00952**	**<0.00902**	<0.00765	<0.00968	<0.0982	0.0114 J
	MW-61	Apr-17		<0.00798	<0.00325	<0.00958	<0.00648	<0.00995	**0.118**	**<0.00952**	**<0.00902**	<0.00765	<0.00968	<0.0982	0.011 J
	MW-61	Oct-17		<0.000319	<0.000130	<0.000383	1/0/1900 J	<0.000398	**0.141**	**<0.000381**	<0.000361	<0.000306	0.00349	<0.00393	0.0132
	MW-62	Apr-15		<0.00319	<0.00130	<0.00380	<0.00260	<0.00400	<0.00370	**<0.00380** J	<0.00360 J	<0.00310	<0.00390	<0.0390 J	0.0144
	MW-62	Oct-15		<0.00638	<0.00260	<0.00766	<0.00518	<0.00796	**0.662**	**<0.00762**	**<0.00722**	<0.00612	**0.158**	<0.0786	0.0202
	MW-62	Apr-16		<0.00798	<0.00325	<0.00958	<0.00648	<0.00995	**0.502**	**<0.00952**	**<0.00902**	<0.00765	0.114	<0.0982	<0.00912
	MW-62	Oct-16		<0.0319 J6	<0.0130 J6	<0.0383 J6	<0.0259 J6	<0.0398 J6	**0.620** J6	**<0.0381** J6	**<0.0361** J6	<0.0306 J6	**0.149** J6	<0.393 J6	<0.0365 J6
	MW-62	Apr-17		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**0.646**	**<0.0190**	**<0.0180**	<0.0153	**0.149**	<0.196	<0.0182
	MW-62	Oct-17		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**0.759**	**<0.0381**	**<0.0361**	<0.0306	**0.173**	<0.393	<0.0365
	MW-67	Apr-15		<0.00160	<0.000650	<0.00190	<0.00130	<0.00200	0.00500 J	**<0.00190**	<0.00180	<0.00150	<0.00190	<0.0200 J4	
	MW-67	Oct-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.00108	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	0.00907
	MW-67	Apr-16		<0.00638	<0.00260	<0.00766	<0.00518	<0.00796	<0.00746	**<0.00762**	**<0.00722**	<0.00612	<0.00774	<0.0786	<0.00730
	MW-67	Oct-16		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	0.0108	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	0.00716 J
	MW-67	Apr-17		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	0.00498 J	**<0.00190**	<0.00180	<0.00153	<0.00194	<0.0196	0.00859
	MW-67	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00119	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.0057
	MW-90	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	0.00285
	MW-90	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00206
	MW-90	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000888 J
	MW-90	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-90	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00243
	MW-90	Oct-17		<0.000319	1/0/1900 J	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00425
	MW-91	Apr-15		<0.00319	<0.00130	<0.00380	<0.00260	<0.00400	**0.184**	**<0.00380**	<0.00360	<0.00310	0.0476	<0.0390	0.00796 J
	MW-91	Oct-15		<0.00798	<0.00325	<0.00958	<0.00648	<0.00995	**0.226**	**<0.00952**	**<0.00902**	<0.00765	0.0626	<0.0982	0.0134 J
	MW-91	Apr-16		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**0.266**	**<0.00190**	**<0.0180**	<0.0153	0.0719	<0.196	<0.0182
	MW-91	Oct-16		<0.0798	<0.0325	<0.0958	<0.0648	<0.0995	**0.218** J	**<0.0952**	**<0.0902**	<0.0765	<0.0968	<0.982	<0.0912
	MW-91	Apr-17		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**0.235**	**<0.0381**	**<0.0361**	<0.0306	0.0634 J	<0.393	<0.0365
	MW-91	Oct-17		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**0.221**	**<0.0381**	**<0.0361**	<0.0306	0.0693 J	<0.393	<0.0365
	MW-92	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0588**	**<0.000381**	<0.000361	<0.000306	0.0174	<0.00393	0.00699
	MW-92	Oct-16		<0.00638	<0.00260	<0.00766	<0.00518	<0.00796	**0.0308**	**<0.00762**	**<0.00722**	<0.00612	0.00835 J	<0.0786	<0.00730
	MW-93	Apr-15		<0.00319	<0.00130	<0.00380	<0.00260	<0.00400	**0.206**	**<0.00380** J	<0.00360 J	<0.00310	0.0368	<0.0390 J	0.00716 J
	MW-93	Oct-15		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	**0.241**	**<0.00381**	<0.00361	<0.00306	0.0414	<0.0393	0.00653 J
	MW-93	Apr-16		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	**0.0331**	**<0.00190**	<0.00180	<0.00153	0.00543	<0.0196	0.00208 J
	MW-93	Oct-16		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	**0.103**	**<0.00381**	<0.00361	<0.00306	0.0146	<0.0393	0.00379 J
	MW-93	Apr-17		<0.00798	<0.00325	<0.00958	<0.00648	<0.00995	**0.148**	**<0.00952**	**<0.00902**	<0.00765	0.0236 J	<0.0982	<0.00912
	MW-94	Oct-15		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	**0.432**	**<0.00381**	<0.00361	<0.00306	0.0857	<0.0393	0.0283
	MW-94	Apr-16		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**0.489**	**<0.0190**	**<0.0180**	<0.0153	0.100	<0.196 J4	0.0403 J
	MW-94	Oct-16		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	**0.458**	**<0.00190**	<0.00180	<0.00153	0.0917	<0.0196	0.0303
	MW-94	Apr-17		<0.00798	<0.00325	<0.00958	<0.00648	<0.00995	**0.398**	**<0.00952**	**<0.00902**	<0.00765	0.0785	<0.0982	0.0317
	MW-95	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	MW-95	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	0.00288
	MW-95	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393 J4	0.0033
	MW-95	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.0024
	MW-96	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.000553 J	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	0.00551
	MW-96	Oct-15		<0.160	<0.0650	<0.192	<0.130	<0.199	**<0.186**	**<0.190**	**<0.180**	<0.153	**<0.194**	<1.96	<0.182
	MW-96	Apr-16		<0.00638	<0.00260	<0.00766	<0.00518	<0.00796	<0.00746	**<0.00762**	**<0.00722**	<0.00612	<0.00774	<0.0786	0.0104 J
	MW-96	Oct-16		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**<0.0186**	**<0.0190**	**<0.0180**	<0.0153	<0.0194	<0.196	<0.0182
	MW-96	Apr-17		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**<0.0186**	**<0.0190**	**<0.0180**	<0.0153	<0.0194	<0.196	<0.0182
	MW-96	Oct-17		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**<0.0186**	**<0.0190**	**<0.0180**	<0.0153	<0.0194	<0.196	<0.0182
	MW-98	Apr-15		<0.00798	<0.00320	<0.00960	<0.00650	<0.0100	**0.360**	**<0.00950** J	**<0.00900** J	<0.00760	0.0870	<0.0980 J	0.00919 J
	MW-98	Oct-15		<0.00798	<0.00325	<0.00958	<0.00648	<0.00995	**0.380**	**<0.00952**	**<0.00902**	<0.00765	0.0836	<0.0982	<0.00912
	MW-98	Apr-16		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**0.177**	**<0.0381**	**<0.0361**	<0.0306	0.0462 J	<0.393	<0.0365
	MW-98	Oct-16		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**0.299**	**<0.0381**	**<0.0361**	<0.0306	0.0823 J	<0.393	<0.0365
	MW-98	Apr-17		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**0.382**	**<0.0381**	**<0.0361**	<0.0306	0.0852 J	<0.393	<0.0365
	MW-98	Oct-17		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**0.488**	**<0.0190**	**<0.0180**	<0.0153	0.118	<0.196	<0.0182
	MW-137	Oct-15		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**0.437**	**<0.0381**	**<0.0361**	<0.0306	0.102	<0.393	<0.0365
	MW-137	Apr-16		<0.0798	<0.0325	<0.0958	<0.0648	<0.0995	**0.460**	**<0.0952**	**<0.0902**	<0.0765	0.102 J	<0.982	<0.0912
	MW-137	Oct-16		<0.0798	<0.0325	<0.0958	<0.0648	<0.0995	**0.421**	**<0.0952**	**<0.0902**	<0.0765	<0.0968	<0.982	<0.0912
	MW-137	Apr-17		<0.0638	<0.0260	<0.0766	<0.0518	<0.0796	**0.414**	**<0.0762**	**<0.0722**	<0.0612	0.0969 J	<0.786	<0.0730
	MW-137	Oct-17		<0.0638	<0.0260	<0.0766	<0.0518	<0.0796	**0.559**	**<0.0762**	**<0.0722**	<0.0612	**0.137** J	<0.786	<0.0730
	MW-138	Oct-15		<0.00638	<0.00260	<0.00766	<0.00518	<0.00796	**0.0792**	**<0.00762**	**<0.00722**	<0.00612	0.0189 J	<0.0786	0.0144 J
	MW-138	Apr-16		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	<0.00373	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	0.0138
	MW-138	Oct-16		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	<0.00373	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	0.0115
	MW-138	Apr-17		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	<0.00373	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	0.0116
	MW-138	Oct-17		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	0.00547	**<0.00190**	<0.00180	<0.00153	<0.00194	<0.0196	0.0119
	RW-1	Apr-15		<0.0160	<0.00650	<0.0190	<0.0130	<0.0200	**<0.0190**	**<0.0190**	**<0.0180**	<0.0150	<0.0190	<0.200	<0.0180
	RW-1R	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	0.000763 J	0.00369	**<0.000381**	<0.000361	<0.000306	0.000516 J	<0.00393	0.000968 J
	RW-1R	Apr-17		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	<0.00373	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	0.00414 J
	RW-2	Apr-15		<0.00319	<0.00130	<0.00380	<0.00260	<0.00400	**0.330**	**<0.00380** J	<0.00360 J	<0.00310	0.0772	<0.0390 J	0.012
	RW-2R	Apr-16		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**0.188**	**<0.0190**	**<0.0180**	<0.0153	0.0419 J	<0.196	<0.0182
	RW-2R	Apr-17		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**0.271**	**<0.0190**	**<0.0180**	<0.0153	0.0664	<0.196	<0.0182
	RW-7	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	**0.0818**	**<0.000380**	<0.000360	<0.000310	0.000663 J	<0.00390	0.0146
	RW-7R	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393 J4	<0.000365
	RW-7R	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	RW-8	Apr-15		<0.00319	<0.00130	<0.00380	<0.00260	<0.00400	0.00710 J	**<0.00380**	<0.00360	<0.00310	<0.00390	<0.0390	0.00942 J
	RW-8	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0928**	**<0.000381**	0.00343	<0.000306	0.0249	<0.00393	0.0117
	RW-9	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	0.00650	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	RW-9	Apr-15		<0.0160	<0.00650	<0.0190	<0.0130	<0.0200	**<0.0190**	**<0.0190**	**<0.0180**	<0.0150	<0.0190	<0.200	<0.0180
	RW-9	Apr-16		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	**0.0283**	**<0.00190**	<0.00180	<0.00153	<0.00194	<0.0196	0.0126
	RW-9	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000991 J	**<0.000381**	<0.000361	0.00182	<0.000387	<0.00393	0.0175
	RW-10	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	RW-10	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	RW-10	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	RW-10	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000569 J
	RW-16	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	RW-16	Apr-14	FD	<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	RW-16	Apr-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000360
	RW-16	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	RW-16	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	RW-17	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	RW-17	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	RW-17	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	RW-17	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	1,1,1-Tri-chloroethane	1,1,2,2-Tetra-chloroethane	1,1,2-Tri-chloroethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,2,4-Trimethyl-benzene	1,2-Dibromo-ethane	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,3,5-Trimethyl-benzene	2-Butanone	2-Phenyl-butane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.06	0.01	0.005	0.025	0.007	0.015	0.00005	0.005	0.005	0.12	5.56	---
				CGWSL Source:	WQCC HH	WQCC HH	USEPA MCL	WQCC HH	USEPA MCL	USEPA TW	USEPA MCL	USEPA MCL	USEPA MCL	USEPA TW	NMED TW	
Area	**Well ID**	**Date**	**Dup**													
North RO Reject Field	MW-117	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.00285	**<0.000380**	<0.000360	<0.000310	0.000897 J	<0.00390	<0.000360
	MW-117	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-117	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-117	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-117	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-117	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-118	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.000863 J	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-118	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-118	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-118	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-118	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-118	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-119	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-119	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-119	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-119	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-119	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-119	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
NCL	MW-18	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	MW-18	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-18	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-18	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-45	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-45	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-45	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-45	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-45	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-45	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-53	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	MW-53	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-53	Apr-16		<0.000319	<0.000130 J4	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-53	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-54A	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	0.000428 J
	MW-54A	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000742 J
	MW-54A	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-54A	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-54A	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-54A	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00118
	MW-54B	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500
	MW-54B	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-54B	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-55	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-55	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-55	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0599**	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-55	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-55	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-55	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-56	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-56	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-56	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-56	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-56	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-108	Apr-15		<0.00319	<0.00130	<0.00380	<0.00260	<0.00400	**0.0465**	**<0.00380**	<0.00360	<0.00310	0.00603 J	<0.0390	0.00565 J
	MW-108	Oct-15		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	**0.0616**	**<0.00381**	<0.00361	<0.00306	0.00805 J	<0.0393	0.00655 J
	MW-108	Apr-16		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**0.0599**	**<0.0190**	**<0.0180**	<0.0153	<0.0194	<0.196	<0.0182
	MW-108	Oct-16		<0.00798	<0.00325	<0.00958	<0.00648	<0.00995	**0.0561**	**<0.00952**	**<0.00902**	<0.00765	<0.00968	<0.0982	<0.00912
	MW-108	Apr-17		<0.00798	<0.00325	<0.00958	<0.00648	<0.00995	**0.0605**	**<0.00952**	**<0.00902**	<0.00765	<0.00968	<0.0982	<0.00912
	MW-108	Oct-17		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	**0.0451**	**<0.00190**	<0.00180	<0.00153	0.00330 J	<0.0196	0.00527
	NCL-31	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	0.000683 J
	NCL-31	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00164
	NCL-31	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000595 J
	NCL-31	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000554 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	NCL-31	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000971 J
	NCL-31	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000489 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000428 J
	NCL-32	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	NCL-32	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	NCL-32	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	NCL-32	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	NCL-32	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	NCL-32	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	NCL-33	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	NCL-33	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398 J	<0.000373	**<0.000381** J	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	NCL-33	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	NCL-33	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	NCL-33	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	NCL-33	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	NCL-34A	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	**0.0979**	**<0.000380**	<0.000360	<0.000310	0.00122	<0.00390	0.0159
	NCL-34A	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0589**	**<0.000381**	<0.000361	<0.000306	0.000423 J	<0.00393	0.0174
	NCL-34A	Apr-16		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**0.102**	**<0.0190**	**<0.0180**	<0.0153	<0.0194	<0.196	0.019 J
	NCL-34A	Oct-16		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**0.0754** J	**<0.0381**	**<0.0361**	<0.0306	<0.0387	<0.393	<0.0365
	NCL-34A	Apr-17		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**0.0560**	**<0.0190**	**<0.0180**	<0.0153	<0.0194	<0.196	0.0184 J
	NCL-34A	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0290**	**<0.000381**	<0.000361	<0.000306	0.00141	<0.00393	0.0216
	NCL-44	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	0.00039 J
	NCL-44	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000419 J
	NCL-44	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00144
	NCL-44	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000672 J
	NCL-44	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000618 J
	NCL-44	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000487 J
	NCL-49	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	NCL-49	Apr-15	FD	<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	NCL-49	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	NCL-49	Oct-15	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	NCL-49	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.00762**	**<0.00722**	<0.00612	<0.00774	<0.0786	<0.000365
	NCL-49	Apr-16	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	NCL-49	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	NCL-49	Oct-16	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	NCL-49	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	NCL-49	Apr-17	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	NCL-49	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	NCL-49	Oct-17	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	1,1,1-Tri-chloroethane	1,1,2,2-Tetra-chloroethane	1,1,2-Tri-chloroethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,2,4-Trimethyl-benzene	1,2-Dibromo-ethane	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,3,5-Trimethyl-benzene	2-Butanone	2-Phenyl-butane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.06	0.01	0.005	0.025	0.007	0.015	0.00005	0.005	0.005	0.12	5.56	---
				CGWSL Source:	WQCC HH	WQCC HH	USEPA MCL	WQCC HH	USEPA MCL	USEPA TW	USEPA MCL	USEPA MCL	USEPA MCL	USEPA TW	NMED TW	
Area	Well ID	Date	Dup													
South Refinery	KWB-2R	Apr-15		<0.00319	<0.00130	<0.00380	<0.00260	<0.00400	**0.307**	**<0.00380**	<0.00360	<0.00310	<0.00390	<0.0390	0.0107	
	KWB-2R	Oct-15		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**0.317**	**<0.0381**	**<0.0361**	<0.0306	<0.0387	<0.393	<0.0365	
	KWB-2R	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0497**	**<0.000381**	<0.000361	<0.000306	0.000489 J	<0.00393	0.0035	
	KWB-2R	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0347**	**<0.000381**	<0.000361	<0.000306	0.000427 J	<0.00393	0.00588	
	KWB-2R	Apr-17		<0.000319	0.00016 J	<0.000383	<0.000259	<0.000398	**0.0341**	**<0.000381**	<0.000361	<0.000306	<0.000387	0.0164	0.00279	
	KWB-2R	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.150**	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00996	
	KWB-5	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	**0.0158**	**<0.000380**	<0.000360	<0.000310	0.00419	<0.00390	0.00291	
	KWB-5	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00334	**<0.000381**	<0.000361	<0.000306	0.00179	<0.00393	0.00314	
	KWB-5	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00535	**<0.000381**	<0.000361	<0.000306	0.000901 J	<0.00393	0.00242	
	KWB-5	Oct-16		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	<0.00186	**<0.00190**	<0.00180	<0.00153	<0.00194	<0.0196	<0.00182	
	KWB-5	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0172**	**<0.000381**	<0.000361	<0.000306	0.00179	<0.00393	0.0028	
	KWB-5	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**<0.0932**	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00202	
	KWB-6	Apr-15		<0.00798	<0.00320	<0.00960	<0.00650	<0.0100	**0.680**	**<0.00950**	**0.0119** J	<0.00760	**0.124**	<0.0980	0.00954 J	
	KWB-6	Oct-15		<0.160	<0.0650	<0.192	<0.130	<0.199	**0.325** J	**<0.190**	**<0.180**	<0.153	**<0.194**	<1.96	<0.182	
	KWB-6	Apr-16		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	**0.876**	**<0.00190**	**0.00683**	<0.00153	**0.134**	<0.0196	0.00944	
	KWB-6	Oct-16		<0.00638	<0.00260	<0.00766	<0.00518	<0.00796	**0.292**	**<0.00762**	**<0.00722**	<0.00612	0.0449	<0.0786	<0.00730	
	KWB-6	Apr-17		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	**0.399**	**<0.00190**	0.00451 J	<0.00153	0.0517	<0.0196	0.00695	
	KWB-6	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.206**	**<0.000381**	<0.000361	<0.000306	0.0302	<0.00393	0.00483	
	MW-28	Apr-15		<0.0319	<0.0130	<0.0380	<0.0260	<0.0400	**0.0950** J	**<0.0380**	**<0.0360**	<0.0310	<0.0390	<0.390	<0.0360	
	MW-28	Oct-15		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**0.151**	**<0.0381**	**<0.0361**	<0.0306	<0.0387	<0.393	<0.0365	
	MW-28	Apr-16		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	**0.113**	**<0.00381**	<0.00361	<0.00306	0.00861 J	<0.0393	0.0053 J	
	MW-28	Oct-16		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**0.253**	**<0.0190**	**<0.0180**	0.0789	0.0202 J	<0.196	<0.0182	
	MW-28	Apr-17		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**0.168**	**<0.0190**	**<0.0180**	<0.0153	<0.0194	<0.196	<0.0182	
	MW-28	Oct-17		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**0.142**	**<0.0190**	**<0.0180**	<0.0153	<0.0194	<0.196	<0.0182	
	MW-48	Apr-15		<0.00319	<0.00130	<0.00380	<0.00260	<0.00400	**0.140**	**<0.00380**	<0.00360	<0.00310	0.00962 J	<0.0390	0.00641 J	
	MW-48	Oct-15		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	**0.211**	**<0.00190**	<0.00180	<0.00153	0.00235 J	<0.0196	0.011	
	MW-48	Apr-16		<0.00638	<0.000130	<0.000383	<0.000259	<0.000398	**0.310**	**<0.00762**	**<0.00722**	<0.00612	0.0223	<0.0786	0.00987 J	
	MW-48	Oct-16		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	**0.323**	**<0.00190**	<0.00180	<0.00153	0.0284	<0.0196	0.0114	
	MW-48	Apr-17		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**0.482**	**<0.0190**	**<0.0180**	<0.0153	0.0577	<0.196	<0.0182	
	MW-48	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.368**	**<0.000381**	<0.000361	<0.000306	0.0465	<0.00393	<0.000365	
	MW-50	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	0.000587 J	
	MW-50	Oct-15		<0.000319 J	<0.000130 J	<0.000383 J	<0.000259	<0.000398	<0.000373 J	**<0.000381** J	<0.000361	<0.000306 J	<0.000387 J	<0.00393	0.000946 J	
	MW-50	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-50	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000625 J	
	MW-50	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-50	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-52	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360	
	MW-52	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-52	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-52	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-52	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-52	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-64	Apr-16		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**0.666**	**<0.0190**	**<0.0180**	<0.0153	**0.140**	<0.196 J4	<0.0182	
	MW-64	Oct-16		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**0.435**	**<0.0381**	**<0.0361** J5	<0.0306	0.0904 J	<0.393	<0.0365	
	MW-64	Apr-17		<0.0798	<0.0325	<0.0958	<0.0648	<0.0995	**0.793**	**<0.0952**	**<0.0902**	<0.0765	**0.163** J	<0.982	<0.0912	
	MW-64	Oct-17		<0.0798	<0.0325	<0.0958	<0.0648	<0.0995	**0.643**	**<0.0952**	**<0.0902**	<0.0765	**0.130** J	<0.982	<0.0912	
	MW-65	Apr-15		<0.00319	<0.00130	<0.00380	<0.00260	<0.00400	**0.0514**	**<0.00380**	<0.00360	<0.00310	0.0228	<0.0390	0.0105	
	MW-65	Apr-16		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	**0.0309**	**<0.00381**	<0.00361	<0.00306	0.0165	<0.0393	0.00821 J	
	MW-65	Oct-16		<0.00638	<0.00260	<0.00766	<0.00518	<0.00796	<0.00746	**<0.00762**	**<0.00722**	<0.00612	<0.00774	<0.0786	<0.00730	
	MW-65	Apr-17		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**<0.0373**	**<0.0381**	**<0.0361**	<0.0306	<0.0387	<0.393	<0.0365	
	MW-65	Oct-17		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**<0.0373**	**<0.0381**	**<0.0361**	<0.0306	<0.0387	<0.393	<0.0365	
	MW-66	Apr-15		<0.0160	<0.00650	<0.0190	<0.0130	<0.0200	**<0.0190**	**<0.0190**	**<0.0180**	<0.0150	<0.0190	<0.200	<0.0180	
	MW-66	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00409	**<0.000381**	<0.000361	<0.000306	0.000859 J	<0.00393	0.00938	
	MW-66	Apr-16		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	0.00940 J	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	0.00771 J	
	MW-66	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00241	**<0.000381**	<0.000361	<0.000306	0.000547 J	<0.00393	0.00983	
	MW-66	Apr-17		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**<0.0186**	**<0.0190**	**<0.0180**	<0.0153	<0.0194	<0.196	<0.0182	
	MW-66	Oct-17		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	<0.00373	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	<0.00365	
	MW-99	Apr-15		<0.00798	<0.00320	<0.00960	<0.00650	<0.0100	**0.337**	**<0.00950**	**<0.00900**	<0.00760	0.0706	<0.0980	0.0108 J	
	MW-99	Oct-15		<0.00798	<0.00325	<0.00958	<0.00648	<0.00995	**0.400**	**<0.00952**	**<0.00902**	<0.00765	0.0169 J	<0.0982	0.0113 J	
	MW-99	Apr-16		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	**0.498**	**<0.00381**	<0.00361	<0.00306	0.0129	<0.0393	0.00922 J	
	MW-99	Oct-16		<0.00638	<0.00260	<0.00766	<0.00518	<0.00796	**0.343**	**<0.00762**	**<0.00722**	<0.00612	<0.00774	<0.0786	0.00804 J	
	MW-99	Apr-17		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**0.252**	**<0.0190**	**<0.0180**	<0.0153	0.0196 J	<0.196	<0.0182	
	MW-99	Oct-17		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**0.152**	**<0.0381**	**<0.0361**	<0.0306	<0.0387	<0.393	<0.0365	
	MW-101	Apr-15		<0.00160	<0.000650	<0.00190	<0.00130	<0.00200	<0.00190	**<0.00190** J	<0.00180 J	<0.00150	<0.00190	<0.0200 J	<0.00180	
	MW-101	Oct-15		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	<0.00186	**<0.00190**	<0.00180	<0.00153	<0.00194	<0.0196	<0.00182	
	MW-101	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00151	
	MW-101	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000391 J	
	MW-101	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00132	
	MW-101	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.000386 J	
	MW-102	Apr-15		<0.00319	<0.00130	<0.00380	<0.00260	<0.00400	**0.136**	**<0.00380**	**0.00548** J	<0.00310	0.0278	<0.0390	0.00509 J	
	MW-102	Oct-15		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**0.465**	**<0.0381**	**<0.0361**	<0.0306	0.115	<0.393	<0.0365	
	MW-102	Apr-16		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**0.402**	**<0.0381**	**<0.0361**	<0.0306	0.110	<0.393	<0.0365	
	MW-102	Oct-16		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**0.337**	**<0.0381**	**<0.0361**	<0.0306	0.0773 J	<0.393	<0.0365	
	MW-102	Apr-17		<0.00638	<0.00260	<0.00766	<0.00518	<0.00796	**0.291**	**<0.00762**	**<0.00722**	<0.00612	0.0282	<0.0786	0.0152 J	
	MW-102	Oct-17		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**0.278**	**<0.0190**	**<0.0180**	<0.0153	0.0413 J	<0.196	0.0188 J	
	MW-103	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	0.0150	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100		
	MW-103	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.0102	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	0.00396	
	MW-103	Apr-16		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	<0.00186	**<0.00190**	<0.00180	<0.00153	<0.00194	<0.0196	0.0034 J	
	MW-103	Apr-17		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**<0.0186**	**<0.0190**	**<0.0180**	<0.0153	<0.0194	<0.196	<0.0182	
	MW-104	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	0.032	
	MW-104	Apr-15	FD	<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	0.0328	
	MW-104	Oct-15		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	<0.00186	**<0.00190**	<0.00180	<0.00153	<0.00194	<0.0196	0.0378	
	MW-104	Oct-15	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000420 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.0349	
	MW-104	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.0344	
	MW-104	Apr-16	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.038	
	MW-104	Oct-16		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	<0.00186	**<0.00190**	<0.00180	<0.00153	<0.00194	<0.0196	0.0346	
	MW-104	Oct-16	FD	<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	<0.00186	**<0.00190**	<0.00180	<0.00153	<0.00194	<0.0196	0.038	
	MW-104	Apr-17		<0.00319	<0.00130	0.0075 J	<0.00259	<0.00398	<0.00373	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	0.0327	
	MW-104	Apr-17	FD	<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	0.00209 J	**<0.00190**	<0.00180	<0.00153	<0.00194	<0.0196	0.0193	
	MW-104	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000544 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.0378	
	MW-104	Oct-17	FD	<0.00160	<0.000650	1/0/1900	<0.00130	<0.00199	<0.00186	**<0.00190**	<0.00180	<0.00153	<0.00194	<0.0196	0.0296	
	MW-105	Apr-15		<0.00160	<0.000650	<0.00190	<0.00130	<0.00200	**0.0678**	**<0.00190** J	<0.00180 J	<0.00150	0.0325	<0.0200 J	0.0128	
	MW-105	Oct-15		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	**0.0487**	**<0.00381**	<0.00361	<0.00306	0.0291	<0.0393	0.0121	
	MW-105	Apr-16		<0.0798	<0.0325	<0.0958	<0.0648	<0.0995	**0.103** J	**<0.0952**	**<0.0902**	<0.0765	<0.0968	<0.982	<0.0912	
	MW-105	Oct-16		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**0.141**	**<0.0381**	**<0.0361**	<0.0306	<0.0387	<0.393	<0.0365	
	MW-105	Apr-17		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**0.104**	**<0.0381**	**<0.0361**	<0.0306	<0.0387	<0.393	<0.0365	
	MW-105	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0964**	**<0.000381**	<0.000361	<0.000306	0.0250	<0.00393	0.0119	
	MW-106	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	**0.0173**	**<0.000380**	<0.000360	<0.000310	0.00273	<0.00390	0.00081 J	
	MW-106	Oct-15		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**0.0921** J	**<0.0381**	**<0.0361**	<0.0306	<0.0387	<0.393	<0.0365	
	MW-106	Apr-16		<0.00798	<0.00325	<0.00958	<0.00648	<0.00995	**0.0824**	**<0.00952**	**<0.00902**	<0.00765	0.0114 J	<0.0982	<0.00912	
	MW-106	Oct-16		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**0.126**	**<0.0190**	**<0.0180**	<0.0153	0.0219 J	<0.196	<0.0182	
	MW-106	Apr-17		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**0.0853**	**<0.0190**	**<0.0180**	<0.0153	<0.0194	<0.196	<0.0182	
	MW-106	Oct-17		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**0.0731**	**<0.0190**	**<0.0180**	<0.0153	<0.0194	<0.196	<0.0182	

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	1,1,1-Tri-chloroethane	1,1,2,2-Tetra-chloroethane	1,1,2-Tri-chloroethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,2,4-Trimethyl-benzene	1,2-Dibromo-ethane	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,3,5-Trimethyl-benzene	2-Butanone	2-Phenyl-butane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.06	0.01	0.005	0.025	0.007	0.015	0.00005	0.005	0.005	0.12	5.56	---
				CGWSL Source:	WQCC HH	WQCC HH	USEPA MCL	WQCC HH	USEPA MCL	USEPA TW	USEPA MCL	USEPA MCL	USEPA MCL	USEPA TW	NMED TW	
Area	**Well ID**	**Date**	**Dup**													
South Refinery	MW-107	Apr-15		<0.00319	<0.00130	<0.00380	<0.00260	<0.00400	0.0133	**<0.00380**	<0.00360	<0.00310	<0.00390	<0.0390	<0.00360	
	MW-107	Oct-15		<0.0319	<0.0130	<0.0383	<0.0259	<0.0398	**0.100**	**<0.0381**	**<0.0361**	<0.0306	<0.0387	<0.393	<0.0365	
	MW-107	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00111	**<0.000381**	<0.000361	<0.000306	0.000591 J	<0.00393	0.00613	
	MW-107	Oct-16		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	0.00205 J	**<0.00190**	<0.00180	<0.00153	<0.00194	<0.0196	0.00592	
	MW-107	Apr-17		<0.0160	<0.00650	<0.0192	<0.0130	<0.0199	**<0.0186**	**<0.0190**	**<0.0180**	<0.0153	<0.0194	<0.196	<0.0182	
	MW-109	Apr-15		<0.00319	<0.00130	<0.00380	<0.00260	<0.00400	<0.00370	**<0.00380**	<0.00360	<0.00310	<0.00390	<0.0390	0.00453 J	
	MW-109	Oct-15		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	0.00487 J	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	0.00396 J	
	MW-109	Apr-16		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	0.00418 J	**<0.00190**	<0.00180	<0.00153	<0.00194	<0.0196	0.00501	
	MW-109	Oct-16		<0.00638	<0.00260	<0.00766	<0.00518	<0.00796	<0.00746	**<0.00762**	**<0.00722**	<0.00612	<0.00774	<0.0786	<0.00730	
	MW-109	Apr-17		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	0.00751	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	0.00698 J	
	MW-109	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00547	**<0.000381**	<0.000361	<0.000306	0.00167	<0.00393	0.0087	
	MW-110	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.00548	**<0.000380**	<0.000360	<0.000310	0.00166	<0.00390	0.00674	
	MW-110	Oct-15		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	**0.0350**	**<0.00190**	<0.00180	<0.00153	0.00228 J	<0.0196	0.00654	
	MW-110	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000871 J	**<0.000381**	<0.000361	<0.000306	0.000525 J	<0.00393	0.00576	
	MW-110	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00126	
	MW-110	Apr-17		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	**0.0193**	**<0.00190**	<0.00180	<0.00153	<0.00194	<0.0196	0.00963	
	MW-110	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	RA-313	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100		
	RA-313	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360	
	RA-313	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393 J4	<0.000365	
	RA-313	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	RW-4	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	0.00302	
	RW-4R	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00269	
	RW-4R	Apr-17		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	<0.00186	**<0.00190**	<0.00180	<0.00153	<0.00194	<0.0196	0.00213 J	
	RW-5R	Apr-15		<0.00319	<0.00130	<0.00380	<0.00260	<0.00400	**0.298**	**<0.00380**	<0.00360	<0.00310	0.0558	<0.0390	0.00691 J	
	RW-5R	Apr-16		<0.00638	<0.00260	<0.00766	<0.00518	<0.00796	**0.437**	**<0.00762**	**<0.00722**	<0.00612	0.100	<0.0786	0.013 J	
	RW-6	Apr-15		<0.00319	<0.00130	<0.00380	<0.00260	<0.00400	**0.134**	**<0.00380**	<0.00360	<0.00310	0.0280	<0.0390	0.00944 J	
	RW-6R	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00555	**<0.000381**	<0.000361	<0.000306	0.00111	<0.00393	0.0059	
	RW-15C	Apr-17		<0.00798	<0.00325	<0.00958	<0.00648	<0.00995	**1.46**	**<0.00952**	**<0.00902**	<0.00765	**0.231**	<0.0982	0.0194 J	
South RO Reject Field	MW-114	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360	
	MW-114	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-114	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-114	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-114	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-114	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-115	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360	
	MW-115	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-115	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-115	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-115	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-115	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-116	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360	
	MW-116	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-116	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-116	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000389 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-116	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-116	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
TEL	MW-49	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400 J	0.00954	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	0.00245	
	MW-49	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.0150	**<0.000381**	<0.000361	<0.000306	0.000858 J	<0.00393	0.00371	
	MW-49	Apr-16		<0.00638	<0.00260	<0.00766	<0.00518	<0.00796	**0.0305**	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.00730	
	MW-49	Oct-16		<0.0319	<0.0130 J4	<0.0383	<0.0259	<0.0398	**0.0457** J	**<0.0381**	**<0.0361**	<0.0306	<0.0387	<0.393 J3	<0.0365	
	MW-49	Apr-17		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	**0.0409**	**<0.00381**	<0.00361	<0.00306	0.00628 J	<0.0393	0.00406 J	
	MW-49	Oct-17		<0.00638	<0.00260	<0.00766	<0.00518	<0.00796	**0.118**	**<0.00762**	**<0.00722**	<0.00612	0.0225	<0.0786	0.0083	
	TEL-1	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	0.00103	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360	
	TEL-1	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000971 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00166	
	TEL-1	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000807 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00174	
	TEL-1	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000939 J	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.00232	
	TEL-1	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.000500 J	**<0.000381**	<0.000361	<0.000306	<0.000387	0.00602 J	<0.000365	
	TEL-1	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	0.00219	**<0.000381**	<0.000361	<0.000306	0.000626 J	<0.00393	0.00198	
	TEL-2	Apr-15		<0.00638	<0.00260	<0.00770	<0.00520	<0.00800 J	**0.138**	**<0.00760**	**<0.00720**	<0.00610	0.0198 J	<0.0790	<0.00730	
	TEL-2	Oct-15		<0.00160	<0.000650	<0.00192	<0.00130	<0.00199	**0.138**	**<0.00190**	<0.00180	<0.00153	0.0109	<0.0196	0.00649	
	TEL-2	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.125**	**<0.000381**	<0.000361	<0.000306	0.0143	<0.00393	0.00662	
	TEL-2	Oct-16		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	**0.0976**	**<0.00381**	<0.00361	<0.00306	0.00929 J	<0.0393	0.00607 J	
	TEL-2	Apr-17		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	**0.0706**	**<0.00381**	<0.00361	<0.00306	0.00599 J	<0.0393	0.004 J	
	TEL-2	Oct-17		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	**0.108**	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	0.00974 J	
	TEL-3	Apr-15		<0.00319	<0.00130	<0.00380	<0.00260	<0.00400	0.0104	**<0.00380**	<0.00360	<0.00310	<0.00390	<0.0390	0.00899 J	
	TEL-3	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0213**	**<0.000381**	<0.000361	<0.000306	0.00128	<0.00393	0.0111	
	TEL-3	Apr-16		<0.00798	<0.00325	<0.00958	<0.00648	<0.00995	0.0128 J	**<0.00952**	**<0.00902**	<0.00765	<0.00968	<0.0982	0.0108 J	
	TEL-3	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0157**	**<0.000381**	<0.000361	<0.000306	0.00115	<0.00393	0.00596	
	TEL-3	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0163**	**<0.000381**	<0.000361	<0.000306	0.000748 J	<0.00393	0.00806	
	TEL-4	Apr-15		<0.00319	<0.00130	<0.00380	<0.00260	<0.00400	**0.0742**	**<0.00380**	<0.00360	<0.00310	<0.00390	<0.0390	0.0117	
	TEL-4	Apr-15	FD	<0.00319	<0.00130	<0.00380	<0.00260	<0.00400	**0.0758**	**<0.00380**	<0.00360	<0.00310	<0.00390	<0.0390	0.0118	
	TEL-4	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0740**	**<0.000381**	<0.000361	<0.000306	0.000524 J	<0.00393	0.0119	
	TEL-4	Oct-15	FD	<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	**0.0861**	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	0.0145	
	TEL-4	Apr-16		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	**0.142**	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	0.0161	
	TEL-4	Apr-16	FD	<0.000319	<0.00130	<0.00383	<0.00259	<0.00398	**0.147**	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	0.0165	
	TEL-4	Oct-16		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	**0.0775**	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	0.0111	
	TEL-4	Oct-16	FD	<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	**0.105**	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	0.0162	
	TEL-4	Apr-17		<0.00319	<0.00130	<0.00383	<0.00259	<0.00398	**0.0287**	**<0.00381**	<0.00361	<0.00306	<0.00387	<0.0393	0.00766 J	
	TEL-4	Apr-17	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0352**	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.0108	
	TEL-4	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0387**	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.0197	
	TEL-4	Oct-17	FD	<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	**0.0343**	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	0.0184	
TMD	MW-8	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100		
	MW-8	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360	
	MW-8	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-8	Apr-17		<0.000319	<0.000130	<0.000383 J4	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-16	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100		
	MW-16	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380** J	<0.000360 J	<0.000310	<0.000390	<0.00390 J	<0.000360	
	MW-16	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-20	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100		
	MW-20	Apr-14	FD	<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100		
	MW-20	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360	
	MW-20	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393 J4	<0.000365	
	MW-20	Apr-17		<0.000319	<0.000130	<0.000383 J4	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-21	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380** J	<0.000360 J	<0.000310	<0.000390	<0.00390 J	<0.000360	
	MW-21	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-21	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-21	Oct-16		<0.000319	<0.000130 J4	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393 J3	<0.000365	
	MW-21	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-21	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	
	MW-25	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100		
	MW-25	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380** J	<0.000360 J	<0.000310	<0.000390	<0.00390 J	<0.000360	
	MW-25	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393 J4	<0.000365	
	MW-25	Apr-17		<0.000319	<0.000130	<0.000383 J4	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365	

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

	Analyte Group:			Volatile Organic Compounds												
			Analyte:	1,1,1-Tri-chloroethane	1,1,2,2-Tetra-chloroethane	1,1,2-Tri-chloroethane	1,1-Dichloro-ethane	1,1-Dichloro-ethene	1,2,4-Trimethyl-benzene	1,2-Dibromo-ethane	1,2-Dichloro-ethane	1,2-Dichloro-propane	1,3,5-Trimethyl-benzene	2-Butanone	2-Phenyl-butane
			Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
			CGWSL:	0.06	0.01	0.005	0.025	0.007	0.015	0.00005	0.005	0.005	0.12	5.56	---
			CGWSL Source:	WQCC HH	WQCC HH	USEPA MCL	WQCC HH	USEPA MCL	USEPA TW	USEPA MCL	USEPA MCL	USEPA MCL	USEPA TW	NMED TW	
Area	**Well ID**	**Date**	**Dup**												
TMD	MW-26	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	MW-26	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-26	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393 J4	<0.000365
	MW-26	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-27	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	MW-27	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-27	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393 J4	<0.000365
	MW-27	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-46R	Nov-14		<0.000320	<0.000130	<0.000380	<0.000260	<0.000400 J	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.000390	
	MW-46R	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-46R	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-46R	Oct-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-46R	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-46R	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-68	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	MW-68	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-68	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-68	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-71	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	MW-71	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	MW-71	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-71	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	MW-89	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	MW-89	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380** J	<0.000360 J	<0.000310	<0.000390	<0.00390 J	<0.000360
	MW-89	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393 J4	<0.000365
	MW-89	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	NP-1	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	0.000581 J	<0.000310	<0.000390	<0.00390	<0.000360
	NP-1	Oct-15		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	0.000431 J	<0.000306	<0.000387	<0.00393	<0.000365
	NP-1	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	0.000526 J	<0.000306	<0.000387	<0.00393 J4	<0.000365
	NP-1	Oct-16		<0.000319 J4	<0.000130 J4	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	0.000446 J	<0.000306	<0.000387	<0.00393 J3	<0.000365
	NP-1	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	0.000408 J	<0.000306	<0.000387	<0.00393	<0.000365
	NP-1	Oct-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	0.000465 J	<0.000306	<0.000387	<0.00393	<0.000365
	NP-2	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500
	NP-6	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500
	NP-6	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380** J	<0.000360 J	<0.000310	<0.000390	<0.00390 J	<0.000360
	NP-6	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
Up-Gradient	UG-1	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	UG-1	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	UG-1	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	UG-1	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	UG-2	Apr-14		<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500
	UG-2	Apr-15		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	UG-2	Apr-16		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	UG-2	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	UG-3R	Apr-14		<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	UG-3R	Apr-14	FD	<0.000500	<0.000500	<0.000500	<0.000400	<0.000500	<0.00050	**<0.000400**	<0.000500	<0.000700	<0.000600	<0.00100	
	UG-3R	Apr-15		<0.000319	<0.000130	<0.000380	<0.000260	<0.000400	<0.000370	**<0.000380**	<0.000360	<0.000310	<0.000390	<0.00390	<0.000360
	UG-3R	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	UG-3R	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	UG-4	Apr-16		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365
	UG-4	Apr-17		<0.000319	<0.000130	<0.000383	<0.000259	<0.000398	<0.000373	**<0.000381**	<0.000361	<0.000306	<0.000387	<0.00393	<0.000365

Definitions

X	Reported concentration, X, exceeds the CGWSL.
X	Analyte detected above the detection limit at a concentration equal to X.
<x	Analyte not detected at detection limit equal to x.
<x	Analyte not detected at detection limit equal to x, but x exceeds the CGWSL.
	Blank cell indicates a sample was collected from the well during the indicated sampling event, but the analyte was not analyzed.
---	No applicable CGWSL.

Abbreviations

CGWSL	Critical Groundwater Screening Level (see Table 3)
CGWSL Source	Source for CGWSL value (see Table 3)
Dup	Duplicate sample
FD	Field duplicate sample
mg/L	Milligrams per Liter
NMED TPH	NMED Risk Assessment Guidance for Site Investigations and Remediation, March 2017, Table 6-4 TPH Groundwater Screening Levels
NMED TW	NMED Risk Assessment Guidance for Site Investigations and Remediation, March 2017, Table A-1, Tap Water Screening Level
TPH	Total Petroleum Hydrocarbons
USEPA TW	United States Environmental Protection Agency Tap Water Screening Level, "Regional Screening Levels (RSL) Summary Table", November 2017
USEPA MCL	United States Environmental Protection Agency Maximum Contaminant Level, "Regional Screening Levels (RSL) Summary Table", November 2017
WQCC HH	NMED Groundwater standard for human health exposure, 20.6.2.3103.A NMAC

Lab Footnote

B	Analyte was also detected in the associated method blank.
J	Indicates an estimated value.
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	4-Methyl-2-Pentanone	Acetone	Benzene	Bromo-dichloro-methane	Bromo-methane	Carbon Disulfide	Carbon Tetrachloride	Chloro-benzene	Chloro-dibromo-methane	Chloroethane	Chloroform	Chloro-methane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	1.24	14.1	0.005	0.08	0.00754	0.81	0.005	0.1	0.08	20.86	0.08	0.0203
				CGWSL Source:	NMED TW	TMED TW	USEPA MCL	USEPA MCL	NMED TW	NMED TW	USEPA MCL	USEPA MCL	USEPA MCL	NMED TW	USEPA MCL	NMED TW
Area	**Well ID**	**Date**	**Dup**													
Cross-Gradient	KWB-13	Apr-14		<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	KWB-13	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	KWB-13	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-13	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-17	Apr-14													
	NP-5	Apr-13		<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	NP-5	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	NP-5	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-3156	Nov-13		<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	RA-3156	Apr-14		<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	RA-3156	Apr-16		<0.00214	<0.0500	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-3156	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-136	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-136	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-136	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-136	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-136	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
Evaporation Ponds	MW-1R	Apr-14		<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-1R	Apr-15		<0.00214	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-1R	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-1R	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-2A	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-2A	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866 J	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-2A	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-2A	Oct-16		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-2A	Apr-17		<0.0214	<0.100	<0.00331	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-2A	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-3	Apr-15		<0.00210	0.012 J	0.000609 J	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-3	Apr-15	FD	<0.00210	0.0191 J	0.000638 J	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-3	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-3	Oct-15	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-3	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-3	Apr-16	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-3	Oct-16		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	0.000282 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-3	Oct-16	FD	<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	0.000311 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-3	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-3	Apr-17	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-3	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-3	Oct-17	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-4A	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-4A	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-4A	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-4A	Oct-16		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	0.000634 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-4A	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-4A	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-4B	Apr-13		<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	MW-4B	Apr-15		<0.00210	<0.0100	0.00183	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-4B	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-5A	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-5A	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866 J	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-5A	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-5A	Oct-16		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	0.00032 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-5A	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-5A	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-5B	Apr-13		<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	MW-5B	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-5B	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-5C	Apr-13		<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	MW-5C	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-5C	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-6A	Apr-14		<0.00100	0.0068 J	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-6A	Apr-15		<0.00210	<0.0100	0.000715 J	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-6A	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-6A	Apr-17		<0.0214	<0.100	<0.00331	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-6B	Mar-13		<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	MW-6B	Mar-13	FD	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	MW-6B	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-6B	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-7A	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-7A	Apr-15	FD	<0.00210	0.0184 J	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-7A	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-7A	Oct-15	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-7A	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-7A	Apr-16	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-7A	Oct-16		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	0.000279 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-7A	Oct-16	FD	<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-7A	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-7A	Apr-17	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-7A	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-7A	Oct-17	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-7B	Apr-13		<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	MW-7B	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-7B	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-10	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320 J	<0.000280
	MW-10	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-10	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-10	Oct-16		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-10	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-10	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-11A	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-11A	Oct-15													
	MW-11A	Apr-16		<0.0100	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-11A	Oct-16													
	MW-11A	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-11A	Oct-17													
	MW-11B	Mar-13		<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	MW-11B	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-11B	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-12	Apr-14													
	MW-13	Apr-14													
	MW-15	Apr-14		<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-15	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-15	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-15	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	4-Methyl-2-Pentanone	Acetone	Benzene	Bromo-dichloro-methane	Bromo-methane	Carbon Disulfide	Carbon Tetrachloride	Chloro-benzene	Chloro-dibromo-methane	Chloroethane	Chloroform	Chloro-methane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	1.24	14.1	0.005	0.08	0.00754	0.81	0.005	0.1	0.08	20.86	0.08	0.0203
				CGWSL Source:	NMED TW	TMED TW	USEPA MCL	USEPA MCL	NMED TW	NMED TW	USEPA MCL	USEPA MCL	USEPA MCL	NMED TW	USEPA MCL	NMED TW
Area	**Well ID**	**Date**	**Dup**													
Evaporation Ponds	MW-18A	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-18A	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-18A	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-18A	Oct-16		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	0.000378 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-18A	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-18A	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-18B	Apr-13		<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	MW-18B	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-18B	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-22A	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320 J	<0.000280
	MW-22A	Apr-15	FD	<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-22A	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-22A	Oct-15	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-22A	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-22A	Apr-16	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-22A	Oct-16		<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	0.000948 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-22A	Oct-16	FD	<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-22A	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-22A	Apr-17	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-22A	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-22A	Oct-17	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-22B	Apr-13		<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	MW-22B	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320 J	<0.000280
	MW-22B	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-70	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-70	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866 J	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-70	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-70	Oct-16		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	0.000292 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-70	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-70	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-72	Apr-14		<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-72	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-72	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-72	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-73	Apr-14		<0.00100	0.0092 J	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-73	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-73	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-73	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-74	Apr-15		<0.00214	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-74	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866 J	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-74	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-74	Oct-16		<0.00214	0.0111 JJ4	<0.000331	<0.000380	<0.000866	0.000538 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-74	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-74	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-75	Apr-15		<0.00210	<0.100	<0.00330	<0.00380	**<0.00870**	<0.00280	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
	MW-75	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-75	Apr-16		<0.00214	<0.0100	0.00134	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-75	Oct-16		<0.00214	0.0156 JJ4	<0.000331	<0.000380	<0.000866	0.00111	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-75	Apr-17		<0.00214	<0.0100	0.00145	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-75	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-76	Apr-15		<0.00210	0.0203 J	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	0.000328 J
	MW-76	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-76	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-76	Oct-16		<0.00214	0.0147 JJ4	0.00227	<0.000380	<0.000866	0.000396 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-76	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-76	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-77	Apr-15		<0.00210	0.135	**0.00962**	<0.000380	<0.000870	0.00204	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-77	Oct-15		<0.00214	0.0357 J	0.00156	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-77	Apr-16		<0.00214	0.0313 J	0.00287	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-77	Oct-16		<0.0214	<0.100 J4	<0.00331	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-77	Apr-17		<0.0214	<0.100	<0.00331	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-78	Apr-14		<0.00100	0.07	0.00310 J	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-78	Apr-15		0.0023 J	0.0649	**0.0114**	<0.000380	<0.000870	0.000862 J	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	0.00045 J
	MW-78	Apr-16		<0.00214	0.0152 J	0.00275	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-78	Apr-17		<0.0214	<0.100	<0.00331	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-79	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-79	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866 J	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-79	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-79	Oct-16		<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	0.00104	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-79	Apr-17		<0.0214	<0.100	<0.00331	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-79	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-80	Apr-14		<0.00100	0.0045 J	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-80	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-80	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-80	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-81	Apr-14		<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-81	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-81	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-81	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-82	Apr-14		<0.00100	0.015	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-82	Apr-14	FD	<0.00100	0.0097 J	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-82	Apr-15		<0.00210	<0.0100	0.000339 J	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-82	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-82	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-83	Apr-15		<0.00210	0.0235 J	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-83	Oct-15		<0.00214	0.0103 J	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-83	Apr-16		<0.00214	0.012 J	0.00114	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-83	Oct-16		<0.00214	<0.0100 J3	0.000449 J	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-83	Apr-17		<0.0214	<0.100	<0.00331	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-83	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-84	Apr-15		<0.00210	0.0263 J	0.000664 J	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-84	Oct-15		<0.00214	0.0166 J	<0.000331	<0.000380	<0.000866 J	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-84	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-84	Oct-16		<0.0214	<0.100 J4	<0.00331	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-84	Apr-17		<0.0214	<0.100	<0.00331	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-84	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-87	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-87	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866 J	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-87	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-87	Oct-16		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	0.000317 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-87	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-87	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds												
				Analyte:	4-Methyl-2-Pentanone	Acetone	Benzene	Bromo-dichloro-methane	Bromo-methane	Carbon Disulfide	Carbon Tetrachloride	Chloro-benzene	Chloro-dibromo-methane	Chloroethane	Chloroform	Chloro-methane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	1.24	14.1	0.005	0.08	0.00754	0.81	0.005	0.1	0.08	20.86	0.08	0.0203
				CGWSL Source:	NMED TW	TMED TW	USEPA MCL	USEPA MCL	NMED TW	NMED TW	USEPA MCL	USEPA MCL	USEPA MCL	NMED TW	USEPA MCL	NMED TW
Area	**Well ID**	**Date**	**Dup**													
Evaporation Ponds	MW-88	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-88	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-88	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-88	Oct-16		<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-88	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-88	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-120	Apr-15		<0.00210	0.0158 J	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-120	Oct-15		<0.00210	<0.0100	<0.000331	<0.000380	<0.000866 J	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-120	Apr-16		<0.00214	0.0108 J	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-120	Oct-16		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-120	Apr-17		<0.0214	<0.100	<0.00331	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-120	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-121	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-121	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866 J	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-121	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-121	Oct-16		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-121	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-121	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-122	Apr-15		<0.00210	0.0115 J	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-122	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866 J	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-122	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-122	Oct-16		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-122	Apr-17		<0.0214	<0.100	<0.00331	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-122	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-123	Apr-15		<0.000360	<0.00210	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-123	Oct-15		<0.000365	<0.00214	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-123	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-123	Oct-16		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-123	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-123	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-124	Apr-15		<0.00210	<0.00210	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-124	Oct-15		<0.00214	<0.00214	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-124	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-124	Oct-16		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-124	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-124	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-1R	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	OCD-1R	Oct-15		<0.00210	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-1R	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-1R	Oct-16		<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-1R	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-1R	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-2A	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320 J	<0.000280
	OCD-2A	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866 J	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-2A	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-2A	Oct-16		<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-2A	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-2A	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-3	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	OCD-3	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866 J	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-3	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-3	Oct-16		<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-3	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-3	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-4	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	OCD-4	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866 J	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-4	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-4	Oct-16		<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-4	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-4	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-5	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	OCD-5	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866 J	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-5	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-5	Oct-16		<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-5	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-5	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-6	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	OCD-6	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866 J	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-6	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-6	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-6	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-6	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-7AR	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	OCD-7AR	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-7AR	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-7AR	Oct-16		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-7AR	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-7AR	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-7B	Mar-13		<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	OCD-7B	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	0.00042 J	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	OCD-7B	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-8A	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	OCD-8A	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-8A	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-8A	Oct-16		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-8A	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-8A	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	OCD-8B	Apr-13		<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	OCD-8B	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	OCD-8B	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
Field East of Refinery	KWB-1A	Apr-15		<0.00100	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	KWB-1A	Oct-15		<0.00210	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-1A	Apr-16		<0.00210	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-1A	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-1A	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-1A	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-1C	Apr-13		<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	KWB-1C	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	KWB-1C	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-7	Apr-15		<0.00210	<0.0100	**0.9290**	<0.000380	<0.000870	<0.00280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	KWB-7	Oct-15		<0.00214	<0.0100	**0.0164**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-7	Apr-16		<0.00214	<0.0100	**0.0365**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-7	Oct-16		<0.00214	<0.0100	**0.0364**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-7	Apr-17		<0.00214	<0.0100	**0.0135**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-7	Oct-17		<0.00214	<0.0100	**0.0363**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds												
				Analyte:	4-Methyl-2-Pentanone	Acetone	Benzene	Bromo-dichloro-methane	Bromo-methane	Carbon Disulfide	Carbon Tetrachloride	Chloro-benzene	Chloro-dibromo-methane	Chloroethane	Chloroform	Chloro-methane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	1.24	14.1	0.005	0.08	0.00754	0.81	0.005	0.1	0.08	20.86	0.08	0.0203
				CGWSL Source:	NMED TW	TMED TW	USEPA MCL	USEPA MCL	NMED TW	NMED TW	USEPA MCL	USEPA MCL	USEPA MCL	NMED TW	USEPA MCL	NMED TW
Area	**Well ID**	**Date**	**Dup**														
Field East of Refinery	KWB-8	Oct-16			<0.428	<2.00	**11.5**	<0.0760	**<0.173**	<0.0550	**<0.0758**	<0.0696	<0.0654	<0.0906	<0.0648	**<0.0552**
	KWB-8	Apr-17			<0.214	<1.00	**5.62**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	KWB-8	Oct-17			<0.00214	0.0801	**12.5**	<0.000380	<0.000866	0.00427	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-10R	Apr-15			<0.0210	<0.100	**5.65**	<0.00380	**<0.00870**	<0.00280	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
	KWB-10R	Oct-15			<0.00214	<0.0100	**6.77**	<0.000380	<0.000866	<0.0275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-10R	Apr-16			<0.107	<0.500	**5.26**	<0.0190	**<0.0433**	0.0329 J	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	KWB-10R	Oct-16			<0.0428	<0.200	**0.565**	<0.00760	**<0.0173**	<0.00550	**<0.00758**	<0.00696	<0.00654	<0.00906	<0.00648	<0.00552
	KWB-10R	Apr-17			<0.107	<0.500	**4.95**	<0.0190	**<0.0433**	<0.0138	**<0.0190**	<0.0174	<0.0164	<0.0226	0.0172 J	<0.0138
	KWB-10R	Oct-17			<0.00214	<0.0100	**7.06**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-11A	Apr-15			<0.00210	0.0176 J	**0.0248**	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	KWB-11A	Oct-15			<0.00214	<0.0100	**0.00571**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-11A	Apr-16			<0.00214	<0.0100	**0.00541**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-11A	Oct-16			<0.00214	<0.0100	**0.00725**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-11A	Apr-17			<0.00214	<0.0100	0.00359	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-11A	Oct-17			<0.00214	<0.0100	**0.0116**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-11B	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	KWB-11B	Oct-15			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-11B	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-11B	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-11B	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-11B	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12A	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	KWB-12A	Apr-15	FD		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	KWB-12A	Oct-15			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12A	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12A	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12A	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12A	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12B	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	KWB-12B	Oct-15			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12B	Oct-15	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276 J
	KWB-12B	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12B	Apr-16	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12B	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12B	Oct-16	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	0.000435 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12B	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12B	Apr-17	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12B	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-12B	Oct-17	FD		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-P4	Apr-13			<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	KWB-P4	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	KWB-P4	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-57	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-57	Oct-15			<0.00214	<0.0100	0.00123 J	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-57	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-57	Oct-16			<0.00214	<0.0100	0.000681 J	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-57	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-57	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-58	Apr-15			<0.0210	<0.100	**6.03**	<0.00380	**<0.00870**	<0.00280	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
	MW-58	Oct-15			<0.214	<1.00	**6.89**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	MW-58	Apr-16			<0.0214	<0.100	**4.12**	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-58	Oct-16			<0.00214	<0.0100	**5.92**	<0.000380	<0.000866	0.000345 JV3	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-58	Apr-17			<0.214	<1.00	**3.00**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	MW-58	Oct-17			<0.00214	<0.0100	**4.08**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-111	Apr-15			<0.00210	<0.0100	**0.0755**	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-111	Oct-15			<0.00214	<0.0100	**0.0243**	<0.000380	<0.000866	<0.00688	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-111	Apr-16			<0.00214	<0.0100	**0.0299**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-111	Oct-16			<0.00214	<0.0100	**0.0432**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-111	Apr-17			<0.00214	<0.0100	**0.0205**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-111	Oct-17			<0.00214	<0.0100	**<0.0331**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-113	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-113	Apr-15	FD		<0.00210	<0.0100	0.000402 J	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-113	Oct-15			<0.00214	<0.0100	0.000477 J	<0.000380	<0.000866	<0.000275 J	<0.000379 J	<0.000348	<0.000327 J	<0.000453	<0.000324	<0.000276
	MW-113	Oct-15	FD		<0.00214	<0.0100	0.000533 J	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-113	Apr-16			<0.00214	<0.0100	**0.0136**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-113	Apr-16	FD		<0.00214	<0.0100	**0.0148**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-113	Oct-16			<0.00214	<0.0100	**0.00660**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-113	Oct-16	FD		<0.00214	<0.0100	**0.00588**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-113	Apr-17			<0.00214	0.0424 J	**0.0136**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-113	Apr-17	FD		<0.00214	<0.0100	**0.0145**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-113	Oct-17			<0.00214	<0.0100	**0.0132**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-113	Oct-17	FD		<0.00214	<0.0100	**0.0138**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-125	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-125	Oct-15			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-125	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-125	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-125	Apr-17			<0.00214	<0.0100	0.000603 J	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-125	Oct-17			<0.00214	<0.0100	0.000404 J	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-126A	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-126A	Oct-15			<0.00214	0.0351 J	**0.0447**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-126A	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-126A	Oct-16			<0.00214	<0.0100	**0.0503**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-126A	Apr-17			<0.00214	<0.0100	0.000354 J	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-126A	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-126B	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-126B	Oct-15			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-126B	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	0.000321 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-126B	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-126B	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-126B	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-127	Apr-15			<0.00210	<0.0100	**4.41**	<0.000380	<0.000870	<0.0140	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-127	Oct-15			<0.0428	<0.200	**1.51**	<0.00760	**<0.0173**	<0.00550	**<0.00758**	<0.00696	<0.00654	<0.00906	<0.00648	<0.00552
	MW-127	Apr-16			<0.00214	<0.0100	**2.01**	<0.000380	<0.000866	0.000424 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-127	Oct-16			<0.0214	<0.100	**0.644**	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-127	Apr-17			<0.00214	<0.0100	**1.04**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-127	Oct-17			<0.00214	<0.0100	**0.462**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-128	Apr-15			<0.00210	<0.0100	**0.297**	<0.000380	<0.000870	0.000321 J	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-128	Oct-15			<0.0428	<0.200	**0.0297**	<0.00760	**<0.0173**	<0.00550	**<0.00758**	<0.00696	<0.00654	<0.00906	<0.00648	<0.00552
	MW-128	Apr-16			<0.00214	<0.0100	**0.0231**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-128	Oct-16			<0.00214	<0.0100	**0.109**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-128	Apr-17			<0.00214	<0.0100	**0.0563**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-128	Oct-17			<0.00214	<0.0100	**0.0701**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds												
				Analyte:	4-Methyl-2-Pentanone	Acetone	Benzene	Bromo-dichloro-methane	Bromo-methane	Carbon Disulfide	Carbon Tetrachloride	Chloro-benzene	Chloro-dibromo-methane	Chloroethane	Chloroform	Chloro-methane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	1.24	14.1	0.005	0.08	0.00754	0.81	0.005	0.1	0.08	20.86	0.08	0.0203
				CGWSL Source:	NMED TW	TMED TW	USEPA MCL	USEPA MCL	NMED TW	NMED TW	USEPA MCL	USEPA MCL	USEPA MCL	NMED TW	USEPA MCL	NMED TW
Area	**Well ID**	**Date**	**Dup**														
Field East of Refinery	MW-129	Apr-15		<0.00210	<0.0100	**0.0372**	<0.000380	<0.000870	<0.0280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-129	Oct-15		<0.214	<1.00	**<0.0331**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	MW-129	Apr-16		<0.00214	<0.0100	**<0.0166**	<0.000380	<0.000866	0.000295 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-129	Oct-16		<0.00214	<0.0100	**0.00791**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-129	Apr-17		<0.00214	<0.0100	0.00299	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-130	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-130	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-130	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-130	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-130	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-130	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-131	Apr-15		<0.00210	<0.0100	**1.91**	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-131	Oct-15		<0.00214	<0.0100	**2.19**	<0.000380	<0.000866	<0.0138	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-131	Apr-16		<0.00214	<0.0100	**2.42**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-131	Oct-16		<0.0107	<0.0500	**1.58**	<0.00190	<0.00433	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-131	Apr-17		<0.00214	<0.0100	**3.09**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-131	Oct-17		<0.00214	<0.0100	**1.39**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-133	Nov-14		<0.210	<1.00	**0.620**	<0.0380	**<0.0870**	<0.0280	**<0.0380**	<0.0350	<0.0330	<0.0450	<0.0320	**<0.0280**
	MW-133	Apr-15		<0.210	<1.00	**0.788**	<0.0380	**<0.0870**	<0.0280	**<0.0380**	<0.0350	<0.0330	<0.0450	<0.0320	**<0.0280**
	MW-134	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-134	Apr-15	FD	<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-134	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-134	Oct-15	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-134	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	0.00039 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-134	Apr-16	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-134	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-134	Oct-16	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-134	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-134	Apr-17	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-134	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-134	Oct-17	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-135	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-135	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	0.000328 J
	MW-135	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-135	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-135	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-135	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-4196	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	RA-4196	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-4196	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-4196	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-4196	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-4196	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-4798	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	RA-4798	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-4798	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-4798	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-4798	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-4798	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-12R	Apr-16		<0.0107	<0.0500	**0.424**	<0.00190	<0.00433	0.00186 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	RW-12R	Apr-17		<0.0107	<0.0500	**0.335**	<0.00190	<0.00433	0.00142 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	RW-13R	Apr-16		<0.00214	<0.0100	**0.878**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-18	Apr-14		<0.00214	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	RW-18	Apr-15		<0.00214	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	RW-18	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	0.000636 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-18	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-20	Apr-15		<0.0210	<0.100	**1.87**	<0.00380	**<0.00870**	<0.00280	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
	RW-22	Apr-15		<0.0210	<0.100	**4.07**	<0.00380	**<0.00870**	<0.00280	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
North Refinery	MW-23	Apr-15		<0.0540	<0.250	**11.6**	<0.00950	**<0.0220**	0.0664	**<0.00950**	<0.00870	<0.00820 J	<0.0110	<0.00810	<0.00690
	MW-23	Oct-15		<0.00214	0.06	**20.3**	<0.000380	<0.000866	0.000766 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-23	Apr-16		<0.0107	<0.0500	**15.5**	<0.00190	<0.00433	0.00185 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-23	Oct-16		<0.0535	<0.250 J3	**12.2**	<0.00950	**<0.0216**	<0.00688	**<0.00948**	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	MW-23	Apr-17		<0.00214	<0.0100	**8.49**	<0.000380	<0.000866 J4	0.000448 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-23	Oct-17		<0.00214	<0.0100	**8.11**	<0.000380	<0.000866	0.000451 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-29	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	0.000401 J	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-29	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-29	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	0.000551 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-29	Oct-16		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-29	Apr-17		<0.00214	<0.0100	0.000616 J	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-29	Oct-17		<0.00214	<0.0100	0.000442 J	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-39	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	0.000372 J	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-39	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	0.00117	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-39	Apr-16		<0.0535	<0.250	**2.14**	<0.00950	**<0.0117**	<0.00688	**<0.00948**	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	MW-39	Oct-16		<0.214	<1.00 J3	**3.62**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	MW-39	Apr-17		<0.0214	<0.100	**1.33**	<0.00380	**<0.00866** J4	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-39	Oct-17		<0.00214	<0.0100	**0.476**	<0.000380	<0.000866	0.000647 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-40	Apr-14		<0.00214	0.0055 J	**0.0110**	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-40	Apr-15		<0.00214	<0.0100	**0.0198**	<0.000380	<0.000870 J	0.000595 J	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-40	Apr-16		<0.00214	<0.0100	**0.0112**	<0.000380	<0.000866	0.00126	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-40	Apr-17		<0.00214	<0.0100	**0.00857**	<0.000380	<0.000866	0.00128	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-41	Apr-14		<0.00100	0.0049 J	**0.0180**	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-41	Apr-15		<0.00210	<0.0100	0.00190	<0.000380	<0.000870	0.000349 J	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-41	Apr-16		<0.00214	<0.0100	0.00360	<0.000380	<0.000866	0.00136	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-41	Apr-17		<0.00214	<0.0100	0.00339	<0.000380	<0.000866 J4	0.000318 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-42	Apr-14		<0.00100	<0.00200	**0.540**	<0.00060	<0.000500	0.0013 J	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-42	Apr-15		<0.0210	<0.100	**0.216**	<0.00380	**<0.00870**	<0.00280	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
	MW-42	Apr-16		<0.0107	<0.0500	**0.103**	<0.00190	<0.00433	0.00212 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-42	Apr-17		<0.00214	<0.0100	**0.0240**	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-43	Apr-15		<0.0210	0.17 J	**0.992**	<0.00380	**<0.00870**	0.0262	<0.00380	<0.00350	<0.00330 J	<0.00450	<0.00320	<0.00280
	MW-43	Oct-15		<0.0214	<0.100	**13.0**	<0.00380	**<0.00866**	0.00398 J	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-43	Apr-16		<0.535	<2.50	**12.4**	**<0.0950**	**<0.216**	<0.0688	**<0.0948**	<0.0870	**<0.0818**	<0.113	**<0.0810**	**<0.0690**
	MW-43	Oct-16		<0.535	<2.50 J3	**12.4**	**<0.0950**	**<0.216**	<0.0688	**<0.0948**	<0.0870	**<0.0818**	<0.113	**<0.0810**	**<0.0690**
	MW-43	Apr-17		<0.107	<0.500 J4	**9.62**	<0.0190	**<0.0433**	<0.0138	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-43	Oct-17		<0.107	<0.500	**10.7**	<0.0190	**<0.0433**	0.0208 J	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-59	Apr-14		<0.00100	<0.00200	**0.0130**	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-59	Apr-15		<0.00210	<0.0100	**0.0119**	<0.000380	<0.000870	0.00087 J	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-59	Apr-16		<0.00214	<0.0100	0.00329	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-59	Apr-17		<0.00214	<0.0100	0.00218	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-60	Apr-15		<0.00210	0.0397 J	**0.0127 J**	<0.000380	<0.000870	0.00178	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-60	Apr-15	FD	<0.00210	<0.0100	**0.00829 J**	<0.000380	<0.000870	0.00374	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-60	Oct-15		<0.00214	<0.0100	0.00326	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-60	Oct-15	FD	<0.00214	<0.0100	0.00307	<0.000380	<0.000866	0.000361 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-60	Apr-16		<0.00214	0.0368 J	0.00473	<0.000380	<0.000866	0.00442	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-60	Apr-16	FD	<0.00214	<0.0100	**0.00565**	<0.000380	<0.000866	0.000403 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds												
				Analyte:	4-Methyl-2-Pentanone	Acetone	Benzene	Bromo-dichloro-methane	Bromo-methane	Carbon Disulfide	Carbon Tetrachloride	Chloro-benzene	Chloro-dibromo-methane	Chloroethane	Chloroform	Chloro-methane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	1.24	14.1	0.005	0.08	0.00754	0.81	0.005	0.1	0.08	20.86	0.08	0.0203
				CGWSL Source:	NMED TW	TMED TW	USEPA MCL	USEPA MCL	NMED TW	NMED TW	USEPA MCL	USEPA MCL	USEPA MCL	NMED TW	USEPA MCL	NMED TW
Area	**Well ID**	**Date**	**Dup**													
North Refinery	MW-60	Oct-16		<0.00214	<0.0100	**0.00898**	<0.000380	<0.000866	0.000392 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-60	Oct-16	FD	<0.00214	<0.0100	**0.00574**	<0.000380	<0.000866	0.00037 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-60	Apr-17		<0.00214	<0.0100	0.00262	<0.000380	<0.000866	0.000535 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-60	Apr-17	FD	<0.00214	<0.0100	**0.00526**	<0.000380	<0.000866	0.000502 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-60	Oct-17		<0.00214	<0.0100	**0.0110**	<0.000380	<0.000866	0.000326 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-60	Oct-17	FD	<0.00214	<0.0100	**0.0122**	<0.000380	<0.000866	0.000369 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-61	Apr-15		<0.0210	0.254 J	**1.74** J	<0.00380	**<0.00870**	0.0258	<0.00380	<0.00350	<0.00330 J	<0.00450	<0.00320	<0.00280
	MW-61	Oct-15		<0.0214	<0.100	**0.681**	<0.00380	**<0.00866**	0.00867 J	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-61	Apr-16		<0.0107	<0.0500	**0.493**	<0.00190	<0.00433	0.00218 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-61	Oct-16		<0.0535	<0.250	**0.501**	<0.00950	**<0.0216**	<0.00688	**<0.00948**	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	MW-61	Apr-17		<0.0535	0.267 J	**0.769**	<0.00950	**<0.0216** J4	<0.00688	**<0.00948**	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	MW-61	Oct-17		0.003 J	<0.0100	**0.976**	<0.000380	<0.000866	0.00179	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-62	Apr-15		<0.0210	0.106 J	**12.8**	<0.00380	**<0.00870**	0.0336	<0.00380	<0.00350	<0.00330 J	<0.00450	<0.00320	<0.00280
	MW-62	Oct-15		<0.0428	<0.200	**1.50**	<0.00760	**<0.0173**	0.0161 J	**<0.00758**	<0.00696	<0.00654	<0.00906	<0.00648	<0.00552
	MW-62	Apr-16		<0.0535	<0.250	**1.12**	<0.00950	**<0.0117**	0.00903 J	**<0.00948**	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	MW-62	Oct-16		<0.214 J6	<1.00 J6	**3.28** J6	<0.0380 J6	**<0.0866**	<0.0275 J6	**<0.0379** J6	<0.0348 J6	<0.0327 J6	<0.0453	<0.0324 J6	**<0.0276** J6
	MW-62	Apr-17		<0.107	<0.500	**1.59**	<0.0190	**<0.0433** J4	<0.0138	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-62	Oct-17		<0.214	<1.00	**0.984**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	MW-67	Apr-15		<0.0110	<0.0100	**0.143**	<0.000380	<0.000870	0.00159	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-67	Oct-15		<0.00210	<0.200	**0.172**	<0.00760	**<0.0173**	<0.00550	**<0.00758**	<0.00696	<0.00654	<0.00906	<0.00648	<0.00552
	MW-67	Apr-16		<0.0428	<0.100	**0.223**	<0.00380	**<0.00866**	0.003 J	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-67	Oct-16		<0.0214	<0.100 J3	**0.214**	<0.00380	**<0.00866**	0.00328 J	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-67	Apr-17		<0.0107	<0.0500	**0.191**	<0.00190	<0.00433	0.00144 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-67	Oct-17		<0.00214	<0.0100	**0.130**	<0.000380	<0.000866	0.000547 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-90	Apr-15		<0.00210	<0.0100	**0.0125**	<0.000380	<0.000870	0.00171	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-90	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276 J
	MW-90	Apr-16		<0.00214	<0.0100	**0.00662**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-90	Oct-16		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-90	Apr-17		<0.00214	<0.0100	0.00225	<0.000380	<0.000866	0.000444 J	<0.000379 J4	<0.000348	<0.000327 J4	<0.000453	<0.000324	<0.000276
	MW-90	Oct-17		<0.00214	<0.0100	0.00311	<0.000380	<0.000866	0.000573 J	<0.000379	<0.000348	<0.000327	<0.000453	0.00116 J	<0.000276
	MW-91	Apr-15		<0.00210	<0.100	**2.91**	<0.00380	**<0.00870**	0.0151	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
	MW-91	Oct-15		<0.0535	<0.250	**3.47**	<0.00950	**<0.0216**	0.00849 J	**<0.00948**	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	MW-91	Apr-16		<0.107	<0.500	**3.85**	<0.0190	**<0.0433**	<0.0138	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-91	Oct-16		<0.535	<2.50 J3	**3.15**	**<0.0950**	**<0.216**	<0.0688	**<0.0948**	<0.0870	**<0.0818**	<0.113	**<0.0810**	**<0.0690**
	MW-91	Apr-17		<0.214	<1.00	**2.67**	<0.0380	**<0.0866**	0.0284 J	**<0.0379** J4	<0.0348	<0.0327 J4	<0.0453	<0.0324	**<0.0276**
	MW-91	Oct-17		<0.214	<1.00	**3.36**	<0.0380	**<0.0866**	0.0295 J	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	MW-92	Apr-16		<0.00214	<0.0100	**2.87**	<0.000380	<0.000866	0.000589 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-92	Oct-16		<0.0428	<0.200 J3	**2.05**	<0.00760	**<0.0173**	<0.00550	**<0.00758**	<0.00696	<0.00654	<0.00906	<0.00648	<0.00552
	MW-93	Apr-15		<0.0210	<0.100	**0.734** J	<0.00380	**<0.00870**	0.0188	<0.00380	<0.00350	<0.00330 J	<0.00450	<0.00320	<0.00280
	MW-93	Oct-15		<0.0214	<0.100	**1.21**	<0.00380	**<0.00866**	0.00341 J	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-93	Apr-16		<0.0107	<0.0500	**0.258**	<0.00190	<0.00433	0.00216 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-93	Oct-16		<0.0214	<0.100 J3	**0.567**	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-93	Apr-17		<0.0535	<0.250	**0.633**	<0.00950	**<0.0216** J4	<0.00688	**<0.00948**	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	MW-94	Oct-15		<0.0214	<0.100	**0.339**	<0.00380	**<0.00866**	0.00445 J	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-94	Apr-16		<0.107	<0.500	**0.417**	<0.0190	**<0.0433**	0.0155 J	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-94	Oct-16		<0.0107	<0.0500 J3	**0.297**	<0.00190	<0.00433	0.00479 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-94	Apr-17		<0.0535	<0.250	**0.284**	<0.00950	**<0.0216** J4	0.0101 J	**<0.00948**	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	MW-95	Apr-14		<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-95	Apr-15		<0.00210	<0.0100	0.00148	<0.000380	<0.000870	0.00181	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-95	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	0.000427 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-95	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-96	Apr-15		<0.00210	<0.0100	0.00288	<0.000380	<0.000870	0.00168	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-96	Oct-15		<1.07	<5.00	**<0.166**	**<0.190**	**<0.433**	<0.138	**<0.190**	**<0.174**	**<0.164**	<0.226	**<0.162**	**<0.138**
	MW-96	Apr-16		<0.0428	<0.200	<0.000331	<0.00760	**<0.0173**	<0.00550	**<0.00758**	<0.00696	<0.00654	<0.00906	<0.0648	<0.00552
	MW-96	Oct-16		<0.107	<0.500 J3	**<0.0166**	<0.0190	**<0.0433**	<0.0138	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-96	Apr-17		<0.107	<0.500	**<0.0166**	<0.0190	**<0.0433**	<0.0138	**<0.0190** J4	<0.0174	<0.0164 J4	<0.0226	<0.0162	<0.0138
	MW-96	Oct-17		<0.107	<0.500	**<0.0166**	<0.0190	**<0.0433**	0.0154 J	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-98	Apr-15		<0.0540	<0.250	**4.17**	<0.00950	**<0.0220**	0.102	**<0.00950**	<0.00870	<0.00820 J	<0.0110	<0.00810	<0.00690
	MW-98	Oct-15		<0.0535	<0.250	**4.79**	<0.00950	**<0.0216**	0.0344	**<0.00948**	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	MW-98	Apr-16		<0.214	<1.00	**4.07**	<0.0380	**<0.0866**	0.0306 J	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	MW-98	Oct-16		<0.214	<1.00 J3	**3.59**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	MW-98	Apr-17		<0.214	<1.00	**4.39**	<0.0380	**<0.0866**	0.0335 J	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	MW-98	Oct-17		<0.107	<0.500	**4.09**	<0.0190	**<0.0433**	0.0215 J	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-137	Oct-15		<0.214	<1.00	**9.44**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	MW-137	Apr-16		<0.535	<2.50	**9.65**	**<0.0950**	**<0.216**	0.0722 J	**<0.0948**	<0.0870	**<0.0818**	<0.113	**<0.0810**	**<0.0690**
	MW-137	Oct-16		<0.535	<2.50 J3	**10.5**	**<0.0950**	**<0.216**	<0.0688	**<0.0948**	<0.0870	**<0.0818**	<0.113	**<0.0810**	**<0.0690**
	MW-137	Apr-17		<0.428	<2.00 J4	**9.69**	<0.0760	**<0.173**	<0.0550	**<0.0758**	<0.0696	<0.0654	<0.0906	<0.0648	**<0.0552**
	MW-137	Oct-17		<0.428	<2.00	**12.5**	<0.0760	**<0.173**	0.0615 J	**<0.0758**	<0.0696	<0.0654	<0.0906	<0.0648	**<0.0552**
	MW-138	Oct-15		<0.0428	<0.200	**1.54**	<0.00760	**<0.0173**	<0.00550	**<0.00758**	<0.00696	<0.00654	<0.00906	<0.00648	<0.00552
	MW-138	Apr-16		<0.0214	<0.100	**1.46**	<0.00380	**<0.00866**	0.00332 J	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-138	Oct-16		<0.0214	<0.100 J3	**0.494**	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-138	Apr-17		<0.0214	<0.100 J4	**0.484**	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-138	Oct-17		<0.0107	<0.0500	**0.701**	<0.00190	<0.00433	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	RW-1	Apr-15		<0.110	<0.500	**0.962**	<0.0190	**<0.0430**	<0.0140	**<0.0190**	<0.0170	<0.0160	<0.0230	<0.0160	<0.0140
	RW-1R	Apr-16		<0.00214	<0.0100	**0.426**	<0.000380	<0.000866	0.000422 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-1R	Apr-17		<0.0214	<0.100	**0.696**	<0.00380	**<0.00866**	0.00277 J	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	RW-2	Apr-15		<0.0210	0.334 J	**5.34**	<0.00380	**<0.00870**	0.00899 J	<0.00380	<0.00350	<0.00330 J	<0.00450	<0.00320	<0.00280
	RW-2R	Apr-16		<0.107	<0.500	**5.86**	<0.0190	**<0.0433**	0.0186 J	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	RW-2R	Apr-17		<0.107	<0.500	**7.78**	<0.0190	**<0.0433** J4	<0.0138	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	RW-7	Apr-15		<0.00210	<0.0100	**0.0535**	<0.000380	<0.000870	0.00171	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	RW-7R	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	0.000326 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-7R	Apr-17		<0.00214	0.01 J	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-8	Apr-15		<0.0210	<0.100	**0.0412**	<0.00380	**<0.00870**	<0.00280	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
	RW-8	Apr-17		<0.00214	<0.0100	**0.0718**	<0.000380	<0.000866	0.00138	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-9	Apr-14		<0.00100	<0.00200	**0.680**	<0.00060	<0.000500	0.0015 J	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	RW-9	Apr-15		<0.110	<0.500	**0.790**	<0.0190	**<0.0430**	<0.0140	**<0.0190**	<0.0170	<0.0160	<0.0230	<0.0160	<0.0140
	RW-9	Apr-16		<0.0107	<0.0500	**0.466**	<0.00190	<0.00433	0.00169 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	RW-9	Apr-17		<0.00214	<0.0100	**0.290**	<0.000380	<0.000866	0.00177	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000246
	RW-10	Apr-14		<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	RW-10	Apr-15		<0.00210	0.01 J	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	RW-10	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-10	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	0.000571 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-16	Apr-14		<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	RW-16	Apr-14	FD	<0.00210	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	RW-16	Apr-15		<0.00214	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	RW-16	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-16	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-17	Apr-14		<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	RW-17	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	RW-17	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-17	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds												
				Analyte:	4-Methyl-2-Pentanone	Acetone	Benzene	Bromo-dichloro-methane	Bromo-methane	Carbon Disulfide	Carbon Tetrachloride	Chloro-benzene	Chloro-dibromo-methane	Chloroethane	Chloroform	Chloro-methane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	1.24	14.1	0.005	0.08	0.00754	0.81	0.005	0.1	0.08	20.86	0.08	0.0203
				CGWSL Source:	NMED TW	TMED TW	USEPA MCL	USEPA MCL	NMED TW	NMED TW	USEPA MCL	USEPA MCL	USEPA MCL	NMED TW	USEPA MCL	NMED TW
Area	**Well ID**	**Date**	**Dup**													
North RO Reject Field	MW-117	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-117	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-117	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-117	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-117	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-117	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-118	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-118	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-118	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-118	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-118	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-118	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-119	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-119	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-119	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-119	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-119	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-119	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
NCL	MW-18	Apr-14		<0.00100	0.0045 J	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-18	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	0.000695 J	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-18	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-18	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-45	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-45	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-45	Apr-16		<0.00214	<0.0100	<0.000331	<0.00380	**<0.00866**	<0.000275	<0.000379	<0.000348	<0.00327	<0.000453	<0.000324	<0.000276
	MW-45	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-45	Apr-17		<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-45	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-53	Apr-14		<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-53	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-53	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-53	Apr-17		<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-54A	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-54A	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-54A	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-54A	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-54A	Apr-17		<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-54A	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-54B	Apr-13		<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	MW-54B	Apr-15		<0.00210	0.0128 J	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-54B	Apr-17		<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-55	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-55	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-55	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-55	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-55	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-55	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-56	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-56	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-56	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-56	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-56	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-108	Apr-15		<0.0210	<0.100	**0.423**	<0.00380	**<0.00870**	0.0317	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
	MW-108	Oct-15		<0.0214	<0.100	**0.394**	<0.00380	**<0.00866**	0.00291 J	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-108	Apr-16		<0.107	<0.500	**0.504**	<0.0190	**<0.0433**	<0.0138	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-108	Oct-16		<0.0535	<0.250	**0.362**	<0.00950	**<0.0216**	0.0137 J	**<0.00948**	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	MW-108	Apr-17		<0.0535	<0.250	**0.382**	<0.00950	**<0.0216**	<0.00688	**<0.00948**	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	MW-108	Oct-17		<0.0107	<0.0500	**0.282**	<0.00190	<0.00433	0.00147 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	NCL-31	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	NCL-31	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-31	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-31	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-31	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-31	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-32	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	NCL-32	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-32	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-32	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-32	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-32	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-33	Apr-15		<0.00210	<0.0100	0.00105	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	NCL-33	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275 J	<0.000379 J	<0.000348 J	<0.000327 J	<0.000453	<0.000324	<0.000276 J
	NCL-33	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-33	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-33	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-33	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-34A	Apr-15		<0.00210	<0.0100	**1.21**	<0.000380	<0.000870	0.00152	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	NCL-34A	Oct-15		<0.00214	<0.0100	**0.695** J	<0.000380	<0.000866	0.00167	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-34A	Apr-16		<0.107	<0.500	**3.25**	<0.0190	**<0.0433**	<0.0138	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	NCL-34A	Oct-16		<0.214	<1.00	**1.13**	<0.0380	**<0.0866** J3	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	NCL-34A	Apr-17		<0.107	<0.500	**1.78**	<0.0190	**<0.0433**	<0.0138	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	NCL-34A	Oct-17		<0.00214	<0.0100	**0.805**	<0.000380	<0.000866	0.000296 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-44	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	NCL-44	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-44	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-44	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	0.00032 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-44	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	0.0003 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-44	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-49	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	NCL-49	Apr-15	FD	<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	NCL-49	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-49	Oct-15	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-49	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-49	Apr-16	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-49	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-49	Oct-16	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-49	Apr-17		<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-49	Apr-17	FD	<0.00214	<0.0100 J4	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-49	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NCL-49	Oct-17	FD	<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds												
				Analyte:	4-Methyl-2-Pentanone	Acetone	Benzene	Bromo-dichloro-methane	Bromo-methane	Carbon Disulfide	Carbon Tetrachloride	Chloro-benzene	Chloro-dibromo-methane	Chloroethane	Chloroform	Chloro-methane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	1.24	14.1	0.005	0.08	0.00754	0.81	0.005	0.1	0.08	20.86	0.08	0.0203
				CGWSL Source:	NMED TW	TMED TW	USEPA MCL	USEPA MCL	NMED TW	NMED TW	USEPA MCL	USEPA MCL	USEPA MCL	NMED TW	USEPA MCL	NMED TW
Area	**Well ID**	**Date**	**Dup**														
South Refinery	KWB-2R	Apr-15			<0.0210	<0.100	**1.98**	<0.00380	**<0.00870**	<0.00280	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
	KWB-2R	Oct-15			<0.214	<1.00	**4.00**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	KWB-2R	Apr-16			<0.00214	<0.0100	**0.0558**	<0.000380	<0.000866	0.000363 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-2R	Oct-16			<0.00214	<0.0100	**0.398**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-2R	Apr-17			<0.00214	<0.0100	**0.0260**	<0.000380	<0.000866	0.000332 J	<0.000379	<0.000348	<0.000327	<0.000453	0.0036 J	<0.000276
	KWB-2R	Oct-17			<0.00214	<0.0100	**1.12**	<0.000380	<0.000866	0.000367 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-5	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	KWB-5	Oct-15			<0.00214	<0.0100	**1.20** J	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-5	Apr-16			<0.00214	<0.0100	**0.688**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-5	Oct-16			<0.0107	<0.0500	**0.367**	<0.00190	<0.00433	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	KWB-5	Apr-17			<0.00214	<0.0100	**0.525**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-5	Oct-17			<0.00214	<0.0100	**0.336**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	KWB-6	Apr-15			<0.0540	<0.250	**15.9**	<0.00950	**<0.0220**	<0.00690	**<0.00950**	<0.00870	<0.00820	<0.0110	<0.00810	<0.00690
	KWB-6	Oct-15			<1.07	<5.00	**8.61**	**<0.190**	**<0.433**	<0.138	**<0.190**	**<0.174**	**<0.164**	<0.226	**<0.162**	**<0.138**
	KWB-6	Apr-16			<0.0107	<0.0500	**12.4**	<0.00190	<0.00433	0.00197 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	KWB-6	Oct-16			<0.0428	<0.200	**3.41**	<0.00760	**<0.0173**	<0.00550	**<0.00758**	<0.00696	<0.00654	<0.00906	<0.00648	<0.00552
	KWB-6	Apr-17			<0.0107	<0.0500	**4.67**	<0.00190	<0.00433	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	KWB-6	Oct-17			<0.00214	<0.0100	**3.22**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-28	Apr-15			<0.210	<1.00	**3.02**	<0.0380	**<0.0870**	0.0471 J	**<0.0380**	<0.0350	<0.0330	<0.0450	<0.0320	**<0.0280**
	MW-28	Oct-15			<0.214	<1.00	**3.05**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	MW-28	Apr-16			<0.0214	<0.100	**1.37**	<0.00380	**<0.00866**	0.00301 J	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-28	Oct-16			<0.107	<0.500	**2.55**	<0.0190	**<0.0433**	0.0152 J	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-28	Apr-17			<0.107	<0.500	**2.58**	<0.0190	**<0.0433** J4	<0.0138	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-28	Oct-17			<0.107	<0.500	**1.58**	<0.0190	**<0.0433**	<0.0138	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-48	Apr-15			<0.0210	<0.100	**0.890**	<0.00380	**<0.00870**	0.00704 J	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
	MW-48	Oct-15			<0.0107	<0.0500	**0.204** J	<0.00190	<0.00433	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-48	Apr-16			<0.0428	<0.200	**7.17**	<0.00760	**<0.0173**	<0.00550	**<0.00758**	<0.00696	<0.00654	<0.00906	<0.0648	<0.00552
	MW-48	Oct-16			<0.0107	<0.0500	**5.12**	<0.00190	<0.00433	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-48	Apr-17			<0.107	<0.500	**11.7**	<0.0190	**<0.0433**	<0.0138	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-48	Oct-17			<0.00214	<0.0100	**11.0**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-50	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	0.0011	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-50	Oct-15			<0.00214	<0.0100	<0.000331 J	<0.000380 J	0.000881 J	0.000553 J	<0.000379 J	<0.000348 J	<0.000327 J	<0.000453	<0.000324 J	<0.000276
	MW-50	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-50	Oct-16			<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-50	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-50	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	0.000308 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-52	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-52	Oct-15			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866 J	<0.000275 J	<0.000379 J	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276 J
	MW-52	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-52	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-52	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-52	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-64	Apr-16			<0.107	<0.500	**25.3**	<0.0190	**<0.0433**	<0.0138	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-64	Oct-16			<0.214	<1.00	**30.9**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	MW-64	Apr-17			<0.535	<2.50	**3.22**	**<0.0950**	**<0.216**	<0.0688	**<0.0948**	<0.0870	**<0.0818**	<0.113	**<0.0810**	**<0.0690**
	MW-64	Oct-17			<0.535	<2.50	**30.7**	**<0.0950**	**<0.216**	<0.0688	**<0.0948**	<0.0870	**<0.0818**	<0.113	**<0.0810**	**<0.0690**
	MW-65	Apr-15			<0.00210	<0.100	**9.99**	<0.00380	**<0.00870**	<0.00280	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
	MW-65	Apr-16			<0.0214	<0.100	**9.73**	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-65	Oct-16			<0.0428	<0.200	**8.04**	<0.00760	**<0.0173**	<0.00550	**<0.00758**	<0.00696	<0.00654	<0.00906	<0.00648	<0.00552
	MW-65	Apr-17			<0.214	<1.00	**6.70**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	MW-65	Oct-17			<0.214	<1.00	**6.25**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	MW-66	Apr-15			<0.110	<0.500	**3.16**	<0.0190	**<0.0430**	<0.0140	**<0.0190**	<0.0170	<0.0160	<0.0230	<0.0160 J	<0.0140
	MW-66	Oct-15			<0.00214	<0.0100	**4.10** J	<0.000380	<0.000866	0.000371 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-66	Apr-16			<0.0214	<0.100	**3.09**	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-66	Oct-16			<0.00214	<0.0100	**3.80**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-66	Apr-17			<0.107	<0.500	**1.89**	<0.0190	**<0.0433** J4	<0.0138	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-66	Oct-17			<0.0214	<0.100	**0.276**	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-99	Apr-15			<0.0540	<0.250	**0.973**	<0.00950	**<0.0220**	0.0072 J	**<0.00950**	<0.00870	<0.00820	<0.0110	<0.00810 J	<0.00690
	MW-99	Oct-15			<0.0535	<0.250	**7.28**	<0.00950	**<0.0216**	<0.00688	**<0.00948**	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	MW-99	Apr-16			<0.0214	<0.100	**5.59**	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-99	Oct-16			<0.0428	<0.200	**5.08**	<0.00760	**<0.0173**	<0.00550	**<0.00758**	<0.00696	<0.00654	<0.00906	<0.00648	<0.00552
	MW-99	Apr-17			<0.107	<0.500	**2.79**	<0.0190	**<0.0433**	<0.0138	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-99	Oct-17			<0.214	<1.00	**2.58**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	MW-101	Apr-15			<0.0110	<0.0500	**0.0187**	<0.00190	<0.00430	<0.00140	<0.00190	<0.00170	<0.00160 J	<0.00230	<0.00160	<0.00140
	MW-101	Oct-15			<0.0107	<0.0500	<0.00166	<0.00190	<0.00433	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-101	Apr-16			<0.00214	<0.0100	**0.0664** J6	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-101	Oct-16			<0.00214	<0.0100	0.000845 J	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-101	Apr-17			<0.00214	<0.0100	**0.00650**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-101	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-102	Apr-15			<0.0210	<0.100	**9.83**	<0.00380	**<0.00870**	0.00959 J	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
	MW-102	Oct-15			<0.214	<1.00	**12.3**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	MW-102	Apr-16			<0.214	<1.00	**10.8**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	MW-102	Oct-16			<0.214	<1.00	**13.2**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	MW-102	Apr-17			<0.0428	<0.200	**8.38**	<0.00760	**<0.0173**	<0.00530	**<0.00758**	<0.00696	<0.00654	<0.00906	<0.00648	<0.00552
	MW-102	Oct-17			<0.107	<0.500	**9.24**	<0.0190	**<0.0433**	<0.0138	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-103	Apr-14			<0.00100	<0.00200	**0.760**	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-103	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	0.000597 J	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-103	Apr-16			<0.0107	<0.0500	**1.35**	<0.00190	<0.00433	0.00139 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-103	Apr-17			<0.107	<0.500	**1.30**	<0.0190	**<0.0433**	<0.0138	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-104	Apr-15			<0.00210	<0.0100	**0.0243**	<0.000380	<0.000870	0.000469 J	<0.000380	<0.000350	<0.000330	<0.000450	0.00516 J	<0.000280
	MW-104	Apr-15	FD		<0.00210	<0.0100	**0.0242**	<0.000380	<0.000870	0.000723 J	<0.000380	<0.000350	<0.000330	<0.000450	0.00513 J	<0.000280
	MW-104	Oct-15			<0.0107	<0.0500	**0.257**	<0.00190	<0.00433	0.00268 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-104	Oct-15	FD		<0.00214	<0.0100	**0.309**	<0.000380	<0.000866	0.000979 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-104	Apr-16			<0.00214	<0.0100 J3	**0.0707**	<0.000380	<0.000866	0.0011	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-104	Apr-16	FD		<0.00214	<0.0100	**0.0685**	<0.000380	<0.000866	0.00109	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-104	Oct-16			<0.0107	<0.0500	**0.341**	<0.00190	<0.00433	0.00182 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-104	Oct-16	FD		<0.0107	<0.0500	**0.284**	<0.00190	<0.00433	0.00181 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-104	Apr-17			<0.0214	<0.100	**0.741**	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-104	Apr-17	FD		<0.0107	<0.0500	**0.529**	<0.00190	<0.00433	<0.00138	<0.00190 J4	<0.00174	<0.00164 J4	<0.00226	<0.00162	<0.00138
	MW-104	Oct-17			<0.00214	<0.0100	**0.144**	<0.000380	<0.000866	0.000538 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-104	Oct-17	FD		<0.0107	<0.0500	**0.150**	<0.00190	<0.00433	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-105	Apr-15			<0.0110	0.126 J	**1.71**	<0.00190	<0.00430	<0.00140	<0.00190	<0.00170	<0.00160 J	<0.00230	<0.00160	<0.00140
	MW-105	Oct-15			<0.0214	<0.100	**0.580**	<0.00380	**<0.00866**	0.00557 J	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-105	Apr-16			<0.535	<2.50	**13.5**	**<0.0950**	**<0.216**	<0.0688	**<0.0948**	<0.0870	**<0.0818**	<0.113	**<0.0810**	**<0.0690**
	MW-105	Oct-16			<0.214	<1.00	**18.2**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	MW-105	Apr-17			<0.214	<1.00	**13.3**	<0.0380	**<0.0866** J4	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	MW-105	Oct-17			0.0145	<0.0100	**9.19**	<0.000380	<0.000866	0.00136	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-106	Apr-15			<0.00210	0.027 J	**0.395**	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-106	Oct-15			<0.214	<1.00	**10.4**	<0.0380	**<0.0866**	0.0914 J	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	MW-106	Apr-16			<0.0535	<0.250	**12.7**	<0.00950	**<0.0117**	0.0107 J	**<0.00948**	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	MW-106	Oct-16			<0.107	<0.500	**11.3**	<0.0190	**<0.0433**	<0.0138	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-106	Apr-17			<0.107	<0.500	**9.71**	<0.0190	**<0.0433**	0.0186 J	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-106	Oct-17			<0.107	<0.500	**10.6**	<0.0190	**<0.0433**	0.0144 J	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds												
				Analyte:	4-Methyl-2-Pentanone	Acetone	Benzene	Bromo-dichloro-methane	Bromo-methane	Carbon Disulfide	Carbon Tetrachloride	Chloro-benzene	Chloro-dibromo-methane	Chloroethane	Chloroform	Chloro-methane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	1.24	14.1	0.005	0.08	0.00754	0.81	0.005	0.1	0.08	20.86	0.08	0.0203
				CGWSL Source:	NMED TW	TMED TW	USEPA MCL	USEPA MCL	NMED TW	NMED TW	USEPA MCL	USEPA MCL	USEPA MCL	NMED TW	USEPA MCL	NMED TW
Area	**Well ID**	**Date**	**Dup**														
South Refinery	MW-107	Apr-15		<0.0210	<0.100	**5.32**	<0.00380	**<0.00870**	0.00287 J	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
	MW-107	Oct-15		<0.214	<1.00	**6.29**	<0.0380	**<0.0866**	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453	<0.0324	**<0.0276**
	MW-107	Apr-16		<0.00214	<0.0100	**1.28**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-107	Oct-16		<0.0107	<0.0500	**6.35**	<0.00190	<0.00433	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-107	Apr-17		<0.107	<0.500	**3.37**	<0.0190	**<0.0433** J4	<0.0138	**<0.0190**	<0.0174	<0.0164	<0.0226	<0.0162	<0.0138
	MW-109	Apr-15		<0.0210	<0.100	**0.621**	<0.00380	**<0.00870**	<0.00280	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
	MW-109	Oct-15		<0.0214	<0.100 J	**0.845** J	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-109	Apr-16		<0.0107	<0.0500	**0.532**	<0.00190	<0.00433	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-109	Oct-16		<0.0428	<0.200	**0.995**	<0.00760	**<0.0173**	<0.00550	**<0.00758**	<0.00696	<0.00654	<0.00906	<0.00648	<0.00552
	MW-109	Apr-17		<0.0214	<0.100	**1.25**	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	MW-109	Oct-17		<0.00214	<0.0100	**1.30**	<0.000380	<0.000866	0.000638 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-110	Apr-15		<0.00210	<0.0100	**0.132**	<0.000380	<0.000870	0.00129	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-110	Oct-15		<0.0107	<0.0500 J	**0.348** J	<0.00190	<0.00433	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	MW-110	Apr-16		<0.00214	<0.0100	**0.0132**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-110	Oct-16		<0.00214	<0.0100	0.000511 J	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-110	Apr-17		<0.0107	<0.0500	**0.299**	<0.00190	<0.00433	<0.00138	<0.00190	<0.00174	<0.00164	<0.00226	0.00406 J	<0.00138
	MW-110	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-313	Apr-14		<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	RA-313	Apr-15		<0.00210	<0.0100	0.000366 J	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	RA-313	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RA-313	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-4	Apr-15		<0.00210	0.0289 J	**0.0167**	<0.000380	<0.000870	0.000854 J	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320 J	<0.000280
	RW-4R	Apr-16		<0.00214	<0.0100	**0.0140**	<0.000380	<0.000866	0.000466 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-4R	Apr-17		<0.0107	0.0509 J	**0.0294**	<0.00190	<0.00433 J4	0.00239 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	RW-5R	Apr-15		<0.00210	<0.100	**2.92**	<0.00380	**<0.00870**	<0.00280	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
	RW-5R	Apr-16		<0.0428	<0.200	**3.48**	<0.00760	**<0.0173**	<0.00550	**<0.00758**	<0.00696	<0.00654	<0.00906	<0.0648	<0.00552
	RW-6	Apr-15		<0.00210	<0.100	**0.636**	<0.00380	**<0.00870**	0.00771 J	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
	RW-6R	Apr-16		<0.00214	<0.0100	**0.218**	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	RW-15C	Apr-17		0.0535	<0.250	**19.1**	<0.00950	**<0.0216**	<0.00688	**<0.00948**	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
South RO Reject Field	MW-114	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-114	Oct-15		<0.00214	<0.0100 J	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-114	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-114	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-114	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-114	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-115	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-115	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-115	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-115	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-115	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-115	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-116	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-116	Oct-15		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-116	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-116	Oct-16		<0.00214	<0.0100	0.000536 J	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-116	Apr-17		<0.00214	<0.0100	0.000430 J	<0.000380	<0.000866 J4	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-116	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
TEL	MW-49	Apr-15		<0.00210	<0.0100	**0.0770**	<0.000380	<0.000870	0.00106 J	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-49	Oct-15		<0.00214	<0.0100	**0.179**	<0.000380	<0.000866	<0.000275 B	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-49	Apr-16		<0.0428	<0.200	**0.196**	<0.00760	**<0.0173**	<0.00550	**<0.00758**	<0.00696	<0.00654	<0.00906	<0.0648	<0.00552
	MW-49	Oct-16		<0.214	<1.00 J3	**0.241**	<0.0380	**<0.0866** J3	<0.0275	**<0.0379**	<0.0348	<0.0327	<0.0453 J3	**0.113** JB	<0.00276
	MW-49	Apr-17		<0.0214	0.137 J	**0.227**	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	0.0119 J	<0.00276
	MW-49	Oct-17		<0.0428	<0.200	**0.573**	<0.00760	**<0.0173**	0.00552 J	**<0.00758**	<0.00696	<0.00654	<0.00906	<0.00648	<0.00552
	TEL-1	Apr-15		<0.00210	0.0104 J	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	TEL-1	Oct-15		<0.00214	<0.0100	0.000378 J	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	TEL-1	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	TEL-1	Oct-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	0.00046 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	TEL-1	Apr-17		<0.00214	0.0125 J3	0.000647 J	<0.000380	<0.000866	0.00042 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	TEL-1	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	TEL-2	Apr-15		<0.0430	<0.200	**0.905**	<0.00760	**<0.0170**	0.00723 J	**<0.00760**	<0.00700	<0.00650	<0.00910	<0.00650	<0.00550
	TEL-2	Oct-15		<0.0107	<0.0500	**0.535**	<0.00190	<0.00433	0.00194 J	<0.00190	<0.00174	<0.00164	<0.00226	<0.00162	<0.00138
	TEL-2	Apr-16		<0.00214	<0.0100	**0.709**	<0.000380	<0.000866	0.00124	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	TEL-2	Oct-16		<0.0214	<0.100	**0.962**	<0.00380	**<0.00866**	0.00325 J	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	TEL-2	Apr-17		<0.0214	<0.100	**0.556**	<0.00380	**<0.00866**	0.00376 J	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	TEL-2	Oct-17		<0.0214	<0.100	**0.590**	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	TEL-3	Apr-15		<0.0210	<0.100	**0.0206**	<0.00380	**<0.00870**	0.00471 J	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
	TEL-3	Oct-15		<0.00214	<0.0100	**0.0385**	<0.000380	<0.000866	0.00367	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	TEL-3	Apr-16		<0.0535	<0.250	**0.317**	<0.00950	**<0.0117**	<0.00688	**<0.00948**	<0.00870	<0.00818	<0.0113	<0.00810	<0.00690
	TEL-3	Oct-16		<0.00214	0.0156 J	**0.0123**	<0.000380	<0.000866	0.000488 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	TEL-3	Apr-17		<0.00214	<0.0100	**0.0799**	<0.000380	<0.000866	0.000918 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	TEL-4	Apr-15		<0.0210	0.243 J	**0.171**	<0.00380	**<0.00870**	0.00333 J	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
	TEL-4	Apr-15	FD	<0.0210	0.216 J	**0.155**	<0.00380	**<0.00870**	0.00471 J	<0.00380	<0.00350	<0.00330	<0.00450	<0.00320	<0.00280
	TEL-4	Oct-15		<0.00214	<0.0100	**0.637**	<0.000380	<0.000866	<0.000275 B	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	TEL-4	Oct-15	FD	<0.0214	<0.100	**0.657**	<0.00380	**<0.00866**	0.00858 J	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	TEL-4	Apr-16		<0.0214	<0.100	**0.530**	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	TEL-4	Apr-16	FD	<0.0214	<0.100	**0.557**	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	TEL-4	Oct-16		<0.0214	<0.100	**0.514**	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	TEL-4	Oct-16	FD	<0.0214	<0.100	**0.479**	<0.00380	**<0.00866**	0.00628 J	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	TEL-4	Apr-17		<0.0214	<0.100 J3	**0.0595**	<0.00380	**<0.00866**	<0.00275	<0.00379	<0.00348	<0.00327	<0.00453	<0.00324	<0.00276
	TEL-4	Apr-17	FD	<0.00214	<0.0100	**0.0583**	<0.000380	<0.000866	0.000882 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	TEL-4	Oct-17		<0.00214	<0.0100	**0.0161**	<0.000380	<0.000866	0.00042 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	TEL-4	Oct-17	FD	<0.00214	<0.0100	**0.0149**	<0.000380	<0.000866	0.000526 J	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
TMD	MW-8	Apr-14		<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-8	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-8	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-8	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276 J4
	MW-16	Apr-14		<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-16	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	0.000446 J	<0.000380	<0.000350	<0.000330 J	<0.000450	<0.000320	<0.000280
	MW-16	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-20	Apr-14		<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-20	Apr-14	FD	<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-20	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-20	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-20	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276 J4
	MW-21	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	0.0011	<0.000380	<0.000350	<0.000330 J	<0.000450	<0.000320	<0.000280
	MW-21	Oct-15		<0.00214	<0.0100	0.000613 J	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-21	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-21	Oct-16		<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J3	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J3	<0.000324	0.00106 JB
	MW-21	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-21	Oct-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-25	Apr-14		<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-25	Apr-15		<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	0.000423 J	<0.000380	<0.000350	<0.000330 J	<0.000450	<0.000320	<0.000280
	MW-25	Apr-16		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-25	Apr-17		<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276 J4

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds												
				Analyte:	4-Methyl-2-Pentanone	Acetone	Benzene	Bromo-dichloro-methane	Bromo-methane	Carbon Disulfide	Carbon Tetrachloride	Chloro-benzene	Chloro-dibromo-methane	Chloroethane	Chloroform	Chloro-methane
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	1.24	14.1	0.005	0.08	0.00754	0.81	0.005	0.1	0.08	20.86	0.08	0.0203
				CGWSL Source:	NMED TW	TMED TW	USEPA MCL	USEPA MCL	NMED TW	NMED TW	USEPA MCL	USEPA MCL	USEPA MCL	NMED TW	USEPA MCL	NMED TW
Area	**Well ID**	**Date**	**Dup**														
TMD	MW-26	Apr-14			<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-26	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-26	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-26	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-27	Apr-14			<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-27	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-27	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-27	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-46R	Nov-14			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280 J	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-46R	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450 J	<0.000320	<0.000280
	MW-46R	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-46R	Oct-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-46R	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-46R	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-68	Apr-14			<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-68	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-68	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-68	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-71	Apr-14			<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-71	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	MW-71	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-71	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-89	Apr-14			<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	MW-89	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	0.000752 J	<0.000380	<0.000350	<0.000330 J	<0.000450	<0.000320	<0.000280
	MW-89	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	MW-89	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NP-1	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	NP-1	Oct-15			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.00275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NP-1	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NP-1	Oct-16			<0.00214	<0.0100 J3	<0.000331	<0.000380	<0.000866 J3	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453 J3	<0.000324	0.00103 JB
	NP-1	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NP-1	Oct-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	NP-2	Apr-13			<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	NP-6	Apr-13			<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
	NP-6	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	0.00376	<0.000380	<0.000350	<0.000330 J	<0.000450	<0.000320	<0.000280
	NP-6	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
Up-Gradient	UG-1	Apr-14			<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	UG-1	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	UG-1	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	UG-1	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	UG-2	Apr-14			<0.0100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	UG-2	Apr-15			<0.00100	<0.0100	<0.000330	<0.000380	<0.000870	0.000348 J	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	UG-2	Apr-16			<0.00210	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	UG-2	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	UG-3R	Apr-14			<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	UG-3R	Apr-14	FD		<0.00100	<0.00200	<0.000600	<0.00060	<0.000500	<0.000900	<0.000600	<0.000400	<0.00050	<0.000500	<0.000600	<0.000500
	UG-3R	Apr-15			<0.00210	<0.0100	<0.000330	<0.000380	<0.000870	<0.000280	<0.000380	<0.000350	<0.000330	<0.000450	<0.000320	<0.000280
	UG-3R	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	UG-3R	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	UG-4	Apr-16			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276
	UG-4	Apr-17			<0.00214	<0.0100	<0.000331	<0.000380	<0.000866	<0.000275	<0.000379	<0.000348	<0.000327	<0.000453	<0.000324	<0.000276

Definitions

X	F
X	A
<x	A
<x	A
	E
---	N

Abbreviations

CGWSL	C
CGWSL Source	S
Dup	D
FD	F
mg/L	M
NMED TPH	N
NMED TW	N
TPH	T
USEPA TW	U
USEPA MCL	U
WQCC HH	N

Lab Footnote

B	A
J	I
J3	T
J4	T
J6	T

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Cymene	Dichloromethane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methyl N-Butyl Ketone	MTBE	Naphthalene	N-Butylbenzene	N-Propylbenzene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.07	0.0047	---	0.005	0.7	0.447	---	---	0.143	0.03	---	---
				CGWSL Source:	USEPA MCL	USEPA TW		USEPA MCL	USEPA MCL	WQCC TW			WQCC TW	WQCC HH		
Area	**Well ID**	**Date**	**Dup**													
Cross-Gradient	KWB-13	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	KWB-13	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	0.00254	<0.00380	<0.000370	0.00317 J	<0.000360	0.000373 J
	KWB-13	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-13	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-17	Apr-14													
	NP-5	Apr-13		<0.00500	**<0.00500**	<0.00500	**<0.0100**	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	NP-5	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	NP-5	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	RA-3156	Nov-13		<0.00500	**<0.00500**	<0.00500	**<0.0100**	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	RA-3156	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	RA-3156	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	RA-3156	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-136	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-136	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-136	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-136	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-136	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
Evaporation Ponds	MW-1R	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	MW-1R	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-1R	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-1R	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 J3 J4	<0.000367	<0.00100 J4	<0.000361	<0.000349
	MW-2A	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-2A	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-2A	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-2A	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-2A	Apr-17		<0.00260	<0.00418	<0.00350	**<0.0100**	<0.00384	<0.00326	<0.00719	<0.0382	<0.00367	<0.0100	<0.00361	<0.00349
	MW-2A	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-3	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-3	Apr-15	FD	<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-3	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00247	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-3	Oct-15	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00199	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-3	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-3	Apr-16	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-3	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00327	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-3	Oct-16	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00305	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-3	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-3	Apr-17	FD	<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 J3 J4	<0.000367	<0.00100 J4	<0.000361	<0.000349
	MW-3	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00149	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-3	Oct-17	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.002	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-4A	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	0.00159	0.00227	<0.00380	0.000461 J	<0.00100	<0.000360	<0.000350
	MW-4A	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00613	0.00237	<0.00382	0.000641 J	<0.00100	<0.000361	0.000436 J
	MW-4A	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00698	0.00166	<0.00382	0.000605 J	<0.00100	<0.000361	0.000357 J
	MW-4A	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0069	0.00278	<0.00382	0.000516 J	<0.00100	<0.000361	0.000434 J
	MW-4A	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	0.00449	0.00105 J	<0.00382 J3 J4	0.000444 J	<0.00100 J4	<0.000361	<0.000349
	MW-4A	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00336	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-4B	Apr-13		<0.00500	**<0.00500**	<0.00500	**<0.0100**	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	MW-4B	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	0.000462 J	0.000845 J	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-4B	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	0.000727 J	<0.000719	<0.00382 J3 J4	<0.000367	<0.00100 J4	<0.000361	<0.000349
	MW-5A	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.00138	<0.00100	<0.000360	<0.000350
	MW-5A	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00174	<0.00100	<0.000361	<0.000349
	MW-5A	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00212	<0.00100	<0.000361	<0.000349
	MW-5A	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00130	<0.00100	<0.000361	<0.000349
	MW-5A	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000991 J	<0.000719	<0.00382	0.00160	<0.00100	<0.000361	<0.000349
	MW-5A	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0013	<0.000719	<0.00382	0.00150	<0.00100	<0.000361	<0.000349
	MW-5B	Apr-13		<0.00500	**<0.00500**	<0.00500	**<0.0100**	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	MW-5B	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.00148	<0.00100	<0.000360	<0.000350
	MW-5B	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00140	<0.00100	<0.000361	<0.000349
	MW-5C	Apr-13		<0.00500	**<0.00500**	<0.00500	**<0.0100**	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	MW-5C	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.000507 J	<0.00100	<0.000360	<0.000350
	MW-5C	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000369 J	<0.00100	<0.000361	<0.000349
	MW-6A	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	MW-6A	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	0.00044 J	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-6A	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	0.00116	0.000386 J	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-6A	Apr-17		<0.00260	<0.00418	<0.00350	**<0.0100**	<0.00384	<0.00326	<0.00719	<0.0382	<0.00367	<0.0100	<0.00361	<0.00349
	MW-6B	Mar-13		<0.00500	**<0.00500**	<0.00500	**<0.0100**	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	MW-6B	Mar-13	FD	<0.00500	**<0.00500**	<0.00500	**<0.0100**	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	MW-6B	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-6B	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-7A	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.00194	<0.00100	<0.000360	<0.000350
	MW-7A	Apr-15	FD	<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.00185	<0.00100	<0.000360	<0.000350
	MW-7A	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00175	<0.00100	<0.000361	<0.000349
	MW-7A	Oct-15	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00174	<0.00100	<0.000361	<0.000349
	MW-7A	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00168	<0.00100	<0.000361	<0.000349
	MW-7A	Apr-16	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00168	<0.00100	<0.000361	<0.000349
	MW-7A	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00188	<0.00100	<0.000361	<0.000349
	MW-7A	Oct-16	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00166	<0.00100	<0.000361	<0.000349
	MW-7A	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00150	<0.00100	<0.000361	<0.000349
	MW-7A	Apr-17	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00148	<0.00100	<0.000361	<0.000349
	MW-7A	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00140	<0.00100	<0.000361	<0.000349
	MW-7A	Oct-17	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00178	<0.00100	<0.000361	<0.000349
	MW-7B	Apr-13		<0.00500	**<0.00500**	<0.00500	**<0.0100**	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	MW-7B	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-7B	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-10	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.00195	<0.00100	<0.000360	<0.000350
	MW-10	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00201	<0.00100	<0.000361	<0.000349
	MW-10	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00216	<0.00100	<0.000361	<0.000349
	MW-10	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00190	<0.00100	<0.000361	<0.000349
	MW-10	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00195	<0.00100	<0.000361	<0.000349
	MW-10	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00141	<0.00100	<0.000361	<0.000349
	MW-11A	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-11A	Oct-15													
	MW-11A	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-11A	Oct-16													
	MW-11A	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 J3 J4	<0.000367	<0.00100 J4	<0.000361	<0.000349
	MW-11A	Oct-17													
	MW-11B	Mar-13		<0.00500	**<0.00500**	<0.00500	**<0.0100**	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	MW-11B	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-11B	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 J3 J4	<0.000367	<0.00100 J4	<0.000361	<0.000349
	MW-12	Apr-14													
	MW-13	Apr-14													
	MW-15	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	MW-15	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	0.000387 J	<0.000720	<0.00380	0.000809 J	<0.00100	<0.000360	<0.000350
	MW-15	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000602 J	<0.00100	<0.000361	<0.000349
	MW-15	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 J3 J4	0.000373 J	<0.00100 J4	<0.000361	<0.000349

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Cymene	Dichloromethane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methyl N-Butyl Ketone	MTBE	Naphthalene	N-Butylbenzene	N-Propylbenzene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.07	0.0047	---	0.005	0.7	0.447	---	---	0.143	0.03	---	---
				CGWSL Source:	USEPA MCL	USEPA TW		USEPA MCL	USEPA MCL	WQCC TW			WQCC TW	WQCC HH		
Area	**Well ID**	**Date**	**Dup**													
Evaporation Ponds	MW-18A	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-18A	Oct-15			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-18A	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000490 J	<0.00100	<0.000361	<0.000349
	MW-18A	Oct-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000586 J	<0.00100	<0.000361	<0.000349
	MW-18A	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000650 J	<0.00100	<0.000361	<0.000349
	MW-18A	Oct-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000529 J	<0.00100	<0.000361	<0.000349
	MW-18B	Apr-13			<0.00500	**<0.00500**	<0.00500	**<0.0100**	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	MW-18B	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-18B	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-22A	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.00557	<0.00100	<0.000360	<0.000350
	MW-22A	Apr-15	FD		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.00733	<0.00100	<0.000360	<0.000350
	MW-22A	Oct-15			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00928	<0.00100	<0.000361	<0.000349
	MW-22A	Oct-15	FD		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00967	<0.00100	<0.000361	<0.000349
	MW-22A	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00907	<0.00100	<0.000361	<0.000349
	MW-22A	Apr-16	FD		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00887	<0.00100	<0.000361	<0.000349
	MW-22A	Oct-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00805	<0.00100	0.000576 J	<0.000349
	MW-22A	Oct-16	FD		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00620	<0.00100	<0.000361	<0.000349
	MW-22A	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00774	<0.00100	<0.000361	<0.000349
	MW-22A	Apr-17	FD		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 J3 J4	0.00654	<0.00100 J4	<0.000361	<0.000349
	MW-22A	Oct-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00552	<0.00100	<0.000361	<0.000349
	MW-22A	Oct-17	FD		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00631	<0.00100	<0.000361	<0.000349
	MW-22B	Apr-13			<0.00500	**<0.00500**	<0.00500	**<0.0100**	<0.00500	<0.00500	<0.0100	<0.0100	0.00650	<0.00500	<0.00500	<0.00500
	MW-22B	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.00634	<0.00100	<0.000360	<0.000350
	MW-22B	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00564	<0.00100	<0.000361	<0.000349
	MW-70	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-70	Oct-15			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-70	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-70	Oct-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-70	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-70	Oct-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-72	Apr-14			<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	MW-72	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-72	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-72	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100 J4	<0.000361	<0.000349
	MW-73	Apr-14			<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	0.00160 J	<0.000700	<0.00100	<0.000500
	MW-73	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.00290	<0.00100	<0.000360	<0.000350
	MW-73	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00270	<0.00100	<0.000361	<0.000349
	MW-73	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00120	<0.00100 J4	<0.000361	<0.000349
	MW-74	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-74	Oct-15			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000826 J	<0.00100	<0.000361	<0.000349
	MW-74	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000972 J	<0.00100	<0.000361	<0.000349
	MW-74	Oct-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-74	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000473 J	<0.00100 J4	<0.000361	<0.000349
	MW-74	Oct-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000527 J	<0.00100	<0.000361	<0.000349
	MW-75	Apr-15			<0.00260	<0.00420	<0.00350	**<0.0100**	<0.00380	0.00731 J	<0.00720	<0.0380	0.00935 J	<0.0100	<0.00360	<0.00350
	MW-75	Oct-15			<0.000260	<0.000418	0.000623 J	<0.00100	<0.000384	0.0101	<0.000719	<0.00382	0.00463	<0.00100	<0.000361	0.00116
	MW-75	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00144	<0.000719	<0.00382	0.00577	<0.00100	<0.000361	<0.000349
	MW-75	Oct-16			<0.000260	<0.000418	0.000603 J	<0.00100	<0.000384	0.0167	<0.000719	<0.00382	0.00407	<0.00100	0.000385 J	0.00123
	MW-75	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00303	<0.000719	<0.00382	0.00645	<0.00100	<0.000361	<0.000349
	MW-75	Oct-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0101	<0.000719	<0.00382	0.00224	<0.00100	<0.000361	0.00087 J
	MW-76	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	0.0161	<0.000720	<0.00380	0.0122	<0.00100	<0.000360	0.000534 J
	MW-76	Oct-15			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.023	<0.000719	<0.00382	0.00839	<0.00100	<0.000361	0.000663 J
	MW-76	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0108	<0.000719	<0.00382	0.00756	<0.00100	<0.000361	0.000356 J
	MW-76	Oct-16			<0.000260	<0.000418	<0.000350	<0.00100	0.000437 J	0.0276	0.00214	<0.00382	0.0245	<0.00100	<0.000361	0.00125
	MW-76	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0127	<0.000719	<0.00382	0.0130	<0.00100	<0.000361	0.000438 J
	MW-76	Oct-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0316	<0.000719	<0.00382	0.0143	<0.00100	<0.000361	0.000893 J
	MW-77	Apr-15			<0.000260	<0.000420	0.00285	<0.00100	0.00363	0.0274	0.0043	<0.00380	0.0131	<0.00100	<0.000360	0.0108
	MW-77	Oct-15			<0.000260	<0.000418	0.0031	<0.00100	0.00533	0.0291	0.00476	<0.00382	0.00722	<0.00100	0.000743 J	0.00989
	MW-77	Apr-16			<0.000260	<0.000418	0.00264	<0.00100	0.00300	0.023	0.00332	<0.00382	0.00647	<0.00100	0.000463 J	0.00578
	MW-77	Oct-16			<0.00260	<0.00418	<0.00350	**<0.0100**	0.00766 J	0.0259	<0.00719	<0.00382	0.00552 J	<0.0100	<0.00361	0.0122
	MW-77	Apr-17			<0.00260	<0.00418	<0.00350	**<0.0100**	<0.00384	0.0207	<0.00719	<0.0382	0.00452 J	<0.0100	<0.00361	0.00565 J
	MW-78	Apr-14			<0.00060	<0.000600	<0.000500	<0.00100	0.00130 J	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	0.0018 J
	MW-78	Apr-15			<0.000260	<0.000420	0.000443 J	<0.00100	0.00262	0.00348	0.00146	<0.00380	0.000629 J	<0.00100	<0.000360	0.0039
	MW-78	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	0.000942 J	0.00168	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	0.00152
	MW-78	Apr-17			<0.00260	<0.00418	<0.00350	**<0.0100**	<0.00384	<0.00326	<0.00719	<0.0382	<0.00367	<0.0100	<0.00361	<0.00349
	MW-79	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-79	Oct-15			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-79	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-79	Oct-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-79	Apr-17			<0.00260	<0.00418	<0.00350	**<0.0100**	<0.00384	<0.00326	<0.00719	<0.0382	<0.00367	<0.0100	<0.00361	<0.00349
	MW-79	Oct-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-80	Apr-14			<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	MW-80	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-80	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-80	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-81	Apr-14			<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	MW-81	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-81	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-81	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-82	Apr-14			<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	MW-82	Apr-14	FD		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	MW-82	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-82	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-82	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100 J4	<0.000361	<0.000349
	MW-83	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	0.00159	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	0.000534 J
	MW-83	Oct-15			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00192	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	0.000461 J
	MW-83	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00143	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	0.000365 J
	MW-83	Oct-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00145	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	0.000696 J
	MW-83	Apr-17			<0.00260	<0.00418	<0.00350	**<0.0100**	<0.00384	<0.00326	<0.00719	<0.0382	<0.00367	<0.0100	<0.00361	<0.00349
	MW-83	Oct-17			<0.000260	<0.000418	<0.000350	<0.00100	0.000439 J	0.00189	0.0012 J	<0.00382	<0.000367	<0.00100	<0.000361	0.000645 J
	MW-84	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	0.000574 J	0.000575 J	<0.000720	<0.00380	0.00279	<0.00100	<0.000360	<0.000350
	MW-84	Oct-15			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00125	<0.00100	<0.000361	<0.000349
	MW-84	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00129	<0.00100	<0.000361	<0.000349
	MW-84	Oct-16			<0.00260	<0.00418	<0.00350	**<0.0100**	<0.00384	<0.00326	<0.00719	<0.00382	<0.00367	<0.0100	<0.00361	<0.00349
	MW-84	Apr-17			<0.00260	<0.00418	<0.00350	**<0.0100**	<0.00384	<0.00326	<0.00719	<0.0382	<0.00367	<0.0100	<0.00361	<0.00349
	MW-84	Oct-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000451 J	<0.000719	<0.00382	0.00174	<0.00100	<0.000361	<0.000349
	MW-87	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.000569 J	<0.00100	<0.000360	<0.000350
	MW-87	Oct-15			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000696 J	<0.00100	<0.000361	<0.000349
	MW-87	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000646 J	<0.00100	<0.000361	<0.000349
	MW-87	Oct-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00107	<0.00100	<0.000361	<0.000349
	MW-87	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000665 J	<0.00100	<0.000361	<0.000349
	MW-87	Oct-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000728 J	<0.00100	<0.000361	<0.000349

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Cymene	Dichloromethane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methyl N-Butyl Ketone	MTBE	Naphthalene	N-Butylbenzene	N-Propylbenzene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.07	0.0047	---	0.005	0.7	0.447	---	---	0.143	0.03	---	---
				CGWSL Source:	USEPA MCL	USEPA TW		USEPA MCL	USEPA MCL	WQCC TW			WQCC TW	WQCC HH		
Area	**Well ID**	**Date**	**Dup**													
Evaporation Ponds	MW-88	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-88	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-88	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-88	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-88	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-88	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-120	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-120	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-120	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-120	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-120	Apr-17		<0.00260	<0.00418	<0.00350	**<0.0100**	<0.00384	<0.00326	<0.00719	<0.0382	<0.00367	<0.0100	<0.00361	<0.00349
	MW-120	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-121	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-121	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-121	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-121	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-121	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-121	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-122	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-122	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-122	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-122	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-122	Apr-17		<0.00260	<0.00418	<0.00350	**<0.0100**	<0.00384	<0.00326	<0.00719	<0.0382	<0.00367	<0.0100	<0.00361	<0.00349
	MW-122	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-123	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.00124	<0.00100	<0.000360	<0.000350
	MW-123	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00126	<0.00100	<0.000361	<0.000349
	MW-123	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00143	<0.00100	<0.000361	<0.000349
	MW-123	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00163	<0.00100	<0.000361	<0.000349
	MW-123	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 J4	0.00114	<0.00100 J4	<0.000361	<0.000349
	MW-123	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00139	<0.00100	<0.000361	<0.000349
	MW-124	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-124	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-124	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-124	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-124	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-124	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-1R	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	OCD-1R	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-1R	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-1R	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-1R	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 J4	<0.000367	<0.00100 J4	<0.000361	<0.000349
	OCD-1R	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-2A	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	OCD-2A	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-2A	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-2A	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-2A	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 J4	<0.000367	<0.00100 J4	<0.000361	<0.000349
	OCD-2A	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-3	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	OCD-3	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-3	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-3	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-3	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 J4	<0.000367	<0.00100 J4	<0.000361	<0.000349
	OCD-3	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-4	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	OCD-4	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-4	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-4	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-4	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 J4	<0.000367	<0.00100 J4	<0.000361	<0.000349
	OCD-4	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-5	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	OCD-5	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-5	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-5	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-5	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 J4	<0.000367	<0.00100 J4	<0.000361	<0.000349
	OCD-5	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-6	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	OCD-6	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-6	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-6	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-6	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100 J4	<0.000361	<0.000349
	OCD-6	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-7AR	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.00196	<0.00100	<0.000360	<0.000350
	OCD-7AR	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00202	<0.00100	<0.000361	<0.000349
	OCD-7AR	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00141	<0.00100	<0.000361	<0.000349
	OCD-7AR	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00179	<0.00100	<0.000361	<0.000349
	OCD-7AR	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00110	<0.00100 J4	<0.000361	<0.000349
	OCD-7AR	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00107	<0.00100	<0.000361	<0.000349
	OCD-7B	Mar-13		<0.00500	**<0.00500**	<0.00500	**<0.0100**	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	OCD-7B	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	OCD-7B	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	OCD-8A	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.00498	<0.00100	<0.000360	<0.000350
	OCD-8A	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00510	<0.00100	<0.000361	<0.000349
	OCD-8A	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00475	<0.00100	<0.000361	<0.000349
	OCD-8A	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00507	<0.00100	<0.000361	<0.000349
	OCD-8A	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00420	<0.00100	<0.000361	<0.000349
	OCD-8A	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00392	<0.00100	<0.000361	<0.000349
	OCD-8B	Apr-13		<0.00500	**<0.00500**	<0.00500	**<0.0100**	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	OCD-8B	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.00155	<0.00100	<0.000360	<0.000350
	OCD-8B	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000919 J	<0.00100	<0.000361	<0.000349
Field East of Refinery	KWB-1A	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	KWB-1A	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-1A	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-1A	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-1A	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-1A	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-1C	Apr-13		<0.00500	**<0.00500**	<0.00500	**<0.0100**	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	KWB-1C	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	KWB-1C	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-7	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	0.0285	0.0338	0.00342	<0.00380	0.0225	0.0120	0.00299	0.0317
	KWB-7	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	0.0240	0.0223	0.000839 J	<0.00382	0.00677	0.00225 J	0.00143	0.0221
	KWB-7	Apr-16		<0.000260	<0.000418	0.000952 J	<0.00100	0.0248	0.014	0.0218	<0.00382	0.0104	0.0141	0.00365	0.0193
	KWB-7	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	0.0167	0.0228	0.0196	<0.00382	0.00582	0.00120 JJ4	0.000757 J	0.0158
	KWB-7	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	0.00858	0.0136	0.007	<0.00382	0.00678	0.00409 J	<0.000361	0.00992
	KWB-7	Oct-17		<0.000260	<0.000418	0.000418 J	<0.00100	0.0156	0.0103	0.0132	<0.00382	0.00510	0.00350 J	0.000456 J	0.0105

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Cymene	Dichloromethane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methyl N-Butyl Ketone	MTBE	Naphthalene	N-Butylbenzene	N-Propylbenzene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.07	0.0047	---	0.005	0.7	0.447	---	---	0.143	0.03	---	---
				CGWSL Source:	USEPA MCL	USEPA TW		USEPA MCL	USEPA MCL	WQCC TW			WQCC TW	WQCC HH		
Area	**Well ID**	**Date**	**Dup**													
Field East of Refinery	KWB-8	Oct-16			<0.0520	**<0.0836**	<0.0700	**<0.200**	**0.828**	<0.0652	1.01	<0.00382	<0.0734	**<0.200** J4	<0.0722	<0.0698
	KWB-8	Apr-17			<0.0260	**<0.0418**	<0.0350	**<0.100**	**1.24**	0.0467 J	1.92	<0.382	0.129	**0.141** J	<0.0361	0.0852 J
	KWB-8	Oct-17			<0.000260	<0.000418	0.00112	<0.00100	0.617	0.0182	0.782	0.00515 J	0.134	**0.0519**	0.00209	0.0217
	KWB-10R	Apr-15			<0.00260	<0.00420	0.00673 J	**<0.0100**	0.528	0.0484	1.04	<0.0380	**3.87**	**0.138**	0.0113	0.069
	KWB-10R	Oct-15			<0.000260	<0.000418	0.00543	<0.00100	0.523	0.0478	0.828	<0.00382	**4.66**	**0.186**	0.01	0.0699
	KWB-10R	Apr-16			<0.0130	**<0.0209**	<0.0175	**<0.0500**	0.437	0.0442 J	0.645	<0.00382	**3.71**	**0.150** J	<0.0180	0.0616
	KWB-10R	Oct-16			<0.00520	**<0.00836**	<0.00700	**<0.0200**	0.513	0.04	0.664	<0.00382	**3.62**	**0.133**	0.0099 J	0.0607
	KWB-10R	Apr-17			<0.0130	**<0.0209**	<0.0175	**<0.0500**	0.505	0.0486 J	0.716	<0.191	**3.65**	**0.156** J	<0.0180	0.0714
	KWB-10R	Oct-17			<0.000260	<0.000418	0.0184	<0.00100	0.530	0.0494	0.655	<0.00382	**5.41**	**0.152**	<0.000361	0.0748
	KWB-11A	Apr-15			<0.000260	<0.000420	0.000951 J	0.00102 J	<0.000380	<0.000330	0.00188	<0.00380	0.00648	0.0233	<0.000360	<0.000350
	KWB-11A	Oct-15			<0.000260	<0.000418	0.000552 J	<0.00100	<0.000384	0.00301	0.0013	<0.00382	0.00434	0.0165	0.00126	<0.000349
	KWB-11A	Apr-16			<0.000260	<0.000418	0.000374 J	<0.00100	<0.000384	0.000412 J	<0.000719	<0.00382	0.00477	0.0134	0.00134	<0.000349
	KWB-11A	Oct-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00244	0.0011	<0.00382	0.00416	0.00936 J4	0.000858 J	<0.000349
	KWB-11A	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	0.00841	<0.000361	<0.000349
	KWB-11A	Oct-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00518	0.000852 J	<0.00382	0.00273	0.00563	0.00151	0.000796 J
	KWB-11B	Apr-15			<0.000260	<0.000420	<0.000350	0.00106 J	<0.000380	<0.000330	<0.000720	<0.00380	0.00121	<0.00100	<0.000360	<0.000350
	KWB-11B	Oct-15			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-11B	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-11B	Oct-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	0.00153 JJ4	<0.000361	<0.000349
	KWB-11B	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-11B	Oct-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000565 J	<0.00100	<0.000361	<0.000349
	KWB-12A	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	KWB-12A	Apr-15	FD		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	KWB-12A	Oct-15			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12A	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12A	Oct-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12A	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12A	Oct-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12B	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	KWB-12B	Oct-15			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12B	Oct-15	FD		<0.000260	<0.000418	<0.000350	<0.00100 J	<0.000384	<0.000326	0.00157	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12B	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12B	Apr-16	FD		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12B	Oct-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12B	Oct-16	FD		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000337 J	<0.000719	<0.00382	<0.000367	0.0139	<0.000361	0.000638 J
	KWB-12B	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12B	Apr-17	FD		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12B	Oct-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-12B	Oct-17	FD		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	KWB-P4	Apr-13			<0.00500	**<0.00500**	<0.00500	**<0.0100**	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	KWB-P4	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	KWB-P4	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-57	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	0.000667 J	<0.000330	0.00141	<0.00380	<0.000370	0.00156 J	<0.000360	<0.000350
	MW-57	Oct-15			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-57	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-57	Oct-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100 J4	<0.000361	<0.000349
	MW-57	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-57	Oct-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	0.00273 J	<0.000361	<0.000349
	MW-58	Apr-15			<0.00260	<0.00420	0.0077 J	**<0.0100**	**1.98**	0.0732	2.08	<0.0380	0.0187	**0.318**	0.00921 J	0.112
	MW-58	Oct-15			<0.0260	**<0.0418**	<0.0350	**<0.100**	**2.00**	0.072 J	2.12	<0.382	<0.0367	**0.354** J	<0.0361	0.125
	MW-58	Apr-16			<0.00260	<0.00418	0.00813 J	**<0.0100**	**1.11**	0.0594	0.83	<0.00382	**0.200**	**0.257**	0.00944 J	0.105
	MW-58	Oct-16			<0.000260	<0.000418	0.00572	<0.00100	**1.10**	0.053	0.873	<0.00382	0.0468	**0.0867**	0.00517	0.093
	MW-58	Apr-17			<0.0260	**<0.0418**	<0.0350	**<0.100**	**0.720**	0.0511 J	0.533	<0.382	<0.0367	**0.191** J	<0.0361	0.091 J
	MW-58	Oct-17			<0.000260	<0.000418	0.00399	<0.00100	0.0965	0.0456	0.22	<0.00382	0.0987	**0.0469**	0.00529	0.0842
	MW-111	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	0.00824	0.000607 J	0.00723	<0.00380	<0.000370	0.00294 J	<0.000360	0.000827 J
	MW-111	Oct-15			<0.000260	<0.000418	<0.000350	<0.00100	0.00615	0.000862 J	0.00113	<0.00382	**1.32**	0.00645	<0.000361	0.000839 J
	MW-111	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	0.00122	0.000887 J	<0.000719	<0.00382	**1.54**	<0.00100	<0.000361	0.00069 J
	MW-111	Oct-16			<0.000260	<0.000418	<0.000350	<0.00100	0.00226	0.00062 J	0.00177 J	<0.00382	**1.29**	0.00103 J	<0.000361	0.000601 J
	MW-111	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	0.000432 J	0.00163	0.00237	<0.00382	**0.955**	0.00310 J	<0.000361	0.000769 J
	MW-111	Oct-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.0384	0.00112	<0.0719	<0.00382	**1.40**	0.00175 J	<0.000361	0.000622 J
	MW-113	Apr-15			<0.000260	<0.000420	<0.000350	0.00114 J	<0.000380	<0.000330	<0.000720	<0.00380	0.0178	<0.00100	<0.000360	<0.000350
	MW-113	Apr-15	FD		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.0158	<0.00100	<0.000360	<0.000350
	MW-113	Oct-15			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0158	<0.00100	<0.000361	<0.000349
	MW-113	Oct-15	FD		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	0.000723 J	<0.00382	0.0176	<0.00100	<0.000361	<0.000349
	MW-113	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	0.00354	<0.000326	0.00518	<0.00382	0.0143	<0.00100	<0.000361	<0.000349
	MW-113	Apr-16	FD		<0.000260	<0.000418	<0.000350	<0.00100	0.00364	<0.000326	0.00531	<0.00382	0.0143	<0.00100	<0.000361	<0.000349
	MW-113	Oct-16			<0.000260	<0.000418	<0.000350	<0.00100	0.0199	0.0014	0.0143	<0.00382	0.0137	0.00208 JJ4	<0.000361	0.00181
	MW-113	Oct-16	FD		<0.000260	<0.000418	<0.000350	<0.00100	0.0175	0.00137	0.0127	<0.00382	0.0143	0.00200 JJ4	<0.000361	0.00163
	MW-113	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	0.00840	0.000441 J	0.0133	<0.00382	0.0147	0.00157 J	<0.000361	0.000359 J
	MW-113	Apr-17	FD		<0.000260	<0.000418	<0.000350	<0.00100	0.00937	0.000513 J	0.0148	<0.00382	0.0140	0.00176 J	<0.000361	0.000359 J
	MW-113	Oct-17			<0.000260	<0.000418	<0.000350	<0.00100	0.0269	0.00565	0.0279	<0.00382	0.0123	0.00420 J	<0.000361	0.00456
	MW-113	Oct-17	FD		<0.000260	<0.000418	<0.000350	<0.00100	0.0215	0.00546	0.0234	<0.00382	0.0117	0.00399 J	<0.000361	0.00444
	MW-125	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-125	Oct-15			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-125	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-125	Oct-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-125	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-125	Oct-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-126A	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-126A	Oct-15			<0.000260	<0.000418	<0.000350	<0.00100	0.00475	0.0208	0.0103	<0.00382	<0.000367	<0.00100	<0.000361	0.0104
	MW-126A	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000495 J	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-126A	Oct-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0591	<0.000719	<0.00382	<0.000367	<0.00100 J4	<0.000361	0.00794
	MW-126A	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00333	0.00141 J	<0.00382	<0.000367	<0.00100	<0.000361	0.00226
	MW-126A	Oct-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000649 J	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-126B	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-126B	Oct-15			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-126B	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-126B	Oct-16			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000426 J	<0.000719	<0.00382	<0.000367	<0.00100 J4	<0.000361	<0.000349
	MW-126B	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-126B	Oct-17			<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-127	Apr-15			<0.000260	<0.000420	0.00159	<0.00100	0.424	0.0213	0.153	<0.00380	**0.868**	**0.0658**	0.00251	0.0335
	MW-127	Oct-15			<0.00520	**<0.00836**	<0.00700	**<0.0200**	0.299	0.0183 J	0.0856	<0.0764	**0.730**	**0.0415** J	<0.00722	0.0305
	MW-127	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	0.348	0.0198	0.112	<0.00382	**0.629**	**0.0425**	0.00229	0.0325
	MW-127	Oct-16			<0.00260	<0.00418	<0.00350	**<0.0100**	0.120	0.012	0.0387	<0.00382	**0.575**	<0.0100 J4	<0.00361	0.0189
	MW-127	Apr-17			<0.000260	<0.000418	0.00108	<0.00100	0.186	0.0193	0.0711	<0.00382	**0.525**	0.0175	0.00216	0.0337
	MW-127	Oct-17			<0.000260	<0.000418	<0.000350	<0.00100	0.0937	0.013	0.0445	<0.00382	**0.885**	0.00901	<0.000361	0.0185
	MW-128	Apr-15			<0.000260	<0.000420	<0.000350	<0.00100	0.0114	0.0031	0.00326	<0.00380	**1.60**	0.00346 J	0.000372 J	0.00369
	MW-128	Oct-15			<0.00520	**<0.00836**	<0.00700	**<0.0200**	<0.00768	<0.00652	<0.0144	<0.0764	**0.860**	<0.0200	<0.00722	<0.00698
	MW-128	Apr-16			<0.000260	<0.000418	<0.000350	<0.00100	0.00494	0.00111	0.00153	<0.00382	**0.846**	0.00104 J	<0.000361	0.00135
	MW-128	Oct-16			<0.000260	<0.000418	<0.000350	<0.00100	0.00408	0.000965 J	0.0037	<0.00382	**0.832**	0.00225 J	<0.000361	0.00136
	MW-128	Apr-17			<0.000260	<0.000418	<0.000350	<0.00100	0.00166	0.00124	0.00159 J	<0.00382	**0.821**	0.00140 J	<0.000361	0.00181
	MW-128	Oct-17			<0.000260	<0.000418	<0.000350	<0.00100	0.00128	0.00133	0.00336	<0.00382	**0.785**	0.00142 J	<0.000361	0.0017

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds												
				Analyte:	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Cymene	Dichloromethane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methyl N-Butyl Ketone	MTBE	Naphthalene	N-Butylbenzene	N-Propylbenzene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.07	0.0047	---	0.005	0.7	0.447	---	---	0.143	0.03	---	---
				CGWSL Source:	USEPA MCL	USEPA TW		USEPA MCL	USEPA MCL	WQCC TW			WQCC TW	WQCC HH		
Area	**Well ID**	**Date**	**Dup**														
Field East of Refinery	MW-129	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	0.00131	0.00198	0.00245	<0.00380	**7.04**	0.00407 J	0.000458 J	0.000956 J
	MW-129	Oct-15		<0.0260	**<0.0418**	<0.0350	**<0.100**	<0.0384	<0.0326	<0.0719	<0.382	**5.79**	**<0.100**	<0.0361	<0.0349
	MW-129	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.0192	0.00172	0.00199	<0.00382	**4.59**	0.00534	0.000444 J	0.000863 J
	MW-129	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	0.000985 J	0.00144	0.00124	<0.00382	**4.73**	0.00186 JJ4	<0.000361	0.000383 J
	MW-129	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000976 J	0.000737 J	<0.00382	**4.34**	0.00247 J	<0.000361	<0.000349
	MW-130	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.000510 J	<0.00100	<0.000360	<0.000350
	MW-130	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000449 J	<0.00100	<0.000361	<0.000349
	MW-130	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000538 J	<0.00100	<0.000361	<0.000349
	MW-130	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00130	0.00112 J	<0.000361	<0.000349
	MW-130	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00130	<0.00100	<0.000361	<0.000349
	MW-130	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00136	<0.00100	<0.000361	<0.000349
	MW-131	Apr-15		<0.000260	<0.000420	0.00103	<0.00100	0.0692	0.0162	0.084	<0.00380	**5.23**	**0.0468**	0.00368	0.028
	MW-131	Oct-15		<0.000260	<0.000418	0.00105	<0.00100	0.0480	0.022	0.0615	<0.00382	**4.54**	**0.0589**	0.00375	0.037
	MW-131	Apr-16		<0.000260	<0.000418	0.000697 J	<0.00100	0.0535	0.0183	0.0513	<0.00382	**3.69**	**0.0353**	0.00308	0.0315
	MW-131	Oct-16		<0.00130	<0.00209	<0.00175	<0.00500	0.0324	0.015	0.0431	<0.0191	**4.09**	0.0135 JJ4	0.00183 J	0.0241
	MW-131	Apr-17		<0.000260	<0.000418	0.000554 J	<0.00100	0.0532	0.0206	0.0735	<0.00382	**3.99**	0.0295	0.00255	0.0338
	MW-131	Oct-17		<0.000260	<0.000418	0.000701 J	<0.00100	<0.0960	0.0162	<0.180	<0.00382	**5.25**	**0.0303**	0.00185	0.0262
	MW-133	Nov-14		<0.0260	**<0.0420**	<0.0350	**<0.100**	0.300	0.057 J	0.18 J	<0.380	**5.60**	**<0.100**	<0.0360	0.084 J
	MW-133	Apr-15		<0.0260	**<0.0420**	<0.0350	**<0.100**	0.199	<0.0330	0.108	<0.380	**6.67**	**<0.100**	<0.0360	0.0451 J
	MW-134	Apr-15		<0.000260	<0.000420	<0.000350	0.00122 J	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-134	Apr-15	FD	<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-134	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-134	Oct-15	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-134	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-134	Apr-16	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-134	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-134	Oct-16	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-134	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-134	Apr-17	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-134	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-134	Oct-17	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-135	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.000829 J	<0.00100	<0.000360	<0.000350
	MW-135	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000608 J	<0.00100	<0.000361	<0.000349
	MW-135	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00197	<0.00100	<0.000361	<0.000349
	MW-135	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000685 J	<0.00100 J4	<0.000361	<0.000349
	MW-135	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-135	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	RA-4196	Apr-15		<0.000260	<0.000420	<0.000350	0.00114 J	<0.000380	<0.000330	<0.000720	<0.00380	0.00173	<0.00100	<0.000360	<0.000350
	RA-4196	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00394	<0.00100	<0.000361	<0.000349
	RA-4196	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00507	<0.00100	<0.000361	<0.000349
	RA-4196	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00657	<0.00100 J4	<0.000361	<0.000349
	RA-4196	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00618	<0.00100	<0.000361	<0.000349
	RA-4196	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00763	<0.00100	<0.000361	<0.000349
	RA-4798	Apr-15		<0.000260	<0.000420	<0.000350	0.00127 J	<0.000380	<0.000330	<0.000720	<0.00380	0.0163	<0.00100	<0.000360	<0.000350
	RA-4798	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00858	<0.00100	<0.000361	<0.000349
	RA-4798	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0121	<0.00100	<0.000361	<0.000349
	RA-4798	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0124	<0.00100 J4	<0.000361	<0.000349
	RA-4798	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00360	<0.00100	<0.000361	<0.000349
	RA-4798	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00889	<0.00100	<0.000361	<0.000349
	RW-12R	Apr-16		<0.00130	<0.00209	<0.00175	<0.00500	0.00606	0.0359	0.014	<0.0191	0.00568	<0.00500	<0.00180	0.0482
	RW-12R	Apr-17		<0.00130	<0.00209	0.00214 J	<0.00500	0.00823	0.0591	0.0239	<0.0191	0.00210 J	0.00877 J	<0.00180	0.0809
	RW-13R	Apr-16		<0.000260	<0.000418	0.000561 J	<0.00100	0.0691	0.0117	0.0939	<0.00382	0.0779	0.0148	0.00124	0.0183
	RW-18	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	RW-18	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	RW-18	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	RW-18	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	RW-20	Apr-15		<0.00260	<0.00420	0.00401 J	**<0.0100**	**0.973**	0.0456	1.3	<0.0380	**0.209**	**0.183**	0.00846 J	0.098
	RW-22	Apr-15		<0.00260	<0.00420	0.00521 J	**<0.0100**	**1.09**	0.0525	0.85	<0.0380	**0.178**	**0.164**	0.00856 J	0.103
North Refinery	MW-23	Apr-15		<0.00650	**<0.0100**	<0.00880	**<0.0250**	0.146	0.0652	1.19	<0.0960 J	0.0253	**0.150** J	<0.00900	0.0952
	MW-23	Oct-15		<0.000260	<0.000418	0.000898 J	<0.00100	0.519	0.121	0.00568	<0.00382	0.0200	**0.213** J	0.0134	0.181
	MW-23	Apr-16		<0.00130	<0.00209	<0.00175	<0.00500	0.179	0.161	0.0147	<0.0191	0.0297	**0.193**	0.0254	0.268
	MW-23	Oct-16		<0.00650	**<0.0104**	<0.00875	**<0.0250**	0.168	0.124	<0.0180	<0.0955	0.0433	**0.220**	0.0257	0.216
	MW-23	Apr-17		<0.000260	<0.000418	0.000602 J	<0.00100	0.0958	0.144	0.00361	<0.00382	0.0270	**0.190**	0.0169	0.137
	MW-23	Oct-17		<0.000260	<0.000418	0.000379 J	<0.00100	0.0421	0.125	0.00327	<0.00382	0.0203	**0.137**	0.0136	0.169
	MW-29	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	0.00109	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-29	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000961 J	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-29	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-29	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000398 J	<0.000719	<0.00382	0.000424 J	<0.00100	<0.000361	<0.000349
	MW-29	Apr-17		<0.000260	<0.000418	0.00281	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-29	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000739 J	<0.000719	<0.00382	0.000990 J	<0.00100	<0.000361	<0.000349
	MW-39	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	0.000713 J	0.00675	0.00121	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-39	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	0.000727 J	0.006	0.00115	<0.00382	<0.000367	0.00583	<0.000361	<0.000349
	MW-39	Apr-16		<0.00650	**<0.0104**	<0.00875	**<0.0250**	0.0211 J	0.0339	0.145	<0.0955	<0.00918	<0.0250	<0.00902	0.0386
	MW-39	Oct-16		<0.0260	**<0.0418**	<0.0350	**<0.100**	<0.0384	0.0418 J	0.161	<0.382	<0.0367	**<0.100**	<0.0361	0.0499 J
	MW-39	Apr-17		<0.00260	<0.00418	<0.00350	**<0.0100**	0.0284	0.0449	0.141	<0.0382	0.00429 J	0.0158 J	0.00439 J	0.0579
	MW-39	Oct-17		<0.000260	<0.000418	0.00232	<0.00100	0.0206	0.0369	0.113	<0.00382	0.00243	0.00239 J	0.00371	0.0449
	MW-40	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	0.047	0.0056 J	<0.00100	<0.000600	0.00280 J	<0.00100	0.0062
	MW-40	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	0.000399 J	0.0308	0.00606	<0.00380	<0.000370	<0.00100	<0.000360	0.00319
	MW-40	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	0.000609 J	0.0775	0.0144	<0.00382	<0.000367	<0.00100	0.00077 J	0.00468
	MW-40	Apr-17		<0.000260	<0.000418	0.000356 J	<0.00100	0.000721 J	0.0804	0.0117	<0.00382	<0.000367	<0.00100	<0.000361	0.00806
	MW-41	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	0.014	<0.000600	<0.00100	0.00360 J	0.00260 J	<0.00100	<0.000500
	MW-41	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	0.00844	<0.000720	<0.00380	0.00440	<0.00100	<0.000360	<0.000350
	MW-41	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.017	<0.000719	<0.00382	0.00384	<0.00100	<0.000361	0.00125
	MW-41	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0148	<0.000719	<0.00382	0.00380	<0.00100	<0.000361	0.000572 J
	MW-42	Apr-14		<0.00060	<0.000600	0.0011 J	<0.00100	0.00300 J	0.039	0.11	<0.00100	0.0220	0.00430 J	<0.00100	0.033
	MW-42	Apr-15		<0.00260	<0.00420	<0.00350	**0.0106** J	<0.00380	0.0326	0.0484	<0.0380	0.0145	<0.0100	<0.00360	0.0205
	MW-42	Apr-16		<0.00130	<0.00209	<0.00175	<0.00500	<0.00192	0.0325	0.038	<0.00382	0.0114	<0.00500	<0.00180	0.0138
	MW-42	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0278	0.00365	<0.0191	0.0104	<0.00100	<0.000361	0.00355
	MW-43	Apr-15		<0.00260	<0.00420	<0.00350	**<0.0100** J	0.0483	0.0617	0.278	<0.0380 J	0.0162	<0.0100 J	0.00396 J	0.0702
	MW-43	Oct-15		<0.00260	<0.00418	<0.00350	**<0.0100**	0.179	0.0642	1.15	<0.0382	0.0274	**0.212**	0.00458 J	0.0949
	MW-43	Apr-16		<0.0650	**<0.104**	<0.0875	**<0.250**	**0.968**	<0.0815	1.23	<0.955	<0.0918	**<0.250**	<0.0902	0.11 J
	MW-43	Oct-16		<0.0650	**<0.104**	<0.0875	**<0.250**	**0.810**	<0.0815	1.26	<0.955	<0.0918	**<0.250**	<0.0902	0.0908 J
	MW-43	Apr-17		<0.0130	**<0.0209**	<0.0175	**<0.0500**	0.445	0.0668	1.26	<0.191	0.0484 J	**0.163** J	<0.0180	0.112
	MW-43	Oct-17		<0.0130	**<0.0209**	<0.0175	**<0.0500**	0.197	0.0878	1.34	<0.191	0.0578	**0.305**	0.0299 J	0.164
	MW-59	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	0.0061	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	0.00066 J
	MW-59	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	0.00736	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	0.000389 J
	MW-59	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0111	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	0.000518 J
	MW-59	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0175	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	0.000538 J
	MW-60	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	0.000627 J	0.0148 J	0.0028	<0.00380	<0.000370	<0.00100	<0.000360	0.00228
	MW-60	Apr-15	FD	<0.000260	<0.000420	<0.000350	<0.00100	0.000450 J	0.00798 J	0.00163	<0.00380	<0.000370	<0.00100	<0.000360	0.00113
	MW-60	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	0.000394 J	0.0182	0.00176	<0.00382	<0.000367	<0.00100	<0.000361	0.0012
	MW-60	Oct-15	FD	<0.000260	<0.000418	<0.000350	<0.00100	0.000395 J	0.0179	0.00181	<0.00382	<0.000367	<0.00100	<0.000361	0.00128
	MW-60	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	0.000604 J	0.0194	0.00283	<0.00382	<0.000367	<0.00100	<0.000361	0.00162
	MW-60	Apr-16	FD	<0.000260	<0.000418	<0.000350	<0.00100	0.000533 J	0.0162	0.00272	<0.00382	<0.000367	<0.00100	<0.000361	0.00159

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds												
				Analyte:	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Cymene	Dichloromethane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methyl N-Butyl Ketone	MTBE	Naphthalene	N-Butylbenzene	N-Propylbenzene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.07	0.0047	---	0.005	0.7	0.447	---	---	0.143	0.03	---	---
				CGWSL Source:	USEPA MCL	USEPA TW		USEPA MCL	USEPA MCL	WQCC TW			WQCC TW	WQCC HH		
Area	**Well ID**	**Date**	**Dup**													
North Refinery	MW-60	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	0.000935 J	0.0182	0.00736	<0.00382	<0.000367	<0.00100	0.000962 J	0.00398
	MW-60	Oct-16	FD	<0.000260	<0.000418	<0.000350	<0.00100	0.000825 J	0.0169	0.00552	<0.00382	<0.000367	<0.00100	0.000804 J	0.00274
	MW-60	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	0.000481 J	0.0178	0.00195 J	<0.00382	<0.000367	<0.00100	<0.000361	0.00101
	MW-60	Apr-17	FD	<0.000260	<0.000418	<0.000350	<0.00100	0.000556 J	0.0174	0.0024	<0.00382	<0.000367	<0.00100	<0.000361	0.00135
	MW-60	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	0.00137	0.0204	0.00622	<0.00382	<0.000367	<0.00100	<0.000361	0.0022
	MW-60	Oct-17	FD	<0.000260	<0.000418	<0.000350	<0.00100	0.00121	0.0182	0.00514	<0.00382	<0.000367	<0.00100	<0.000361	0.00193
	MW-61	Apr-15		<0.00260	<0.00420	0.00425 J	**<0.0100** J	0.209	0.122	1.68	<0.0380 J	<0.00370	**0.176** J	0.00782 J	0.201
	MW-61	Oct-15		<0.00260	<0.00418	0.00467 J	**<0.0100**	0.0659	0.107	0.369	<0.0382	<0.00367	**0.0668**	0.00529 J	0.137
	MW-61	Apr-16		<0.00130	<0.00209	0.00375 J	<0.00500	0.0292	0.0787	0.223	<0.0191	<0.00184	**0.0340**	0.00378 J	0.11
	MW-61	Oct-16		<0.00650	**<0.0104**	<0.00875	**<0.0250**	0.0353	0.104	0.225	<0.0955	<0.00918	**0.0335** J	<0.00902	0.145
	MW-61	Apr-17		<0.00650	**<0.0104**	<0.00875	**<0.0250**	0.0225 J	0.086	0.228	<0.0955	<0.00918	**0.0307** J	<0.00902	0.131
	MW-61	Oct-17		<0.000260	<0.000418	0.0057	<0.00100	0.0420	0.114	0.375	<0.00382	<0.000367	**0.0522**	0.00713	0.157
	MW-62	Apr-15		<0.00260	<0.00420	<0.00350	**<0.0100** J	0.457	0.112	0.0405	<0.0380 J	0.0151	**0.158** J	0.00986 J	0.167
	MW-62	Oct-15		<0.00520	**<0.00836**	<0.00700	**<0.0200**	0.163	0.138	1.72	<0.0764	<0.00734	**0.186**	0.00854 J	0.244
	MW-62	Apr-16		<0.00650	**<0.0104**	<0.00875	**<0.0250**	0.356	0.0729	1.8	<0.0955	<0.00918	**0.236**	<0.00902	0.132
	MW-62	Oct-16		<0.0260 J6	**<0.0418** J6	<0.0350 J6	**<0.100**	0.0535 JJ6	0.123 J6	1.14 J6	<0.382 J6	<0.0367 J6	**0.189** JJ6	<0.0361 J6	0.234 J6
	MW-62	Apr-17		<0.0130	**<0.0209**	<0.0175	**<0.0500**	0.248	0.107	1.13	<0.191	<0.0184	**0.204** J	<0.0180	0.22
	MW-62	Oct-17		<0.0260	**<0.0418**	<0.0350	**<0.100**	0.268	0.113	1.35	<0.382	<0.0367	**0.206** J	<0.0361	0.201
	MW-67	Apr-15		0.00198	<0.000420	0.00131	<0.00100	0.00447	0.0376	0.00291	<0.00380	**0.869**	<0.00100	0.00452	0.0234
	MW-67	Oct-15		<0.00520	**<0.00836**	<0.00700	**<0.0200**	<0.00768	0.0301	<0.0144	<0.0764	**0.924**	<0.0200	<0.00722	<0.00698
	MW-67	Apr-16		0.00527 J	<0.00418	<0.00341	**<0.0100**	0.00869 J	0.0321	<0.00719	<0.0382	**0.359**	<0.0100	<0.00361	0.012
	MW-67	Oct-16		0.00322 J	<0.00418	<0.00350	**<0.0100**	0.0124	0.0346	0.00797 J	<0.0382	**0.253**	0.0298 J	<0.00361	0.0167
	MW-67	Apr-17		0.00265	<0.00209	0.00186 J	<0.00500	0.0128	0.0361	0.0121	<0.0191	**0.195**	0.00571 J	0.00516	0.0225
	MW-67	Oct-17		0.00275	<0.000418	0.000487 J	<0.00100	0.00330	0.03	0.00245	<0.00382	**0.201**	<0.00100	0.00196	0.00976
	MW-90	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	0.000433 J	0.0185	<0.000720	<0.00380	0.00575	0.00178 J	<0.000360	0.00291
	MW-90	Oct-15		<0.000260	<0.000418	0.000725 J	<0.00100	<0.000384	0.0095	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	0.000834 J
	MW-90	Apr-16		0.000294 J	<0.000418	<0.000350	<0.00100	<0.000384	0.00803	<0.000719	<0.00382	<0.000367	0.00105 J	<0.000361	0.00142
	MW-90	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000752 J	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-90	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.018	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	0.00336
	MW-90	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0337	<0.000719	<0.00382	<0.000367	<0.00100	0.000443 J	0.00447
	MW-91	Apr-15		<0.00260	<0.00420	0.00398 J	**<0.0100**	0.491	0.0876	0.702	<0.0380	<0.00370	**0.0490** J	<0.00360	0.0882
	MW-91	Oct-15		<0.00650	**<0.0104**	<0.00875	**<0.0250**	0.449	0.108	0.753	<0.0955	<0.00918	**0.0884** J	<0.00902	0.119
	MW-91	Apr-16		<0.0130	**<0.0209**	<0.0175	**<0.0500**	**0.899**	0.118	1.33	<0.191	<0.0184	**0.124** J	<0.0180	0.14
	MW-91	Oct-16		<0.0650	**<0.104**	<0.0875	**<0.250**	**0.816**	0.109 J	1.27	<0.955	<0.0918	**<0.250**	<0.0902	0.113 J
	MW-91	Apr-17		<0.0260	**<0.0418**	<0.0350	**<0.100**	0.473	0.108	0.832	<0.382	<0.0367	**<0.100**	<0.0361	0.114
	MW-91	Oct-17		<0.0260	**<0.0418**	<0.0350	**<0.100**	0.384	0.116	0.756	<0.382	<0.0367	**<0.100**	<0.0361	0.115
	MW-92	Apr-16		0.0640	<0.000418	0.00344	<0.00100	0.462	0.0373	0.161	<0.00382	0.113	**0.224** J	0.00634	0.051
	MW-92	Oct-16		**0.0968**	**<0.00836**	<0.00700	**<0.0200**	0.400	0.0242	0.0947	<0.0764	0.134	**0.174**	<0.00722	0.0329
	MW-93	Apr-15		<0.00260	<0.00420	0.00479 J	**<0.0100** J	0.0675	0.0425	0.31	<0.0380 J	<0.00370	**0.0554** J	0.00461 J	0.0625
	MW-93	Oct-15		<0.00260	<0.00418	<0.00350	**<0.0100**	0.0717	0.0518	0.483	<0.0382	<0.00367	**0.100**	0.00496 J	0.0743
	MW-93	Apr-16		<0.00130	<0.00209	<0.00175	<0.00500	0.0106	0.0119	0.0567	<0.0191	<0.00184	0.0113 J	<0.00180	0.00919
	MW-93	Oct-16		<0.00260	<0.00418	<0.00350	**<0.0100**	0.0114	0.0258	0.25	<0.0382	<0.00367	**0.0326** J	<0.00361	0.0309
	MW-93	Apr-17		<0.00650	**<0.0104**	<0.00875	**<0.0250**	<0.00960	0.0355	0.326	<0.0955	<0.00918	**0.0422** J	<0.00902	0.0491
	MW-94	Oct-15		<0.00260	<0.00418	0.0301	**<0.0100**	0.509	0.0646	0.214	<0.0382	**0.798**	**0.202**	0.0219	0.0923
	MW-94	Apr-16		0.0149 J	**<0.0209**	<0.0175	**<0.0500**	0.553	0.0776	0.228	<0.191	**0.621**	**0.228** J	0.0379 J	0.12
	MW-94	Oct-16		<0.00130	<0.00209	0.0163	<0.00500	0.564	0.0705	0.202	<0.0191	**2.01**	**0.128**	0.0207	0.104
	MW-94	Apr-17		<0.00650	**<0.0104**	0.0477	**<0.0250**	0.432	0.0621	0.168	<0.0955	**0.958**	**0.174**	0.0553	0.0909
	MW-95	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	0.0058	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	MW-95	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	0.007	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-95	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0101	<0.000719	<0.00382	0.000379 J	<0.00100	<0.000361	<0.000349
	MW-95	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0114	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-96	Apr-15		<0.000260	<0.000420	0.000719 J	<0.00100	0.00172	0.055	0.00438	<0.00380	**35.0**	0.00126 J	0.00185	0.0395
	MW-96	Oct-15		**<0.130**	**<0.209**	<0.175	**<0.500**	<0.192	<0.163	<0.360	<1.91	**39.2**	**<0.500**	<0.180	<0.174
	MW-96	Apr-16		<0.00520	**<0.00836**	<0.00700	**<0.0200**	<0.00768	0.0853	<0.0144	<0.0764	**32.9**	<0.0200	<0.00722	0.0861
	MW-96	Oct-16		<0.0130	**<0.0209**	<0.0175	**<0.0500**	<0.0192	0.0675	<0.0360	<0.191	**39.6**	**<0.0500**	<0.0180	0.0551
	MW-96	Apr-17		<0.0130	**<0.0209**	<0.0175	**<0.0500**	<0.0192	0.0837	<0.0360	<0.191	**30.6**	**<0.0500**	<0.0180	0.0765
	MW-96	Oct-17		<0.0130	**<0.0209**	<0.0175	**<0.0500**	<0.0192	0.0852	<0.0360	<0.191	**40.0**	**<0.0500**	<0.0180	0.0664
	MW-98	Apr-15		<0.00650	**<0.0100**	<0.00880	**<0.0250** J	**0.927**	0.0716	1.7	<0.0960 J	<0.00920	**0.174** J	<0.00900	0.0968
	MW-98	Oct-15		<0.00650	**<0.0104**	<0.00875	**<0.0250**	0.659	0.0781	1.68	<0.0955	<0.00918	**0.237**	<0.00902	0.0981
	MW-98	Apr-16		<0.0260	**<0.0418**	<0.0350	**<0.100**	0.430	0.0409 J	0.865	<0.382	<0.0367	**0.139** J	<0.0361	0.0527 J
	MW-98	Oct-16		<0.0260	**<0.0418**	<0.0350	**<0.100**	0.698	0.071 J	1.37	<0.382	<0.0367	**<0.100**	<0.0361	0.08 J
	MW-98	Apr-17		<0.0260	**<0.0418**	<0.0350	**<0.100**	**1.05**	0.0745 J	1.84	<0.382	<0.0367	**0.239** J	<0.0361	0.111
	MW-98	Oct-17		<0.0130	**<0.0209**	<0.0175	**<0.0500**	**1.26**	0.0983	2.16	<0.191	<0.0184	**0.245** J	0.0211 J	0.134
	MW-137	Oct-15		<0.0260	**<0.0418**	<0.0350	**<0.100**	**1.59**	0.0997 J	0.681	<0.382	0.0606 J	**0.215** J	<0.0361	0.143
	MW-137	Apr-16		<0.0650	**<0.104**	<0.0875	**<0.250**	**1.65**	0.104 J	0.694	<0.955	<0.0918	**0.262** J	<0.0902	0.159 J
	MW-137	Oct-16		<0.0650	**<0.104**	<0.0875	**<0.250**	**1.54**	0.0962 J	0.757	<0.955	<0.0918	**<0.250**	<0.0902	0.136 J
	MW-137	Apr-17		<0.0520	**<0.0836**	<0.0700	**<0.200**	**1.58**	0.0899 J	0.727	<0.764	<0.0734	**0.272** J	<0.0722	0.142 J
	MW-137	Oct-17		<0.0520	**<0.0836**	<0.0700	**<0.200**	**1.53**	0.113 J	0.891	<0.764	0.0754 J	**0.317** J	<0.0722	0.18 J
	MW-138	Oct-15		<0.00520	**<0.00836**	<0.00700	**<0.0200**	0.569	0.0684	0.0339	<0.0764	0.0926	**0.0894** J	0.00966 J	0.0973
	MW-138	Apr-16		<0.00260	<0.00418	<0.00341	**<0.0100**	0.309	0.0759	0.00736 J	<0.0382	0.0955	**0.0959**	0.00732 J	0.0867
	MW-138	Oct-16		<0.00260	<0.00418	<0.00350	**<0.0100**	0.0149	0.064	<0.00719	<0.0382	0.0935	**0.0364** J	<0.00361	0.0664
	MW-138	Apr-17		<0.00260	<0.00418	<0.00350	**<0.0100**	0.0167	0.0602	<0.00719	<0.0382	0.125	**0.0639**	0.00404 J	0.0674
	MW-138	Oct-17		<0.00130	<0.00209	<0.00175	<0.00500	0.0244	0.0579	0.00565 J	<0.0191	**0.163**	**0.0635**	0.00606	0.0697
	RW-1	Apr-15		**1.02**	**<0.0210**	<0.0180	**<0.0500**	0.0470 J	<0.0160	0.0365 J	<0.190	<0.0180	**<0.0500**	<0.0180	0.0175 J
	RW-1R	Apr-16		**2.14**	<0.000418	<0.000350	<0.00100	0.0214	<0.000326	0.0111	<0.00382	0.0133	0.00762	0.000511 J	0.00513
	RW-1R	Apr-17		**0.624**	<0.00418	<0.00350	**<0.0100**	0.0169	0.00424 J	0.00743 J	<0.0382	0.0441	<0.0100	0.00401 J	0.00361 J
	RW-2	Apr-15		**0.619**	<0.00420	0.00554 J	**<0.0100** J	**1.02**	0.0551	0.445	<0.0380 J	<0.00370	**0.157** J	0.0106	0.0813
	RW-2R	Apr-16		**0.555**	**<0.0209**	<0.0175	**<0.0500**	0.591	0.0332 J	0.253	<0.191	0.0226 J	**0.145** J	<0.0180	0.0412 J
	RW-2R	Apr-17		**0.828**	**<0.0209**	<0.0175	**<0.0500**	**0.837**	0.0533	0.413	<0.191	<0.0184	**0.145** J	<0.0180	0.0816
	RW-7	Apr-15		<0.000260	<0.000420	0.00705	<0.00100	0.0185	0.0362	0.035	<0.00380	0.0122	0.0112	0.0066	0.0441
	RW-7R	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0687	<0.00100	<0.000361	<0.000349
	RW-7R	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0325	<0.00100	<0.000361	<0.000349
	RW-8	Apr-15		<0.00260	<0.00420	<0.00350	**0.0113** J	0.00801 J	0.0204	<0.00720	<0.0380	**2.41**	<0.0100	<0.00360	0.00788 J
	RW-8	Apr-17		0.000478 J	<0.000418	0.00735	<0.00100	0.0198	0.0193	0.0386	<0.00382	**1.94**	**0.0320**	0.00837	0.0191
	RW-9	Apr-14		<0.00060	<0.000600	0.0013 J	<0.00100	0.00150 J	0.1	0.024	<0.00100	0.00340 J	0.00750	0.0099	0.035
	RW-9	Apr-15		<0.0130	**<0.0210**	<0.0180	**0.0564** J	<0.0190	0.0643	<0.0360	<0.190	<0.0180	**<0.0500**	<0.0180	0.0179 J
	RW-9	Apr-16		<0.00130	<0.00209	<0.00175	<0.00500	0.00775	0.0698	0.0708	<0.0191	0.00656	0.00554 J	0.00303 J	0.0367
	RW-9	Apr-17		<0.000260	<0.000418	0.000668 J	<0.00100	0.00105	0.0868	0.0193	<0.00382	0.00435	<0.00100	<0.000361	0.00499
	RW-10	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	RW-10	Apr-15		<0.000260	<0.000420	<0.000350	0.0012 J	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	RW-10	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	RW-10	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	0.000403 J	0.00399	0.000792 J	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	RW-16	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	0.00087 J	<0.000600	<0.00100	0.0130	<0.000700	<0.00100	<0.000500
	RW-16	Apr-14	FD	<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	0.00084 J	<0.000600	<0.00100	0.0120	<0.000700	<0.00100	<0.000500
	RW-16	Apr-15		<0.000260	<0.000420	<0.000350	0.00114 J	<0.000380	<0.000330	<0.000720	<0.00380	0.0190	<0.00100	<0.000360	<0.000350
	RW-16	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0186	<0.00100	<0.000361	<0.000349
	RW-16	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0152	<0.00100	<0.000361	<0.000349
	RW-17	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	0.00310 J	<0.000700	<0.00100	<0.000500
	RW-17	Apr-15		<0.000260	<0.000420	<0.000350	0.00112 J	<0.000380	<0.000330	<0.000720	<0.00380	0.00772	<0.00100	<0.000360	<0.000350
	RW-17	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	**0.195**	<0.00100	<0.000361	<0.000349
	RW-17	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	**0.189**	<0.00100	<0.000361	<0.000349

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds												
				Analyte:	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Cymene	Dichloromethane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methyl N-Butyl Ketone	MTBE	Naphthalene	N-Butylbenzene	N-Propylbenzene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.07	0.0047	---	0.005	0.7	0.447	---	---	0.143	0.03	---	---
				CGWSL Source:	USEPA MCL	USEPA TW		USEPA MCL	USEPA MCL	WQCC TW			WQCC TW	WQCC HH		
Area	**Well ID**	**Date**	**Dup**													
North RO Reject Field	MW-117	Apr-15		<0.000260	<0.000420	0.00179	<0.00100	<0.000380	<0.000330	0.00135	<0.00380	<0.000370	0.00150 J	<0.000360	<0.000350
	MW-117	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-117	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-117	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100 J4	<0.000361	<0.000349
	MW-117	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-117	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-118	Apr-15		<0.000260	<0.000420	0.000657 J	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-118	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-118	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-118	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100 J4	<0.000361	<0.000349
	MW-118	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-118	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-119	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-119	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-119	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-119	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100 J4	<0.000361	<0.000349
	MW-119	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-119	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
NCL	MW-18	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	MW-18	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-18	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-18	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-45	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.00356	<0.00100	<0.000360	<0.000350
	MW-45	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00268	<0.00100	<0.000361	<0.000349
	MW-45	Apr-16		<0.000418	<0.000418	<0.000326	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00152	<0.00100	<0.000361	<0.000349
	MW-45	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00206	<0.00100	<0.000361	<0.000349
	MW-45	Apr-17		0.00152	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00316	<0.00100	<0.000361	<0.000349
	MW-45	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00305	<0.00100	<0.000361	<0.000349
	MW-53	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	MW-53	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-53	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-53	Apr-17		0.000391 J	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-54A	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-54A	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-54A	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-54A	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-54A	Apr-17		0.000888 J	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-54A	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-54B	Apr-13		<0.00500	**<0.00500**	<0.00500	**<0.0100**	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	MW-54B	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-54B	Apr-17		0.000616 J	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-55	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-55	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00433	<0.00100	<0.000361	<0.000349
	MW-55	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0163	<0.00100	<0.000361	<0.000349
	MW-55	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00521	<0.00100	<0.000361	<0.000349
	MW-55	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0535	<0.00100	<0.000361	<0.000349
	MW-55	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0390	<0.00100	<0.000361	<0.000349
	MW-56	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.0129	<0.00100	<0.000360	<0.000350
	MW-56	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00975	<0.00100	<0.000361	<0.000349
	MW-56	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0160	<0.00100	<0.000361	<0.000349
	MW-56	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00819	<0.00100	<0.000361	<0.000349
	MW-56	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0222	<0.00100	<0.000361	<0.000349
	MW-108	Apr-15		<0.00260	<0.00420	<0.00350	**<0.0100**	0.0101	0.033	0.0665	<0.0380	<0.00370	0.0113 J	<0.00360	0.0311
	MW-108	Oct-15		<0.00260	<0.00418	<0.00350	**<0.0100**	0.00812 J	0.0345	0.081	<0.0382	<0.00367	0.0166 J	<0.00361	0.0346
	MW-108	Apr-16		<0.0130	**<0.0209**	<0.0175	**<0.0500**	<0.0192	0.036 J	0.0795	<0.00382	<0.0184	**<0.0500**	<0.0180	0.038 J
	MW-108	Oct-16		<0.00650	**<0.0104**	<0.00875	**<0.0250**	<0.00960	0.0293	0.0721	<0.0955	<0.00918	<0.0250	<0.00902	0.0319
	MW-108	Apr-17		<0.00650	**<0.0104**	<0.00875	**<0.0250**	<0.00960	0.0384	0.0815	<0.0955	<0.00918	<0.0250	<0.00902	0.0396
	MW-108	Oct-17		<0.00130	<0.00209	0.0021 J	<0.00500	0.00404 J	0.0249	0.0602	<0.0191	<0.00184	0.00744 J	0.00296 J	0.0263
	NCL-31	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	0.000622 J	<0.000720	<0.00380	0.000497 J	<0.00100	<0.000360	<0.000350
	NCL-31	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00689	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-31	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000678 J	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-31	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00483	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-31	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0018	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-31	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-32	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	NCL-32	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000476 J	<0.00100	<0.000361	<0.000349
	NCL-32	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000751 J	<0.00100	<0.000361	<0.000349
	NCL-32	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.000385 J	<0.00100	<0.000361	<0.000349
	NCL-32	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-32	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-33	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.000806 J	<0.00100	<0.000360	<0.000350
	NCL-33	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100 J	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-33	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-33	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-33	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-33	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-34A	Apr-15		<0.000260	<0.000420	0.00696	<0.00100	0.00565	0.0929	0.094	<0.00380	<0.00730	0.00636	0.00713	0.101
	NCL-34A	Oct-15		<0.000260	<0.000418	0.00732	<0.00100	0.00215	0.0851	0.0653	<0.00382	0.00168	<0.00100	0.00646	0.0857
	NCL-34A	Apr-16		<0.0130	**<0.0209**	<0.0175	**<0.0500**	0.0758	0.1	0.188	<0.0382	<0.0184	**<0.0500**	<0.0180	0.112
	NCL-34A	Oct-16		<0.0260	**<0.0418**	<0.0350	**<0.100**	<0.0384	0.0901 J	0.111	<0.382	<0.0367	**<0.100**	<0.0361	0.0971 J
	NCL-34A	Apr-17		<0.0130	**<0.0209**	<0.0175	**<0.0500**	<0.0192	0.0914	0.1	<0.191	<0.0184	**<0.0500**	<0.0180	0.101
	NCL-34A	Oct-17		<0.000260	<0.000418	0.00832	<0.00100	0.00230	0.109	0.0762	<0.00382	0.000379 J	0.00132 J	0.00733	0.112
	NCL-44	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	0.000652 J	<0.000720	<0.00380	0.000410 J	<0.00100	<0.000360	<0.000350
	NCL-44	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000446 J	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-44	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00618	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-44	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00177	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-44	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.0013	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-44	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00115	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-49	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	NCL-49	Apr-15	FD	<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	NCL-49	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-49	Oct-15	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-49	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-49	Apr-16	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-49	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-49	Oct-16	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-49	Apr-17		0.000449 J	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-49	Apr-17	FD	0.000303 J	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-49	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NCL-49	Oct-17	FD	<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Cymene	Dichloromethane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methyl N-Butyl Ketone	MTBE	Naphthalene	N-Butylbenzene	N-Propylbenzene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.07	0.0047	---	0.005	0.7	0.447	---	---	0.143	0.03	---	---
				CGWSL Source:	USEPA MCL	USEPA TW		USEPA MCL	USEPA MCL	WQCC TW			WQCC TW	WQCC HH		
Area	Well ID	Date	Dup													
South Refinery	KWB-2R	Apr-15		<0.00260	<0.00420	0.00468 J	**<0.0100**	**0.992**	0.0698	0.224	<0.0380	0.0186	0.0260 J	0.0073 J	0.119
	KWB-2R	Oct-15		<0.0260	**<0.0418**	<0.0350	**<0.100**	**1.72**	0.0921 J	0.448	<0.382	<0.0367	**<0.100**	<0.0361	0.169
	KWB-2R	Apr-16		<0.000260	<0.000418	0.000603 J	<0.00100	0.0483	0.0187	0.0496	<0.00382	0.0231	0.00806	0.00205	0.0314
	KWB-2R	Oct-16		<0.000260	<0.000418	0.000596 J		0.0130	0.033	0.027	<0.00382	0.0184	0.00440 J	0.00303	0.0544
	KWB-2R	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	0.00543	0.00816	0.0273	<0.00382	0.0192	0.00609	<0.000361	0.0121
	KWB-2R	Oct-17		<0.000260	<0.000418	0.00198	<0.00100	0.325	0.0635	0.183	<0.00382	0.0202	**0.0675**	0.00453	0.111
	KWB-5	Apr-15		<0.000260	<0.000420	0.000613 J	<0.00100	0.0395	0.0146	0.0323	<0.00380	<0.000370	**0.0392**	0.0022	0.0226
	KWB-5	Oct-15		<0.000260	<0.000418	0.000434 J	<0.00100	0.0151	0.0161	0.0135	<0.00382	**10.7**	0.0156	0.00173	0.0276
	KWB-5	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	0.00678	0.0105	0.0123	<0.0191	**12.6**	0.0114	0.00148	0.0181
	KWB-5	Oct-16		<0.00130	<0.00209	<0.00175	<0.00500	<0.00192	0.0086	<0.00360	<0.0764	**9.88**	0.00511 JJ4	<0.00180	0.0132
	KWB-5	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	0.0103	0.0138	0.0387	<0.00382	**8.84**	**0.0302**	0.00176	0.0247
	KWB-5	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.0960	0.00852	<0.180	<0.00382	**12.4**	0.0131	0.00118	0.0134
	KWB-6	Apr-15		<0.00650	**<0.0100**	<0.00880	**<0.0250**	**2.04**	0.0738	2.71	<0.0960	0.119	**0.239**	<0.00900	0.121
	KWB-6	Oct-15		**<0.130**	**<0.209**	<0.175	**<0.500**	**0.831**	<0.163	1.03	<1.91	**9.07**	**<0.500**	<0.180	<0.174
	KWB-6	Apr-16		<0.00130	<0.00209	0.00591	<0.00500	**0.799**	0.0477	1.64	<0.0191	0.138	**0.137**	0.00837	0.0883
	KWB-6	Oct-16		<0.00520	**<0.00836**	<0.00700	**<0.0200**	0.241	0.0173 J	0.394	<0.0764	0.135	**0.0549** J	<0.00722	0.032
	KWB-6	Apr-17		<0.00130	<0.00209	0.0045 J	<0.00500	0.346	0.0344	0.373	<0.0191	**0.154**	**0.0563**	0.00434 J	0.0737
	KWB-6	Oct-17		<0.000260	<0.000418	0.00825	<0.00100	0.183	0.0199	0.275	<0.00382	0.102	**0.0436**	<0.000361	0.0386
	MW-28	Apr-15		<0.0260	**<0.0420**	<0.0350	**<0.100**	0.0625 J	0.0689 J	0.194	<0.380	**1.33**	**<0.100**	<0.0360	0.0744 J
	MW-28	Oct-15		<0.0260	**<0.0418**	<0.0350	**<0.100**	0.0441 J	0.0671 J	0.243	<0.382	**1.11**	**<0.100**	<0.0361	0.089 J
	MW-28	Apr-16		<0.00260	<0.00418	<0.00341	**<0.0100**	0.0276	0.0433	0.156	<0.0382	**0.261**	0.0247 J	<0.00361	0.0577
	MW-28	Oct-16		<0.0130	**<0.0209**	<0.0175	**<0.0500**	0.0796	0.0876	0.338	<0.191	**0.630**	**0.0504** J	0.0552	0.117
	MW-28	Apr-17		<0.0130	**<0.0209**	<0.0175	**<0.0500**	0.0489 J	0.0613	0.238	<0.191	**0.423**	**0.0668** J	<0.0180	0.0909
	MW-28	Oct-17		<0.0130	**<0.0209**	<0.0175	**<0.0500**	0.0578	0.052	0.216	<0.191	**0.158**	**<0.0500**	<0.0180	0.0638
	MW-48	Apr-15		<0.00260	<0.00420	<0.00350	**<0.0100**	0.158	0.0361	0.143	<0.0380	**0.223**	0.0245 J	<0.00360	0.0478
	MW-48	Oct-15		<0.00130	<0.00209	0.00472 J	<0.00500	0.0655	0.0549	0.119	<0.0191	**0.832**	0.0128 J	0.0065	0.0857
	MW-48	Apr-16		<0.00520	**<0.00836**	<0.00700	**<0.0200**	**0.790**	0.067	0.671	<0.0764	**0.326**	**0.101**	<0.00722	0.0983
	MW-48	Oct-16		<0.00130	<0.00209	0.0052	<0.00500	0.448	0.0689	0.502	<0.0191	**0.851**	**0.0832**	0.00827	0.111
	MW-48	Apr-17		<0.0130	**<0.0209**	<0.0175	**<0.0500**	**1.27**	0.0828	1.04	<0.191	**0.214**	**0.224** J	<0.0180	0.144
	MW-48	Oct-17		<0.000260	<0.000418	0.00678	<0.00100	**0.917**	0.0884	0.705	<0.00382	**0.263**	**0.138**	0.0102	0.137
	MW-50	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.00219	<0.00100	<0.000360	<0.000350
	MW-50	Oct-15		<0.000260 J	<0.000418 J	<0.000350 J	<0.00100	<0.000384 J	<0.000326 J	<0.000719 J	<0.00382	<0.000367	<0.00100 J	<0.000361 J	<0.000349
	MW-50	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-50	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-50	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-50	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-52	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-52	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100 J	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-52	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-52	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-52	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-52	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-64	Apr-16		<0.0130	**<0.0209**	<0.0175	**<0.0500**	**3.11**	0.0817	5.26	<0.00382	**0.666**	**0.195** J	<0.0180	0.122
	MW-64	Oct-16		<0.0260	**<0.0418**	<0.0350	**<0.100**	**2.61**	0.0602 J	3.79	<0.00382	**0.531**	**0.140** J	<0.0361	0.0878 J
	MW-64	Apr-17		<0.0650	**<0.104**	<0.0875	**<0.250**	**3.35**	0.0986 J	5.49	<0.955	**0.408**	**<0.250**	<0.0902	0.146 J
	MW-64	Oct-17		<0.0650	**<0.104**	<0.0875	**<0.250**	**3.20**	0.0919 J	4.57	<0.955	**0.484**	**<0.250**	<0.0902	0.12 J
	MW-65	Apr-15		<0.00260	<0.00420	<0.00350	**<0.0100**	**1.03**	0.0578	0.135	<0.0380	**3.22**	**0.239**	0.0101	0.085
	MW-65	Apr-16		<0.00260	<0.00418	<0.00341	**<0.0100**	0.288	0.0444	0.0822	<0.00382	**3.71**	**0.155**	0.00732 J	0.0577
	MW-65	Oct-16		<0.00520	**<0.00836**	<0.00700	**<0.0200**	0.0574	0.045	0.0205 J	<0.00382	**2.70**	**0.194**	0.00791 J	0.0628
	MW-65	Apr-17		<0.0260	**<0.0418**	<0.0350	**<0.100**	0.0768 J	0.0479 J	0.0736 J	<0.382	**2.27**	**0.205** J	<0.0361	0.0493 J
	MW-65	Oct-17		<0.0260	**<0.0418**	<0.0350	**<0.100**	0.0507 J	0.057 J	<0.0719	<0.382	**2.13**	**0.223** J	<0.0361	0.073 J
	MW-66	Apr-15		<0.0130	**<0.0210**	<0.0180	**<0.0500**	0.0615	0.0266 J	0.0668	<0.190	**1.66**	**0.0617** J	<0.0180	0.0342 J
	MW-66	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	0.0234	0.0565	0.0281	<0.00382	**2.42**	**0.133**	0.007	0.0807
	MW-66	Apr-16		<0.00260	<0.00418	<0.00341	**<0.0100**	0.0181	0.0337	0.0285	<0.00382	**1.48**	**0.0638**	0.00609 J	0.0523
	MW-66	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	0.0214	0.0617	0.0228	<0.00382	**1.48**	**0.0979**	0.00948	0.104
	MW-66	Apr-17		<0.0130	**<0.0209**	<0.0175	**<0.0500**	<0.0192	0.0311 J	<0.0360	<0.191	**1.21**	**0.104** J	0.0236 J	0.0525
	MW-66	Oct-17		<0.00260	<0.00418	<0.00350	**<0.0100**	<0.00384	0.00696 J	<0.00719	<0.0382	0.134	0.0147 J	<0.00361	0.0118
	MW-99	Apr-15		<0.00650	**<0.0100**	<0.00880	**<0.0250**	0.252	0.0295	0.622	<0.0960	0.0799	**0.0376** J	<0.00900	0.0338
	MW-99	Oct-15		<0.00650	**<0.0104**	0.0122 J	**<0.0250**	0.551	0.0559	0.509	<0.0955	**3.96**	**0.0453** J	0.0104 J	0.0768
	MW-99	Apr-16		<0.00260	<0.00418	0.00375 J	**<0.0100**	0.629	0.0459	0.531	<0.00382	**1.99**	**0.0656**	0.00756 J	0.0706
	MW-99	Oct-16		<0.00520	**<0.00836**	<0.00700	**<0.0200**	0.635	0.0462	0.591	<0.00382	**2.45**	**0.0343** J	<0.00722	0.071
	MW-99	Apr-17		<0.0130	**<0.0209**	<0.0175	**<0.0500**	0.402	0.0477 J	0.416	<0.191	**4.65**	**<0.0500**	<0.0180	0.0667
	MW-99	Oct-17		<0.0260	**<0.0418**	<0.0350	**<0.100**	0.146	0.0522 J	0.228	<0.382	**2.71**	**<0.100**	<0.0361	0.0637 J
	MW-101	Apr-15		<0.00130	<0.00210	<0.00180	<0.00500 J	0.00202 J	0.00279 J	<0.00360	<0.0190 J	0.113	<0.00500 J	<0.00180	<0.00170
	MW-101	Oct-15		<0.00130	<0.00209	<0.00175	<0.00500	<0.00192	<0.00163	<0.00360	<0.0191	0.0981	<0.00500	<0.00180	<0.00174
	MW-101	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	0.00176	0.00564	<0.000719	<0.00382	0.119	<0.00100	0.000427 J	0.00597
	MW-101	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000381 J	<0.000719	<0.00382	0.104	<0.00100	<0.000361	<0.000349
	MW-101	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	0.000830 J	0.00413	<0.000719	<0.00382	0.107	<0.00100	<0.000361	0.000928 J
	MW-101	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.132	<0.00100	<0.000361	<0.000349
	MW-102	Apr-15		<0.00260	<0.00420	<0.00350	**<0.0100**	0.602	0.0207	0.598	<0.0380	**1.88**	**0.129**	<0.00360	0.0257
	MW-102	Oct-15		<0.0260	**<0.0418**	<0.0350	**<0.100**	**1.04**	0.0583 J	1.06	<0.382	**2.12**	**0.256** J	<0.0361	0.0897 J
	MW-102	Apr-16		<0.0260	**<0.0418**	<0.0350	**<0.100**	**0.858**	0.0503 J	0.544	<0.00382	**2.07**	**0.278** J	<0.0361	0.0846 J
	MW-102	Oct-16		<0.0260	**<0.0418**	<0.0350	**<0.100**	**1.03**	0.0524 J	0.624	<0.00382	**1.61**	**0.278** J	<0.0361	0.0814 J
	MW-102	Apr-17		<0.00520	**<0.00836**	<0.00700	**<0.0200**	**0.726**	0.0401	0.372	<0.0764	**1.87**	**0.200**	0.0125 J	0.0725
	MW-102	Oct-17		<0.0130	**<0.0209**	<0.0175	**<0.0500**	**0.897**	0.0503	0.466	<0.191	**1.89**	**0.483**	<0.0180	0.0717
	MW-103	Apr-14		<0.00060	<0.000600	0.0036 J	<0.00100	0.150	0.031	0.012	<0.00100	<0.000600	**0.0510**	0.0061	0.046
	MW-103	Apr-15		<0.000260	<0.000420	0.00207	<0.00100	0.0879	0.0247	0.00819	<0.00380	0.000441 J	0.0220	0.00291	0.0357
	MW-103	Apr-16		<0.00130	<0.00209	<0.00175	<0.00500	0.0508	0.022	<0.00360	<0.00382	<0.00184	0.0108 J	0.00286 J	0.0311
	MW-103	Apr-17		<0.0130	**<0.0209**	<0.0175	**<0.0500**	<0.0192	0.0192 J	<0.0360	<0.00382	<0.0184	**<0.0500**	<0.0180	0.0295 J
	MW-104	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	0.0432	<0.000720	<0.00380	0.00138	<0.00100	<0.000360	0.00324
	MW-104	Apr-15	FD	<0.000260	<0.000420	<0.000350	<0.00100	0.000481 J	0.0441	<0.000720	<0.00380	0.00135	<0.00100	<0.000360	0.00335
	MW-104	Oct-15		<0.00130	<0.00209	<0.00175	<0.00500	0.0126	0.0449	<0.00360	<0.0191	0.00189 J	<0.00500	<0.00180	0.00458 J
	MW-104	Oct-15	FD	<0.000260	<0.000418	<0.000350	<0.00100	0.0117	0.0406	0.000722 J	<0.00382	0.00199	0.00132 J	0.000449 J	0.00402
	MW-104	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	0.00108	0.0535 J6	<0.000719	<0.00382	0.00130	<0.00100	0.000558 J	0.00447
	MW-104	Apr-16	FD	<0.000260	<0.000418	<0.000350	<0.00100	0.00107	0.0602	<0.000719	<0.00382	0.00120	<0.00100	0.000602 J	0.00513
	MW-104	Oct-16		<0.00130	<0.00209	<0.00175	<0.00500	0.00837	0.0442	<0.00360	<0.00382	<0.00184	<0.00500	0.00434 J	0.00503
	MW-104	Oct-16	FD	<0.00130	<0.00209	<0.00175	<0.00500	0.00721	0.0475	<0.00360	<0.00382	0.00509	<0.00500	0.00422 J	0.005 J
	MW-104	Apr-17		<0.00260	<0.00418	<0.00350	**<0.0100**	0.0244	0.0565	<0.00719	<0.0382	<0.00367	<0.0100	<0.00361	0.00933 J
	MW-104	Apr-17	FD	<0.00130	<0.00209	<0.00175	<0.00500	0.0168	0.038	0.00402 J	<0.0191	0.0132	<0.00500	<0.00180	0.00632
	MW-104	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	0.00651	0.0457	<0.000719	<0.00382	0.00837	0.00196 J	0.000421 J	0.00489
	MW-104	Oct-17	FD	<0.00130	<0.00209	<0.00175	<0.00500	0.00774	0.0371	<0.00360	<0.0191	0.00820	<0.00500	<0.00180	0.00405 J
	MW-105	Apr-15		<0.00130	<0.00210	0.00604	<0.00500 J	0.545	0.0573	0.205	<0.0190 J	<0.00180	**0.0623** J	0.00866	0.0639
	MW-105	Oct-15		<0.00260	<0.00418	0.00614 J	**<0.0100**	0.188	0.0321	0.109	<0.0382	<0.00367	0.0299 J	0.00651 J	0.0349
	MW-105	Apr-16		<0.0650	**<0.104**	<0.0875	**<0.250**	**2.02**	0.104 J	0.379	<0.00382	<0.0918	**<0.250**	<0.0902	0.104 J
	MW-105	Oct-16		<0.0260	**<0.0418**	<0.0350	**<0.100**	**2.77**	0.136	0.683	<0.00382	<0.0367	**0.129** J	<0.0361	0.147
	MW-105	Apr-17		<0.0260	**<0.0418**	<0.0350	**<0.100**	**1.71**	0.0921 J	0.446	<0.382	<0.0367	**0.104** J	<0.0361	0.109
	MW-105	Oct-17		<0.000260	<0.000418	0.00692	<0.00100	**0.927**	0.0814	0.39	<0.00382	0.0209	**0.0737**	0.00608	0.0846
	MW-106	Apr-15		<0.000260	<0.000420	0.000357 J	0.001 J	0.0206	0.00691	0.0475	<0.00380	<0.000370	0.0126	0.000406 J	0.00815
	MW-106	Oct-15		<0.0260	**<0.0418**	<0.0350	**<0.100**	0.0823 J	<0.0326	0.217	<0.382	0.0397 J	**0.113** J	<0.0361	<0.0349
	MW-106	Apr-16		<0.00650	**<0.0104**	<0.00875	**<0.0250**	0.0446	0.0329	0.203	<0.00382	0.0580	**0.0442** J	<0.00902	0.043
	MW-106	Oct-16		<0.0130	**<0.0209**	<0.0175		0.0440 J	0.0469 J	0.297	<0.00382	0.109	**0.0690** J	<0.0180	0.0617
	MW-106	Apr-17		<0.0130	**<0.0209**	<0.0175	**<0.0500**	0.0301 J	0.0344 J	0.236	<0.191	0.0832	**<0.0500**	<0.0180	0.0482 J
	MW-106	Oct-17		<0.0130	**<0.0209**	<0.0175	**<0.0500**	0.0438 J	0.0321 J	0.195	<0.191	0.0949	**<0.0500**	<0.0180	0.0382 J

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds												
				Analyte:	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Cymene	Dichloromethane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methyl N-Butyl Ketone	MTBE	Naphthalene	N-Butylbenzene	N-Propylbenzene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.07	0.0047	---	0.005	0.7	0.447	---	---	0.143	0.03	---	---
				CGWSL Source:	USEPA MCL	USEPA TW		USEPA MCL	USEPA MCL	WQCC TW			WQCC TW	WQCC HH		
Area	**Well ID**	**Date**	**Dup**													
South Refinery	MW-107	Apr-15		<0.00260	<0.00420	<0.00350	**<0.0100**	0.00658 J	0.0107	0.0146	<0.0380	**1.77**	0.0157 J	<0.00360	<0.00350
	MW-107	Oct-15		<0.0260	**<0.0418**	<0.0350	**<0.100**	0.0403 J	0.0454 J	0.0867 J	<0.382	**2.77**	**<0.100**	<0.0361	0.0689 J
	MW-107	Apr-16		<0.000260	<0.000418	0.00123	<0.00100	0.00466	0.0417	0.00427	<0.00382	**2.44**	0.00773	0.000878 J	0.0602
	MW-107	Oct-16		<0.00130	<0.00209	<0.00175	<0.00500	0.0192	0.0457	0.00857 J	<0.00382	**3.05**	**0.0614**	0.00182 J	0.0693
	MW-107	Apr-17		<0.0130	**<0.0209**	<0.0175	**<0.0500**	<0.0192	0.0334 J	<0.0360	<0.191	**2.78**	**0.0788** J	<0.0180	0.0528
	MW-109	Apr-15		<0.00260	<0.00420	<0.00350	**<0.0100**	0.0190	0.0351	0.0176	<0.0380	<0.00370	<0.0100	<0.00360	0.0297
	MW-109	Oct-15		<0.00260	<0.00418	<0.00350	**<0.0100**	0.0126	0.0344	0.0176	<0.0382	<0.00367	<0.0100	<0.00361	0.0305
	MW-109	Apr-16		<0.00130	<0.00209	<0.00175	<0.00500	0.00864	0.0375	0.0142	<0.00382	<0.00184	<0.00500	0.0021 J	0.0359
	MW-109	Oct-16		<0.00520	**<0.00836**	<0.00700	**<0.0200**	0.0115 J	0.0438	<0.0144	<0.00382	<0.00734	<0.0200	<0.00722	0.0452
	MW-109	Apr-17		<0.00260	<0.00418	<0.00350	**<0.0100**	0.00980 J	0.0536	0.0272	<0.0382	<0.00367	<0.0100	0.00378 J	0.0569
	MW-109	Oct-17		<0.000260	<0.000418	0.00108	<0.00100	0.0124	0.0658	0.023	<0.00382	<0.000367	0.00191 J	0.00382	0.0633
	MW-110	Apr-15		<0.000260	<0.000420	0.000563 J	<0.00100	0.00609	0.0331	0.00624	<0.00380	<0.000370	0.00482 J	0.00231	0.0279
	MW-110	Oct-15		<0.00130	<0.00209	0.00315 J	<0.00500	0.182	0.0305	0.0298	<0.0191	<0.00184	0.00731 J	0.00291 J	0.0347
	MW-110	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	0.000927 J	0.026	0.000733 J	<0.00382	<0.000367	<0.00100	0.00224	0.0212
	MW-110	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00078 J	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-110	Apr-17		<0.00130	<0.00209	0.00412 J	<0.00500	0.0262	0.0536	0.0161	<0.0191	<0.00184	<0.00500	0.00474 J	0.0589
	MW-110	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	RA-313	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	RA-313	Apr-15		<0.000260	<0.000420	<0.000350	0.00129 J	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	RA-313	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	RA-313	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	RW-4	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	0.00245	0.00966	<0.000720	<0.00380	0.0902	<0.00100	0.000393 J	0.00458
	RW-4R	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.00999	<0.000719		**0.191**	<0.00100	<0.000361	0.00118
	RW-4R	Apr-17		<0.00130	<0.00209	<0.00175	<0.00500	<0.00192	0.00716	<0.00360	<0.0191	0.132	<0.00500	<0.00180	0.00532
	RW-5R	Apr-15		<0.00260	<0.00420	<0.00350	**<0.0100**	**1.03**	0.0398	1.39	<0.0380	**2.15**	**0.174**	0.00606 J	0.0598
	RW-5R	Apr-16		<0.00520	**<0.00836**	<0.00700	**<0.0200**	**1.20**	0.0643	1.68		**1.64**	**0.205**	0.0117 J	0.11
	RW-6	Apr-15		<0.00260	<0.00420	<0.00350	**<0.0100**	0.0476	0.0173	0.102	<0.0380	**2.27**	**0.0602**	0.00738 J	0.0237
	RW-6R	Apr-16		<0.000260	<0.000418	0.000401 J	<0.00100	0.00474	0.00797	0.00472	<0.00382	**2.68**	0.00574	0.00138	0.00731
	RW-15C	Apr-17		<0.00650	**<0.0104**	<0.00875	**<0.0250**	**4.19**	0.143	4.92	<0.00382	**4.25**	**0.383**	0.0168 J	0.296
South RO Reject Field	MW-114	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-114	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-114	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-114	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-114	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-114	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-115	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-115	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-115	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-115	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-115	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-115	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-116	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-116	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-116	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-116	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-116	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-116	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
TEL	MW-49	Apr-15		<0.000260	<0.000420	0.000537 J	<0.00100 J	0.00274	0.014	0.0175	<0.00380	0.0553 J	0.00117 J	0.00116	0.00957
	MW-49	Oct-15		<0.000260	<0.000418	0.00077 J	<0.00100	0.00457	0.0247	0.038	<0.00382	0.0447	0.00255 J	0.00158	0.0157
	MW-49	Apr-16		<0.00520	**<0.00836**	<0.00700	**<0.0200**	<0.00768	0.0219	0.054	<0.00382	0.0535	<0.0200	<0.00722	0.0206
	MW-49	Oct-16		<0.0260	**<0.0418**	<0.0350	**<0.100**	<0.0384	<0.0326	0.0831 J	<0.00382	0.0628 J	**<0.100**	<0.0361	<0.0349
	MW-49	Apr-17		<0.00260	<0.00418	<0.00350	**<0.0100**	0.00427 J	0.0218	0.0564	<0.0382	0.0811	<0.0100	<0.00361	0.0266
	MW-49	Oct-17		<0.00520	**<0.00836**	<0.00700	**<0.0200**	0.0184 J	0.0706	0.195	<0.0764	0.0712	<0.0200	<0.00722	0.0659
	TEL-1	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	0.00478	<0.00100	<0.000360	<0.000350
	TEL-1	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	0.000924 J	<0.000719	<0.00382	0.00245	0.00102 J	<0.000361	<0.000349
	TEL-1	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	0.000718 J	0.00136	<0.000719	<0.00382	0.00229	<0.00100	<0.000361	<0.000349
	TEL-1	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	0.000666 J	0.001	<0.000719	<0.00382	0.000724 J	<0.00100	<0.000361	<0.000349
	TEL-1	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	0.000506 J	0.000391 J	<0.000719	<0.00382	0.00231	<0.00100	<0.000361	<0.000349
	TEL-1	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	0.00119	0.00311	0.00169 J	<0.00382	0.00285	<0.00100	<0.000361	0.000492 J
	TEL-2	Apr-15		<0.00520	**<0.00840**	<0.00700	**<0.0200** J	0.0119 J	0.0407	0.171	<0.0760	0.0113 JJ3	<0.0200	<0.00720	0.0462
	TEL-2	Oct-15		<0.00130	<0.00209	0.00397 J	<0.00500	0.00577	0.0405	0.146	<0.0191	0.0110	0.00630 J	0.00382 J	0.0487
	TEL-2	Apr-16		<0.000260	<0.000418	0.00438	<0.00100	0.00692	0.038	0.136	<0.00382	0.0156	0.00966	0.00424	0.0484
	TEL-2	Oct-16		<0.00260	<0.00418	<0.00350	**<0.0100**	0.00418 J	0.0325	0.116	<0.00382	0.0110	<0.0100	0.00404 J	0.0376
	TEL-2	Apr-17		<0.00260	<0.00418	<0.00350	**<0.0100**	<0.00384	0.023	0.0837	<0.0382	0.0104	<0.0100	<0.00361	0.027
	TEL-2	Oct-17		<0.00260	<0.00418	<0.00350	**<0.0100**	<0.00384	0.0442	0.101	<0.0382	0.00964 J	<0.0100	<0.00361	0.0408
	TEL-3	Apr-15		<0.00260	<0.00420	<0.00350	**<0.0100**	<0.00380	0.0471	0.00929 J	<0.0380	0.00560 J	<0.0100	<0.00360	0.00541 J
	TEL-3	Oct-15		<0.000260	<0.000418	0.00128	<0.00100	0.000880 J	0.0605	0.0171	<0.00382	0.000964 J	0.00123 J	0.00133	0.0092
	TEL-3	Apr-16		<0.00650	**<0.0104**	<0.00875	**<0.0250**	<0.00960	0.0593	<0.0180	<0.00382	0.0445	<0.0250	<0.00902	<0.00872
	TEL-3	Oct-16		<0.000260	<0.000418	0.000629 J	<0.00100	0.000539 J	0.0336	0.00823	<0.00382	0.00109	0.00107 J	0.00134	0.00792
	TEL-3	Apr-17		<0.000260	<0.000418	0.000657 J	<0.00100	0.000764 J	0.0465	0.00827	<0.00382	0.00327	<0.00100	0.00121	0.00869
	TEL-4	Apr-15		<0.00260	<0.00420	<0.00350	**<0.0100**	<0.00380	0.0332	0.0394	<0.0380	0.140	<0.0100	0.00396 J	0.0523
	TEL-4	Apr-15	FD	<0.00260	<0.00420	<0.00350	**<0.0100**	<0.00380	0.0334	0.0407	<0.0380	0.142	<0.0100	0.00405 J	0.0535
	TEL-4	Oct-15		<0.000260	<0.000418	0.00179	<0.00100	0.00655	0.053	0.0703	<0.00382	0.00902	0.00422 J	0.00309	0.0633
	TEL-4	Oct-15	FD	<0.00260	<0.00418	<0.00350	**<0.0100**	0.00756 J	0.0625	0.0837	<0.0382	0.0127	<0.0100	0.00385 J	0.0751
	TEL-4	Apr-16		<0.00260	<0.00418	<0.00341	**<0.0100**	0.0160	0.0745	0.142	<0.00382	0.105	<0.0100	0.00421 J	0.0955
	TEL-4	Apr-16	FD	<0.00260	<0.00418	<0.00341	**<0.0100**	0.0161	0.0771	0.147	<0.00382	0.0945	<0.0100	0.0045 J	0.0984
	TEL-4	Oct-16		<0.00260	<0.00418	<0.00350	**<0.0100**	<0.00384	0.0503	0.0668	<0.00382	0.0415	<0.0100	0.00422 J	0.0666
	TEL-4	Oct-16	FD	<0.00260	<0.00418	<0.00350	**<0.0100**	<0.00384	0.07	0.0863	<0.00382	0.0476	<0.0100	<0.00361	0.086
	TEL-4	Apr-17		<0.00260	<0.00418	<0.00350	**<0.0100**	<0.00384	0.0344	0.0243	<0.0382	0.0522	<0.0100	<0.00361	0.0423
	TEL-4	Apr-17	FD	<0.000260	<0.000418	0.000555 J	<0.00100	0.000616 J	0.0442	0.0281	<0.00382	0.0492	<0.00100	0.0043	0.0522
	TEL-4	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	0.000587 J	0.0621	0.0261	<0.00382	0.0975	<0.00100	0.00372	0.0691
	TEL-4	Oct-17	FD	<0.000260	<0.000418	0.000981 J	<0.00100	0.000497 J	0.0596	0.0235	<0.00382	0.0874	<0.00100	0.00336	0.0648
TMD	MW-8	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	0.00140 J	<0.000700	<0.00100	<0.000500
	MW-8	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-8	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-8	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 J3 J4	0.00228	<0.00100 J4	<0.000361	<0.000349
	MW-16	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	MW-16	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100 J	<0.000380	<0.000330	<0.000720	<0.00380 J	<0.000370	<0.00100 J	<0.000360	<0.000350
	MW-16	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-20	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	MW-20	Apr-14	FD	<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	MW-20	Apr-15		<0.000260	<0.000420	<0.000350 J	<0.00100	<0.000380	<0.000330 J	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-20	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-20	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 J3 J4	<0.000367	<0.00100 J4	<0.000361	<0.000349
	MW-21	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100 J	<0.000380	<0.000330	<0.000720	<0.00380 J	0.00729	<0.00100 J	<0.000360	<0.000350
	MW-21	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.00636	<0.00100	<0.000361	<0.000349
	MW-21	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0101	<0.00100	<0.000361	<0.000349
	MW-21	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0112	<0.00100	<0.000361	<0.000349
	MW-21	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0149	<0.00100	<0.000361	<0.000349
	MW-21	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0180	<0.00100	<0.000361	<0.000349
	MW-25	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	MW-25	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100 J	<0.000380	<0.000330	<0.000720	<0.00380 J	<0.000370	<0.00100 J	<0.000360	<0.000350
	MW-25	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-25	Apr-17		<0.000260	<0.000418 J4	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382 J3 J4	<0.000367	<0.00100 J4	<0.000361	<0.000349

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Volatile Organic Compounds											
				Analyte:	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Cymene	Dichloromethane	Ethylbenzene	Isopropylbenzene	m,p-Xylene	Methyl N-Butyl Ketone	MTBE	Naphthalene	N-Butylbenzene	N-Propylbenzene
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.07	0.0047	---	0.005	0.7	0.447	---	---	0.143	0.03	---	---
				CGWSL Source:	USEPA MCL	USEPA TW		USEPA MCL	USEPA MCL	WQCC TW			WQCC TW	WQCC HH		
Area	**Well ID**	**Date**	**Dup**													
TMD	MW-26	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	MW-26	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-26	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-26	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-27	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	MW-27	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-27	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-27	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-46R	Nov-14		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-46R	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-46R	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-46R	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-46R	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-46R	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-68	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	MW-68	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-68	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-68	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-71	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	MW-71	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	MW-71	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-71	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-89	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	MW-89	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100 J	<0.000380	<0.000330	<0.000720	<0.00380 J	<0.000370	<0.00100 J	<0.000360	<0.000350
	MW-89	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	MW-89	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	NP-1	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100 J	<0.000380	<0.000330	<0.000720	<0.00380	**0.204**	<0.00100	<0.000360	<0.000350
	NP-1	Oct-15		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	**0.291**	<0.00100	<0.000361	<0.000349
	NP-1	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	**0.213**	<0.00100	<0.000361	<0.000349
	NP-1	Oct-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	**0.283**	<0.00100	<0.000361	<0.000349
	NP-1	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	**0.391**	<0.00100	<0.000361	<0.000349
	NP-1	Oct-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	**0.407**	<0.00100	<0.000361	<0.000349
	NP-2	Apr-13		<0.00500	**<0.00500**	<0.00500	**<0.0100**	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	NP-6	Apr-13		<0.00500	**<0.00500**	<0.00500	**<0.0100**	<0.00500	<0.00500	<0.0100	<0.0100	<0.00500	<0.00500	<0.00500	<0.00500
	NP-6	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100 J	<0.000380	<0.000330	<0.000720	<0.00380 J	0.00878	<0.00100 J	<0.000360	<0.000350
	NP-6	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	0.0353	<0.00100	<0.000361	<0.000349
Up-Gradient	UG-1	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	UG-1	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	UG-1	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	UG-1	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	UG-2	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	UG-2	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	UG-2	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	UG-2	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	UG-3R	Apr-14		<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	UG-3R	Apr-14	FD	<0.00060	<0.000600	<0.000500	<0.00100	<0.000500	<0.000500	<0.000600	<0.00100	<0.000600	<0.000700	<0.00100	<0.000500
	UG-3R	Apr-15		<0.000260	<0.000420	<0.000350	<0.00100	<0.000380	<0.000330	<0.000720	<0.00380	<0.000370	<0.00100	<0.000360	<0.000350
	UG-3R	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	UG-3R	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	UG-4	Apr-16		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349
	UG-4	Apr-17		<0.000260	<0.000418	<0.000350	<0.00100	<0.000384	<0.000326	<0.000719	<0.00382	<0.000367	<0.00100	<0.000361	<0.000349

Definitions

X	F
X	A
<x	A
<x	A
	E
---	N

Abbreviations

CGWSL	C
CGWSL Source	S
Dup	D
FD	F
mg/L	M
NMED TPH	N
NMED TW	N
TPH	T
USEPA TW	U
USEPA MCL	U
WQCC HH	N

Lab Footnote

B	A
J	I
J3	T
J4	T
J6	T

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:										
				Analyte:	o-Xylene	Styrene (Monomer)	Tetra-chloro-ethene	Toluene	Total Xylenes	trans-1,2-Dichloro-ethene	trans-1,3-Dichloro-propene	Tribromo-methane	Trichloro-ethene	Vinyl Chloride
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.193	0.1	0.005	0.75	0.62	0.1	0.0047	---	0.005	1.00E-03
				CGWSL Source:	WQCC TW	USEPA MCL	USEPA MCL	WQCC HH	WQCC HH	USEPA MCL	USEPA TW	USEPA TW	USEPA MCL	WQCC HH
Area	**Well ID**	**Date**	**Dup**											
Cross-Gradient	KWB-13	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	KWB-13	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	0.00254 J	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	KWB-13	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-13	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-17	Apr-14											
	NP-5	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00200
	NP-5	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	NP-5	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RA-3156	Nov-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00200
	RA-3156	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600	<0.000469	<0.000500	<0.000400
	RA-3156	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RA-3156	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.0000469	<0.000398	<0.000259
	MW-136	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-136	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-136	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-136	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-136	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
Evaporation Ponds	MW-1R	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	MW-1R	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-1R	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-1R	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-2A	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-2A	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-2A	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-2A	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-2A	Apr-17		<0.00341	<0.00307	<0.00372	<0.00412	<0.0106	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-2A	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-3	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-3	Apr-15	FD	<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-3	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-3	Oct-15	FD	<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-3	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-3	Apr-16	FD	<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-3	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-3	Oct-16	FD	<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-3	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-3	Apr-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-3	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-3	Oct-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-4A	Apr-15		0.000658 J	<0.000310	<0.000370	<0.000780	0.00293 J	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-4A	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	0.00237 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-4A	Apr-16		0.000352 J	<0.00100	<0.000372	<0.000780	0.00201 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-4A	Oct-16		0.000870 J	<0.000307	<0.000372	<0.000780	0.00365	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-4A	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-4A	Oct-17		0.000597 J	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-4B	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00200
	MW-4B	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-4B	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-5A	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-5A	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-5A	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-5A	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-5A	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-5A	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-5B	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00200
	MW-5B	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-5B	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-5C	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00200
	MW-5C	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-5C	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-6A	Apr-14		0.00160 J	<0.000500	<0.000600	<0.000500	0.00160 J	<0.000400	<0.000600		<0.000500	<0.000400
	MW-6A	Apr-15		0.000920 J	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-6A	Apr-16		0.00119	<0.00100	<0.000372	<0.000780	0.00119 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-6A	Apr-17		<0.00341	<0.00307	<0.00372	<0.00412	<0.0106	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-6B	Mar-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00200
	MW-6B	Mar-13	FD	<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00200
	MW-6B	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-6B	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-7A	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-7A	Apr-15	FD	<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-7A	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-7A	Oct-15	FD	<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-7A	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-7A	Apr-16	FD	<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-7A	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-7A	Oct-16	FD	<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-7A	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-7A	Apr-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-7A	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-7A	Oct-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-7B	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00200
	MW-7B	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-7B	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-10	Apr-15		<0.000340	<0.000310 J	<0.000370	<0.000780 J	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-10	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-10	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-10	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-10	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-10	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-11A	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-11A	Oct-15											
	MW-11A	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-11A	Oct-16											
	MW-11A	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-11A	Oct-17											
	MW-11B	Mar-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00200
	MW-11B	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-11B	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-12	Apr-14											
	MW-13	Apr-14											
	MW-15	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	MW-15	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-15	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-15	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

Area	Well ID	Date	Dup	o-Xylene	Styrene (Monomer)	Tetra-chloro-ethene	Toluene	Total Xylenes	trans-1,2-Dichloro-ethene	trans-1,3-Dichloro-propene	Tribromo-methane	Trichloro-ethene	Vinyl Chloride
Analyte Group:													
Analyte:				o-Xylene	Styrene (Monomer)	Tetra-chloro-ethene	Toluene	Total Xylenes	trans-1,2-Dichloro-ethene	trans-1,3-Dichloro-propene	Tribromo-methane	Trichloro-ethene	Vinyl Chloride
Units:				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
CGWSL:				0.193	0.1	0.005	0.75	0.62	0.1	0.0047	---	0.005	1.00E-03
CGWSL Source:				WQCC TW	USEPA MCL	USEPA MCL	WQCC HH	WQCC HH	USEPA MCL	USEPA TW	USEPA TW	USEPA MCL	WQCC HH
Evaporation Ponds	MW-18A	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-18A	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-18A	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-18A	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-18A	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-18A	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-18B	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00200
	MW-18B	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-18B	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-22A	Apr-15		<0.000340	<0.000310 J	<0.000370	<0.000780 J	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-22A	Apr-15	FD	<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-22A	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-22A	Oct-15	FD	<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-22A	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-22A	Apr-16	FD	<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-22A	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-22A	Oct-16	FD	<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-22A	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-22A	Apr-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-22A	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-22A	Oct-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-22B	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00200
	MW-22B	Apr-15		<0.000340	<0.000310 J	<0.000370	<0.000780 J	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-22B	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-70	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-70	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-70	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-70	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-70	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-70	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-72	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	MW-72	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-72	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-72	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-73	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	MW-73	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-73	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-73	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-74	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-74	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-74	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-74	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-74	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-74	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-75	Apr-15		<0.00340	<0.00310	<0.00370	<0.00780	<0.0110	<0.00400	<0.00420	<0.00470	<0.00400	<0.00260
	MW-75	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-75	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-75	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-75	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-75	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-76	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-76	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-76	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-76	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	0.00214 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-76	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-76	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-77	Apr-15		0.00101	<0.000310	<0.000370	0.00216 J	0.00531	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-77	Oct-15		0.00112	<0.000307	<0.000372	0.00386 J	0.00589	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-77	Apr-16		0.000583 J	<0.00100	<0.000372	0.00138 J	0.00390	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-77	Oct-16		<0.00341	<0.00307	<0.00372	<0.00780	<0.0106	<0.00396	<0.00419	<0.000469	<0.00398	<0.00259
	MW-77	Apr-17		<0.00341	<0.00307	<0.00372	<0.00412	<0.0106	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-78	Apr-14		0.00210 J	<0.000500	<0.000600	0.00140 J	0.00210 J	<0.000400	<0.000600		<0.000500	<0.000400
	MW-78	Apr-15		0.00356	<0.000310	<0.000370	0.00385 J	0.00502	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-78	Apr-16		0.00135	<0.00100	<0.000372	0.00125 J	0.00135 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-78	Apr-17		<0.00341	<0.00307	<0.00372	<0.00412	<0.0106	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-79	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-79	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-79	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-79	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-79	Apr-17		<0.00341	<0.00307	<0.00372	<0.00412	<0.0106	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-79	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-80	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	MW-80	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-80	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-80	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-81	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	MW-81	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-81	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-81	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-82	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	MW-82	Apr-14	FD	<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	MW-82	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-82	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-82	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-83	Apr-15		0.000607 J	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-83	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-83	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-83	Oct-16		0.000569 J	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-83	Apr-17		<0.00341	<0.00307	<0.00372	<0.00412	<0.0106	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-83	Oct-17		0.00120	<0.000307	<0.000372	<0.000412	0.00240 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-84	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-84	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-84	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-84	Oct-16		<0.00341	<0.00307	<0.00372	<0.00780	<0.0106	<0.00396	<0.00419	<0.000469	<0.00398	<0.00259
	MW-84	Apr-17		<0.00341	<0.00307	<0.00372	<0.00412	<0.0106	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-84	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-87	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-87	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-87	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-87	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-87	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-87	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

			Analyte Group:										
			Analyte:	o-Xylene	Styrene (Monomer)	Tetra-chloro-ethene	Toluene	Total Xylenes	trans-1,2-Dichloro-ethene	trans-1,3-Dichloro-propene	Tribromo-methane	Trichloro-ethene	Vinyl Chloride
			Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
			CGWSL:	0.193	0.1	0.005	0.75	0.62	0.1	0.0047	---	0.005	1.00E-03
			CGWSL Source:	WQCC TW	USEPA MCL	USEPA MCL	WQCC HH	WQCC HH	USEPA MCL	USEPA TW	USEPA TW	USEPA MCL	WQCC HH
Area	**Well ID**	**Date**	**Dup**										
Evaporation Ponds	MW-88	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-88	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-88	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-88	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-88	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-88	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-120	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-120	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-120	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-120	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-120	Apr-17		<0.00341	<0.00307	<0.00372	<0.00412	<0.0106	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-120	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-121	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-121	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-121	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-121	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-121	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-121	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-122	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-122	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-122	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-122	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-122	Apr-17		<0.00341	<0.00307	<0.00372	<0.00412	<0.0106	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-122	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-123	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-123	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-123	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-123	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-123	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-123	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-124	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-124	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-124	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-124	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-124	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-124	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-1R	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	OCD-1R	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-1R	Apr-16		<0.000341	<0.00100	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-1R	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-1R	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-1R	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-2A	Apr-15		<0.000340	<0.000310 J	<0.000370	<0.000780 J	<0.00110	<0.000400	<0.000420	<0.000469	<0.000400	<0.000260
	OCD-2A	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-2A	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-2A	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-2A	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-2A	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-3	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	OCD-3	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-3	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-3	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-3	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-3	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-4	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	OCD-4	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-4	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-4	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-4	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-4	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-5	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	OCD-5	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-5	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-5	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-5	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-5	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-6	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	OCD-6	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-6	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-6	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-6	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-6	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-7AR	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	OCD-7AR	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-7AR	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-7AR	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-7AR	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-7AR	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-7B	Mar-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00200
	OCD-7B	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	OCD-7B	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-8A	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	OCD-8A	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-8A	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-8A	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-8A	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-8A	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	OCD-8B	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00200
	OCD-8B	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	OCD-8B	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
Field East of Refinery	KWB-1A	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	KWB-1A	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-1A	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-1A	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-1A	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-1A	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-1C	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00200
	KWB-1C	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	KWB-1C	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-7	Apr-15		0.00377	<0.000310	<0.000370	0.00213 J	0.00718	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	KWB-7	Oct-15		0.000608 J	<0.000307	<0.000372	<0.000780	0.00145 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-7	Apr-16		0.00167	<0.000307	<0.000372	<0.000780	0.0235	<0.000396	<0.000419 J4	<0.000469	<0.000398	<0.000259
	KWB-7	Oct-16		<0.000341	<0.000307	<0.000372	0.00155 J	0.0196	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-7	Apr-17		0.000576 J	<0.000307	<0.000372	<0.000412	0.00757	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-7	Oct-17		0.00112	<0.000307	<0.000372	<0.000412	0.0143	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

			Analyte Group:												
			Analyte:	o-Xylene	Styrene (Monomer)	Tetra-chloro-ethene	Toluene	Total Xylenes	trans-1,2-Dichloro-ethene	trans-1,3-Dichloro-propene	Tribromo-methane	Trichloro-ethene	Vinyl Chloride
			Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
			CGWSL:	0.193	0.1	0.005	0.75	0.62	0.1	0.0047	---	0.005	1.00E-03
			CGWSL Source:	WQCC TW	USEPA MCL	USEPA MCL	WQCC HH	WQCC HH	USEPA MCL	USEPA TW	USEPA TW	USEPA MCL	WQCC HH
Area	**Well ID**	**Date**	**Dup**										
Field East of Refinery	KWB-8	Oct-16		0.150 J	<0.0614	**<0.0744**	**1.48**	**1.16**	<0.0792	**<0.0838**		**<0.0796**	<0.0518
	KWB-8	Apr-17		0.145	<0.0307	**<0.0372**	0.747	**2.07**	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	KWB-8	Oct-17		0.0133	<0.000307	<0.000372	0.336	**0.795**	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-10R	Apr-15		**0.343**	<0.00310	<0.00370	0.141	**1.38**	<0.00400	<0.00420	<0.00470	<0.00400	<0.00260
	KWB-10R	Oct-15		**0.254**	<0.000307	<0.000372	0.124	**1.08**	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-10R	Apr-16		0.184	<0.0154	**<0.0186**	0.0937 J	**0.829**	<0.0198	**<0.0210**	<0.0234	**<0.0199**	<0.0130
	KWB-10R	Oct-16		**0.196**	<0.00614	**<0.00744**	0.110	**0.860**	<0.00792	**<0.00838**	<0.00938	**<0.00796**	<0.00518
	KWB-10R	Apr-17		**0.198**	<0.0154	**<0.0186**	0.0605	**0.914**	<0.0198	**<0.0210**	<0.0234	**<0.0199**	<0.0130
	KWB-10R	Oct-17		0.112 J	<0.000307	<0.000372	0.0588	**0.767**	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-11A	Apr-15		0.000869 J	<0.000310 J	<0.000370	<0.000780	0.00275 J	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	KWB-11A	Oct-15		0.000511 J	<0.000307	<0.000372	<0.000780	0.00181 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-11A	Apr-16		0.000423 J	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-11A	Oct-16		0.000483 J	<0.000307	<0.000372	<0.000780	0.00158 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-11A	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-11A	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-11B	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	KWB-11B	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-11B	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-11B	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-11B	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-11B	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-12A	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	KWB-12A	Apr-15	FD	<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	KWB-12A	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-12A	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-12A	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-12A	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-12A	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-12B	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	KWB-12B	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-12B	Oct-15	FD	0.000692 J	<0.000307	<0.000372	<0.000780	0.00226 J	<0.000396 J	<0.000419	<0.000469	<0.000398	<0.000259 J
	KWB-12B	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-12B	Apr-16	FD	<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-12B	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-12B	Oct-16	FD	<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-12B	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-12B	Apr-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-12B	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-12B	Oct-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-P4	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00200
	KWB-P4	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	KWB-P4	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-57	Apr-15		0.000561 J	<0.000310	<0.000370	<0.000780	0.00197 J	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-57	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-57	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-57	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-57	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-57	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-58	Apr-15		0.0830	<0.00310	<0.00370	0.0174 J	**2.16**	<0.00400	<0.00420	<0.00470	<0.00400	<0.00260
	MW-58	Oct-15		0.0603 J	<0.0307	**<0.0372**	<0.0780	**2.18**	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	MW-58	Apr-16		0.0183	<0.000307	<0.000372	0.00806 J	**0.848**	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-58	Oct-16		0.0201	<0.000307	<0.000372	0.0159	**0.893**	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-58	Apr-17		<0.0341	<0.0307	**<0.0372**	<0.0412	0.533	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	MW-58	Oct-17		0.00179	<0.000307	<0.000372	0.0101	0.222	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-111	Apr-15		0.00158	<0.000310	<0.000370	<0.000780	0.00881	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-111	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	0.00113 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-111	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-111	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	0.00177 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-111	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	0.00237 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-111	Oct-17		<0.0341	<0.000307	<0.000372	<0.000412	<0.106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-113	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-113	Apr-15	FD	<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-113	Oct-15		<0.000341	<0.000307	<0.000372 J	<0.000780	<0.00106	<0.000396 J	<0.000419	<0.000469	<0.000398	<0.000259
	MW-113	Oct-15	FD	<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-113	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	0.00518	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-113	Apr-16	FD	<0.000341	<0.000307	<0.000372	<0.000780	0.00531	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-113	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	0.0143	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-113	Oct-16	FD	<0.000341	<0.000307	<0.000372	<0.000780	0.0127	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-113	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	0.0133	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-113	Apr-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	0.0148	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-113	Oct-17		<0.000341	<0.000307	<0.000372	0.000501 J	0.0279	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-113	Oct-17	FD	<0.000341	<0.000307	<0.000372	0.000660 J	0.0234	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-125	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-125	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-125	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-125	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-125	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-125	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-126A	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-126A	Oct-15		<0.000341	<0.000307	<0.000372	0.000858 J	0.0103	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-126A	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419 J4	<0.000469	<0.000398	<0.000259
	MW-126A	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-126A	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	0.00141 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-126A	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-126B	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-126B	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-126B	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-126B	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-126B	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-126B	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-127	Apr-15		0.142	<0.000310	<0.000370	0.183	0.296	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-127	Oct-15		0.0552	<0.00614	**<0.00744**	0.216	0.141	<0.00792	**<0.00838**	<0.00938	**<0.00796**	<0.00518
	MW-127	Apr-16		0.0375	<0.000307	<0.000372	0.287	0.149	<0.000396	<0.000419 J4	<0.000469	<0.000398	<0.000259
	MW-127	Oct-16		0.0127	<0.00307	<0.00372	0.0877	0.0514	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-127	Apr-17		0.00990	<0.000307	<0.000372	0.0958	0.0810	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-127	Oct-17		0.00373	<0.000307	<0.000372	0.0396	0.0482	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-128	Apr-15		<0.000340	<0.000310	<0.000370	0.000928 J	0.00326	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-128	Oct-15		<0.00682	<0.00614	**<0.00744**	<0.0156	<0.0212	<0.00792	**<0.00838**	<0.00938	<0.000400	<0.00518
	MW-128	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	0.00153 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-128	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	0.00370	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-128	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	0.00159 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-128	Oct-17		<0.000341	<0.000307	<0.000372	0.000781 J	0.00336	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

			Analyte Group:										
			Analyte:	o-Xylene	Styrene (Monomer)	Tetra-chloro-ethene	Toluene	Total Xylenes	trans-1,2-Dichloro-ethene	trans-1,3-Dichloro-propene	Tribromo-methane	Trichloro-ethene	Vinyl Chloride
			Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
			CGWSL:	0.193	0.1	0.005	0.75	0.62	0.1	0.0047	---	0.005	1.00E-03
			CGWSL Source:	WQCC TW	USEPA MCL	USEPA MCL	WQCC HH	WQCC HH	USEPA MCL	USEPA TW	USEPA TW	USEPA MCL	WQCC HH
Area	**Well ID**	**Date**	**Dup**										
Field East of Refinery	MW-129	Apr-15		0.00112	<0.000310	<0.000370	<0.000780	0.00357	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-129	Oct-15		<0.0341	<0.0307	**<0.0372**	<0.0780	<0.106	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	MW-129	Apr-16		0.000796 J	<0.000307	<0.000372	<0.0390	0.00278 J	<0.000396	<0.000419 J4	<0.000469	<0.000398	<0.000259
	MW-129	Oct-16		<0.000341	<0.000307	<0.000372	0.000920 J	0.00124 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-129	Apr-17		<0.000341	<0.000307	<0.000372	0.000543 J	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-130	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-130	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-130	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-130	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-130	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-130	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-131	Apr-15		0.0606	<0.000310	<0.000370	0.215	0.145	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-131	Oct-15		0.0243	<0.000307	<0.000372	0.0522	0.0859	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-131	Apr-16		0.0370	<0.000307	<0.000372	0.142	0.0883	<0.000396	<0.000419 J4	<0.000469	<0.000398	<0.000259
	MW-131	Oct-16		0.0182	<0.00154	<0.00186	0.0299	0.0613	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-131	Apr-17		0.0406	<0.000307	<0.000372	0.153	0.114	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-131	Oct-17		<0.0852	<0.000307	<0.000372	0.0627	<0.265	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-133	Nov-14		0.0380 J	<0.0310	**<0.0370**	0.100 J	0.220 J	<0.0400	**<0.0420**		**<0.0400**	<0.0260
	MW-133	Apr-15		<0.0340	<0.0310	**<0.0370**	<0.0780	<0.110	<0.0400	**<0.0420**	<0.0470	**<0.0400**	<0.0260
	MW-134	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-134	Apr-15	FD	<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-134	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-134	Oct-15	FD	<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-134	Apr-16		<0.00100	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419 J4	<0.000469	<0.000398	<0.000259
	MW-134	Apr-16	FD	<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419 J4	<0.000469	<0.000398	<0.000259
	MW-134	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-134	Oct-16	FD	<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-134	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-134	Apr-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-134	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-134	Oct-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-135	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-135	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-135	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-135	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-135	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-135	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RA-4196	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	RA-4196	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RA-4196	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RA-4196	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RA-4196	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RA-4196	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RA-4798	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	RA-4798	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RA-4798	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RA-4798	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RA-4798	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RA-4798	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RW-12R	Apr-16		<0.00170	<0.00154	<0.00186	<0.00390	0.0140 J	<0.00198	<0.00210		<0.00199	<0.00130
	RW-12R	Apr-17		0.00177 J	<0.00154	<0.00186	0.00354 J	0.0257	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	RW-13R	Apr-16		0.0139	<0.000307	<0.000372	0.0175	0.108	<0.000396	<0.000419		<0.000398	<0.000259
	RW-18	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	RW-18	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	RW-18	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RW-18	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RW-20	Apr-15		0.0590	<0.00310	<0.00370	0.211	**1.35**	<0.00400	<0.00420	<0.00470	<0.00400	<0.00260
	RW-22	Apr-15		0.0952	<0.00310	<0.00370	0.216	**0.945**	<0.00400	<0.00420	<0.00470	<0.00400	<0.00260
North Refinery	MW-23	Apr-15		0.181	<0.00770	**<0.370**	0.431	**1.37**	<0.00990	**<0.0100**	<0.0120 J	**<0.0100**	<0.00650
	MW-23	Oct-15		0.00237	<0.000307	<0.000372	0.00501	0.00805	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-23	Apr-16		0.00284 J	<0.00154	<0.00186	0.00412 J	0.0176	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-23	Oct-16		<0.00852	<0.00768	**<0.00930**	<0.0195	<0.0265	<0.00990	**<0.0105**	<0.0117	**<0.00995**	<0.00648
	MW-23	Apr-17		0.00188	<0.000307	<0.000372	0.00243	0.00549	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-23	Oct-17		0.00198	<0.000307	<0.000372	0.00561	0.00525	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-29	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-29	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-29	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-29	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-29	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-29	Oct-17		<0.000341	<0.000307	<0.000372	0.000676 J	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-39	Apr-15		0.00632	<0.000310	<0.000370	0.00137 J	0.00753	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-39	Oct-15		0.00530	<0.000307	<0.000372	0.00108 J	0.00645	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-39	Apr-16		0.0365	<0.00768	**<0.00930**	0.0293 J	0.181	<0.00990	**<0.0105**	<0.0117	**<0.00995**	<0.00648
	MW-39	Oct-16		0.0428 J	<0.0307	**<0.0372**	<0.0780	0.204 J	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	MW-39	Apr-17		0.0454	<0.00307	<0.00372	0.0251	0.186	<0.00396	<0.00419	<0.000469	<0.00398	<0.00259
	MW-39	Oct-17		0.0368	<0.000307	<0.000372	0.00816	0.150	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-40	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	0.00560 J	<0.000400	<0.000600		<0.000500	<0.000400
	MW-40	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	0.00606	<0.000400	<0.000420	<0.000470	<0.000400	0.000999 J
	MW-40	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	0.0144	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-40	Apr-17		<0.000341	<0.000307	<0.000372	0.000732 J	0.0117	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-41	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	MW-41	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-41	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-41	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-42	Apr-14		0.00110 J	<0.000500	<0.000600	0.00230 J	0.110	<0.000400	<0.000600		<0.000500	<0.000400
	MW-42	Apr-15		<0.00340	<0.00310	<0.00370	<0.00780	0.0484	<0.00400	<0.00420	<0.00470	<0.00400	<0.00260
	MW-42	Apr-16		<0.00170	<0.00154	<0.00186	<0.00390	0.0380	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-42	Apr-17		<0.000341	<0.000307	<0.000372	0.000845 J	0.00365	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-43	Apr-15		0.0227	<0.00310	<0.00370	0.0538	0.300	<0.00400	<0.00420	<0.00470 J	<0.00400	<0.00260
	MW-43	Oct-15		**0.333**	<0.00307	<0.00372	**0.808**	**1.48**	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-43	Apr-16		**0.626**	<0.0768	**<0.0930**	**1.66**	**1.86**	<0.0990	**<0.105**	<0.117	**<0.0995**	<0.0648
	MW-43	Oct-16		**0.555**	<0.0768	**<0.0930**	0.618 J	**1.81**	<0.0990	**<0.105**	<0.117	**<0.0995**	<0.0648
	MW-43	Apr-17		**0.539**	<0.0154	**<0.0186**	0.519	**1.80**	<0.0198	**<0.0210**	<0.0234	**<0.0199**	<0.0130
	MW-43	Oct-17		**0.421**	<0.0154	**<0.0186**	0.285	**1.76**	<0.0198	**<0.0210**	<0.0234	**<0.0199**	<0.0130
	MW-59	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	MW-59	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-59	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-59	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-60	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	0.00280 J	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-60	Apr-15	FD	<0.000340	<0.000310	<0.000370	<0.000780	0.00163 J	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-60	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	0.00176 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-60	Oct-15	FD	<0.000341	<0.000307	<0.000372	<0.000780	0.00181 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-60	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	0.00283 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-60	Apr-16	FD	<0.000341	<0.000307	<0.000372	<0.000780	0.00272 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

			Analyte Group:										
			Analyte:	o-Xylene	Styrene (Monomer)	Tetra-chloro-ethene	Toluene	Total Xylenes	trans-1,2-Dichloro-ethene	trans-1,3-Dichloro-propene	Tribromo-methane	Trichloro-ethene	Vinyl Chloride
			Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
			CGWSL:	0.193	0.1	0.005	0.75	0.62	0.1	0.0047	---	0.005	1.00E-03
			CGWSL Source:	WQCC TW	USEPA MCL	USEPA MCL	WQCC HH	WQCC HH	USEPA MCL	USEPA TW	USEPA TW	USEPA MCL	WQCC HH
Area	**Well ID**	**Date**	**Dup**										
North Refinery	MW-60	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	0.00736	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-60	Oct-16	FD	<0.000341	<0.000307	<0.000372	<0.000780	0.00552	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-60	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	0.00195 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-60	Apr-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	0.00240 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-60	Oct-17		<0.000341	<0.000307	<0.000372	0.000476 J	0.00622	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-60	Oct-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	0.00514	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-61	Apr-15		0.00784 J	<0.00310	<0.00370	0.0130 J	**1.69**	<0.00400	<0.00420	<0.00470 J	<0.00400	<0.00260
	MW-61	Oct-15		0.00496 J	<0.00307	<0.00372	0.0379 J	0.374	<0.00396	<0.00419	<0.00469	<0.00398 J	<0.00259
	MW-61	Apr-16		0.00263 J	<0.00154	<0.00186	0.0185 J	0.226	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-61	Oct-16		<0.00852	<0.00768	**<0.00930**	0.0260 J	0.225	<0.00990	**<0.0105**	<0.0117	**<0.00995**	<0.00648
	MW-61	Apr-17		<0.00852	<0.00768	**<0.00930**	0.0312	0.228	<0.00990	**<0.0105**	<0.0117	**<0.00995**	<0.00648
	MW-61	Oct-17		0.00327	<0.000307	<0.000372	0.0612	0.378	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-62	Apr-15		<0.00340	<0.00310	**<0.190**	<0.00780	0.0405	<0.00400	<0.00420	<0.00470 J	<0.00400	<0.00260
	MW-62	Oct-15		0.00886 J	<0.00614	**<0.00744**	<0.0156	**1.73**	<0.00792	**<0.00838**	<0.00938	**<0.00796** J	<0.00518
	MW-62	Apr-16		<0.00852	<0.00768	**<0.00930**	<0.0195	**1.80**	<0.00990	**<0.0105**	<0.0117	**<0.00995**	<0.00648
	MW-62	Oct-16		<0.0341 J6	<0.0307 J6	**<0.0372** J6	<0.0780 J6	**1.14** J6	<0.0396 J6	**<0.0419** J6	<0.0469 J6	**<0.0398** J6	<0.0259 J6
	MW-62	Apr-17		<0.0170	<0.0154	**<0.0186**	<0.0206	**1.13**	<0.0198	**<0.0210**	<0.0234	**<0.0199**	<0.0130
	MW-62	Oct-17		<0.0341	<0.0307	**<0.0372**	<0.0412	**1.35**	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	MW-67	Apr-15		<0.000340	<0.000310	<0.000370	0.00260 J	0.00291 J	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-67	Oct-15		<0.00682	<0.00614	**<0.00744**	<0.0156	<0.0212	<0.00792	**<0.00838**	<0.00938	**<0.00796**	<0.00518
	MW-67	Apr-16		<0.00341	<0.00307	<0.00372	<0.00780	<0.0106	<0.00396	<0.00419 J4	<0.00469	<0.00398	<0.00259
	MW-67	Oct-16		0.00407 J	<0.00307	<0.00372	<0.00780	0.0120 J	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-67	Apr-17		<0.00170	<0.00154	<0.00186	0.00361 J	0.0121 J	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-67	Oct-17		<0.000341	<0.000307	<0.000372	0.00140	0.00245 J	<0.000396	<0.000419	<0.000469	0.000515 J	<0.000259
	MW-90	Apr-15		<0.000340	<0.000310	<0.000370	0.00194 J	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-90	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396 J	<0.000419	<0.000469	<0.000398	<0.000259 J
	MW-90	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-90	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-90	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-90	Oct-17		0.000368 J	<0.000307	<0.000372	0.000744 J	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-91	Apr-15		0.150	<0.00310	<0.00370	**1.91**	**0.852**	<0.00400	<0.00420	<0.00470	<0.00400	<0.00260
	MW-91	Oct-15		0.180	<0.00768	**<0.00930**	0.652	**0.933**	<0.00990	**<0.0105**	<0.0117	**<0.00995**	<0.00648
	MW-91	Apr-16		**0.365**	<0.0154	**<0.0186**	**4.01**	**1.69**	<0.0198	**<0.0210**	<0.000469	**<0.0199**	<0.0130
	MW-91	Oct-16		**0.310**	<0.0768	**<0.0930**	**3.33**	**1.58**	<0.0990	**<0.105**	<0.117	**<0.0995**	<0.0648
	MW-91	Apr-17		**0.216**	<0.0307	**<0.0372**	**1.61**	**1.05**	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	MW-91	Oct-17		**0.219**	<0.0307	**<0.0372**	**1.12**	**0.975**	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	MW-92	Apr-16		0.0268	<0.000307	0.000488 J	0.0173	0.188	0.000917 J	<0.000419	<0.000469	<0.000398	0.000399 J
	MW-92	Oct-16		0.0151 J	<0.00614	**<0.00744**	<0.0156	0.110	<0.00792	**<0.00838**	<0.00938	**<0.00796**	<0.00518
	MW-93	Apr-15		0.00938 J	<0.00310	<0.00370	0.00961 J	0.319	<0.00400	<0.00420	<0.00470 J	<0.00400	<0.00260
	MW-93	Oct-15		0.0110	<0.00307	<0.00372	0.0170 J	0.494	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-93	Apr-16		<0.00170	<0.00154	<0.00186	<0.00390	0.0567	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-93	Oct-16		<0.00341	<0.00307	<0.00372	<0.00780	0.250	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-93	Apr-17		<0.00852	<0.00768	**<0.00930**	<0.0103	0.326	<0.00990	**<0.0105**	<0.0117	**<0.00995**	<0.00648
	MW-94	Oct-15		**0.360**	<0.00307	<0.00372	0.553	0.574	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-94	Apr-16		**0.387**	<0.0154	**<0.0186**	0.687	0.615	<0.0198	**<0.0210** J4	<0.0234	**<0.0199**	<0.0130
	MW-94	Oct-16		**0.390**	<0.00154	<0.00186	0.468	0.592	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-94	Apr-17		**0.292**	<0.00768	**<0.00930**	0.435	0.460	<0.00990	**<0.0105**	<0.0117	**<0.00995**	<0.00648
	MW-95	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	MW-95	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-95	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419 J4	<0.000469	<0.000398	<0.000259
	MW-95	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-96	Apr-15		0.00110	<0.000310	<0.000370	0.00156 J	0.00547	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-96	Oct-15		<0.170	**<0.154**	**<0.186**	<0.390	<0.530	**<0.198**	**<0.210**	<0.234	**<0.199**	<0.130
	MW-96	Apr-16		<0.00682	<0.00614	**<0.00744**	<0.0156	<0.0212	<0.00792	**<0.00838**	<0.00938	**<0.00796**	<0.00518
	MW-96	Oct-16		<0.0170	<0.0154	**<0.0186**	<0.0390	<0.0530	<0.0198	**<0.0210**	<0.0234	**<0.0199**	<0.0130
	MW-96	Apr-17		<0.0170	<0.0154	**<0.0186**	<0.0206	<0.0530	<0.0198	**<0.0210**	<0.0234	**<0.0199**	<0.0130
	MW-96	Oct-17		<0.0170	<0.0154	**<0.0186**	<0.0206	<0.0530	<0.0198	**<0.0210**	<0.0234	**<0.0199**	<0.0130
	MW-98	Apr-15		0.0358	<0.00770	**<0.0930**	0.283	**1.74**	<0.00990	**<0.0100**	<0.0120 J	**<0.0100**	<0.00650
	MW-98	Oct-15		0.0316	<0.00768	**<0.00930**	0.268	**1.71**	<0.00990	**<0.0105**	<0.0117	**<0.00995**	<0.00648
	MW-98	Apr-16		<0.0341	<0.0307	**<0.0372**	0.220 J	**0.865**	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	MW-98	Oct-16		<0.0341	<0.0307	**<0.0372**	0.245 J	**1.37**	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	MW-98	Apr-17		0.0443 J	<0.0307	**<0.0372**	0.356	**1.88**	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	MW-98	Oct-17		0.0525	<0.0154	**<0.0186**	0.421	**2.21**	<0.0198	**<0.0210**	<0.0234	**<0.0199**	<0.0130
	MW-137	Oct-15		**0.480**	<0.0307	**<0.0372**	**2.16**	**1.16**	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	MW-137	Apr-16		**0.539**	<0.0768	**<0.0930**	**2.53**	**1.23**	<0.0990	**<0.105**	<0.117	**<0.0995**	<0.0648
	MW-137	Oct-16		**0.343**	<0.0768	**<0.0930**	**1.51**	**1.10**	<0.0990	**<0.105**	<0.117	**<0.0995**	<0.0648
	MW-137	Apr-17		**0.427**	<0.0614	**<0.0744**	**2.08**	**1.15**	<0.0792	**<0.0838**	<0.0938	**<0.0796**	<0.0518
	MW-137	Oct-17		**0.265**	<0.0614	**<0.0744**	**1.54**	**1.16**	<0.0792	**<0.0838**	<0.0938	**<0.0796**	<0.0518
	MW-138	Oct-15		<0.00682	<0.00614	**<0.00744**	<0.0156	0.0339 J	<0.00792	**<0.00838**	<0.00938	**<0.00796**	<0.00518
	MW-138	Apr-16		<0.00341	<0.00307	<0.00372	0.0158 J	<0.0106	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-138	Oct-16		<0.00341	<0.00307	<0.00372	<0.00780	<0.0106	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-138	Apr-17		<0.00341	<0.00307	<0.00372	<0.00412	<0.0106	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-138	Oct-17		<0.00170	<0.00154	<0.00186	0.00577	0.00565 J	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	RW-1	Apr-15		<0.0170	<0.0150	**<0.0190**	<0.0390	<0.0530	<0.0200	**<0.0210**	<0.0230	**<0.0200**	<0.0130
	RW-1R	Apr-16		0.00110	<0.000307	0.00258	0.00542	0.0122	0.025	<0.000419	<0.000469	**0.00959**	0.00116
	RW-1R	Apr-17		<0.00341	<0.00307	<0.00372	0.0102	<0.0106	0.0108	<0.00419	<0.00469	**0.00896** J	<0.00259
	RW-2	Apr-15		0.0853	<0.00310	**<0.0930**	0.115	0.530	<0.00400	<0.00420	<0.00470 J	**0.0326**	<0.00260
	RW-2R	Apr-16		0.0461 J	<0.0154	**<0.0186**	0.0569 J	0.299	<0.0198	**<0.0210**	<0.0234	**0.0285** J	<0.0130
	RW-2R	Apr-17		0.0183 J	<0.0154	**0.0218** J	0.0430 J	0.431	<0.0198	**<0.0210**	<0.0234	**0.0249** J	<0.0130
	RW-7	Apr-15		0.00176	<0.000310	<0.000370	0.00396 J	0.0367	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	RW-7R	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419 J4	<0.000469	<0.000398	<0.000259
	RW-7R	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RW-8	Apr-15		<0.00340	<0.00310	<0.00370	<0.00780	<0.0110	<0.00400	<0.00420	<0.00470	<0.00400	<0.00260
	RW-8	Apr-17		0.0112	<0.000307	<0.000372	0.00213	0.0498	<0.000396	<0.000419	<0.000469	0.00110	<0.000259
	RW-9	Apr-14		<0.000500	<0.000500	<0.000600	0.00190 J	0.0240	<0.000400	<0.000600		<0.000500	<0.000400
	RW-9	Apr-15		<0.0170	<0.0150	**<0.0190**	<0.0390	<0.0530	<0.0200	**<0.0210**	<0.0230	**<0.0200**	<0.0130
	RW-9	Apr-16		<0.00170	<0.00154	<0.00186	<0.00390	0.0708	<0.00198	<0.00210	<0.0469	<0.00199	<0.00130
	RW-9	Apr-17		<0.000341	<0.000307	<0.000372	0.00184	0.0193	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RW-10	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	RW-10	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	RW-10	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RW-10	Apr-17		0.00299	<0.000307	<0.000372	0.00119	0.00378	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RW-16	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	RW-16	Apr-14	FD	<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	RW-16	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	RW-16	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RW-16	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RW-17	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	RW-17	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	RW-17	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RW-17	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:										
				Analyte:	o-Xylene	Styrene (Monomer)	Tetra-chloro-ethene	Toluene	Total Xylenes	trans-1,2-Dichloro-ethene	trans-1,3-Dichloro-propene	Tribromo-methane	Trichloro-ethene	Vinyl Chloride
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.193	0.1	0.005	0.75	0.62	0.1	0.0047	---	0.005	1.00E-03
				CGWSL Source:	WQCC TW	USEPA MCL	USEPA MCL	WQCC HH	WQCC HH	USEPA MCL	USEPA TW	USEPA TW	USEPA MCL	WQCC HH
Area	**Well ID**	**Date**	**Dup**											
North RO Reject Field	MW-117	Apr-15		0.000942 J	<0.000310	0.00071 J	<0.000780	0.00229 J	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	MW-117	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-117	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-117	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-117	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-117	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-118	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	MW-118	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-118	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-118	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-118	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-118	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-119	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	MW-119	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-119	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-119	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-119	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-119	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
NCL	MW-18	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400	
	MW-18	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	MW-18	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-18	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-45	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	MW-45	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-45	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-45	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-45	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-45	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-53	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400	
	MW-53	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	MW-53	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-53	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-54A	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	MW-54A	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-54A	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-54A	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-54A	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-54A	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-54B	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00200	
	MW-54B	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	MW-54B	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-55	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	MW-55	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-55	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-55	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-55	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-55	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-56	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	MW-56	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-56	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-56	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-56	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	MW-108	Apr-15		0.00412 J	<0.00310	<0.00370	0.00956 J	0.0706	<0.00400	<0.00420	<0.00470	<0.00400	<0.00260	
	MW-108	Oct-15		0.00444 J	<0.00307	<0.00372	0.00978 J	0.0855	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259	
	MW-108	Apr-16		<0.0170	<0.0154	**<0.0186**	<0.0390	0.0795 J	<0.0198	**<0.0210**	<0.0234	**<0.0199**	<0.0130	
	MW-108	Oct-16		<0.00852	<0.00768	**<0.00930**	<0.0195	0.0721 J	<0.00990	**<0.0105**	<0.0117	**<0.00995**	<0.00648	
	MW-108	Apr-17		<0.00852	<0.00768	**<0.00930**	<0.0103	0.0815	<0.00990	**<0.0105**	<0.0117	**<0.00995**	<0.00648	
	MW-108	Oct-17		0.00238 J	<0.00154	<0.00186	0.00383 J	0.0626	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130	
	NCL-31	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	NCL-31	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-31	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-31	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-31	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-31	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-32	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	NCL-32	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-32	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-32	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-32	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-32	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-33	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	NCL-33	Oct-15		<0.000341	<0.000307	<0.000372 J	<0.000780 J	<0.00106	<0.000396 J	<0.000419	<0.000469 J	<0.000398	<0.000259 J	
	NCL-33	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-33	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-33	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-33	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-34A	Apr-15		0.00121	<0.000310	<0.000370	<0.000780	0.0952	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	NCL-34A	Oct-15		0.000477 J	<0.000307	<0.000372	<0.000780	0.0658	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-34A	Apr-16		<0.0170	<0.0154	**<0.0186**	<0.0390	0.188	<0.0198	**<0.0210**	<0.0234	**<0.0199**	<0.0130	
	NCL-34A	Oct-16		<0.0341	<0.0307	**<0.0372**	<0.0780	0.111 J	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259	
	NCL-34A	Apr-17		<0.0170	<0.0154	**<0.0186**	<0.0206	0.100 J	<0.0198	**<0.0210**	<0.0234	**<0.0199**	<0.0130	
	NCL-34A	Oct-17		0.000631 J	<0.000307	<0.000372	<0.000412	0.0768	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-44	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	NCL-44	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-44	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-44	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-44	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-44	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-49	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	NCL-49	Apr-15	FD	<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260	
	NCL-49	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-49	Oct-15	FD	<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-49	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-49	Apr-16	FD	<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-49	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-49	Oct-16	FD	<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-49	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-49	Apr-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-49	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	
	NCL-49	Oct-17	FD	<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259	

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:										
				Analyte:	o-Xylene	Styrene (Monomer)	Tetra-chloro-ethene	Toluene	Total Xylenes	trans-1,2-Dichloro-ethene	trans-1,3-Dichloro-propene	Tribromo-methane	Trichloro-ethene	Vinyl Chloride
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.193	0.1	0.005	0.75	0.62	0.1	0.0047	---	0.005	1.00E-03
				CGWSL Source:	WQCC TW	USEPA MCL	USEPA MCL	WQCC HH	WQCC HH	USEPA MCL	USEPA TW	USEPA TW	USEPA MCL	WQCC HH
Area	**Well ID**	**Date**	**Dup**											
South Refinery	KWB-2R	Apr-15		0.0115	<0.00310	<0.00370	0.0140 J	0.236	<0.00400	<0.00420	<0.00470	<0.00400	<0.00260
	KWB-2R	Oct-15		<0.0341	<0.0307	**<0.0372**	<0.0780	0.448	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	KWB-2R	Apr-16		0.00189	<0.000307	<0.000372	0.00152 J	0.0515	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-2R	Oct-16		0.00185	<0.000307	<0.000372	0.00290 J	0.0289	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-2R	Apr-17		0.000772 J	<0.000307	<0.000372	<0.000412	0.0281	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-2R	Oct-17		0.00977	<0.000307	<0.000372	0.0161	0.193	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-5	Apr-15		0.00713	<0.000310	<0.000370	0.0130	0.0394	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	KWB-5	Oct-15		0.00312	<0.000307	<0.000372	0.00578	0.0166	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-5	Apr-16		0.00349	<0.000307	<0.000372	0.00412 J	0.0158	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-5	Oct-16		<0.00170	<0.00154	<0.00186	<0.00390	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	KWB-5	Apr-17		0.00472	<0.000307	<0.000372	0.00470	0.0434	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-5	Oct-17		<0.0852	<0.000307	<0.000372	0.00156	<0.265	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	KWB-6	Apr-15		**0.760**	<0.00770	**<0.00930**	**1.70**	**3.47**	<0.00990	**<0.0100**	<0.0120	**<0.0100**	<0.00650
	KWB-6	Oct-15		**0.297** J	**<0.154**	**<0.186**	<0.390	**1.33** J	**<0.198**	**<0.210**	<0.234	**<0.199**	<0.130
	KWB-6	Apr-16		**0.243**	<0.00154	<0.00186	0.120	**1.88**	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	KWB-6	Oct-16		0.0232	<0.00614	**<0.00744**	0.0167 J	0.417	<0.00792	**<0.00838**	<0.00938	**<0.00796**	<0.00518
	KWB-6	Apr-17		0.0179	<0.00154	<0.00186	0.0205	0.391	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	KWB-6	Oct-17		0.00804	<0.000307	<0.000372	0.0122	0.283	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-28	Apr-15		<0.0340	<0.0310	**<0.0370**	<0.0780	0.194 J	<0.0400	**<0.0420**	<0.0470	**<0.0400**	<0.0260
	MW-28	Oct-15		<0.0341	<0.0307	**<0.0372**	<0.0780	0.243 J	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	MW-28	Apr-16		0.00496 J	<0.00307	<0.00372	0.0350 J	0.161	<0.00396	<0.00419	<0.0469	<0.00398	<0.00259
	MW-28	Oct-16		<0.0170	<0.0154	**<0.0186**	0.0683 J	0.338	<0.0198	**<0.0210**	<0.0469	**<0.0199**	<0.0130
	MW-28	Apr-17		<0.0170	<0.0154	**<0.0186**	0.0587	0.238	<0.0198	**<0.0210**	<0.0234	**<0.0199**	<0.0130
	MW-28	Oct-17		<0.0170	<0.0154	**<0.0186**	0.0474 J	0.216	<0.0198	**<0.0210**	<0.0234	**<0.0199**	<0.0130
	MW-48	Apr-15		0.00973 J	<0.00310	<0.00370	0.0146 J	0.153	<0.00400	<0.00420	<0.00470	<0.00400	<0.00260
	MW-48	Oct-15		0.00658	<0.00154	<0.00186	0.0120 J	0.125	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-48	Apr-16		0.0788	<0.00614	**<0.00744**	0.214	**0.750**	<0.00792	**<0.00838**	<0.000469	**<0.00796**	<0.00518
	MW-48	Oct-16		0.0356	<0.00154	<0.00186	0.214	0.538	<0.00198	<0.00210	<0.000469	<0.00199	<0.00130
	MW-48	Apr-17		0.115	<0.0154	**<0.0186**	0.667	**1.16**	<0.0198	**<0.0210**	<0.0234	**<0.0199**	<0.0130
	MW-48	Oct-17		0.0924	<0.000307	<0.000372	0.722	**0.797**	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-50	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-50	Oct-15		<0.000341	<0.000307 J	<0.000372 J	<0.000780 J	<0.00106 J	<0.000396 J	<0.000419 J	<0.000469 J	<0.000398 J	<0.000259
	MW-50	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-50	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-50	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-50	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-52	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-52	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780 J	<0.00106	<0.000396 J	<0.000419	<0.000469	<0.000398	<0.000259 J
	MW-52	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-52	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-52	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-52	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-64	Apr-16		**2.44**	<0.0154	**<0.0186**	**18.8**	**7.70**	<0.0198	**<0.0210** J4		**<0.0199**	<0.0130
	MW-64	Oct-16		**1.51**	<0.0307	**<0.0372**	**11.6**	**5.30**	<0.0396	**<0.0419**		**<0.0398**	<0.0259
	MW-64	Apr-17		**2.09**	<0.0768	**<0.0930**	**13.2**	**7.58**	<0.0990	**<0.105**	<0.117	**<0.0995**	<0.0648
	MW-64	Oct-17		**1.44**	<0.0768	**<0.0930**	**9.81**	**6.01**	<0.0990	**<0.105**	<0.117	**<0.0995**	<0.0648
	MW-65	Apr-15		0.0228	<0.00310	<0.00370	0.0294 J	0.158	<0.00400	<0.00420	<0.0469	<0.00400	<0.00260
	MW-65	Apr-16		0.0149	<0.00307	<0.00372	0.0211 J	0.0971	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-65	Oct-16		0.00937 J	<0.00614	**<0.00744**	0.0271 J	0.0298 J	<0.00792	**<0.00838**	<0.00938	**<0.00796**	<0.00518
	MW-65	Apr-17		<0.0341	<0.0307	**<0.0372**	<0.0412	<0.106	<0.0396	**<0.0419**	<0.117	**<0.0398**	<0.0259
	MW-65	Oct-17		<0.0341	<0.0307	**<0.0372**	<0.0412	<0.106	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	MW-66	Apr-15		<0.0170	<0.0150 J	**<0.0190**	<0.0390 J	0.0668 J	<0.0200	**<0.0210**	<0.0230	**<0.0200**	<0.0130
	MW-66	Oct-15		0.00390	<0.000307	<0.000372	0.00722	0.0320	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-66	Apr-16		<0.00341	<0.00307	<0.00372	<0.00780	0.0285 J	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-66	Oct-16		0.00365	<0.000307	<0.000372	0.0109	0.0265	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-66	Apr-17		<0.0170	<0.0154	**<0.0186**	<0.0206	<0.0530	<0.0198	**<0.0210**	<0.0234	**<0.0199**	<0.0130
	MW-66	Oct-17		<0.00341	<0.00307	<0.00372	<0.00412	<0.0106	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-99	Apr-15		**0.315**	<0.00770 J	**<0.00930**	0.149 J	**0.937**	<0.00990	**<0.0100**	<0.0120	**<0.0100**	<0.00650
	MW-99	Oct-15		0.0953	<0.00768	**<0.00930**	0.221	0.604	<0.00990	**<0.0105**	<0.0117	**<0.00995**	<0.00648
	MW-99	Apr-16		0.0843	<0.00307	<0.00372	0.0427 J	0.615	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-99	Oct-16		0.108	<0.00614	**<0.00744**	0.190	**0.699**	<0.00792	**<0.00838**	<0.00938	**<0.00796**	<0.00518
	MW-99	Apr-17		0.106	<0.0154	**<0.0186**	0.0860	0.522	<0.0198	**<0.0210**	<0.0234	**<0.0199**	<0.0130
	MW-99	Oct-17		<0.0341	<0.0307	**<0.0372**	<0.0412	0.228 J	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	MW-101	Apr-15		<0.00170	<0.00150	<0.00190	<0.00390	<0.00530	<0.00200	<0.00210	<0.00230 J	<0.00200	<0.00130
	MW-101	Oct-15		<0.00170	<0.00154	<0.00186	<0.00390	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-101	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-101	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-101	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-101	Oct-17		<0.000341	<0.000307	<0.000372	0.000439 J	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-102	Apr-15		**0.247**	<0.00310	<0.00370	**1.45**	**0.846**	<0.00400	<0.00420	<0.00470	<0.00400	<0.00260
	MW-102	Oct-15		**0.361**	<0.0307	**<0.0372**	**1.20**	**1.43**	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	MW-102	Apr-16		0.0881 J	<0.0307	**<0.0372**	0.541	**0.632**	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	MW-102	Oct-16		0.0952 J	<0.0307	**<0.0372**	0.626	**0.719**	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	MW-102	Apr-17		0.0189 J	<0.00614	**<0.00744**	0.243	0.391	<0.00792	**<0.00838**	<0.00938	**<0.00796**	<0.00518
	MW-102	Oct-17		0.0353 J	<0.0154	**<0.0186**	0.275	0.501	<0.0198	**<0.0210**	<0.0234	**<0.0199**	<0.0130
	MW-103	Apr-14		0.00450 J	<0.000500	<0.000600	0.00940	0.0170	<0.000400	<0.000600		<0.000500	<0.000400
	MW-103	Apr-15		0.00549	<0.000310	<0.000370	0.0154	0.0137	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-103	Apr-16		0.00422 J	<0.00154	<0.00186	0.0153 J	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-103	Apr-17		<0.0170	<0.0154	**<0.0186**	<0.0206	<0.0530	<0.0198	**<0.0210**	<0.0234	**<0.0199**	<0.0130
	MW-104	Apr-15		<0.000340	<0.000310 J	<0.000370	<0.000780 J	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-104	Apr-15	FD	<0.000340	<0.000310 J	<0.000370	<0.000780 J	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-104	Oct-15		<0.00170	<0.00154	<0.00186	<0.00390	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-104	Oct-15	FD	<0.000341	0.000881 J	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-104	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-104	Apr-16	FD	<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-104	Oct-16		<0.00170	<0.00154	<0.00186	<0.00390	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-104	Oct-16	FD	<0.00170	<0.00154	<0.00186	<0.00390	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-104	Apr-17		<0.00341	<0.00307	<0.00372	<0.00412	<0.0106	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-104	Apr-17	FD	<0.00170	<0.00154	<0.00186	<0.00206	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-104	Oct-17		<0.000341	0.000402 J	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-104	Oct-17	FD	<0.00170	<0.00154	<0.00186	<0.00206	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-105	Apr-15		0.00965	<0.00150	**<0.0190**	0.0314	0.214	<0.00200	<0.00210	<0.00230 J	<0.00200	<0.00130
	MW-105	Oct-15		<0.00341	<0.00307	<0.00372	<0.00780	0.109	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-105	Apr-16		<0.0852	<0.0768	**<0.0930**	<0.195	0.379 J	<0.0990	**<0.105**	<0.117	**<0.0995**	<0.0648
	MW-105	Oct-16		<0.0341	<0.0307	**<0.0372**	<0.0780	**0.683**	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	MW-105	Apr-17		<0.0341	<0.0307	**<0.0372**	<0.0412	0.446	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	MW-105	Oct-17		<0.0341	<0.000307	<0.000372	0.0192	0.390	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-106	Apr-15		0.00393	<0.000310	<0.000370	0.0420	0.0514	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-106	Oct-15		<0.0341	<0.0307	**<0.0372**	0.216 J	0.217 J	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	MW-106	Apr-16		<0.00852	<0.00768	**<0.00930**	0.124 J	0.203	<0.00990	**<0.0105**	<0.0117	**<0.00995**	<0.00648
	MW-106	Oct-16		<0.0170	<0.0154	**<0.0186**	0.146 J	0.297	<0.0198	**<0.0210**	<0.0234	**<0.0199**	<0.0130
	MW-106	Apr-17		<0.0170	<0.0154	**<0.0186**	0.116	0.236	<0.0198	**<0.0210**	<0.0234	**<0.0199**	<0.0130
	MW-106	Oct-17		<0.0170	<0.0154	**<0.0186**	0.272	0.195	<0.0198	**<0.0210**	<0.0234	**<0.0199**	<0.0130

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:										
				Analyte:	o-Xylene	Styrene (Monomer)	Tetra-chloro-ethene	Toluene	Total Xylenes	trans-1,2-Dichloro-ethene	trans-1,3-Dichloro-propene	Tribromo-methane	Trichloro-ethene	Vinyl Chloride
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.193	0.1	0.005	0.75	0.62	0.1	0.0047	---	0.005	1.00E-03
				CGWSL Source:	WQCC TW	USEPA MCL	USEPA MCL	WQCC HH	WQCC HH	USEPA MCL	USEPA TW	USEPA TW	USEPA MCL	WQCC HH
Area	**Well ID**	**Date**	**Dup**											
South Refinery	MW-107	Apr-15		<0.00340	<0.00310	<0.00370	0.0106 J	0.0146 J	<0.00400	<0.00420	<0.00470	<0.00400	<0.00260
	MW-107	Oct-15		0.0431 J	<0.0307	**<0.0372**	<0.0780	0.130 J	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	MW-107	Apr-16		0.00145	<0.000307	<0.000372	0.00399 J	0.00572	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-107	Oct-16		0.00265 J	<0.00154	<0.00186	0.00800 J	0.0112 J	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-107	Apr-17		<0.0170	<0.0154	**<0.0186**	<0.0206	<0.0530	<0.0198	**<0.0210**	<0.0234	**<0.0199**	<0.0130
	MW-109	Apr-15		<0.00340	<0.00310	<0.00370	0.0117 J	0.0176 J	<0.00400	<0.00420	<0.00470	<0.00400	<0.00260
	MW-109	Oct-15		<0.00341	<0.00307	<0.00372	0.0141 J	0.0176 J	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-109	Apr-16		<0.00170	<0.00154	<0.00186	0.00837 J	0.0142 J	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-109	Oct-16		<0.00682	<0.00614	**<0.00744**	<0.0156	<0.0212	<0.00792	**<0.00838**	<0.00938	**<0.00796**	<0.00518
	MW-109	Apr-17		<0.00341	<0.00307	<0.00372	0.0172	0.0272 J	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-109	Oct-17		<0.000341	<0.000307	<0.000372	0.0182	0.0230	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-110	Apr-15		<0.000340	<0.000310	<0.000370	0.00352 J	0.00624	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-110	Oct-15		<0.00170	<0.00154	<0.00186	0.00464 J	0.0298	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	MW-110	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-110	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-110	Apr-17		<0.00170	<0.00154	<0.00186	0.00378 J	0.0161	<0.00198	<0.00210	<0.0234	<0.00199	<0.00130
	MW-110	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RA-313	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	RA-313	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	RA-313	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419 J4	<0.000469	<0.000398	<0.000259
	RA-313	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RW-4	Apr-15		<0.000340	<0.000310 J	<0.000370	<0.000780 J	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	RW-4R	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RW-4R	Apr-17		<0.00170	<0.00154	<0.00186	<0.00206	<0.00530	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	RW-5R	Apr-15		**0.522**	<0.00310	<0.00370	**2.26**	**1.91**	<0.00400	<0.00420	<0.00470	<0.00400	<0.00260
	RW-5R	Apr-16		**0.570**	<0.00614	**<0.00744**	**2.51**	**2.25**	<0.00792	**<0.00838**	<0.00938	**<0.00796**	<0.00518
	RW-6	Apr-15		0.0558	<0.00310	<0.00370	0.0126 J	0.158	<0.00400	<0.00420	<0.00470	<0.00400	<0.00260
	RW-6R	Apr-16		0.00275	<0.000307	<0.000372	0.00683	0.00747	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	RW-15C	Apr-17		**0.472**	<0.00768	**<0.00930**	0.172	**5.39**	<0.00990	**<0.0105**	<0.0117	**<0.00995**	<0.00648
South RO Reject Field	MW-114	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-114	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-114	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-114	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-114	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-114	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-115	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-115	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-115	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-115	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-115	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-115	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-116	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-116	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-116	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-116	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-116	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-116	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
TEL	MW-49	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	0.0175	<0.000400 J	<0.000420	<0.000470	<0.000400	<0.000260
	MW-49	Oct-15		<0.000341	<0.000307	<0.000372	0.00201 J	0.0380	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-49	Apr-16		<0.00682	<0.00614	**<0.00744**	<0.0156	0.0540 J	<0.00792	**<0.00838**	<0.00938	**<0.00796**	<0.00518
	MW-49	Oct-16		<0.0341	<0.0307	**<0.0372**	<0.0780	<0.106	<0.0396	**<0.0419**	<0.0469	**<0.0398**	<0.0259
	MW-49	Apr-17		<0.00341	<0.00307	<0.00372	<0.00412	0.0564	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	MW-49	Oct-17		<0.00682	<0.00614	**<0.00744**	0.0109 J	0.195	<0.00792	**<0.00838**	<0.00938	**<0.00796**	<0.00518
	TEL-1	Apr-15		0.00214	<0.000310	<0.000370	<0.000780	0.00214 J	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	TEL-1	Oct-15		0.00197	<0.000307	<0.000372	0.00108 J	0.00197 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	TEL-1	Apr-16		0.00160	<0.000307	<0.000372	0.000793 J	0.00160 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	TEL-1	Oct-16		0.00183	<0.000307	<0.000372	<0.000780	0.00183 J	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	TEL-1	Apr-17		0.000572 J	<0.000307	<0.000372	0.000539 J	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	TEL-1	Oct-17		0.00319	<0.000307	<0.000372	0.00203	0.00488	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	TEL-2	Apr-15		0.0182 J	<0.00610	**<0.00740**	0.0372 J	0.189	<0.00790	**<0.00840**	<0.00940	**<0.00800**	<0.00520
	TEL-2	Oct-15		0.00970	<0.00154	<0.00186	0.0186 J	0.155	<0.00198	<0.00210	<0.00234	<0.00199	<0.00130
	TEL-2	Apr-16		0.0102	<0.000307	<0.000372	0.0243	0.146	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	TEL-2	Oct-16		0.00660 J	<0.00307	<0.00372	0.0218 J	0.123	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	TEL-2	Apr-17		0.00370 J	<0.00307	<0.00372	0.00914 J	0.0874	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	TEL-2	Oct-17		<0.00341	<0.00307	<0.00372	0.0143	0.101	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	TEL-3	Apr-15		<0.00340	<0.00310	<0.00370	<0.00780	<0.0110	<0.00400	<0.00420	<0.00470	<0.00400	<0.00260
	TEL-3	Oct-15		0.00316	<0.000307	<0.000372	0.00154 J	0.0202	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	TEL-3	Apr-16		<0.00852	<0.00768	**<0.00930**	<0.0195	<0.0265	<0.00990	**<0.0105**	<0.0117	**<0.00995**	<0.00648
	TEL-3	Oct-16		0.00232	<0.000307	<0.000372	0.00119 J	0.0105	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	TEL-3	Apr-17		0.00192	<0.000307	<0.000372	0.00219	0.0102	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	TEL-4	Apr-15		<0.00340	<0.00310	<0.00370	<0.00780	0.0394	<0.00400	<0.00420	<0.00470	<0.00400	<0.00260
	TEL-4	Apr-15	FD	<0.00340	<0.00310	<0.00370	<0.00780	0.0407	<0.00400	<0.00420	<0.00470	<0.00400	<0.00260
	TEL-4	Oct-15		0.00162	<0.000307	<0.000372	0.00623	0.0719	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	TEL-4	Oct-15	FD	<0.00341	<0.00307	<0.00372	0.00878 J	0.0837	<0.00396	<0.00419	<0.00469	<0.000398	<0.00259
	TEL-4	Apr-16		<0.00341	<0.00307	<0.00372	0.0132 J	0.142	<0.00396	<0.00419	<0.000469	<0.00398	<0.00259
	TEL-4	Apr-16	FD	<0.00341	<0.00307	<0.00372	0.0128 J	0.147	<0.00396	<0.00419	<0.000469	<0.00398	<0.00259
	TEL-4	Oct-16		<0.00341	<0.00307	<0.00372	<0.00780	0.0668	<0.00396	<0.00419	<0.000469	<0.00398	<0.00259
	TEL-4	Oct-16	FD	<0.00341	<0.00307	<0.00372	<0.00780	0.0863	<0.00396	<0.00419	<0.000469	<0.00398	<0.00259
	TEL-4	Apr-17		<0.00341	<0.00307	<0.00372	<0.00412	0.0243 J	<0.00396	<0.00419	<0.00469	<0.00398	<0.00259
	TEL-4	Apr-17	FD	0.000606 J	<0.000307	<0.000372	0.00218	0.0287	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	TEL-4	Oct-17		0.000782 J	<0.000307	<0.000372	0.00131	0.0269	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	TEL-4	Oct-17	FD	0.000684 J	<0.000307	<0.000372	0.00118	0.0242	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
TMD	MW-8	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	MW-8	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-8	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-8	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-16	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	MW-16	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470 J	<0.000400	<0.000260
	MW-16	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-20	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	MW-20	Apr-14	FD	<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	MW-20	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-20	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.00100 J4	<0.000469	<0.000398	<0.000259
	MW-20	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-21	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470 J	<0.000400	<0.000260
	MW-21	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-21	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-21	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-21	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-21	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-25	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	MW-25	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470 J	<0.000400	<0.000260
	MW-25	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.00100 J4	<0.000469	<0.000398	<0.000259
	MW-25	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259

Appendix B, Table B.4 - Summary of Groundwater Analytical Data - Volatile Organic Compounds

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:										
				Analyte:	o-Xylene	Styrene (Monomer)	Tetra-chloro-ethene	Toluene	Total Xylenes	trans-1,2-Dichloro-ethene	trans-1,3-Dichloro-propene	Tribromo-methane	Trichloro-ethene	Vinyl Chloride
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	0.193	0.1	0.005	0.75	0.62	0.1	0.0047	---	0.005	1.00E-03
				CGWSL Source:	WQCC TW	USEPA MCL	USEPA MCL	WQCC HH	WQCC HH	USEPA MCL	USEPA TW	USEPA TW	USEPA MCL	WQCC HH
Area	**Well ID**	**Date**	**Dup**											
TMD	MW-26	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	MW-26	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-26	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.00100 J4	<0.000469	<0.000398	<0.000259
	MW-26	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-27	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	MW-27	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-27	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.00100 J4	<0.000469	<0.000398	<0.000259
	MW-27	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-46R	Nov-14		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420		<0.000400	<0.000260 J
	MW-46R	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-46R	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-46R	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-46R	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-46R	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-68	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	MW-68	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-68	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-68	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-71	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	MW-71	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	MW-71	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-71	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	MW-89	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	MW-89	Apr-15		0.000538 J	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470 J	<0.000400	<0.000260
	MW-89	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.00100 J4	<0.000469	<0.000398	<0.000259
	MW-89	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	NP-1	Apr-15		<0.000340	<0.000310 J	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	NP-1	Oct-15		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	NP-1	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.00100 J4	<0.000469	<0.000398	<0.000259
	NP-1	Oct-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	NP-1	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	NP-1	Oct-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	NP-2	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00200
	NP-6	Apr-13		<0.00500	<0.00500	<0.00500	<0.00500	<0.0150	<0.00500	**<0.00500**	<0.00500	<0.00500	<0.00200
	NP-6	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470 J	<0.000400	<0.000260
	NP-6	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000470	<0.000398	<0.000259
Up-Gradient	UG-1	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	UG-1	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	UG-1	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	UG-1	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	UG-2	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	UG-2	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	UG-2	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	UG-2	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	UG-3R	Apr-14		<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	UG-3R	Apr-14	FD	<0.000500	<0.000500	<0.000600	<0.000500	<0.00150	<0.000400	<0.000600		<0.000500	<0.000400
	UG-3R	Apr-15		<0.000340	<0.000310	<0.000370	<0.000780	<0.00110	<0.000400	<0.000420	<0.000470	<0.000400	<0.000260
	UG-3R	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	UG-3R	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	UG-4	Apr-16		<0.000341	<0.000307	<0.000372	<0.000780	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259
	UG-4	Apr-17		<0.000341	<0.000307	<0.000372	<0.000412	<0.00106	<0.000396	<0.000419	<0.000469	<0.000398	<0.000259

Definitions

X	F
X	A
<x	A
<x	A
	E
---	N

Abbreviations

CGWSL	C
CGWSL Source	S
Dup	D
FD	F
mg/L	M
NMED TPH	N
NMED TW	N
TPH	T
USEPA TW	U
USEPA MCL	U
WQCC HH	N

Lab Footnote

B	A
J	In
J3	T
J4	T
J6	T

Appendix B, Table B.5 - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

		Analyte Group:		Water Quality Parameters								Cyanide
		Analyte:		Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
		Units:		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		CGWSL:		---	250	1.60	---	---	600	1,000	10.0	0.200
		CGWSL Source:			WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	USEPA MCL	USEPA MCL
Area	**Well ID**	**Date**	**Dup**									
Cross-Gradient	KWB-13	Apr-14		418	158	0.580	0.724	143	**1,820**	**3,750**	**14.6**	<0.00500 H
	KWB-13	Apr-15		474	**788**	0.704	6.65	148	**1,970**	**3,060**	**15.3**	<0.00180
	KWB-13	Apr-16		626	148	0.630	2.26 J	258	**2,500**	**3,720**	**13.7**	<0.00120
	KWB-13	Apr-17		526	180	0.803	1.18	200	**2,390**	**3,600**	**16.1**	<0.00180
	MW-17	Apr-14		395	174	1.19	2.31	72.2	**1,200**	**2,340**	2.19	
	NP-5	Apr-13		465	**413**	**2.58**	<0.400	253	**3,090**	**5,980**	2.33	
	NP-5	Apr-15		448	**993**	**2.13**	0.484 J	209	**3,030**	**6,060** J	1.38	
	NP-5	Apr-17		514	**444**	**1.63**	0.422 J	212	**3,770**	**4,810**	2.22	
	RA-3156	Nov-13		537	238	0.208	3.06	169	**1,450**	**3,390**	9.09	
	RA-3156	Apr-14		<0.500	**278**	0.299	2.67		**1,800**	**3,280**	7.89	
	RA-3156	Apr-16		370	**1,140**	0.478	3.67 J	695	**1,070**	**3,050**	<0.197	
	RA-3156	Apr-17		337	**568**	0.668	2.41	292	**1,080**	**2,400**	0.330 J	
	MW-136	Oct-15		706	**265**	1.56	3.20	144	**2,740**	**4,020**	**22.1**	<0.00180
	MW-136	Apr-16		699	**336**	1.23	2.95 J	149	**2,870**	**4,250**	9.76	<0.00120
	MW-136	Oct-16		651	**355**	**1.66**	2.81	140	**2,530**	**4,400**	**12.4**	0.00188 J
	MW-136	Apr-17		643	**401**	**1.81**	2.81	140	**2,370**	**4,360**	**17.1**	<0.00180
	MW-136	Oct-17		671	**357**	1.50	2.61	148	**2,470**	**3,850**	**10.5**	<0.00180
Evaporation Ponds	MW-1R	Apr-14		540	**1,560**	0.567	4.27	1010	**1,900**	**5,740**	<0.150	
	MW-1R	Apr-15		765 J	**1,970**	0.821	4.52 J	1080 J	**2,400**	**5,020**	<0.0200	
	MW-1R	Apr-16		1030	**3,330**	0.603 J6	6.54	2090	**3,320**	**10,100**	<0.197	
	MW-1R	Apr-17		763	**2,880**	0.736	5.11	1830	**3,010**	**9,180**	0.402 J	
	MW-2A	Apr-15		944	**6,730**	1.06	7.71 J	4780	**4,830**	**14,200**	0.0404 J	
	MW-2A	Oct-15		677	**3,870**	**2.14**	5.85	2590	**3,670**	**10,500**	0.0390 J	
	MW-2A	Apr-16		933	**8,400**	1.53	7.35	5280	**7,640**	**20,700**	0.501 J	
	MW-2A	Oct-16		598	**3,290**	**3.43**	4.91	2270	**3,450**	**9,660**	0.122	
	MW-2A	Apr-17		720	**6,650**	**2.19**	6.21	4310	**6,010**	**19,000**	0.0220 J	
	MW-2A	Oct-17		323	**1,980**	**3.25**	3.65	1,350	**2,500**	**6,060**	0.0340 J	
	MW-3	Apr-15		839	33.2	**2.10**	6.16	1850	25.0	**12,200**	**24.5**	
	MW-3	Apr-15	FD	927	**3,270**	1.60	6.80	1790	**3,000**	**17,800**	**20.2**	
	MW-3	Oct-15		613	**1,950**	**1.99**	7.17	1220	**2,810**	**6,140**	0.182	
	MW-3	Oct-15	FD	636	**1,920**	**1.84**	7.11	1210	**2,730**	**6,480**	0.0580 J	
	MW-3	Apr-16		728	**1,360**	**1.87**	5.64	1160	**2,640**	**6,260**	0.404 J	
	MW-3	Apr-16	FD	690	**1,290**	**1.87**	5.47	1140	**2,530**	**6,240**	0.231 J	
	MW-3	Oct-16		574	**1,290**	**2.21**	5.69	865	**2,380**	**5,180**	0.0520 J	
	MW-3	Oct-16	FD	591	**1,270**	**2.20**	5.85	854	**2,380**	**5,040**	0.0490 J	
	MW-3	Apr-17		603	**1,330**	**1.94**	4.57	944	**2,480**	**5,080**	<0.197	
	MW-3	Apr-17	FD	599	**1,330**	**1.98**	4.57	876	**2,380**	**5,190**	<0.0197	
	MW-3	Oct-17		549	**1,340**	**2.39**	6.28	829	**2,470**	**4,640**	<0.0197	
	MW-3	Oct-17	FD	578	**1,290**	**1.99**	6.35	803	**2,430**	**4,660**	<0.0197	
	MW-4A	Apr-15		660	**1,560**	1.29	4.12 J	1080	**2,850**	**7,470**	<0.0200	
	MW-4A	Oct-15		394	**1,380**	**1.92**	5.23	1010	**2,110**	**4,290**	0.0530 J	
	MW-4A	Apr-16		507	**1,860**	**1.78**	4.03 J	1060	**2,990**	**5,090**	<0.197	
	MW-4A	Oct-16		393	**1,510**	**2.06**	4.06	890	**1,970**	**4,610**	0.0640 J	
	MW-4A	Apr-17		417	**1,480**	**1.93**	3.51	919	**2,070**	**4,550**	<0.0197	
	MW-4A	Oct-17		434	**1,470**	**1.85**	5.42	913	**2,050**	**4,500**	<0.0197	
	MW-4B	Apr-13		371	**928**	0.870	3.64	556	**1,330**	**3,660**	<1.00	
	MW-4B	Apr-15		367	**1,110**	0.963	2.32	696	**1,340**	**3,410** J	<0.0200	
	MW-4B	Apr-17		360	**1,330**	0.985	2.55	758	**1,410**	**3,690**	<0.0197	
	MW-5A	Apr-15		519	**4,100**	1.53	6.15 J	4220	**9,370**	**17,000**	<0.0200	
	MW-5A	Oct-15		513	**4,760**	**1.78**	7.27	4500	**8,480**	**17,800**	0.0450 J	
	MW-5A	Apr-16		472	**3,010**	**3.11**	7.39	2990	**5,610**	**13,700**	1.72	
	MW-5A	Oct-16		500	**3,500**	**3.43**	6.34	3880	**7,950**	**16,300**	0.0440 JJ6	
	MW-5A	Apr-17		439	**3,010**	**2.92**	7.27	3360	**5,840**	**12,500**	0.212	
	MW-5A	Oct-17		436	**2,580**	**2.83**	8.93	2,440	**4,960**	**9,500**	<0.0197	
	MW-5B	Apr-13		473	**1,840**	**2.20**	10.8	1600	**2,950**	**7,500**	2.93	
	MW-5B	Apr-15		482	**1,590**	1.41	9.01	1580	**3,510**	**5,980**	<0.0200	
	MW-5B	Apr-17		420	**1,560**	**1.73**	9.18	1650	**2,590**	**6,290**	0.0210 J	
	MW-5C	Apr-13		420	**639**	1.20	4.21	446	**1,580**	**3,620**	<1.00	
	MW-5C	Apr-15		427	**585**	0.910	3.97 J	485	**2,020**	**3,290**	<0.0200	
	MW-5C	Apr-17		383	**576**	0.971	3.90	500	**1,740**	**3,110**	<0.0197	
	MW-6A	Apr-14		762	**1,620**	1.31	2.44	998	**1,980**	**5,600**	0.245 J	
	MW-6A	Apr-15		809	**2,010**	**1.85**	2.14 J	1090	**2,240**	**6,500**	0.875	
	MW-6A	Apr-16		449	**1,300**	1.52	1.74 J	835	**2,360**	**4,290**	0.461 J	
	MW-6A	Apr-17		353	**904**	**1.62**	1.38	770	**2,080**	**4,660**	<0.197	
	MW-6B	Mar-13		530	**1,370**	0.533	4.31	710	**1,640**	**4,480**	<1.00	
	MW-6B	Mar-13	FD	478	**1,420**	0.814	4.87	753	**1,690**	**4,510**	<1.00	
	MW-6B	Apr-15		568	**1,740**	0.669 J	5.09	873	**2,280**	**4,760**	<0.0200	
	MW-6B	Apr-17		418	**1,250**	0.694	3.97	738	**1,730**	**4,150**	<0.197	
	MW-7A	Apr-15		609	**3,080**	0.693	4.18	2060	**3,620**	**9,840**	<0.0200	
	MW-7A	Apr-15	FD	593	**3,100**	0.996	4.21	2060	**3,190**	**9,300**	0.0262 J	
	MW-7A	Oct-15		403	**2,470**	1.08	3.96	1590	**4,020**	**7,100**	<0.0197	
	MW-7A	Oct-15	FD	404	**2,230**	1.12	3.95	1690	**3,150**	**7,180**	<0.0197	
	MW-7A	Apr-16		459	**2,500**	1.24	4.18 J	1810	**3,360**	**7,620**	<0.197	
	MW-7A	Apr-16	FD	423	**2,550**	1.24	3.94 J	1690	**3,710**	**7,540**	<0.197 J6	
	MW-7A	Oct-16		406	**2,790**	1.49	4.22	1600	**3,420**	**7,460**	0.0260 J	
	MW-7A	Oct-16	FD	395	**2,240**	1.45	4.01	1550 O1V	**2,790**	**7,340**	0.0470 J	
	MW-7A	Apr-17		371	**2,240**	1.31	3.79	2000	**2,700**	**6,690**	0.0360 J	
	MW-7A	Apr-17	FD	434	**2,230**	1.07	3.89 O1	1780	**2,930**	**7,810**	<0.0197	
	MW-7A	Oct-17		366	**2,300**	1.23	3.97	1,550	**2,990**	**7,100**	<0.0197	
	MW-7A	Oct-17	FD	386	**2,520**	1.24	3.94	1,650	**3,290**	**6,820**	<0.0197	
	MW-7B	Apr-13		545	**1,030**	**3.09**	6.66	540	**1,800**	**4,280**	<1.00	
	MW-7B	Apr-15		556	**1,060**	0.795	6.27	672	**2,200**	**4,640**	<0.0200	
	MW-7B	Apr-17		530	**1,060**	0.966	6.71	652	**1,750**	**4,720**	0.0670 J	
	MW-10	Apr-15		466	**1,380**	0.919	3.54 J	941	**2,110**	**5,030**	<0.0200	
	MW-10	Oct-15		518	**1,580**	0.783	3.68	1080	**2,620**	**5,340**	0.280 J	
	MW-10	Apr-16		523	**1,530**	0.826	3.83 J	1110	**2,220**	**5,120**	<0.197	
	MW-10	Oct-16		647	**2,100**	1.18	3.54	1180	**3,740**	**6,550**	0.0970 J	
	MW-10	Apr-17		460	**1,460**	0.825	3.41	996	**2,030**	**4,850**	**593**	
	MW-10	Oct-17		475	**1,370**	0.808	3.34	973	**2,060**	**4,830**	<0.0197	
	MW-11A	Apr-15		1630	**11,800**	0.0639 J	19.0 J	6090	**2,910**	**24,900** J	1.47	
	MW-11A	Oct-15		1200	**9,930**	0.152	20.3	5260	**3,780**	**18,300**	0.265	
	MW-11A	Apr-16		1280 V	**9,440**	0.414 J6	19.0	5150	**3,510**	**18,600**	0.715 JJ6	
	MW-11A	Oct-16		1230	**9,180**	0.752	20.8	4850	**3,250**	**16,600**	0.0480 JB	
	MW-11A	Apr-17		1280	**10,200**	0.683	20.1	5130	**3,290**	**19,500**	0.305 J	
	MW-11A	Oct-17		1,130	**9,650**	0.340	19.8	4,460	**3,510**	**17,900**	<0.0197	
	MW-11B	Mar-13		855	**6,560**	<0.500	35.2	3340	**3,030**	**15,100**	<1.00	
	MW-11B	Apr-15		1070	**6,000**	0.562	36.6	4040	**3,860**	**12,700**	<0.0200	
	MW-11B	Apr-17		979	**6,050**	0.825	35.2	3660	**2,890**	**14,000**	<0.197	
	MW-12	Apr-14		728	**2,460**	0.685	5.57	1280	**2,490**	**7,960**	4.10	
	MW-13	Apr-14		682	**1,780**	0.354	5.56	914	**2,180**	**6,520**	0.463 J	
	MW-15	Apr-14		849	**2,960**	**2.33**	5.68	1420	**1,770**	**19,900**	**40.2**	
	MW-15	Apr-15		565	**2,150**	**2.12**	5.01	1300	**2,000**	**5,470**	**16.0**	
	MW-15	Apr-16		487	**611**	**2.01**	5.53	795	**1,240**	**4,720**	3.99	
	MW-15	Apr-17		285	**612**	1.58	4.31	447	**1,100**	**2,640**	0.485 J	

Appendix B, Table B.5 - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

		Analyte Group:		Water Quality Parameters								Cyanide
			Analyte:	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
			Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
			CGWSL:	---	250	1.60	---	---	600	1,000	10.0	0.200
			CGWSL Source:		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	USEPA MCL	USEPA MCL
Area	**Well ID**	**Date**	**Dup**									
Evaporation Ponds	MW-18A	Apr-15		718	**11,600**	**6.14**	56.7	7290	**9,490**	**32,600**	2.18	<0.00180
	MW-18A	Oct-15		711	**9,930**	**5.43**	51.8	6250	**10,600**	**27,400**	0.146	<0.00180
	MW-18A	Apr-16		704	**6,820**	**2.83**	46.6	4730	**6,360**	**20,500**	0.371 J	<0.00180
	MW-18A	Oct-16		662	**7,270**	**3.22**	42.4	4740	**6,870**	**20,200**	0.0300 J	<0.00180
	MW-18A	Apr-17		623	**5,790**	1.46	38.8	3940	**6,330**	**17,100**	0.0220 J	<0.00180
	MW-18A	Oct-17		713	**7,090**	1.60	40.7	4,020	**7,410**	**15,100**	<0.0197	<0.00180
	MW-18B	Apr-13		592	**803**	1.10	6.32	474	**1,870**	**4,060**	<1.00	
	MW-18B	Apr-15		581	**763**	0.931	5.91	460	**1,840**	**4,410**	0.0280 J	
	MW-18B	Apr-17		576	**860**	0.797	5.91	481	**2,070**	**4,080**	<0.0197	
	MW-22A	Apr-15		549	**2,150**	0.758	3.79 J	1450	**2,500**	**7,270**	<0.0200	
	MW-22A	Apr-15	FD	494	**2,020**	0.682	3.16 J	1240	**2,590**	**6,630**	<0.0200	
	MW-22A	Oct-15		529	**1,980**	0.621	3.64	1480	**2,660**	**6,330**	0.358 J	
	MW-22A	Oct-15	FD	527	**1,970**	0.610	3.65	1640	**2,650**	**6,090**	0.441 J	
	MW-22A	Apr-16		548	**1,890**	0.645	4.08 J	1440	**2,340**	**6,190**	<0.197	
	MW-22A	Apr-16	FD	541	**1,900**	0.660	4.04 J	1440	**2,560**	**6,160**	<0.197	
	MW-22A	Oct-16		570	**1,940**	0.752	3.96	1490	**2,380**	**6,970**	0.219 B	
	MW-22A	Oct-16	FD	563	**2,030**	0.733	3.88	1450	**2,400**	**7,220**	0.0490 JB	
	MW-22A	Apr-17		493	**2,090**	0.632	3.71	1350	**2,530**	**6,630**	<0.197	
	MW-22A	Apr-17	FD	503	**1,860**	0.743	3.73	1340	**2,160**	**4,210**	<0.0197	
	MW-22A	Oct-17		491	**1,990**	0.614	3.49	1,380	**2,450**	**6,010**	<0.0197	
	MW-22A	Oct-17	FD	505	**2,210**	0.655	3.43	1,340	**2,610**	**5,910**	<0.0197	
	MW-22B	Apr-13		530	**1,470**	0.619	4.48	932	**2,240**	**5,460**	<1.00	
	MW-22B	Apr-15		477	**1,400**	0.823	4.02 J	1150	**2,170**	**5,590**	<0.0200	
	MW-22B	Apr-17		396	**1,400**	0.771	4.15	1150	**2,080**	**5,670**	0.408 J	
	MW-70	Apr-15		695	**1,240**	0.740	4.90	774	**2,230**	**5,700**	<0.0200 J	
	MW-70	Oct-15		756			5.51	782				
	MW-70	Apr-16		720	**1,370**	0.775	5.46	908	**2,240**	**5,730**	0.416 J	
	MW-70	Oct-16										
	MW-70	Apr-17		673	**1,290**	0.626	4.87	852	**2,460**	**4,660**	<0.0197	
	MW-70	Oct-17										
	MW-72	Apr-14		795	**4,350**	**6.27**	9.87	2440	**3,020**	**10,300**	3.10	
	MW-72	Apr-15		896	**5,240**	**3.91**	13.3	3030	**3,800**	**12,900**	6.37	
	MW-72	Apr-16		700	**3,310**	**5.88**	8.82	2060	**3,400**	**9,140**	1.88	
	MW-72	Apr-17		670	**3,460**	**6.25**	9.30	2510	**2,950**	**9,140**	1.56	
	MW-73	Apr-14		590	**2,260**	**2.09**	2.54	2160	**3,510**	**9,120**	<0.150	
	MW-73	Apr-15		659	**2,480**	**1.94**	3.12 J	2200	**4,560**	**9,360**	0.757	
	MW-73	Apr-16		597	**2,790**	**1.96**	2.32 J	2240	**5,090**	**9,360**	0.501 J	
	MW-73	Apr-17		571	**2,390**	**2.11**	2.55	2690	**3,940**	**8,880**	0.313	
	MW-74	Apr-15		552	**1,170**	**6.02**	39.4	2230	**4,450**	**9,360**	**176**	
	MW-74	Oct-15		558	**1,810**	**6.19**	39.2	2330	**4,140**	**8,720**	**12.3**	
	MW-74	Apr-16		632	**1,640**	**7.44**	35.6	2080	**3,100**	**8,280**	0.796 J	
	MW-74	Oct-16		566	**1,900**	**8.61**	44.9	3120	**4,880**	**10,200**	**211**	
	MW-74	Apr-17		557	**2,030**	**7.23**	39.9	2690	**4,490**	**9,080**	**55.7**	
	MW-74	Oct-17		576	**2,050**	**7.68**	41.1	2,170	**4,470**	**9,220**	**44.7**	
	MW-75	Apr-15		372	11.8 J	**8.20**	20.3	1490	14.2 J	**4,020**	<0.200	
	MW-75	Oct-15		352	**1,550**	**7.80**	19.3	1560	**2,510**	**5,280**	0.0590 J	
	MW-75	Apr-16		374	**1,530**	**7.62**	21.5	1640	**1,940**	**5,940**	<0.197	
	MW-75	Oct-16		351	**1,400**	**7.88**	17.5	1480	**2,080**	**6,000**	0.0490 JB	
	MW-75	Apr-17		333	**1,550**	**7.16**	17.5	1510	**2,520**	**6,100**	3.35	
	MW-75	Oct-17		358	**1,490**	**7.81**	18.2	1,350	**2,240**	**5,020**	<0.0197	
	MW-76	Apr-15		558	18.1 J	**3.15**	29.7	1120	22.0 J	**4,650**	<0.200	
	MW-76	Oct-15		445	**1,370**	**3.10**	28.0	1070	**2,480**	**4,840**	0.0310 J	
	MW-76	Apr-16		531	**1,180**	**2.96**	29.4	1110	**2,250**	**5,220**	<0.197	
	MW-76	Oct-16		553	**1,200**	**3.26**	28.6	1130	**2,490**	**6,010**	0.0470 JB	
	MW-76	Apr-17		485	**1,380**	**2.54**	25.9	969	**2,850**	**5,750**	<0.197	
	MW-76	Oct-17		479	**1,300**	**3.06**	26.5	993	**2,440**	**4,630**	<0.0197	
	MW-77	Apr-15		609	10.8 J	**4.21**	72.1	1410	37.7 J	**5,350**	<0.200	
	MW-77	Oct-15		557	**433**	**2.42**	82.5	1490	**4,820**	**7,510**	0.211	
	MW-77	Apr-16		589	**378**	**3.03**	82.9	1610	**4,010**	**7,110**	0.406 J	
	MW-77	Oct-16		579	**294**	**3.14**	82.1	1380	**4,000**	**7,850**	0.0470 JB	
	MW-77	Apr-17		534	**393**	**2.43**	67.1	1280	**4,900**	**6,950**	<0.197	
	MW-78	Apr-14		542	215	**10.9**	25.2	524	**2,650**	**5,760**	<0.150	
	MW-78	Apr-15		576	63.2	0.0979 J	18.9	320	19.6 J	**2,560**	4.24	
	MW-78	Apr-16		659	72.5	**9.96**	22.9	540	**2,690**	**5,270**	<0.197	
	MW-78	Apr-17		537	98.0	**9.91**	17.4	366	**2,640**	**4,290**	0.372 J	
	MW-79	Apr-15		649	**1,570**	**5.52**	7.98	1150	**2,930**	**5,660**	1.90 J	
	MW-79	Oct-15		517	**1,440**	**6.43**	7.61	857	**2,440**	**5,210**	0.147	
	MW-79	Apr-16		603	**1,390**	**7.08**	8.43	1140	**2,040**	**5,320**	1.87	
	MW-79	Oct-16		525 V	**1,380**	**7.01**	7.28	869 V	**2,000**	**5,180**	0.0700 JB	
	MW-79	Apr-17		527 V	**1,590**	**7.33**	7.58	987	**2,330**	**5,040**	2.26	
	MW-79	Oct-17		598	**1,700**	**6.17**	6.86	871	**2,320**	**5,190**	0.188	
	MW-80	Apr-14		645	**1,470**	**3.62**	3.84	983	**2,070**	**6,080**	2.73	
	MW-80	Apr-15		693	**1,600**	**3.15**	3.08 J	1210	**2,700**	**5,600**	0.519	
	MW-80	Apr-16		875	**1,970**	**3.30**	4.07 J	1240	**2,270**	**6,340**	0.523 J	
	MW-80	Apr-17		759	**2,530**	**3.59**	3.53	1230	**2,640**	**7,920**	2.63	
	MW-81	Apr-14		111	**1,140**	**8.13**	9.51	255	**2,350**	**6,500**	**79.1**	
	MW-81	Apr-15		583	**1,110**	**6.20**	9.40	1380	**2,800**	**6,260**	**99.5**	
	MW-81	Apr-16		687	**1,120**	**5.93**	12.2	1690	**2,790**	**6,730**	**105**	
	MW-81	Apr-17		560	**1,370**	**7.55**	9.28	1260	**3,050**	**6,880**	**80.5**	
	MW-82	Apr-14		279	**2,880**	**18.2**	9.55	1800	**3,910**	**6,260**	<0.150	
	MW-82	Apr-14	FD	286	**1,510**	**18.0**	9.02	1810	**2,070**	**5,460**	<0.150	
	MW-82	Apr-15		284	**1,110**	**10.7**	9.28	1700	**2,200**	**5,770**	<0.0200	
	MW-82	Apr-16		350	**1,360**	**12.1**	9.87	1790	**2,350**	**5,410**	0.262 J	
	MW-82	Apr-17		347	**1,500**	**11.4**	8.92	1400	**2,380**	**5,630**	0.0820 J	
	MW-83	Apr-15		566	55.5	**3.96**	58.4	364	32.7 J	**4,810**	<0.200	
	MW-83	Oct-15		388	202	**7.32**	34.0	271	**3,210**	**4,530**	0.0860 J	
	MW-83	Apr-16		483	**769**	**4.80**	36.7	563	**3,770**	**4,980**	<0.197	
	MW-83	Oct-16		417	11.0	**6.99**	45.9	139	**3,300**	**4,610**	0.101	
	MW-83	Apr-17		483	45.4	**4.80**	49.4	256	**3,840**	**5,900**	<0.197	
	MW-83	Oct-17		462	**291**	**4.74**	48.2	293	**3,590**	**5,240**	<0.0197	
	MW-84	Apr-15		555	**1,460**	**4.41**	7.41	1480	**4,620**	**4,230**	<0.200	
	MW-84	Oct-15		596	**1,070**	**8.23**	17.0	1580	**7,300**	**12,400**	4.83	
	MW-84	Apr-16		643	**1,410**	**5.54**	10.2	1840	**4,550**	**9,480**	<0.197	
	MW-84	Oct-16		561	**1,230**	**5.96**	12.2	1460	**5,280**	**9,560**	0.0480 J	
	MW-84	Apr-17		573	**1,850**	**5.68**	8.06	1430	**4,690**	**9,360**	<0.197	
	MW-84	Oct-17		589	**1,860**	**5.22**	6.56	1,520	**4,670**	**8,460**	0.0570 J	
	MW-87	Apr-15		740	**4,880**	1.19	27.3	3190	**4,390**	**13,800**	0.241	
	MW-87	Oct-15		737			26.5	3250				
	MW-87	Apr-16		728 V	**4,180**	1.40	27.9 V	3230 V	**4,310**	**12,000**	<0.197	
	MW-87	Oct-16										
	MW-87	Apr-17		648	**4,340**	1.02	24.3	3560	**5,020**	**13,500**	<0.0197	
	MW-87	Oct-17										

Appendix B, Table B.5 - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

		Analyte Group:		Water Quality Parameters								Cyanide
		Analyte:		Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
		Units:		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
		CGWSL:		---	250	1.60	---	---	600	1,000	10.0	0.200
		CGWSL Source:			WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	USEPA MCL	USEPA MCL
Area	**Well ID**	**Date**	**Dup**									
Evaporation Ponds	MW-88	Apr-15		519	**3,000**	**1.80**	2.66 J	2250	**4,970**	**11,000**	<0.0200	
	MW-88	Oct-15		397			3.03	1270				
	MW-88	Apr-16		417	**1,610**	1.22	3.10 J	1220	**2,600**	**5,800**	<0.197	
	MW-88	Oct-16										
	MW-88	Apr-17		406	**1,710**	1.04	3.00	1100	**2,410**	**6,300**	<0.197	
	MW-88	Oct-17										
	MW-120	Apr-15		677	**2,480**	**2.49**	3.92 J	1620	**3,080**	**7,660**	2.49	
	MW-120	Oct-15		860 J	**3,640**	**2.38**	3.60	1790 J	**3,100**	**9,720**	0.0350 J	
	MW-120	Apr-16		939	**3,690**	**2.56**	4.25 J	1910	**2,510**	**9,100**	<0.197	
	MW-120	Oct-16		919	**3,830**	**2.68**	3.71	1520	**2,410**	**9,080**	0.0470 JJ6	
	MW-120	Apr-17		728	**3,070**	**3.15**	3.11	1600	**2,730**	**8,460**	<0.197	
	MW-120	Oct-17		671	**2,970**	**3.24**	3.33	1,240	**3,580**	**7,120**	<0.0197	
	MW-121	Apr-15		642	**1,370**	**3.69**	2.67	854	**2,740**	**6,040**	2.08	
	MW-121	Oct-15		619	**1,220**	**4.24**	3.38	942	**3,360**	**6,290**	2.96	
	MW-121	Apr-16		718	**1,520**	**4.34**	3.39 J	968	**3,790**	**5,550**	2.13	
	MW-121	Oct-16		588	**1,150**	**5.24**	3.18	834	**3,070**	**5,470**	1.69	
	MW-121	Apr-17		597	**1,210**	**4.69**	2.87	862	**2,840**	**5,100**	1.19	
	MW-121	Oct-17		610	**1,050**	**5.14**	3.19	780	**3,070**	**5,440**	1.39	
	MW-122	Apr-15		658	**2,970**	**3.38**	5.51 J	2660	**4,380**	**10,700**	0.229	
	MW-122	Oct-15		382	**1,580**	**3.29**	4.06	1090	**2,560**	**5,700**	0.0380 J	
	MW-122	Apr-16		549	**1,920**	**3.57**	4.78 J	1350	**3,430**	**6,700**	0.499 J	
	MW-122	Oct-16		491	**1,760**	**3.29**	4.31	1160	**2,270**	**5,730**	0.0280 J	
	MW-122	Apr-17		632	**2,700**	**3.71**	5.19	1770	**3,900**	**9,060**	<0.197	
	MW-122	Oct-17		397	**1,610**	**3.02**	3.93	950	**2,640**	**4,580**	<0.0197	
	MW-123	Apr-15		532	**1,560**	1.16	3.84 J	1120	**2,220**	**5,650**	<0.0200	
	MW-123	Oct-15		527	**1,710**	1.11	3.71	1190	**2,360**	**5,490**	0.270 J	
	MW-123	Apr-16		570	**1,880**	1.09	3.73 J	1320	**2,410**	**5,850**	<0.197	
	MW-123	Oct-16		510	**1,600**	1.20	3.59	1090	**2,420**	**4,990**	0.0470 J	
	MW-123	Apr-17		514 V	**1,730**	1.22	3.72	1240 V	**2,190**	**6,200**	0.0540 JP1	
	MW-123	Oct-17		516	**1,580**	1.08	3.46	1,030	**2,360**	**5,000**	<0.0197	
	MW-124	Apr-15		779	**3,240**	0.922	6.80	1970	**3,610**	**11,400**	0.0265 J	
	MW-124	Oct-15		780	**3,210**	0.915	7.41	1840	**4,120**	**10,100**	0.0310 J	
	MW-124	Apr-16		929	**1,490**	1.20	8.45	2150	**1,720**	**9,800**	0.415 J	
	MW-124	Oct-16		719	**3,270**	1.31	6.37	1670	**3,930**	**9,340**	0.0470 J	
	MW-124	Apr-17		715	**3,110**	0.739	6.44	2140	**3,950**	**9,780**	<0.0197	
	MW-124	Oct-17		781	**3,510**	0.871	6.24	1,830	**4,440**	**8,860**	<0.0197	
	OCD-1R	Apr-15		837	**5,290**	**2.50**	4.95 J	4050	**4,860**	**14,900**	1.29	
	OCD-1R	Oct-15		641	**3,100**	**2.78**	4.86	2660	**3,710**	**9,160**	0.144	
	OCD-1R	Apr-16		641	**2,570**	**2.90**	4.54 J	2220	**3,550**	**8,960**	0.928 J	
	OCD-1R	Oct-16		701	**2,560**	**3.36**	4.76	1800	**3,060**	**8,900**	0.0530 JB	
	OCD-1R	Apr-17		570	**2,490**	**3.60**	4.22	1960	**3,020**	**8,460**	0.213 J	
	OCD-1R	Oct-17		607	**2,280**	**3.08**	4.07	1,570	**3,110**	**7,220**	0.0720 J	
	OCD-2A	Apr-15		788	**2,960**	0.969	5.05	1600	**2,740**	**8,340**	0.264	
	OCD-2A	Oct-15		707			7.05	1490				
	OCD-2A	Apr-16		678	**1,800**	0.705	5.98	1340	**2,750**	**5,870**	0.417 J	
	OCD-2A	Oct-16										
	OCD-2A	Apr-17		655	**1,840**	0.800	5.49	995	**1,860**	**5,850**	<0.197	
	OCD-2A	Oct-17										
	OCD-3	Apr-15		659	**1,610**	1.02	12.6	1060	**2,240**	**6,070**	0.0878 J	
	OCD-3	Oct-15		760			14.1	904				
	OCD-3	Apr-16		746	**1,640**	0.899	14.5	1100	**3,080**	**5,890**	<0.197	
	OCD-3	Oct-16										
	OCD-3	Apr-17		733	**2,030**	0.998	14.4	1120	**2,160**	**6,440**	<0.197	
	OCD-3	Oct-17										
	OCD-4	Apr-15		1010	**5,850**	0.506	36.5	3590	**4,550**	**12,900**	<0.0200	
	OCD-4	Oct-15		833			33.2	2560				
	OCD-4	Apr-16		927	**5,320**	0.608	36.2	3400	**3,610**	**12,700**	0.446 J	
	OCD-4	Oct-16										
	OCD-4	Apr-17		809	**4,110**	0.908	33.7	2330	**2,850**	**11,000**	0.0390 JP1	
	OCD-4	Oct-17										
	OCD-5	Apr-15		901	**4,490**	0.691	39.6	2930	**3,090**	**10,800**	0.0434 J	
	OCD-5	Oct-15		836	**4,700**	0.548	39.6	3130	**3,430**	**12,000**	0.0380 J	
	OCD-5	Apr-16		900	**5,030**	0.774 J3J6	41.2	2960	**3,780**	**9,960**	0.222 J	
	OCD-5	Oct-16		851	**4,700**	0.892	39.0	2830	**3,080**	**12,700**	0.0520 JBJ6	
	OCD-5	Apr-17		829	**4,720**	0.872	40.0	2780	**2,990**	**12,100**	<0.197	
	OCD-5	Oct-17		906	**7,230**	0.669	35.5	2,710	**5,020**	**11,200**	<0.0197	
	OCD-6	Apr-15		779	**4,050**	**1.85**	15.5	2470	**3,320**	**10,300**	0.211	
	OCD-6	Oct-15		756	**4,510**	**2.09**	15.0	3380	**3,400**	**10,700**	0.0280 J	
	OCD-6	Apr-16		866	**4,440**	**2.47**	17.0	2700	**3,410**	**10,600**	1.22	
	OCD-6	Oct-16		790	**4,110**	**2.79**	14.1	2600	**2,850**	**10,200**	0.0920 J	
	OCD-6	Apr-17		834	**4,030**	**2.39**	15.8	2870	**2,570**	**11,000**	1.02	
	OCD-6	Oct-17		855	**4,770**	**2.66**	15.4	2580	**3,190**	**11,600**	<0.0197	
	OCD-7AR	Apr-15		609	**2,110**	**2.91**	5.52	2050	**3,650**	**8,260**	0.260	
	OCD-7AR	Oct-15		635	**2,490**	**2.55**	5.83	2870	**4,500**	**8,960**	0.0250 J	
	OCD-7AR	Apr-16		694	**2,550**	**2.78**	6.27	2580	**4,740**	**8,480**	1.03	
	OCD-7AR	Oct-16		596	**3,020**	**3.50**	5.78	2410	**4,870**	**8,860**	0.0430 J	
	OCD-7AR	Apr-17		600	**2,550**	**2.72**	5.59	2870	**3,970**	**8,960**	0.0420 J	
	OCD-7AR	Oct-17		618	**2,700**	**3.02**	5.71	2,450	**4,190**	**9,920**	<0.0197	
	OCD-7B	Mar-13		552	**867**	1.33	12.2	650	**2,270**	**4,670**	<1.00	
	OCD-7B	Apr-15		641	**910**	0.852	11.9	685	**2,580**	**4,520**	<0.0200	
	OCD-7B	Apr-17		564	**960**	1.05	11.0	629	**2,100**	**4,540**	<0.0197	
	OCD-8A	Apr-15		1190	**6,270**	0.826	10.8	3330	**3,620**	**13,700**	<0.0200	<0.00180
	OCD-8A	Oct-15		946	**5,140**	1.36	11.0	2870	**3,690**	**11,900**	<0.0197	<0.00180
	OCD-8A	Apr-16		762	**3,480**	**1.88**	9.09	2410	**3,630**	**11,000**	<0.197	<0.00180
	OCD-8A	Oct-16		680	**3,270**	**2.39**	9.22	2380	**3,660**	**9,600**	0.0870 J	0.00182 J
	OCD-8A	Apr-17		658	**2,870**	**2.16**	8.50	2510	**3,410**	**8,960**	0.0300 J	<0.00180
	OCD-8A	Oct-17		696	**2,960**	**2.27**	8.54	2030	**4,140**	**9,000**	<0.0197	<0.00180
	OCD-8B	Apr-13		716	**2,180**	0.980	8.75	1330	**2,880**	**7,400**	<1.00	
	OCD-8B	Apr-15		680	**2,020**	0.934	9.51	1520	**2,910**	**7,110**	0.0233 J	
	OCD-8B	Apr-17		660	**2,030**	0.925	9.07	1800	**2,620**	**7,390**	0.0320 J	
Field East of Refinery	KWB-1A	Apr-15		596	**555**	1.17	1.01	202	**3,400**	**5,320**	4.22	<0.00180
	KWB-1A	Oct-15		549	**539**	1.15	1.09	230	**2,800**	**4,580**	0.666 J	<0.00180
	KWB-1A	Apr-16		619	**575**	1.26	1.37 J	271	**3,080**	**4,990**	4.61	<0.00120
	KWB-1A	Oct-16		553	**553**	1.21	1.21	274	**2,950**	**4,600**	0.514 B	<0.00180
	KWB-1A	Apr-17		566	**530**	1.39	1.19	269	**2,940**	**4,930**	1.09	<0.00180
	KWB-1A	Oct-17		514	**387**	1.12	0.966 J	266	**2,990**	**4,520**	0.409	<0.00180
	KWB-1C	Apr-13		474	**380**	1.03	5.68	161	**2,150**	**4,420**	1.75	
	KWB-1C	Apr-15		619	**1,160**	**25.3**	1.23	210	**2,920**	**5,340**	0.180	
	KWB-1C	Apr-17		560	**508**	1.25	1.36	267	**2,860**	**5,000**	0.0350 JP1	
	KWB-7	Apr-15		279	**301**	0.754	0.209 J	238	**886**	**2,100**	<0.200	<0.00180 J
	KWB-7	Oct-15		320	**358**	0.813	0.152 J	252	**1,120**	**2,570**	0.202 J	<0.00180
	KWB-7	Apr-16		325	**281**	0.917	0.236 J	248	**953**	**2,830**	<0.197	0.00500 J
	KWB-7	Oct-16		355	**420**	0.933	0.194 J	281	**1,160**	**3,030**	0.0580 JB	<0.00180
	KWB-7	Apr-17		306	**305**	0.822	0.225 J	230	**1,070**	**2,540**	0.0600 J	<0.00180
	KWB-7	Oct-17		345	**354**	0.599	0.230 J	268	**907**	**3,080**	<0.0197	<0.00180

Appendix B, Table B.5 - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Water Quality Parameters								Cyanide
				Analyte:	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	250	1.60	---	---	600	1,000	10.0	0.200
				CGWSL Source:		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	USEPA MCL	USEPA MCL
Area	**Well ID**	**Date**	**Dup**										
Field East of Refinery	KWB-8	Oct-16		251	**579**	0.467	0.351 J	443	**701**	**3,120**	0.0380 JB	<0.00900	
	KWB-8	Apr-17		237	**574**	0.623	0.414 J	320	442	**2,400**	0.0510 J	<0.00180	
	KWB-8	Oct-17		273	**913**	0.467	0.411 J	462	417	**3,270**	<0.985	<0.00180	
	KWB-10R	Apr-15		132	**800**	**19.7**	0.440 J	141	1.03 J	**1,190**	<0.200		
	KWB-10R	Oct-15		132	192	1.31	0.491 J	136	0.117 J	**1,090**	0.0420 J		
	KWB-10R	Apr-16		149	190	1.42	0.573 J	153	<0.0774	**1,090**	<0.197		
	KWB-10R	Oct-16		148	189	1.28	0.548 J	135	110	**1,160**	0.364 B		
	KWB-10R	Apr-17		134	230	1.57	0.521 J	131	0.475 J	**1,130**	<0.0197		
	KWB-10R	Oct-17		138	186	1.39	0.453 J	123	3.08 J	**1,080**	0.440		
	KWB-11A	Apr-15		568	**1,270**	0.580	0.305 J	370	**2,280**	**4,020**	**15.7**	<0.00180 J	
	KWB-11A	Oct-15		674	**1,620**	0.660	0.748 J	406	**1,570**	**5,320**	**49.3**	<0.00180	
	KWB-11A	Apr-16		710	**1,600**	0.642	0.797 J	426	**1,570**	**5,840**	**42.4**	0.0230	
	KWB-11A	Oct-16		647	**1,460**	0.742	0.719 J	450	**1,590**	**5,940**	**30.9**	<0.00180	
	KWB-11A	Apr-17		607	**1,310**	0.487	0.903 J	372	**1,540**	**4,960**	**33.9**	<0.00180	
	KWB-11A	Oct-17		406	**788**	0.474	0.566 J	379	**979**	**3,550**	1.95	<0.00180	
	KWB-11B	Apr-15		469	**275**	0.318	2.12	93.0	**1,760**	**2,630**	2.80	<0.00180 J	
	KWB-11B	Oct-15		410	247	0.467	2.07	80.6	**1,340**	**2,350**	2.17	<0.00180	
	KWB-11B	Apr-16		438	218	0.441	2.11 JO1	81.3 V	**1,200**	**2,160**	2.43	<0.00120	
	KWB-11B	Oct-16		408	239	0.479	2.00	81.0	**1,290**	**2,410**	2.17	<0.00180	
	KWB-11B	Apr-17		479	**291**	0.369	2.37	89.5	**1,660**	**2,710**	3.48	<0.00180	
	KWB-11B	Oct-17		476	230	0.280	2.13	87.5	**1,300**	**2,590**	3.54	<0.00180	
	KWB-12A	Apr-15		528	**668**	**18.5**	0.723 J	128	**2,380**	**3,660**	4.31	<0.00180	
	KWB-12A	Apr-15	FD	493	133	0.605	0.630 J	123	**2,110**	**3,630**	4.34	<0.00180	
	KWB-12A	Oct-15		560	138	0.618	0.963 J	155	**2,730**	**3,490**	4.55	<0.00180	
	KWB-12A	Apr-16		579	**539**	0.879	0.811 J	155	**2,360**	**3,670**	6.18	<0.00180	
	KWB-12A	Oct-16		549	163	0.757	1.15	161	**2,400**	**3,930**	7.34	<0.00180	
	KWB-12A	Apr-17		541	136	0.446	0.786 J	131	**2,280**	**4,260**	7.12	<0.00180	
	KWB-12A	Oct-17		511	133	0.512	0.999 J	127	**2,230**	**3,640**	8.21	<0.00180	
	KWB-12B	Apr-15		549	**689**	**20.2**	0.523 J	130	**2,520**	**3,730**	3.80	<0.00180	
	KWB-12B	Oct-15		537	124	0.398	0.537 J	131	**2,580**	**3,320**	4.77	<0.00180	
	KWB-12B	Oct-15	FD	538	123	0.430	0.569 J	127	**2,450**	**3,270**	4.82	<0.00180	
	KWB-12B	Apr-16		528	121	0.438	0.466 J	132	**2,520**	**3,600**	6.42	<0.00120	
	KWB-12B	Apr-16	FD	500	108	0.459	0.445 J	123	**1,930**	**3,930**	4.30	<0.00120	
	KWB-12B	Oct-16		497	129	0.500	0.565 J	128	**2,210**	**3,620**	5.44	<0.00180	
	KWB-12B	Oct-16	FD	505	116	0.474	0.584 J	129	**2,190**	**3,740**	5.56	<0.00180	
	KWB-12B	Apr-17		554	144	0.419	0.641 J	135	**2,410**	**3,880**	6.87	<0.00180	
	KWB-12B	Apr-17	FD	556	146	0.310	0.720 J	149	**2,980**	**3,520**	7.57	<0.00180	
	KWB-12B	Oct-17		542	136	0.353	0.603 J	139	**2,370**	**3,730**	7.26	<0.00180	
	KWB-12B	Oct-17	FD	526	115	0.332	0.584 J	134	**2,310**	**3,910**	6.71	<0.00180	
	KWB-P4	Apr-13											
	KWB-P4	Apr-15											
	KWB-P4	Apr-17											
	MW-57	Apr-15		641	**1,430**	**22.3**	1.57	460	**2,890**	**6,010**	**16.2**		
	MW-57	Oct-15		487	**541**	**1.69**	1.16	342	**2,050**	**3,330**	**12.9**		
	MW-57	Apr-16		593	**386**	**2.02**	1.59 J	368	**2,350**	**3,660**	**11.0**		
	MW-57	Oct-16		538	210	**2.99**	2.00	387	**2,710**	**4,730**	**33.3**		
	MW-57	Apr-17		538	**336**	**2.38**	1.62	342	**2,630**	**4,530**	**13.8**		
	MW-57	Oct-17		570	179	**2.39**	1.81	402	**3,110**	**5,100**	**33.3**		
	MW-58	Apr-15		200	149	1.15	0.317 J	58.8	9.63	**1,150**	<0.200	<0.00180	
	MW-58	Oct-15		234	239	1.35	0.459 J	71.5	4.80 J	**1,240**	<0.197	<0.00180	
	MW-58	Apr-16		262	**278** J	1.24	0.421 J	123	134	**1,510**	0.518 J	<0.00120	
	MW-58	Oct-16		210	174	1.57	0.392 J	94.2	3.77 J	**1,140**	0.0620 JB	<0.00180	
	MW-58	Apr-17		229	**280**	1.40	0.370 J	123	106	**1,550**	0.0380 J	<0.00180	
	MW-58	Oct-17		235	249	1.26	0.553 J	116	13.1	**1,340**	<0.0197	<0.00180	
	MW-111	Apr-15		270	**427**	1.01	0.521 J	172	294	**1,600**	<0.0200		
	MW-111	Oct-15		227	**408**	1.51	0.415 J	222	473 J	**1,530**	0.0220 J		
	MW-111	Apr-16		248	**402**	1.33	<0.185	229	355	**2,130**	0.0640 J		
	MW-111	Oct-16		224	**426**	1.39	0.222 JB	192	390	**1,820**	0.0880 JB		
	MW-111	Apr-17		232	**456** J3	1.28	0.203 J	211	366 P1	**2,250**	0.266 J		
	MW-111	Oct-17		217	**392**	1.31	0.102 J	234	317	**1,880**	<0.0197		
	MW-113	Apr-15		285	194	0.606	0.526 J	151	**957**	**2,030**	<0.0200		
	MW-113	Apr-15	FD	259	191	0.607	0.622 J	132	**877**	**1,980**	<0.0200		
	MW-113	Oct-15		287	197	0.503	0.528 J	153	**1,000**	**2,020**	0.243 J		
	MW-113	Oct-15	FD	288	197	0.493	0.529 J	156	**998**	**2,140**	<0.197		
	MW-113	Apr-16		314	199	0.294 J3	0.611 J	154	**1,090**	**2,370**	0.393 J		
	MW-113	Apr-16	FD	327	207	0.389	0.612 J	167	**1,080**	**2,400**	0.0480 J		
	MW-113	Oct-16		298 V	182	0.488	0.429 J	156	**925**	**2,150**	0.0470 JB		
	MW-113	Oct-16	FD	299	195	0.594	0.408 J	160	**945**	**2,240**	0.0510 JB		
	MW-113	Apr-17		304	193	0.459	0.525 J	158	**1,070**	**2,140**	<0.197		
	MW-113	Apr-17	FD	296	208	0.525	0.514 J	151	**940**	**2,420**	<0.197		
	MW-113	Oct-17		294	148	0.331	0.405 J	150	**848**	**2,430**	0.442		
	MW-113	Oct-17	FD	301	184	0.510	0.414 J	151	**1,040**	**2,240**	<0.0197		
	MW-125	Apr-15		523 J	**329**	1.17	1.21	217	**2,680**	**4,700**	0.295		
	MW-125	Oct-15		524	**316**	1.22	1.31	224	**2,750**	**4,200**	0.348 J		
	MW-125	Apr-16		577	**342**	1.18	1.39 J	245	**2,900**	**4,440**	0.537 J		
	MW-125	Oct-16		530	**294**	1.25	1.33	220	**2,660**	**4,370**	0.247 B		
	MW-125	Apr-17		495	**310**	1.33	1.27	218	**2,810**	**4,600**	0.751 J		
	MW-125	Oct-17		573	**313**	1.39	1.78	236	**3,000**	**5,200**	0.216		
	MW-126A	Apr-15		355	**898**	0.833	0.602 J	189	**1,530**	**2,900**	<0.200		
	MW-126A	Oct-15		281	200	1.03	0.511 J	178	**1,300**	**2,500**	<0.197		
	MW-126A	Apr-16		342	245	1.02	0.465 J	124	**1,270**	**2,360**	0.258 J		
	MW-126A	Oct-16		192	78.9	1.28	0.379 J	132	**875**	**1,860**	0.139 B		
	MW-126A	Apr-17		369	**271**	0.804	0.584 J	193	**1,780**	**2,850**	0.509 J		
	MW-126A	Oct-17		294	150	0.957	0.418 J	146	**1,300**	**2,410**	<0.0197		
	MW-126B	Apr-15		548	**319**	0.658	2.10 J	196	**2,550**	**3,660**	0.684 J		
	MW-126B	Oct-15		531	**295**	0.850	2.18	201	**2,330**	**4,060**	0.438 J		
	MW-126B	Apr-16		574	**314**	0.837	2.54 J	214	**2,700**	**3,590**	0.737 JB		
	MW-126B	Oct-16		542	**286**	0.862	2.19	220	**2,210**	**3,650**	0.295 B		
	MW-126B	Apr-17		524	**308**	0.649	2.27	206	**2,550**	**3,890**	0.342 J		
	MW-126B	Oct-17		524	**290**	0.729	2.17	197	**2,410**	**3,740**	0.419		
	MW-127	Apr-15		238	209	0.902	0.579 J	147	511	**1,750**	<0.200		
	MW-127	Oct-15		234	243	1.06	0.256 J	143	**642**	**1,900**	<0.197		
	MW-127	Apr-16		244	245	1.10	0.335 J	153	552	**1,910**	<0.197		
	MW-127	Oct-16		248	237	1.14	0.282 J	146	**713**	**3,840**	0.0490 JB		
	MW-127	Apr-17		242	**251**	0.949	0.264 J	146	**799**	**2,140**	<0.197		
	MW-127	Oct-17		262	231	0.993	1.46	142	**776**	**1,970**	0.146		
	MW-128	Apr-15		214 J	**307**	1.22	0.414 J	104	290	**1,490**	<0.0200		
	MW-128	Oct-15		202	**282**	1.22	0.341 J	105	280	**1,560**	<0.197		
	MW-128	Apr-16		1010	**266**	1.22	1.92 J	560	286	**1,580**	1.28		
	MW-128	Oct-16		203	249	1.28	0.586 J	108	280	**1,470**	0.0460 JB		
	MW-128	Apr-17		182	**264**	1.27	0.536 J	106	273	**1,580**	0.0340 J		
	MW-128	Oct-17		186	200	1.29	0.354 J	107	248	**1,370**	<0.0197		

Appendix B, Table B.5 - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Water Quality Parameters								Cyanide
				Analyte:	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	250	1.60	---	---	600	1,000	10.0	0.200
				CGWSL Source:		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	USEPA MCL	USEPA MCL
Area	**Well ID**	**Date**	**Dup**										
Field East of Refinery	MW-129	Apr-15		192	**302**	0.900	0.530 J	195	69.4	**1,330**	<0.200	
	MW-129	Oct-15		169	**313**	1.08	0.315 J	194	57.8	**1,280**	<0.197	
	MW-129	Apr-16		170	**300**	1.10	0.331 J	210	44.1	**1,520**	<0.197	
	MW-129	Oct-16		162	**293**	1.13	0.270 J	198	44.1	**1,340**	0.0770 JB	
	MW-129	Apr-17		163	**300**	1.02	0.334 J	199	44.1	**1,250**	<0.197 J5	
	MW-130	Apr-15		81.8 J	**259**	0.952	6.71	125	**1,080**	**3,710**	0.471	
	MW-130	Oct-15		261	237	0.829	0.688 J	293	**1,200**	**2,380**	0.495 J	
	MW-130	Apr-16		281	**293**	0.907	0.870 J	324	**1,030**	**2,570**	3.82 J6	
	MW-130	Oct-16		260	**253**	0.914	0.695 J	285	**1,110**	**2,600**	0.631	
	MW-130	Apr-17		263 V	**266**	0.778	0.676 J	290 V	**1,020**	**2,510**	3.26	
	MW-130	Oct-17		252	218	0.533	0.625 J	281	**880**	**2,520**	2.75	
	MW-131	Apr-15		168	**271**	0.683	0.328 J	157	9.57	**1,980**	<0.0200	
	MW-131	Oct-15		197	**295**	0.787	0.622 J	161	16.1	**1,180**	0.0380 J	
	MW-131	Apr-16		158	**288**	0.774	0.238 J	167	9.49	**1,250**	<0.197	
	MW-131	Oct-16		158	**291**	0.868	0.250 J	158	9.61	**1,270**	0.0530 JB	
	MW-131	Apr-17		151	**285**	0.773	0.275 J	153	10.3	**1,230**	<0.197	
	MW-131	Oct-17		149	**284**	0.807	0.200 J	149	15.5	**1,290**	<0.0197	
	MW-133	Nov-14		200	170	1.10	0.460 J	140 V	140	**1,300**	<0.0200	
	MW-133	Apr-15		163	174	1.19	0.323 J	122	116	**1,190**	<0.200	
	MW-134	Apr-15		840	**767**	1.24	2.21 J	454	**3,470**	**5,520**	8.15	
	MW-134	Apr-15	FD	710	**752**	1.35	1.46	307	**3,380**	**6,400**	8.04	
	MW-134	Oct-15		532	**521**	1.31	1.60	302	**2,980**	**5,040**	3.33	
	MW-134	Oct-15	FD	529	**516**	1.32	1.58	301	**3,030**	**4,690**	2.98	
	MW-134	Apr-16		576 V	**498**	1.24	1.70 J	311 V	**2,800**	**4,560**	2.79	
	MW-134	Apr-16	FD	565	**497**	1.24	1.69 J	303	**2,780**	**4,910**	2.73	
	MW-134	Oct-16		518	**460**	1.23	1.60	288	**2,980**	**5,020**	2.10	
	MW-134	Oct-16	FD	512	**473**	1.18	1.58	286	**2,910**	**4,860**	2.28	
	MW-134	Apr-17		528	**499**	0.944	1.56	247	**2,880**	**4,140**	3.37	
	MW-134	Apr-17	FD	527	**470**	0.902	1.61	269	**3,170**	**4,120**	4.03	
	MW-134	Oct-17		502	**373**	0.730	1.50	246	**2,620**	**4,480**	3.80	
	MW-134	Oct-17	FD	525	**425**	1.02	1.58	249	**2,700**	**4,960**	3.59	
	MW-135	Apr-15		848	**1,100**	0.764	1.42 J	552	**2,170**	**5,040**	**67.8**	
	MW-135	Oct-15		677	**1,380**	1.17	1.32	544	**2,460**	**5,800**	**76.9**	
	MW-135	Apr-16		2780	**1,010**	0.993	5.74	2640	**2,470**	**5,320**	**34.7**	
	MW-135	Oct-16		590	**1,310**	1.18	0.993 J	624	**2,500**	**5,980**	**58.9**	
	MW-135	Apr-17		608	**1,200**	1.23	0.979 J	626	**2,900**	**5,050**	**63.3**	
	MW-135	Oct-17		569	**1,100**	0.644	0.923 J	633	**2,810**	**5,650**	**54.5**	
	RA-4196	Apr-15		391	144	0.410	2.07	93.4	**1,400**	**2,170**	<0.0200	
	RA-4196	Oct-15		417	145	0.324	2.26	104	**1,470**	**2,290**	0.269 J	
	RA-4196	Apr-16		422	122	0.344	2.36 J	103	**1,150**	**2,800**	0.0700 J	
	RA-4196	Oct-16		382	151	0.299	2.11	103	**1,310**	**2,410**	0.0490 JBJ6	
	RA-4196	Apr-17		378	142	0.309	2.19	91.1	**1,250**	**2,220**	<0.197	
	RA-4196	Oct-17		376	109	0.242	2.10	99.4	**1,100**	**2,360**	<0.0197	
	RA-4798	Apr-15		465	183	0.415	2.21	128	**1,740**	**2,740**	0.936	
	RA-4798	Oct-15		396	142	0.335	2.12	105	**1,520**	**2,230**	1.53	
	RA-4798	Apr-16		449	142	0.347	2.40 J	117	**1,290**	**2,290**	1.28	
	RA-4798	Oct-16		437	174	0.359	2.27	129	**1,560**	**2,880**	0.930	
	RA-4798	Apr-17		305	95.1	0.359	2.03	64.6	**1,010**	**1,820**	1.55	
	RA-4798	Oct-17		378	127	0.215	2.06	99.5	**1,300**	**2,220**	1.82	
	RW-12R	Apr-16		448	174	0.334	0.437 J	181	**1,610**	**3,130**	0.326 J	
	RW-12R	Apr-17		392	189	0.623	0.293 J	152	**1,740**	**2,420** J3	<0.197	
	RW-13R	Apr-16		202	222	0.691	0.346 J	167	341	**1,190**	0.0460 J	
	RW-18	Apr-14		545	**347**	**1.78**	0.984	218	**2,860**	**5,600**	3.33	
	RW-18	Apr-15		482	232	**2.46**	1.30	230	**3,670**	**4,440**	6.55	
	RW-18	Apr-16		542	193	**2.85**	1.13 J	186	**3,800**	**4,640**	2.79	<0.00120
	RW-18	Apr-17		504	176	**2.51**	1.09	141	**2,870**	**4,400**	1.90	
	RW-20	Apr-15		228	**256**	0.530	<0.180	228	125	**1,430**	<0.200	
	RW-22	Apr-15		184	**402**	0.860	0.319 J	274	78.4	**1,680**	<0.200	
North Refinery	MW-23	Apr-15		222	**864**	**1.63**	0.562 J	577	509	**3,030**	0.0259 J	
	MW-23	Oct-15		114	**480**	**1.72**	1.92	463	29.9	**2,190**	2.70 J	
	MW-23	Apr-16		110	**500**	**1.81**	2.14 J	561	1.84 J	**1,990**	<0.197	
	MW-23	Oct-16		259	**445**	1.58	2.16	430	0.536 J	**2,140**	<0.197	
	MW-23	Apr-17		102	**517**	**1.74**	1.59	446	5.27	**2,040**	<0.197	
	MW-23	Oct-17		106	**438**	**1.64**	1.70	460	6.35	**1,800**	<0.197	
	MW-29	Apr-15		427	**283**	0.795	1.52	207	**2,100**	1,000	<0.0200	
	MW-29	Oct-15		397	115	0.722	0.823 J	167	**2,080**	**3,330**	<0.197	
	MW-29	Apr-16		465	134	1.04	1.29 J	210	**2,620**	**3,830**	0.105 J6	
	MW-29	Oct-16		398	**282**	0.919	0.964 J	227	**1,660**	**3,210**	0.502 J	
	MW-29	Apr-17		412 V	**268**	0.642	0.745 J	178 V	**1,790**	**3,670**	<0.197	
	MW-29	Oct-17		407	**278**	0.949	1.14	261	**1,600**	**3,370**	<0.0985	
	MW-39	Apr-15		509	190	**3.09**	3.62 J	179	**1,380**	**2,640**	<0.200	
	MW-39	Oct-15		432	152	**2.48**	3.14	133	**1,660**	**2,960**	0.300 J	
	MW-39	Apr-16		113	**305**	**2.68**	0.459 J	1290	**951**	**4,010**	0.530 J	
	MW-39	Oct-16		189	**334**	**2.35**	0.546 J	1510	**2,360**	**5,950**	<0.197	
	MW-39	Apr-17		84.0	**271**	**2.60**	0.347 J	1260	**957**	**3,890**	<0.197	
	MW-39	Oct-17		73.3	148	**3.06**	0.303 J	989	**953**	**3,040**	<0.0197	
	MW-40	Apr-14		386	179	1.28	1.56	124	**1,340**	**2,700**	<0.150	
	MW-40	Apr-15		571	**298**	**1.66**	1.89 J	134	**1,380**	**2,640**	<0.200	
	MW-40	Apr-16		504	146	**1.70**	1.76 J	127	**1,680**	**2,670**	<0.197	
	MW-40	Apr-17		474	156	**1.76**	1.62	110	**1,550**	**3,190**	<0.197	
	MW-41	Apr-14		242	**275**	0.747	0.444	387	**1,450**	**3,760**	<0.150	
	MW-41	Apr-15		313	**290**	1.07	0.648 J	501	**1,410**	**2,710**	<0.0200	
	MW-41	Apr-16		258	**312**	1.04	0.393 J	453	**1,180**	**2,530**	<0.197	
	MW-41	Apr-17		224	**328**	0.936	0.415 J	379	**1,200**	**2,890**	<0.197	
	MW-42	Apr-14		248	**914**	0.545	0.560	508	**954**	**3,440**	<0.150	
	MW-42	Apr-15		309	**562**	0.962	0.579 J	611	**1,110**	**3,440**	<0.0200	
	MW-42	Apr-16		295	**457**	0.867	0.617 J	601	**1,090**	**3,010**	<0.197	
	MW-42	Apr-17		222	**406**	0.831	0.421 J	462	**1,100**	**3,410**	0.416 JP1	
	MW-43	Apr-15		186	**726**	0.709	<0.180	511	122	**2,290**	<0.0200	<0.00180
	MW-43	Oct-15		241	**984**	**2.19**	1.26	658	**677**	**4,160**	<0.197 J	0.0810
	MW-43	Apr-16		178	**1,010**	**2.27**	0.956 J	812	**747**	**4,820**	0.270 J	<0.00120
	MW-43	Oct-16		212	**855**	**2.00**	1.23	664	**619**	**4,470**	<0.197	<0.0180
	MW-43	Apr-17		180	**687**	**2.10**	0.905 J	559	450 J	**3,530**	<0.197	0.0802
	MW-43	Oct-17		184	**756**	**2.17**	1.01	585	472	**3,200**	<0.394	<0.00180
	MW-59	Apr-14		514	176	0.475	0.643	156	**1,890**	**3,420**	<0.150	
	MW-59	Apr-15		489 J	178	1.23	0.489 J	139	**1,760**	**3,300**	0.0241 J	
	MW-59	Apr-16		2370	126	1.28	2.61 J	711	**1,790**	**3,300**	0.374 J	
	MW-59	Apr-17		467	184	1.13	0.519 J	134	**1,870**	**3,160**	<0.197	
	MW-60	Apr-15		411 J	198	0.968	0.558 J	190	**1,810**	**3,530**	<0.200	<0.00180
	MW-60	Apr-15	FD	403 J	241	1.07	0.541 J	186	**1,910**	**3,710**	<0.200	<0.00180
	MW-60	Oct-15		395	209	0.964	0.565 J	185	**1,910**	**3,560**	<0.197	<0.00180
	MW-60	Oct-15	FD	416	210	0.996	0.569 J	191 J	**1,990**	**3,660**	0.276 J	<0.00180
	MW-60	Apr-16		446	212	0.568	0.624 J	227	**2,090**	**3,980**	0.0410 J	<0.00120
	MW-60	Apr-16	FD	447	190	1.00	0.588 J	226	**2,140**	**3,200**	0.0650 JJ6	<0.00120

Appendix B, Table B.5 - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Water Quality Parameters								Cyanide
				Analyte:	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	250	1.60	---	---	600	1,000	10.0	0.200
				CGWSL Source:		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	USEPA MCL	USEPA MCL
Area	**Well ID**	**Date**	**Dup**										
North Refinery	MW-60	Oct-16		408	163	1.04	0.540 J	151	**2,020**	**3,610**	0.0710 JB	<0.00180
	MW-60	Oct-16	FD	410	162	1.05	0.509 J	149	**2,050**	**3,280**	0.0660 JBJ6	<0.00180
	MW-60	Apr-17		410	201	0.835	0.606 J	196	**2,060**	**3,470**	<0.197	<0.0900
	MW-60	Apr-17	FD	409	206	0.960	0.597 J	198	**1,850**	**3,650**	<0.197	<0.0900
	MW-60	Oct-17		422	222	1.07	0.717 J	233	**2,040**	**3,720**	<0.394	<0.00180
	MW-60	Oct-17	FD	412	212	0.885	0.707 J	230	**2,000**	**3,990**	<0.197	0.00553
	MW-61	Apr-15		457	**287**	1.30	1.10 J	349	**1,280**	**2,910**	<0.200	
	MW-61	Oct-15		375	179	**2.61**	2.28	286	**2,080**	**2,520**	<0.197	
	MW-61	Apr-16		439	240	**2.65**	2.82 J	278	**2,120**	**2,680**	0.552 J	
	MW-61	Oct-16		409	115	**3.14**	3.89	226	**1,400**	**2,430**	<0.197	
	MW-61	Apr-17		322	225	**2.08**	1.85	248	**1,100**	**2,600**	<0.197	
	MW-61	Oct-17		330	**303**	**1.93**	2.61	291	**933**	**3,110**	<0.394	
	MW-62	Apr-15		126	**485**	1.52	1.72	478	21.0	**1,930**	<0.0200	
	MW-62	Oct-15		425	**273**	**1.93**	1.31	399	**1,900**	**4,050**	<0.197	
	MW-62	Apr-16		481	**276**	**1.92**	1.42 J	456	**1,850**	**3,830**	0.322 J	
	MW-62	Oct-16		371	243	**1.79**	1.15	359	**1,390**	**3,460**	<0.197	
	MW-62	Apr-17		358	**275**	**1.78**	1.20	358	**1,180**	**3,210**	<0.197	
	MW-62	Oct-17		341	**265**	**2.23**	1.92	349	**1,030**	**2,480**	<0.394	
	MW-67	Apr-15		194	208	0.698	0.531 J	160	329	**1,510**	<0.200	<0.00180
	MW-67	Oct-15		192	225	0.589	0.533 J	177	311	**1,450**	<0.197	<0.00180
	MW-67	Apr-16		202	**312**	0.548	0.427 J	218	281	**1,790**	<0.197	0.0440 J
	MW-67	Oct-16		205	**310**	0.620	0.574 J	211	303	**1,880**	<0.0197 J6	<0.0180
	MW-67	Apr-17		199	**393**	0.570	0.565 J	229	275	**2,010**	<0.197	<0.0900
	MW-67	Oct-17		207	**305**	0.568	0.500 J	200	388	**1,740**	<0.0985	<0.00180
	MW-90	Apr-15		302	104	**2.73**	1.63	286	**2,230**	**3,800**	<0.200	
	MW-90	Oct-15		481	22.7	**6.77**	2.07	135	**4,530**	**5,130**	3.44	
	MW-90	Apr-16		411	85.9	**6.25**	1.69 J	246	**3,250**	**5,180**	0.377 J	
	MW-90	Oct-16		534	74.7	**8.22**	1.84	142	**3,610**	**5,730**	**14.7**	
	MW-90	Apr-17		363	161	**3.41**	1.61	189	**2,740**	**3,880**	<0.197	
	MW-90	Oct-17		322	116	**2.74**	1.34	182	**1,930**	**3,340**	<0.0985	
	MW-91	Apr-15		355	32.8	1.40	0.523 J	30.8	**643**	**1,980**	<0.200	
	MW-91	Oct-15		361	35.7	1.34	0.686 J	35.0	**854**	**2,280**	<1.97	
	MW-91	Apr-16		379	37.1	1.37	0.464 J	36.6	**776**	**2,270**	0.320 J	
	MW-91	Oct-16		366	37.4	1.45	0.525 J	35.1	**862**	**2,260**	<0.0197	
	MW-91	Apr-17		362	74.8	1.18	0.463 J	33.8	**790**	**2,120**	<0.197	
	MW-91	Oct-17		389	115	0.897	0.620 J	39.2	**944**	**2,520**	<0.394	
	MW-92	Apr-16		130 O1	**415**	1.30	1.73 J	450 O1V	24.1	**2,310**	0.602 J	
	MW-92	Oct-16		134	**539**	**1.63**	2.02	454	14.6	**2,150**	<0.985	
	MW-93	Apr-15		579	221	**2.23**	2.58 J	126	**2,050**	**3,080**	<0.0200	
	MW-93	Oct-15		516	**251**	**2.37**	5.23	133	**3,070**	**3,080**	2.92 J	
	MW-93	Apr-16		677	206	**3.06**	1.76 J	164	**2,130**	**3,270**	<0.197	
	MW-93	Oct-16		553 V	200	**2.78**	3.45 O1	167 V	**1,630**	**3,260**	<0.197	
	MW-93	Apr-17		489	192	**2.38**	2.97	167	**1,430**	**2,930**	<0.197	
	MW-94	Oct-15		109	245	1.01	0.224 J	355	75.8	**2,530**	<0.197	
	MW-94	Apr-16		124	217	1.02	0.189 J	532	199	**2,980**	<0.197	
	MW-94	Oct-16		137	172	1.04	0.467 J	319	175	**2,530**	<0.0197	
	MW-94	Apr-17		95.6	196	0.874	0.331 J	427	85.7	**2,660**	<0.197	
	MW-95	Apr-14		177	226	0.560	0.494	143	160	**1,440**	<0.150	
	MW-95	Apr-15		178	**275**	1.02	0.655 J	177	359	**1,680**	<0.200	
	MW-95	Apr-16		191	**280**	0.805	0.518 J	180	326	**1,670**	<0.197	
	MW-95	Apr-17		203 V	**349**	0.868	0.730 J	194 V	420	**1,710**	<0.197	
	MW-96	Apr-15		208	**884**	1.19	1.03	224	**1,730**	**1,680**	0.211 J	
	MW-96	Oct-15		230	190	1.23	1.21	244	583	**1,990**	0.202 J	
	MW-96	Apr-16		187	159	1.18	1.10 J	234	255	**1,590**	0.313 J	
	MW-96	Oct-16		210	169	1.19	1.03	225	456	**1,990**	0.0230 J	
	MW-96	Apr-17		179	191	1.08	1.10	208	298	**1,600**	<0.197	
	MW-96	Oct-17		173	159	0.785	0.907 J	199	535	**1,680**	<0.0985	
	MW-98	Apr-15		497	41.6	1.29	<0.180	91.5	**2,010**	**3,040**	<0.0200	
	MW-98	Oct-15		427	55.7	1.53	0.134 J	74.9	**1,790**	**3,340**	<0.197	
	MW-98	Apr-16		539	74.2	1.43	<0.185	89.6	**1,690**	**3,040**	<0.197	
	MW-98	Oct-16		450	88.0	1.52	0.241 J	72.7	**1,610**	**3,370**	<0.197	
	MW-98	Apr-17		516	93.5	**1.68**	0.180 J	79.2	**1,850**	**3,200**	<0.197	
	MW-98	Oct-17		541	105	1.30	0.176 J	87.1	**1,890**	**3,520**	<0.394	
	MW-137	Oct-15		142	**390**	**1.97**	1.90	1320	**1,090**	**3,880**	<0.197	0.144
	MW-137	Apr-16		178	**343**	**1.87**	2.43 J	1740	**2,160**	**3,950**	<0.197	**0.348** J
	MW-137	Oct-16		142	**445**	1.32	1.23	960	**1,040**	**3,550**	<0.197	<0.0450
	MW-137	Apr-17		139	**478**	1.54	1.53	1120	**1,050**	**4,230**	<0.197	0.116
	MW-137	Oct-17		141	**548**	1.11	0.979 J	759	**683**	**2,910**	<0.394	<0.00180
	MW-138	Oct-15		139	**490**	1.08	1.75	410	154	**1,920**	<0.197	<0.00180
	MW-138	Apr-16		160	**571**	1.13	2.03 J	568	164	**2,180**	<0.197	0.0290 J
	MW-138	Oct-16		138	**527**	0.927	1.84	426	122	**2,380**	<0.197	<0.0450
	MW-138	Apr-17		121	**571**	1.14	1.81	424	72.3	**1,930**	<0.197	<0.00180
	MW-138	Oct-17		124	**453**	1.06	1.50	401	27.9	**2,100**	<0.0985	<0.00180
	RW-1	Apr-15		358	224	1.33	3.57	210	**1,330**	**2,410**	<0.200	
	RW-1R	Apr-16		505	180	1.38	6.39	203	**1,500**	**2,990**	0.422 J	
	RW-1R	Apr-17		558	246	1.41	7.37	268	**1,860**	**3,690**	<0.197	
	RW-2	Apr-15		726	**365**	**1.75**	5.55 J	383	**3,510**	**5,310**	<0.200	
	RW-2R	Apr-16		875	**430**	**2.09**	5.80	396	**2,200**	**3,810**	0.281 J	
	RW-2R	Apr-17		519	**251**	**2.35**	2.86	261	**1,200**	**3,030**	<0.197	
	RW-7	Apr-15		252	237	1.15	1.88 J	192	19.0	**1,500**	<0.200	
	RW-7R	Apr-16		262	186	0.651	0.651 J	110	**624**	878	<0.197	
	RW-7R	Apr-17		266	204	0.513	0.922 J	105	**693**	**1,740**	<0.197	
	RW-8	Apr-15		227	115	0.801	0.353 J	209	473	**1,600**	<0.200	
	RW-8	Apr-17		218	163	0.731	0.360 J	161	**665**	**1,820**	<0.197	
	RW-9	Apr-14		291	**318**	1.10	1.57	306	**1,260**	**3,380**	<0.150	
	RW-9	Apr-15		315	**313**	**1.68**	1.69	318	**1,310**	**3,150**	<0.200	
	RW-9	Apr-16		336	**313**	**1.69**	1.96 J	356	**1,440**	**3,370**	1.73	
	RW-9	Apr-17		355	**369**	**1.90**	2.26	326	**1,370**	**3,370**	<0.197	
	RW-10	Apr-14		324	231	**2.17**	5.84	227	**2,060**	**3,420**	<0.150	
	RW-10	Apr-15		494	187	**3.34**	9.04	172	**2,010**	**3,290**	0.639	
	RW-10	Apr-16		638	159	**4.28**	13.2	176	**2,040**	**3,330**	1.21	
	RW-10	Apr-17		457	88.0	**3.53**	3.24	110	**1,500**	**2,660**	<0.197	
	RW-16	Apr-14		531	**452**	**3.74**	0.799	430	**2,680**	**5,130**	<0.150	
	RW-16	Apr-14	FD	556	**429**	**3.89**	0.767	455	**2,550**	**5,150**	<0.150	
	RW-16	Apr-15		641	**534**	**4.61**	1.69 J	594	**3,220**	**5,430**	2.87	
	RW-16	Apr-16		604	**416**	**3.01**	1.15 J	502	**3,360**	**5,610**	2.45	
	RW-16	Apr-17		499	**291**	**4.90**	0.832 J	372	**2,740**	**5,030**	2.20	
	RW-17	Apr-14		585	**524**	**1.84**	3.88	405	**3,280**	**6,100**	<0.150	
	RW-17	Apr-15		683	**494**	**2.58**	9.10	631	**4,180**	**5,840**	**31.6**	
	RW-17	Apr-16		2840	**377**	**2.22**	28.7	1800	**3,400**	**5,880**	4.77	
	RW-17	Apr-17		568	**398**	**2.61**	4.02	306	**2,950**	**4,820**	3.33	

Appendix B, Table B.5 - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Water Quality Parameters								Cyanide
				Analyte:	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	250	1.60	---	---	600	1,000	10.0	0.200
				CGWSL Source:		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	USEPA MCL	USEPA MCL
Area	**Well ID**	**Date**	**Dup**										
North RO Reject Field	MW-117	Apr-15		613	87.2	**3.79**	5.97		102	**2,220**	**3,670**	0.372 J	
	MW-117	Oct-15		478	55.4	**3.40**	6.44		109	**1,690**	**2,980**	0.779 J	
	MW-117	Apr-16		554	94.4	**3.45**	5.82		112	**2,060**	**3,390**	0.349	
	MW-117	Oct-16		592	**272**	**3.57**	6.90		115	**2,240**	**3,590**	0.137 BJ6	
	MW-117	Apr-17		548	245	**3.33**	6.50		96.7	**2,090**	**3,640**	0.266 J	
	MW-117	Oct-17		559	216	**2.05**	5.82		105	<0.0774	**3,450**	0.196	
	MW-118	Apr-15		601	**767**	**4.14**	5.30		153	**2,510**	**3,960**	1.7	
	MW-118	Oct-15		583	86.6	**5.13**	5.64		162	**2,690**	**3,960**	0.622 J	
	MW-118	Apr-16		573	189	**5.86**	4.80 J		152	**2,480**	**3,950**	1.57	
	MW-118	Oct-16		559	131	**6.47**	5.92		164	**2,640**	**4,450**	6.71	
	MW-118	Apr-17		544	175	**5.98**	5.06		139	**2,630**	**3,830**	8.51	
	MW-118	Oct-17		550	192	**4.20**	5.72		118	**2,890**	**3,780**	6.27	
	MW-119	Apr-15		590	48.2	**1.99**	0.232 J		54.5	**2,040**	**3,030**	0.292 J	
	MW-119	Oct-15		624	152	**2.65**	0.985 J		86.3	**2,290**	**3,500**	0.437 J	
	MW-119	Apr-16		595	191	**2.50**	0.614 J		101	**1,900**	**3,330**	0.518 J	
	MW-119	Oct-16		619	**280**	**2.91**	0.991 J		132	**2,010**	**3,690**	0.189 B	
	MW-119	Apr-17		587	**290**	**2.86**	0.965 J		123	**2,420**	**3,650**	<0.197	
	MW-119	Oct-17		612	**268**	**2.77**	1.27		172	**2,240**	**3,750**	<0.0197	
NCL	MW-18	Apr-14		507	159	0.954	2.89		83.2	**1,830**	**3,700**	**35.2**	<0.00500
	MW-18	Apr-15		407	185	1.45	7.18		66.7	**1,600**	**3,110** J	**36.1**	<0.00180
	MW-18	Apr-16		504	178	1.39	3.69 J		107	**1,600**	**2,920**	**42.6**	0.00200 J
	MW-18	Apr-17		486	77.5	**3.44**	13.9		65.0	**1,970**	**3,420**	**51.0**	<0.00180
	MW-45	Apr-15		605	**1,260**	1.44	4.47		346	**2,580**	**5,300** J	<0.0200	<0.00180
	MW-45	Oct-15		610	**454**	1.37	5.02		376	**2,910**	**4,660**	0.0290 J	<0.00180
	MW-45	Apr-16		689	**524**	1.51	6.33		429	**2,710**	**4,760**	<0.197	<0.00180
	MW-45	Oct-16		640	**546**	1.48 J6	5.30		392	**2,810**	**4,730**	0.377 B	0.00953
	MW-45	Apr-17		625	**545**	1.27	5.69		394	**2,840**	**5,410**	0.0270 J	<0.00180
	MW-45	Oct-17		596	**544**	1.59	4.79		369	**2,650**	**5,740**	<0.0197	<0.00180
	MW-53	Apr-14		290	95.4	0.827	0.935		87.6	**1,190**	**2,060**	<0.150	
	MW-53	Apr-15		348	**1,010**	0.922	1.16		104	**1,290**	**2,810** J	**34.5**	
	MW-53	Apr-16		459	**346**	1.06	1.42 J		161	**1,340**	**2,890**	**25.3**	
	MW-53	Apr-17		340	222	0.904	1.12		130	**1,330**	**2,290**	**15.6**	
	MW-54A	Apr-15		318	192	1.10	0.276 J		62.9	**712**	**2,080** J	0.450	
	MW-54A	Oct-15		356	210	1.10	0.330 J		70.2	**796**	**2,140**	4.32 J	
	MW-54A	Apr-16		381	176	1.12	0.303 J		69.4	**625**	**1,780**	<0.197 J6	
	MW-54A	Oct-16		331	175	0.997	0.254 J		61.5	**670**	**1,770**	0.134 J6B	
	MW-54A	Apr-17		330	193	0.987	0.289 J		59.8	**797**	**1,800**	0.0860 J	
	MW-54A	Oct-17		359	204	1.34	0.271 J		67.2	**819**	**2,060**	0.691	
	MW-54B	Apr-13		345	176	<0.500	1.16		48.8	**747**	**2,050**	<1.00	
	MW-54B	Apr-15		307	166	0.613	0.767 J		48.0	**752**	**1,890** J	0.0276 J	
	MW-54B	Apr-17		317	127	0.617	1.18		54.5	**1,040**	**1,840**	0.100 J	
	MW-55	Apr-15		627	**266**	**1.88**	0.692 J		167	**2,940**	**4,910** J	**15.5**	<0.00180
	MW-55	Oct-15		411	216	**1.85**	0.756 J		166	**2,300**	**4,000**	5.57	<0.00180
	MW-55	Apr-16		472	**442**	1.04	0.829 J		253	**2,080**	**4,200**	2.26	<0.00120
	MW-55	Oct-16		465	219	**2.09**	0.732 J		174	**2,190**	**3,810**	3.65	<0.00180
	MW-55	Apr-17		378	**446**	1.44	0.745 J		206	**1,550**	**3,580**	3.14	<0.00180
	MW-55	Oct-17		444	**435**	**2.02**	0.675 J		228	**2,020**	**3,970**	3.45	<0.00180
	MW-56	Apr-15		485	**927**	1.11	1.90		272	**1,900**	**3,640** J	1.28	
	MW-56	Oct-15		514	**399**	1.12	2.05		342	**2,490**	**4,080**	4.34	
	MW-56	Apr-16		559 V	**403**	1.10	2.32 JO1		379 V	**1,970**	**3,790**	2.76	
	MW-56	Oct-16		446 V	**263**	1.19	1.97		317 V	**1,910**	**4,110**	0.151 B	
	MW-56	Apr-17		501 V	**453**	1.00	2.10		338 V	**2,070**	**4,100**	3.93	
	MW-108	Apr-15		289	78.8	**2.52**	1.50		76.8	**962**	**2,540** J	<0.390	
	MW-108	Oct-15		298	77.5	**2.30**	1.31		88.9	**1,090**	**2,530**	<0.197	
	MW-108	Apr-16		333	79.6	**2.04**	1.28 J		92.6	**981**	**2,120**	0.304 J	
	MW-108	Oct-16		343	112	**2.75**	3.88		116	**1,340**	**2,830**	0.0460 JB	
	MW-108	Apr-17		251	80.4	**1.90**	0.893 J		81.7	**717**	**1,980**	0.0310 JJ6	
	MW-108	Oct-17		339	92.9	**1.88**	4.67		135	**1,510**	**2,660**	<0.0985	
	NCL-31	Apr-15		266	89.5	1.25	0.220 J		100	**1,240**	**2,670** J	<0.200	
	NCL-31	Oct-15		392	129	1.20	0.418 J		125	**2,100**	**3,220**	<0.197	
	NCL-31	Apr-16		340	78.9	1.14	0.272 J		109	**1,420**	**3,020**	0.385 J	
	NCL-31	Oct-16		445	67.8	1.57	0.564 J		148	**2,400**	**3,820**	0.0840 JB	
	NCL-31	Apr-17		369	65.7	1.19	0.434 J		111	**1,890**	**3,150**	0.127	
	NCL-31	Oct-17		341	53.7	1.44	0.362 J		103	**2,020**	**3,000**	<0.0197	
	NCL-32	Apr-15		446	177	**1.92**	4.15 J		92.6	**1,050**	**2,250**	<0.200	
	NCL-32	Oct-15		540	**329**	1.57	4.98		97.0	**1,430**	**2,280**	<0.197	
	NCL-32	Apr-16		697	206	**2.05**	7.60		115	**1,340**	**2,740**	<0.197	
	NCL-32	Oct-16		390	128	1.48	3.26		102	**1,220**	**2,230**	1.77	
	NCL-32	Apr-17		387	155	1.54	3.19		102	**1,310**	**2,440**	4.90	
	NCL-32	Oct-17		398	117	1.31	2.94		109	**1,490**	**2,540**	6.14	
	NCL-33	Apr-15		431	**281**	**2.58**	4.31 J		111	**800**	**2,280**	<0.0200	
	NCL-33	Oct-15		419	**404**	**2.49**	4.86		119	**847**	**2,140**	<0.197	
	NCL-33	Apr-16		622	**280**	**2.82**	7.58		113	**1,370**	**3,200**	0.367 J	
	NCL-33	Oct-16		462	**400**	**2.65**	5.28		109	**900**	**2,790**	0.0750 JB	
	NCL-33	Apr-17		514	**412**	**2.62**	5.98		101	**1,220**	**2,750**	0.0320 J	
	NCL-33	Oct-17		509	**458**	**2.77**	6.09		114	**1,150**	**2,820**	<0.0197	
	NCL-34A	Apr-15		275	249	1.36	0.570 J		117	110	**1,490**	<0.200	
	NCL-34A	Oct-15		202	182	1.43	0.877 J		103	104 J	**1,250**	0.284 J	
	NCL-34A	Apr-16		347	**416**	1.31	2.20 J		140	82.2	**1,540**	0.265 J	
	NCL-34A	Oct-16		249	238	1.43	1.27		107	95.0	**1,370**	0.0470 JB	
	NCL-34A	Apr-17		270	**313**	1.27	1.36		108	76.1	**1,440**	0.0570 JJ6	
	NCL-34A	Oct-17		214	202	1.37	1.08		111	131	**1,400**	<0.0394	
	NCL-44	Apr-15		269	161	**1.78**	1.64 J		73.4	468	**2,510**	<0.200	
	NCL-44	Oct-15		276	182	**1.69**	2.07		71.4	**633**	**1,890**	<0.197	
	NCL-44	Apr-16		414	234	1.59	2.62 J		98.3	**965**	**2,120**	<0.197	
	NCL-44	Oct-16		373	222	**1.67**	2.29		94.9	**1,030**	**2,130**	0.0810 JB	
	NCL-44	Apr-17		360	198	**1.65**	2.31		99.7	**1,070**	**2,390**	0.0470 J	
	NCL-44	Oct-17		350	158	**1.69**	2.26		119	**1,260**	**2,480**	<0.0197	
	NCL-49	Apr-15		377	109	**1.64**	0.552 J		105	**1,400**	**2,840** J	4.53	
	NCL-49	Apr-15	FD	380	**395**	0.531	0.589 J		105	**1,650**	**2,850** J	4.50	
	NCL-49	Oct-15		406	112	0.593	0.607 J		115	**1,770**	**2,830**	5.79	
	NCL-49	Oct-15	FD	407	113	0.598	0.613 J		114	**1,800**	**2,860**	5.79	
	NCL-49	Apr-16		468	119	0.685	0.749 J		136	**1,570**	**2,820**	5.71	
	NCL-49	Apr-16	FD	470	119	0.685	0.792 J		137	**1,580**	**2,790**	5.63	
	NCL-49	Oct-16		425	128	0.600	0.590 J		120	**1,700**	**2,770**	6.08	
	NCL-49	Oct-16	FD	429	130	0.600	0.597 J		122	**1,670**	**3,290**	6.01	
	NCL-49	Apr-17		451	172	0.576	0.632 J		133	**2,010**	**3,070**	9.84	
	NCL-49	Apr-17	FD	452	159	0.575	0.633 J		133	**1,970**	**2,990**	9.78	
	NCL-49	Oct-17		481	173	0.698	0.594 J		132	**2,080**	**3,200**	8.41	
	NCL-49	Oct-17	FD	458	169	0.713	0.605 J		131	**2,050**	**3,140**	8.41	

Appendix B, Table B.5 - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Water Quality Parameters								Cyanide
				Analyte:	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	250	1.60	---	---	600	1,000	10.0	0.200
				CGWSL Source:		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	USEPA MCL	USEPA MCL
Area	**Well ID**	**Date**	**Dup**										
South Refinery	KWB-2R	Apr-15		233	**259**	0.879	0.777 J	267	**884**	**2,450**	<0.200	
	KWB-2R	Oct-15		168	228	1.21	1.23	296	418	**1,970**	<0.197	
	KWB-2R	Apr-16		322	207	0.485	0.456 J	325	**1,460**	**2,910**	0.0340 JJ6	
	KWB-2R	Oct-16		275	215	0.901	0.433 J	282	**1,150**	**2,850**	0.0740 JB	
	KWB-2R	Apr-17		280	**279**	0.904	0.460 J	286	**1,060**	**2,550**	0.0220 J	
	KWB-2R	Oct-17		139	240	1.09	1.33	283	259	**1,770**	<0.394	
	KWB-5	Apr-15		237	**518**	0.687	1.79	198	8.08	**1,500**	<0.0200	
	KWB-5	Oct-15		228	**575**	0.853	1.60	203	6.81	**1,540**	0.243 J	
	KWB-5	Apr-16		252	**5,800**	0.392	1.66 J	222	235 J	**1,760**	0.0400 J	
	KWB-5	Oct-16		228	**562**	0.910	1.34	220	6.46	**1,560**	0.0460 JBJ6	
	KWB-5	Apr-17		224	**575**	0.936	1.48	204	14.8	**1,580**	<0.197	
	KWB-5	Oct-17		220	**565**	0.877	1.41	208	21.9	**1,560**	0.0530 J	
	KWB-6	Apr-15		212	**305**	0.366	0.220 J	193	16.2	**1,460**	0.148	
	KWB-6	Oct-15		229	**265**	0.935	0.181 J	144	264	**1,410**	0.273 J	
	KWB-6	Apr-16		246	**313**	1.03	0.206 J	199	83.1	**1,410**	<0.197	
	KWB-6	Oct-16		232	**280**	0.977	0.219 JB	109	275	**1,590**	0.0770 JB	
	KWB-6	Apr-17		227	**260**	0.965	0.183 J	120	211	**1,630**	0.556 J	
	KWB-6	Oct-17		256	**290**	0.842	0.162 J	131	377	**1,890**	<0.394	
	MW-28	Apr-15		439 J	160	1.59	0.685 J	89.5	**1,080**	**2,760**	<0.390	0.0132
	MW-28	Oct-15		379	159	**1.67**	0.632 J	92.7	**1,060**	**3,000**	0.211 J	0.0108
	MW-28	Apr-16		1500	135	1.42	4.06 J	450	**672**	**3,040**	0.470 J	<0.00120
	MW-28	Oct-16		480	147	1.40	0.640 J	74.0	**1,320**	**1,900**	0.0460 JB	<0.0180
	MW-28	Apr-17		380	190	1.56	0.778 J	89.9	**1,170**	**2,420**	<0.197	<0.0900
	MW-28	Oct-17		376	146	1.51	1.37	90.3	**1,180**	**2,640**	<0.394	<0.00180
	MW-48	Apr-15		258 J	161	0.498	0.680 J	276	47.6	725	<0.200	
	MW-48	Oct-15		186	**391**	0.644	2.61	355	235	**1,940**	<0.197	
	MW-48	Apr-16		234	**1,110**	1.45	1.80 J	314	20.5	**2,950**	<0.197	
	MW-48	Oct-16		200	**580**	1.07	1.18	339	239	**2,270**	0.0300 JB	
	MW-48	Apr-17		190	**909**	1.47	1.13	255	18.2	**2,210**	0.202 J	
	MW-48	Oct-17		191	**820**	1.01	0.908 J	272	19.3	**2,280**	<0.0197	
	MW-50	Apr-15		450	**259**	0.966	2.18	178	**1,680**	**2,860**	<0.200	
	MW-50	Oct-15		403	226	0.899	2.29	175	**1,740**	**2,770**	2.61 J	
	MW-50	Apr-16		645	**491**	**3.96**	8.60	969	**4,280**	**4,580**	**150**	
	MW-50	Oct-16		546	**511**	**3.86** J6	12.4	912	**4,690**	**9,320**	0.594	
	MW-50	Apr-17		566	**463**	**2.21**	5.90	646	**3,710**	**6,840**	**155**	
	MW-50	Oct-17		572	**431**	**2.57**	5.57	620	**3,580**	**6,620**	**136**	
	MW-52	Apr-15		168 J	158	**1.88**	0.252 J	267	**832**	**3,740**	1.54	<0.00180
	MW-52	Oct-15		196	144	**1.76**	0.242 J	285	**998**	**2,040**	3.13	<0.00180
	MW-52	Apr-16		778	160	**1.79**	1.20 J	1350	**995**	**1,920**	1.73	<0.00120
	MW-52	Oct-16		194	144	**1.77**	0.262 J	278	**1,100**	**2,370**	1.04	0.00182 J
	MW-52	Apr-17		181	154	**1.65**	0.283 J	297	**1,060**	**2,260**	3.27	<0.00180
	MW-52	Oct-17		238	114	1.09	0.245 J	275	**1,270**	**2,550**	9.42	<0.00180
	MW-64	Apr-16		109	**379**	1.08	0.754 J	396	39.9	**1,510**	<0.197	
	MW-64	Oct-16		109	**356**	0.855	0.689 J	361	4.08 J	**1,650**	0.0790 JB	
	MW-64	Apr-17		99.7	**382**	1.03	0.774 J	367	3.93 J	**1,760**	0.0400 J	
	MW-64	Oct-17		96.6	**326**	0.984	0.656 J	351	7.90	**1,590**	<0.394	
	MW-65	Apr-15		147	**382**	1.21	0.783 J	257	<0.0770	**1,410**	0.0613 J	
	MW-65	Apr-16		155 V	**394**	1.28	0.691 J	311 V	0.323 J	**1,750**	0.0490 JJ6	
	MW-65	Oct-16		157	**356**	1.48	1.46	287	0.431 J	**1,380**	0.219 B	
	MW-65	Apr-17		134	**354**	1.38	1.01	279	0.822 J	**1,430**	0.0330 J	
	MW-65	Oct-17		132	**314**	1.44	1.03	267	0.470 J	**1,320**	<0.0197	
	MW-66	Apr-15		120	141	1.53	0.858 J	134	0.596 J	948	0.0292 J	<0.00180
	MW-66	Oct-15		134	201	1.34	0.742 J	163	0.110 J	**1,090**	<0.197	0.00180 J
	MW-66	Apr-16		600	134	1.36	4.83 J	740	0.591 J	942	0.363 J	<0.00120
	MW-66	Oct-16		131	174	1.42	0.770 J	155	0.327 J	**1,020**	0.0480 JB	<0.00180
	MW-66	Apr-17		115	184	1.55	0.830 J	143	0.360 J	976	0.0370 JP1	<0.00180
	MW-66	Oct-17		139	179	1.42	1.14	159	1.69 J	**1,080**	<0.0197	<0.00180
	MW-99	Apr-15		48.7	33.4	0.328	5.30	23.9	41.3	267	0.789	
	MW-99	Oct-15		176	249	0.706	0.955 J	215	127	**1,390**	<0.197	
	MW-99	Apr-16		805	208	0.866	6.37	1100	153	**1,410**	0.0330 JJ6	
	MW-99	Oct-16		137	192	0.656	3.60	168	39.0	**1,200**	0.0350 JB	
	MW-99	Apr-17		161	**284**	0.758	0.819 J	205	169	**1,370**	<0.197	
	MW-99	Oct-17		173	**256**	0.748	0.624 J	215	142	**1,430**	<0.394	
	MW-101	Apr-15		188	201	0.708	0.485 J	141	188	**1,340**	<0.200	
	MW-101	Oct-15		188	236	0.993	0.483 J	138	206	**1,470**	0.230 J	
	MW-101	Apr-16		220	239	0.940	0.522 J	169	168	**1,270**	0.197 J	
	MW-101	Oct-16		183	229	1.00	0.509 J	112	191	**1,400**	0.127 B	
	MW-101	Apr-17		197	234	0.926	0.587 J	139	160	**1,390**	<0.197	
	MW-101	Oct-17		197	229	0.998	0.853 J	142	171	**1,360**	<0.0197	
	MW-102	Apr-15		94.4	175	0.825	0.419 J	357	1.75 J	**1,470**	0.0642 J	
	MW-102	Oct-15		193	219	1.13	0.683 J	385	296	**1,750**	<0.197	
	MW-102	Apr-16		127	245	0.901	0.372 J	437	2.35 J	**1,530**	0.339 J	
	MW-102	Oct-16		176	**271**	1.28	0.772 J	418	217	**1,740**	0.0620 JBJ6	
	MW-102	Apr-17		120	**258**	1.09	0.504 J	379	11.3	**1,550**	<0.197	
	MW-102	Oct-17		124	**259**	1.16	0.507 J	373	7.70	**1,730**	<0.394	
	MW-103	Apr-14		24.5	**1,040**	**7.45**	0.831	1420	<10.0 B	**3,820**	<0.150	
	MW-103	Apr-15		192	**7,890**	**3.44**	2.46 J	6710	19.6	**12,500**	<0.0200	
	MW-103	Apr-16		193	**13,700**	**5.44**	3.73 J	7960	2.24 J	**21,100**	0.430 J	
	MW-103	Apr-17		306	**12,000**	1.39	3.12 J	10000	48.0	**22,300**	0.0530 J	
	MW-104	Apr-15		208	31.4	**1.67**	4.73	42.7	**856**	**1,070**	<0.0200	
	MW-104	Apr-15	FD	207	31.0	**2.12**	4.63	42.3	**679**	**1,130**	0.185	
	MW-104	Oct-15		169	21.0	**2.01**	4.92	38.6	510	912	<0.197	
	MW-104	Oct-15	FD	170	21.6	**2.07**	4.86	40.3	473	925	<0.197	
	MW-104	Apr-16		179 V	25.9	**2.49**	4.96 JJ5O1	43.6 V	408	819	0.455 JB	
	MW-104	Apr-16	FD	178	25.6	**2.51**	5.16	44.7	439	809	0.286 JB	
	MW-104	Oct-16		165	72.9	**1.94**	4.77	38.4	322	975	0.0640 JB	
	MW-104	Oct-16	FD	164	73.4	**1.90**	4.78	37.9	323	928	0.0820 JB	
	MW-104	Apr-17		203	209	**1.94**	5.56	50.9	217	986	0.0450 JJ6	
	MW-104	Apr-17	FD	197	230	**1.77**	5.20 O1	48.7 O1V	219	**1,010**	<0.197	
	MW-104	Oct-17		213	178	1.58	5.84	60.5	258	**1,070**	<0.394	
	MW-104	Oct-17	FD	213	201	1.19	5.73	59.2	281	**1,140**	<0.0985	
	MW-105	Apr-15		111	25.3	0.700 J	4.26	17.2	263	530	<0.200	
	MW-105	Oct-15		148	13.4	0.330	4.41	12.0	297	664	0.221 J	
	MW-105	Apr-16		257	42.0	1.48	4.55 J	52.6	278	**1,300**	0.414 J	
	MW-105	Oct-16		227	12.7	**2.06**	4.97	20.7	20.6	**1,050**	0.105 B	
	MW-105	Apr-17		212	48.2	1.60	4.45	38.3	9.54	982	<0.197	
	MW-105	Oct-17		245	101	**1.62**	6.49	89.2	132	**1,370**	<0.394	
	MW-106	Apr-15		197	**280**	**6.81**	10.4	162	559	**1,400**	**22.3**	
	MW-106	Oct-15		373	148	**1.76**	2.43	221	**1,790**	**3,420**	<0.197	
	MW-106	Apr-16		422	185	1.51	4.40 J	271	**1,380**	**3,120**	<0.197	
	MW-106	Oct-16		347	216	1.30	1.37	240	**1,410**	**3,080**	0.0530 JB	
	MW-106	Apr-17		313	**302**	1.28	2.44	236	**1,020**	**2,630**	<0.197	
	MW-106	Oct-17		313	217	0.930	1.78	265	**1,210**	**3,050**	<0.985	

Appendix B, Table B.5 - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Water Quality Parameters								Cyanide
				Analyte:	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	250	1.60	---	---	600	1,000	10.0	0.200
				CGWSL Source:		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	USEPA MCL	USEPA MCL
Area	**Well ID**	**Date**	**Dup**										
South Refinery	MW-107	Apr-15		160 J	**291**	1.54	0.583 J	73.1	27.1	**1,220**	<0.0200		
	MW-107	Oct-15		176	**297**	**1.67**	0.880 J	76.9	102	**1,390**	<0.197		
	MW-107	Apr-16		727	**277**	**1.67**	3.22 J	381	6.07	**1,850**	0.376 J		
	MW-107	Oct-16		186	**271**	**1.82**	0.965 J	80.1	72.4	**1,480**	0.170 B		
	MW-107	Apr-17		140	**313**	**1.76**	0.655 J	75.4	<0.0774	**1,260**	<0.197		
	MW-109	Apr-15		192 J	**261**	**2.04**	0.929 J	406	**931**	**2,910**	<0.390		
	MW-109	Oct-15		181	232	**1.81**	0.862 J	438	**950**	**2,170**	<0.197		
	MW-109	Apr-16		707	204	**1.90**	4.01 J	2200	**848**	**2,190**	0.384 J		
	MW-109	Oct-16		153	226	**2.06**	0.802 J	431	**751**	**2,590**	0.0360 JB		
	MW-109	Apr-17		200	195	**1.99**	1.03	394	**1,040**	**2,700**	<0.197		
	MW-109	Oct-17		193	166	1.41	0.913 J	374	**814**	**2,710**	<0.394		
	MW-110	Apr-15		107 J	93.8	**1.64**	0.244 J	244	283	**1,420**	<0.0200		
	MW-110	Oct-15		174	136	**1.62**	0.268 J	294	**787**	**1,680**	<0.197		
	MW-110	Apr-16		555	99.0	1.53	1.19 J	1380	**2,100**	**1,360**	0.765 J		
	MW-110	Oct-16		115	97.6	1.50	0.150 J	276	555	**1,430**	0.0620 JB		
	MW-110	Apr-17		120	135	1.45	0.207 J	265	387	**1,330**	<0.197		
	MW-110	Oct-17		106	97.3	0.903	0.0756 J	267	419	**1,430**	<0.0197		
	RA-313	Apr-14		171	17.2	1.01	0.935		450	868	<0.150		
	RA-313	Apr-15		150	19.1	0.914	1.04	17.8	**605**	808	<0.0200		
	RA-313	Apr-16		175	17.6	0.893	1.02 J	17.3	501	881	0.680 J		
	RA-313	Apr-17		167	15.0	0.893	1.26	16.4	455	937	0.447 J		
	RW-4	Apr-15		202	**258**	0.845	1.67	144	468	**1,710** J	<0.0200		
	RW-4R	Apr-16		207	**351**	1.06	2.00 J	290	470	**1,810**	0.346 J		
	RW-4R	Apr-17		151	**280**	0.977	1.50	177	318	**1,510**	<0.197		
	RW-5R	Apr-15		4.82	**260**	0.965	0.461 J	189	0.376 J	565	<0.0200		
	RW-5R	Apr-16		4.61 J	**262**	0.564	0.364 J	203	0.655 J	399	0.495 J		
	RW-6	Apr-15		168	**414**	0.628	0.686 J	205	129	**1,650**	0.0335 J		
	RW-6R	Apr-16		191	**405**	0.747	0.356 J	226	104	**1,470**	0.485 J		
	RW-15C	Apr-17		160	**409**	0.774	1.59	269	19.4	**1,610**	0.442 J		
South RO Reject Field	MW-114	Apr-15		570 J	80.3	**1.95**	2.29	114	**2,140**	**3,640**	0.0752 J		
	MW-114	Oct-15		579	111	**1.89**	2.46	104	**2,250**	**2,990**	<0.197		
	MW-114	Apr-16		681	88.6	**1.87**	2.59 J	126	**1,170**	**3,710**	0.416 J		
	MW-114	Oct-16		569	231	**2.03**	2.49	89.3	**2,100**	**4,050**	4.69		
	MW-114	Apr-17		599	**266**	**1.78**	2.83	131	**2,350**	**3,480**	0.260 JJ5		
	MW-114	Oct-17		582	157	1.35	2.83	132	**1,950**	**3,700**	2.80		
	MW-115	Apr-15		546 J	**464**	**2.42**	0.425 J	385	**3,510**	**6,200**	0.0333 J		
	MW-115	Oct-15		532	**326**	**2.8**	0.578 J	320	**3,640**	**4,640**	<0.197		
	MW-115	Apr-16		2410	153	**1.93** J6	2.64 J	1290	**2,020**	**5,390**	0.375 J		
	MW-115	Oct-16		541	**382**	**2.69**	0.395 JB	144	**2,750**	**4,990**	0.113 B		
	MW-115	Apr-17		394	**304**	1.51	0.514 J	183	**2,770**	**4,190**	<0.197		
	MW-115	Oct-17		450	249	1.01	0.558 J	213	**2,910**	**4,480**	0.0420 J		
	MW-116	Apr-15		534 J	131	**2.28**	3.57	92.1	**1,800**	**3,300**	0.0753 J		
	MW-116	Oct-15		644	223	**2.80**	5.67	145	**2,280**	**3,800**	<0.197		
	MW-116	Apr-16		719	**500**	1.33	1.63 J	259	**3,300**	**4,580**	0.473 J		
	MW-116	Oct-16		569	196	**2.91**	4.26	114	**2,040**	**3,500**	0.0480 JB		
	MW-116	Apr-17		501	**270**	**2.00**	2.22	154	**2,060**	**3,450**	0.258 J		
	MW-116	Oct-17		614	233	**2.72**	4.47	147	**2,080**	**3,160**	1.4		
TEL	MW-49	Apr-15		197	**423**	1.18	2.04	309	**665**	**2,340**	<0.200		<0.00180
	MW-49	Oct-15		192	**381**	1.45	2.48	326	**621**	**2,260**	<0.197		0.00280 J
	MW-49	Apr-16		203	**368**	1.38	2.19 J	347	584	**2,270**	0.0580 J		<0.00180 J3J6
	MW-49	Oct-16		206	**364**	1.50	2.45	329	**602**	**1,860**	0.179 BJ6		<0.00900
	MW-49	Apr-17		194	**373**	1.35	2.19	328	531	**2,390**	<0.197		<0.0900
	MW-49	Oct-17		192	**373**	1.31	2.83	331	535	**2,140**	<0.0197		<0.00180
	TEL-1	Apr-15		209	**269**	**2.26**	0.962 J	434	**1,230**	**2,480**	<0.200		
	TEL-1	Oct-15		479	195	**2.54**	1.92	374	**2,060**	**3,390**	<0.197		
	TEL-1	Apr-16		389	113	**3.00**	1.72 J	373	**1,510**	**2,570**	0.0380 J		
	TEL-1	Oct-16		477	51.4	**3.39**	2.22	155	**1,710**	**3,090**	0.0730 JB		
	TEL-1	Apr-17		284	195	**2.73**	1.32	370	**1,320**	**2,940**	<0.197		
	TEL-1	Oct-17		208	243	**2.12**	0.896 J	480	**986**	**2,350**	<0.394		
	TEL-2	Apr-15		164	**949**	0.914	0.945 J	372	498 J	**2,390**	<0.200		
	TEL-2	Oct-15		188	**371**	1.18	1.10	404	**680**	**2,460**	<0.197		
	TEL-2	Apr-16		224	**344**	1.08	0.954 J	419	**825**	**2,720**	0.0460 J		
	TEL-2	Oct-16		228	**294**	1.04	1.14	406	**764**	**2,830**	0.0390 JB		
	TEL-2	Apr-17		224	**302**	1.11	1.04	411	**865**	**2,730**	<0.197		
	TEL-2	Oct-17		246	226	0.911	1.09	442	**1,160**	**3,000**	<0.0197		
	TEL-3	Apr-15		485	**829**	**2.52**	6.12	184	**1,330**	**2,750**	0.224 J		
	TEL-3	Oct-15		550	66.4	**2.95**	6.85	74.7	**1,520**	**2,960**	<0.197		
	TEL-3	Apr-16		473	**585**	**2.71**	7.31	364	**622**	**2,900**	0.0420 J		
	TEL-3	Oct-16		427	25.1	**3.43**	5.27	20.6	**1,020**	**1,850**	0.0450 JB		
	TEL-3	Apr-17		463	55.1	**3.04**	5.21	39.8	**1,070**	**1,980**	0.269 J		
	TEL-4	Apr-15		301	**1190**	0.678	0.455 J	294	**947**	**3,200**	<0.200		
	TEL-4	Apr-15	FD	289	**535**	0.690	0.411 J	281	**1,140**	**3,300**	<0.200		
	TEL-4	Oct-15		412	**347**	**2.55**	0.934 J	657	**4,000**	**7,150**	0.385 J		
	TEL-4	Oct-15	FD	417	**353**	**3.14**	0.950 J	693	**4,040**	**6,590**	<0.197		
	TEL-4	Apr-16		410	**524**	1.53	0.666 J	509	**2,070**	**4,260**	0.0440 J		
	TEL-4	Apr-16	FD	408	**519**	1.53	0.618 J	515	**1,980**	**4,040**	0.0400 JJ6		
	TEL-4	Oct-16		370	**336**	**1.69**	0.613 J	465	**2,290**	**5,350**	0.0340 JB		
	TEL-4	Oct-16	FD	370	**347**	1.58	0.608 J	454	**2,240**	**5,370**	0.0360 JB		
	TEL-4	Apr-17		432	**442**	1.36	0.587 J	542	**2,680**	**6,520**	0.404 J		
	TEL-4	Apr-17	FD	427	**436**	1.22	0.588 J	546	**2,630**	**5,570**	<0.197		
	TEL-4	Oct-17		343	**511**	0.862	0.512 J	468	**1,660**	**4,240**	<0.0985		
	TEL-4	Oct-17	FD	342	**501**	0.868	0.510 J	465	**1,520**	**3,600**	<0.0197		
TMD	MW-8	Apr-14		486	**383**	**1.78**	2.05	388	**2,710**	**5,060**	5.20		
	MW-8	Apr-15		390	**321**	1.51	1.59	328	**2,940**	**4,210**	1.1		
	MW-8	Apr-16		377	**275**	**2.02**	1.69 J	295	**2,380**	**3,690**	0.503 J		
	MW-8	Apr-17		346	**334**	**2.20**	1.44	262	**2,100**	**3,900**	1.04		
	MW-16	Apr-14		531	**422**	**2.79**	8.99	388	**2,170**	**4,020**	0.269 J		
	MW-16	Apr-15		666	**660**	**2.32**	10.2	545	**2,670**	**4,890**	0.461		
	MW-16	Apr-17		558	**936**	**2.36** J6	9.27	689	**2,900**	**4,150**	1.75		
	MW-20	Apr-14		505	**457**	**2.11**	0.416	249	**2,580**	**4,900**	6.74		
	MW-20	Apr-14	FD	487	**440**	**1.72**	0.419	247	**2,700**	**4,840**	6.50		
	MW-20	Apr-15		510	**429**	1.51	0.398 J	232	**3,490**	**4,790**	5.08		
	MW-20	Apr-16		594	**515**	**2.18**	0.370 J	274	**2,790**	**4,850**	8.09		
	MW-20	Apr-17		525	**588**	**2.27**	0.425 J	274	**2,800**	**5,650**	8.74		
	MW-21	Apr-15		542	**481**	**1.90**	1.81 J	468	**3,210**	**5,210**	**17.0**		
	MW-21	Oct-15		530	**550**	**1.75**	2.00	436	**3,520**	**5,190**	**16.5**		
	MW-21	Apr-16		590	**516**	**1.69**	2.31 J	440	**3,150**	**5,720**	**15.0**		
	MW-21	Oct-16		543	**474**	**1.74**	1.91	429	**3,150**	**4,240**	**12.0**		
	MW-21	Apr-17		507	**599**	**1.95**	1.88	423	**2,860**	**6,630**	**20.4**		
	MW-21	Oct-17		562	**574**	**1.81**	1.86	416	**3,350**	**5,000**	**17.1**		
	MW-25	Apr-14		985	**4,440**	0.635	6.80	1220	**2,060**	**11,700**	<0.150		
	MW-25	Apr-15		896	**6,780**	1.03	8.34	3710	**5,740**	**17,000**	0.0974 J		
	MW-25	Apr-16		647	**4,130**	1.13	6.61	2670	**4,100**	**11,800**	0.125		
	MW-25	Apr-17		484 V	**2,330**	1.17	5.11	1540	**2,800**	**6,240**	0.152		

Appendix B, Table B.5 - Summary of Groundwater Analytical Data - Water Quality Parameters and Cyanide

2017 Annual Groundwater Monitoring Report

HollyFrontier Navajo Refining LLC, Artesia Refinery, Artesia, New Mexico

				Analyte Group:	Water Quality Parameters								Cyanide
				Analyte:	Calcium	Chloride	Fluoride	Potassium	Sodium	Sulfate	TDS	Nitrate/Nitrite	Cyanide
				Units:	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				CGWSL:	---	250	1.60	---	---	600	1,000	10.0	0.200
				CGWSL Source:		WQCC Dom	WQCC HH			WQCC Dom	WQCC Dom	USEPA MCL	USEPA MCL
Area	**Well ID**	**Date**	**Dup**										
TMD	MW-26	Apr-14		718	**953**	**2.16**	6.01	662	**4,330**	**8,280**	0.252 J	
	MW-26	Apr-15		698	**1,130**	1.15	5.42	704	**5,950**	**8,660**	0.268	
	MW-26	Apr-16		725	**1,260**	**1.86**	5.75	695	**4,520**	**8,730**	0.301	
	MW-26	Apr-17		707	**1,580**	**1.75**	5.90	760	**5,120**	**8,730**	0.580	
	MW-27	Apr-14		431	148	0.983	9.89	159	**1,600**	**2,600**	0.632 J	
	MW-27	Apr-15		607	246	0.928	11.2	128	**2,320**	**3,640**	0.703	
	MW-27	Apr-16		470	234	1.19	9.36	156	**3,950**	**3,150**	0.687	
	MW-27	Apr-17		410	138	1.29	8.43	136	**1,550**	**2,150**	1.22	
	MW-46R	Nov-14		650	**290**	**1.90**	2.30	170	**2,300**	**3,800**	<0.0200	
	MW-46R	Apr-15		599	**288**	1.24	1.82	152	**2,590**	**3,980**	0.169	
	MW-46R	Apr-16		645	**290**	1.47	1.26 J	168	**2,470**	**3,980**	0.0520 JJ6	
	MW-46R	Oct-16		605 V	**339**	**1.97**	1.83	161	**2,170**	**4,010**	0.368	
	MW-46R	Apr-17		588	**315**	**1.70**	1.30	182	**2,420**	**3,930**	0.206	
	MW-46R	Oct-17		627	**275**	**1.63**	1.27	183	**2,590**	**4,040**	0.0920 J	
	MW-68	Apr-14		375	**299**	**1.79**	4.84	207	**1,330**	**2,920**	5.10	
	MW-68	Apr-15		552	**397**	1.15	4.65	242	**2,610**	**4,460**	4.52	
	MW-68	Apr-16		489	**263**	**1.75**	5.58	206	**1,840**	**2,980**	0.510	
	MW-68	Apr-17		381	237	**1.88**	4.60	165	**1,620**	**2,890**	0.381	
	MW-71	Apr-14		558	**887**	1.39	4.15	399	**2,740**	**6,280**	**53.6**	<0.00500
	MW-71	Apr-15		642	**906**	1.09	3.59	447	**3,150**	**6,110**	**50.6**	<0.00180
	MW-71	Apr-16		669	**907**	**1.62**	3.72 J	502	**2,890**	**5,450**	**45.6**	<0.00180
	MW-71	Apr-17		601	**848**	**1.63**	3.62	491	**2,940**	**5,300**	**54.0**	<0.00180
	MW-89	Apr-14		542	248	**2.40**	10.5	188	**2,030**	**3,360**	1.34	
	MW-89	Apr-15		528	**324**	**3.61**	13.5	302	**2,200**	**3,720**	2.34	
	MW-89	Apr-16		556	**399**	**3.58**	12.0	299	**1,490**	**3,640**	3.64	
	MW-89	Apr-17		550	**394**	**3.97**	12.2	289	**2,170**	**3,600**	4.77	
	NP-1	Apr-15		473	**436**	**2.06**	3.53 J	451	**2,930**	**4,450**	8.41	
	NP-1	Oct-15										
	NP-1	Apr-16		470	**391**	**1.96**	3.12 J	403	**2,620**	**4,460**	0.494 J	
	NP-1	Oct-16										
	NP-1	Apr-17		421	**422**	**2.08**	2.73	340	**2,440**	**4,060**	9.95	
	NP-1	Oct-17										
	NP-2	Apr-13		517	**379**	**1.70**	1.63	258	**2,660**	**5,160**	1.74	
	NP-6	Apr-13										
	NP-6	Apr-15										
	NP-6	Apr-17										
Up-Gradient	UG-1	Apr-14		474	126	0.580	1.59	79.6	**1,720**	**2,960**	**10.1**	<0.00500	
	UG-1	Apr-15		455 J	133	0.865	1.11	84.6	**1,880**	**2,920**	**14.4**	<0.00180	
	UG-1	Apr-16		512	102	0.926	1.07 J	99.7	**1,920**	**4,050**	**17.0**	0.00432 J	
	UG-1	Apr-17		471	178	0.928	1.14	99.1	**1,830**	**3,390**	**15.0**	<0.00180	
	UG-2	Apr-14		403	97.1	1.14	1.75	104	**1,530**	**2,660**	3.77	<0.00500	
	UG-2	Apr-15		337 J	72.2	**1.65**	1.73	82.6	**1,080**	**1,170**	4.62	<0.00180	
	UG-2	Apr-16		402	86.5	**1.75**	2.04 J	103	**1,210**	**2,240**	5.46	0.00511	
	UG-2	Apr-17		342	78.9	**1.67**	1.60	94.0	**1,060**	**2,270**	**16.3**	<0.00180	
	UG-3R	Apr-14		422	46.8	0.492	1.65	56.9	**1,480**	**2,340**	2.26	<0.00500	
	UG-3R	Apr-14	FD	389	46.8	0.496	1.53	53.6	**1,500**	**2,400**	2.20	<0.00500	
	UG-3R	Apr-15		420 J	27.5	0.716	2.36	59.1	**1,450**	**1,420**	1.03	<0.00180	
	UG-3R	Apr-16		440	47.7	0.690	1.86	75.8	**1,350**	**2,340**	1.73	<0.00180	
	UG-3R	Apr-17		393	61.1	0.707	1.74	70.7	**1,310**	**2,140**	2.60	<0.00180 J5	
	UG-4	Apr-16		590	49.2	0.668	1.99 J	224	**2,480**	**4,140**	0.407	<0.00180	
	UG-4	Apr-17		594 V	154	0.666	1.87	202 V	**2,750**	**4,350**	0.547 J	<0.00180	

Definitions

X	Reported concentration, X, exceeds the CGWSL.
X	Analyte detected above the detection limit at a concentration equal to X.
<x	Analyte not detected at detection limit equal to x.
<x	Analyte not detected at detection limit equal to x, but x exceeds the CGWSL.
	Blank cell indicates a sample was collected from the well during the indicated sampling event, but the analyte was not analyzed.
---	No applicable CGWSL.

Abbreviations

CGWSL	Critical Groundwater Screening Level (see Table 3)
CGWSL Source	Source for CGWSL value (see Table 3)
Dup	Duplicate sample
FD	Field duplicate sample
mg/L	Milligrams per Liter
USEPA MCL	United States Environmental Protection Agency Maximum Contaminant Level, "Regional Screening Levels (RSL) Summary Table", November 2017
WQCC Dom	NMED Groundwater standard for domestic exposure, 20.6.2.3103.B NMAC
WQCC HH	NMED Groundwater standard for human health exposure, 20.6.2.3103.A NMAC

Lab Footnote

B	Analyte was also detected in the associated method blank.
H	The reported result is from a sample analyzed outside of Holding Time.
J	Indicates an estimated value.
J3	The associated batch QC was outside the established quality control range for precision.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
O1	The analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
P1	Relative percent difference value not applicable for sample concentrations less than 5 times the reporting limit.
V	The sample concentration is too high to evaluate accurate spike recoveries.