



Directional Survey

30 015 43272

Well Name: LONE TREE DRAW 13 STATE 15H

Sub-Division DELAWARE BASIN WEST		Region SLOPE WEST		Field Name BURTON FLAT		County EDDY		State/Province NM					
Surface Legal Location SEC13 T21S R27E		API/UWI 3001543272		Latitude (") 32° 29' 9.301" N		Longitude (") 104° 8' 56.591" W		Orig KB Elevation (ft) 3,214.40		Ground Elev MSL (ft) 3,189.40		KB - GL (ft) 25.00	
Wellbores													
Wellbore Name OH				Parent Wellbore				SAP Well ID 38891				Vertical Section Direction (*) 179.70	
Kick Offs & Key Depths													
Date 9/9/2015				Type CURVE				Top Depth (ftKB) 6,840.0					
Actual Deviation Survey ACTUAL, Proposed? No				Definitive? No		Proposed? No		Proposed Deviation Survey					
Deviation Survey													
Date 9/3/2015				Description ACTUAL									
MD Tie in (ftKB)		TVD Tie in (ftKB)		Incination Tie in (")		Azimuth Tie in (")		NSTie in (ft)		EWTie in (ft)			
Survey Data													
Date	MD (ftKB)	Incl (")	Azm (")	TVD (ftKB)	VS (ft)	N/S (ft)	E/W (ft)	DLS ("/100ft)	Survey Tool	Survey Company			
9/3/2015	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	MWD	TELEDRIIFT			
9/3/2015	106.00	0.80	164.00	106.00	0.71	-0.71	0.20	0.75	MWD	TELEDRIIFT			
9/3/2015	231.00	1.90	277.00	230.97	1.29	-1.30	-1.61	1.87	MWD	TELEDRIIFT			
9/3/2015	308.00	1.80	269.00	307.93	1.14	-1.16	-4.09	0.36	MWD	TELEDRIIFT			
9/3/2015	370.00	2.20	296.00	369.90	0.63	-0.66	-6.13	1.63	MWD	TELEDRIIFT			
9/3/2015	434.00	1.30	282.00	433.87	-0.07	0.03	-7.95	1.55	MWD	TELEDRIIFT			
9/3/2015	497.00	1.10	281.00	496.85	-0.34	0.29	-9.24	0.32	MWD	TELEDRIIFT			
9/3/2015	558.00	1.10	289.00	557.84	-0.65	0.60	-10.37	0.25	MWD	TELEDRIIFT			
9/3/2015	639.00	0.90	308.00	638.83	-1.30	1.24	-11.60	0.47	MWD	TELEDRIIFT			
9/3/2015	733.00	0.90	313.00	732.82	-2.27	2.20	-12.73	0.08	MWD	TELEDRIIFT			
9/3/2015	828.00	0.80	301.00	827.81	-3.12	3.05	-13.84	0.21	MWD	TELEDRIIFT			
9/3/2015	922.00	1.00	279.00	921.80	-3.60	3.52	-15.21	0.42	MWD	TELEDRIIFT			
9/3/2015	1,017.00	0.90	292.00	1,016.78	-4.01	3.93	-16.72	0.25	MWD	TELEDRIIFT			
9/3/2015	1,111.00	0.40	344.00	1,110.78	-4.61	4.52	-17.50	0.77	MWD	TELEDRIIFT			
9/3/2015	1,207.00	0.80	22.66	1,206.77	-5.55	5.46	-17.33	0.57	MWD	TELEDRIIFT			
9/3/2015	1,301.00	0.90	57.60	1,300.76	-6.55	6.46	-16.46	0.55	MWD	TELEDRIIFT			
9/3/2015	1,395.00	0.50	42.00	1,394.76	-7.24	7.16	-15.56	0.47	MWD	TELEDRIIFT			
9/3/2015	1,449.00	0.70	93.00	1,448.75	-7.40	7.32	-15.07	1.01	MWD	TELEDRIIFT			
9/3/2015	1,583.00	0.50	87.00	1,582.75	-7.38	7.31	-13.67	0.16	MWD	TELEDRIIFT			
9/3/2015	1,676.00	0.60	119.00	1,675.74	-7.16	7.09	-12.84	0.34	MWD	TELEDRIIFT			
9/3/2015	1,771.00	0.20	12.00	1,770.74	-7.08	7.01	-12.37	0.72	MWD	TELEDRIIFT			
9/3/2015	1,866.00	0.30	154.60	1,865.74	-7.01	6.95	-12.23	0.50	MWD	TELEDRIIFT			
9/3/2015	1,960.00	0.30	25.60	1,959.74	-7.01	6.95	-12.02	0.58	MWD	TELEDRIIFT			
9/3/2015	2,054.00	0.20	41.60	2,053.74	-7.36	7.29	-11.80	0.13	MWD	TELEDRIIFT			
9/3/2015	2,148.00	0.40	301.60	2,147.74	-7.65	7.59	-11.97	0.51	MWD	TELEDRIIFT			
9/3/2015	2,243.00	0.50	272.60	2,242.73	-7.85	7.78	-12.67	0.26	MWD	TELEDRIIFT			
9/3/2015	2,336.00	0.20	197.60	2,335.73	-7.71	7.64	-13.12	0.52	MWD	TELEDRIIFT			
9/3/2015	2,430.00	0.10	189.60	2,429.73	-7.48	7.41	-13.19	0.11	MWD	TELEDRIIFT			
9/3/2015	2,521.00	0.50	280.00	2,520.73	-7.47	7.40	-13.59	0.56	MWD	TELEDRIIFT			
9/3/2015	2,616.00	0.20	15.00	2,615.73	-7.70	7.63	-13.95	0.58	MWD	TELEDRIIFT			
9/3/2015	2,628.00	0.20	38.00	2,627.73	-7.74	7.67	-13.94	0.66	MWD	TELEDRIIFT			
9/3/2015	2,746.00	0.07	172.79	2,745.73	-7.83	7.76	-13.80	0.22	MWD	WEATHERFORD			
9/3/2015	2,778.00	0.07	238.93	2,777.73	-7.80	7.73	-13.81	0.24	MWD	WEATHERFORD			
9/3/2015	2,872.00	1.67	15.17	2,871.72	-9.09	9.02	-13.51	1.83	MWD	WEATHERFORD			
9/3/2015	2,966.00	3.26	17.08	2,965.63	-12.96	12.90	-12.36	1.69	MWD	WEATHERFORD			
9/3/2015	3,060.00	4.52	17.35	3,059.41	-19.04	18.99	-10.47	1.34	MWD	WEATHERFORD			
9/3/2015	3,154.00	4.75	16.60	3,153.10	-26.30	26.25	-8.26	0.25	MWD	WEATHERFORD			
9/3/2015	3,249.00	4.82	15.39	3,247.77	-33.90	33.87	-6.07	0.13	MWD	WEATHERFORD			
9/3/2015	3,343.00	4.61	15.82	3,341.45	-41.33	41.31	-4.00	0.23	MWD	WEATHERFORD ..			
9/3/2015	3,437.00	4.41	15.54	3,435.16	-48.44	48.43	-2.00	0.21	MWD	WEATHE			
9/3/2015	3,531.00	6.11	14.84	3,528.76	-56.75	56.75	0.25	1.81	MWD	WEATHE			
9/3/2015	3,625.00	7.31	19.34	3,622.12	-67.21	67.23	3.51	1.39	MWD	WEATHE			
9/3/2015	3,719.00	7.31	17.74	3,715.35	-78.53	78.56	7.32	0.22	MWD	WEATHE			
9/3/2015	3,813.00	7.37	15.10	3,808.58	-90.02	90.08	10.71	0.36	MWD	WEATHE			
9/3/2015	3,908.00	6.86	11.60	3,902.85	-101.45	101.52	13.44	0.70	MWD	WEATHE			
9/3/2015	4,002.00	8.08	13.47	3,996.05	-113.36	113.45	16.11	1.32	MWD	WEATHE			
9/3/2015	4,096.00	7.45	9.41	4,089.19	-125.78	125.88	18.64	0.89	MWD	WEATHE			
9/3/2015	4,190.00	7.01	4.74	4,182.44	-137.50	137.61	20.11	0.78	MWD	WEATHE			
9/3/2015	4,284.00	8.09	10.86	4,275.63	-149.71	149.82	21.83	1.43	MWD	WEATHE			
9/3/2015	4,378.00	7.52	8.43	4,368.76	-162.28	162.40	23.98	0.70	MWD	WEATHE			
9/3/2015	4,472.00	8.04	16.34	4,461.89	-174.66	174.80	26.73	1.26	MWD	WEATHI			
9/3/2015	4,566.00	8.12	17.41	4,554.96	-187.28	187.44	30.57	0.18	MWD	WEATHI			
9/3/2015	4,660.00	7.61	16.05	4,648.08	-199.57	199.76	34.27	0.58	MWD	WEATHI			
9/3/2015	4,755.00	9.14	15.90	4,742.06	-212.86	213.06	38.08	1.61	MWD	WEATHI			
9/3/2015	4,849.00	8.87	15.27	4,834.90	-227.01	227.23	42.03	0.31	MWD	WEATH			
9/3/2015	4,943.00	8.42	13.95	4,927.83	-240.66	240.90	45.60	0.52	MWD	WEATH			
9/3/2015	5,037.00	8.18	12.66	5,020.85	-253.85	254.10	48.73	0.32	MWD	WEATH			
9/3/2015	5,130.00	7.80	12.32	5,112.95	-266.45	266.73	51.52	0.41	MWD	WEATH			
9/3/2015	5,224.00	7.54	11.32	5,206.11	-278.72	279.00	54.09	0.31	MWD	WEATH			
9/3/2015	5,319.00	7.37	12.63	5,300.30	-290.76	291.06	56.65	0.25	MWD	WEATH			
9/3/2015	5,413.00	6.57	9.26	5,393.61	-301.94	302.25	58.83	0.96	MWD	WEATH			
9/3/2015	5,507.00	7.30	11.17	5,486.92	-313.10	313.42	60.86	0.81	MWD	WEATH			
9/3/2015	5,601.00	6.33	11.03	5,580.25	-324.03	324.36	63.00	1.03	MWD	WEATHERFORD			
9/3/2015	5,696.00	7.22	12.81	5,674.59	-334.98	335.33	65.33	0.96	MWD	WEATHERFORD			
9/3/2015	5,790.00	6.61	10.75	5,767.91	-346.04	346.40	67.65	0.70	MWD	WEATHERFORD			
9/3/2015	5,884.00	6.02	16.66	5,861.34	-356.07	356.44	70.07	0.93	MWD	WEATHERFORD			

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Sub-Division		Region		Field Name			County		State/Province			
DELAWARE BASIN WEST		SLOPE WEST		BURTON FLAT			EDDY		NM			
Surface Legal Location		API/UWI		Latitude (")		Longitude (")		Orig KB Elevation (ft)		Ground Elev MSL (ft)		KB - GL (ft)
SEC13 T21S R27E		3001543272		32° 29' 9.301" N		104° 8' 56.591" W		3,214.40		3,189.40		25.00
Survey Data												
Date	MD (ftKB)	Incl (")	Azm (")	TVD (ftKB)	VS (ft)	N/S (ft)	E/W (ft)	DLS ("/100ft)	Survey Tool	Survey Company		
9/3/2015	5,978.00	5.26	17.16	5,954.88	-364.89	365.28	72.76	0.81	MWD	WEATHERFORD		
9/3/2015	6,072.00	4.74	11.92	6,048.52	-372.80	373.20	74.83	0.74	MWD	WEATHERFORD		
9/3/2015	6,166.00	3.80	5.80	6,142.26	-379.69	380.10	75.95	1.11	MWD	WEATHERFORD		
9/3/2015	6,260.00	3.03	350.26	6,236.10	-385.24	385.64	75.84	1.27	MWD	WEATHERFORD		
9/3/2015	6,354.00	2.63	345.56	6,329.98	-389.78	390.18	74.88	0.49	MWD	WEATHERFORD		
9/3/2015	6,448.00	2.21	341.66	6,423.90	-393.60	393.99	73.77	0.48	MWD	WEATHERFORD		
9/3/2015	6,542.00	1.58	324.47	6,517.85	-396.38	396.76	72.45	0.90	MWD	WEATHERFORD		
9/3/2015	6,636.00	1.29	296.71	6,611.82	-397.92	398.29	70.75	0.79	MWD	WEATHERFORD		
9/3/2015	6,730.00	1.59	296.82	6,705.79	-398.99	399.36	68.64	0.32	MWD	WEATHERFORD		
9/3/2015	6,824.00	1.34	280.56	6,799.76	-399.79	400.15	66.40	0.51	MWD	WEATHERFORD		
9/3/2015	6,855.00	2.38	201.46	6,830.74	-399.27	399.62	65.81	8.07	MWD	WEATHERFORD		
9/3/2015	6,887.00	5.46	184.13	6,862.67	-397.13	397.48	65.45	10.21	MWD	WEATHERFORD		
9/3/2015	6,918.00	8.60	178.73	6,893.43	-393.34	393.69	65.40	10.34	MWD	WEATHERFORD		
9/3/2015	6,949.00	12.57	176.53	6,923.90	-387.65	388.00	65.66	12.87	MWD	WEATHERFORD		
9/10/2015	6,981.00	16.89	176.88	6,954.84	-379.53	379.88	66.12	13.50	MWD	WEATHERFORD		
9/10/2015	7,012.00	21.10	177.58	6,984.14	-369.45	369.80	66.60	13.60	MWD	WEATHERFORD		
9/10/2015	7,044.00	26.27	178.01	7,013.44	-356.61	356.96	67.09	16.17	MWD	WEATHERFORD		
9/10/2015	7,075.00	30.51	178.16	7,040.70	-341.88	342.24	67.58	13.68	MWD	WEATHERFORD		
9/10/2015	7,106.00	32.88	178.90	7,067.08	-325.59	325.95	68.00	7.75	MWD	WEATHERFORD		
9/10/2015	7,137.00	34.36	178.13	7,092.89	-308.43	308.80	68.44	4.97	MWD	WEATHERFORD		
9/10/2015	7,169.00	36.34	178.12	7,118.99	-289.93	290.29	69.05	6.19	MWD	WEATHERFORD		
9/10/2015	7,200.00	38.66	178.67	7,143.58	-271.06	271.43	69.57	7.56	MWD	WEATHERFORD		
9/10/2015	7,232.00	42.02	179.27	7,167.97	-250.35	250.72	69.94	10.57	MWD	WEATHERFORD		
9/10/2015	7,263.00	43.85	180.14	7,190.67	-229.24	229.61	70.05	6.20	MWD	WEATHERFORD		
9/10/2015	7,294.00	46.37	179.55	7,212.54	-207.28	207.65	70.11	8.24	MWD	WEATHERFORD		
9/10/2015	7,326.00	49.02	180.23	7,234.08	-183.61	183.98	70.15	8.43	MWD	WEATHERFORD		
9/10/2015	7,357.00	51.62	180.23	7,253.87	-159.76	160.13	70.06	8.39	MWD	WEATHERFORD		
9/10/2015	7,389.00	53.27	180.57	7,273.37	-134.39	134.76	69.88	5.22	MWD	WEATHERFORD		
9/10/2015	7,420.00	54.84	181.26	7,291.57	-109.30	109.67	69.48	5.38	MWD	WEATHERFORD		
9/10/2015	7,451.00	56.35	181.41	7,309.09	-83.74	84.10	68.88	4.89	MWD	WEATHERFORD		
9/10/2015	7,483.00	59.21	181.33	7,326.15	-56.68	57.04	68.23	8.94	MWD	WEATHERFORD		
9/10/2015	7,514.00	61.69	180.80	7,341.43	-29.72	30.08	67.73	8.14	MWD	WEATHERFORD		
9/10/2015	7,546.00	64.08	180.21	7,356.02	-1.24	1.60	67.49	7.65	MWD	WEATHERFORD		
9/10/2015	7,577.00	67.15	181.00	7,368.82	26.98	-26.63	67.18	10.17	MWD	WEATHERFORD		
9/10/2015	7,608.00	70.69	181.44	7,379.96	55.89	-55.55	66.57	11.50	MWD	WEATHERFORD		
9/10/2015	7,640.00	73.84	181.56	7,389.71	86.35	-86.01	65.77	9.85	MWD	WEATHERFORD		
9/10/2015	7,671.00	77.59	180.90	7,397.36	116.38	-116.04	65.13	12.27	MWD	WEATHERFORD		
9/10/2015	7,702.00	80.51	180.72	7,403.25	146.81	-146.47	64.70	9.44	MWD	WEATHERFORD		
9/10/2015	7,734.00	82.92	180.05	7,407.86	178.47	-178.13	64.48	7.81	MWD	WEATHERFORD		
9/10/2015	7,765.00	85.09	180.03	7,411.09	209.30	-208.96	64.46	7.00	MWD	WEATHERFORD		
9/10/2015	7,796.00	86.36	179.44	7,413.41	240.21	-239.87	64.61	4.52	MWD	WEATHERFORD		
9/10/2015	7,828.00	88.39	178.87	7,414.87	272.17	-271.83	65.08	6.59	MWD	WEATHERFORD		
9/10/2015	7,859.00	88.67	178.56	7,415.67	303.16	-302.82	65.77	1.35	MWD	WEATHERFORD		
9/10/2015	7,887.00	88.95	178.07	7,416.25	331.14	-330.80	66.60	2.02	MWD	WEATHERFORD		
9/10/2015	7,981.00	90.77	177.92	7,416.48	425.10	-424.74	69.88	1.94	MWD	WEATHERFORD		
9/10/2015	8,075.00	89.79	178.22	7,416.02	519.06	-518.68	73.05	1.09	MWD	WEATHERFORD		
9/10/2015	8,169.00	90.42	176.83	7,415.85	612.99	-612.59	77.11	1.62	MWD	WEATHERFORD		
9/10/2015	8,264.00	92.17	177.19	7,413.70	707.85	-707.43	82.06	1.88	MWD	WEATHERFORD		
9/10/2015	8,358.00	91.47	177.57	7,410.71	801.73	-801.29	86.36	0.85	MWD	WEATHERFORD		
9/10/2015	8,452.00	90.56	177.62	7,409.05	895.65	-895.19	90.30	0.97	MWD	WEATHERFORD		
9/10/2015	8,546.00	89.65	178.82	7,408.88	989.61	-989.14	93.22	1.60	MWD	WEATHERFORD		
9/10/2015	8,640.00	89.02	179.00	7,409.97	1,083.60	-1,083.12	95.01	0.70	MWD	WEATHERFORD		
9/10/2015	8,734.00	90.28	179.54	7,410.54	1,177.59	-1,177.10	96.21	1.46	MWD	WEATHERFORD		
9/10/2015	8,828.00	89.72	180.76	7,410.54	1,271.59	-1,271.10	95.96	1.43	MWD	WEATHERFORD		
9/10/2015	8,922.00	88.95	179.50	7,411.63	1,365.58	-1,365.09	95.75	1.57	MWD	WEATHERFORD		
9/10/2015	9,016.00	89.65	179.64	7,412.78	1,459.57	-1,459.08	96.45	0.76	MWD	WEATHERFORD		
9/10/2015	9,110.00	89.65	179.32	7,413.35	1,553.56	-1,553.08	97.31	0.34	MWD	WEATHERFORD		
9/10/2015	9,204.00	87.48	178.62	7,415.71	1,647.52	-1,647.03	98.99	2.43	MWD	WEATHERFORD		
9/10/2015	9,298.00	88.25	179.44	7,419.21	1,741.45	-1,740.95	100.58	1.20	MWD	WEATHERFORD		
9/10/2015	9,392.00	88.25	179.71	7,422.08	1,835.40	-1,834.90	101.28	0.29	MWD	WEATHERFORD		
9/10/2015	9,486.00	87.62	179.98	7,425.47	1,929.34	-1,928.84	101.54	0.73	MWD	WEATHERFORD		
9/10/2015	9,580.00	88.53	180.24	7,428.63	2,023.29	-2,022.78	101.35	1.01	MWD	WEATHERFORD		
9/10/2015	9,674.00	87.69	180.45	7,431.73	2,117.23	-2,116.73	100.79	0.92	MWD	WEATHERFORD		
9/10/2015	9,769.00	88.46	180.65	7,434.92	2,212.16	-2,211.67	99.88	0.84	MWD	WEATHERFORD		
9/10/2015	9,863.00	89.58	180.24	7,436.52	2,306.14	-2,305.65	99.15	1.27	MWD	WEATHERFORD		
9/10/2015	9,957.00	90.91	179.59	7,436.12	2,400.14	-2,399.65	99.29	1.57	MWD	WEATHERFORD		
9/10/2015	10,051.00	89.58	179.65	7,435.72	2,494.13	-2,493.64	99.91	1.42	MWD	WEATHERFORD		
9/10/2015	10,145.00	89.58	179.99	7,436.41	2,588.13	-2,587.64	100.21	0.36	MWD	WEATHERFORD		
9/10/2015	10,239.00	90.28	179.00	7,436.52	2,682.13	-2,681.63	101.03	1.29	MWD	WEATHERFORD		
9/10/2015	10,333.00	91.54	179.03	7,435.03	2,776.11	-2,775.61	102.65	1.34	MWD	WEATHERFORD		
9/10/2015	10,427.00	90.21	178.79	7,433.60	2,870.08	-2,869.58	104.44	1.44	MWD	WEATHERFORD		
9/10/2015	10,521.00	90.98	177.92	7,432.62	2,964.05	-2,963.53	107.14	1.24	MWD	WEATHERFORD		
9/10/2015	10,615.00	90.21	178.62	7,431.64	3,058.02	-3,057.48	109.97	1.11	MWD	WEATHERFORD		
9/10/2015	10,709.00	89.16	179.65	7,432.16	3,152.01	-3,151.47	111.39	1.56	MWD	WEATHERFORD		
9/10/2015	10,803.00	90.63	180.09	7,432.33	3,246.00	-3,245.46	111.61	1.63	MWD	WEATHERFORD		
9/10/2015	10,897.00	90.14	180.61	7,431.70	3,340.00	-3,339.46	111.03	0.76	MWD	WEATHERFORD		
9/10/2015	10,991.00	89.16	180.28	7,432.28	3,433.98	-3,433.45	110.30	1.10	MWD	WEATHERFORD		
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Sub-Division DELAWARE BASIN WEST	Region SLOPE WEST	Field Name BURTON FLAT	County EDDY	State/Province NM
Surface Legal Location SEC13 T21S R27E	API(UW) 3001543272	Latitude (°) 32° 29' 9.301" N	Longitude (°) 104° 8' 56.591" W	Orig KB Elevation (ft) 3,214.40 Ground Elev MSL (ft) 3,189.40 KB - GL (ft) 25.00

Date	MD (ftKB)	Incl (°)	Azm (°)	TVD (ftKB)	VS (ft)	N/S (ft)	E/W (ft)	DLS (°/100ft)	Survey Tool	Survey Company
9/10/2015	11,085.00	90.77	181.07	7,432.33	3,527.97	-3,527.44	109.19	1.91	MWD	WEATHERFORD
9/10/2015	11,180.00	92.86	181.90	7,429.32	3,622.87	-3,622.36	106.73	2.37	MWD	WEATHERFORD
9/10/2015	11,274.00	91.89	180.41	7,425.43	3,716.75	-3,716.25	104.84	1.89	MWD	WEATHERFORD
9/10/2015	11,368.00	91.05	179.80	7,423.02	3,810.72	-3,810.22	104.67	1.10	MWD	WEATHERFORD
9/10/2015	11,462.00	88.95	179.96	7,423.02	3,904.71	-3,904.22	104.87	2.24	MWD	WEATHERFORD
9/10/2015	11,556.00	89.58	179.98	7,424.22	3,998.70	-3,998.21	104.92	0.67	MWD	WEATHERFORD
9/10/2015	11,650.00	91.33	179.99	7,423.48	4,092.72	-4,092.20	104.94	1.86	MWD	WEATHERFORD
9/10/2015	11,744.00	90.49	180.07	7,421.98	4,186.68	-4,186.19	104.89	0.90	MWD	WEATHERFORD
9/10/2015	11,838.00	89.44	179.23	7,422.04	4,280.68	-4,280.19	105.47	1.43	MWD	WEATHERFORD
9/10/2015	11,929.00	89.51	179.66	7,422.88	4,371.67	-4,371.18	106.35	0.48	MWD	WEATHERFORD
9/10/2015	12,000.00	89.51	179.66	7,423.48	4,442.67	-4,442.17	106.77	0.00	BIT	WEATHERFORD