2017 ANNUAL GROUNDWATER REPORT

Johnston Fed #6A
NMOCD Case#: 3RP-202-0
Meter Code: 89232
T31N, R9W, Sec35, Unit F

SITE DETAILS

Site Location: Latitude: 36.856422 N, Longitude: -107.753819 W
Land Type: Federal
Operator: Hilcorp Energy

SITE BACKGROUND

Environmental Remediation activities at the Johnston Fed #6A (Site) are being managed pursuant to the procedures set forth in the document entitled, "Remediation Plan for Groundwater Encountered during Pit Closure Activities" (Remediation Plan, El Paso Natural Gas Company / El Paso Field Services Company, 1995). This Remediation Plan was conditionally approved by the New Mexico Oil Conservation Division (NMOCD) in correspondence dated November 30, 1995; and the NMOCD approval conditions were adopted into El Paso CGP Company (EPCGP's) program methods. Currently, the Site is operated by Hilcorp Energy and is active.

The Site is located on Federal land. An initial site assessment was completed in August 1994, and an excavation of 80 cubic yards (cy), to a depth of approximately 12 feet below ground surface (bgs), was completed in September 1994. Various site investigations have occurred since 1994. Monitoring wells were installed in 1994 (MW-1 through MW-4), 1997 (temporary monitoring wells PZ-01 through PZ-07), 2000 (MW-5), 2006 (MW-6), and 2015 (MW-7 though MW-9). Free product recovery has been periodically conducted since 1997. Mobile dual-phase extraction (MDPE) events to enhance free product recovery were initiated in 2016. Free product was observed and recovered in MW-1 in June 2017. Currently, groundwater sampling is conducted on a semi-annual basis.

GROUNDWATER SAMPLING ACTIVITIES

Pursuant to the Remediation Plan, Stantec provided field work notifications via email to the NMOCD on May 30, 2017 and November 6, 2017, prior to initiating groundwater sampling activities at the Site. Copies of the 2017 NMOCD notifications are provided in Appendix A. On June 9 and November 12, 2017, water levels were gauged at MW-1 through MW-9. Groundwater samples were collected from selected monitoring wells using HydraSleeve™ (HydraSleeve) no-purge groundwater sampling devices. The HydraSleeves were set during the previous sampling event approximately 0.5 foot above termination depth of the monitoring wells using a suspension tether and stainless steel weights to collect a sample from the screened interval.

Groundwater samples were placed into laboratory-supplied sample containers, packed on ice, and shipped under standard chain-of-custody protocols to TestAmerica Laboratories, Inc. in Pensacola, Florida where they were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX). As requested by the NMOCD on November 13, 2018, BTEX constituents were analyzed using United States Environmental Protection Agency (EPA) Method 8260 during the November sampling event. The unused sample water is

combined in a waste container and taken to Basin Disposal, Inc. (Basin) for disposal. Waste disposal documentation is included as Appendix B.

FREE PRODUCT RECOVERY

Approximately 10 milliliters of free product was manually recovered from MW-1 during the spring semi-annual groundwater monitoring event in June 2017. The recovered product was disposed at Basin disposal with excess wastewater generated during groundwater sampling activities.

Mobile dual phase extraction (MDPE) events were completed on July 15, 16, and 17, 2017, and September 23, 24, and 25, 2017, by AcuVac Remediation, LLC, of Houston, Texas (AcuVac). The planned MDPE activities were presented in a work plan dated June 29, 2018, and subsequently approved by the NMOCD. The NMOCD was notified of the start of the July MDPE activities on July 8, 2018. NMOCD was notified of the start of the September 2017 MDPE activities on September 15, 2018. The purpose of the MDPE events was to enhance free product recovery from monitoring well MW-1.

MDPE is a process combining soil vapor extraction (SVE) with groundwater depression to enhance the removal of liquid and vapor phase hydrocarbons. A submersible pump is used to simultaneously remove dissolved-phase contaminated groundwater, inducing a hydraulic gradient toward the extraction well, and creating groundwater depression to expose the hydrocarbon smear zone to SVE. Recovered liquids were transferred to a portable storage tank for off-site disposal. Recovered vapors were used as fuel and burned in the MDPE internal combustion engine (ICE), resulting in little to no emissions. Power generated by the ICE is used to create the induced vacuum for SVE.

A total of six events, cumulatively totaling 52.25 hours of MDPE operation, were completed using MW-1 as an extraction well. Based on field data collected by AcuVac, approximately 66.75 gallons of hydrocarbons were recovered from MW-1. AcuVac's reports summarizing the MDPE events at the Site are presented as Appendix C. Recovered fluids from the MDPE event where transported to Basin for disposal. Waste disposal documentation is included as Appendix B.

SUMMARY TABLES

Historic groundwater analytical results and well gauging data are summarized in Tables 1 and 2, respectively. When free product was present, static water level elevations were corrected for measurable thicknesses of free product (specific gravity of 0.75).

SITE MAPS

Groundwater analytical maps (Figures 1 and 3) and groundwater elevation contour maps (Figures 2 and 4) summarize results of the 2017 groundwater sampling and gauging events.

ANALYTICAL LAB REPORTS

The groundwater analytical lab report is included as Appendix D.

GROUNDWATER RESULTS

- The groundwater flow direction at the Site is generally to the north-northeast (see Figures 2 and 4).

- Free product was observed in MW-1 in June 2017; therefore, a groundwater sample was not collected from MW-1 during this event.

- Monitoring wells MW-2, MW-4, and MW-6 were not selected to be sampled in June 2017.

- The groundwater sample collected from MW-1 in November 2017 exceeded the New Mexico Water Quality Control Commission (NMWQCC) standard (10 micrograms per liter [µg/L]) for benzene in groundwater. Concentrations of benzene were not detected in the remaining Site monitoring wells sampled in 2017.

- The groundwater sample collected from MW-1 in November 2017 exceeded the NMWQCC standard (750 µg/L) for toluene in groundwater. Concentrations of toluene were not detected in the remaining Site monitoring wells sampled in 2017.

- Concentrations of ethylbenzene were either below the NMWQCC standard (750 µg/L) or not detected in the Site monitoring wells sampled in 2017.

- The groundwater sample collected from MW-1 in November 2017 exceeded the NMWQCC standard (620 µg/L) for total xylenes in groundwater. Concentrations of total xylenes were either below the NMWQCC standard (620 µg/L) or not detected in the remaining Site monitoring wells sampled in 2017.

PLANNED FUTURE ACTIVITIES

Groundwater monitoring events will be conducted on a semi-annual basis. Groundwater samples will be collected from monitoring wells not containing free product and analyzed for BTEX constituents using EPA Method 8260. No additional activities are planned for 2018 at this time. The activities completed in 2018 and their results will be summarized in the 2018 Annual Report, completed for submittal in early 2019.

TABLES

TABLE-1 GROUNDWATER ANALYTICAL RESULTS

Johnston Fed #6A					
Location	**Date**	**Benzene (µg/L)**	**Toluene (µg/L)**	**Ethylbenzene (µg/L)**	**Total Xylenes (µg/L)**
NMWQCC Standards:		10	750	750	620
MW-1	08/10/95	605	1380	74.6	718
MW-1	12/13/95	1330	1610	235	1540
MW-1	04/11/96	775	1070	124	810
MW-1	07/23/96	676	1980	233	2090
MW-1	10/14/96	1790	8350	580	6200
MW-1	01/22/97	6420	19800	934	10700
MW-1	04/11/97	7310	23500	1010	10800
MW-1	02/07/11	611	8260	1260	11600
MW-1	02/21/12	577	5510	916	5420
MW-1	06/09/13	510	17000	1400	15000
MW-1	11/12/17	27	2800	560	3900
MW-2	12/13/95	15.1	50.8	<2.5	53.8
MW-2	04/11/96	<1	<1	<1	3.13
MW-2	07/23/96	<1	1.15	<1	4.06
MW-2	10/14/96	<1	1.04	<1	4.85
MW-2	01/22/97	<1	<1	<1	<3
MW-2	04/11/97	<1	<1	<1	<3
MW-2	10/09/00	<0.5	<0.5	<0.5	<0.5
MW-2	06/18/01	<0.5	<0.5	<0.5	<0.5
MW-2	06/03/02	<0.5	<0.5	<0.5	<1
MW-2	06/09/13	<0.14	<0.30	<0.20	<0.23
MW-2	09/09/13	<0.14	<0.30	<0.20	<0.23
MW-2	12/12/13	<0.20	<0.38	<0.20	<0.65
MW-2	04/02/14	<0.20	<0.38	<0.20	<0.65
MW-2	10/23/14	<0.38	<0.70	<0.50	<1.6
MW-2	05/30/15	<1.0	<5.0	<1.0	<5.0
MW-2	11/19/15	<1.0	<1.0	<1.0	<3.0
MW-2	11/12/17	<1.0	<1.0	<1.0	<10

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Johnston Fed #6A					
Location	**Date**	**Benzene (µg/L)**	**Toluene (µg/L)**	**Ethylbenzene (µg/L)**	**Total Xylenes (µg/L)**
NMWQCC Standards:		10	750	750	620
MW-3	12/13/95	488	1020	104	1120
MW-3	04/11/96	772	231	113	379
MW-3	07/25/96	687	112	115	209
MW-3	10/14/96	900	240	140	340
MW-3	01/22/97	907	234	215	340
MW-3	04/11/97	944	209	223	322
MW-3	06/18/01	510	23	160	98
MW-3	06/03/02	380	<5	110	29
MW-3	03/05/09	1.2	17.9	9.4	59
MW-3	02/17/10	3.2	4.5	3.4	25.9
MW-3	02/07/11	8.6	1.3	6	13.1
MW-3	02/21/12	4.7	7.6	23.1	19.1
MW-3	06/09/13	<0.14	0.71 J	49	12
MW-3	09/09/13	0.78 J	0.48 J	30	2.2 J
MW-3	12/12/13	<0.20	51	23	5.4
MW-3	04/02/14	3.5	57	19	8.7
MW-3	10/23/14	<0.38	<0.70	6.2	<1.6
MW-3	05/30/15	<1.0	<5.0	4.6	17
MW-3	11/19/15	<1.0	2.5	2.1	<3.0
MW-3	04/16/16	<1.0	52	1.9	<5.0
MW-3	10/13/16	<1.0	61	1.9	<5.0
MW-3	06/09/17	<1.0	<5.0	1.6	25
MW-3	11/12/17	<1.0	<1.0	<1.0	<10

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Johnston Fed #6A					
Location	**Date**	**Benzene (µg/L)**	**Toluene (µg/L)**	**Ethylbenzene (µg/L)**	**Total Xylenes (µg/L)**
NMWQCC Standards:		10	750	750	620
MW-4	12/13/95	545	121	114	177
MW-4	04/11/96	591	160	133	193
MW-4	07/25/96	793	96.4	172	174
MW-4	10/14/96	800	100	130	235
MW-4	01/22/97	899	26.7	157	186
MW-4	04/11/97	703	20.1	149	138
MW-4	10/09/00	81	36	45	20
MW-4	06/18/01	490	70	91	96
MW-4	06/03/02	16	<5	17	2.2
MW-4	06/18/03	<1	<1	1.7	<3
MW-4	06/22/04	0.56 J	1.1	2.8	<1
MW-4	03/23/05	<1	<1	<1	0.99
MW-4	03/27/06	0.39 J	<1	<1	0.83 J
MW-4	03/28/07	0.39 J	0.6 J	<1	1.7 J
MW-4	03/10/08	0.25 J	<1	<1	<2
MW-4	06/09/13	<0.14	<0.30	<0.20	<0.23
MW-4	09/09/13	<0.14	<0.30	<0.20	<0.23
MW-4	12/12/13	<0.20	0.51 J	<0.20	<0.65
MW-4	04/02/14	<0.20	1.2 J	<0.20	<0.65
MW-4	10/23/14	<0.38	<0.70	<0.50	<1.6
MW-4	05/30/15	<1.0	<5.0	<1.0	<5.0
MW-4	11/19/15	<1.0	<1.0	<1.0	<3.0
MW-4	11/12/17	<1.0	<1.0	<1.0	<10

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Johnston Fed #6A					
Location	**Date**	**Benzene (µg/L)**	**Toluene (µg/L)**	**Ethylbenzene (µg/L)**	**Total Xylenes (µg/L)**
NMWQCC Standards:		10	750	750	620
MW-5	08/30/00	130	180	56	650
MW-5	06/18/01	170	300	68	630
MW-5	06/04/02	43	87	31	360
MW-5	03/05/09	1.9	9.8	44	120
MW-5	02/17/10	1.7	2.6	2.7	19.2
MW-5	02/07/11	11.9	920	177	1870
MW-5	02/21/12	2.7	1.7	5.2	85.5
MW-5	06/09/13	<0.14	<0.30	0.31 J	0.79 J
MW-5	09/09/13	<0.14	<0.30	<0.20	<0.23
MW-5	12/12/13	<0.20	<0.38	<0.20	<0.65
MW-5	04/02/14	<0.20	<0.38	<0.20	<0.65
MW-5	10/23/14	<0.38	0.96 J	<0.50	1.9 J
MW-5	05/30/15	<1.0	<5.0	<1.0	2.1 J
MW-5	11/19/15	<1.0	<1.0	<1.0	<3.0
MW-5	04/16/16	<1.0	<5.0	<1.0	<5.0
MW-5	10/13/16	<1.0	<5.0	<1.0	<5.0
MW-5	06/09/17	<1.0	<5.0	<1.0	<5.0
MW-5	11/12/17	<1.0	<1.0	<1.0	<10
MW-6	03/28/07	<1	<1	<1	<2
MW-6	03/10/08	9.4	<1	0.5 J	139
MW-6	03/05/09	<1	<1	<1	<2
MW-6	02/07/11	<1	<1	<1	<2
MW-6	02/21/12	<1	<1	<1	<2
MW-6	06/09/13	<0.14	<0.30	<0.20	<0.23
MW-6	09/09/13	<0.14	<0.30	<0.20	<0.23
MW-6	12/12/13	<0.20	<0.38	<0.20	<0.65
MW-6	10/23/14	<0.38	<0.70	<0.50	<1.6
MW-6	04/02/14	<0.20	<0.38	<0.20	<0.65
MW-6	05/30/15	<1.0	<5.0	<1.0	<5.0
MW-6	11/19/15	<1.0	<1.0	<1.0	<3.0
MW-6	11/12/17	<1.0	<1.0	<1.0	<10
MW-7	11/19/15	<1.0	<1.0	<1.0	<3.0
MW-7	04/16/16	<1.0	<5.0	<1.0	<5.0
MW-7	10/13/16	<1.0	<5.0	<1.0	<5.0
MW-7	06/09/17	<1.0	<5.0	<1.0	<5.0
MW-7	11/12/17	<1.0	<1.0	<1.0	<10

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Johnston Fed #6A					
Location	**Date**	**Benzene (µg/L)**	**Toluene (µg/L)**	**Ethylbenzene (µg/L)**	**Total Xylenes (µg/L)**
NMWQCC Standards:		10	750	750	620
MW-8	11/19/15	<1.0	<1.0	<1.0	<3.0
MW-8	04/16/16	<1.0	<5.0	<1.0	<5.0
MW-8	10/13/16	<1.0	<5.0	<1.0	<5.0
MW-8	06/09/17	<1.0	<5.0	<1.0	<5.0
MW-8	11/12/17	<1.0	<1.0	<1.0	<10
MW-9	11/19/15	<1.0	<1.0	<1.0	<3.0
MW-9	04/16/16	<1.0	<5.0	<1.0	<5.0
MW-9	10/13/16	<1.0	<5.0	<1.0	<5.0
MW-9	06/09/17	<1.0	<5.0	<1.0	<5.0
MW-9	11/12/17	<1.0	<1.0	<1.0	<10

Notes:

The groundwater monitoring dates for each monitoring well where no groundwater samples were collected and analyzed have been omitted.

"µg/L" = micrograms per liter

Results highlighted yellow exceed their respective New Mexico Water Quality Control Commission (NMWQCC) standards.

"J" = Result is less than the reporting limit but greater than or equal to the method detection limit and the result in an approximate value.

"<" = analyte was not detected at the indicated reporting limit (some historic data were reported at the detection limit).

TABLE 2 - GROUNDWATER ELEVATION RESULTS

Johnston Fed #6A						
Location	Date	TOC	Depth to Water (ft.)	Depth to LNAPL (ft.)	LNAPL Thickness (ft.)	GW Elevation (ft.)
MW-1	08/10/95	6001.88	37.24	NR		5964.64
MW-1	12/13/95	6001.88	37.35	NR		5964.53
MW-1	04/11/96	6001.88	37.48	NR		5964.40
MW-1	07/23/96	6001.88	37.55	NR		5964.33
MW-1	10/14/96	6001.88	37.22	37.07	0.15	5964.78
MW-1	01/22/97	6001.88	38.26	37.43	0.83	5964.25
MW-1	04/11/97	6001.88	38.31	37.20	1.11	5964.41
MW-1	06/18/01	6001.88	38.21	37.34	0.87	5964.33
MW-1	09/04/01	6001.88	38.27	37.54	0.73	5964.16
MW-1	03/04/02	6001.88	38.35	37.74	0.61	5963.99
MW-1	06/04/02	6001.88	38.14	37.81	0.33	5963.99
MW-1	09/10/02	6001.88	38.24	38.00	0.23	5963.83
MW-1	12/12/02	6001.88	38.11	38.01	0.10	5963.85
MW-1	03/14/03	6001.88	38.08	37.95	0.13	5963.90
MW-1	06/18/03	6001.88	38.47	37.88	0.59	5963.86
MW-1	09/16/03	6001.88	38.25	38.17	0.08	5963.69
MW-1	12/17/03	6001.88	38.23	38.13	0.10	5963.73
MW-1	03/16/04	6001.88	38.57	37.90	0.67	5963.82
MW-1	06/22/04	6001.88	38.65	37.90	0.75	5963.80
MW-1	09/22/04	6001.88	38.60	38.21	0.39	5963.58
MW-1	12/21/04	6001.88	38.38	38.20	0.18	5963.64
MW-1	03/23/05	6001.88	38.50	37.95	0.55	5963.80
MW-1	06/17/05	6001.88	38.62	38.13	0.49	5963.63
MW-1	09/20/05	6001.88	38.83	38.40	0.43	5963.38
MW-1	12/14/05	6001.88	38.72	38.31	0.41	5963.47
MW-1	03/25/06	6001.88	38.66	38.15	0.51	5963.61
MW-1	03/27/06	6001.88	38.62	38.05	0.57	5963.69
MW-1	06/06/06	6001.88	38.84	38.29	0.55	5963.46
MW-1	09/25/06	6001.88	39.01	38.51	0.50	5963.25
MW-1	12/07/06	6001.88	38.33	ND		5963.55
MW-1	03/28/07	6001.88	38.09	38.02	0.07	5963.85
MW-1	06/18/07	6001.88	38.86	38.09	0.77	5963.60
MW-1	09/17/07	6001.88	39.32	38.40	0.92	5963.25
MW-1	12/17/07	6001.88	39.13	38.42	0.71	5963.29
MW-1	03/10/08	6001.88	38.24	37.90	0.34	5963.90
MW-1	06/17/08	6001.88	37.71	37.38	0.33	5964.42
MW-1	09/10/08	6001.88	37.72	37.41	0.31	5964.40
MW-1	12/02/08	6001.88	37.89	37.51	0.38	5964.28
MW-1	03/05/09	6001.88	37.63	37.20	0.43	5964.58
MW-1	06/02/09	6001.88	37.83	37.49	0.34	5964.31
MW-1	08/28/09	6001.88	37.99	37.65	0.34	5964.15

TABLE 2 - GROUNDWATER ELEVATION RESULTS

Johnston Fed #6A						
Location	**Date**	**TOC**	**Depth to Water (ft.)**	**Depth to LNAPL (ft.)**	**LNAPL Thickness (ft.)**	**GW Elevation (ft.)**
MW-1	11/04/09	6001.88	37.77	ND		5964.11
MW-1	02/17/10	6001.88	38.11	37.60	0.51	5964.16
MW-1	05/24/10	6001.88	38.27	37.81	0.46	5963.96
MW-1	09/24/10	6001.88	38.46	38.05	0.41	5963.73
MW-1	11/02/10	6001.88	38.55	38.16	0.39	5963.63
MW-1	02/07/11	6001.88	38.37	37.93	0.44	5963.84
MW-1	05/02/11	6001.88	38.57	ND		5963.31
MW-1	09/23/11	6001.88	38.75	38.32	0.43	5963.46
MW-1	11/01/11	6001.88	38.80	ND		5963.08
MW-1	02/21/12	6001.88	38.65	38.21	0.44	5963.56
MW-1	05/14/12	6001.88	38.84	38.36	0.48	5963.40
MW-1	06/09/13	6001.88	39.22	38.41	0.81	5963.27
MW-1	09/09/13	6001.88	39.21	38.60	0.61	5963.13
MW-1	12/12/13	6001.88	39.01	38.65	0.36	5963.14
MW-1	04/02/14	6001.88	38.94	38.61	0.33	5963.19
MW-1	10/23/14	6001.88	39.03	38.82	0.21	5963.01
MW-1	05/30/15	6001.88	39.04	38.86	0.18	5962.98
MW-1	11/19/15	6001.88	38.70	38.58	0.12	5963.27
MW-1	04/16/16	6001.88	38.49	38.40	0.09	5963.46
MW-1	10/13/16	6001.88	38.61	38.60	0.01	5963.28
MW-1	06/09/17	6001.88	38.51	38.47	0.04	5963.40
MW-1	11/12/17	6001.88	38.69	ND		5963.19

TABLE 2 - GROUNDWATER ELEVATION RESULTS

Johnston Fed #6A						
Location	Date	TOC	Depth to Water (ft.)	Depth to LNAPL (ft.)	LNAPL Thickness (ft.)	GW Elevation (ft.)
MW-2	12/13/95	6001.82	37.39	NR		5964.43
MW-2	04/11/96	6001.82	37.47	NR		5964.35
MW-2	07/23/96	6001.82	37.60	NR		5964.22
MW-2	10/14/96	6001.82	37.70	NR		5964.12
MW-2	01/22/97	6001.82	37.66	NR		5964.16
MW-2	04/11/97	6001.82	37.58	NR		5964.24
MW-2	10/09/00	6001.82	37.56	NR		5964.26
MW-2	06/18/01	6001.82	37.58	NR		5964.24
MW-2	09/04/01	6001.82	37.75	NR		5964.07
MW-2	06/03/02	6001.82	37.88	NR		5963.94
MW-2	09/10/02	6001.82	38.02	NR		5963.80
MW-2	12/12/02	6001.82	38.01	NR		5963.81
MW-2	03/14/03	6001.82	37.97	ND		5963.85
MW-2	06/18/03	6001.82	38.01	ND		5963.81
MW-2	09/16/03	6001.82	38.18	ND		5963.64
MW-2	12/17/03	6001.82	38.13	ND		5963.69
MW-2	03/16/04	6001.82	38.04	ND		5963.78
MW-2	06/22/04	6001.82	38.05	ND		5963.77
MW-2	09/22/04	6001.82	38.26	ND		5963.56
MW-2	12/21/04	6001.82	38.20	ND		5963.62
MW-2	03/23/05	6001.82	38.07	ND		5963.75
MW-2	06/17/05	6001.82	38.07	ND		5963.75
MW-2	09/20/05	6001.82	38.33	ND		5963.49
MW-2	12/14/05	6001.82	38.24	ND		5963.58
MW-2	03/27/06	6001.82	38.16	ND		5963.66
MW-2	06/06/06	6001.82	38.22	ND		5963.60
MW-2	09/25/06	6001.82	38.42	ND		5963.40
MW-2	12/07/06	6001.82	38.35	ND		5963.47
MW-2	03/28/07	6001.82	38.13	ND		5963.69
MW-2	06/18/07	6001.82	38.14	ND		5963.68
MW-2	09/17/07	6001.82	38.35	ND		5963.47
MW-2	12/17/07	6001.82	38.33	ND		5963.49
MW-2	03/10/08	6001.82	37.80	ND		5964.02
MW-2	06/17/08	6001.82	37.41	ND		5964.41
MW-2	09/10/08	6001.82	37.40	ND		5964.42
MW-2	12/02/08	6001.82	37.39	ND		5964.43
MW-2	03/05/09	6001.82	37.38	ND		5964.44
MW-2	06/02/09	6001.82	37.40	ND		5964.42
MW-2	08/28/09	6001.82	37.60	ND		5964.22
MW-2	11/04/09	6001.82	37.73	ND		5964.09
MW-2	02/17/10	6001.82	37.76	ND		5964.06

TABLE 2 - GROUNDWATER ELEVATION RESULTS

Johnston Fed #6A						
Location	**Date**	**TOC**	**Depth to Water (ft.)**	**Depth to LNAPL (ft.)**	**LNAPL Thickness (ft.)**	**GW Elevation (ft.)**
MW-2	05/24/10	6001.82	37.77	ND		5964.05
MW-2	09/24/10	6001.82	37.97	ND		5963.85
MW-2	11/02/10	6001.82	38.01	ND		5963.81
MW-2	02/07/11	6001.82	38.05	ND		5963.77
MW-2	05/02/11	6001.82	38.09	ND		5963.73
MW-2	09/23/11	6001.82	38.25	38.23	0.02	5963.59
MW-2	11/01/11	6001.82	38.26	ND		5963.56
MW-2	02/21/12	6001.82	38.31	ND		5963.51
MW-2	05/14/12	6001.82	38.36	ND		5963.46
MW-2	06/09/13	6001.82	38.56	ND		5963.26
MW-2	09/09/13	6001.82	38.68	ND		5963.14
MW-2	12/12/13	6001.82	38.67	ND		5963.15
MW-2	04/02/14	6001.82	38.63	ND		5963.19
MW-2	10/23/14	6001.82	38.79	ND		5963.03
MW-2	05/30/15	6001.82	38.82	ND		5963.00
MW-2	11/19/15	6001.82	38.56	ND		5963.26
MW-2	04/16/16	6001.82	38.39	ND		5963.43
MW-2	10/13/16	6001.82	38.58	ND		5963.24
MW-2	06/09/17	6001.82	38.44	ND		5963.38
MW-2	11/12/17	6001.82	38.65	ND		5963.17

TABLE 2 - GROUNDWATER ELEVATION RESULTS

Johnston Fed #6A						
Location	Date	TOC	Depth to Water (ft.)	Depth to LNAPL (ft.)	LNAPL Thickness (ft.)	GW Elevation (ft.)
MW-3	12/13/95	6001.21	37.11	NR		5964.10
MW-3	04/11/96	6001.21	37.17	NR		5964.04
MW-3	07/25/96	6001.21	37.30	NR		5963.91
MW-3	10/14/96	6001.21	37.40	NR		5963.81
MW-3	01/22/97	6001.21	37.35	NR		5963.86
MW-3	04/11/97	6001.21	37.29	NR		5963.92
MW-3	06/18/01	6001.21	37.26	NR		5963.95
MW-3	09/04/01	6001.21	37.42	NR		5963.79
MW-3	06/03/02	6001.21	37.55	NR		5963.66
MW-3	12/12/02	6001.21	37.70	NR		5963.51
MW-3	03/14/03	6001.21	37.66	ND		5963.55
MW-3	06/18/03	6001.21	37.87	37.63	0.24	5963.52
MW-3	09/16/03	6001.21	37.89	37.87	0.02	5963.34
MW-3	12/17/03	6001.21	37.80	ND		5963.41
MW-3	03/16/04	6001.21	37.85	37.72	0.13	5963.46
MW-3	06/22/04	6001.21	37.88	37.72	0.16	5963.45
MW-3	09/22/04	6001.21	38.07	37.96	0.11	5963.23
MW-3	12/21/04	6001.21	37.96	37.93	0.03	5963.28
MW-3	03/23/05	6001.21	37.88	37.80	0.08	5963.39
MW-3	06/17/05	6001.21	37.92	ND		5963.29
MW-3	09/20/05	6001.21	38.16	ND		5963.05
MW-3	12/14/05	6001.21	38.09	ND		5963.12
MW-3	03/25/06	6001.21	38.09	ND		5963.12
MW-3	03/27/06	6001.21	37.88	ND		5963.33
MW-3	06/06/06	6001.21	37.98	ND		5963.23
MW-3	09/25/06	6001.21	38.16	ND		5963.05
MW-3	12/07/06	6001.21	38.06	ND		5963.15
MW-3	03/28/07	6001.21	37.87	ND		5963.34
MW-3	06/18/07	6001.21	37.86	ND		5963.35
MW-3	09/17/07	6001.21	38.10	ND		5963.11
MW-3	12/17/07	6001.21	38.09	ND		5963.12
MW-3	03/10/08	6001.21	37.80	ND		5963.41
MW-3	06/17/08	6001.21	37.10	ND		5964.11
MW-3	09/10/08	6001.21	37.13	ND		5964.08
MW-3	12/02/08	6001.21	37.14	ND		5964.07
MW-3	03/05/09	6001.21	37.14	ND		5964.07
MW-3	06/02/09	6001.21	37.12	ND		5964.09
MW-3	08/28/09	6001.21	37.40	ND		5963.81
MW-3	11/04/09	6001.21	37.52	ND		5963.69
MW-3	02/17/10	6001.21	37.53	ND		5963.68
MW-3	05/24/10	6001.21	37.53	ND		5963.68

TABLE 2 - GROUNDWATER ELEVATION RESULTS

Johnston Fed #6A						
Location	**Date**	**TOC**	**Depth to Water (ft.)**	**Depth to LNAPL (ft.)**	**LNAPL Thickness (ft.)**	**GW Elevation (ft.)**
MW-3	09/24/10	6001.21	37.72	ND		5963.49
MW-3	11/02/10	6001.21	37.79	ND		5963.42
MW-3	02/07/11	6001.21	37.83	ND		5963.38
MW-3	05/02/11	6001.21	38.86	ND		5962.35
MW-3	09/23/11	6001.21	38.02	ND		5963.19
MW-3	11/01/11	6001.21	38.06	ND		5963.15
MW-3	02/21/12	6001.21	38.11	ND		5963.10
MW-3	05/14/12	6001.21	38.15	ND		5963.06
MW-3	06/09/13	6001.21	38.32	ND		5962.89
MW-3	09/09/13	6001.21	38.48	ND		5962.73
MW-3	12/12/13	6001.21	38.45	ND		5962.76
MW-3	04/02/14	6001.21	38.42	ND		5962.79
MW-3	10/23/14	6001.21	38.57	ND		5962.64
MW-3	05/30/15	6001.21	38.60	ND		5962.61
MW-3	11/19/15	6001.21	38.31	ND		5962.90
MW-3	04/16/16	6001.21	38.15	ND		5963.06
MW-3	10/13/16	6001.21	38.36	ND		5962.85
MW-3	06/09/17	6001.21	38.23	ND		5962.98
MW-3	11/12/17	6001.21	38.44	ND		5962.77

TABLE 2 - GROUNDWATER ELEVATION RESULTS

Johnston Fed #6A						
Location	Date	TOC	Depth to Water (ft.)	Depth to LNAPL (ft.)	LNAPL Thickness (ft.)	GW Elevation (ft.)
MW-4	12/13/95	6001.26	37.34	NR		5963.92
MW-4	04/11/96	6001.26	37.42	NR		5963.84
MW-4	07/25/96	6001.26	37.54	NR		5963.72
MW-4	10/14/96	6001.26	37.64	NR		5963.62
MW-4	01/22/97	6001.26	37.60	NR		5963.66
MW-4	04/11/97	6001.26	37.47	NR		5963.79
MW-4	10/09/00	6001.26	37.56	NR		5963.70
MW-4	06/18/01	6001.26	37.53	NR		5963.73
MW-4	09/04/01	6001.26	37.66	NR		5963.60
MW-4	06/03/02	6001.26	37.80	NR		5963.46
MW-4	09/10/02	6001.26	37.95	NR		5963.32
MW-4	12/12/02	6001.26	38.95	NR		5962.31
MW-4	03/14/03	6001.26	37.91	ND		5963.36
MW-4	06/18/03	6001.26	37.95	ND		5963.31
MW-4	09/16/03	6001.26	38.17	ND		5963.09
MW-4	12/17/03	6001.26	38.06	ND		5963.20
MW-4	03/16/04	6001.26	38.00	ND		5963.26
MW-4	06/22/04	6001.26	38.04	ND		5963.22
MW-4	09/22/04	6001.26	38.27	ND		5962.99
MW-4	12/21/04	6001.26	38.23	ND		5963.03
MW-4	03/23/05	6001.26	38.11	ND		5963.15
MW-4	06/17/05	6001.26	38.08	ND		5963.18
MW-4	09/20/05	6001.26	38.35	ND		5962.91
MW-4	12/14/05	6001.26	38.24	ND		5963.02
MW-4	03/27/06	6001.26	38.16	ND		5963.10
MW-4	06/06/06	6001.26	38.24	ND		5963.02
MW-4	09/25/06	6001.26	38.45	ND		5962.81
MW-4	12/07/06	6001.26	38.34	ND		5962.92
MW-4	03/28/07	6001.26	38.16	ND		5963.10
MW-4	06/18/07	6001.26	38.14	ND		5963.12
MW-4	09/17/07	6001.26	38.37	ND		5962.89
MW-4	12/17/07	6001.26	38.36	ND		5962.90
MW-4	03/10/08	6001.26	38.05	ND		5963.21
MW-4	06/17/08	6001.26	37.35	ND		5963.91
MW-4	09/10/08	6001.26	37.43	ND		5963.83
MW-4	12/02/08	6001.26	37.40	ND		5963.86
MW-4	03/05/09	6001.26	37.40	ND		5963.86
MW-4	06/02/09	6001.26	37.43	ND		5963.83
MW-4	08/28/09	6001.26	37.64	ND		5963.62
MW-4	11/04/09	6001.26	37.76	ND		5963.50
MW-4	02/17/10	6001.26	37.80	ND		5963.46

TABLE 2 - GROUNDWATER ELEVATION RESULTS

Johnston Fed #6A						
Location	**Date**	**TOC**	**Depth to Water (ft.)**	**Depth to LNAPL (ft.)**	**LNAPL Thickness (ft.)**	**GW Elevation (ft.)**
MW-4	05/24/10	6001.26	37.80	ND		5963.46
MW-4	09/24/10	6001.26	38.03	ND		5963.23
MW-4	11/02/10	6001.26	38.05	ND		5963.21
MW-4	02/07/11	6001.26	38.08	ND		5963.18
MW-4	05/02/11	6001.26	38.15	ND		5963.11
MW-4	09/23/11	6001.26	38.30	ND		5962.96
MW-4	11/01/11	6001.26	38.32	ND		5962.94
MW-4	02/21/12	6001.26	38.37	ND		5962.89
MW-4	05/14/12	6001.26	38.40	ND		5962.86
MW-4	06/09/13	6001.26	38.62	ND		5962.64
MW-4	09/09/13	6001.26	38.79	ND		5962.47
MW-4	12/12/13	6001.26	38.77	ND		5962.49
MW-4	04/02/14	6001.26	38.74	ND		5962.52
MW-4	10/23/14	6001.26	38.94	ND		5962.32
MW-4	05/30/15	6001.26	38.61	ND		5962.65
MW-4	11/19/15	6001.26	38.62	ND		5962.64
MW-4	04/16/16	6001.26	38.46	ND		5962.80
MW-4	10/13/16	6001.26	38.67	ND		5962.59
MW-4	06/09/17	6001.26	38.52	ND		5962.74
MW-4	11/12/17	6001.26	38.75	ND		5962.51

TABLE 2 - GROUNDWATER ELEVATION RESULTS

Johnston Fed #6A						
Location	Date	TOC	Depth to Water (ft.)	Depth to LNAPL (ft.)	LNAPL Thickness (ft.)	GW Elevation (ft.)
MW-5	08/30/00	6001.96	38.11	NR		5963.85
MW-5	06/18/01	6001.96	38.13	NR		5963.83
MW-5	09/04/01	6001.96	38.33	NR		5963.63
MW-5	06/04/02	6001.96	38.51	NR		5963.45
MW-5	09/10/02	6001.96	39.13	NR		5962.84
MW-5	12/12/02	6001.96	38.83	NR		5963.13
MW-5	03/14/03	6001.96	38.70	ND		5963.26
MW-5	06/18/03	6001.96	38.85	ND		5963.11
MW-5	09/16/03	6001.96	38.88	ND		5963.08
MW-5	12/17/03	6001.96	38.75	ND		5963.21
MW-5	03/16/04	6001.96	38.72	ND		5963.24
MW-5	06/22/04	6001.96	38.74	ND		5963.22
MW-5	09/22/04	6001.96	38.74	ND		5963.22
MW-5	12/21/04	6001.96	38.93	ND		5963.03
MW-5	03/23/05	6001.96	38.72	ND		5963.24
MW-5	06/17/05	6001.96	38.72	ND		5963.24
MW-5	09/20/05	6001.96	39.06	ND		5962.90
MW-5	12/14/05	6001.96	38.94	ND		5963.02
MW-5	03/27/06	6001.96	38.86	ND		5963.10
MW-5	06/06/06	6001.96	38.97	ND		5962.99
MW-5	09/25/06	6001.96	37.20	ND		5964.76
MW-5	12/07/06	6001.96	39.07	ND		5962.89
MW-5	03/28/07	6001.96	38.83	ND		5963.13
MW-5	06/18/07	6001.96	38.84	ND		5963.12
MW-5	09/17/07	6001.96	39.09	ND		5962.87
MW-5	12/17/07	6001.96	39.04	ND		5962.92
MW-5	03/10/08	6001.96	38.48	ND		5963.48
MW-5	06/17/08	6001.96	37.83	ND		5964.13
MW-5	09/10/08	6001.96	37.91	ND		5964.05
MW-5	12/02/08	6001.96	37.95	ND		5964.01
MW-5	03/05/09	6001.96	37.93	ND		5964.03
MW-5	06/02/09	6001.96	37.95	ND		5964.01
MW-5	08/28/09	6001.96	38.19	ND		5963.77
MW-5	11/04/09	6001.96	38.32	ND		5963.64
MW-5	02/17/10	6001.96	38.38	ND		5963.58
MW-5	05/24/10	6001.96	38.35	ND		5963.61
MW-5	09/24/10	6001.96	38.61	ND		5963.35
MW-5	11/02/10	6001.96	38.66	ND		5963.30
MW-5	02/07/11	6001.96	38.74	ND		5963.22
MW-5	05/02/11	6001.96	38.81	ND		5963.15
MW-5	09/23/11	6001.96	38.99	ND		5962.97

TABLE 2 - GROUNDWATER ELEVATION RESULTS

Johnston Fed #6A						
Location	**Date**	**TOC**	**Depth to Water (ft.)**	**Depth to LNAPL (ft.)**	**LNAPL Thickness (ft.)**	**GW Elevation (ft.)**
MW-5	11/01/11	6001.96	39.09	ND		5962.87
MW-5	02/21/12	6001.96	39.09	ND		5962.87
MW-5	05/14/12	6001.96	39.16	ND		5962.80
MW-5	06/09/13	6001.96	39.38	ND		5962.58
MW-5	09/09/13	6001.96	39.56	ND		5962.40
MW-5	12/12/13	6001.96	39.55	ND		5962.41
MW-5	04/02/14	6001.96	39.52	ND		5962.44
MW-5	10/23/14	6001.96	39.71	ND		5962.25
MW-5	05/30/15	6001.96	39.73	ND		5962.23
MW-5	11/19/15	6001.96	39.33	ND		5962.63
MW-5	04/16/16	6001.96	39.19	ND		5962.77
MW-5	10/13/16	6001.96	39.34	ND		5962.62
MW-5	06/09/17	6001.96	39.27	ND		5962.69
MW-5	11/12/17	6001.96	39.52	ND		5962.44

TABLE 2 - GROUNDWATER ELEVATION RESULTS

Johnston Fed #6A						
Location	**Date**	**TOC**	**Depth to Water (ft.)**	**Depth to LNAPL (ft.)**	**LNAPL Thickness (ft.)**	**GW Elevation (ft.)**
MW-6	12/07/06	6001.33	39.62	ND		5961.71
MW-6	03/28/07	6001.33	39.43	ND		5961.90
MW-6	06/18/07	6001.33	39.43	ND		5961.90
MW-6	09/17/07	6001.33	39.43	ND		5961.90
MW-6	12/17/07	6001.33	38.65	ND		5962.68
MW-6	03/10/08	6001.33	39.21	ND		5962.12
MW-6	03/05/09	6001.33	37.61	ND		5963.72
MW-6	06/02/09	6001.33	37.46	ND		5963.87
MW-6	08/28/09	6001.33	37.89	ND		5963.44
MW-6	11/04/09	6001.33	38.03	ND		5963.30
MW-6	05/24/10	6001.33	38.07	ND		5963.26
MW-6	09/24/10	6001.33	38.30	ND		5963.03
MW-6	11/02/10	6001.33	38.36	ND		5962.97
MW-6	02/07/11	6001.33	38.39	ND		5962.94
MW-6	05/02/11	6001.33	36.42	ND		5964.91
MW-6	09/23/11	6001.33	38.65	ND		5962.68
MW-6	11/01/11	6001.33	38.70	ND		5962.63
MW-6	02/21/12	6001.33	38.75	ND		5962.58
MW-6	05/14/12	6001.33	38.79	ND		5962.54
MW-6	06/09/13	6001.33	39.08	ND		5962.25
MW-6	09/09/13	6001.33	39.28	ND		5962.05
MW-6	12/12/13	6001.33	39.26	ND		5962.07
MW-6	10/23/14	6001.33	39.43	ND		5961.90
MW-6	04/02/14	6001.33	39.24	ND		5962.09
MW-6	05/30/15	6001.33	39.45	ND		5961.88
MW-6	11/19/15	6001.33	39.02	ND		5962.31
MW-6	04/16/16	6001.33	38.92	ND		5962.41
MW-6	10/13/16	6001.33	39.00	ND		5962.33
MW-6	06/09/17	6001.33	39.16	ND		5962.17
MW-6	11/12/17	6001.33	39.23	ND		5962.10

TABLE 2 - GROUNDWATER ELEVATION RESULTS

Johnston Fed #6A						
Location	**Date**	**TOC**	**Depth to Water (ft.)**	**Depth to LNAPL (ft.)**	**LNAPL Thickness (ft.)**	**GW Elevation (ft.)**
MW-7	11/19/15	6001.26	37.80	ND		5963.46
MW-7	04/16/16	6001.26	37.63	ND		5963.63
MW-7	10/13/16	6001.26	37.83	ND		5963.43
MW-7	06/09/17	6001.26	37.69	ND		5963.57
MW-7	11/12/17	6001.26	37.90	ND		5963.36
MW-8	11/19/15	6001.06	37.71	ND		5963.35
MW-8	04/16/16	6001.06	37.55	ND		5963.51
MW-8	10/13/16	6001.06	37.81	ND		5963.25
MW-8	06/09/17	6001.06	37.63	ND		5963.43
MW-8	11/12/17	6001.06	37.89	ND		5963.17
MW-9	11/19/15	6001.39	38.35	ND		5963.04
MW-9	04/16/16	6001.39	38.20	ND		5963.19
MW-9	10/13/16	6001.39	39.35	ND		5962.04
MW-9	06/09/17	6001.39	40.35	ND		5961.04
MW-9	11/12/17	6001.39	41.35	ND		5960.04

Notes:
"ft" = feet
"TOC" = Top of casing
"LNAPL" - Light non-aqueous phase liquid
"ND" = LNAPL not detected
"NR" = LNAPL not recorded

FIGURES

L:\San Juan River Basin\SJRB GENERAL\GIS-NEW_MXDs\JOHNSTON FED#6A\2017 MAPS\Fed6_GARM_1SA_2017.mxd

LEGEND:

- 6002 — APPROXIMATE GROUND SURFACE CONTOUR AND ELEVATION, FEET
- ACCESS ROAD
- FENCE
- OVHD — OVERHEAD POWER LINE
- MONITORING WELL
- MONITORING WELL WITH MEASUREABLE FREE PRODUCT
- GAS VALVE
- OTHER MONITORING WELL
- SMA BENCHMARK
- RIG ANCHOR
- WELLHEAD

EXPLANATION OF ANALYTES AND APPLICABLE STANDARDS:

RESULTS IN **BOLDFACE** TYPE INDICATE CONCENTRATION IN EXCESS OF THE STANDARD FOR THAT ANALYTE.
NS = NOT SAMPLED
µg/L = MICROGRAMS PER LITER
<1 = BELOW METHOD DETECTION LIMIT

ANALYTE	NMWQCC STANDARDS
B = Benzene	10 µg/L
T = Toluene	750 µg/L
E = Ethylbenzene	750 µg/L
X = Total Xylenes	620 µg/L

N

SCALE IN FEET
0 30 60

REVISION	DATE	DESIGN BY	DRAWN BY	REVIEWED BY
A	7/17/2017	SLG	SLG	SRV

TITLE:

GROUNWATER ANALYTICAL RESULTS
JUNE 9, 2017

PROJECT:

JOHNSTON FEDERAL #6A
SAN JUAN RIVER BASIN
SAN JUAN COUNTY, NEW MEXICO

Stantec

Figure No.: 1

L:\San Juan River Basin\SJRB GENERAL\GIS-NEW_MXDs\JOHNSTON FED#6A\2017 MAPS\Fed6_GECM_1SA_2017.mxd

UNDERGROUND ELECTRIC BOX
ELECTRIC VAULT
6003
6002
6001
6000
OVHD
SMA BENCHMARK
ELEV. 5999.94'
NAD 83 NAVD 88
STATE PLANE COORDINATE SYSTEM
NEW MEXICO WEST
PUMPJACK
TANK
PIT
FORMER 300
BBL TANKS
JOHNSTON FED #6A
WELLHEAD
MW-6
5962.17
SEPARATOR
5962.5
6005
COMPRESSOR
MW-9
5963.10
MW-5
5962.69
FORMER
SUMP
MW-4
5962.74
METER
HOUSE
MW-3
5962.98
5963
MW-8
5963.43
MW-1
5963.40
MW-2
5963.38
FORMER EPC PIT
EXCAVATED TO 12 FEET
MW-7
5963.57
5963.5
AERIAL IMAGERY FROM GOOGLE EARTH, DATED 10/5/2016.

LEGEND:

- 6002 — APPROXIMATE GROUND SURFACE CONTOUR AND ELEVATION, FEET
- ACCESS ROAD
- FENCE
- OVHD — OVERHEAD POWER LINE
- MONITORING WELL
- MONITORING WELL WITH MEASUREABLE FREE PRODUCT
- GAS VALVE
- OTHER MONITORING WELL
- SMA BENCHMARK
- RIG ANCHOR
- WELLHEAD

NOTES:

5962.23 — GROUNDWATER ELEVATION (CORRECTED FOR PRODUCT THICKNESS WHEN PRESENT) FEET ABOVE MEAN SEA LEVEL

5962.4 — CORRECTED WATER LEVEL ELEVATION CONTOUR DASHED WHERE INFERRED (FEET ABOVE MEAN SEA LEVEL).

DIRECTION OF APPARENT GROUNDWATER FLOW

N

SCALE IN FEET
0 30 60

REVISION	DATE	DESIGN BY	DRAWN BY	REVIEWED BY
A	7/17/2017	SLG	SLG	SRV

TITLE:

GROUNWATER ELEVATION MAP
JUNE 9, 2017

PROJECT:

JOHNSTON FEDERAL #6A
SAN JUAN RIVER BASIN
SAN JUAN COUNTY, NEW MEXICO

Stantec

Figure No.: **2**

L:\San Juan River Basin\SJRB GENERAL\GIS-NEW_MXDs\JOHNSTON FED#6A\2017 MAPS\Fed6_GARM_2SA_2017.mxd

LEGEND:

- 6002 — APPROXIMATE GROUND SURFACE CONTOUR AND ELEVATION, FEET
- ACCESS ROAD
- FENCE
- OVHD — OVERHEAD POWER LINE
- MONITORING WELL
- GAS VALVE
- OTHER MONITORING WELL
- SMA BENCHMARK
- RIG ANCHOR
- WELLHEAD

EXPLANATION OF ANALYTES AND APPLICABLE STANDARDS:

RESULTS IN **BOLDFACE** TYPE INDICATE CONCENTRATION IN EXCESS OF THE STANDARD FOR THAT ANALYTE.
NS = NOT SAMPLED
µg/L = MICROGRAMS PER LITER
<1 = BELOW METHOD DETECTION LIMIT

ANALYTE	NMWQCC STANDARDS
B = Benzene	10 µg/L
T = Toluene	750 µg/L
E = Ethylbenzene	750 µg/L
X = Total Xylenes	620 µg/L

N

SCALE IN FEET
0 30 60

REVISION	DATE	DESIGN BY	DRAWN BY	REVIEWED BY
A	12/6/2017	SLG	SLG	SRV

TITLE:

GROUNWATER ANALYTICAL RESULTS
NOVEMBER 12, 2017

PROJECT:
JOHNSTON FEDERAL #6A
SAN JUAN RIVER BASIN
SAN JUAN COUNTY, NEW MEXICO

Stantec

Figure No.: 3

L:\San Juan River Basin\SJRB GENERAL\GIS-NEW_MXDs\JOHNSTON FED#6A\2017 MAPS\Fed6_GECM_2SA_2017.mxd

UNDERGROUND ELECTRIC BOX

ELECTRIC VAULT

6003

6002

6001

6000

OVHD

SMA BENCHMARK
ELEV. 5999.94'
NAD 83 NAVD 88
STATE PLANE COORDINATE SYSTEM
NEW MEXICO WEST

PUMPJACK

TANK

FORMER 300 BBL TANKS

JOHNSTON FED #6A WELLHEAD

MW-6
5962.10

PIT

5962.5

SEPARATOR

6005

FORMER SUMP

MW-9
5962.85

MW-5
5962.44

MW-4
5962.51

COMPRESSOR

5963

METER HOUSE

MW-3
5962.77

MW-8
5963.17

MW-1
5963.19

MW-2
5963.17

FORMER EPC PIT
EXCAVATED TO 12 FEET

MW-7
5963.36

AERIAL IMAGERY FROM GOOGLE EARTH, DATED 10/5/2016.

LEGEND:

- 6002 — APPROXIMATE GROUND SURFACE CONTOUR AND ELEVATION, FEET
- ACCESS ROAD
- FENCE
- OVERHEAD POWER LINE
- MONITORING WELL
- GAS VALVE
- OTHER MONITORING WELL
- SMA BENCHMARK
- RIG ANCHOR
- WELLHEAD

NOTES:

- 5962.23 — GROUNDWATER ELEVATION (CORRECTED FOR PRODUCT THICKNESS WHEN PRESENT) FEET ABOVE MEAN SEA LEVEL
- 5962.4 — CORRECTED WATER LEVEL ELEVATION CONTOUR DASHED WHERE INFERRED (FEET ABOVE MEAN SEA LEVEL).
- DIRECTION OF APPARENT GROUNDWATER FLOW

N

SCALE IN FEET
0 30 60

REVISION	DATE	DESIGN BY	DRAWN BY	REVIEWED BY
A	12/6/2017	SLG	SLG	SRV

TITLE:

GROUNWATER ELEVATION MAP
NOVEMBER 12, 2017

PROJECT:

JOHNSTON FEDERAL #6A
SAN JUAN RIVER BASIN
SAN JUAN COUNTY, NEW MEXICO

Stantec

Figure No.: **4**

APPENDICES

APPENDIX A – NMOCD NOTIFICATIONS OF SITE ACTIVITIES

APPENDIX B – WASTE DISPOSAL DOCUMENTATION

APPENDIX C – MOBILE DUAL PHASE EXTRACTION REPORT

APPENDIX D – JUNE 9, 2017 GROUNDWATER SAMPLING ANALYTICAL REPORT
NOVEMBER 12, 2017 GROUNDWATER SAMPLING ANALYTICAL REPORT

APPENDIX A

From: Varsa, Steve
To: Randolph.Bayliss@state.nm.us
Cc: brandon.powell@state.nm.us; Wiley, Joe
Subject: El Paso CGP Company - Notice of upcoming groundwater sampling activities
Date: Tuesday, May 30, 2017 3:05:18 PM

Hi Randy –

This correspondence is to provide notice to the NMOCD of upcoming semi-annual groundwater sampling and monitoring activities at the following project sites:

Site Name	NMOCD Case #
Canada Mesa #2	3RP-155-0
Fields A#7A	3RP-170-0
Fogelson 4-1	3RP-068-0
Gallegos Canyon Unit #124E	3RP-407-0
GCU Com A #142E	3RP-179-0
Hammond #41A	3RP-186-0
James F. Bell #1E	3RP-196-0
Johnston Fed #4	3RP-201-0
Johnston Fed #6A	3RP-202-0
K27 LDO72	3RP-204-0
Knight #1	3RP-207-0
Lateral L 40 Line Drip	3RP-212-0
Lat O-21 Line Drip	3RP-213-0
Lindrith B #24	3RP-214-0
Miles Fed #1A	3RP-223-0
Sandoval GC A #1A	3RP-235-0
Standard Oil Com #1	3RP-238-0
State Gas Com N #1	3RP-239-0

Groundwater sampling and monitoring is planned to be conducted the week of June 5, 2017.

Thank you,
Steve

Stephen Varsa, P.G.
Supervising Hydrogeologist
MWH, now part of Stantec
11153 Aurora Avenue
Des Moines, Iowa 50322
Direct: (515) 251-1020
Cell: (515) 710-7523

Office: (515) 253-0830
steve.varsa@stantec.com

From:	Varsa, Steve
To:	Bayliss, Randolph, EMNRD
Cc:	Griswold, Jim, EMNRD; Perrin, Charlie, EMNRD; Powell, Brandon, EMNRD; Smith, Cory, EMNRD; Fields, Vanessa, EMNRD; Wiley, Joe
Subject:	RE: MPDE Work Plan Approvals
Date:	Saturday, July 08, 2017 4:55:00 PM

Hi Randy –

Pursuant to the conditions in the above-referenced July 5, 2017, approval letter, the following is the schedule for the MDPE activities:

James F. Bell #1E – start late the afternoon of Tuesday, July 11, and will go through Friday, July 14.
Johnston Federal #4 and Johnston Federal #6A – both sites beginning on Saturday, July 15, and go through Tuesday, July 18.
No work planned for Wednesday, July 19 (rest day).
GCU #124 – Thursday, July 20 through Sunday, July 23.
Knight #1 – Monday and Tuesday, July 24 and 25.
K27 LD072 – Wednesday, July 26.
Miles Federal #1A – Thursday, July 27.

As noted in the work plan submittal, work at State Gas Com N#1 is still pending receipt of a State Water Easement. NMOCD will be notified once the State Gas Com pilot testing activities have been scheduled, or if there are changes to the schedule offered above. Do you anticipate any OCD staff will be on-site during one or more of these events?

Thank you,
Steve

Stephen Varsa, P.G.
Supervising Hydrogeologist
MWH, now part of Stantec
11153 Aurora Avenue
Des Moines, Iowa 50322
Direct: (515) 251-1020
Cell: (515) 710-7523
Office: (515) 253-0830
steve.varsa@stantec.com

From: Bayliss, Randolph, EMNRD [mailto:Randolph.Bayliss@state.nm.us]
Sent: Wednesday, July 05, 2017 9:08 AM
To: Wiley, Joe <Joe_Wiley@kindermorgan.com>; Varsa, Steve <steve.varsa@stantec.com>
Cc: Griswold, Jim, EMNRD <Jim.Griswold@state.nm.us>; Perrin, Charlie, EMNRD <charlie.perrin@state.nm.us>; Powell, Brandon, EMNRD <Brandon.Powell@state.nm.us>; Smith, Cory, EMNRD <Cory.Smith@state.nm.us>; Fields, Vanessa, EMNRD <Vanessa.Fields@state.nm.us>

Subject: MPDE Work Plan Approvals

Good morning Joe, Steve, others.

Thank you for your proposed MPDE efforts.

Cheers

Randolph Bayliss, P.E.
Hydrologist, Districts III and IV
NMOCD Environmental Bureau
1220 S St Francis St, Santa Fe, NM 87505
505-476-3084, Cell 575-840-5961

From:	Varsa, Steve
To:	Bayliss, Randolph, EMNRD
Cc:	Fields, Vanessa, EMNRD; Smith, Cory, EMNRD; Wiley, Joe
Bcc:	Varsa, Steve
Subject:	FW: 3RP-202-0 Johnston Federal #6A - LNAPL Recovery Work Plan
Date:	Friday, September 15, 2017 7:51:00 PM
Attachments:	2017-06 Ltr_Bayliss-2017 MDPE Work Plan (JFed 6A).pdf

Hi Randy –

Stantec, on behalf of El Paso CGP Company, LLC, is providing notice of plans to completed additional light non-aqueous phase liquid (LNAPL) recovery activities at the above-referenced site. Three, 10-hour LNAPL recovery events will be completed from Saturday, September 23 through Monday, September 25, 2017. With the exception of the event duration, and collection of just one Summa sample on September 25, 2017, the methods and procedures to be utilized are anticipated to be the same as outlined in the attached work plan. The results of the LNAPL recovery activities will be included in the 2017 annual report for the Site.

Please feel free to contact Joe Wiley or me if you have any questions.

Thank you,
Steve

Stephen Varsa, P.G.
Supervising Hydrogeologist
MWH, now part of Stantec
11153 Aurora Avenue
Des Moines, Iowa 50322
Direct: (515) 251-1020
Cell: (515) 710-7523
Office: (515) 253-0830
steve.varsa@stantec.com

From: Varsa, Steve
Sent: Thursday, June 29, 2017 3:35 PM
To: 'Randolph.Bayliss@state.nm.us' <Randolph.Bayliss@state.nm.us>
Cc: 'Wiley, Joe' <Joe_Wiley@kindermorgan.com>
Subject: FW: 3RP-202-0 Johnston Federal #6A - LNAPL Recovery Work Plan

Hi Randy – Please find attached the above-referenced work plan for your review. The work is scheduled to begin the week of July 10, 2017. Please contact Joe Wiley or me if you have any questions.

Thank you,
Steve

Stephen Varsa, P.G.
Supervising Hydrogeologist
MWH, now part of Stantec
11153 Aurora Avenue
Des Moines, Iowa 50322
Direct: (515) 251-1020
Cell: (515) 710-7523
Office: (515) 253-0830
steve.varsa@stantec.com

From: Varsa, Steve
To: Bayliss, Randolph, EMNRD
Cc: Smith, Cory, EMNRD; Fields, Vanessa, EMNRD; Wiley, Joe
Subject: El Paso CGP Company - Notice of upcoming groundwater sampling activities
Date: Monday, November 06, 2017 11:41:36 AM

Hi Randy –

This correspondence is to provide notice to the NMOCD of upcoming semiannual groundwater sampling and monitoring activities at the following project sites:

Site Name	NMOCD Case #
Canada Mesa #2	3RP-155-0
Fields A#7A	3RP-170-0
Fogelson 4-1	3RP-068-0
Gallegos Canyon Unit #124E	3RP-407-0
GCU Com A #142E	3RP-179-0
James F. Bell #1E	3RP-196-0
Johnston Fed #4	3RP-201-0
Johnston Fed #6A	3RP-202-0
K27 LDO72	3RP-204-0
Knight #1	3RP-207-0
Lateral L 40 Line Drip	3RP-212-0
Lat O-21 Line Drip	3RP-213-0
Miles Fed #1A	3RP-223-0
Sandoval GC A #1A	3RP-235-0
Standard Oil Com #1	3RP-238-0
State Gas Com N #1	3RP-239-0

Groundwater sampling and monitoring is planned to be conducted November 10-14, 2017.

Please contact Joe Wiley, remediation manager with El Paso CGP Company, at (713) 420-3475, or me, if you have any questions.

Thank you,
Steve

Stephen Varsa, P.G.
Supervising Hydrogeologist
MWH, now part of Stantec
11153 Aurora Avenue
Des Moines, Iowa 50322
Direct: (515) 251-1020
Cell: (515) 710-7523
Office: (515) 253-0830
steve.varsa@stantec.com

APPENDIX B

BASIN DISPOSAL

30 Years of Environmental Health and Safety Excellence

200 Montana, Bloomfield, NM 87413
505-632-8936 or 505-334-3013
OPEN 24 Hours per Day

NO. 688185
NMOCD PERMIT: NM -001-0005
Oil Field Waste Document, Form C138
INVOICE:

DATE 6/11/17
DEL. TKT#.

GENERATOR: ElPaso CGP
BILL TO: ElPaso CGP

HAULING CO. ~~Stan. Oil~~ Stantec
DRIVER:

ORDERED BY: Joseph Wiley
(Print Full Name)
CODES:

WASTE DESCRIPTION: ☒ **Exempt Oilfield Waste** ☑ Produced Water ☐ Drilling/Completion Fluids ☐ Reserve Pit

STATE: ☐ NM ☐ CO ☐ AZ ☐ UT

TREATMENT/DISPOSAL METHODS: ☒ EVAPORATION ☒ INJECTION ☒ TREATING PLANT

NO.	TRUCK	LOCATION(S)	VOLUME	COST	H2S	COST	TOTAL	TIME
1		Fogelson 4-1, Gallegos CO 124E	50 BBL					
2		SCU Com A 142E Johnson Fed 4						
3		Johnston Federal 6A Lateral L-40 Lat 0-21 line						
4		Sandoval GC A#1A Standard Oil Com 1						
5								

I, [signature] representitive or authorized agent for the above generator and hauler hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination that the above described waste is RCRA Exempt Oil field wastes.

☑ Approved ☐ Denied ATTENDANT SIGNATURE [signature]

san juan reproduction 168-6

BASIN DISPOSAL

30 Years of Environmental Health and Safety Excellence

200 Montana, Bloomfield, NM 87413

505-632-8936 or 505-334-3013

OPEN 24 Hours per Day

NO. 690591

NMOCD PERMIT: NM -001-0005

Oil Field Waste Document, Form C138

INVOICE:

DATE 7-17-17

DEL. TKT#.

GENERATOR: ElPaso

BILL TO: ElPaso

HAULING CO. Sierra oilfield

DRIVER: Juan
(Print Full Name)

ORDERED BY: Joseph W

CODES:

WASTE DESCRIPTION: ☒ Exempt Oilfield Waste ☐ Produced Water ☐ Drilling/Completion Fluids ☐ Reserve Pit

STATE: ☑ NM ☐ CO ☐ AZ ☐ UT

TREATMENT/DISPOSAL METHODS: ☒ EVAPORATION ☒ INJECTION ☒ TREATING PLANT

NO.	TRUCK	LOCATION(S)	VOLUME	COST	H2S	COST	TOTAL	TIME
1	54	Johnson fed 6A	12	.75			9.00	
2							17 JUL 17	7:03PM
3								
4								
5		Juan Mateo						

I, _____ representitive or authorized agent for the above generator and hauler hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination that the above described waste is RCRA Exempt Oil field wastes.

☑ Approved ☐ Denied ATTENDANT SIGNATURE _____

BASIN DISPOSAL

30 Years of Environmental Health and Safety Excellence

200 Montana, Bloomfield, NM 87413
505-632-8936 or 505-334-3013
OPEN 24 Hours per Day

NO. 695642

NMOCD PERMIT: NM -001-0005
Oil Field Waste Document, Form C138
INVOICE:

DATE 9/26/17

GENERATOR: El Paso

HAULING CO. Sierra

ORDERED BY: Joseph Wiley

DEL. TKT#.

BILL TO: El Paso

DRIVER: CJ
(Print Full Name)

CODES:

WASTE DESCRIPTION: ☒ Exempt Oilfield Waste ☑ Produced Water ☐ Drilling/Completion Fluids ☐ Reserve Pit

STATE: ☑ NM ☐ CO ☐ AZ ☐ UT

TREATMENT/DISPOSAL METHODS: ☒ EVAPORATION ☒ INJECTION ☒ TREATING PLANT

NO.	TRUCK	LOCATION(S)	VOLUME	COST	H2S	COST	TOTAL	TIME
1	79	Johnson Fed 6A	15	20		10 50		
2							'17SEP'26	9:02AM
3								
4								
5								

I, [signature] representitive or authorized agent for the above generator and hauler hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination that the above described waste is RCRA Exempt Oil field wastes.

☑ Approved ☐ Denied ATTENDANT SIGNATURE [signature]

san juan reproduction 168-6

BASIN DISPOSAL

30 Years of Environmental Health and Safety Excellence

200 Montana, Bloomfield, NM 87413
505-632-8936 or 505-334-3013
OPEN 24 Hours per Day

NO. 699930
NMOCD PERMIT: NM -001-0005
Oil Field Waste Document, Form C138
INVOICE:

DATE 11.12.17

GENERATOR: El Paso

HAULING CO. Stantec

ORDERED BY: Joe Wiley

DEL. TKT#.

BILL TO: Stantec

DRIVER: Sam Spiering
(Print Full Name)

CODES:

WASTE DESCRIPTION: ☒ Exempt Oilfield Waste ☐ Produced Water ☑ Drilling/Completion Fluids ☐ Reserve Pit

STATE: ☑ NM ☐ CO ☐ AZ ☐ UT

TREATMENT/DISPOSAL METHODS: ☒ EVAPORATION ☒ INJECTION ☒ TREATING PLANT

NO.	TRUCK	LOCATION(S)	VOLUME	COST	H2S	COST	TOTAL	TIME
1		Fogelson 4-1	1	70			70 17 NOV 12	1:45PM
2		State Gas Com, Knight, JF Bell Lat L-40, Std Oil Com						
3		Sandoval, GCU 124E, J-Fed 4 J-Fed 6						
4								
5								

I, [signature], representitive or authorized agent for the above generator and hauler hereby certify that according to the Resource Conservation and Recovery Act (RCRA) and the US Environmental Protection Agency's July 1988 regulatory determination that the above described waste is RCRA Exempt Oil field wastes.

☑ Approved ☐ Denied ATTENDANT SIGNATURE [signature]

san juan reproduction 168-6

APPENDIX C

AcuVac Remediation, LLC
1656-H Townhurst, Houston, Texas 77043
713.468.6688 • www.acuvac.com

August 15, 2017

Mr. Stephen Varsa
Supervising Hydrogeologist
Stantec Consulting Services, Inc.
11153 Aurora Avenue
Des Moines, IA 50322

Dear Stephen:

Re: Johnston Federal No. 6A, San Juan County, NM (Event #2)

At your request, AcuVac Remediation, LLC (AcuVac) performed three Mobile Dual Phase Extraction (MDPE) events on well MW-1; 6.0 hour Event #2A on July 15, 2017, 12.0 hour Event #2B on July 16, 2017, and 10.25 hour Event #2C on July 17, 2017, at the above referenced site (Site). Following is the Report and a copy of the Operating Data collected during Event #2. Additionally, the attached Table #1 contains the Summary Well Data, and Table #2 contains the Summary Recovery Data.

The purpose of the MDPE events was to enhance recovery of Phase Separated Hydrocarbons (PSH) present at the Site through the removal of petroleum hydrocarbons in both liquid and vapor phases. PSH is referred to as petroleum hydrocarbons and Light Non-Aqueous Phase Liquids (LNAPL). The source of the PSH is a historical release of natural gas condensate.

OBJECTIVES

The objectives of the MDPE events were to:

- Maximize liquid and vapor phase petroleum hydrocarbon removal from groundwater and soils in the subsurface formations within the influence of the extraction well.
- Expose the capillary fringe area and below to the extraction well induced vacuums.
- Increase the vapor phase and liquid LNAPL specific yields with high induced vacuums.
- Create an induced hydraulic gradient to gain hydraulic control of the area surrounding the extraction well during the event periods.
- Select and monitor the groundwater depression and pump rates to accomplish the above objectives.

METHODS AND EQUIPMENT

AcuVac owns and maintains an inventory of equipment to perform MDPE events. No third party equipment was utilized. The events at the Site were conducted using the AcuVac I-6 System (System) with a Roots RAI-33 blower used as a vacuum pump and a Roots RAI-22 positive displacement blower. The following table lists equipment and instrumentation employed during Event #2, and the data element captured by each.

Equipment and Instrumentation Employed by AcuVac	
Measurement Equipment	**Data Element**
Extraction Well Induced Vacuum and Flow	
Dwyer Magnehelic Gauges	Extraction Well Vacuum
Dwyer Averaging Pitot Tubes / Magnehelic Gauges	Extractions Well Vapor Flow
Observation Wells	
Dwyer Digital Manometer	Vacuum / Pressure Influence
Extraction Well Vapor Monitoring	
V-1 vacuum box	Extraction Well Non-Diluted Vapor Sample Collection
HORIBA® Analyzer	Extraction Well Vapor TPH Concentration
QRae Mini II O_2 Monitor	Extraction Well Vapor Oxygen Content
LNAPL Thickness (if present)	
Solinst Interface Probes Model 122	Depth to LNAPL and Depth to Groundwater
Liquid Recovery	
Totalizer Flow Meter	Liquid Flow and Total Volume
Grundfos Red-Flo 2 Total Fluids Pump	In-Well Pumping
Grundfos Variable Frequency Drive	Pump Speed and Other Diagnostics
Groundwater Depression / Upwelling	
In-Situ Level Troll 700 Data Logger	Liquid Column in Extraction and Observation Wells
In-Situ Vented Cable with Chamber	Equalize Well Vacuum/Pressure
In-Situ Rugged Reader Data Logger Interface	Capture Readings from Data Logger Trolls
Atmospheric Conditions	
Testo Model 511	Relative and Absolute Barometric Pressure

The vacuum extraction portion of the System consists of a vacuum pump driven by an internal combustion engine (IC engine). The vacuum pump was connected to the extraction well, and the vacuum created on the extraction well caused light hydrocarbons in the soil and on the groundwater to volatilize and flow through a moisture knockout tank to the vacuum pump and the IC engine where they were burned as part of the normal combustion process. Propane was used as auxiliary fuel to help power the engine if the well vapors did not provide the required energy.

The IC engine provided the power necessary to achieve and maintain high induced vacuums and/or high well vapor flows required to maximize the vacuum radius of influence for pilot tests and short term event remediation.

Emissions from the engine were passed through three catalytic converters to maximize destruction of removed hydrocarbon vapors. The engine's fuel-to-air ratio was adjusted to maintain efficient combustion. Because the engine is the power source for the equipment, the System stops when the engine stops. This prevents an uncontrolled release of hydrocarbons. Since the System is held entirely under vacuum, any leaks in the seals or connections are leaked into the System and not emitted into the atmosphere. The engine is automatically shut down by vacuum loss, low oil pressure, over speed, or overheating.

Groundwater extraction was provided by an in-well Grundfos Redi-Flo 2 total fluids pump that discharged through a totalizer/flow meter. The discharge line from this meter was then connected to a stand-by tank. The electrical power for the groundwater pump was supplied from a 120v Honda generator. The groundwater flow rate was adjusted to maintain a target level. An interface meter was used to collect depth to groundwater and depth to LNAPL measurements. Grab samples of recovered liquid were taken periodically in a graduated cylinder to determine the average percentage of LANPL being recovered.

The design of the AcuVac System enabled independent control of both the induced well vacuum and the groundwater pumping functions such that the AcuVac team controlled the induced hydraulic gradient to increase exposure of the formation to soil vapor extraction (SVE). The ability to separate the vapor and liquid flows within the extraction well improved the LNAPL recovery rates, and enabled the AcuVac team to record data specific to each media.

RECOVERY SUMMARY FOR MDPE EVENT #2

The Recovery Summary table below summarizes the groundwater and LNAPL recovery data for Event #2, and compares the results to the previous Event #1.

Recovery Summary

	Event #2A	Event #2B	Event #2C	Total	
	MW-1	MW-1	MW-1	Event #2	Event #1
Event Hours	6.0	12.0	10.25	28.25	7.0
GW Recovery	65	191	80	336	168
NAPL Recovery					
Liquid	0	0	0	0	0
Vapor	9.5	21.6	11.2	42.3	4.4
Total	9.5	21.6	11.2	42.3	4.4
Gallons/Hour	**1.6**	**1.8**	**1.1**	**1.5**	**0.6**

SUMMARY OF MDPE EVENT #2A- WELL MW-1

- The total event time was 6.0 hours. The Event was conducted on July 15, 2017. The data is compared to Event #1 conducted on November 29, 2016, which had total event time of 7.0 hours.
- The total liquid volume recovered was 65 gals with no measureable liquid LNAPL recovered.
- Based on the HORIBA® data, total vapor LNAPL burned as IC engine fuel was 9.5 gals, for a total liquid and vapor LNAPL recovery of 9.5 gals, or 1.6 gals per hour.

- The volume of liquid and vapor LNPAL recovered during Event #2A is compared with Event #1 in the table below.

LNAPL Recovery Well MW-1					
		Event #2A		Event #1	
		Amount	Percent	Amount	Percent
Event Hours		6.0	-	7.0	-
GW Recovery	gals	65	-	168	-
NAPL Recovery					
Liquid	gals	0	0	0	0
Vapor	gals	9.5	100.00	4.4	100.00
Total	gals	9.5	100.00	4.4	100.00
Gallons/Hour		**1.6**	**-**	**0.6**	**-**

- Average HORIBA® analytical data from the influent vapor samples for Event #2A is compared with Event #1 in the table below:

Influent Vapor Data Well MW-1			
Data Element		**Event #2A**	**Event #1**
TPH- Maximum	ppmv	38,040	15,190
TPH- Average	ppmv	31,603	12,570
TPH- Minimum	ppmv	27,720	9,030
TPH- Initial	ppmv	27,910	9,030
TPH- Final	ppmv	27,720	13,790
CO_2	%	7.86	7.97
CO	%	0.44	0.02
O_2	%	8.7	10.7
H_2S	ppm	67	11

- The Event #2A extraction well induced vacuum and well vapor flow are compared with Event #1 in the table below.

Well Vacuum and Well Vapor Flow Well MW-1			
Data Element		**Event #2A**	**Event #1**
Well Vacuum- Max	"H_2O	35.00	40.00
Well Vacuum- Avg	"H_2O	31.67	31.33
Well Vacuum- Min	"H_2O	20.00	20.00
Well Vapor Flow- Max	scfm	23.62	26.40
Well Vapor Flow- Avg	scfm	23.11	23.22
Well Vapor Flow- Min	scfm	22.01	18.49

- The groundwater pump inlet was set at 45.5 ft BTOC in well MW-1. The average groundwater pump rate during the course of Event #2A was 0.12 gpm, and the maximum groundwater pump rate was 0.42 gpm. The total liquid volume recovered was 65 gals.
- The average groundwater depression, based on the positioning of the groundwater pump in well MW-1, was 6.0 ft below the hydro-equivalent static level.
- LNAPL with a measured thickness of 0.04 ft was recorded in well MW-1 prior to the start of Event #2A, and no measureable LNAPL was recorded at the conclusion of the Event #2A.

The total LNAPL removed, including liquid and vapor, during the 6.0 hour Event #2A, well MW-1 was 9.5 gals.

ADDITIONAL INFORMATION

- Well MW-1 produced a steady amount of liquid volume during the course of the Event #2A. However, no quantifiable liquid LNAPL was recovered from well MW-1.
- All LNAPL volume recovered, 9.5 gals, was burned as IC engine fuel.
- The TPH vapor concentrations increased during Event #2A and then decreased at the end of the event. The initial TPH reading was 27,910 ppmv, the average reading was 31,603 ppmv, the maximum reading, 38,040 ppmv was at event hour 2.0, and the lowest reading, 27,720 ppmv, was recorded at event hour 6.0.
- At approximately 1600 hours, a Stop Work was issued due to inclement weather moving into the area.

SUMMARY OF MDPE EVENT #2B- WELL MW-1

- The total event time was 12.0 hours. The Event was conducted on July 16, 2017. The data is compared to Event #2A conducted on July 15, 2017, which had total event time of 6.0 hours.
- The total liquid volume recovered was 191 gals with no measureable liquid LNAPL recovered.
- Based on the HORIBA® data, total vapor LNAPL burned as IC engine fuel was 21.6 gals, for a total liquid and vapor LNAPL recovery of 21.60 gals, or 1.8 gals per hour.
- The volume of liquid and vapor LNPAL recovered during Event #2B is compared with Event #2A in the table below.

LNAPL Recovery Well MW-1					
		Event #2B		Event #2A	
		Amount	Percent	Amount	Percent
Event Hours		12.0	-	6.0	-
GW Recovery	gals	191	-	65	-
NAPL Recovery					
Liquid	gals	0	0	0	0
Vapor	gals	21.6	100.00	9.5	100.00
Total	gals	21.6	100.00	9.5	100.00
Gallons/Hour		**1.8**	**-**	**1.6**	**-**

- Average HORIBA® analytical data from the influent vapor samples for Event #2B is compared with Event #2A in the table below:

Influent Vapor Data Well MW-1			
Data Element		**Event #2B**	**Event #2A**
TPH- Maximum	ppmv	38,890	38,040
TPH- Average	ppmv	33,057	31,603
TPH- Minimum	ppmv	26,760	27,720
TPH- Initial	ppmv	32,660	27,910
TPH- Final	ppmv	26,760	27,720
CO_2	%	6.54	7.86
CO	%	0.31	0.44
O_2	%	8.7	8.7
H_2S	ppm	18	67

- The Event #2B extraction well induced vacuum and well vapor flow are compared with Event #2A in the table below.

Well Vacuum and Well Vapor Flow Well MW-1			
Data Element		**Event #2B**	**Event #2A**
Well Vacuum- Max	"H_2O	40.00	35.00
Well Vacuum- Avg	"H_2O	38.00	31.67
Well Vacuum- Min	"H_2O	30.00	20.00
Well Vapor Flow- Max	scfm	25.55	23.62
Well Vapor Flow- Avg	scfm	25.19	23.11
Well Vapor Flow- Min	scfm	23.39	22.01

- The groundwater pump inlet was set at 45.5 ft BTOC in well MW-1. The average groundwater pump rate during the course of Event #2B was 0.23 gpm, and the maximum groundwater pump rate was 0.60 gpm. The total liquid volume recovered was 191 gals.
- The average groundwater depression, based on the positioning of the groundwater pump in well MW-1, was 6.0 ft below the hydro-equivalent static level.
- No measurable LNAPL thickness was recorded in well MW-1 prior to the start of Event #2B, and no measurable LNAPL was recorded at the conclusion of the Event #2B.

The total LNAPL removed, including liquid and vapor, during the 12.0 hour Event #2B, Well MW-1, was 21.6 gals.

ADDITIONAL INFORMATION

- Well MW-1 produced a steady amount of liquid volume during the course of the Event #2B. However, no quantifiable liquid LNAPL was recovered from well MW-1.
- All LNAPL volume recovered, 21.6 gals, was burned as IC engine fuel.

- The TPH vapor concentrations increased during Event #2B and then decreased at the end of the event. The initial TPH reading was 32,660 ppmv, the average reading was 33,057 ppmv, the maximum reading, 38,890 ppmv was at event hour 7.0, and the lowest reading, 26,760 ppmv, was recorded at event hour 11.0.

SUMMARY OF MDPE EVENT #2C- WELL MW-1

- The total event time was 10.25 hours. The Event was conducted on July 17, 2017. The data is compared to Event #2B conducted on July 16, 2017, which had total event time of 12.0 hours.
- The total liquid volume recovered was 80 gals with no measureable liquid LNAPL recovered.
- Based on the HORIBA® data, total vapor LNAPL burned as IC engine fuel was 11.2 gals, for a total liquid and vapor LNAPL recovery of 11.2 gals, or 1.1 gals per hour.
- The volume of liquid and vapor LNPAL recovered during Event #2C is compared with Event #2A in the table below.

LNAPL Recovery Well MW-1					
		Event #2C		Event #2B	
		Amount	Percent	Amount	Percent
Event Hours		12.0	-	10.25	-
GW Recovery	gals	191	-	191	-
NAPL Recovery					
Liquid	gals	0	0	0	0
Vapor	gals	11.2	100.00	21.6	100.00
Total	gals	11.2	100.00	21.6	100.00
Gallons/Hour		**1.1**	**-**	**1.8**	**-**

- Average HORIBA® analytical data from the influent vapor samples for Event #2C is compared with Event #2B in the table below:

Influent Vapor Data Well MW-1			
Data Element		**Event #2C**	**Event #2B**
TPH- Maximum	ppmv	22,370	38,890
TPH- Average	ppmv	20,210	33,057
TPH- Minimum	ppmv	17,940	26,760
TPH- Initial	ppmv	17,940	32,660
TPH- Final	ppmv	22,370	26,760
CO_2	%	4.86	6.54
CO	%	0.07	0.31
O_2	%	11.1	8.7
H_2S	ppm	0	18

- The Event #2C extraction well induced vacuum and well vapor flow are compared with Event #2B in the table below.

Well Vacuum and Well Vapor Flow Well MW-1			
Data Element		**Event #2C**	**Event #2B**
Well Vacuum- Max	"H_2O	35.00	40.00
Well Vacuum- Avg	"H_2O	35.00	38.00
Well Vacuum- Min	"H_2O	35.00	30.00
Well Vapor Flow- Max	scfm	24.90	25.55
Well Vapor Flow- Avg	scfm	24.90	25.19
Well Vapor Flow- Min	scfm	24.90	23.39

- The groundwater pump inlet was set at 45.5 ft BTOC in well MW-1. The average groundwater pump rate during the course of Event #2C was 0.14 gpm, and the maximum groundwater pump rate was 0.14 gpm. The total liquid volume recovered was 80 gals.
- The average groundwater depression, based on the positioning of the groundwater pump in well MW-1, was 6.0 ft below the hydro-equivalent static level.
- No measurable LNAPL was recorded in well MW-1 prior to the start of Event #2C, and no measurable LNAPL was recorded at the conclusion of the Event #2C.

The total LNAPL removed, including liquid and vapor, during the 10.25 hour Event #2C, Well MW-1, was 11.2 gals.

ADDITIONAL INFORMATION

- Well MW-1 produced a steady amount of liquid volume during the course of the Event #2C. However, no quantifiable liquid LNAPL was recovered from well MW-1.
- All LNAPL volume recovered, 11.2 gals, was burned as IC engine fuel.
- The TPH vapor concentrations were on an increasing trend during Event #2C, and then decreased at the end of the event. The initial TPH reading was 17,9400 ppmv, the average reading was 20,210 ppmv, the maximum reading, 22,370 ppmv was at event hour 10.25, and the lowest reading, 17,940 ppmv, was recorded at event hour 0.50.

The total LNAPL removed, including liquid and vapor, during the 28.25 hour Event #2, Well MW-1, was 42.2 gals.

METHOD OF CALIBRATION AND CALCULATIONS

The HORIBA® Analytical instrument is calibrated with Hexane, CO and CO_2.

The formula used to calculate the emission rate is:

$$ER = HC\ (ppmv) \times MW\ (Hexane) \times Flow\ Rate\ (scfm) \times 1.58E^{-7} \frac{(min)(lb\ mole)}{(hr)(ppmv)(ft^3)} = lbs/hr$$

INFORMATION INCLUDED WITH REPORT

- Table #1 Summary Well Data
- Table #2 Summary Recovery Data
- Recorded Data
- Photographs of the MDPE System, Well MW-1.

After you have reviewed the report and if you have any questions, please contact me. We appreciate you selecting AcuVac to provide this service.

Sincerely,
ACUVAC REMEDIATION, LLC

Paul D. Faucher
Vice President, Operations

Summary Well Data
Table #1

Event		2A	2B	2C
WELL NO.		**MW-1**	**MW-1**	**MW-1**
Total Event Hours		6.0	12.0	10.25
TD	ft BGS	47.0	47.0	47.0
Well Screen	ft BGS	32.0 – 47.0	32.0 – 47.0	32.0 – 47.0
Well Size	in	4.0	4.0	4.0
Well Data				
DTGW - Static - Start Event	ft BTOC	38.58	-	38.91
DTLNAPL - Static - Start Event	ft BTOC	38.54	-	-
LNAPL	ft BTOC	0.04	-	-
Hydro-Equivalent- Beginning	ft BTOC	38.55	-	38.91
DTGW - End Event	ft BTOC	-	47.15	38.61
DTLNAPL - End Event	ft BTOC	-	-	-
LNAPL	ft BTOC	-	-	-
Hydro-Equivalent- Ending	ft BTOC	-	47.15	38.61
Extraction Data				
Maximum Extraction Well Vacuum	"H_2O	35.00	40.00	35.00
Average Extraction Well Vacuum	"H_2O	31.67	38.00	35.00
Minimum Extraction Well Vacuum	"H_2O	20.00	30.00	35.00
Maximum Extraction Well Vapor Flow	scfm	23.62	25.55	24.90
Average Extraction Well Vapor Flow	scfm	23.11	25.19	24.90
Minimum Extraction Well Vapor Flow	scfm	22.01	23.39	24.90
Maximum GW / LNAPL Pump Rate	gpm	0.42	0.60	0.14
Average GW / LNAPL Pump Rate	gpm	0.12	0.23	0.14
Influent Data				
Maximum TPH	ppmv	38,040	38,890	22,370
Average TPH	ppmv	31,603	33,057	20,210
Minimum TPH	ppmv	27,720	26,760	17,940
Initial TPH	ppmv	27,910	32,660	17,940
Final TPH	ppmv	27,720	26,760	22,370
Average CO_2	%	7.86	6.54	4.86
Average CO	%	0.44	0.31	0.07
Average O_2	%	8.7	8.7	11.1
Average H_2S	ppm	67	18	0

Summary Recovery Data
Table #2

Event		2A	2B	2C
WELL NO.		**MW-1**	**MW-1**	**MW-1**
Recovery Data- Current Event				
Total Liquid Volume Recovered	gals	65	191	80
Total Liquid LNAPL Recovered	gals	-	-	-
Total Liquid LNAPL Recovered / Total Liquid	%	-	-	-
Total Liquid LNAPL Recovered / Total LNAPL	%	-	-	-
Total Vapor LNAPL Recovered	gals	9.5	21.6	11.2
Total Vapor LNAPL Recovered / Total LNAPL	%	100.00	100.00	100.00
Total Vapor and Liquid LNAPL Recovered	gals	9.5	21.6	11.2
Average LNAPL Recovery	gals/hr	1.6	1.8	1.1
Total LNAPL Recovered	lbs	66	151	78
Total Volume of Well Vapors	cu. ft	8,320	18,137	15,314
Recovery Data- Cumulative				
Total Liquid Volume Recovered	gals	233	424	504
Total Liquid LNAPL Recovered	gals	-	-	-
Total Vapor LNAPL Recovered	gals	13.9	35.5	46.6
Total Vapor and Liquid LNAPL Recovered	gals	13.9	38.5	46.6
Average LNAPL Recovery	gals/hr	1.1	1.4	1.3
Total LNAPL Recovered	lbs	97	248	326
Total Volume of Well Vapors	cu. ft	18,072	36,209	51,522

AcuVac Remediation

OPERATING DATA – EVENT # 2A PAGE # 1 ACUVAC MDP SYSTEM

Location: Johnston Federal #6A, San Juan County, NM **Project Managers: Faucher / George**

Well # MW-1 TD 47.0 BGS

		Date	7/15/17					
		Time	1000	1030	1100	1130	1200	1230
		Hr Meter	1735.2	1735.7	1736.2	1736.7	1737.2	1737.7
ENGINE / BLOWER	Engine Speed	RPM	2000	2100	2100	2100	2100	2000
	Oil Pressure	psi	50	50	50	50	50	50
	Water Temp	°F	150	150	150	150	150	150
	Alternator	Volts	13	13	13	13	13	13
	Intake Vacuum	"Hg	10	10	10	10	10	10
	Gas Flow Fuel/Propane	cfh	130	130	130	130	130	130
ATMOSPHERE VACUUM / AIR	Extraction Well Vac.	"H_2O	20	20	30	30	30	30
	Extraction Well Flow	scfm	22.01	22.01	22.52	22.52	22.52	22.52
	Influent Vapor Temp.	°F	70	70	70	70	70	70
	Air Temp	°F	–	–	–	–	–	–
	Barometric Pressure	"Hg	–	–	–	–	–	–
VAPOR / INFLUENT	TPH	ppmv	–	–	27,910	–	38,040	–
	CO_2	%	–	–	8.32	–	8.48	–
	CO	%	–	–	.30	–	.71	–
	O_2	%	–	–	10.2	–	9.9	–
	H_2S	ppm	–	–	38	–	100	–
NOTES	See page 2 for notes							
	1045							
RECOVERY	TOTALIZER			2438.84	2448.91	2460.13	2472.83	2477.67
	Pump Rate	gals/min		.37	.42	.16	.17	.20
	Total Volume	gals		~~0~~	21.29	33.99	38.83	43.83
	NAPL	% Vol	sheen	sheen	sheen	sheen	sheen	sheen
	NAPL	Gals	–	–	–	–	–	–
	GW Depression	ft						
	Extraction Well	DTNAPL	38.54					
	Extraction Well	DTGW	38.58					

.04

AcuVac Remediation

OPERATING NOTES - EVENT # 2A PAGE # 2 ACUVAC MDP SYSTEM

Location: Johnston Federal #6A, San Juan County, NM Project Managers: Faucher / Hendley

NOTES

7/15/17

0730 Arrived at JF #4 site for tailgate safety meeting.

0900 Arrived at JF #6A site. Positioned Acu Vac system near MW-1. Mobilized AcuVac equipment. Gauged MW-1: DTNAPL = 38.54, DTGW = 38.58, NAPL thickness = 0.04. Positioned in-well GeoTech pump 18" above bottom of well.

1000 Event started. Initial well vac 20" H_2O with a scfm

1045 flow. (1045) GW Pump started, ran out of liquid in approx. 5 minutes. GeoTech pump then began automatic on/off when liquid was present in well.

1100 Increased well vac to 30" H_2O. GeoTech pump then kept a continuous low pump rate. It did not stop itself. Initial vapor sample obtained. TPH vapor = 27,910 ppm. This is much higher than last event which was conducted in cold weather conditions.

1200 Well vapor sample obtained. TPH vapors ↑ 38,040. CO ↑. CO_2 ↑. H_2S high at 100 ppm.

1230 Total volume flow rate started to slowed to approx. 0.15 gpm for remainder of event.

AcuVac Remediation

OPERATING DATA – EVENT # 2A PAGE # 3 ACUVAC MDP SYSTEM

Location: Johnston Federal #6A, San Juan County, NM **Project Managers: Faucher / George**

Well # MW-1

		Date	7/15/17					
		Time	1300	1330	1400	1430	1500	1530
		Hr Meter	1738.2	1738.7	1739.2	1739.7	1740.2	1740.7
ENGINE / BLOWER	Engine Speed	RPM	2000	1900	1900	2000	2000	2000
	Oil Pressure	psi	50	50	50	50	50	50
	Water Temp	°F	160	150	150	150	160	160
	Alternator	Volts	13	13	13	13	13	13
	Intake Vacuum	"Hg	10	10	10	10	10	10
	Gas Flow Fuel/Propane	cfh	130	130	130	130	130	130
ATMOSPHERE VACUUM / AIR	Extraction Well Vac.	"H_2O	35	35	35	35	35	35
	Extraction Well Flow	scfm	23.62	23.62	23.62	23.62	23.62	23.62
	Influent Vapor Temp.	°F	70	70	70	70	70	70
	Air Temp	°F	–	–	–	–	–	–
	Barometric Pressure	"Hg	–	–	–	–	–	–
VAPOR / INFLUENT	TPH	ppmv	–	–	32,740	–	–	–
	CO_2	%	–	–	7.42	–	–	–
	CO	%	–	–	.47	–	–	–
	O_2	%	–	–	9.2	–	–	–
	H_2S	ppm	–	–	59	–	–	–

NOTES

~~See page # for notes.~~

At 1300 increased well vac to 35" H_2O. All else remained same.

well vapor sample taken at 1400, TPH ↓ 32,740. CO + CO_2 also ↓.

RECOVERY	GW Pump totalizer	~~ON/OFF~~	2482.63	2488.81	2498.19	2494.80	2498.24	2502.22
	Pump Rate	gals/min	.08	.12	.11	.13	.05	–
	Total Volume	gals	49.97	52.35	56.06	59.40	63.38	64.92
	NAPL	% Vol	sheen	sheen	sheen	sheen	sheen	sheen
	NAPL	Gals	–	–	–	–	–	–
	GW Depression	ft						
	Extraction Well	DTNAPL						
	Extraction Well	DTGW						

AcuVac Remediation

OPERATING DATA – EVENT # 2A PAGE # 4 ACUVAC MDP SYSTEM

Location: Johnston Federal #6A, San Juan County, NM **Project Managers: Faucher / George**

Well # MW-1

	Date		7/15/17					
	Time		1600	1630	1700			
	Hr Meter		1741.2					
ENGINE / BLOWER	Engine Speed	RPM	2000					
	Oil Pressure	psi	50					
	Water Temp	°F	150					
	Alternator	Volts	13					
	Intake Vacuum	"Hg	10					
	Gas Flow Fuel/Propane	cfh	130					
ATMOSPHERE VACUUM / AIR	Extraction Well Vac.	"H_2O	35					
	Extraction Well Flow	scfm	23.62					
	Influent Vapor Temp.	°F	70					
	Air Temp	°F	—					
	Barometric Pressure	"Hg	—					
VAPOR / INFLUENT	TPH	ppmv	27,720					
	CO_2	%	7.22					
	CO	%	.29					
	O_2	%	5.4					
	H_2S	ppm	72					

ISSUED

STOP WORK

NOTES

At 1600 the event was called due to weather. Acu Vac system shut down + demobed equipment that needed protection from the rain.

Departed site at 16:33 and traveled back to Farmington.

RECOVERY	TOTALIZER	ON/OFF	2503.76					
	Pump Rate	gals/min	—					
	Total Volume	gals	64.52					
	NAPL	% Vol	—					
	NAPL	Gals	—					
	GW Depression	ft						
	Extraction Well	DTNAPL	ND					
	Extraction Well	DTGW	ND					

AcuVac Remediation

OPERATING DATA – EVENT # 2B PAGE # 1 ACUVAC MDP SYSTEM

Location: Johnston Federal #6A, San Juan County, NM **Project Managers: Faucher / George**

Well # MW-1

		Date	7/16/17					
		Time	0615	0645	0715	0745	0815	0845
		Hr Meter	1741.4	1742.0	1742.5	1743.0	1743.5	1744.0
ENGINE / BLOWER	Engine Speed	RPM	2000	2000	2000	2100	2100	2100
	Oil Pressure	psi	50	50	50	50	50	50
	Water Temp	°F	145	145	150	150	150	150
	Alternator	Volts	13	13	13	13	13	13
	Intake Vacuum	"Hg	10	10	10	10	10	10
	Gas Flow Fuel/Propane	cfh	120	120	130	130	120	120
ATMOSPHERE VACUUM / AIR	Extraction Well Vac.	"H_2O	30	30	30	35	35	35
	Extraction Well Flow	scfm	23.39	23.39	23.39	24.91	24.91	24.91
	Influent Vapor Temp.	°F	70	70	70	70	70	70
	Air Temp	°F	–	–	–	–	–	–
	Barometric Pressure	"Hg	–	–	–	–	–	–
VAPOR / INFLUENT	TPH	ppmv	–	–	32,660	–	–	–
	CO_2	%	–	–	6.66	–	–	–
	CO	%	–	–	.41	–	–	–
	O_2	%	–	–	6.6	–	–	–
	H_2S	ppm	–	–	33	–	–	–
NOTES	see page 2 for notes.							
RECOVERY	TOTALIZER		2503.76	2523.82	2537.19	2548.47	2558.17	2568.90
	Pump Rate	gals/min	–	.44	.38	.32	.36	.26
	Total Volume	gals	0	20.12	33.43	44.71	54.41	65.12
	NAPL	% Vol	–	SHEEN	SHEEN	SHEEN	SHEEN	SHEEN
	NAPL	Gals	–	–	–	–	–	–
EW	Data Logger Head	ft	–	–	–	–	–	–
	GW Depression	ft						
	Extraction Well	DTNAPL	ND					
	Extraction Well	DTGW	ND					

AcuVac Remediation

OPERATING NOTES - EVENT # 2B PAGE # 2 ACUVAC MDP SYSTEM

Location: Johnston Federal #6A, San Juan County, NM Project Managers: Faucher / George

Date: 7/16/17 MW-1

NOTES

0600 Arrived at site. Started AcuVac Unit. Mobilized equipment put away the day before due to weather conditions.

0615 Event started. Well vac = 30" H_2O. weather conditions good

0715 Initial vapor sample obtained. TPH = 32,660, CO = .41, CO_2 = 6.66 O_X = 6.6, H_2S = 33

0745 Well vac ↑ to 35" H_2O. Recovery flow rate from well much higher than yesterday. 45 total g/s @ 0745.

0815 Flow rate has slowed to .35 per gallon. However overall total volume & rate much higher than yesterday.

AcuVac Remediation

OPERATING DATA – EVENT # 2B PAGE # 3 ACUVAC MDP SYSTEM

Location: Johnston Federal #6A, San Juan County, NM **Project Managers: Faucher / George**

Well # MW-1

		Date	7/16/17					
		Time	0915	0945	1015	1045	1115	1145
		Hr Meter	1744.5	1745.0	1745.5	1746.0	1746.5	1747.0
ENGINE / BLOWER	Engine Speed	RPM	2000	2000	2000	2000	2000	
	Oil Pressure	psi	50	50	50	50	50	50
	Water Temp	°F	160	160	160	160	160	150
	Alternator	Volts	13	13	13	13	13	13
	Intake Vacuum	"Hg	10	10	10	10	10	10
	Gas Flow Fuel/Propane	cfh	100	100	100	90	90	90
ATMOSPHERE VACUUM / AIR	Extraction Well Vac.	"H_2O	35	40	40	40	40	40
	Extraction Well Flow	scfm	24.91	25.55	25.55	25.55	25.55	25.55
	Influent Vapor Temp.	°F	70	70	70	70	70	70
	Air Temp	°F	–	–	–	–	–	–
	Barometric Pressure	"Hg	–	–	–	–	–	–
VAPOR / INFLUENT	TPH	ppmv	29,960	–	–	–	35,910	–
	CO_2	%	6.60	–	–	–	5.98	–
	CO	%	.34	–	–	–	.22	–
	O_2	%	7.3	–	–	–	8.2	–
	H_2S	ppm	37	–	–	–	34	–

NOTES

0915 Flow rate • volume slowed to 8.8 g/s = .30 per gallon. Increased well vac to max at 40 "H_2O. Vapor samples obtained. TPH ↓.

0945 Flow ↑ to 10 g/s + .35 "H_2O.

1045 Generator stopped. Oil added. Restart generator at 11:20.

1115 Vapor samples obtained 1115. TPH ↑ 35,910. H_2S constant @ 34 ppm CO_2 + CO ↓.

1145 After re-start of pump, water column pumped down. 18 g/s from 11:20 → 11:45,

RECOVERY								
	~~GW Pump~~ Totalizer ~~ON/OFF~~		2576.76	2586.25	2595.45	2596.10	2596.10	2614.10
	Pump Rate	gals/min	.32	.31	.02	–	.60	.39
	Total Volume	gals	73.0	82.49	91.69	92.34	92.34	110.34
	NAPL	% Vol	SHEEN	SHEEN	SHEEN	SHEEN	SHEEN	SHEEN
	NAPL	Gals	–	–	–	–	–	–
	GW Depression	ft	–	–	–	–	–	–
	Extraction Well	DTNAPL						
	Extraction Well	DTGW						

AcuVac Remediation

OPERATING DATA – EVENT # 23 PAGE # 4 ACUVAC MDP SYSTEM

Location: Johnston Federal #6A, San Juan County, NM **Project Managers: Faucher / George**

Well # MW-1

		Date	7/16/17					
		Time	1215	1245	1315	1345	1415	1445
		Hr Meter	1747.5	1748.0	1748.5	1749.0	1749.5	1750.0
ENGINE / BLOWER	Engine Speed	RPM	2000	2000	2000	2000	2000	2000
	Oil Pressure	psi	50	50	50	50	50	50
	Water Temp	°F	160	150	150	160	160	160
	Alternator	Volts	13	13	13	13	13	13
	Intake Vacuum	"Hg	10	10	10	10	10	10
	Gas Flow Fuel/Propane	cfh	80	80	80	80	80	80
ATMOSPHERE VACUUM / AIR	Extraction Well Vac.	"H_2O	40	40	40	40	40	40
	Extraction Well Flow	scfm	25.55	25.55	25.55	25.55	25.55	25.55
	Influent Vapor Temp.	°F	70	70	70	70	70	70
	Air Temp	°F	–	–	–	–	–	–
	Barometric Pressure	"Hg	–	–	–	–	–	–
VAPOR / INFLUENT	TPH	ppmv	–	–	38,890	–	–	–
	CO_2	%	–	–	6.46	–	–	–
	CO	%	–	–	.59	–	–	–
	O_2	%	–	–	9.4	–	–	–
	H_2S	ppm	–	–	3.1	–	–	–

NOTES

1215 Total volume flow rate evened out at .25 gallon per minute.

1315 Vapor sample obtained. TPH ↑, CO + CO_2 ↑, H_2S ↓

RECOVERY	~~GW Pump~~ Totalizer		2625.87	2632.43	2638.30	2645.60	2652.14	2659.20
	Pump Rate	gals/min	.22	.20	.22	.25	.23	.21
	Total Volume	gals	122.11	128.67	134.54	141.24	148.73	155.50
	NAPL	% Vol	SHEEN	SHEEN	SHEEN	SHEEN	SHEEN	SHEEN
	NAPL	Gals	–	–	–	–	–	–
	GW Depression	ft	–	–	–	–	–	–
	Extraction Well	DTNAPL						
	Extraction Well	DTGW						

AcuVac Remediation

OPERATING DATA – EVENT # 2B PAGE # 5 ACUVAC MDP SYSTEM

Location: Johnston Federal #6A, San Juan County, NM **Project Managers: Faucher / George**

Well # MW-1

		Date	7/16/17	7/16/17	7/16/17	7/16/17	7/16/17	7/16/17
		Time	1515	1545	1615	1645	1715	1745
		Hr Meter	1750.5	1751.0	1751.5	1752.0	1752.5	1753.0
ENGINE / BLOWER	Engine Speed	RPM	2000	2000	2000	2000	2000	2000
	Oil Pressure	psi	50	50	50	50	50	50
	Water Temp	°F	160	160	160	160	150	150
	Alternator	Volts	13	13	13	13	13	13
	Intake Vacuum	"Hg	10	10	10	10	10	10
	Gas Flow Fuel/Propane	cfh	80	80	80	80	80	80
ATMOSPHERE VACUUM / AIR	Extraction Well Vac.	"H_2O	40	40	40	40	40	40
	Extraction Well Flow	scfm	25.55	25.55	25.55	25.55	25.55	25.55
	Influent Vapor Temp.	°F	70	70	70	70	70	70
	Air Temp	°F	–	–	–	–	–	–
	Barometric Pressure	"Hg	–	–	–	–	–	–
VAPOR / INFLUENT	TPH	ppmv	34,160	–	–	–	26,760	–
	CO_2	%	6.22	–	–	–	7.30	–
	CO	%	.15	–	–	–	.13	–
	O_2	%	10.3	–	–	–	10.2	–
	H_2S	ppm	0	–	–	–	0	–

NOTES

1515 Vapor samples obtained. TPH = 34,160 ↓ H_2S not present + has declined in event.

1545 Volume flow rate trending down during event.

1715 Vapor samples obtained. TPH = 34,160 ↓. TPH stayed constant in this range for event.

RECOVERY								
	TOTALIZER		2665.50	2671.64	2677.25	2682.34	2686.57	2691.05
	Pump Rate	gals/min	.20	.19	.17	.14	.15	.12
	Total Volume	gals	161.74	167.88	173.49	178.58	182.81	187.29
	NAPL	% Vol	SHEEN	SHEEN	SHEEN	SHEEN	SHEEN	SHEEN
	NAPL	Gals	–	–	–	–	–	–
	GW Depression	ft	–	–	–	–	–	–
	Extraction Well	DTNAPL						
	Extraction Well	DTGW						

AcuVac Remediation

OPERATING DATA – EVENT # 23 PAGE # 6 ACUVAC MDP SYSTEM

Location: Johnston Federal #6A, San Juan County, NM **Project Managers: Faucher / George**

Well # MW-1	Date	7/16/17						
	Time	1815						
	Hr Meter	1753.0						
ENGINE / BLOWER	Engine Speed RPM	2000						
	Oil Pressure psi	50						
	Water Temp °F	150						
	Alternator Volts	13						
	Intake Vacuum "Hg	10						
	Gas Flow Fuel/Propane cfh	80						
ATMOSPHERE VACUUM / AIR	Extraction Well Vac. "H_2O	40						
	Extraction Well Flow scfm							
	Influent Vapor Temp. °F	70						
	Air Temp °F	–						
	Barometric Pressure "Hg	–						
VAPOR / INFLUENT	TPH ppmv	–						
	CO_2 %	–						
	CO %	–						
	O_2 %	–						
	H_2S ppm	–						
NOTES	1815 End of event, Total volume = 191 gallons.							
RECOVERY	TOTALIZER	2694.75						
	Pump Rate gals/min	.20						
	Total Volume gals	190.99						
	NAPL % Vol							
	NAPL Gals							
	GW Depression ft	8.50						
	Extraction Well DTNAPL	Trace						
	Extraction Well DTGW	47.15						

AcuVac Remediation

OPERATING DATA – EVENT # 2C **PAGE #** 1 **ACUVAC MDP SYSTEM**

Location: Johnston Federal #6A, San Juan County, NM **Project Managers: Faucher / George**

Well # MW-1

		Date	7/17/17					
		Time	0730	0800	0900	1000	1100	1200
		Hr Meter	1753.5	1754.0	1754.5	1755.5	1756.5	1757.5
ENGINE / BLOWER	Engine Speed	RPM	1800	1800	1800	1800	1800	1800
	Oil Pressure	psi	50	50	50	50	50	50
	Water Temp	°F	150	150	150	150	150	150
	Alternator	Volts	13	13	13	13	13	13
	Intake Vacuum	"Hg	10	10	10	10	10	10
	Gas Flow Fuel/Propane	cfh	80	80	80	80	80	80
ATMOSPHERE VACUUM / AIR	Extraction Well Vac.	"H_2O	35	35	35	35	35	35
	Extraction Well Flow	scfm	24.90	24.90	24.90	24.90	24.90	24.90
	Influent Vapor Temp.	°F	70	70	70	70	70	70
	Air Temp	°F	–	–	–	–	–	–
	Barometric Pressure	"Hg	–	–	–	–	–	–
VAPOR / INFLUENT	TPH	ppmv	–	17,940	–	–	–	–
	CO_2	%	–	4.86	–	–	–	–
	CO	%	–	.07	–	–	–	–
	O_2	%	–	11.1	–	–	–	–
	H_2S	ppm	–	0	–	–	–	–
NOTES								
RECOVERY	~~GW Pump~~ Tahlizer	ON/OFF	2694.75	2713.21	–	–	–	–
	Pump Rate	gals/min	–	–	–	–	–	–
	Total Volume	gals	–	–	–	–	–	–
	NAPL	% Vol	–	SHEEN	SHEEN	SHEEN	SHEEN	SHEEN
	NAPL	Gals	–	–	–	–	–	–
	GW Depression	ft						
	Extraction Well	DTNAPL	–					
	Extraction Well	DTGW	38.91					

AcuVac Remediation

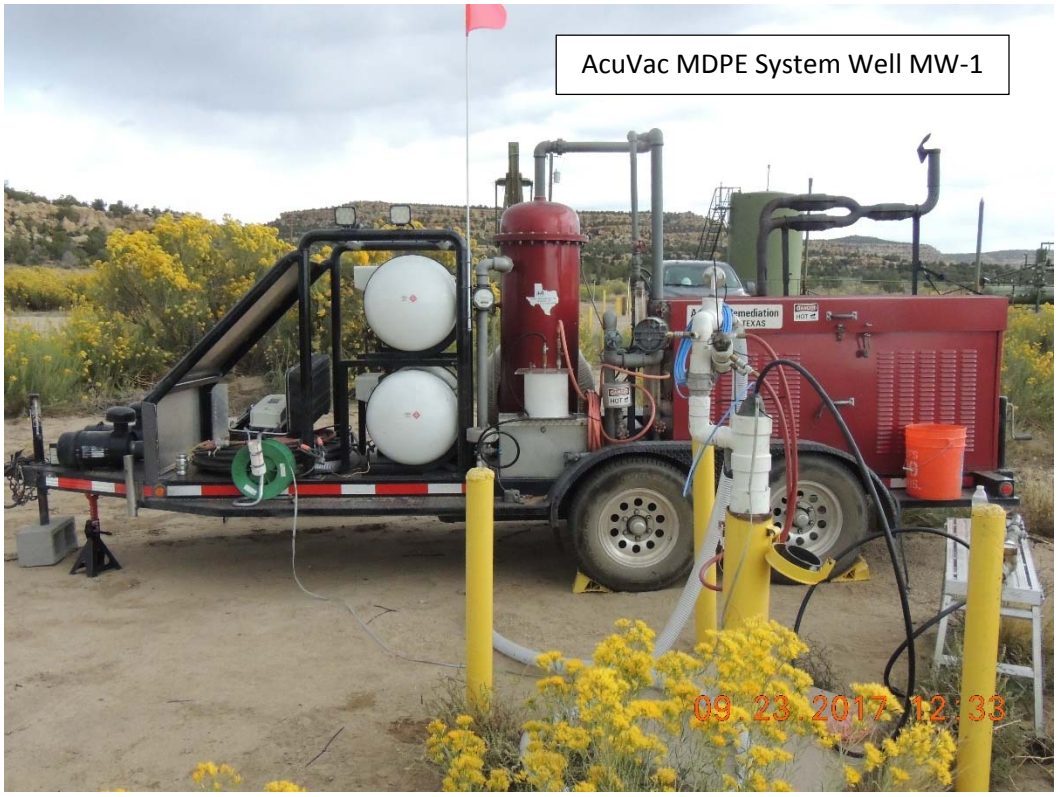
OPERATING DATA – EVENT # 2C **PAGE #** 2 **ACUVAC MDP SYSTEM**

Location: Johnston Federal #6A, San Juan County, NM **Project Managers: Faucher / George**

Well # MW-1

		Date	7/11/17					
		Time	1300	1400	1500	1600	1745	
		Hr Meter	1758.5	1759.5	1760.5	1761.5	1782.75	
ENGINE / BLOWER	Engine Speed	RPM	1800	1800	1800	1800	1800	
	Oil Pressure	psi	50	50	50	50	50	
	Water Temp	°F	160	160	160	160	160	
	Alternator	Volts	13	13	13	13	13	
	Intake Vacuum	"Hg	10	10	10	10	10	
	Gas Flow Fuel/Propane	cfh	80	80	80	80	80	
ATMOSPHERE VACUUM / AIR	Extraction Well Vac.	"H_2O	35	35	35	35	35	
	Extraction Well Flow	scfm	24.90	24.90	24.90	24.90	24.90	
	Influent Vapor Temp.	°F	70	70	70	70	70	
	Air Temp	°F	-	-	-	-	-	
	Barometric Pressure	"Hg	-	-	-	-	-	
VAPOR / INFLUENT	TPH	ppmv	-	-	20,320	-	22,370	
	CO_2	%	-	-	4.60	-	4.74	
	CO	%	-	-	.12	-	.16	
	O_2	%	-	-	12.8	-	13.0	
	H_2S	ppm	-	-	0	-	0	
NOTES								
RECOVERY	GW Pump	ON/OFF	-	-	-	-	2775.12	
	Pump Rate	gals/min	-	-	-	-	.14	
	Total Volume	gals	-	-	-	-	80.37	
	NAPL	% Vol	-	-	-	-	SHEEN	
	NAPL	Gals	-	-	-	-	-	
	GW Depression	ft						
	Extraction Well	DTNAPL					-	
	Extraction Well	DTGW					38.61	

JOHNSTON FEDERAL #6A
SAN JUAN COUNTY, NM

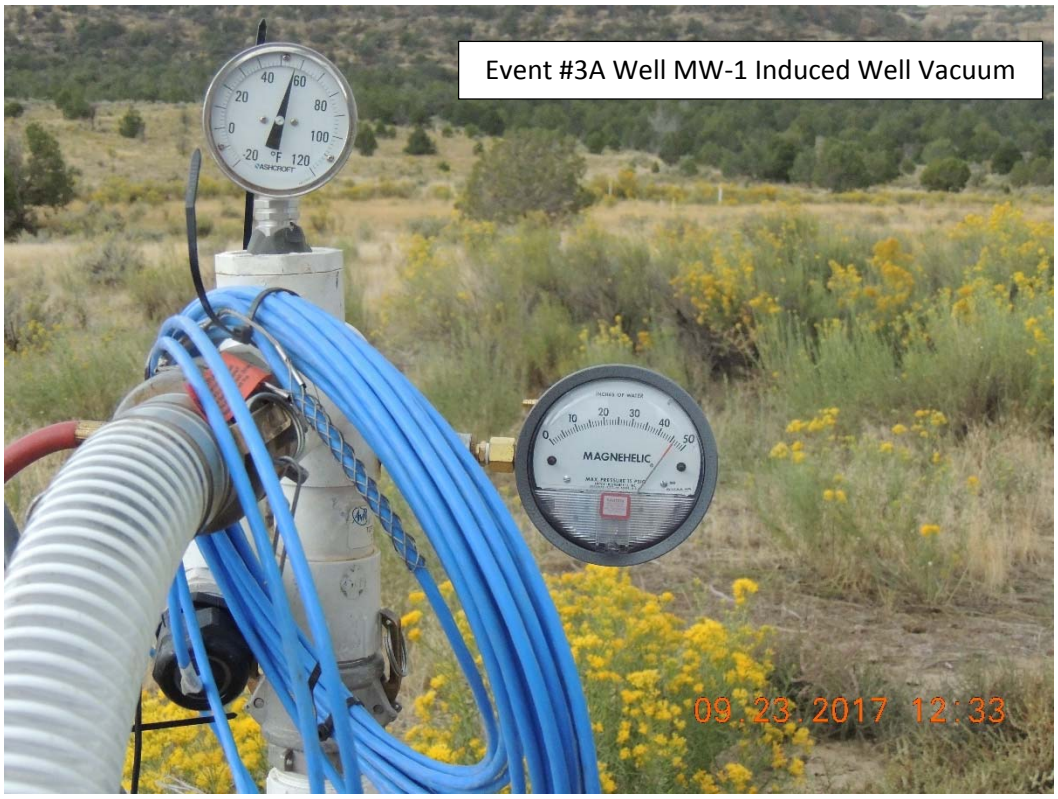


AcuVac MDPE System Well MW-1

AcuVac MDPE System Well MW-1

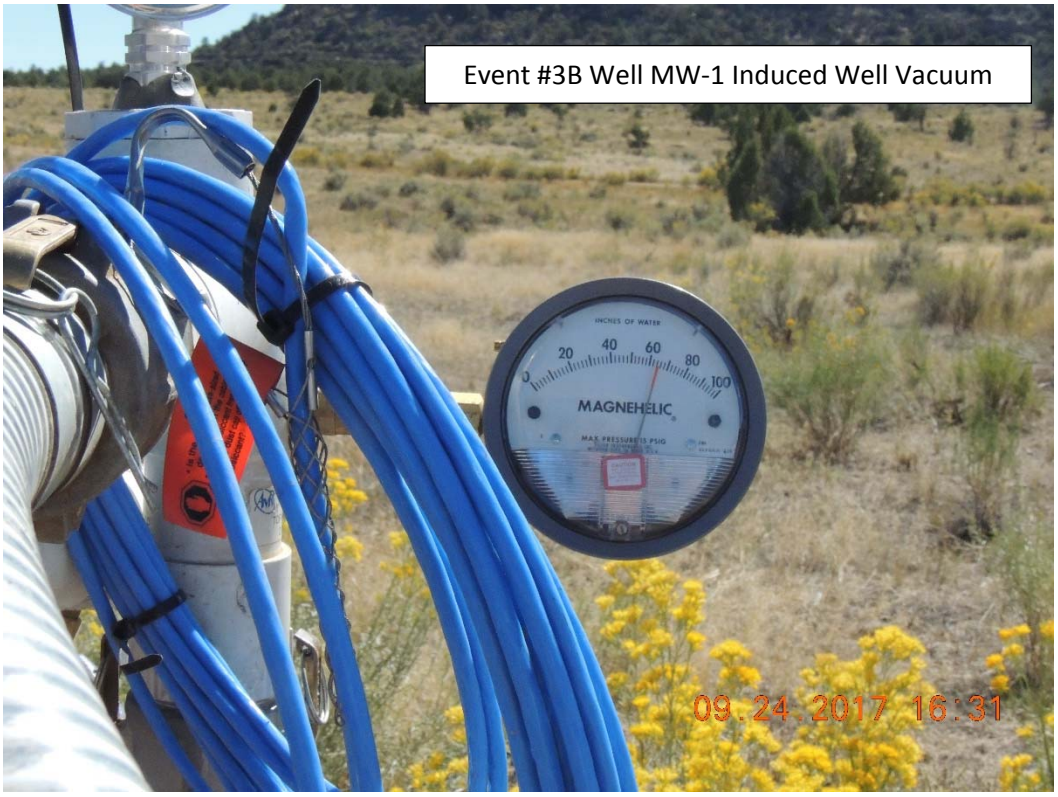
JOHNSTON FEDERAL #6A
SAN JUAN COUNTY, NM

Well MW-1 and Standby Collection Tank



Event #3A Well MW-1 Induced Well Vacuum

JOHNSTON FEDERAL #6A
SAN JUAN COUNTY, NM



AcuVac Remediation, LLC
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October 6, 2017

Mr. Stephen Varsa
Supervising Hydrogeologist
Stantec Consulting Services, Inc.
11153 Aurora Avenue
Des Moines, IA 50322

Dear Stephen:

Re: Johnston Federal No. 6A, San Juan County, NM (Event #3)

At your request, AcuVac Remediation, LLC (AcuVac) performed three Mobile Dual Phase Extraction (MDPE) events on well MW-1; 4.0 hour Event #3A on September 23, 2017, and 10.0 hour Event #3B on September 24, 2017 and 10.0 hour Event #3C on September 25, 2017, at the above referenced site (Site). Following is the Report and a copy of the Operating Data collected during Event #3. Additionally, the attached Table #1 contains the Summary Well Data, and Table #2 contains the Summary Recovery Data.

The purpose of the MDPE events was to enhance recovery of Phase Separated Hydrocarbons (PSH) present at the Site through the removal of petroleum hydrocarbons in both liquid and vapor phases. PSH is referred to as petroleum hydrocarbons and Light Non-Aqueous Phase Liquids (LNAPL). The source of the PSH is a historical release of natural gas condensate.

OBJECTIVES

The objectives of the MDPE events were to:

- Maximize liquid and vapor phase petroleum hydrocarbon removal from groundwater and soils in the subsurface formations within the influence of the extraction well.
- Expose the capillary fringe area and below to the extraction well induced vacuums.
- Increase the vapor phase and liquid LNAPL specific yields with high induced vacuums.
- Create an induced hydraulic gradient to gain hydraulic control of the area surrounding the extraction well during the event periods.
- Select and monitor the groundwater depression and pump rates to accomplish the above objectives.

METHODS AND EQUIPMENT

AcuVac owns and maintains an inventory of equipment to perform MDPE events. No third party equipment was utilized. The events at the Site were conducted using the AcuVac I-6 System (System) with a Roots RAI-33 blower used as a vacuum pump and a Roots RAI-22 positive displacement blower. The following table lists equipment and instrumentation employed during Event #3, and the data element captured by each.

Equipment and Instrumentation Employed by AcuVac	
Measurement Equipment	**Data Element**
Extraction Well Induced Vacuum and Flow	
Dwyer Magnehelic Gauges	Extraction Well Vacuum
Dwyer Averaging Pitot Tubes / Magnehelic Gauges	Extractions Well Vapor Flow
Observation Wells	
Dwyer Digital Manometer	Vacuum / Pressure Influence
Extraction Well Vapor Monitoring	
V-1 vacuum box	Extraction Well Non-Diluted Vapor Sample Collection
HORIBA® Analyzer	Extraction Well Vapor TPH Concentration
QRae Mini II O_2 Monitor	Extraction Well Vapor Oxygen Content
LNAPL Thickness (if present)	
Solinst Interface Probes Model 122	Depth to LNAPL and Depth to Groundwater
Liquid Recovery	
Totalizer Flow Meter	Liquid Flow and Total Volume
Grundfos Red-Flo 2 Total Fluids Pump	In-Well Pumping
Grundfos Variable Frequency Drive	Pump Speed and Other Diagnostics
Groundwater Depression / Upwelling	
In-Situ Level Troll 700 Data Logger	Liquid Column in Extraction and Observation Wells
In-Situ Vented Cable with Chamber	Equalize Well Vacuum/Pressure
In-Situ Rugged Reader Data Logger Interface	Capture Readings from Data Logger Trolls
Atmospheric Conditions	
Testo Model 511	Relative and Absolute Barometric Pressure

The vacuum extraction portion of the System consists of a vacuum pump driven by an internal combustion engine (IC engine). The vacuum pump was connected to the extraction well, and the vacuum created on the extraction well caused light hydrocarbons in the soil and on the groundwater to volatilize and flow through a moisture knockout tank to the vacuum pump and the IC engine where they were burned as part of the normal combustion process. Propane was used as auxiliary fuel to help power the engine if the well vapors did not provide the required energy.

The IC engine provided the power necessary to achieve and maintain high induced vacuums and/or high well vapor flows required to maximize the vacuum radius of influence for pilot tests and short term event remediation.

Emissions from the engine were passed through three catalytic converters to maximize destruction of removed hydrocarbon vapors. The engine's fuel-to-air ratio was adjusted to maintain efficient combustion. Because the engine is the power source for the equipment, the System stops when the engine stops. This prevents an uncontrolled release of hydrocarbons. Since the System is held entirely under vacuum, any leaks in the seals or connections are leaked into the System and not emitted into the atmosphere. The engine is automatically shut down by vacuum loss, low oil pressure, over speed, or overheating.

Groundwater extraction was provided by an in-well Grundfos Redi-Flo 2 total fluids pump that discharged through a totalizer/flow meter. The discharge line from this meter was then connected to a stand-by tank. The electrical power for the groundwater pump was supplied from a 120v Honda generator. The groundwater flow rate was adjusted to maintain a target level. An interface meter was used to collect depth to groundwater and depth to LNAPL measurements. Grab samples of recovered liquid were taken periodically in a graduated cylinder to determine the average percentage of LANPL being recovered.

The design of the AcuVac System enabled independent control of both the induced well vacuum and the groundwater pumping functions such that the AcuVac team controlled the induced hydraulic gradient to increase exposure of the formation to soil vapor extraction (SVE). The ability to separate the vapor and liquid flows within the extraction well improved the LNAPL recovery rates and enabled the AcuVac team to record data specific to each media.

RECOVERY SUMMARY FOR MDPE EVENT #3

The Recovery Summary table below lists the groundwater and LNAPL recovery data for Event #3, and compares the results to the previous Event #2.

Recovery Summary

	Event #3A	Event #3B	Event #3C	Total	
	MW-1	MW-1	MW-1	Event #3	Event #2
Event Hours	4.0	10.0	10.0	24.0	28.25
GW Recovery	103	259	228	590	336
NAPL Recovery					
Liquid	0	0	0	0	0
Vapor	3.4	8.2	8.6	20.2	42.3
Total	3.4	8.2	8.6	20.2	42.3
Gallons/Hour	**0.8**	**0.8**	**0.9**	**0.8**	**1.5**

SUMMARY OF MDPE EVENT #3A- WELL MW-1

- The total event time was 4.0 hours. The Event was conducted on September 23, 2017. The data is compared to Event #2C conducted on July 17, 2017, which had total event time of 10.25 hours.
- The total liquid volume recovered was 103 gals with no measureable liquid LNAPL recovered.
- Based on the HORIBA® data, total vapor LNAPL burned as IC engine fuel was 3.4 gals, for a total liquid and vapor LNAPL recovery of 3.4 gals, or 0.8 gals per hour.

- The volume of liquid and vapor LNPAL recovered during Event #3A is compared with Event #2C in the table below.

LNAPL Recovery Well MW-1					
		Event #3A		Event #2C	
		Amount	Percent	Amount	Percent
Event Hours		4.0	-	10.25	-
GW Recovery	gals	103	-	80	-
NAPL Recovery					
Liquid	gals	0	0	0	0
Vapor	gals	3.4	100.00	11.2	100.00
Total	gals	3.4	100.00	11.2	100.00
Gallons/Hour		**0.8**	**-**	**1.1**	**-**

- Average HORIBA® analytical data from the influent vapor samples for Event #3A is compared with Event #2C in the table below:

Influent Vapor Data Well MW-1			
Data Element		**Event #3A**	**Event #2C**
TPH- Maximum	ppmv	18,440	22,370
TPH- Average	ppmv	15,580	20,210
TPH- Minimum	ppmv	13,900	17,940
TPH- Initial	ppmv	14,400	17,940
TPH- Final	ppmv	13,900	22,370
CO_2	%	9.16	4.86
CO	%	0	0.07
O_2	%	7.3	11.1
H_2S	ppm	22	0

- The Event #3A extraction well induced vacuum and well vapor flow are compared with Event #2C in the table below.

Well Vacuum and Well Vapor Flow Well MW-1			
Data Element		**Event #3A**	**Event #2C**
Well Vacuum- Max	"H_2O	45.00	35.00
Well Vacuum- Avg	"H_2O	36.67	35.00
Well Vacuum- Min	"H_2O	30.00	35.00
Well Vapor Flow- Max	scfm	30.39	24.90
Well Vapor Flow- Avg	scfm	24.92	24.90
Well Vapor Flow- Min	scfm	18.02	24.90

- The groundwater pump inlet was set at 45.5 ft BTOC in well MW-1. The average groundwater pump rate during the course of Event #3A was 0.40 gpm, and the maximum groundwater pump rate was 0.46 gpm. The total liquid volume recovered was 103 gals.
- The average groundwater depression, based on the positioning of the groundwater pump in well MW-1, was 6.0 ft below the hydro-equivalent static level.
- No measured LNAPL was recorded in well MW-1 prior to the start of Event #3A, and no measureable LNAPL was recorded at the conclusion of the Event #3A.

The total LNAPL removed, including liquid and vapor, during the 4.0 hour Event #3A, well MW-1 was 3.4 gals.

ADDITIONAL INFORMATION

- Well MW-1 produced a steady amount of liquid volume during the course of the Event #3A. However, no quantifiable liquid LNAPL was recovered from well MW-1.
- All LNAPL volume recovered, 3.4 gals, was burned as IC engine fuel.
- The TPH vapor concentrations increased during Event #3A and then decreased at the end of the event. The initial TPH reading was 14,400 ppmv, the average reading was 15,580 ppmv, the maximum reading, 18,440 ppmv, was at event hour 2.0, and the lowest reading, 13,900 ppmv, was recorded at event hour 4.0.
- At approximately 1100 hours, event hour 4.0, a Stop Work was issued due to inclement weather moving into the area.

SUMMARY OF MDPE EVENT #3B- WELL MW-1

- The total event time was 10.0 hours. The Event was conducted on September 24, 2017. The data is compared to Event #3A conducted on September 23, 2017, which had total event time of 4.0 hours.
- The total liquid volume recovered was 259 gals with no measureable liquid LNAPL recovered.
- Based on the HORIBA® data, total vapor LNAPL burned as IC engine fuel was 8.2 gals, for a total liquid and vapor LNAPL recovery of 8.2 gals, or 0.8 gals per hour.

- The volume of liquid and vapor LNAPL recovered during Event #B is compared with Event #3A in the table below.

LNAPL Recovery Well MW-1					
		Event #3B		Event #3A	
		Amount	Percent	Amount	Percent
Event Hours		10.0	-	4.0	-
GW Recovery	gals	259	-	103	-
NAPL Recovery					
Liquid	gals	0	0	0	0
Vapor	gals	8.2	100.00	3.4	100.00
Total	gals	8.2	100.00	3.4	100.00
Gallons/Hour		**0.8**	**-**	**0.8**	**-**

- Average HORIBA® analytical data from the influent vapor samples for Event #3B is compared with Event #3A in the table below:

Influent Vapor Data Well MW-1			
Data Element		**Event #3B**	**Event #3A**
TPH- Maximum	ppmv	13,870	18,440
TPH- Average	ppmv	10,975	15,580
TPH- Minimum	ppmv	6,720	13,900
TPH- Initial	ppmv	6,720	14,400
TPH- Final	ppmv	10,610	13,900
CO_2	%	6.18	9.16
CO	%	0	0
O_2	%	12.7	7.3
H_2S	ppm	2	22

- The Event #3B extraction well induced vacuum and well vapor flow are compared with Event #3A in the table below.

Well Vacuum and Well Vapor Flow Well MW-1			
Data Element		**Event #3B**	**Event #3A**
Well Vacuum- Max	"H_2O	60.00	45.00
Well Vacuum- Avg	"H_2O	51.20	36.67
Well Vacuum- Min	"H_2O	30.00	30.00
Well Vapor Flow- Max	scfm	41.09	30.39
Well Vapor Flow- Avg	scfm	34.48	24.92
Well Vapor Flow- Min	scfm	20.44	18.02

- The groundwater pump inlet was set at 45.5 ft BTOC in well MW-1. The average groundwater pump rate during the course of Event #3B was 0.41 gpm, and the maximum groundwater pump rate was 0.77 gpm. The total liquid volume recovered was 259 gals.
- The average groundwater depression, based on the positioning of the groundwater pump in well MW-1, was 6.0 ft below the hydro-equivalent static level.
- LNAPL with a measured thickness of 0.01 ft was recorded in well MW-1 prior to the start of Event #3B. LNAPL with a measured thickness of 0.03 ft was recorded at the conclusion of the Event #3B.

The total LNAPL removed, including liquid and vapor, during the 10.0 hour Event #3B, Well MW-1 was 8.2 gals.

ADDITIONAL INFORMATION

- Well MW-1 produced a steady amount of liquid volume during the course of the Event #3B. However, no quantifiable liquid LNAPL was recovered from well MW-1.
- All LNAPL volume recovered, 8.2 gals, was burned as IC engine fuel.
- The TPH vapor concentrations increased during Event #3B and then decreased at the end of the event. The initial TPH reading was 6,720 ppmv, the average reading was 10,975 ppmv, the maximum reading, 13,870 ppmv, was at event hour 4.0, and the lowest reading, 6,720 ppmv, was recorded at event hour 0.5.

SUMMARY OF MDPE EVENT #3C- WELL MW-1

- The total event time was 10.0 hours. The event was conducted on September 25, 2017. The data is compared to Event #3B conducted on September 24, 2017, which had total event time of 10.0 hours.
- The total liquid volume recovered was 228 gals with no measureable liquid LNAPL recovered.
- Based on the HORIBA® data, total vapor LNAPL burned as IC engine fuel was 8.6 gals, for a total liquid and vapor LNAPL recovery of 8.6 gals, or 0.9 gals per hour.
- The volume of liquid and vapor LNPAL recovered during Event #3C is compared with Event #3B in the table below.

LNAPL Recovery Well MW-1					
		Event #3C		Event #3B	
		Amount	Percent	Amount	Percent
Event Hours		10.0	-	10.0	-
GW Recovery	gals	228	-	259	-
NAPL Recovery					
Liquid	gals	0	0	0	0
Vapor	gals	8.6	100.00	8.2	100.00
Total	gals	8.6	100.00	8.2	100.00
Gallons/Hour		**0.9**	**-**	**0.8**	**-**

- Average HORIBA® analytical data from the influent vapor samples for Event #3C is compared with Event #3B in the table below:

Influent Vapor Data Well MW-1			
Data Element		**Event #3C**	**Event #3B**
TPH- Maximum	ppmv	12,300	13,870
TPH- Average	ppmv	9,662	10,975
TPH- Minimum	ppmv	6,120	6,720
TPH- Initial	ppmv	8,760	6,720
TPH- Final	ppmv	11,710	10,610
CO_2	%	5.12	6.18
CO	%	0	0
O_2	%	15	12.7
H_2S	ppm	0	2

- The Event #3C extraction well induced vacuum and well vapor flow are compared with Event #3B in the table below.

Well Vacuum and Well Vapor Flow Well MW-1			
Data Element		**Event #3C**	**Event #3B**
Well Vacuum- Max	"H_2O	64.00	60.00
Well Vacuum- Avg	"H_2O	59.87	51.20
Well Vacuum- Min	"H_2O	30.00	30.00
Well Vapor Flow- Max	scfm	46.02	41.09
Well Vapor Flow- Avg	scfm	41.07	34.48
Well Vapor Flow- Min	scfm	21.66	20.44

- The groundwater pump inlet was set at 45.5 ft BTOC in well MW-1. The average groundwater pump rate during the course of Event #3C was 0.37 gpm, and the maximum groundwater pump rate was 0.81 gpm. The total liquid volume recovered was 228 gals.
- The average groundwater depression, based on the positioning of the groundwater pump in well MW-1, was 6.0 ft below the hydro-equivalent static level.
- LNAPL with a measured thickness of 0.01 ft was recorded in well MW-1 prior to the start of Event #3C. LNAPL with a measured thickness of 0.04 ft was recorded at the conclusion of the Event #3C.

The total LNAPL removed, including liquid and vapor, during the 10.0 hour Event #3C, Well MW-1 was 8.6 gals.

ADDITIONAL INFORMATION

- Well MW-1 produced a steady amount of liquid volume during the course of the Event #3C. However, no quantifiable liquid LNAPL was recovered from well MW-1.

- All LNAPL volume recovered, 8.6 gals, was burned as IC engine fuel.
- The TPH vapor concentrations were on an increasing trend during Event #3C and then decreased at the end of the event. The initial TPH reading was 6,120 ppmv, the average reading was 9,662 ppmv, the maximum reading, 12,300 ppmv, was at event hour 8.0, and the lowest reading, 6,120 ppmv was recorded at event hour 0.50.

The total LNAPL removed, including liquid and vapor, during the 24.0 hour Event #3, Well MW-1 was 20.2 gals.

METHOD OF CALIBRATION AND CALCULATIONS

The HORIBA® Analytical instrument is calibrated with Hexane, CO and CO_2.

The formula used to calculate the emission rate is:

$$ER = HC\ (ppmv) \times MW\ (Hexane) \times Flow\ Rate\ (scfm) \times 1.58E^{-7} \frac{(min)(lb\ mole)}{(hr)(ppmv)(ft^3)} = lbs/hr$$

INFORMATION INCLUDED WITH REPORT

- Table #1 Summary Well Data
- Table #2 Summary Recovery Data
- Recorded Data
- Photographs of the MDPE System, Well MW-1.

After you have reviewed the report and if you have any questions, please contact me. We appreciate you selecting AcuVac to provide this service.

Sincerely,
ACUVAC REMEDIATION, LLC

Paul D. Faucher
Vice President, Operations

Summary Well Data
Table #1

Event		3A	3B	3C
WELL NO.		**MW-1**	**MW-1**	**MW-1**
Total Event Hours		4.0	10.0	10.0
TD	ft BGS	47.0	47.0	47.0
Well Screen	ft BGS	32.0 – 47.0	32.0 – 47.0	32.0 – 47.0
Well Size	in	4.0	4.0	4.0
Well Data				
DTGW - Static - Start Event	ft BTOC	38.62	39.04	39.25
DTLNAPL - Static - Start Event	ft BTOC	-	39.03	39.24
LNAPL	ft BTOC	-	0.01	0.01
Hydro-Equivalent- Beginning	ft BTOC	38.62	39.03	39.24
DTGW - End Event	ft BTOC	-	47.48	47.49
DTLNAPL - End Event	ft BTOC	-	47.45	47.45
LNAPL	ft BTOC	-	0.03	0.04
Hydro-Equivalent- Ending	ft BTOC	-	47.46	47.46
Extraction Data				
Maximum Extraction Well Vacuum	"H_2O	45.00	60.00	64.00
Average Extraction Well Vacuum	"H_2O	36.67	51.20	59.87
Minimum Extraction Well Vacuum	"H_2O	30.00	30.00	30.00
Maximum Extraction Well Vapor Flow	"H_2O	30.39	41.09	46.02
Average Extraction Well Vapor Flow	scfm	24.92	34.48	41.07
Minimum Extraction Well Vapor Flow	scfm	18.02	20.44	21.66
Maximum GW / LNAPL Pump Rate	gpm	0.46	0.77	0.81
Average GW / LNAPL Pump Rate	gpm	0.40	0.41	0.37
Influent Data				
Maximum TPH	ppmv	18,440	13,870	12,300
Average TPH	ppmv	15,580	10,975	9,662
Minimum TPH	ppmv	13,900	6,720	6,120
Initial TPH	ppmv	14,400	6,720	8,720
Final TPH	ppmv	13,900	10,610	11,710
Average CO_2	%	9.16	6.18	5.12
Average CO	%	0	0	0
Average O_2	%	7.3	12.7	15.0
Average H_2S	ppm	22	2	0

Summary Recovery Data
Table #2

Event		3A	3B	3C
WELL NO.		**MW-1**	**MW-1**	**MW-1**
Recovery Data- Current Event				
Total Liquid Volume Recovered	gals	103	259	228
Total Liquid LNAPL Recovered	gals	-	-	-
Total Liquid LNAPL Recovered / Total Liquid	%	-	-	-
Total Liquid LNAPL Recovered / Total LNAPL	%	-	-	-
Total Vapor LNAPL Recovered	gals	3.4	8.2	8.6
Total Vapor LNAPL Recovered / Total LNAPL	%	100.00	100.00	100.00
Total Vapor and Liquid LNAPL Recovered	gals	3.4	8.2	8.6
Average LNAPL Recovery	gals/hr	0.8	0.8	0.9
Total LNAPL Recovered	lbs	23	57	60
Total Volume of Well Vapors	cu. ft	5,981	20,688	24,642
Recovery Data- Cumulative				
Total Liquid Volume Recovered	gals	607	866	1,094
Total Liquid LNAPL Recovered	gals	-	-	-
Total Vapor LNAPL Recovered	gals	46.63	46.63	46.63
Total Vapor and Liquid LNAPL Recovered	gals	49.99	58.17	66.75
Average LNAPL Recovery	gals/hr	1.3	1.2	1.1
Total LNAPL Recovered	lbs	350	407	467
Total Volume of Well Vapors	cu. ft	57,503.	78,191	102,833

APPENDIX D

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pensacola
3355 McLemore Drive
Pensacola, FL 32514
Tel: (850)474-1001

TestAmerica Job ID: 400-139101-1
Client Project/Site: ElPaso CGP Company, LLC -JohnstonFed #6A

For:
Stantec Consulting Services Inc
1560 Broadway
Suite 1800
Denver, Colorado 80202

Attn: Ms. Sarah Gardner

Madonna Myers

Authorized for release by:
6/22/2017 12:11:36 PM
Madonna Myers, Project Manager II
(615)796-1870
madonna.myers@testamericainc.com

Designee for

Carol Webb, Project Manager II
(850)471-6250
carol.webb@testamericainc.com

Table of Contents

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 400-139101-1

Laboratory: TestAmerica Pensacola

Narrative

Job Narrative
400-139101-1

Comments
No additional comments.

Receipt
The samples were received on 6/10/2017 8:18 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.2º C.

GC VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Stantec Consulting Services Inc
Project/Site: ElPaso CGP Company, LLC -JohnstonFed #6A

TestAmerica Job ID: 400-139101-1

Client Sample ID: MW-3 — Lab Sample ID: 400-139101-1

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Ethylbenzene	1.6		1.0		ug/L	1		8021B	Total/NA
Xylenes, Total	25		5.0		ug/L	1		8021B	Total/NA

Client Sample ID: MW-5 — Lab Sample ID: 400-139101-2

No Detections.

Client Sample ID: MW-7 — Lab Sample ID: 400-139101-3

No Detections.

Client Sample ID: MW-8 — Lab Sample ID: 400-139101-4

No Detections.

Client Sample ID: MW-9 — Lab Sample ID: 400-139101-5

No Detections.

Client Sample ID: TRIP BLANK — Lab Sample ID: 400-139101-6

No Detections.

This Detection Summary does not include radiochemical test results.

Sample Summary

Client: Stantec Consulting Services Inc
Project/Site: ElPaso CGP Company, LLC -JohnstonFed #6A

TestAmerica Job ID: 400-139101-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
400-139101-1	MW-3	Water	06/09/17 11:50	06/10/17 08:18
400-139101-2	MW-5	Water	06/09/17 11:20	06/10/17 08:18
400-139101-3	MW-7	Water	06/09/17 11:40	06/10/17 08:18
400-139101-4	MW-8	Water	06/09/17 11:30	06/10/17 08:18
400-139101-5	MW-9	Water	06/09/17 11:25	06/10/17 08:18
400-139101-6	TRIP BLANK	Water	06/09/17 11:10	06/10/17 08:18

Client Sample ID: MW-3
Lab Sample ID: 400-139101-1
Date Collected: 06/09/17 11:50
Matrix: Water
Date Received: 06/10/17 08:18

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<1.0		1.0		ug/L			06/16/17 17:49	1
Ethylbenzene	**1.6**		1.0		ug/L			06/16/17 17:49	1
Toluene	<5.0		5.0		ug/L			06/16/17 17:49	1
Xylenes, Total	**25**		5.0		ug/L			06/16/17 17:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (pid)	*101*		*78 - 124*		*06/16/17 17:49*	*1*

Client: Stantec Consulting Services Inc
Project/Site: ElPaso CGP Company, LLC -JohnstonFed #6A

TestAmerica Job ID: 400-139101-1

Client Sample ID: MW-5
Date Collected: 06/09/17 11:20
Date Received: 06/10/17 08:18

Lab Sample ID: 400-139101-2
Matrix: Water

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<1.0		1.0		ug/L			06/16/17 19:34	1
Ethylbenzene	<1.0		1.0		ug/L			06/16/17 19:34	1
Toluene	<5.0		5.0		ug/L			06/16/17 19:34	1
Xylenes, Total	<5.0		5.0		ug/L			06/16/17 19:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (pid)	*97*		*78 - 124*		*06/16/17 19:34*	*1*

Client: Stantec Consulting Services Inc
Project/Site: ElPaso CGP Company, LLC -JohnstonFed #6A

TestAmerica Job ID: 400-139101-1

Client Sample ID: MW-7
Date Collected: 06/09/17 11:40
Date Received: 06/10/17 08:18

Lab Sample ID: 400-139101-3
Matrix: Water

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<1.0		1.0		ug/L			06/16/17 20:09	1
Ethylbenzene	<1.0		1.0		ug/L			06/16/17 20:09	1
Toluene	<5.0		5.0		ug/L			06/16/17 20:09	1
Xylenes, Total	<5.0		5.0		ug/L			06/16/17 20:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (pid)	*94*		*78 - 124*		*06/16/17 20:09*	*1*

Client Sample ID: MW-8
Lab Sample ID: 400-139101-4
Date Collected: 06/09/17 11:30
Matrix: Water
Date Received: 06/10/17 08:18

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<1.0		1.0		ug/L			06/16/17 20:44	1
Ethylbenzene	<1.0		1.0		ug/L			06/16/17 20:44	1
Toluene	<5.0		5.0		ug/L			06/16/17 20:44	1
Xylenes, Total	<5.0		5.0		ug/L			06/16/17 20:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (pid)	*95*		*78 - 124*		*06/16/17 20:44*	*1*

Client: Stantec Consulting Services Inc
Project/Site: ElPaso CGP Company, LLC -JohnstonFed #6A

TestAmerica Job ID: 400-139101-1

Client Sample ID: MW-9
Date Collected: 06/09/17 11:25
Date Received: 06/10/17 08:18

Lab Sample ID: 400-139101-5
Matrix: Water

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<1.0		1.0		ug/L			06/16/17 21:19	1
Ethylbenzene	<1.0		1.0		ug/L			06/16/17 21:19	1
Toluene	<5.0		5.0		ug/L			06/16/17 21:19	1
Xylenes, Total	<5.0		5.0		ug/L			06/16/17 21:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (pid)	*96*		*78 - 124*		*06/16/17 21:19*	*1*

Client: Stantec Consulting Services Inc
Project/Site: ElPaso CGP Company, LLC -JohnstonFed #6A

TestAmerica Job ID: 400-139101-1

Client Sample ID: TRIP BLANK
Date Collected: 06/09/17 11:10
Date Received: 06/10/17 08:18

Lab Sample ID: 400-139101-6
Matrix: Water

Method: 8021B - Volatile Organic Compounds (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<1.0		1.0		ug/L			06/17/17 00:15	1
Ethylbenzene	<1.0		1.0		ug/L			06/17/17 00:15	1
Toluene	<5.0		5.0		ug/L			06/17/17 00:15	1
Xylenes, Total	<5.0		5.0		ug/L			06/17/17 00:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (pid)	*99*		*78 - 124*		*06/17/17 00:15*	*1*

QC Association Summary

Client: Stantec Consulting Services Inc
Project/Site: ElPaso CGP Company, LLC -JohnstonFed #6A

TestAmerica Job ID: 400-139101-1

GC VOA

Analysis Batch: 357255

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-139101-1	MW-3	Total/NA	Water	8021B	
400-139101-2	MW-5	Total/NA	Water	8021B	
400-139101-3	MW-7	Total/NA	Water	8021B	
400-139101-4	MW-8	Total/NA	Water	8021B	
400-139101-5	MW-9	Total/NA	Water	8021B	
400-139101-6	TRIP BLANK	Total/NA	Water	8021B	
MB 400-357255/5	Method Blank	Total/NA	Water	8021B	
LCS 400-357255/1004	Lab Control Sample	Total/NA	Water	8021B	
400-139101-1 MS	MW-3	Total/NA	Water	8021B	
400-139101-1 MSD	MW-3	Total/NA	Water	8021B	

Method: 8021B - Volatile Organic Compounds (GC)

Lab Sample ID: MB 400-357255/5
Matrix: Water
Analysis Batch: 357255

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<1.0		1.0		ug/L			06/16/17 17:14	1
Ethylbenzene	<1.0		1.0		ug/L			06/16/17 17:14	1
Toluene	<5.0		5.0		ug/L			06/16/17 17:14	1
Xylenes, Total	<5.0		5.0		ug/L			06/16/17 17:14	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (pid)	*99*		*78 - 124*		*06/16/17 17:14*	*1*

Lab Sample ID: LCS 400-357255/1004
Matrix: Water
Analysis Batch: 357255

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene			50.0	48.5		ug/L		97	85 - 115		
Ethylbenzene			50.0	50.5		ug/L		101	85 - 115		
Toluene			50.0	50.1		ug/L		100	85 - 115		
Xylenes, Total			150	151		ug/L		101	85 - 115		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (pid)	*98*		*78 - 124*

Lab Sample ID: 400-139101-1 MS
Matrix: Water
Analysis Batch: 357255

Client Sample ID: MW-3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene	<1.0		50.0	59.3		ug/L		119	44 - 150		
Ethylbenzene	1.6		50.0	59.4		ug/L		116	70 - 142		
Toluene	<5.0		50.0	63.5		ug/L		127	69 - 136		
Xylenes, Total	25		150	203		ug/L		119	68 - 142		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (pid)	*98*		*78 - 124*

Lab Sample ID: 400-139101-1 MSD
Matrix: Water
Analysis Batch: 357255

Client Sample ID: MW-3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	<1.0		50.0	59.9		ug/L		120	44 - 150	1	16
Ethylbenzene	1.6		50.0	60.9		ug/L		119	70 - 142	2	16
Toluene	<5.0		50.0	64.0		ug/L		128	69 - 136	1	16
Xylenes, Total	25		150	206		ug/L		121	68 - 142	1	15

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (pid)	*102*		*78 - 124*

Lab Chronicle

Client: Stantec Consulting Services Inc
Project/Site: ElPaso CGP Company, LLC -JohnstonFed #6A

TestAmerica Job ID: 400-139101-1

Client Sample ID: MW-3
Date Collected: 06/09/17 11:50
Date Received: 06/10/17 08:18

Lab Sample ID: 400-139101-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	357255	06/16/17 17:49	CMW	TAL PEN
	Instrument ID: CH_JOAN									

Client Sample ID: MW-5
Date Collected: 06/09/17 11:20
Date Received: 06/10/17 08:18

Lab Sample ID: 400-139101-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	357255	06/16/17 19:34	CMW	TAL PEN
	Instrument ID: CH_JOAN									

Client Sample ID: MW-7
Date Collected: 06/09/17 11:40
Date Received: 06/10/17 08:18

Lab Sample ID: 400-139101-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	357255	06/16/17 20:09	CMW	TAL PEN
	Instrument ID: CH_JOAN									

Client Sample ID: MW-8
Date Collected: 06/09/17 11:30
Date Received: 06/10/17 08:18

Lab Sample ID: 400-139101-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	357255	06/16/17 20:44	CMW	TAL PEN
	Instrument ID: CH_JOAN									

Client Sample ID: MW-9
Date Collected: 06/09/17 11:25
Date Received: 06/10/17 08:18

Lab Sample ID: 400-139101-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	357255	06/16/17 21:19	CMW	TAL PEN
	Instrument ID: CH_JOAN									

Client Sample ID: TRIP BLANK
Date Collected: 06/09/17 11:10
Date Received: 06/10/17 08:18

Lab Sample ID: 400-139101-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8021B		1	5 mL	5 mL	357255	06/17/17 00:15	CMW	TAL PEN
	Instrument ID: CH_JOAN									

Lab Chronicle

Client: Stantec Consulting Services Inc
Project/Site: ElPaso CGP Company, LLC -JohnstonFed #6A

TestAmerica Job ID: 400-139101-1

Laboratory References:

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

Accreditation/Certification Summary

Client: Stantec Consulting Services Inc
TestAmerica Job ID: 400-139101-1
Project/Site: ElPaso CGP Company, LLC -JohnstonFed #6A

Laboratory: TestAmerica Pensacola

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alabama	State Program	4	40150	06-30-17
Arizona	State Program	9	AZ0710	01-11-18
Arkansas DEQ	State Program	6	88-0689	09-01-17
California	ELAP	9	2510	03-31-18
Florida	NELAP	4	E81010	06-30-18
Georgia	State Program	4	N/A	06-30-17
Illinois	NELAP	5	200041	10-09-17
Iowa	State Program	7	367	08-01-18
Kansas	NELAP	7	E-10253	10-31-17
Kentucky (UST)	State Program	4	53	06-30-17
Kentucky (WW)	State Program	4	98030	12-31-17
L-A-B	ISO/IEC 17025		L2471	02-22-20
Louisiana	NELAP	6	30976	06-30-18
Louisiana (DW)	NELAP	6	LA170005	12-31-17
Maryland	State Program	3	233	09-30-17
Massachusetts	State Program	1	M-FL094	06-30-17
Michigan	State Program	5	9912	06-30-17
New Jersey	NELAP	2	FL006	06-30-17
North Carolina (WW/SW)	State Program	4	314	12-31-17
Oklahoma	State Program	6	9810	08-31-17
Pennsylvania	NELAP	3	68-00467	01-31-18
Rhode Island	State Program	1	LAO00307	12-30-17
South Carolina	State Program	4	96026	06-30-17
Tennessee	State Program	4	TN02907	06-30-17
Texas	NELAP	6	T104704286-16-10	09-30-17
USDA	Federal		P330-16-00172	05-24-19
Virginia	NELAP	3	460166	06-14-18
Washington	State Program	10	C915	05-15-18
West Virginia DEP	State Program	3	136	06-30-17

Method Summary

Client: Stantec Consulting Services Inc
Project/Site: ElPaso CGP Company, LLC -JohnstonFed #6A

TestAmerica Job ID: 400-139101-1

Method	Method Description	Protocol	Laboratory
8021B	Volatile Organic Compounds (GC)	SW846	TAL PEN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

TestAmerica Pensacola
3355 McLemore Drive
Pensacola, FL 32514
Phone (850) 474-1001 Fax (850) 478-2671

Chain of Custody Record

400-139101 COC

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

6/22/2017

Client Information	Sampler: S. Gardner & J. Garvey	Lab PM: Webb, Carol M	Carrier Tracking No(s):	COC No: 400-65863-26938.1
Client Contact: Ms. Sarah Gardner	Phone: 303 291 2239	E-Mail: carol.webb@testamericainc.com		Page: Page 1 of 1
Company: Stantec Consulting Services Inc				Job #:
Address: 1560 Broadway Suite 1800	Due Date Requested:			
City: Denver	TAT Requested (days): Standard			
State, Zip: CO, 80202				
Phone: 303-291-2239(Tel)	PO #: Purchase Order Requested			
Email: sarah.gardner@mwhglobal.com	WO #:			
Project Name: Johnston Fed #6A	Project #: 40005479			
Site: Johnston Fed #6A	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8021B - BTEX 8021	Total Number of containers	Special Instructions/Note:
			Preservation Code:				A		
MW-3	June 9, 2017	1150	G	W	N	N	2	2	
MW-5	June 9, 2017	1120	G	W	N	N	2	2	
MW-7	June 9, 2017	1140	G	W	N	N	2	2	
MW-8	June 9, 2017	1130	G	W	N	N	2	2	
MW-9	June 9, 2017	1125	G	W	N	N	2	2	
TRIP BLANK	June 9, 2017	1110	—	W	N	N	2	2	

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	6/9/2017 1500	Stantec	[signature]	6/10/17 0818	TA-Pen
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 3.2°C IR2

Login Sample Receipt Checklist

Client: Stantec Consulting Services Inc

Job Number: 400-139101-1

Login Number: 139101

List Source: TestAmerica Pensacola

List Number: 1

Creator: Perez, Trina M

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.2°C IR-2
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Pensacola
3355 McLemore Drive
Pensacola, FL 32514
Tel: (850)474-1001

TestAmerica Job ID: 400-145965-1
Client Project/Site: El Paso CGP Company - Johnson Fed 6A

For:
Stantec Consulting Services Inc
1560 Broadway
Suite 1800
Denver, Colorado 80202

Attn: Ms. Sarah Gardner

Madonna Myers

Authorized for release by:
11/20/2017 12:07:46 PM
Madonna Myers, Project Manager II
(615)796-1870
madonna.myers@testamericainc.com

Designee for

Carol Webb, Project Manager II
(850)471-6250
carol.webb@testamericainc.com

Table of Contents

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Job ID: 400-145965-1

Laboratory: TestAmerica Pensacola

Narrative

Job Narrative
400-145965-1

Comments
No additional comments.

Receipt
The samples were received on 11/14/2017 9:01 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.9º C.

Receipt Exceptions

The Chain-of-Custody (COC) was incomplete as received and/or improperly completed. Per client instructions, method 8260 was used in place of method 8021.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Detection Summary

Client: Stantec Consulting Services Inc
Project/Site: El Paso CGP Company - Johnson Fed 6A

TestAmerica Job ID: 400-145965-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 400-145965-1

No Detections.

Client Sample ID: MW-3 — Lab Sample ID: 400-145965-2

No Detections.

Client Sample ID: MW-4 — Lab Sample ID: 400-145965-3

No Detections.

Client Sample ID: MW-2 — Lab Sample ID: 400-145965-4

No Detections.

Client Sample ID: MW-7 — Lab Sample ID: 400-145965-5

No Detections.

Client Sample ID: MW-8 — Lab Sample ID: 400-145965-6

No Detections.

Client Sample ID: MW-9 — Lab Sample ID: 400-145965-7

No Detections.

Client Sample ID: MW-5 — Lab Sample ID: 400-145965-8

No Detections.

Client Sample ID: MW-6 — Lab Sample ID: 400-145965-9

No Detections.

Client Sample ID: MW-1 — Lab Sample ID: 400-145965-10

Analyte	Result	Qualifier	RL		Unit	Dil Fac	D	Method	Prep Type
Benzene	27		10		ug/L	10		8260C	Total/NA
Toluene	2800		10		ug/L	10		8260C	Total/NA
Ethylbenzene	560		10		ug/L	10		8260C	Total/NA
Xylenes, Total	3900		100		ug/L	10		8260C	Total/NA

This Detection Summary does not include radiochemical test results.

Sample Summary

Client: Stantec Consulting Services Inc
Project/Site: El Paso CGP Company - Johnson Fed 6A

TestAmerica Job ID: 400-145965-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
400-145965-1	TRIP BLANK	Water	11/12/17 10:10	11/14/17 09:01
400-145965-2	MW-3	Water	11/12/17 11:39	11/14/17 09:01
400-145965-3	MW-4	Water	11/12/17 11:36	11/14/17 09:01
400-145965-4	MW-2	Water	11/12/17 11:24	11/14/17 09:01
400-145965-5	MW-7	Water	11/12/17 11:17	11/14/17 09:01
400-145965-6	MW-8	Water	11/12/17 11:12	11/14/17 09:01
400-145965-7	MW-9	Water	11/12/17 11:04	11/14/17 09:01
400-145965-8	MW-5	Water	11/12/17 10:57	11/14/17 09:01
400-145965-9	MW-6	Water	11/12/17 10:50	11/14/17 09:01
400-145965-10	MW-1	Water	11/12/17 10:35	11/14/17 09:01

Client: Stantec Consulting Services Inc
Project/Site: El Paso CGP Company - Johnson Fed 6A

TestAmerica Job ID: 400-145965-1

Client Sample ID: TRIP BLANK
Date Collected: 11/12/17 10:10
Date Received: 11/14/17 09:01

Lab Sample ID: 400-145965-1
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<1.0		1.0		ug/L			11/17/17 14:57	1
Toluene	<1.0		1.0		ug/L			11/17/17 14:57	1
Ethylbenzene	<1.0		1.0		ug/L			11/17/17 14:57	1
Xylenes, Total	<10		10		ug/L			11/17/17 14:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane	*99*		*81 - 121*		*11/17/17 14:57*	*1*
4-Bromofluorobenzene	*89*		*78 - 118*		*11/17/17 14:57*	*1*
Toluene-d8 (Surr)	*101*		*80 - 120*		*11/17/17 14:57*	*1*

Client: Stantec Consulting Services Inc
Project/Site: El Paso CGP Company - Johnson Fed 6A

TestAmerica Job ID: 400-145965-1

Client Sample ID: MW-3
Date Collected: 11/12/17 11:39
Date Received: 11/14/17 09:01

Lab Sample ID: 400-145965-2
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<1.0		1.0		ug/L			11/17/17 09:42	1
Toluene	<1.0		1.0		ug/L			11/17/17 09:42	1
Ethylbenzene	<1.0		1.0		ug/L			11/17/17 09:42	1
Xylenes, Total	<10		10		ug/L			11/17/17 09:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane	*98*		*81 - 121*		*11/17/17 09:42*	*1*
4-Bromofluorobenzene	*97*		*78 - 118*		*11/17/17 09:42*	*1*
Toluene-d8 (Surr)	*100*		*80 - 120*		*11/17/17 09:42*	*1*

Client Sample ID: MW-4
Date Collected: 11/12/17 11:36
Date Received: 11/14/17 09:01

Lab Sample ID: 400-145965-3
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<1.0		1.0		ug/L			11/17/17 15:26	1
Toluene	<1.0		1.0		ug/L			11/17/17 15:26	1
Ethylbenzene	<1.0		1.0		ug/L			11/17/17 15:26	1
Xylenes, Total	<10		10		ug/L			11/17/17 15:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane	*99*		*81 - 121*		*11/17/17 15:26*	*1*
4-Bromofluorobenzene	*91*		*78 - 118*		*11/17/17 15:26*	*1*
Toluene-d8 (Surr)	*100*		*80 - 120*		*11/17/17 15:26*	*1*

Client Sample ID: MW-2
Date Collected: 11/12/17 11:24
Date Received: 11/14/17 09:01

Lab Sample ID: 400-145965-4
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<1.0		1.0		ug/L			11/17/17 15:57	1
Toluene	<1.0		1.0		ug/L			11/17/17 15:57	1
Ethylbenzene	<1.0		1.0		ug/L			11/17/17 15:57	1
Xylenes, Total	<10		10		ug/L			11/17/17 15:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane	*101*		*81 - 121*		*11/17/17 15:57*	*1*
4-Bromofluorobenzene	*84*		*78 - 118*		*11/17/17 15:57*	*1*
Toluene-d8 (Surr)	*109*		*80 - 120*		*11/17/17 15:57*	*1*

Client: Stantec Consulting Services Inc
Project/Site: El Paso CGP Company - Johnson Fed 6A

TestAmerica Job ID: 400-145965-1

Client Sample ID: MW-7
Date Collected: 11/12/17 11:17
Date Received: 11/14/17 09:01

Lab Sample ID: 400-145965-5
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<1.0		1.0		ug/L			11/17/17 16:19	1
Toluene	<1.0		1.0		ug/L			11/17/17 16:19	1
Ethylbenzene	<1.0		1.0		ug/L			11/17/17 16:19	1
Xylenes, Total	<10		10		ug/L			11/17/17 16:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane	*98*		*81 - 121*		*11/17/17 16:19*	*1*
4-Bromofluorobenzene	*85*		*78 - 118*		*11/17/17 16:19*	*1*
Toluene-d8 (Surr)	*108*		*80 - 120*		*11/17/17 16:19*	*1*

Client: Stantec Consulting Services Inc
Project/Site: El Paso CGP Company - Johnson Fed 6A

TestAmerica Job ID: 400-145965-1

Client Sample ID: MW-8
Date Collected: 11/12/17 11:12
Date Received: 11/14/17 09:01

Lab Sample ID: 400-145965-6
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<1.0		1.0		ug/L			11/17/17 16:41	1
Toluene	<1.0		1.0		ug/L			11/17/17 16:41	1
Ethylbenzene	<1.0		1.0		ug/L			11/17/17 16:41	1
Xylenes, Total	<10		10		ug/L			11/17/17 16:41	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane	*100*		*81 - 121*		*11/17/17 16:41*	*1*
4-Bromofluorobenzene	*90*		*78 - 118*		*11/17/17 16:41*	*1*
Toluene-d8 (Surr)	*106*		*80 - 120*		*11/17/17 16:41*	*1*

Client: Stantec Consulting Services Inc
Project/Site: El Paso CGP Company - Johnson Fed 6A

TestAmerica Job ID: 400-145965-1

Client Sample ID: MW-9
Date Collected: 11/12/17 11:04
Date Received: 11/14/17 09:01

Lab Sample ID: 400-145965-7
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<1.0		1.0		ug/L			11/17/17 17:03	1
Toluene	<1.0		1.0		ug/L			11/17/17 17:03	1
Ethylbenzene	<1.0		1.0		ug/L			11/17/17 17:03	1
Xylenes, Total	<10		10		ug/L			11/17/17 17:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane	*100*		*81 - 121*		*11/17/17 17:03*	*1*
4-Bromofluorobenzene	*87*		*78 - 118*		*11/17/17 17:03*	*1*
Toluene-d8 (Surr)	*104*		*80 - 120*		*11/17/17 17:03*	*1*

Client Sample ID: MW-5
Date Collected: 11/12/17 10:57
Date Received: 11/14/17 09:01

Lab Sample ID: 400-145965-8
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<1.0		1.0		ug/L			11/17/17 17:25	1
Toluene	<1.0		1.0		ug/L			11/17/17 17:25	1
Ethylbenzene	<1.0		1.0		ug/L			11/17/17 17:25	1
Xylenes, Total	<10		10		ug/L			11/17/17 17:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane	*99*		*81 - 121*		*11/17/17 17:25*	*1*
4-Bromofluorobenzene	*88*		*78 - 118*		*11/17/17 17:25*	*1*
Toluene-d8 (Surr)	*102*		*80 - 120*		*11/17/17 17:25*	*1*

Client Sample ID: MW-6
Date Collected: 11/12/17 10:50
Date Received: 11/14/17 09:01

Lab Sample ID: 400-145965-9
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<1.0		1.0		ug/L			11/17/17 17:47	1
Toluene	<1.0		1.0		ug/L			11/17/17 17:47	1
Ethylbenzene	<1.0		1.0		ug/L			11/17/17 17:47	1
Xylenes, Total	<10		10		ug/L			11/17/17 17:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane	*98*		*81 - 121*		*11/17/17 17:47*	*1*
4-Bromofluorobenzene	*91*		*78 - 118*		*11/17/17 17:47*	*1*
Toluene-d8 (Surr)	*100*		*80 - 120*		*11/17/17 17:47*	*1*

Client Sample ID: MW-1
Date Collected: 11/12/17 10:35
Date Received: 11/14/17 09:01

Lab Sample ID: 400-145965-10
Matrix: Water

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	27		10		ug/L			11/17/17 18:09	10
Toluene	2800		10		ug/L			11/17/17 18:09	10
Ethylbenzene	560		10		ug/L			11/17/17 18:09	10
Xylenes, Total	3900		100		ug/L			11/17/17 18:09	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane	*98*		*81 - 121*		*11/17/17 18:09*	*10*
4-Bromofluorobenzene	*91*		*78 - 118*		*11/17/17 18:09*	*10*
Toluene-d8 (Surr)	*108*		*80 - 120*		*11/17/17 18:09*	*10*

QC Association Summary

Client: Stantec Consulting Services Inc
Project/Site: El Paso CGP Company - Johnson Fed 6A

TestAmerica Job ID: 400-145965-1

GC/MS VOA

Analysis Batch: 376306

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
400-145965-1	TRIP BLANK	Total/NA	Water	8260C	
400-145965-2	MW-3	Total/NA	Water	8260C	
400-145965-3	MW-4	Total/NA	Water	8260C	
400-145965-4	MW-2	Total/NA	Water	8260C	
400-145965-5	MW-7	Total/NA	Water	8260C	
400-145965-6	MW-8	Total/NA	Water	8260C	
400-145965-7	MW-9	Total/NA	Water	8260C	
400-145965-8	MW-5	Total/NA	Water	8260C	
400-145965-9	MW-6	Total/NA	Water	8260C	
400-145965-10	MW-1	Total/NA	Water	8260C	
MB 400-376306/5	Method Blank	Total/NA	Water	8260C	
LCS 400-376306/3	Lab Control Sample	Total/NA	Water	8260C	
400-145965-2 MS	MW-3	Total/NA	Water	8260C	
400-145965-2 MSD	MW-3	Total/NA	Water	8260C	

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 400-376306/5

Matrix: Water
Analysis Batch: 376306

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	<1.0		1.0		ug/L			11/17/17 09:20	1
Toluene	<1.0		1.0		ug/L			11/17/17 09:20	1
Ethylbenzene	<1.0		1.0		ug/L			11/17/17 09:20	1
Xylenes, Total	<10		10		ug/L			11/17/17 09:20	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane	*96*		*81 - 121*		*11/17/17 09:20*	*1*
4-Bromofluorobenzene	*88*		*78 - 118*		*11/17/17 09:20*	*1*
Toluene-d8 (Surr)	*105*		*80 - 120*		*11/17/17 09:20*	*1*

Lab Sample ID: LCS 400-376306/3

Matrix: Water
Analysis Batch: 376306

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene			50.0	47.6		ug/L		95	70 - 130		
Toluene			50.0	50.0		ug/L		100	70 - 130		
Ethylbenzene			50.0	50.3		ug/L		101	70 - 130		
Xylenes, Total			100	98.6		ug/L		99	70 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Dibromofluoromethane	*96*		*81 - 121*
4-Bromofluorobenzene	*84*		*78 - 118*
Toluene-d8 (Surr)	*96*		*80 - 120*

Lab Sample ID: 400-145965-2 MS

Matrix: Water
Analysis Batch: 376306

Client Sample ID: MW-3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene	<1.0		50.0	50.3		ug/L		101	56 - 142		
Toluene	<1.0		50.0	49.7		ug/L		99	65 - 130		
Ethylbenzene	<1.0		50.0	51.4		ug/L		102	58 - 131		
Xylenes, Total	<10		100	101		ug/L		101	59 - 130		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane	*101*		*81 - 121*
4-Bromofluorobenzene	*87*		*78 - 118*
Toluene-d8 (Surr)	*96*		*80 - 120*

Lab Sample ID: 400-145965-2 MSD

Matrix: Water
Analysis Batch: 376306

Client Sample ID: MW-3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	<1.0		50.0	47.4		ug/L		95	56 - 142	6	30
Toluene	<1.0		50.0	48.5		ug/L		97	65 - 130	2	30

Client: Stantec Consulting Services Inc
Project/Site: El Paso CGP Company - Johnson Fed 6A

TestAmerica Job ID: 400-145965-1

Method: 8260C - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: 400-145965-2 MSD
Matrix: Water
Analysis Batch: 376306

Client Sample ID: MW-3
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Ethylbenzene	<1.0		50.0	47.7		ug/L		94	58 - 131	7	30
Xylenes, Total	<10		100	95.6		ug/L		96	59 - 130	6	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Dibromofluoromethane	*100*		*81 - 121*
4-Bromofluorobenzene	*88*		*78 - 118*
Toluene-d8 (Surr)	*97*		*80 - 120*

Lab Chronicle

Client: Stantec Consulting Services Inc
Project/Site: El Paso CGP Company - Johnson Fed 6A

TestAmerica Job ID: 400-145965-1

Client Sample ID: TRIP BLANK
Date Collected: 11/12/17 10:10
Date Received: 11/14/17 09:01

Lab Sample ID: 400-145965-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	5 mL	5 mL	376306	11/17/17 14:57	RS	TAL PEN
	Instrument ID: CH_LARS									

Client Sample ID: MW-3
Date Collected: 11/12/17 11:39
Date Received: 11/14/17 09:01

Lab Sample ID: 400-145965-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	5 mL	5 mL	376306	11/17/17 09:42	RS	TAL PEN
	Instrument ID: CH_LARS									

Client Sample ID: MW-4
Date Collected: 11/12/17 11:36
Date Received: 11/14/17 09:01

Lab Sample ID: 400-145965-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	5 mL	5 mL	376306	11/17/17 15:26	RS	TAL PEN
	Instrument ID: CH_LARS									

Client Sample ID: MW-2
Date Collected: 11/12/17 11:24
Date Received: 11/14/17 09:01

Lab Sample ID: 400-145965-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	5 mL	5 mL	376306	11/17/17 15:57	RS	TAL PEN
	Instrument ID: CH_LARS									

Client Sample ID: MW-7
Date Collected: 11/12/17 11:17
Date Received: 11/14/17 09:01

Lab Sample ID: 400-145965-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	5 mL	5 mL	376306	11/17/17 16:19	RS	TAL PEN
	Instrument ID: CH_LARS									

Client Sample ID: MW-8
Date Collected: 11/12/17 11:12
Date Received: 11/14/17 09:01

Lab Sample ID: 400-145965-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	5 mL	5 mL	376306	11/17/17 16:41	RS	TAL PEN
	Instrument ID: CH_LARS									

Lab Chronicle

Client: Stantec Consulting Services Inc
Project/Site: El Paso CGP Company - Johnson Fed 6A

TestAmerica Job ID: 400-145965-1

Client Sample ID: MW-9
Date Collected: 11/12/17 11:04
Date Received: 11/14/17 09:01

Lab Sample ID: 400-145965-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	5 mL	5 mL	376306	11/17/17 17:03	RS	TAL PEN
	Instrument ID: CH_LARS									

Client Sample ID: MW-5
Date Collected: 11/12/17 10:57
Date Received: 11/14/17 09:01

Lab Sample ID: 400-145965-8
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	5 mL	5 mL	376306	11/17/17 17:25	RS	TAL PEN
	Instrument ID: CH_LARS									

Client Sample ID: MW-6
Date Collected: 11/12/17 10:50
Date Received: 11/14/17 09:01

Lab Sample ID: 400-145965-9
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	5 mL	5 mL	376306	11/17/17 17:47	RS	TAL PEN
	Instrument ID: CH_LARS									

Client Sample ID: MW-1
Date Collected: 11/12/17 10:35
Date Received: 11/14/17 09:01

Lab Sample ID: 400-145965-10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		10	5 mL	5 mL	376306	11/17/17 18:09	RS	TAL PEN
	Instrument ID: CH_LARS									

Laboratory References:
TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

Accreditation/Certification Summary

Client: Stantec Consulting Services Inc
TestAmerica Job ID: 400-145965-1
Project/Site: El Paso CGP Company - Johnson Fed 6A

Laboratory: TestAmerica Pensacola

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
Alabama	State Program	4	40150	06-30-18
Arizona	State Program	9	AZ0710	01-11-18
Arkansas DEQ	State Program	6	88-0689	09-01-18
California	ELAP	9	2510	03-31-18
Florida	NELAP	4	E81010	06-30-18
Georgia	State Program	4	N/A	06-30-18
Illinois	NELAP	5	200041	10-09-18
Iowa	State Program	7	367	08-01-18
Kansas	NELAP	7	E-10253	12-31-17
Kentucky (UST)	State Program	4	53	06-30-18
Kentucky (WW)	State Program	4	98030	12-31-17
L-A-B	ISO/IEC 17025		L2471	02-22-20
Louisiana	NELAP	6	30976	06-30-18
Louisiana (DW)	NELAP	6	LA170005	12-31-17
Maryland	State Program	3	233	09-30-18
Massachusetts	State Program	1	M-FL094	06-30-18
Michigan	State Program	5	9912	06-30-18
New Jersey	NELAP	2	FL006	06-30-18
North Carolina (WW/SW)	State Program	4	314	12-31-17
Oklahoma	State Program	6	9810	08-31-18
Pennsylvania	NELAP	3	68-00467	01-31-18
Rhode Island	State Program	1	LAO00307	12-30-17
South Carolina	State Program	4	96026	06-30-18
Tennessee	State Program	4	TN02907	06-30-18
Texas	NELAP	6	T104704286-17-12	09-30-18
USDA	Federal		P330-16-00172	05-24-19
Virginia	NELAP	3	460166	06-14-18
Washington	State Program	10	C915	05-15-18
West Virginia DEP	State Program	3	136	06-30-18

Method Summary

Client: Stantec Consulting Services Inc
Project/Site: El Paso CGP Company - Johnson Fed 6A

TestAmerica Job ID: 400-145965-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL PEN

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PEN = TestAmerica Pensacola, 3355 McLemore Drive, Pensacola, FL 32514, TEL (850)474-1001

TestAmerica Pensacola
3355 McLemore Drive
Pensacola, FL 32514
Phone (850) 474-1001 Fax (850) 478-2671

Chain of Custody Record

00-145965 COC

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Daniel Babcock	Lab PM: Webb, Carol M	Carrier Tracking No(s):	COC No: 400-69060-27994.1
Client Contact: Ms. Sarah Gardner	Phone:	E-Mail: carol.webb@testamericainc.com		Page: Page 1 of 1
Company: Stantec Consulting Services Inc		Analysis Requested		Job #: 203720281
Address: 1560 Broadway Suite 1800	Due Date Requested: Normal			Preservation Codes:
City: Denver	TAT Requested (days): 10 Day Std			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
State, Zip: CO, 80202				
Phone: 303-291-2239(Tel)	PO #: Purchase Order Requested			
Email: sarah.gardner@mwhglobal.com	WO#: ARF W-ERG-STN-05-17-17-SLG-01			Other:
Project Name: Johnston Fed #6A Nov 2017	Project #: 40005479 Johnston Fed #6A			
Site:	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	8021B - BTEX 8021	Special Instructions/Note:
Trip Blank	11/12/17	1010	—	—	2	Per ARF
MW-3		1139	G	W	2	
MW-4		1136			2	
MW-2		1124			2	
MW-7		1117			2	
MW-8		1112			2	
MW-9		1104			2	
MW-5		1057			2	
MW-6		1050			2	
MW-1		1035			2	

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Daniel Babcock	11/13/17 1100	Stantec		11/14/17 0901	TA Pen
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 1.9°C IR8

Ver: 08/04/2016

Login Sample Receipt Checklist

Client: Stantec Consulting Services Inc

Job Number: 400-145965-1

Login Number: 145965
List Number: 1
Creator: Perez, Trina M

List Source: TestAmerica Pensacola

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.9°C IR-8
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	