2014 Annual Report

Flying J Petroleums Former Refinery
Williston, North Dakota

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Acronyms and Abbreviations

μg/L	micrograms per liter
BTEX	benzene, toluene, ethylbenzene, and xylenes
CAMU	corrective action management unit
cm/sec	centimeters per second
CMI	corrective measures implementation
CMS	Corrective Measures Study
DO	dissolved oxygen
FJM	Flying J Petroleums, Inc.
ft^2/day	square feet per day
GWTS	Groundwater treatment system
LNAPL	light, non-aqueous phase liquid
mg/L	milligrams per liter
MNA	Monitored natural attenuation
NDDH	North Dakota Department of Health
ORP	oxidation/reduction potential
PAHs	polyaromatic hydrocarbons
P&A	Plugged and abandoned
PCGWM	post-closure groundwater monitoring
POTW	publicly owned treatment works
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RPD	relative percent difference
SAP	sampling and analysis plan
SVE	Soil vapor extraction
TPH-DRO	total petroleum hydrocarbon-diesel range organics
TPH-GRO	TPH-gasoline range organics
USEPA	U. S. Environmental Protection Agency
VOCs	volatile organic compounds

1.0 Introduction

The purpose of this report is to summarize annual post-closure monitoring and corrective measures implementation (CMI) activities that took place during 2014 at the Flying J Petroleums, Inc. (FJM) Former Refinery (site) in Williston, North Dakota (**Figure 1**). Industrial operations have been shut down since 1986 and remediation systems have been operating since 1989. This report focuses on evaluating the performance monitoring results of these remediation activities and continued post-closure monitoring of the closed surface impoundments (**Figure 2**).

FJM voluntarily conducted post-closure and corrective action activities between 1992 and 1994, before the North Dakota Department of Health (NDDH) issued the Post-Closure/Corrective Action Permit. This permit was renewed in 2010 by NDDH (2010); activities that took place during 2014 were conducted under the renewed permit. During 2013 FJM submitted changes to the Post Closure and Corrective Action Permit Application (permit) and Sampling and Analysis Plan (SAP).The Class 1 permit modification was approved by the NDDH on August 20th 2013. Revised sampling procedure are outlined in the SAP, Section 2.0 discusses changes to the CMI and post-closure groundwater monitoring (PCGWM). Historically, groundwater monitoring activities were conducted quarterly from June 1992 to June 1995; semiannually from 1995 to 2004; and annually since 2004. Since 2005, PCGWM and CMI activities have been reported together in an annual report.

1.1 Report Organization

The content of this report contains text that describes the site background, interim remediation, corrective action and groundwater monitoring activities at the project site. Much of relevant text has not been changed in this report even though the authors of this report have changed. For consistency, the 2014 Annual Report has been prepared by Johnston Leigh, Inc. (JLI) by updating the text, tables and figures presented in the AECOM 2013 Flying J Former Refinery, Williston, North Dakota report, dated March 25, 2014.

This report presents an overview of the history and location of the former refinery and the corrective measures that have been terminated and those currently operating at the site (Section 1.2). Section 2.0 describes the activities that took place during 2014, along with the operating systems and monitoring programs. Section 3.0 presents the 2014 groundwater monitoring results; site-wide groundwater elevations; light, non-aqueous phase liquid (LNAPL) thickness; and data quality assurance. Section 4.0 focuses on performance evaluations of operating systems. The conclusions of the 2014 monitoring and performance evaluations are summarized in Section 5.0 and cited references are presented in Section 6.0.

1.2 General Setting and Site History

The project site is located in northwestern North Dakota, in Section 19, Township 154 North, Range 100 West, 5th Principal Meridian, in Williams County (**Figure 1**). The former refinery is located approximately 1 mile east of the town of Williston and about 1.5 miles north of the Missouri River. The former refinery property covers an area of 41.6 acres.

FJM has owned the property since 1980. Refining activities have been shut down since 1984 and commercial product storage activities ceased in 1986. During refinery operation, the principal products were gasoline and various grades of fuel oil. The former refinery consisted of 7 buildings, a series of storage tanks, loading facilities for trucks and rail, 10 major process units, and 4 wastewater surface impoundments containing listed wastes, classified as regulated units under the Resource Conservation and Recovery Act (RCRA). The four RCRA surface impoundments were closed in 1988 by removing the sludge and visually stained soils and constructing an impermeable cap from clay backfill over the excavated areas. Demolition of most of the structures, tanks, and process units was initiated in November 1992 and completed in July 1994. Select tanks and storage buildings were spared from demolition for their anticipated use during CMI.

Two shallow aquifers, which are separated by clay till, underlie the former refinery. The upper water table aquifer (upper sand/till aquifer) consists of unconsolidated sand surrounded in the immediate vicinity of the site by clay till. The lower confined aquifer (lower sand aquifer) consists of unconsolidated sand that is bordered by clay till along the western portion of the site.

Current activities consist of the PCGWM program and RCRA corrective action at the former refinery, which are explained in the subsections below.

1.2.1 The PCGWM Program

The PCGWM program is intended to monitor potential releases to groundwater from the closed surface impoundments (**Figure 2**). However, differentiating between a release from the closed surface impoundments and previous releases from refinery operations is not practicable. Previous releases from refinery operations resulted in LNAPL and dissolved hydrocarbon plumes that are located adjacent to and upgradient of the former surface impoundments. Currently, PCGWM of the surface impoundments includes a network of 14 monitoring wells (**shown on Figure 2**) to monitor the extent of hazardous constituents dissolved in groundwater beneath the facility. Fluid levels in the PCGWM wells are gauged semiannually and the wells are sampled annually to identify any further migration of LNAPL or dissolved hazardous constituents.

1.2.2 RCRA Corrective Action

The RCRA corrective action program at the former refinery was initiated in 1988 when LNAPL was noticed in a trench excavated for installation of a subsurface storm water sewer. Subsequently, FJM and NDDH signed a consent order that required FJM to conduct subsurface investigations at the former refinery to characterize the nature and extent of soil and groundwater contamination from past refining activities. In addition, the consent order required FJM to design, construct, and operate interim measures for the removal of LNAPL. The consent order was later incorporated into the Post-Closure/Corrective Action Permit in February 1994, which identified both RCRA post-closure care and corrective action requirements. FJM completed a *RCRA Facility Investigation* (RFI) in 1991 (GeoWest, 1991) and a *Corrective Measures Study* (CMS) in 1992 (GeoWest, 1992), both of which were approved by NDDH.

A brief history of interim and corrective measures that have been installed at the former refinery since 1989 is presented in the following subsections.

Upper Sand Recovery System

During 1989 and 1990, FJM installed a below-grade oil/water separator, an aboveground LNAPL containment tank, and four LNAPL and groundwater collection laterals to collect and remove LNAPL from the upper sand aquifer. This system was originally installed as an interim measure, but was subsequently incorporated into corrective measures in 1997. The system operated from 1989 through 2002, when there was no longer enough LNAPL to support system operations. In 2002 less than 10 gallons were recovered from the LNAPL collection system and it was shutdown; the associated monitoring wells are still monitored for LNAPL rebound.

Groundwater Treatment System (GWTS)

In 1993, the groundwater treatment system (GWTS) was constructed as an interim measure to treat recovered groundwater. A lift sump and a shallow tray air stripper were added to the GWTS to enable discharge of treated groundwater to the local publicly owned treatment works (POTW). The GWTS was subsequently incorporated into the corrective measures at the site and operated through the 2008 operating season. FJM requested, in a letter dated April 13, 2009, that an alternate method to recover LNAPL within the lower sand be implemented to increase LNAPL recovery and decrease the amount of production and disposal of groundwater at the site. LNAPL recovery was replaced with skimming pumps to recover LNAPL without recovering groundwater. In a letter dated April 29, 2009, NDDH conditionally approved the use of the recovery system.

Lower Sand Recovery System

The lower sand recovery system consisted of four LNAPL recovery wells and two monitoring wells. As an interim measure, recovery well 89-01 was installed in the lower sand and periodically operated from 1990 through 2005. The other recovery wells (95-02, 95-03, and 95-04) were installed in 1997 and operated as

corrective measures through 2008. Well 95-01 was also installed in 1997 but has never had LNAPL and therefore was never used as a recovery well. Recovery well 89-01 was periodically operated to recover groundwater, but was not effective at recovering LNAPL (RETEC, 2004: pp. 8-14).

The NDDH renewed the facility permit, effective May 26, 2010. The permit application modified the recovery of LNAPL to include active recovery from lower sand wells with a calculated LNAPL transmissivity of greater than 0.5 square feet per day (ft^2/day). Based on these goals and transmissivity testing conducted in 2012, it was determined that active recovery would continue to be required in MW-5R and MW 89-04. Due to LNAPL thickness and time required to remove the NAPL through bailing procedure (and not elevated transmissivity value), well MW-89-03 was converted from a passive recovery well to an active recovery well in 2013.

Monitored Natural Attenuation (MNA)

In 2003, the efficacy of monitored natural attenuation (MNA) was evaluated as a means to reducing constituent mass at the site. The evaluation, included in the 2004 *Permit Application* (RETEC, 2004), demonstrated evidence of biodegradation in the upper sand aquifer and some evidence of biodegradation in the lower sand aquifer, although biodegradation is hampered by the presence of LNAPL in the lower sand. MNA was selected as a corrective measure in the permit and the site continues to be monitored for biodegradation.

Soil Vapor Extraction (SVE) and Bioventing

A combination of soil vapor extraction (SVE) and bioventing was selected as a corrective measure in 1997. The SVE system operated from 1997 to 2003. The SVE wells and trenches were installed in the upper sand and till formation to recover vadose zone hydrocarbon vapors and enhance *in situ* biodegradation of residual non-volatile hydrocarbons. A thermal oxidizer was operated as part of the SVE system to destroy volatile organics during the operating seasons of 1997 through 1999, and during system start-up from 2000 through 2002. By the end of the 2003, hydrocarbon removal mass had decreased more than 90% since 1997 and asymptotic levels had been reached. The thermal oxidizer was not operated in 2003 and was dismantled along with the SVE system in 2004. NDDH approved the termination of the SVE and bioventing system as a corrective measure in the permit 2004 application (RETEC, 2004).

In-Situ Landfarming of Surface Soils

In-situ landfarming was selected as a corrective measure in 1997 for two areas: the south drainage ditch and corrective action management unit (CAMU) A. The south drainage ditch was landfarmed from 1997 to 2003. NDDH approved the completion of landfarming in the south drainage ditch in a meeting on April 2, 2003. The October 2002 analytical results confirm the October 2001 results showing that volatile organic compounds (VOCs) and polyaromatic hydrocarbons (PAHs) are no longer detectable in the south drainage ditch soils (see the *Second Half 2002 Corrective Measure Implementation Progress Report*; RETEC, 2003). Landfarming in CAMU A could not be initiated until the SVE remedy was complete and the

system dismantled. As this took place in 2004, landfarming was initiated in CAMU A during 2004 and continued through 2005. Following the 2005 landfarming season, FJM requested that landfarming be discontinued since performance objectives set forth in the *CMI Performance Monitoring Plan* had been met. This request was made by The RETEC Group, Inc. in a letter dated March 15, 2006. NDDH approved the completion of in-situ landfarming in a letter to FJM dated April 7, 2006. The NDDH initiated a Class 1 Permit Modification to this effect on April 7, 2006.

Site Irrigation and Revegetation

The irrigation and revegetation remedy was selected to reduce potential erosion and to stimulate biological activity at the former refinery. The former refinery was revegetated in 1997; however, in-situ landfarming as a remedy interrupts vegetative growth. Landfarming in CAMU A continued through 2005 and the NDDH approved completion of landfarming in a letter dated April 7, 2006. CAMU A was revegetated on May 1–2, 2007 during the local planting season.

In addition to these corrective measures, site security, inspection, and other institutional controls are maintained by FJM to control land use and prevent potential exposure to soil and groundwater in the vicinity of the site.

2.0 Description of 2014 CMI and PCGWM Activities

The following activities or corrective measures were conducted during 2014:

- Monitoring well gauging and sampling;
- LNAPL recovery using skimming pumps and bailers;
- Site inspections; and
- Redevelopment evaluation of PCGWM monitoring wells.

These activities are described in this section, as well as operation and maintenance activities that took place during 2014. **Table 1** shows the chronology of events related to the PCGWM and CMI performance monitoring programs between 1992 and 2014.

2.1 Well Gauging and Sampling Activities

During 2014, the following activities were conducted to satisfy the requirements of the PCGWM program, CMI performance monitoring program, and MNA program:

- PCGWM program:
  - Groundwater elevations and LNAPL thickness were measured on April 22 and September 22, 2014 in 14 Post-Closure Groundwater monitoring wells identified on **Figure 2.**
  - The 14 Post-Closure Groundwater monitoring wells were sampled in September 2014.
  - The 5 replacement Post-Closure monitoring wells were also sampled in March, June, September, and December 2014.
  - The samples collected were analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX); total petroleum hydrocarbon-diesel range organics (TPH-DRO); and TPH-gasoline range organics (TPH-GRO).
- CMI program:
  - Groundwater elevations and LNAPL thickness were measured on April 22 and September 21, 2014 in 12 CMI Performance monitoring wells identified on **Figure 2**.
  - The 12 CMI Performance monitoring wells were sampled in September 2014.
  - The samples collected were analyzed for BTEX, TPH-DRO, and TPH-GRO.

- MNA program:
  - Analytical results for the CMI program were evaluated for a select number of wells for the MNA program (See Section 3.3).
  - The 12 groundwater samples collected from CMI Performance monitoring wells were also measured for dissolved oxygen (DO) and oxidation/reduction potential (ORP) in the field on September 22-23, 2014.

JLI personnel conducted the gauging and sampling events during 2014. Environmental Science Laboratory (ESC) laboratory of Mount Juliet, TN, performed the laboratory analyses of all groundwater samples.

The results of the PCGWM are summarized in Section 3.2.1; CMI monitoring in Section 3.2.2; and MNA evaluation in Section 3.3.

2.2 Lower Sand LNAPL Recovery System

The lower sand recovery system was shut down at the end of the 2008 operating season along with the GWTS as discussed above. As approved in the facility permit, lower sand LNAPL recovery currently consists of active skimming in wells with a previously reported LNAPL transmissivity greater than 0.5 ft^2/day, and passive collection in other wells that exhibit greater than 0.5 feet of LNAPL presence (currently MW-88-01), as long as active recovery is still required based on LNAPL transmissivity.

LNAPL recovery was initiated with the skimmers at MW-89-04 and MW-5R in May 2011. In 2013, MW 89-03 was converted to an active recovery system to optimize LNAPL recovery and not because of transmissivity value. Sheds have been built around the active skimmer systems to allow them to facilitate year-round LNAPL collection.

Recovered LNAPL was historically stored at the site in Tank M-1. Tank M-1 was closed in September 2011 and will be cleaned and removed from the site following the procedures outlined in the *2013 Post Closure and Corrective Action Permit Modification* (AECOM, August 8, 2013).

In place of Tank M-1, two 550-gallon poly tanks, each set inside a 600-gallon poly secondary containment, were installed in September 2011 to store the recovered LNAPL. In 2013 the same poly tank/secondary containment system was placed at MW-89-03. The LNAPL recovered from Spill Buster™ optical product recovery pumps operating on wells MW-89-03, MW-89-04, and MW-5R are pumped to each 550-gallon recovery tank. When the poly recovery tanks are full, a licensed waste hauler will be contracted to pump each tank using a vacuum truck and dispose of the waste at an appropriate facility. Recovery tank for well MW89-04 was pumped on January 21, 2014 and a copy of the waste manifest is included in **Appendix A**.

2.2.1 LNAPL Transmissivity Evaluation

In September 2014, LNAPL baildown tests were conducted at monitoring wells MW-89-03 and MW-89-04 to determine the LNAPL transmissivity. MW-5R did not have a baildown test performed due to insufficient LNAPL thickness in the monitoring well. The results are presented in Section 3.1.2.2.

2.3 Irrigation and Revegetation

The former refinery, including CAMU A, is irrigated if seasonal rainfall is insufficient to maintain soil moisture. The site was not irrigated during 2014 because the site received adequate rain throughout the summer and fall seasons. The 2014 monthly Williston precipitation data are presented in **Table 2**.

Revegetation is implemented around the closed surface impoundments if required in response to burrowing animals.

2.4 Inspection Activities

Inspection activities during 2014 at the former refinery included the following:

- Inspections of the two RCRA surface impoundments, and
- Annual inspection of the PCGWM monitoring wells (**Figure 2**).

During 2014, the vegetative cover remained intact over the surface impoundments and no erosion, settling, or ponded water was observed. The benchmark, security system, and drainage control structures were all observed to be in good condition. Animal burrows were observed on the south side of the larger impoundment and also in the smaller impoundment on the north side. Holes were filled in; reseeding is pending until early spring. Copies of the quarterly surface impoundments inspection forms are included in **Appendix B**.

During the September 2014 annual monitoring event, JLI personnel inspected the PCGWM wells for any damage to the wells, well caps, concrete bases, and locks, including impacts to the wells created by frost heave.

2.5 PCGWM Monitoring Well Redevelopment Evaluation

An evaluation of PCGWM wells was completed to identify wells that may require redevelopment due to sedimentation. The total depth of each of the 14 PCGWM wells was measured and recorded during the September 2014 gauging event (**Appendix B**). **Table 3** includes a comparison of the total depth of each well measured in September 2014 to its installed total depth. Redevelopment is required if an accumulation of more than 2 feet of sediment has occurred. No redevelopment was required in 2014.

3.0 Summary of Groundwater Monitoring Results

This section presents the results of the groundwater monitoring activities conducted during 2014 at the former refinery and includes:

- Groundwater elevation and LNAPL thickness in the upper sand/till and lower sand aquifers;
- PCGWM analytical results;
- CMI performance indicator analytical results;
- MNA results; and
- Data quality evaluation.

3.1 Groundwater Elevation and LNAPL Thickness

FJM contractor JLI measured site-wide groundwater elevations and LNAPL thicknesses on April 22, 2014 and September 21, 2014. The results of the April and September fluid level measurements are presented in **Tables 4 and 5**, respectively. The locations of monitoring wells completed in the upper and lower sand aquifers are shown on **Figure 2**. The historical groundwater elevations measured for the PCGWM wells since April 1991 are included in **Appendix C**.

3.1.1 Upper Sand/Till

The upper sand/till LNAPL recovery system was shut down at the end of 2002. Groundwater elevations and LNAPL thicknesses are measured for trend data.

3.1.1.1 Groundwater Elevations

Figures 3 and 4 illustrate the groundwater elevation contours for the unconfined upper sand/till aquifer as measured in April and September 2014, respectively. Groundwater elevations are corrected for LNAPL thickness based on an LNAPL density of 0.80 g/cm^3. A southwesterly flow direction is inferred from the groundwater elevations measured in April and September 2014. The overall groundwater flow pattern at the site is consistent with the pattern observed during 2013.

The hydraulic gradient in the upper sand/till aquifer between wells MW-1C and MW-K during April 2014 was approximately 0.016, and in September 2014 was approximately 0.019. This gradient is consistent with gradients calculated during previous years. Based on the hydraulic conductivity range of approximately $1x10^{-6}$ to $1.4x10^{-6}$ centimeters per second (cm/sec) (GeoWest, 1992), an assumed effective porosity of 0.30, and the gradient identified above, the average horizontal groundwater velocity in the sand/till aquifer ranged from $1.5x10^{-4}$ to $1.33x10^{-3}$ feet per day (0.05 to 0.48 feet per year) in May 2014.

In September 2014, the average horizontal groundwater velocity in the sand/till aquifer ranged from $1.8x10^{-4}$ to $1.58x10^{-3}$ feet per day (0.06 to 0.58 feet per year).

3.1.1.2 LNAPL thickness and extent

The thickness and extent of LNAPL in the upper sand/till during April and September 2014 are shown with those from May 1997 on **Figures 5 and 6**. Since May 1997, there has been an overall decline in both thickness and extent of LNAPL in the upper sand/till. This decline is due to the operation of the upper sand LNAPL/groundwater recovery wells (1989 through 2002) recovering more than 173,000 gallons of LNAPL.

3.1.2 Lower sand

The original LNAPL recovery system has been shut down. LNAPL is now recovered actively with skimmers or passively as required by permit. The lower sand is believed to be a confined aquifer.

3.1.2.1 Groundwater elevations

Figure 7 and 8 depict the corrected groundwater potentiometric elevation contours for the lower sand aquifer measured in April and September 2014, respectively. Groundwater elevations are corrected for LNAPL thickness based on a density of 0.80 g/cm^3. Overall, the potentiometric surface observed for the lower sand aquifer is consistent with previous years.

The hydraulic gradient in the lower sand aquifer has been measured to the southwest or the northeast, depending on the time of the year. Based on the two well gauging events in 2014, the gradient was very shallow (0.0007 ft/ft in April and 0.0006 ft/ft in September) to the southwest. Based on the hydraulic conductivity range of approximately $9.9x10^{-4}$ to $8.9x10^{-3}$ cm/sec (GeoWest, 1992), an assumed effective porosity of 0.30, and the gradient identified above, the average horizontal groundwater velocity in the lower sand aquifer ranged from 0.006 to 0.058 feet per day (2.34 to 21.06 feet per year) in April 2014. In September 2014, the average horizontal groundwater velocity in the lower sand aquifer ranged from 0.006 to 0.053 feet per day (2.16 to 19.51 feet per year).

3.1.2.2 LNAPL thickness and extent

The extent of LNAPL in the lower sand measured during April and September 2014 is shown with those from 1997 on **Figures 9 and 10**, respectively. Both figures indicate the decrease in LNAPL that has occurred over time. However, given the issues associated with screen placement in the wells and the fact that the aquifer is confined, the apparent LNAPL thicknesses are not good indicators of the actual thickness of the zone of mobile LNAPL in the formation. Comparisons should be considered as general/qualitative, rather than strictly quantitative. The decline in LNAPL thickness is due to the

recovery of LNAPL utilizing the original system which used groundwater suppression to collect and remove LNAPL, and now the skimming operations. MW-5R did not recover any LNAPL in 2014 nor in 2013; in 2012 the Spill Buster collected 49.30 gallons. LNAPL was recovered from MW-89-04 (300 gallons) and MW-89-03 (51 gallons). Overall the quantity of LNAPL collected at the site (351 gallons) was approximately half the volume as collected last year (687 gallons). LNAPL recovery volume from the lower sand in 2014 is presented in **Table 6**.

3.2 LNAPL transmissivity

In September 2014, JLI personnel conducted an LNAPL baildown test on lower sand wells MW-89-03 and MW-89-04. The baildown test was conducted to evaluate the local LNAPL transmissivity for well MW89-04. A baildown test was not required on well MW89-03 but was performed to confirm the LNAPL transmissivity value. Well MW-5R did not accumulate LNAPL greater than a few tenths of a foot and transmissivity testing was not performed.

The LNAPL transmissivity calculated for well MW-89-04 was 0.15 ft2/day and 0.02 ft2/day for MW-89-03. The results of these tests were submitted to the ND Department of Health by JLI in a letter dated November 18, 2014 in which FJM requested cessation of NAPL recovery at the site. Active LNAPL recovery continues in MW-89-03 and MW-89-04 pending a response to the request.

3.3 Groundwater analytical results

Two groundwater monitoring programs are implemented at the site: the PCGWM program and the CMI performance indicator well program. The original purpose of the PCGWM program was to evaluate potential releases from the closed surface impoundments consistent with the 1989 Consent Order. However, hydrocarbon constituents are present in groundwater upgradient of the impoundments, which makes detection and compliance monitoring not practicable. As such, and as described in Section 6.0 of the Permit Application (AECOM, 2010), the purpose of the PCGWM program is to demonstrate that groundwater contaminants are not migrating and that corrective measures are reducing the extent or magnitude of existing groundwater contamination. The CMI program is intended to evaluate the effectiveness of corrective measures in reducing the severity and extent of groundwater contamination.

3.3.1 PCGWM analytical results

ESC analyzed the PCGWM groundwater samples following U. S. Environmental Protection Agency (USEPA) analytical methods listed in Table E-1 of the SAP (AECOM, 2010). **Table 7** presents the PCGWM analytical results for the September 2014 monitoring event and summarizes the statistical evaluation. Results are shown in **Figures 11-16**. All PCGWM analytical results and statistical analyses reported from June 1992 to September 2014 are presented in **Appendix D**. Current (2014) chain-of-custody forms and laboratory analytical reports from ESC are provided in **Appendix B**.

The results of PCGWM analytical data are summarized below by the PCGWM analytes BTEX, TPH-GRO, and TPH-DRO. The constituent summaries below are followed by an evaluation of whether any reported concentrations are considered statistically significant.

PCGMW wells MW87-08, MW90-01, MW-8BR, MW-9, and MW-10 were abandoned and replaced with MW87-08R, MW90-01R, MW-8BRR, MW-9R, and MW-10R. These well were damaged by the installation of a railroad spur and required replacement in 2013. These wells are required to be sampled quarterly for two years to establish a baseline. The aforementioned wells were sampled quarterly in 2014 (March 15th, June, 11th, September 22nd -23rd, and December 10th) for the same PCGWM analytes. Cumulative analytical results from these five PCGWM replacement wells are included in **Appendix D**.

3.3.1.1 BTEX

Benzene, toluene, ethylbenzene, and xylenes were not detected in any of the samples collected from PCGWM wells in September 2014 (**Table 7**)

3.3.1.2 TPH-GRO and TPH-DRO

TPH-GRO was not detected in any of the samples collected from PCGWM wells. TPH-DRO was detected above the detection limit of 0.1 mg/L in 12 wells, at concentrations ranging from 0.1 mg/L to 1.7 mg/L (**Table 7**).

3.3.1.3 Statistical analysis of the PCGWM data

The PCGWM data were statistically analyzed in accordance with the SAP (AECOM, 2010). None of the constituents in any well showed statistically significant results. The results of the Kruskal-Wallis test are provided in **Appendix D**.

The Kruskal-Wallis Test was performed on historical groundwater results for BTEX-analyzed in samples from the nine upper and seven lower sand aquifer wells. The Kruskal-Wallis Test evaluates whether the presence of a hazardous constituent in the downgradient wells, compared to the background well, is statistically significant. The results of this analysis indicated that BTEX in all wells was not statistically significant.

If the Kruskal-Wallis Test indicated that the historical analyte concentrations in a well were statistically significant, the Combined Shewhart-Cumulative Sum control chart analysis would be performed to determine if the detections represent a statistically increasing trend. A cumulative sum (Si) value and a standardized mean (Zi) would be calculated based upon the standardized baseline concentration for the analyte. Zi values of 4.5 or greater or Si values of 5.0 or greater would indicate a contaminant

concentration that is "out-of-control" (USEPA, 1989 and 1992) and thus show a statistically significant increasing trend in contamination.

3.3.2 CMI performance indicator analytical results

JLI personnel monitored performance indicator wells on September 21-22, 2014. The purpose of the indicator well sampling is to monitor dissolved hydrocarbon concentrations to evaluate the annual reduction in dissolved-phase constituents. To demonstrate reduction, the analytical results are compared to the May 1997 baseline groundwater sampling results.

The 2014 analytical results are summarized below by the upper sand/till and lower sand aquifers. The analytical reports and field forms are presented in **Appendix B**.

3.3.2.1 Upper sand/till aquifer

The results of the September 2014 indicator well sampling for the upper sand/till aquifer are provided in **Table 8** and on **Figures 11–13**. Historical performance indicator well results are summarized in **Table 9**. Seven performance indicator wells are completed in the upper sand/till aquifer.

- Total BTEX was detected in six wells;
- TPH-GRO was detected in three wells; and
- TPH-DRO was detected in seven wells.

The dissolved-phase plumes remained stable from the last sampling event while maintaining a statistical decrease in concentration and or size with time, as illustrated on the Fi**gures 11–13**. Benzene concentrations in groundwater from well MW-C2 are the exception to the overall declining trend, and have been gradually trending upward since 1997; however, the September 2014 results decreased significantly from 2013 results.

3.3.2.2 Lower sand aquifer

The results of the September 2014 indicator well sampling for the lower sand aquifer are provided in **Table 8** and **Figures 14–16**. Historical indicator well results are summarized in **Table 9**. Five performance indicator wells are completed in the lower sand aquifer.

- Total BTEX was detected in three wells;
- TPH-GRO was not detected in any wells; and
- TPH-DRO was detected in four wells.

The dissolved-phase plumes remained stable from the last sampling event while maintaining a statistical decrease in concentration and or size with time, as illustrated on the **Figures 14–16**.

3.4 Monitored Natural Attenuation

During a meeting with NDDH on April 2, 2003 FJM volunteered to establish an MNA evaluation program for the upper sand/till and lower sand aquifers. The purpose of this program was to evaluate whether the dissolved hydrocarbons in the upper sand/till and lower sand are influenced by intrinsic biodegradation. Before the evaluation, it was understood that the poor permeability of the clay till limits the downgradient migration of dissolved hydrocarbons in the aquifers, but the effect of intrinsic biodegradation was unknown. The activities and results for the May and October 2003 MNA sampling events were used to evaluate biodegradation processes at the site. This evaluation is presented in the 2004 permit application (RETEC, 2004). The MNA parameters that continue to be collected at the site are presented in **Table 10**.

3.4.1 Upper sand

The BTEX, TPH-DRO, and TPH-GRO plumes have not migrated since 1990 and total BTEX concentrations have shown significant reductions. Given that the presence of MNA has been established at the site, constituent concentration trends over time provides the primary line of evidence for continued MNA at the site. Reductions in benzene concentrations are evident in all wells except for well MW-C2 (**Appendix D**). Although benzene concentrations show an increasing trend at MW-C2, methane has historically been detected at very high concentrations (between 4,300 and 17,000 µg/L). The presence of methane at such high concentrations indicates methanogenesis is occurring at MW-C2. Additionally, although benzene concentrations show an increasing trend at MW-C2, the September 2014 results decreased significantly from 2013 results. In the other upper sand wells, benzene is showing a general decreasing trend and methane has historically been detected at high concentrations indicating methanogenesis.

3.4.2 Lower sand

The BTEX, TPH-DRO, and TPH-GRO plumes have not migrated since 1990 and total BTEX concentrations have shown significant reductions. Given that the presence of MNA has been established at the site, constituent concentration trends over time provides the primary line of evidence for continued MNA at the site. While benzene fluctuations can be seen in MW-00-16 and MW-T1R, the general trend of all the evaluated lower sand wells demonstrates benzene reduction is occurring (**Appendix D**). Benzene in groundwater from well MW-89-07 has been trending upwards since 2009 but has decreased to 5300 µg/L from a historical high of 8600 µg/L in 2013. Biodegradation is not expected to be as effective in the lower sand aquifer because 1) LNAPL is still present within the dissolved-hydrocarbon plume, and 2) the aquifer is low in terminal electron acceptors (e.g., oxygen, nitrate, sulfate, iron).

3.5 Analytical data quality assurance

During 2014, quality assurance/quality control (QA/QC) of all analytical data was performed in accordance with the procedures outlined in the SAPs for the PCGWM and for CMI performance monitoring (RETEC, 2004; Appendix F and Appendix L, respectively). The QA/QC evaluation was performed by JLI personnel for compliance with quality control criteria established by standard analytical methods. The laboratory analytical data evaluations by JLI are presented in **Appendix B**.

The usability of the analytical data was evaluated by the following criteria:

- Condition of the samples as received including missing labels, broken containers, temperature, preservation, and volume.
- Confirming holding times were met.
- Whether constituents in blank samples were detected above their detection limits and indicate sample cross-contamination.
- Whether laboratory control and laboratory control duplicate samples met advisory levels.
- Whether matrix spike and matrix spike duplicates met advisory levels.
- Whether blind duplicate samples met a relative percent difference (RPD) of 30 percent or less.

Precision, accuracy, method compliance, and completeness of the data set are determined to be acceptable for all methods reported. All submitted data are suitable for their intended use as qualified.

Quality assurance/quality control (QA/QC) of analytical data from quarterly sampling of PCGMW replacement wells MW-87-08R, MW-90-01R, MW-8BRR, MW-9R, and MW-10R was performed by ESC Lab Sciences. This evaluation is included with the laboratory analytical reports in **Appendix B**. The results of their evaluation were reviewed by JLI personnel and were found to be suitable for their intended use as qualified.

4.0 CMI Performance Monitoring Results

In 2014, LNAPL recovery was based on the requirements stipulated in the facility permit issued May 2010. In this section, the results of system performance are summarized for the following corrective measures at the site:

- LNAPL rebound in the upper sand/till;
- LNAPL recovery from the lower sand; and
- Hydrocarbons recovered by corrective measures.

4.1 Evaluation of LNAPL rebound in the upper sand/till aquifer

During 2014, LNAPL was detected in two upper sand/till aquifer monitoring wells, ranging in thickness from 0.01 to 0.03 feet (**Figures 5 and 6**). The data does not suggest rebound is occurring in the upper sand/till wells.

4.2 LNAPL recovery from the lower sand

During 2014, the lower sand LNAPL recovery system consisted of three skimming systems that are operated year-round in enclosed sheds. Approximately 351 gallons of LNAPL were recovered during 2014. There was no LNAPL recovery at MW-5R in 2014. A total of approximately 300 gallons of LNAPL was recovered from well MW89-04, and approximately 51 gallons of LNAPL was recovered from well MW89-03 (**Table 6**).

Based on transmissivity calculations and LNAPL thickness in wells, FJM has requested cessation of LNAPL recovery. LNAPL recovery will continue at MW-89-03 and MW-89-04 with the Spill Buster pumps in 2015 pending response to the request.

4.3 Hydrocarbons recovered by corrective measures

Approximately 450,594 gallons of LNAPL have been removed via corrective measures from 1989 through 2014 at the site. LNAPL recovery from the lower sand will continue at the site as required

5.0 Summary and Conclusions

A summary of the 2014 site PCGWM and CMI activities are presented below.

5.1 LNAPL recovery system evaluation

In 2014, the lower sand LNAPL recovery system consisted of the skimming pumps and bailing to recover LNAPL. The following summarizes the recovery activity:

- The LNAPL transmissivity calculated for well MW-89-04 was 0.15 ft2/day and 0.02 ft2/day for MW-89-03. This is the second year in a row that the transmissivity value has been below the 0.5 ft^2/day. FJM has met the LNAPL endpoint and requested cessation of NAPL recovery at the site

- Spill Buster skimmers ran continually in wells MW-89-03 and MW-89-04, except for downtime due to maintenance and power fluctuations; and approximately 351 gallons of LNAPL were recovered by skimming during 2014.

5.2 Groundwater monitoring and sampling results

- Groundwater and potentiometric surfaces in the two upper aquifers at the site are consistent with those measured in the past.

- Extent and thickness of LNAPL continues to decrease at the site; there is no apparent rebound of LNAPL in the upper aquifer.

- Overall dissolved-phase concentrations continue to decrease at the site. The plumes have not migrated over time.

- Using the Kruskal-Wallis Sum Test, none of the reported concentrations were statistically significant relative to background concentrations.

- MNA is an effective means of benzene reduction in the upper sand/till aquifer in the absence of LNAPL; and

- MNA is not as effective in the lower sand aquifer as in the upper sand/till aquifer, however, the general trend of all the evaluated lower sand wells demonstrates benzene reduction is occurring.

- FJM recommends that both the upper sand and lower sand MNA wells continue to be monitored for BTEX, DO, and ORP, and continue to be evaluated using the benzene trend charts (**Appendix E**). The PCGWM and CMI monitoring programs will be continued annually.

5.3 Irrigation/revegetation system

Irrigation did not occur during the 2014 operating season because the site received adequate rain throughout the summer and fall seasons. There were minor vegetation activities as a result of burrowing animals around the closed surface impoundments.

6.0 References

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7.0 Certification Statement

This document fulfills the annual requirement of the Resource Conservation and Recovery Act (RCRA) Post-Closure and Corrective Action Permit (Permit No. HW-007) for the Williston Refinery in Williston, North Dakota (Module VI.A) as well as Section 33-24-05-40(2)(i) of the North Dakota Administrative Code (NDAC).

I have a program in place to reduce the volume and toxicity of hazardous waste, other than remediation wastes, generated as a result of corrective measures implementation to the degree I have determined to be economically practicable.

I have selected the practicable method of treatment, storage, or disposal currently available to me via the approved corrective measures remedy to minimize the present and future threat to human health and the environment.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system design to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine and imprisonment for knowing violations.

Molly Gregersen, FJM Petroleums	Date

TABLES

Table 1
Chronology of Events

Year	Month	Date(s)	Event Description
1992	Jan	31	Post-Closure Permit Application (PCPA) submitted to North Dakota State Department of Health (NDSDH).
	Apr	13	NDSDH issues draft Post-Closure Permit.
	May	5	Ground water levels and free product thickness measured at site monitoring wells for interim measures evaluation.
		21	Public comment hearing held in Williston for draft Post-Closure Permit.
	Jun	3	4 upper sand collection laterals begin operation.
		23	16 monitoring wells sampled by Flying J during Phase I of Comprehensive Monitoring Evaluation (CME) and initial post-closure ground water monitoring (PCGWM).
		27	15 monitoring wells sampled by EPA during Phase II of CME.
	Jul	3	Flying J submits comments on draft Post-Closure Permit.
		7	Lower sand recovery well begins operation.
	Aug	27	NDSDH states in letter to Flying J that draft Post-Closure Permit will be reissued with revisions.
	Oct	5	16 monitoring wells sampled by Flying J for Third Quarter, 1992 PCGWM.
		9	Second Quarter, 1992 PCGWM Data Report submitted to NDSDH.
		19	Revised Draft Post-Closure Permit reissued by NDSDH for public comment.
		19	NDSDH identifies in letter to Flying J that some BTEX, TDS, and dissolved metals analyses from samples obtained during initial PCGWM were not analyzed using the test methods outlined in the PCPA.
		29	Letter of explanation sent by Evergreen Analytical to NDSDH regarding differences in test methods.
	Nov	2	Demolition of refinery structures, tanks, and process units initiated.
		15	Lower sand recovery well was turned off to allow site demolition activities.
	Dec	9	16 monitoring wells sampled by Flying J for Fourth Quarter, 1992 PCGWM.
		10	96 monitoring wells measured for water and oil levels to evaluate interim measure performance
		11	Upper sand collection laterals and oil/water separator were shut down for the winter season after sustained winter temperatures compromised their operation.
		23	Third Quarter, 1992 PCGWM Data Report submitted to NDSDH.
1993	Feb	2	Post-Closure Care and Corrective Action Permit issued by NDSDH.
		5	Fourth Quarter, 1992 PCGWM Data Report submitted to NDSDH.
		2	Request submitted by Flying J for Administrative Review of Permit.
		8	16 monitoring wells sampled by Flying J for First Quarter, 1993 PCGWM.
		26	1992 Annual PCGWM Report submitted to NDSDH.
	May	14	First Quarter, 1993 PCGWM Data Report submitted to NDSDH.
	Jun	21	16 monitoring wells sampled by Flying J for Second Quarter, 1993 PCGWM.
		28	Final decision and Post-Closure Permit issued by NDSDH.
	Jul	27	NDSDH withdraws final decision and Post-Closure Permit.
	Aug	13	Second Quarter, 1993 PCGWM Data Report submitted to NDSDH.
	Sep	13	16 monitoring wells sampled by Flying J for Third Quarter, 1993 PCGWM.
		22	96 monitoring wells measured by Flying J for water level elevation and free product thickness.
	Oct	14	Revised Sampling and Analysis Plan for PCGWM (Appendix H) submitted to NDSDH.
	Nov	10	Draft Post-Closure Permit Issued by NDSDH for public comment.
		12	Third Quarter, 1993 PCGWM Data Report submitted to NDSDH.
		30	16 monitoring wells sampled by Flying J for Fourth Quarter, 1993 PCGWM.
1994	Feb	9	Fourth Quarter, 1993 PCGWM Data Report submitted to NDSDH.
	Mar	1	1993 Annual PCGWM Report submitted to NDSDH.
		21-23	15 monitoring wells sampled by Flying J for First Quarter, 1994 PCGWM.
	May	12	First Quarter, 1994 PCGWM Data Report submitted to NDSDH.
	Jun	20-22	15 monitoring wells sampled by Flying J for Second Quarter, 1994 PCGWM.
	Aug	15	Second Quarter, 1994 PCGWM Data Report submitted to NDSDH.
	Sep	13-14	15 monitoring wells sampled by Flying J for Third Quarter, 1994 PCGWM.
	Nov	3	Third Quarter, 1994 PCGWM Data Report submitted to NDSDH.
	Dec	12-15	16 monitoring wells sampled by Flying J for Fourth Quarter, 1994 PCGWM.

Table 1
Chronology of Events

Year	Month	Date(s)	Event Description
1995	Feb	14	Fourth Quarter, 1994 PCGWM Data Report submitted to NDSDH.
		21	1994 Annual Report submitted to NDSDH.
	Mar	21-23	16 monitoring wells sampled by Flying J for First Quarter, 1995 PCGWM.
	May	15	First Quarter, 1995 PCGWM Data Report Submitted to NDSDH.
	Jun	12-14	15 monitoring wells sampled by Flying J for Second Quarter, 1995 PCGWM.
	Jul	25	NDSDH submits written approval of permit modification to the Post-Closure Care and Corrective Action Permit to Flying J.
	Aug	14	Second Quarter, 1995 PCGWM Data Report Submitted to NDSDH.
		25	Permit modifications (bi-annual sampling and reduced constituent sampling) become effective.
	Oct	9-11	15 monitoring wells sampled by Flying J for October, 1995 Bi-Annual PCGWM.
	Dec	22	October, 1995 Bi-Annual PCGWM Data Report Submitted to NDSDH
1996	Feb	29	1995 Annual Report submitted to NDSDH.
	May	4	14 monitoring wells sampled by Flying J for First 1996 Bi-Annual PCGWM.
	Jun	10	2 monitoring wells sampled by Flying J for First 1996 Bi-Annual PCGWM.
	Jul	30	May, 1996 Bi-Annual PCGWM Data Report Submitted to NDSDH.
	Oct	7-9	16 monitoring wells sampled by Flying J for October, 1995 Bi-Annual PCGWM.
	Dec	23	October, 1996 Bi-Annual PCGWM Data Report Submitted to NDSDH.
1997	Feb	24	1996 Annual Report submitted to NDDH.
	Apr	30	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel.
	May	1	Annual Resurvey of 16 PCGWM wells conducted.
		6-9	16 monitoring wells sampled by Flying J for First 1997 Bi-Annual PCGWM.
		19	Interim Measures groundwater recovery and treatment system started for operational season.
		28	Corrective Measures Implementation systems (lower sand recovery wells, SVE system) started for operational season.
	Jul	18	May 1997 Bi-Annual PCGWM Data Report submitted to NDDH.
		18	1st Half Corrective Measures Implementation Progress Report submitted to NDDH.
	Oct	1-3	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel.
		5-7	16 Monitoring wells sampled by Flying J for October 1997 Bi-Annual PCGWM.
		28	CMI system shutdown for the season.
	Nov	26	Corrective Measures Implementation Report submitted to NDDH.
	Dec	15	October 1997 Bi-Annual PCGWM Data Report submitted to NDDH.
1998	Feb	27	1997 Annual Report submitted to NDDH.
	Apr	30	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel.
	May	4-6	16 monitoring wells sampled by Flying J personnel for May 1998 Bi-Annual PCGWM.
		12	Annual re-survey of 16 PCGWM wells conducted.
		14	Interim Measures groundwater recovery and treatment system started for operational season.
		15	Corrective Measures Implementation SVE system started for the operational season.
		19	Corrective Measures Implementation lower sand recovery well system started for the operational season.
	Jul	24	May 1998 Bi-Annual PCGWM Report submitted to NDDH.
		31	1st Half 1998 Corrective Measures Implementation Progress Report submitted to NDDH.
	Oct	12-13	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel.
		20-22	16 Monitoring wells sampled by Flying J for October 1998 Bi-Annual PCGWM.
	Nov	6, 11	CMI system shutdown for the season.
		19	Post-Closure/Corrective Action Permit Application submitted to NDDH.
	Dec	22	October 1998 Bi-Annual PCGWM Data Report submitted to NDDH.

Table 1
Chronology of Events

Year	Month	Date(s)	Event Description
1999	Jan	29	Second Half 1998 Corrective Maintenance Implementation Progress Report submitted to NDDH
	Feb	26	1998 Annual Report submitted to NDDH.
	Apr	15	Post-Closure/Corrective Action Permit renewed by NDDH.
		28	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel.
		30	Annual re-survey of 16 PCGWM wells conducted
	May	2-5	16 monitoring wells sampled by Flying J personnel for May 1999 Bi-Annual PCGWM
		17	Interim Measures groundwater recovery and treatment system started for the operational season.
		17	Corrective Measures Implementation lower sand recovery well system started for the operational season.
		20	Corrective Measures Implementation SVE system started for the operational season.
	Jul	30	First Half 1999 Corrective Measures Implementation Progress Report submitted to NDDH.
	Sep	20-21	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel.
	Oct	4-6	16 Monitoring wells sampled by Flying J for October 1999 Bi-Annual PCGWM.
		13-14	19 Monitoring wells sampled by Flying J for October 1999 CMI Performance Monitoring
	Nov	1-2	51 soil samples collected from 24 soil borings drilled in the SVE treatment and lead-contaminated areas.
		2-3	CMI system shutdown for the season
2000	Jan	28	Second Half 1999 CMI Progress Report submitted to NDDH
	Feb	1	1999 Annual Report submitted to NDDH.
	Apr	20	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel.
	May	2-4	16 monitoring wells sampled by Flying J personnel for May 2000 Bi-Annual PCGWM.
		9-10	17 Monitoring wells sampled by Flying J for May 2000 CMI Performance Monitoring.
		15-16	Drilled and installed vapor extraction well VEW-37 in Lead-Contaminated Area No. 3 and connected VEW-37 to existing SVE system.
		16-18	Drilled and installed monitoring wells MW-00-16 and MW-00-17 on City of Williston property north of Highway 1804.
		17	Collected 35 soil samples from 12 soil borings drilled in Lead-Contaminated Area No. 3.
		17	Interim Measures groundwater recovery and treatment system started for the operational season.
		22	Corrective Measures Implementation lower sand recovery well system started for the operational season.
		22	Corrective Measures Implementation SVE system started for the operational season.
		30	Annual re-survey of 16 PCGWM wells conducted.
	Jul	28	First Half 2000 Corrective Measures Implementation Progress Report submitted to NDDH.
	Sep	26-28	3.5 cubic yards of lead-contaminated soil excavated and transported for disposal to Safety Kleen in Sawyer, North Dakota.
	Oct	3	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel.
		9-11	16 monitoring wells sampled by Flying J for October 2000 Bi-Annual PCGWM.
		17-18	17 monitoring wells sampled by Flying J for October 2000 CMI performance monitoring.
		19	CMI SVE system shutdown for the season.
		25	CMI groundwater recovery system shutdown for the season.
2001	Jan	31	Second Half 2000 CMI Progress Report submitted to NDDH
	Feb	22	2000 Annual Report submitted to NDDH.
	May	2	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel.
		8-9	16 monitoring wells sampled by Flying J personnel for May 2001 Bi-Annual PCGWM.
		14-16	17 Monitoring wells sampled by Flying J for May 2001 CMI Performance Monitoring.
		22	Interim Measures groundwater recovery and treatment system started for the operational season.
		22	Corrective Measures Implementation lower sand recovery well system started for the operational season.
		23	Corrective Measures Implementation SVE system started for the operational season.
	Jun	8	Annual re-survey of 16 PCGWM wells conducted.
	Jul	31	First Half 2001 Corrective Measures Implementation Progress Report submitted to NDDH.
	Sep	29	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel.
	Oct	1-2	16 monitoring wells sampled by Flying J for October 2001 Bi-Annual PCGWM.
		8-9	17 monitoring wells sampled by Flying J for October 2001 CMI performance monitoring.
		15	CMI SVE system shutdown for the season.
		16	CMI groundwater recovery system shutdown for the season.
	Nov	13	26 soil samples collected from 14 soil borings drill in the SVE treatment area.

Table 1
Chronology of Events

Year	Month	Date(s)	Event Description
2002	Jan	31	Second Half 2001 CMI Progress Report submitted to NDDH.
	Feb	26	2001 Annual Report submitted to NDDH.
	Apr	27	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel.
	Apr 29 - May 1		17 Monitoring wells sampled by Flying J for May 2002 CMI Performance Monitoring.
	May	10	Annual re-survey of 16 PCGWM wells conducted.
		14-15	16 monitoring wells sampled by Flying J personnel for May 2002 Bi-Annual PCGWM.
		20	Interim Measures groundwater recovery and treatment system started for the operational season.
		20	CMI lower sand recovery well system started for the operational season.
		21	CMI SVE system started for the operational season.
	Jul	31	First Half 2002 CMI Progress Report submitted to NDDH.
	Sep	30	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel.
	Oct	5-6	16 monitoring wells sampled by Flying J for October 2002 Bi-Annual PCGWM.
		11	CMI SVE system shutdown for the season.
		12-13	23 monitoring wells sampled by Flying J for October 2002 CMI performance monitoring.
		18	CMI groundwater recovery system shutdown for the season.
2003	Jan	31	Second Half 2002 CMI Progress Report submitted to NDDH.
	Feb	25	2002 Annual Report submitted to NDDH.
	Apr	2	CMI Progress Review Meeting between NDDH and Flying J
		23	Flying J personnel annual training
		24	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel.
		2-27	17 Monitoring wells sampled by Flying J for May 2002 CMI Performance Monitoring.
		30	Annual re-survey of 16 PCGWM wells conducted.
	May	13-14	16 monitoring wells sampled by Flying J personnel for May 2003 Bi-Annual PCGWM.
		11	CMI SVE system started for the operational season.
		27	CMI lower sand recovery well system started for the operational season.
	Jun	16	Lower Sand Free Product Recovery Progress Report to NDDH.
		29	Spill Prevention, Control, and Countermeasures Plan submitted to NDDH
	Jul	31	First Half 2003 CMI Progress Report submitted to NDDH.
	Oct	2	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel.
		4-5	24 monitoring wells sampled by Flying J for October 2003 CMI performance monitoring.
		11-12	16 monitoring wells sampled by Flying J for October 2003 Bi-Annual PCGWM.
		23	CMI SVE system shutdown for the season.
		28	CMI groundwater recovery system shutdown for the season.
2004	Jan	15	Post-Closure/Corrective Action Permit Application submitted to NDDH.
		30	Second Half 2003 CMI Progress Report and the submitted to NDDH.
	Feb	11	2003 Annual Report for Post-Closure Care and Groundwater Monitoring submitted to NDDH.
	Apr	5-30	SVE wells removed and abandoned by Flying J personnel.
		11	Annual re-survey of 16 PCGWM wells conducted.
	May	3	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel.
		10	Flying J personnel annual training.
		14	Lower sand groundwater recovery system started.
		17	16 monitoring wells sampled by Flying J for May 2004 Bi-Annual PCGWM.
		17	*In-Situ* landfarming activities for the former process areas started.
		18	23 wells sampled for May 2004 CMI performance monitoring.
	Jun	1	Soil samples collected in former process areas for landfarming performance monitoring.
		24	Groundwater recovery wells and air stripper shutdown for repairs.
	Jul	7	Groundwater recovery wells and air stripper re-started.
		12	Post-Closure/Corrective Action Permit renewed by NDDH.
	Aug	17	Recovered oil stored in Tank M-1 transported off-site to Flying J Refinery in North Salt Lake, UT.
	Sep	13	Recovered oil stored in Tank M-1 transported off-site to Flying J Refinery in North Salt Lake, UT.
		29	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel.
	Oct	2	Lower sand groundwater recovery system shutdown for the season.
		12	16 monitoring wells sampled by Flying J for October 2004 Bi-Annual PCGWM.
		12-13	22 wells sampled for October 2004 CMI performance monitoring.
		13	Soil samples collected in former process areas for landfarming performance monitoring.
		18-22	Landfarming end of season tilling of former process areas.

Table 1
Chronology of Events

Year	Month	Date(s)	Event Description
2005	Feb	18	*2004 Corrective Measures Implementation Progress Report* and the *2004 Annual Report for Post-Closure Care and Groundwater Monitoring* were submitted to NDDH.
	May	12	Flying J personnel underwent annual Hazwoper refresher training.
		13	PCGWM wells were resurveyed for the year.
		19	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel.
		16 & 23	Soil samples were collected for *in-situ* landfarming.
		24	Scaling removed from the air stripper's knockout trays and the lower aquifer recovery system was started for the season
		26	Influent and effluent groundwater samples were collected from the air stripper.
		30	Soil within CAMU A was tilled to 18–24 inches for the *in-situ* landfarming corrective measure.
	Jun 21 - Jul 8		Recovery well 95-03 was shut down for repairs.
	Jul	14	Oil/water separator was shut down for cleaning.
		25-27	Air stripper was shut down for cleaning.
		31	Soil within CAMU A was tilled to 18–24 inches for the *in-situ* landfarming corrective measure.
	Aug	16	Soil within CAMU A was tilled to 18–24 inches for the *in-situ* landfarming corrective measure.
	Sep	27	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel.
		29	The GWRTS was shut down and winterized for the season due to build-up in the main standpipe that discharges to the POTW.
	Oct	4-5	NDDH representative inspected surface impoundments as part of the OMI.
		4-19	16 PCGWM wells and CMI performance indicator wells were sampled during the annual sampling event.
		24	Soil samples collected for *in-situ* landfarming and analyzed for TPH-DRO and TPH-GRO.
2006	Mar	15	2005 Annual Report was submitted to NDDH
		15	Requests submitted to NDDH to discontinue *in situ* landfarming of CAMU A.
	Apr	7	NDDH approves termination of *in situ* landfarming in CAMU A and issues re Class 1 permit modification.
		25	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel.
	May	2	CMI lower sand recovery well system started for the operational season.
		17	Influent and effluent groundwater samples were collected from the air stripper
		19	PCGWM wells were resurveyed for the year
	Jun	2	Influent and effluent groundwater samples were collected from the air stripper
	Jul	11	Influent and effluent groundwater samples were collected from the air stripper
	Aug	1	GWRTS was shut down for cleaning; leaks in oil/water separator detected, GWRTS shut down for season
	Oct	9	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel
		23-25	16 PCGWM wells and 21 CMI performance indicator wells were sampled during the annual sampling event
2007	Feb	28	2006 Annual Report was submitted to NDDH
	Apr	30	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel
	May	10	CMI lower sand recovery well system started for the operational season
		24	PCGWM wells were resurveyed for the year
	Jun	1	Influent and effluent groundwater samples were collected from the air stripper
	Jul	2	Influent and effluent groundwater samples were collected from the air stripper
	Aug	6	Influent and effluent groundwater samples were collected from the air stripper
	Sep	4	Influent and effluent groundwater samples were collected from the air stripper
	Oct	4	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel
		10	GWRTS shut down for season
		16-18	16 PCGWM wells and 22 CMI performance indicator wells were sampled during the annual sampling event

Table 1
Chronology of Events

Year	Month	Date(s)	Event Description
2008	Feb	29	2007 Annual Report was submitted to NDDH
	Apr	22	Plugged and abandoned monitoring wells (MW-87-29, MW-87-30, MW-87-32, MW-87-33, MW-87-34, MW-87-35, MW-87-36R, MW-87-40, Vent Well #1, Vent Well # 2, and Vent Well #3)
	May	6-7	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel
		21	PCGWM wells were resurveyed for the year
	Jun	2	CMI lower sand recovery well system started for the operational season
		10	Influent and effluent groundwater samples were collected from the air stripper
	Sep	2	Influent and effluent groundwater samples were collected from the air stripper
	Oct	1	Meeting with Williston mayor and staff, NDDH, Developer, Halliburton and AECOM to discuss well abandonment north of highway and future development of FJT property
		3	Influent and effluent groundwater samples were collected from the air stripper
		5-6	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel
		21	GWRTS shut down for season
		22-27	16 PCGWM wells and 20 CMI performance indicator wells were sampled during the annual sampling event
2009	Feb	27	2008 Annual Report was submitted to NDDH.
	Mar	23	NDDH approves the removal of methane analysis from the MNA sampling program.
	Apr	21-22	Plugged and abandoned (P&A) twelve monitoring wells (MW-87-19, MW-87-20, MW-87-21, MW-87-22, MW-87-23, MW-87-24, MW-87-26, MW-87-27, MW-87-28, MW-87-39, MW-00-17, MW-WL-13) and 3 vacuum wells. Fluid levels were measured prior to P&A of monitoring wells.
	May	13	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel.
		27	PCGWM wells were resurveyed.
	Jun	16	CMI lower sand recovery well system started for the operational season; consisted of one belt skimmer and two skimming pumps.
	Jul	6-13	LNAPL Baildown testing performed on 5 lower sand wells.
	Oct	12-13	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel.
		26-28	14 PCGWM wells and 16 CMI performance indicator wells were sampled during the annual sampling event.
	Nov	4	Insulated enclosures installed around skimming pumps for year-round operation; belt skimmer shut down for winter.
2010	Feb	26	2009 Annual Report submitted to NDDH.
	May	11	Site-wide groundwater elevations measured by Flying J personnel
		26	NDDH issues new permit for the facility
	Sep	14-15	PC and CMI wells sampled and transmissivity testing on MW-5-R and MW-89-04
		23	Site-wide groundwater elevations measured in all monitoring wells by Flying J personnel.
2011	Feb	24	2010 Annual Report submitted to NDDH.
	Apr	28	Site-wide groundwater elevations measured by Johnston Leigh personnel.
	Mar	12	CMI lower sand recovery well system started for the operational season
	Sep	27-29	PC and CMI wells sampled and transmissivity testing on MW-5-R and MW-89-04
		28	Site-wide groundwater elevations measured in all monitoring wells by Johnston Leigh personnel.
2012	Jan	4	CMI lower sand recovery well system started for the operational season
	Apr	13	2011 Annual Report submitted to NDDH.
		24	Site-wide groundwater elevations measured by Johnston Leigh personnel.
	Sep	25-27	PC and CMI wells sampled and transmissivity testing on MW-89-03 and MW-89-04
			Site-wide groundwater elevations measured in all monitoring wells by Johnston Leigh personnel.

Table 1
Chronology of Events

Year	Month	Date(s)	Event Description
2013	Feb	20	CMI lower sand recovery well system started for the operational season. New LNAPL recovery pump at MW 89-03 was started February 20, 2013.
	May	7	Site-wide groundwater elevations measured by Johnston Leigh personnel.
	Aug	20	2012 Revised Annual Report submitted to NDDH.
	Sep	23-28	Installation and removal of monitoring wells ○ Monitoring wells that were destroyed in 2013 by the Construction of the new rail spur included MW-87-03, MW-87-05, MW-87-06, MW-87-07, MW-87-13. ○ Monitoring Wells MW-90-01, MW-8BR, MW-9, MW-8AR, MW87-08 and MW-10 were abandoned because they were in the Rail Line right of way. ○ They were replaced with MW-87-08R, MW-90-01R, MW-8BRR, MW-9R, and MW-10R in 2013. ○ Hazcon Drilling also plugged and abandoned monitoring wells MW-87-01, MW-87-02, MW-87-04, MW-87-09, MW-89-10, MW-87-11, MW-87-12, MW-87-15, MW-87-18, MW-87-41, MW-N, MW-0, MW-V-3R, MW-V1, MW-T2, and MW-2
	Dec	9-13	First quarterly sampling event of newly installed monitoring wells MW-87-08R, MW-90-01R, MW-8BRR, MW-9R and MW-10R.
2014	Jan	1	CMI lower sand recovery well system continued operating.
	Mar	15	Quarterly sampling event of newly installed monitoring wells MW-87-08R, MW-90-01R, MW-8BRR, MW-9R and MW-10R.
	Apr	22	Site-wide groundwater elevations measured in all monitoring wells by Johnston Leigh personnel.
	May	5	2013 Revised Annual Report submitted to NDDH.
	Jun	11	Quarterly sampling event of newly installed monitoring wells MW-87-08R, MW-90-01R, MW-8BRR, MW-9R and MW-10R.
	Sep	21	Site-wide groundwater elevations measured in all monitoring wells by Johnston Leigh personnel.
		22-23	PC and CMI wells sampled and transmissivity testing on MW-89-03 and MW-89-04.
	Oct	27-29	LIF investigation of impoundments conducted by Johnston Leigh Inc and Matrix personnel.
	Nov	18	September 2014 Baildown Test Results Results submitted to NDDH.
	Dec	10	Quarterly sampling event of newly installed monitoring wells MW-87-08R, MW-90-01R, MW-8BRR, MW-9R and MW-10R.

Table 2
2014 NWSFO-Collected Precipitation Data

Month	Total Precipitation (inches)	Greatest 24-hour Precipitation (inches)	Date
January	0.18	0.10	1/1/14
February	0.26	0.14	2/13/14
March	0.32	0.50	3/28/14
April	1.71	0.33	4/27/14
May	1.62	1.55	5/18/14
June	1.44	1.43	6/1/14
July	0.66	0.51	7/24/14
August	2.24	0.84	8/23/14
September	1.35	1.23	9/30/14
October	0.25	1.74	10/1/14
November	0.63	0.17	11/28/14
December	0.03	0.43	12/23/14
Total	***10.69***	***8.97***	

Notes:

[a] Data collected from the Williston Station (Latitude 48 10 N, Longitude 103 38 W) by the National Weather Service Forecast Office, Bismarck, ND (http://www.nws.noaa.gov/climate/index.php?wfo=bis).

Table 3

Summary of PCGWM Sedimentation Evaluation

Well Number	Sample Date	Original Total Depth	Current Total Depth	Difference in Depths	Difference greater than 2 feet?
		(ft)	(ft)	(ft)	
Upper Sand and Till Wells					
MW-1C	9/21/14	36.50	36.40	0.10	No
MW-87-08R	9/21/14	25.25	25.30	-0.05	No
MW-87-25	9/21/14	20.30	20.30	0.00	No
MW-90-01R	9/21/14	25.00	25.00	0.00	No
MW-K	9/21/14	30.10	30.30	-0.20	No
MW-W2	9/21/14	26.20	27.40	-1.20	No
MW-Y	9/21/14	21.00	20.60	0.40	No
Lower Sand Wells					
MW-10R	9/21/14	57.30	57.30	0.00	No
MW-1BR	9/21/14	60.90	61.45	-0.55	No
MW-8BRR	9/21/14	42.31	42.40	-0.09	No
MW-9R	9/21/14	57.15	57.20	-0.05	No
MW-PR	9/21/14	30.90	30.50	0.40	No
MW-W1R	9/21/14	36.70	36.20	0.50	No
MW-WL-11	9/21/14	38.53	38.60	-0.07	No

Note:

PCGWM = Post-Closure Groundwater Monitoring

Table 4
April 2014 Site-Wide Groundwater and LNAPL Level Measurements

Monitoring Well	Date	Coordinates East	Coordinates North	Ground Surface (ft msl)	Top of Casing (ft msl)	Depth to Water (ft TOC)	Depth to LNAPL (ft TOC)	Corrected Groundwater Elevation (ft msl)	LNAPL Thickness (ft)
Upper Sand Wells									
MW-C2	4/22/2014	11515.71	11090.64	1864.50	1867.29	4.67	ND	1862.62	ND
MW-T3	4/22/2014	12203.94	10797.66	1872.51	1873.12	10.97	ND	1862.15	ND
MW-U2	4/22/2014	11561.84	10806.04	1863.08	1865.04	5.83	ND	1859.21	ND
MW-V2	4/22/2014	11883.68	10973.81	1874.80	1876.21	13.46	ND	1862.75	ND
MW-V3R	4/22/2014	11884.66	10954.06	1874.59	Plugged and Abandoned				
MW-X3	4/22/2014	12113.55	10234.60	1865.37	1867.39	8.40	ND	1858.99	ND
MW-87-17R	4/22/2014	11767.57	11240.86	1877.63	1880.03	16.39	ND	1863.64	ND
MW-87-18	-	12018.08	11250.13	1878.67	Plugged and Abandoned				
MW-87-21	-	11877.09	11364.69	1877.80	Plugged and Abandoned				
MW-87-24	-	11789.11	11485.12	1876.15	Plugged and Abandoned				
MW-87-27	-	11473.06	11715.64	1872.96	Plugged and Abandoned				
MW-87-28	-	11460.19	11533.77	1870.96	Plugged and Abandoned				
MW-89-08	4/22/2014	12073.93	10383.17	1865.97	1869.49	8.71	NM	NM	NM
MW-WL-2	4/22/2014	9875.42	11050.63	1850.44	1852.82	NM	NM	NM	NM
MW-WL-3	4/22/2014	9692.56	10552.08	1850.13	1852.24	NM	NM	NM	NM
MW-WL-4	4/22/2014	10129.70	10528.06	1855.63	1858.16	NM	NM	NM	NM
GRW-95-01	4/22/2014	11242.11	11785.63	1878.09	1879.89	16.66	NM	1863.23	NM
MW-WL-1	4/22/2014	10052.30	13116.98	1852.39	1854.62	NM	NM	NM	NM
Till Wells									
MW-AR	4/22/2014	11791.24	10144.44	1859.82	1862.71	10.75	ND	1851.96	ND
MW-B		11672.69	10205.43	1858.72	1859.59	9.05	9.04	1850.55	0.01
MW-C	4/22/2014	11490.56	10288.37	1857.24	1858.29	9.09	ND	1849.20	ND
MW-F	4/22/2014	11035.33	10275.88	1851.67	1853.24	2.70	ND	1850.54	ND
MW-G	4/22/2014	11059.89	10493.77	1856.45	1857.15	7.10	ND	1850.05	ND
MW-H	4/22/2014	11253.16	10513.93	1856.23	1857.66	7.73	ND	1849.93	ND
MW-I	4/22/2014	11453.55	10523.45	1859.87	1861.06	6.48	ND	1854.58	ND
MW-J	4/22/2014	11540.25	10408.19	1859.57	1860.61	11.08	11.05	1849.55	0.03
MW-K	4/22/2014	10863.38	10383.75	1852.30	1853.09	2.84	ND	1850.25	ND
MW-M	4/22/2014	11424.23	11246.35	1864.11	1866.61	4.55	ND	1862.06	ND
MW-N	-	11021.68	10884.52	1862.06	Plugged and Abandoned				
MW-O	-	11021.70	10870.19	1862.38	Plugged and Abandoned				
MW-Q2	4/22/2014	11439.45	10153.40	1851.44	1853.34	NM (Ice Plug)	NM	NM	NM
MW-R	4/22/2014	11163.18	10138.20	1850.45	1852.74	NM (Ice Plug)	NM	NM	NM
MW-S	-	10898.57	10123.08	1851.33	Plugged and Abandoned				
MW-T2	-	12194.04	10798.04	1872.42	Plugged and Abandoned				
MW-V1	-	11881.94	10964.08	1874.76	Plugged and Abandoned				
MW-W2	4/22/2014	11297.66	10755.66	1861.40	1863.76	7.43	ND	1856.33	ND

Table 4
April 2014 Site-Wide Groundwater and LNAPL Level Measurements

Monitoring Well	Date	Coordinates East	Coordinates North	Ground Surface (ft msl)	Top of Casing (ft msl)	Depth to Water (ft TOC)	Depth to LNAPL (ft TOC)	Corrected Groundwater Elevation (ft msl)	LNAPL Thickness (ft)
Till Wells, continued									
MW-X2	4/22/2014	12107.30	10233.04	1865.23	1867.2	8.30	ND	1858.90	ND
MW-Y	4/22/2014	11170.05	9905.47	1850.10	Needs Survey	4.42	ND	NA	ND
MW-Z	4/22/2014	10900.32	9888.98	1850.63	1853.84	6.91	ND	1846.93	ND
MW-1C	4/22/2014	12609.47	11217.33	1888.90	1890.04	9.58	ND	1880.46	ND
MW-2A	4/22/2014	10863.03	10740.32	1858.99	1861.47	DRY	DRY	DRY	ND
MW-87-01	-	11037.01	9676.25	1850.94	Plugged and Abandoned				
MW-87-02	-	10682.33	9672.86	1850.85	Plugged and Abandoned				
MW-87-03	-	11870.48	10003.94	1856.19	Abandoned				
MW-87-04	-	11806.51	9753.73	1852.75	Plugged and Abandoned				
MW-87-05	-	12233.79	10010.86	1859.89	Abandoned				
MW-87-06	-	12516.62	10171.21	1864.74	Abandoned				
MW-87-07	-	12878.76	10305.37	1867.29	Abandoned				
MW-87-08	-	12520.71	9935.06	1860.40	Plugged and Abandoned				
MW-87-08R	4/22/2014	*-103.5843244	*48.14323003	1850.09	1865.11	8.18	ND	1856.93	ND
MW-87-09	-	12203.92	9864.53	1858.12	Plugged and Abandoned				
MW-87-10	-	10597.82	10104.37	1850.56	Plugged and Abandoned				
MW-87-11	-	10005.03	10066.75	1849.26	Plugged and Abandoned				
MW-87-12	-	9995.05	10066.75	1849.23	Plugged and Abandoned				
MW-87-13	-	10236.00	9850.52	1851.38	Abandoned				
MW-87-14	4/22/2014	11618.67	10390.75	1862.67	1864.73	10.66	ND	1854.07	ND
MW-87-15	-	12584.31	11244.10	1889.88	Plugged and Abandoned				
MW-87-16	4/22/2014	11030.75	10882.68	1862.40	1864.98	11.3	ND	1853.68	ND
MW-87-19	-	12728.06	11811.55	1897.38	Abandoned				
MW-87-22	-	12092.19	11373.79	1881.25	Abandoned				
MW-87-23	-	11965.50	11475.88	1878.44	Plugged and Abandoned				
MW-87-25	4/22/2014	11268.38	11387.85	1866.90	1867.67	6.02	ND	1861.65	ND
MW-87-26	-	11518.70	11972.34	1875.26	Plugged and Abandoned				
MW-87-29	-	11100.79	11682.65	1866.93	Plugged and Abandoned				
MW-87-30	-	11100.79	11682.65	1866.93	Plugged and Abandoned				
MW-87-32	-	11075.39	11864.53	1867.69	Plugged and Abandoned				
MW-87-33	-	11095.28	11747.79	1867.50	Plugged and Abandoned				
MW-87-34	-	11101.69	11607.85	1864.93	Plugged and Abandoned				
MW-87-35	-	11217.50	11891.36	1870.03	Plugged and Abandoned				
MW-87-36R	-	11263.76	11942.25	1871.40	Plugged and Abandoned				
MW-87-37	4/22/2014	11422.70	9676.91	1850.78	1852.80	4.76	ND	1848.04	ND
MW-87-40	-	11314.58	11616.57	1869.62	Plugged and Abandoned				
MW-87-41	-	10955.29	11110.80	1860.16	Plugged and Abandoned				

Table 4
April 2014 Site-Wide Groundwater and LNAPL Level Measurements

Monitoring Well	Date	Coordinates East	Coordinates North	Ground Surface (ft msl)	Top of Casing (ft msl)	Depth to Water (ft TOC)	Depth to LNAPL (ft TOC)	Corrected Groundwater Elevation (ft msl)	LNAPL Thickness (ft)
Till Wells, continued									
MW-89-05	4/22/2014	11914.70	10517.70	1867.84	1870.36	8.76	ND	1861.60	ND
MW-90-01	-	11722.39	10002.67	1857.80	Plugged and Abandoned				
MW-90-01R	4/22/2014	*-103.587596	*48.143526	1865.58	1865.45	16.86	ND	1848.59	ND
MW-94-01	4/22/2014	11925.67	10272.40	1864.49	1867.3	5.43	ND	1861.87	ND
MW-94-02	-	12476.25	10146.51	1863.54	Abandoned				
MW-WL-5	4/22/2014	10527.32	11180.19	1857.21	1858.21	NM	NM	NM	NM
MW-WL-9	4/22/2014	10820.67	10520.33	1851.31	1853.33	NM	NM	NM	NM
MW-WL-12	4/22/2014	10910.66	10200.16	1853.24	1854.96	NM	NM	NM	NM
MW-WL-13	4/22/2014	10753.31	11398.83	1860.83	1863.41	NM	NM	NM	NM
MW-WL-14B	4/22/2014	9949.42	11149.64	1853.47	1856.57	NM	NM	NM	NM
MW-WL-15B	4/22/2014	10682.53	10996.88	1858.41	1860.55	NM	NM	NM	NM
MW-WL-16	4/22/2014	10711.28	10784.10	1857.56	1860.07	NM	NM	NM	NM
MW-WL-17	4/22/2014	10636.23	10497.26	1853.03	1855.94	NM	NM	NM	NM
Lower Sand Wells									
MW-C1	4/22/2014	11513.36	11105.06	1864.87	1867.02	11.65	ND	1855.37	ND
MW-PR	4/22/2014	11567.34	9812.71	1852.10	Needs Survey	NM (Ice Plug)	NM	NM	NM
MW-Q1R	4/22/2014	11472.45	10153.83	1851.70	1854.03	NM (Ice Plug)	NM	NM	NM
MW-T1R	4/22/2014	12184.92	10815.16	1873.60	1875.71	25.73	ND	1849.98	ND
MW-U1R	4/22/2014	11571.31	10814.01	1863.43	1865.48	15.56	ND	1849.92	ND
MW-W1R	4/22/2014	11319.97	10756.52	1861.80	1864.13	14.49	ND	1849.64	ND
MW-X1R	4/22/2014	12122.06	10238.32	1865.93	1868.03	18.32	ND	1849.71	ND
MW-1BR	4/22/2014	12620.95	11208.91	1888.20	1890.01	39.51	ND	1850.50	ND
MW-3AR	4/22/2014	11595.05	10308.00	1859.24	1861.34	11.75	ND	1849.59	ND
MW-5R	4/22/2014	11796.34	11230.88	1877.88	1880.08	29.56	29.52	1850.55	0.04
MW-6R	4/22/2014	12036.38	11237.15	1879.03	1882.28	31.93	ND	1850.35	ND
MW-8BR	-	11879.41	10014.95	1857.30	Plugged and Abandoned				
MW-8BRR	4/22/2014	*-103.587021	*48.143582	1866.03	1866.03	16.48	ND	1849.55	ND
MW-9	-	12223.15	10036.34	1861.01	Plugged and Abandoned				
MW-9R	4/22/2014	*-103.585583	*48.143747	1868.33	1868.33	18.67	ND	1849.66	ND
MW-10	-	12535.43	10198.47	1866.20	Plugged and Abandoned				
MW-10R	4/22/2014	*-103.584171	*48.144072	1870.50	1870.5	20.7	ND	1849.80	ND
MW-87-20	-	12726.14	11806.36	1897.26	Plugged and Abandoned				
MW-87-39	-	11270.54	11685.57	1869.56	Plugged and Abandoned				
MW-88-01	4/22/2014	11732.92	10519.41	1865.45	1867.97	18.30	18.23	1849.73	0.07
MW-89-01	4/22/2014	11798.62	10452.18	NM	1867.10	17.48	ND	1849.62	ND
MW-89-02	4/22/2014	11698.75	10419.80	1862.97	1865.23	15.62	15.60	1849.63	0.02
MW-89-03	4/22/2014	11859.63	10359.79	1865.34	1867.59	NMPR	NMPR	NMPR	NMPR

Table 4
April 2014 Site-Wide Groundwater and LNAPL Level Measurements

Monitoring Well	Date	Coordinates		Ground Surface (ft msl)	Top of Casing (ft msl)	Depth to Water (ft TOC)	Depth to LNAPL (ft TOC)	Corrected Groundwater Elevation (ft msl)	LNAPL Thickness (ft)
		East	North						
Lower Sand Wells, continued									
MW-89-04	4/22/2014	11919.13	10512.14	1867.84	1870.22	NMPR	NMPR	NMPR	NMPR
MW-89-06	4/22/2014	11791.63	10798.30	1868.82	1870.67	17.75	ND	1852.92	ND
MW-89-07	4/22/2014	11623.29	10961.58	1865.90	1868.95	18.91	ND	1850.04	ND
GRW-95-02	4/22/2014	11241.42	11806.76	1878.11	1881.11	30.79	ND	1850.32	ND
GRW-95-03	4/22/2014	10817.40	11792.38	1869.05	1870.55	20.79	ND	1849.76	ND
GRW-95-04	4/22/2014	10581.30	11734.97	1865.34	1867.14	17.48	17.44	1849.69	0.04
MW-00-16	4/22/2014	11788.29	11453.23	1875.80	1878.74	28.29	ND	1850.45	ND
MW-00-17	-	11760.25	11757.85	1877.80	Plugged and Abandoned				
Bedrock Wells									
MW-1AR	4/22/2014	12617.78	11218.23	1888.56	1890.91	39.78	ND	1851.13	ND
MW-2	4/22/2014	10863.04	10735.22	1858.96	Plugged and Abandoned				
MW-3	4/22/2014	11597.71	10292.34	1858.77	1861.25	11.37	ND	1849.88	ND
MW-4	4/22/2014	11053.62	10154.40	1850.32	1851.66	2.63	ND	1849.03	ND
MW-7	-	11743.72	10586.05	1865.55	Abandoned				
MW-8AR	-	11880.22	10014.87	1856.58	Plugged and Abandoned				
MW-WL-6	4/22/2014	10828.86	11120.20	1858.86	1860.99	NM	NM	NM	NM
MW-WL-7	4/22/2014	10826.33	10936.85	1857.27	1859.75	NM	NM	NM	NM
MW-WL-8	4/22/2014	10827.20	10733.27	1857.07	1859.50	NM	NM	NM	NM
MW-WL-11	4/22/2014	10896.22	10354.51	1853.20	1855.41	8.85	ND	1846.56	ND

Notes:

ND = Not detected

NA = Well not accessible during gauging event

NM = Not measured NMPR = Not Measured Product Recovery Well

Wells re-surveyed to decimal degree, local coordinate system is being updated to decimal degree.

LNAPL thickness in the lower sand wells is corrected in the same fashion as for the upper sand/till wells in order to estimate actual groundwater elevations.

However, LNAPL thickness in the lower sand wells occurs under confined conditions and apparent LNAPL thickness is believed to be more exaggerated.

The resulting groundwater elevations in the lower sand may be less reliable.

Table 5
September 2014 Site-Wide Groundwater and LNAPL Level Measurements

Monitoring Well	Date	Coordinates East	Coordinates North	Ground Surface (ft msl)	Top of Casing (ft msl)	Depth to Water (ft TOC)	Depth to LNAPL (ft TOC)	Corrected Groundwater Elevation (ft msl)	LNAPL Thickness (ft)
Upper Sand Wells									
MW-C2	9/21/2014	11515.71	11090.64	1864.50	1867.29	6.05	ND	1861.24	ND
MW-T3	9/21/2014	12203.94	10797.66	1872.51	1873.12	11.03	ND	1862.09	ND
MW-U2	9/21/2014	11561.84	10806.04	1863.08	1865.04	9.12	ND	1855.92	ND
MW-V2	9/21/2014	11883.68	10973.81	1874.80	1876.21	13.41	ND	1862.80	ND
MW-V3R	-	11884.66	10954.06	1874.59	Plugged and Abandoned				
MW-X3	9/21/2014	12113.55	10234.60	1865.37	1867.39	8.75	ND	1858.64	ND
MW-87-17R	9/21/2014	11767.57	11240.86	1877.63	1880.03	16.30	ND	1863.73	ND
MW-87-18	-	12018.08	11250.13	1878.67	Plugged and Abandoned				
MW-87-21	-	11877.09	11364.69	1877.80	Plugged and Abandoned				
MW-87-24	-	11789.11	11485.12	1876.15	Plugged and Abandoned				
MW-87-27	-	11473.06	11715.64	1872.96	Plugged and Abandoned				
MW-87-28	-	11460.19	11533.77	1870.96	Plugged and Abandoned				
MW-89-08	9/21/2014	12073.93	10383.17	1865.97	1869.49	8.92	NM	NM	NM
MW-WL-2	9/21/2014	9875.42	11050.63	1850.44	1852.82	NM	NM	NM	NM
MW-WL-3	9/21/2014	9692.56	10552.08	1850.13	1852.24	NM	NM	NM	NM
MW-WL-4	9/21/2014	10129.70	10528.06	1855.63	1858.16	NM	NM	NM	NM
GRW-95-01	9/21/2014	11242.11	11785.63	1878.09	1879.89	16.56	NM	1863.33	NM
MW-WL-1	9/21/2014	10052.30	13116.98	1852.39	1854.62	NM	NM	NM	NM
Till Wells									
MW-AR	9/21/2014	11791.24	10144.44	1859.82	1862.71	10.50	ND	1852.21	ND
MW-B		11672.69	10205.43	1858.72	1859.59	6.95	ND	1852.64	ND
MW-C	9/21/2014	11490.56	10288.37	1857.24	1858.29	8.92	ND	1849.37	ND
MW-F	9/21/2014	11035.33	10275.88	1851.67	1853.24	5.64	ND	1847.60	ND
MW-G	9/21/2014	11059.89	10493.77	1856.45	1857.15	9.51	ND	1847.64	ND
MW-H	9/21/2014	11253.16	10513.93	1856.23	1857.66	9.7	ND	1847.96	ND
MW-I	9/21/2014	11453.55	10523.45	1859.87	1861.06	10.16	ND	1850.90	ND
MW-J	9/21/2014	11540.25	10408.19	1859.57	1860.61	9.82	9.80	1850.81	0.02
MW-K	9/21/2014	10863.38	10383.75	1852.30	1853.09	6.98	ND	1846.11	ND
MW-M	9/21/2014	11424.23	11246.35	1864.11	1866.61	5.13	ND	1861.48	ND
MW-N	-	11021.68	10884.52	1862.06	Plugged and Abandoned				
MW-O	-	11021.70	10870.19	1862.38	Plugged and Abandoned				
MW-Q2	9/21/2014	11439.45	10153.40	1851.44	1853.34	4.84	ND	1848.50	ND
MW-R	9/21/2014	11163.18	10138.20	1850.45	1852.74	6.35	ND	1846.39	ND
MW-S	-	10898.57	10123.08	1851.33	Plugged and Abandoned				
MW-T2	-	12194.04	10798.04	1872.42	Plugged and Abandoned				
MW-V1	-	11881.94	10964.08	1874.76	Plugged and Abandoned				
MW-W2	9/21/2014	11297.66	10755.66	1861.40	1863.76	7.71	ND	1856.05	ND

Table 5
September 2014 Site-Wide Groundwater and LNAPL Level Measurements

Monitoring Well	Date	Coordinates East	Coordinates North	Ground Surface (ft msl)	Top of Casing (ft msl)	Depth to Water (ft TOC)	Depth to LNAPL (ft TOC)	Corrected Groundwater Elevation (ft msl)	LNAPL Thickness (ft)
Till Wells, continued									
MW-X2	9/21/2014	12107.30	10233.04	1865.23	1867.2	9.11	ND	1858.09	ND
MW-Y	9/21/2014	11170.05	9905.47	1850.10	Needs Survey	6.03	ND	NA	ND
MW-Z	9/21/2014	10900.32	9888.98	1850.63	1853.84	8.03	ND	1845.81	ND
MW-1C	9/21/2014	12609.47	11217.33	1888.90	1890.04	7.97	ND	1882.07	ND
MW-2A	9/21/2014	10863.03	10740.32	1858.99	1861.47	DRY	DRY	DRY	ND
MW-87-01	-	11037.01	9676.25	1850.94	Plugged and Abandoned				
MW-87-02	-	10682.33	9672.86	1850.85	Plugged and Abandoned				
MW-87-03	-	11870.48	10003.94	1856.19	Abandoned				
MW-87-04	-	11806.51	9753.73	1852.75	Plugged and Abandoned				
MW-87-05	-	12233.79	10010.86	1859.89	Abandoned				
MW-87-06	-	12516.62	10171.21	1864.74	Abandoned				
MW-87-07	-	12878.76	10305.37	1867.29	Abandoned				
MW-87-08	-	12520.71	9935.06	1860.40	Plugged and Abandoned				
MW-87-08R	9/21/2014	*-103.584324	*48.143230	1850.09	1865.11	9.87	ND	1855.24	ND
MW-87-09	-	12203.92	9864.53	1858.12	Plugged and Abandoned				
MW-87-10	-	10597.82	10104.37	1850.56	Plugged and Abandoned				
MW-87-11	-	10005.03	10066.75	1849.26	Plugged and Abandoned				
MW-87-12	-	9995.05	10066.75	1849.23	Plugged and Abandoned				
MW-87-13	-	10236.00	9850.52	1851.38	Abandoned				
MW-87-14	9/21/2014	11618.67	10390.75	1862.67	1864.73	9.94	ND	1854.79	ND
MW-87-15	-	12584.31	11244.10	1889.88	Plugged and Abandoned				
MW-87-16	9/21/2014	11030.75	10882.68	1862.40	1864.98	11.76	ND	1853.22	ND
MW-87-19	-	12728.06	11811.55	1897.38	Abandoned				
MW-87-22	-	12092.19	11373.79	1881.25	Abandoned				
MW-87-23	-	11965.50	11475.88	1878.44	Plugged and Abandoned				
MW-87-25	9/21/2014	11/6/1930	3/5/1931	2/8/1905	1867.67	6.47	ND	1861.20	ND
MW-87-26	-	11518.70	11972.34	1875.26	Plugged and Abandoned				
MW-87-29	-	11100.79	11682.65	1866.93	Plugged and Abandoned				
MW-87-30	-	11100.79	11682.65	1866.93	Plugged and Abandoned				
MW-87-32	-	11075.39	11864.53	1867.69	Plugged and Abandoned				
MW-87-33	-	11095.28	11747.79	1867.50	Plugged and Abandoned				
MW-87-34	-	11101.69	11607.85	1864.93	Plugged and Abandoned				
MW-87-35	-	11217.50	11891.36	1870.03	Plugged and Abandoned				
MW-87-36R	-	11263.76	11942.25	1871.40	Plugged and Abandoned				
MW-87-37	9/21/2014	11422.70	9676.91	1850.78	1852.80	6.66	ND	1846.14	ND
MW-87-40	-	11314.58	11616.57	1869.62	Plugged and Abandoned				
MW-87-41	-	10955.29	11110.80	1860.16	Plugged and Abandoned				

Table 5
September 2014 Site-Wide Groundwater and LNAPL Level Measurements

Monitoring Well	Date	Coordinates East	Coordinates North	Ground Surface (ft msl)	Top of Casing (ft msl)	Depth to Water (ft TOC)	Depth to LNAPL (ft TOC)	Corrected Groundwater Elevation (ft msl)	LNAPL Thickness (ft)
Till Wells, continued									
MW-89-05	9/21/2014	11914.70	10517.70	1867.84	1870.36	8.59	ND	1861.77	ND
MW-90-01	-	11722.39	10002.67	1857.80	Plugged and Abandoned				
MW-90-01R	9/21/2014	*-103.587596	*48.143526	1865.58	1865.58	15.87	ND	1849.71	ND
MW-94-01	9/21/2014	11925.67	10272.40	1864.49	1867.3	DRY	DRY	DRY	ND
MW-94-02	-	12476.25	10146.51	1863.54	Abandoned				
MW-WL-5	9/21/2014	10527.32	11180.19	1857.21	1858.21	NM	NM	NM	NM
MW-WL-9	9/21/2014	10820.67	10520.33	1851.31	1853.33	NM	NM	NM	NM
MW-WL-12	9/21/2014	10910.66	10200.16	1853.24	1854.96	NM	NM	NM	NM
MW-WL-13	9/21/2014	10753.31	11398.83	1860.83	1863.41	NM	NM	NM	NM
MW-WL-14B	9/21/2014	9949.42	11149.64	1853.47	1856.57	NM	NM	NM	NM
MW-WL-15B	9/21/2014	10682.53	10996.88	1858.41	1860.55	NM	NM	NM	NM
MW-WL-16	9/21/2014	10711.28	10784.10	1857.56	1860.07	NM	NM	NM	NM
MW-WL-17	9/21/2014	10636.23	10497.26	1853.03	1855.94	NM	NM	NM	NM
Lower Sand Wells									
MW-C1	9/21/2014	11513.36	11105.06	1864.87	1867.02	12.11	ND	1854.91	ND
MW-PR	9/21/2014	11567.34	9812.71	1852.10	Needs Survey	8.32	ND	NA	ND
MW-Q1R	9/21/2014	11472.45	10153.83	1851.70	1854.03	4.86	ND	1849.17	ND
MW-T1R	9/21/2014	12184.92	10815.16	1873.60	1875.71	26.11	ND	1849.60	ND
MW-U1R	9/21/2014	11571.31	10814.01	1863.43	1865.48	15.90	ND	1849.58	ND
MW-W1R	9/21/2014	11319.97	10756.52	1861.80	1864.13	14.85	ND	1849.28	ND
MW-X1R	9/21/2014	12122.06	10238.32	1865.93	1868.03	18.65	ND	1849.38	ND
MW-1BR	9/21/2014	12620.95	11208.91	1888.20	1890.01	39.87	ND	1850.14	ND
MW-3AR	9/21/2014	11595.05	10308.00	1859.24	1861.34	12.05	ND	1849.29	ND
MW-5R	9/21/2014	11796.34	11230.88	1877.88	1880.08	30.34	30.33	1849.75	0.01
MW-6R	9/21/2014	12036.38	11237.15	1879.03	1882.28	32.51	ND	1849.77	ND
MW-8BR	-	11879.41	10014.95	1857.30	Plugged and Abandoned				
MW-8BRR	9/21/2014	*-103.587021	*48.143582	1866.03	1866.03	16.77	ND	1849.26	ND
MW-9	-	12223.15	10036.34	1861.01	Plugged and Abandoned				
MW-9R	9/21/2014	*-103.585583	*48.143747	1868.33	1868.33	18.99	ND	1849.34	ND
MW-10	-	12535.43	10198.47	1866.20	Plugged and Abandoned				
MW-10R	9/21/2014	*-103.584171	*48.144072	1870.50	1870.5	20.98	ND	1849.52	ND
MW-87-20	-	12726.14	11806.36	1897.26	Plugged and Abandoned				
MW-87-39	-	11270.54	11685.57	1869.56	Plugged and Abandoned				
MW-88-01	9/21/2014	11732.92	10519.41	1865.45	1867.97	18.65	18.54	1849.41	0.11
MW-89-01	9/21/2014	11798.62	10452.18	NM	1867.10	17.77	ND	1849.33	ND
MW-89-02	9/21/2014	11698.75	10419.80	1862.97	1865.23	15.56	15.53	1849.69	0.03
MW-89-03	9/21/2014	11859.63	10359.79	1865.34	1867.59	NM	NM	NM	NM

Table 5
September 2014 Site-Wide Groundwater and LNAPL Level Measurements

Monitoring Well	Date	Coordinates East	Coordinates North	Ground Surface (ft msl)	Top of Casing (ft msl)	Depth to Water (ft TOC)	Depth to LNAPL (ft TOC)	Corrected Groundwater Elevation (ft msl)	LNAPL Thickness (ft)
Lower Sand Wells, continued									
MW-89-04	9/21/2014	11919.13	10512.14	1867.84	1870.22	NM	NM	NM	NM
MW-89-06	9/21/2014	11791.63	10798.30	1868.82	1870.67	18.18	ND	1852.49	ND
MW-89-07	9/21/2014	11623.29	10961.58	1865.90	1868.95	19.28	ND	1849.67	ND
GRW-95-02	9/21/2014	11241.42	11806.76	1878.11	1881.11	31.1	ND	1850.01	ND
GRW-95-03	9/21/2014	10817.40	11792.38	1869.05	1870.55	21.15	ND	1849.40	ND
GRW-95-04	9/21/2014	10581.30	11734.97	1865.34	1867.14	17.82	17.79	1849.35	0.03
MW-00-16	9/21/2014	11788.29	11453.23	1875.80	1878.74	28.42	ND	1850.32	ND
MW-00-17	-	11760.25	11757.85	1877.80	Plugged and Abandoned				
Bedrock Wells									
MW-1AR	9/21/2014	12617.78	11218.23	1888.56	1890.91	39.90	ND	1851.01	ND
MW-2	-	10863.04	10735.22	1858.96	Plugged and Abandoned				
MW-3	9/21/2014	11597.71	10292.34	1858.77	1861.25	11.47	ND	1849.78	ND
MW-4	9/21/2014	11053.62	10154.40	1850.32	1851.66	2.45	ND	1849.21	ND
MW-7	-	11743.72	10586.05	1865.55	Abandoned				
MW-8AR	-	11880.22	10014.87	1856.58	Plugged and Abandoned				
MW-WL-6	9/21/2014	10828.86	11120.20	1858.86	1860.99	NM	NM	NM	NM
MW-WL-7	9/21/2014	10826.33	10936.85	1857.27	1859.75	NM	NM	NM	NM
MW-WL-8	9/21/2014	10827.20	10733.27	1857.07	1859.50	NM	NM	NM	NM
MW-WL-11	9/21/2014	10896.22	10354.51	1853.20	1855.41	8.58	ND	1846.83	ND

Notes:

ND = Not detected
NA = Well not accessible during gauging event
NM = Not measured
Wells re-surveyed to decimal degree, local coordinate system is being updated to decimal degree.
LNAPL thickness in the lower sand wells is corrected in the same fashion as for the upper sand/till wells in order to estimate actual groundwater elevations.
However, LNAPL thickness in the lower sand wells occurs under confined conditions and apparent LNAPL thickness is believed to be more exaggerated.
The resulting groundwater elevations in the lower sand may be less reliable.

Table 6
2014 LNAPL Recovery from the Lower Sand Recovery System

Source	January	February	March	April	May	June	July	August	September	October	November	December	TOTAL
	(gal)	(gal)	(gal)	(gal)	(gal)	(gal)	(gal)	(gal)	(gal)	(gal)	(gal)	(gal)	(gal)
RECW 89-01	0	0	0	0	0	0	0	0	0	0	0	0	0
RECW 95-02	0	0	0	0	0	0	0	0	0	0	0	0	0
RECW 95-02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RECW 95-04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-88-01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-5R[a]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MW-89-03[a]	0.00	0.00	3.66	3.66	1.83	9.15	1.83	3.66	5.49	3.66	5.49	12.81	51.25
MW-89-04[a]	42.10	38.44	31.12	5.49	31.12	20.13	10.98	25.63	10.98	16.47	32.95	34.78	300.19
										Total Recovered during 2014:			***351***

Notes:

(gal) = gallons

[a] LNAPL Recovery using CleanEarth Technology Spill Buster Skimming Pump

GWTS = Groundwater Treatment System

Table 7
Summary of PCGWM Analytical Results and Statistical Analysis for the 2014 Annual Sampling Event

Well Number	Sample Date	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)	TPH-DRO (mg/L)	TPH-GRO (mg/L)	Statistically Significant?	Statistically Increasing?
Drinking Water Standards		**5**	**1,000**	**700**	**10,000**	**--**	**--**	**--**	**--**
Upper Sand and Till Wells									
MW-1C	9/23/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	0.4	ND(0.1)	No	NA
MW-87-08R[1]	9/22/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	0.53J	ND(0.1)	No	NA
MW-87-08R[1] (Duplicate)	9/22/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	0.28J	ND(0.1)	No	NA
MW-87-25	9/23/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	0.33	ND(0.1)	No	NA
MW-90-01R[1]	9/23/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	0.31	ND(0.1)	No	NA
MW-K	9/23/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	0.58	ND(0.1)	No	NA
MW-W2	9/23/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	ND(0.1)	ND(0.1)	No	NA
MW-Y	9/22/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	0.12	ND(0.1)	No	NA
Lower Sand Wells									
MW-1BR	9/23/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	0.19J	ND(0.1)	No	NA
MW-1BR (Duplicate)	9/22/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	1.4J	ND(0.1)	No	NA
MW-10R[1]	9/22/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	0.1	ND(0.1)	No	NA
MW-8BRR[1]	9/22/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	0.29	ND(0.1)	No	NA
MW-9R[1]	9/22/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	0.55	ND(0.1)	No	NA
MW-PR	9/22/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	0.11	ND(0.1)	No	NA
MW-W1R	9/23/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	0.17	ND(0.1)	No	NA
MW-WL-11	9/23/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	ND(0.1)	ND(0.1)	No	NA

Notes:

[1] Replacement well; previous PCGWM well was plugged and abandoned in September 2013.

µg/L = micrograms per liter
DRO = diesel range organics
GRO = gasoline range organics
mg/L = milligrams per liter
ND = Not Detected above given reporting limit.
TPH = total petroleum hydrocarbons
J = Estimated concentration

Table 8

Summary of Analytical Results for 2014 CMI Groundwater Performance Monitoring

Monitoring Well	Date	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylene (µg/L)	Total BTEX (µg/L)	TPH-GRO (mg/L)	TPH-DRO (mg/L)
Drinking Water Standards		***5***	***1000***	***700***	***10000***	--	--	--
Performance Monitoring Indicator Wells								
Upper Sand/Till Aquifer								
MW-87-14	9/23/2014	**6400**	ND(250)	150	99	6649	12	1.1
MW-87-16	9/23/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	0	ND(0.1)	1.7J
MW-87-16 (Duplicate)	9/23/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	0	ND(0.1)	0.26J
MW-89-05	9/22/2014	**220**	ND(50)	8.2	19	247.2	1.3	8.8
MW-C2	9/22/2014	**220**	ND(250)	ND(25)	ND(75)	220	ND(5)	11
MW-M	9/22/2014	**700**	6.4	ND(0.5)	24	730.4	1.9	4.1
MW-T3	9/23/2014	2.8	ND(5)	5.2	8.2	16.2	ND(0.1)	30
MW-X3	9/23/2014	**150**	ND(500)	200	ND(150)	350	ND(10)	24
Lower Sand Aquifer								
MW-00-16	9/22/2014	1	ND(5)	ND(0.5)	ND(1.5)	1	ND(0.1)	0.15J
MW-89-07	9/22/2014	**5300**	ND(500)	100	300	5700	ND(10)	2.4
MW-T1R	9/22/2014	**1000**	ND(100)	28	39	1067	ND(2)	0.23
MW-U1R	9/23/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	0	ND(0.1)	0.81
MW-X1R	9/22/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	0	ND(0.1)	ND(0.1)

Notes:

µg/L = micrograms per liter

J = Estimated concentration

NA = not analyzed due to insufficient sample volume

NS = not sampled

ND(0.5) = not detected at given reporting limit

UJ = undetected, reporting limit is estimated

Concentrations in **bold** exceed the Drinking Water Standard.

Table 9
Summary of Historical Analytical Results for CMI Groundwater Performance Monitoring, 1997-2014

Well	Formation	Date	Event	pH	Conductivity (mmhos)	Temperature (°C)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)
MW-3A R	Lower Sand	5/13/1997	5/97 Baseline	NM	NM	NM	<0.50	<0.50	<0.50	<0.50	**0.0089**	**0.74**
MW-6 R	Lower Sand	5/12/1997	5/97 Baseline	NM	NM	NM	<0.50	<0.50	<0.50	**0.32**	<0.01	**0.21**
MW-87-03	Till	5/9/1997	5/97 Baseline	NM	NM	NM	<0.50	<0.50	<0.50	<0.50	**0.027**	<0.094
	Till	10/13/1999	10/99 Indicator	6.8	3400	9.0	<0.50	<0.50	<0.50	<0.50	<0.01	NM
MW-87-04	Till	10/13/1999	10/99 Indicator	7.0	11000	8.3	<0.050	<0.050	<0.050	<0.050	<0.01	NM
MW-87-05	Till	5/9/1997	5/97 Baseline	NM	NM	NM	**14**	<0.50	**3.5**	<0.5	**0.11**	**13**
	Till	10/9/1997	10/97 Indicator	7.5	2375	9.0	**0.25**	**1.9**	**0.58**	**2.9**	**0.014**	**0.31**
	Till	10/9/1997	10/97 Indicator (dup)	7.5	2375	9.0	<0.50	**0.72**	<0.50	**1.2**	**0.0083**	**0.39**
	Till	5/11/1998	5/98 Indicator	7.3	2900	8.5	**48**	<1.2	<1.2	<1.2	**0.44**	**13**
	Till	10/26/1998	10/98 Indicator	7.6	3350	9.5	**1.2**	<0.50	<0.50	<0.50	**0.095**	**4.8**
	Till	5/2/1999	5/99 Indicator	8.3	3100	6.5	**59**	<6.2	**340**	**180**	**0.63**	**10**
	Till	10/13/1999	10/99 Indicator	6.8	5000	12	**760**	<100	**2900**	<100	**4.7**	**6.7**
	Till	10/13/1999	10/99 Indicator (dup)	6.8	5000	12	**0.99**	<0.50	<0.50	<0.50	**0.05**	**1.8**
	Till	5/10/2000	5/00 Indicator	6.8	3275	0.10	<0.50	<0.50	<0.50	<0.50	**0.083**	**0.52**
	Till	10/17/2000	10/00 Indicator	3.4	3500	12	<0.50	<0.50	<0.50	<0.50	**0.028**	**1.3**
	Till	5/16/2001	5/01 Indicator	7.9	3190	10	**12**	<0.50	<0.50	<0.50	**0.014**	**4.2**
	Till	5/16/2001	5/01 Indicator (dup)	7.9	3190	10	**12**	<0.50	<0.50	<0.50	**0.014**	**3.3**
	Till	10/8/2001	10/01 Indicator	7	3740	15	<0.50	<0.50	<0.50	<0.50	**0.01**	**2.9**
	Till	5/1/2002	5/02 Indicator	7.0	4740	6.1	<0.50	<0.50	<0.50	**0.66**	**0.016**	**1.5**
	Till	10/13/2002	10/02 Indicator	7.4	4909	9.6	<0.50	<0.50	<0.50	<0.50	**0.010**	**1.4**
	Till	4/26/2003	5/03 Indicator	6.9	3650	7.0	<0.50	<0.50	<0.50	<0.50	<0.010	**3.7**
	Till	10/4/2003	10/03 Indicator	7.1	3880	13.2	<0.50	<0.50	<0.50	<0.50	<0.010	**0.69**
		5/19/2004	5/04 Indicator	7.17	1649	8.4	<0.50UJ	<0.50	<0.50UJ	<0.50	<0.010	**0.86**
	Till	10/13/2004	10/04 Indicator	7.40	4700	8.5	<0.50	<0.50	<0.50	**0.89**	**0.013**	**0.46**
	Till	10/12/2005	10/05 Indicator	7.9	3200	9.1	<0.50	<5	<0.50	<1.5	<0.100	**1.2**
	Till	10/23/2006	10/06 Indicator	6.99	4790	13.0	**2500**	<100	**520**	<100	**4.2**	**6.3**
	Till	10/16/2007	10/07 Indicator	6.95	4500	10.2	<0.50	<0.50	<0.50	<0.50	**0.012**	**1.1**
	Till	10/23/2008	10/08 Indicator	7.16	5040	10.7	<0.50	<0.50	<0.50	<0.50	<0.01	**1**
	Till	10/27/2009	10/09 Indicator	6.9	7921	10.20	<0.50	<0.50	<0.50	<0.50	**0.13**	**4.9**
MW-87-06	Till	10/13/1999	10/99 Indicator	10.0	7000	6.9	<5.0	<5.0	<5.0	**15.0**	**2.4**	NM
MW-87-07	Till	10/13/1999	10/99 Indicator	7.1	5000	8.5	<0.50	<0.50	<0.50	<0.50	**0.12**	NM
	Till	5/14/2003	5/03 Indicator	7.2	5780	7.4	<0.50	<0.50	<0.50	<0.50	<0.010	NA
	Till	10/5/2003	10/03/Indicator	7.3	3360	11.6	<0.50	<0.50	**1.1**	<0.50	**0.086**	NM
	Till	10/13/2004	10/04 Indicator	7.4	5060	9.0	<0.50	<0.50	**7.1**	**28**	**0.20**	<0.25
	Till	10/19/2005	10/05 Indicator	8.10	1958	11.1	<0.50	<5	<0.50	<1.5	<0.100	**0.26**
	Till	10/24/2006	10/06 Indicator	7.45	17430	10.5	<0.5	<0.5	<0.5	<0.5	**0.18**	<0.25
	Till	10/17/2007	10/07 Indicator	7.19	5070	10.5	<0.5	<0.5	<0.5	<0.5	**0.13**	<0.25
	Till	10/23/2008	10/08 Indicator	7.42	7380	10.6	<0.50	<0.50	<0.50	<0.50	**0.18**	<0.25
	Till	10/26/2009	10/09 Indicator	7.08	6798	9.51	<0.50	<0.50	<0.50	<0.50	**0.12**	<0.25
	Till	10/26/2009	10/09 Indicator dup	7.08	6798	9.51	<0.50	<0.50	<0.50	<0.50	**0.12**	<0.25
MW-87-09	Till	5/9/1997	5/97 Baseline	NM	NM	NM	<0.50	<0.50	<0.50	<0.50	**0.025**	NM
	Till	10/13/1999	10/99 Indicator	6.9	8000	7.5	<0.50	<0.50	<0.50	<0.50	**0.72**	NA
MW-87-14	Till	5/12/1997	5/97 Baseline	NM	NM	NM	**9600**	**180**	**1900**	**1800**	**21**	**3.6**
	Till	10/9/1997	10/97 Indicator	7.4	8200	10.0	**8600**	**310**	**1500**	**1400**	**16**	**3.5**
	Till	5/11/1998	5/98 Indicator	7.3	5000	8.5	**340**	<12	**47**	**43**	**0.68**	**0.31**
	Till	10/26/1998	10/98 Indicator	7.5	6250	10.5	**1400**	<0.50	**200**	<50	**2.4**	**1.1**

Table 9
Summary of Historical Analytical Results for CMI Groundwater Performance Monitoring, 1997-2014

Well	Formation	Date	Event	pH	Conductivity (mmhos)	Temperature (°C)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)
MW-87-14	Till	5/2/1999	5/99 Indicator	8.3	550	6.5	**1900**	<50	**270**	**130**	**3.2**	**2.0**
(cont'd)	Till	10/13/1999	10/99 Indicator	6.9	6000	11.0	**4400**	<100	**410**	**340**	**7.4**	**0.82**
	Till	5/10/2000	5/00 Indicator	6.6	7250	0.08	**12000**	<50	**1500**	**1600**	**21**	**1.9**
	Till	10/17/2000	10/00 Indicator	6.2	7000	10	**9300**	<250	**1200**	**1200**	**11.0**	**2.9**
	Till	5/15/2001	5/01 Indicator	6.7	8090	11	**9400**	<250	**1400**	**1400**	**12.0**	**1.3**
	Till	10/8/2001	10/01 Indicator	6.7	7160	10.6	**2600**	<120	**<120**	**<120**	**3.4**	0.91
	Till	5/1/2002	5/02 Indicator	6.9	10330	6	**8800**	<500	**1300**	<500	<10	**2.3**
	Till	10/13/2002	10/02 Indicator	7.0	10490	11.7	**5700**	<100	**410**	**430**	**5.7**	<0.10
	Till	10/4/2003	10/03 Indicator	6.8	9420	14.4	**13000**	<500	**1400**	**880**	**10.0**	**0.630**
	Till	5/18/2004	5/04 Indicator	6.89	7020	9.7	**12000J**	<500UJ	**1500J**	**1100J**	**15J**	**2.7**
	Till	10/13/2004	10/04 Indicator	Insufficient water to collect sample.								
	Till	10/14/2005	10/05 Indicator	7.52	5100	11	**8400**	<2500	**1200**	**880**	<50	**1.4**
	Till	10/25/2006	10/06 Indicator	7.88	5820	9.7	**8300**	<200	**1000**	**900**	**13**	<0.25
	Till	10/18/2007	10/07 Indicator	6.81	7370	11.3	**12000J**	<250UJ	**1700J**	**1700J**	**22.0 J**	**1**
	Till	10/23/2008	10/08 Inducator	6.91	10440	11.3	**11000**	<250	**440**	**480**	**13**	**0.82**
	Till	10/28/2009	10/09 Indicator	Insufficient water to collect sample.								
	Till	9/28/2011	9/11 Indicator	7.9	10140	16.1	3300	<100	120	<30	5.1	1.2
	Till	9/26/2012	9/12 Indicator	7.1	8830	12.2	6600	<100	**17**	**30**	**15**	**2.1**
	Till	9/27/2013	9/13 Indicator	6.87	9770	10.1	**5100**	<120	**12**	**38**	**13**	**1.5**
	Till	9/23/2014	9/14 Indicator	6.84	7710	11	**6400**	<250	**150**	**99**	**12**	**1.1**
MW-87-16	Till	4/30/2002	5/02 Indicator	7.9	1350	12.8	<0.50	<0.50	<0.50	<0.50	<0.01	NM
	Till	10/13/2002	10/02 Indicator	7.4	1587	10.9	<0.50	<0.50	**3.2**	**5.3**	**0.019**	NM
	Till	10/5/2003	10/03 Indicator	Dry								
	Till	5/18/2004	5/04 Indicator	7.42	8060	9.3	<0.50UJ	<0.50	<0.50UJ	**0.77**	<0.01	<0.19
	Till	10/13/2004	10/04 Indicator	Insufficient water to collect sample.								
	Till	10/27/2009	10/09 Indicator	6.93	15190	10.56	<0.50	<0.50	<0.50	<0.50	<0.01	<0.25
	Till	9/28/2011	9/11 Indicator	8.22	13700	15.60	<0.50	<5	<0.5	<1.5	<0.1	<0.1
	Till	9/26/2012	9/12 Indicator	7.6	9950	11.30	<0.50	<5	<0.5	<1.5	<0.1	**0.18**
	Till	9/25/2013	9/13 Indicator	7.21	12580	13.90	<0.5	<5	<0.5	<1.5	<0.1	**0.22**
	Till	9/23/2014	9/14 Indicator	7.17	10110	12.4	<0.50	<5.0	<0.50	<1.5	<0.1	**1.7J**
	Till	9/23/2014	9/14 Indicator Dup	7.17	10110	12.4	<0.50	<5.0	<0.50	<1.5	<0.1	**0.26J**
MW-87-24	Upper Sand	10/12/2002	10/02 Indicator	NM	NM	NM	<5.0	<5.0	**21**	**97**	**0.71**	NM
	Upper Sand	10/4/2003	10/03 Indicator	Dry								
	Upper Sand	5/18/2004	5/04 Indicator	7.25	3300	10.9	**4.3J**	<2.5UJ	**95J**	**260J**	**1.3J**	**25**
	Upper Sand	10/13/2004	10/04 Indicator	Insufficient water to collect sample.								
MW-87-26	Till	5/9/1997	5/97 Baseline	NM	NM	NM	<0.50	<0.50	<0.50	<0.50	**0.01**	<0.094
MW-87-27	Upper Sand	4/30/2002	5/02 Indicator	7.09	3390	11.1	<0.50	<0.50	<0.50	<0.50	<0.01	NM
	Upper Sand	10/13/2002	10/02 Indicator	7.04	4576	10.4	<0.50	**1.0**	<0.50	**3.2**	<0.01	<0.10
	Upper Sand	4/26/2003	5/03 Indicator	7.32	3920	8.4	<0.50	<0.50	<0.50	<0.50	<0.010	<0.10
	Upper Sand	10/5/2003	10/03 Indicator	7.16	2950	10.4	<0.50	<0.50	<0.50	<0.50	<0.010	<0.100
	Upper Sand	5/18/2004	5/04 Indicator	7.14	4540	9.4	<0.50UJ	<0.50	<0.50UJ	<0.50	<0.01	<0.10
	Upper Sand	10/13/2004	10/04 Indicator	7.42	4380	9.1	<0.50	<0.50	<0.50	<0.50	<0.01	<0.25
	Upper Sand	10/12/2005	10/05 Indicator	7.53	3340	9.1	<0.50	<5	<0.50	<1.5	<0.100	<0.10
	Upper Sand	10/24/2006	10/06 Indicator	7.3	4190	9.8	<0.5	<0.5	<0.5	<0.5	<0.01	<0.25
	Upper Sand	10/17/2007	10/07 Indicator	7.23	5210	10.9	<0.5	<0.5	<0.5	<0.5	**0.014**	<0.25
	Upper Sand	10/23/2008	10/08 Indicator	7.09	5790	10.6	<0.50	<0.50	<0.50	<0.50	**0.012**	<0.25

Table 9
Summary of Historical Analytical Results for CMI Groundwater Performance Monitoring, 1997-2014

Well	Formation	Date	Event	pH	Conductivity (mmhos)	Temperature (^oC)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)
MW-87-28	Upper Sand	5/12/1997	5/97 Baseline	NM	NM	NM	**160**	**13**	**310**	**670**	**6.7**	**150**
	Upper Sand	10/9/1997	10/97 Indicator	7.2	3000	11.0	**1700**	**600**	**2100**	**4800**	**37**	**17000**
	Upper Sand	5/11/1998	5/98 Indicator	7.7	4600	9.2	**200**	<12	**220**	**1100**	**4.5**	**22**
	Upper Sand	10/26/1998	10/98 Indicator	7.6	3800	10.0	**370**	<5.0	**230**	**1600**	**4.9**	**19**
	Upper Sand	5/2/1999	5/99 Indicator	7.8	2900	9.0	**290**	<50	**280**	**1300**	**6.4**	**120**
	Upper Sand	10/13/1999	10/99 Indicator	6.5	4025	10.0	**180**	<12	**120**	**650**	**2.4**	**20**
	Upper Sand	5/10/2000	5/00 Indicator	6.7	4100	0.1	**190**	**17**	**160**	**1200**	**4.2**	**120**
	Upper Sand	10/17/2000	10/00 Indicator	4.8	3700	11	**230**	<12	**140**	**1000**	**12.0**	**19**
	Upper Sand	5/15/2001	5/01 Indicator	6.4	3190	12	**190**	<12	**170**	**1200**	**4.4**	**120**
	Upper Sand	10/8/2001	10/01 Indicator	7.4	2948	9	**120**	<5	**85**	**420**	**2.7**	**5.2**
	Upper Sand	5/1/2002	5/02 Indicator	6.7	6300	11	**160**	<50	**98**	**980**	**2.1**	**4.8**
	Upper Sand	10/13/2002	10/02 Indicator	6.9	7904	12.4	**170**	<12	**320**	**1200**	**4.4**	**7.7**
	Upper Sand	10/5/2003	10/03 Indicator	6.5	5200	12.2	**120**	<12	**250**	**1200**	**3.0**	**3.0**
	Upper Sand	5/18/2004	5/04 Indicator	6.69	5210	10.0	**160J**	<12	**240J**	**1600**	**4.4**	**4**
	Upper Sand	10/13/2004	10/04 Indicator	6.99	4040	12.1	**82**	<6.2	**200**	**860**	**2.4**	**1.8**
	Upper Sand	10/14/2005	10/05 Indicator	8.39	3410	12	**77**	<25	**160**	**1000**	**5.8**	**3.7**
	Upper Sand	10/24/2006	10/06 Indicator	6.9	5120	12.6	**95**	<6.2	**200**	**1000**	**3.7**	**2.4**
	Upper Sand	11/26/2007[2]	10/07 Indicator	7.1	4180	12.6	**53**	**5.5**	**190**	**650**	**4.7**	**3.6**
	Upper Sand	10/23/2008	10/08 Indicator	6.67	7760	10.9	**53**	<6.2	**220**	**690**	**3.5**	**3.6**
MW-87-39	Lower Sand	5/12/1997	5/97 Baseline	NM	NM	NM	<0.50	<0.50	<0.50	**0.5**	**0.0063**	**0.13**
	Lower Sand	10/9/1997	10/97 Indicator	7.7	2700	8.5	<0.50	**0.96**	<0.50	**0.44**	**0.0054**	**0.16**
	Lower Sand	5/11/1998	5/98 Indicator	7.7	2850	10.0	<0.50	<0.50	<0.50	<0.50	**0.0069**	**0.13**
	Lower Sand	10/26/1998	10/98 Indicator	7.7	2800	9.0	<0.50	<0.50	<0.50	<0.50	**0.028**	<0.10
	Lower Sand	5/2/1999	5/99 Indicator	8.7	2300	5.0	<0.50	<0.50	<0.50	<0.50	<0.01	**0.47**
	Lower Sand	10/13/1999	10/99 Indicator	6.8	2925	8.0	<0.50	<0.50	**0.67**	<0.50	**0.02**	**0.565**
	Lower Sand	5/10/2000	5/00 Indicator	7.0	1200	0.12	<0.50	<0.50	<0.50	<0.50	<0.01	<0.1
	Lower Sand	10/17/2000	10/00 Indicator	4.9	2500	9	<0.50	<0.50	<0.50	<0.50	<0.01	<0.01
	Lower Sand	5/14/2001	5/01 Indicator	7.0	3170	14	<0.50	<0.50	<0.50	<0.50	<0.01	<0.10
	Lower Sand	10/8/2001	10/01 Indicator	6.5	2450	7.5	<0.50	<0.50	<0.50	**1.1**	<0.01	<0.10
	Lower Sand	4/30/2002	5/02 Indicator	7.2	3160	11.1	<0.50	<0.50	<0.50	**0.62**	<0.01	<0.10
	Lower Sand	10/13/2002	10/02 Indicator	7.3	3954	9.1	<0.50	<0.50	<0.50	**1.1**	<0.01	<0.10
	Lower Sand	4/27/2003	5/03 Indicator	7.6	3620	8.8	<0.05	<0.50	<0.50	<0.50	<0.010	<0.10
	Lower Sand	10/5/2003	10/03 Indicator	7.3	3260	9.2	<0.50	<0.50	<0.50	<0.50	<0.010	<0.10
	Lower Sand	10/5/2003	10/03 Indicator (dup)	7.3	3260	9.2	<0.50	<0.50	<0.50	<0.50	<0.010	<0.100
	Lower Sand	5/18/2004	5/04 Indicator	7.21	3340	10.6	<0.50UJ	<0.50	<0.50UJ	<0.50	<0.010	<0.10
	Lower Sand	10/12/2004	10/04 Indicator	7.40	3420	10.3	<0.50	<0.50	<0.50	<0.50	<0.010	<0.25
	Lower Sand	10/12/2005	10/05 Indicator	7.60	3180	9	<0.50	<5	<0.50	<1.5	<0.100	<0.10
	Lower Sand	10/24/2006	10/06 Indicator	7.41	3400	8	<0.5	<0.5	<0.5	<0.5	<0.01	<0.25
	Lower Sand	10/17/2007	10/07 Indicator	7.18	3450	9.4	<0.5	<0.5	<0.5	<0.5	<0.01	<0.25
	Lower Sand	10/23/2008	10/08 Indicator	7.35	3670	10	<0.50	<0.50	<0.50	<0.50	<0.01	<0.25
MW-87-40	Till	5/9/1997	5/97 Baseline	NM	NM	NM	<0.50	<0.50	<0.50	<0.50	0.01	**0.12**
MW-87-41	Till	4/30/2002	5/02 Indicator	7.2	8500	8.8	<0.50	<0.50	<0.50	<0.50	<0.01	<0.10
	Till	10/12/2002	10/02 Indicator	7.3	1003	9.3	<0.50	<0.50	<0.50	<0.50	<0.01	**1.9**
	Till	4/26/2003	5/03 Indicator	7.0	12020	7.3	<0.50	<0.50	<0.50	<0.50	<0.010	<0.100
	Till	10/5/2003	10/03 Indicator	7.1	7920	10.3	<0.50	<0.50	<0.50	<0.50	<0.010	<0.100
	Till	5/18/2004	5/04 Indicator	7.88	6600	8.1	<0.50UJ	<0.50	<0.50UJ	<0.50	<0.010	<0.10

Table 9
Summary of Historical Analytical Results for CMI Groundwater Performance Monitoring, 1997-2014

Well	Formation	Date	Event	pH	Conductivity (mmhos)	Temperature (°C)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)
MW-87-41	Till	10/13/2004	10/04 Indicator	7.32	8020	7.3	<0.50	<0.50	<0.50	<0.50	<0.010	<0.25
(cont'd)	Till	10/12/2005	10/05 Indicator	7.96	5760	11.4	<0.50	<5	<0.50	<1.5	<0.100	<0.10
	Till	10/24/2006	10/06 Indicator	7.78	7970	9	<0.5	<0.5	<0.5	<0.5	<0.01	<0.25
	Till	10/17/2007	10/07 Indicator	6.96	8950	10.5	<0.5	<0.5	<0.5	<0.5	<0.01	<0.25
	Till	10/23/2008	10/08 Indicator	7.22	10960	9.7	<0.50	<0.50	<0.50	<0.50	<0.01	<0.25
	Till	10/26/2009	10/09 Indicator	6.98	13060	8.03	<0.50	<0.50	<0.50	<0.50	<0.01	<0.25
MW-89-05	Till	5/9/1997	5/97 Baseline	NM	NM	NM	**1100**	<50	**1600**	<50	**3.6**	**7.3**
	Till	10/9/1997	10/97 Indicator	6.7	5800	14.5	**2400**	**120**	**1500**	**74**	**4.8**	**9.6**
	Till	5/11/1998	5/98 Indicator	7.8	3500	10.0	**5500**	<100	**1400**	<100	**7.4**	**8.8**
	Till	10/26/1998	10/98 Indicator	7.3	3800	11.0	**4800**	<120	**1100**	**150**	**11**	**7.2**
	Till	5/2/1999	5/99 Indicator	8.3	3100	8.3	**6200**	<250	**960**	<250	**9.1**	**7.5**
	Till	10/13/1999	10/99 Indicator	6.7	3300	8.5	**1.1**	<0.050	<0.050	**0.91**	**0.054**	**1.8**
	Till	5/10/2000	5/00 Indicator	6.7	4400	0.11	**2100**	<250	**1400**	<250	**5.8**	**3.9**
	Till	10/17/2000	10/00 Indicator	10.3	5000	13.5	**740**	<25	**1300 J**	<25	**2.8**	**7.2**
	Till	5/15/2001	5/01 Indicator	6.3	3840	11.0	**2100**	<100	**1400**	<100	**3.0**	**6.2**
	Till	10/8/2001	10/01 Indicator	7.4	6271	11.7	**4200**	<250	**1000**	**390**	**5.5**	**4.6**
	Till	5/1/2002	5/02 Indicator	6.8	6000	5.2	**1400**	**63**	**1200**	**100**	**2.9**	NM
	Till	10/12/2002	10/02 Indicator	7.0	6178	12.9	**970**	<25	**270**	<25	**0.99**	**7.1**
	Till	4/27/2003	5/03 Indicator	7.0	5740	6.5	**250**	<50	**2200**	<50	**3.0**	NA
	Till	10/5/2003	10/03 Indicator	7.0	2870	15.4	**510**	**340**	**1300 J**	**470**	**3.30**	**6.60**
	Till	5/19/2004	5/04 Indicator	6.92	3500	10.4	**2200J**	<62 UJ	**1400J**	<62 UJ	**3.7J**	**8.2**
	Till	10/13/2004	10/04 Indicator	Insufficient water to collect sample.								
	Till	10/14/2005	10/05 Indicator	7.68	3880	10	**960 J**	<25	**260**	<7.5	**2.5**	**4.6**
	Till	11/28/2006	10/06 Indicator	7.1	4490	7.4	na	na	na	na	na	**6.1**
	Till	10/18/2007	10/07 Indicator	6.68	4500	14.4	**140**	<10	**390**	**22**	**1.7**	**4.5**
	Till	10/23/2008	10/08 Indicator	6.85	6360	13.4	**69**	<5.0	**190**	<5.0	**1.5**	**6.8**
	Till	10/28/2009	10/09 Indicator	6.8	6328	10.60	**5.5**	**95**	**100**	**1300**	<0.05	<5.0
	Till	9/28/2011	9/11 Indicator	7.12	6600	16.50	**29**	<5	**3.8**	**5.9**	**1.1**	**6**
	Till	9/27/2012	9/12 Indicator	7.48	2530	13.60	**7000**	**13**	**54**	**230**	**17**	**7.6**
	Till	9/28/2013	9/13 Indicator	7.02	5120	12.4	**1600**	<100	**21**	**30**	**3.8**	**14**
	Till	9/22/2014	9/14 Indicator	6.97	2460	12.6	**220**	<50	**8.2**	**19**	**1.3**	**8.8**
MW-89-07	Lower Sand	5/13/1997	5/97 Baseline	NM	NM	NM	**6100**	**390**	**1600**	**6200**	**23**	**74**
	Lower Sand	10/10/1997	10/97 Indicator	7.6	1500	9.0	**5100**	**140**	**100**	**4700**	**15**	**19**
	Lower Sand	5/11/1998	5/98 Indicator	7.3	1480	9.0	**5900**	<250	**920**	**4400**	**17**	**6.5**
	Lower Sand	10/26/1998	10/98 Indicator	7.6	1400	10.0	**6000**	<100	**1100**	**4800**	**32**	**11**
	Lower Sand	5/2/1999	5/99 Indicator	8.1	1300	7.5	**6600**	<250	**1000**	**4200**	**18**	**6.3**
	Lower Sand	10/13/1999	10/99 Indicator	6.7	1300	8.0	**2100**	<62	**5200**	**4200**	**6.8**	**0.65**
	Lower Sand	5/10/2000	5/00 Indicator	6.9	1300	0.1	**4200**	<100	**560**	**2100**	**14**	**3.6**
	Lower Sand	5/10/2000	5/00 Indicator (dup)	6.9	1300	0.1	**4100**	<100	**510**	**2000**	**13**	**2.8**
	Lower Sand	10/17/2000	10/00 Indicator	7.5	1400	8	**1700**	<50	**250**	**940**	**5.1**	**4.7**
	Lower Sand	10/17/2000	10/00 Indicator (dup)	7.5	1400	8	**2800**	<100	**330**	**1200**	**6.5**	**7.0**
	Lower Sand	5/14/2001	5/01 Indicator	6.9	1900	14	**3800**	<0.50	**420**	**970**	**7.2**	**5.8**
	Lower Sand	10/8/2001	10/01 Indicator	6.7	1826	11	**460**	<25	**110**	**460**	**2.9**	**5.0**
	Lower Sand	4/30/2002	5/02 Indicator	7.1	1670	12	**1300**	<62	**140**	**440**	**2.7**	**2.7**
	Lower Sand	10/12/2002	10/02 Indicator	7.4	1965	8.8	**21**	**0.93**	**24**	**55**	**0.74**	**3.8**
	Lower Sand	4/26/2003	5/03 Indicator	7.0	2170	11	**1600**	<50	**110**	**220**	**3.10**	**4.20**

Table 9
Summary of Historical Analytical Results for CMI Groundwater Performance Monitoring, 1997-2014

Well	Formation	Date	Event	pH	Conductivity (mmhos)	Temperature (°C)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)
MW-89-07	Lower Sand	10/4/2003	10/03 Indicator	7.0	1856	11.0	<50	<50	**1.1**	<50	**0.086**	NA
(cont'd)	Lower Sand	5/18/2004	5/04 Indicator	7.00	1102	11.4	**180J**	**83**	**74J**	**3200**	**6.5**	**24**
	Lower Sand	10/13/2004	10/04 Indicator	7.35	1490	10.7	**4500**	**<120**	**180**	**730**	**4.2**	**3.2**
	Lower Sand	10/14/2005	10/05 Indicator	7.90	1581	9	<0.50	<5	<0.50	<1.5	<0.100	**0.44**
	Lower Sand	10/24/2006	10/06 Indicator	7.48	4350	9.8	**590**	<25	**110**	**310**	**2.9**	**0.99**
	Lower Sand	10/18/2007	10/07 Indicator	6.9	1882	10.5	**450**	<25	**83**	**260**	**2.6**	**1.2**
	Lower Sand	10/27/2008	10/08 Indicator	6.94	1980	9.4	**21**	<0.50	**9.4**	**25**	**0.43**	**1.6**
	Lower Sand	10/27/2009	10/09 Indicator	LNAPL in well - no sample collected								
	Lower Sand	9/27/2012	9/12 Indicator	7.5	1620	10.1	**6700**	**9.9**	**13**	**56**	**13**	**10**
	Lower Sand	9/28/2013	9/13 Indicator	7.5	2520	10.6	**8300**	<100	**220**	**420**	**24**	**3.1 J**
	Lower Sand	9/22/2014	9/14 Indicator	7.57	1660	9.6	**5300**	<500	**100**	**300**	<10	**2.4**
MW-94-02	Lower Sand	10/13/1999	10/99 Indicator	6.7	1900	13.0	**1000**	**1300**	**1300**	**760**	**4.7**	NA
MW-C	Till	5/12/1997	5/97 Baseline	NM	NM	NM	<0.50	<0.50	<0.50	**3.5**	**0.22**	**81**
	Till	10/10/1997	10/97 Indicator	7.3	2900	10.0	<0.50	<0.50	**1.7**	**6**	**0.061**	**49**
	Till	5/11/1998	5/98 Indicator	8.2	1780	8.2	<0.50	<0.50	<0.50	<0.50	<0.01	**32**
	Till	10/26/1998	10/98 Indicator	7.6	3310	9.5	<0.50	<0.50	<0.50	<0.50	**0.041**	**2.1**
	Till	5/2/1999	5/99 Indicator	7.9	2500	6.0	<0.50	<0.50	<0.50	**1.4**	**0.18**	**200**
	Till	10/13/1999	10/99 Indicator	6.3	3495	6.3	<2.5	<2.5	<2.5	**3.4**	**0.073**	**100**
	Till	5/10/2000	5/00 Indicator	6.6	3500	0.1	<2.5	<2.5	**2.6**	<2.5	**0.089**	**120**
	Till	10/17/2000	10/00 Indicator	NR	3700	11	<0.50	<0.50	<0.50	<0.50	**0.16**	**69**
	Till	5/16/2001	5/01 Indicator	6.5	300	9.0	<0.50	<0.50	<0.50	<0.50	**0.074**	**27**
	Till	10/8/2001	10/01 Indicator	7.1	3130	8.4	<0.50	<0.50	<0.50	<0.50	**0.7**	**65**
	Till	5/1/2002	5/02 Indicator	6.7	5210	5.0	<0.50	<0.50	<0.50	<0.50	**0.14**	**70**
	Till	10/12/2002	10/02 Indicator	6.9	5529	9.2	<0.50	<0.50	<0.50	<0.50	**0.46**	**120**
	Till	4/26/2003	5/03 Indicator	6.5	5760	8.6	**0.63**	<0.50	<0.50	**0.67**	**0.035**	**65**
	Till	10/5/2003	10/03 Indicator	6.7	4650	9.9	<1.2	<1.2	<1.2	<1.2	**0.18**	**27.0 J**
	Till	5/18/2004	5/04 Indicator	8.97	2800	9.4	<0.50UJ	<0.50	<0.50UJ	<0.50	<0.010	<0.10
	Till	10/14/2004	10/04 Indicator	7.26	1650	10.4	<0.50	<0.50	<0.50	<0.50	<0.010	**18**
	Till	10/12/2005	10/05 Indicator	7.24	3530	9	<0.50	<5	<0.50	<1.5	<0.100	**66**
	Till	10/24/2006	10/06 Indicator	6.99	4000	9.6	<0.5	<0.5	<0.5	<0.5	**0.1**	**61**
	Till	10/17/2007	10/07 Indicator	6.49	4890	10.5	<0.5	<0.5	<0.5	<0.5	**0.17**	**25**
	Till	10/27/2008	10/08 Indicator	6.59	5590	8.8	<0.50	<0.50	<0.50	<0.50	**0.02**	**31J**
	Till	10/28/2009	10/09 Indicator	6.52	5657	8.70	<0.50	<0.50	<0.50	<0.50	<0.10	**30**
MW-C1	Lower Sand	5/12/1997	5/97 Baseline	NM	NM	NM	**23**	**0.81**	5.5	**1.4**	**0.22**	**2.6**
MW-C2	Upper Sand	5/12/1997	5/97 Baseline	NM	NM	NM	**2400**	**6000**	**360**	**2200**	**9.2**	**32**
	Upper Sand	10/10/1997	10/97 Indicator	7.8	1525	12.0	**2000**	<50	**370**	**1800**	**8.5**	**22**
	Upper Sand	5/11/1998	5/98 Indicator	8.1	1230	9.5	**2600**	<100	**380**	**2000**	**12**	**16**
	Upper Sand	10/26/1998	10/98 Indicator	7.6	1550	12.5	**2400**	<50	**560**	**2300**	**13**	**14**
	Upper Sand	5/2/1999	5/99 Indicator	8.5	1350	8.0	**3200**	<100	**440**	**1100**	**8.5**	**23**
	Upper Sand	10/13/1999	10/99 Indicator	7.1	1700	11.0	**2600**	<50	**400**	**670**	**7**	**15**
	Upper Sand	5/10/2000	5/00 Indicator	7	1300	0.11	**2700**	<100	**270**	**1200**	**9.2**	**9.2**
	Upper Sand	10/17/2000	10/00 Indicator	6.8	1500	13	**550**	<250	**390**	**870**	**10.0**	**13**
	Upper Sand	5/15/2001	5/01 Indicator	6.3	1880	11	**3400**	<120	**440**	**1300**	**7.7**	**12**
	Upper Sand	10/8/2001	10/01 Indicator	7.0	1914	16	**2800**	<120	**380**	**1400**	**8.1**	**8.6**
	Upper Sand	5/1/2002	5/02 Indicator	7.5	1790	9	**3200**	<120	**360**	**1600**	**6.1**	**12**
	Upper Sand	10/12/2002	10/02 Indicator	7.4	2019	11.8	**3300**	<100	**360**	**1600**	**8.2**	**10.0**

Table 9
Summary of Historical Analytical Results for CMI Groundwater Performance Monitoring, 1997-2014

Well	Formation	Date	Event	pH	Conductivity (mmhos)	Temperature (°C)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)
MW-C2	Upper Sand	10/4/2003	10/03 Indicator	7.4	1771	15.6	**4300**	<100	**430**	**1700**	**7.5**	**7.80**
(cont'd)	Upper Sand	5/18/2004	5/04 Indicator	7.37	1450	10.0	**4900J**	<120	**550J**	**2300**	**11**	**7.7**
	Upper Sand	10/13/2004	10/04 Indicator	7.53	1695	12.1	**5900**	<120	**500**	**1800**	**8.9**	**8.2**
	Upper Sand	10/14/2005	10/05 Indicator	7.92	1810	11	**2700**	<250	**180**	**1100**	**12**	**7.6**
	Upper Sand	10/25/2006	10/06 Indicator	7.44	2250	11	**3400**	<100	**330**	**1700**	**9.5**	**9.8**
	Upper Sand	10/25/2006	10/06 Indicator dup	7.44	2250	11	**2900**	<100	**280**	**1500**	**8.1**	**13**
	Upper Sand	10/18/2007	10/07 Indicator	6.83	3190	12.2	**4700**	<100	**510**	**2200**	**13**	**12**
	Upper Sand	10/18/2007	10/07 Indicator dup	6.83	3190	12.2	**4400**	<100	**420**	**2100**	**12**	**11**
	Upper Sand	10/27/2008	10/08 Indicator	7.22	2880	11.4	**2600**	<50	**380**	**1500**	**10**	**8.8**
	Upper Sand	10/27/2008	10/08 Indicator dup	7.22	2880	11.4	**2500**	<50	**300**	**1400**	**9.4**	**11**
	Upper Sand	10/28/2009	10/09 Indicator	7.05	4620	10.60	**5800**	<100	**380**	**280**	**12**	**8.7**
	Upper Sand	10/28/2009	10/09 Indicator dup	7.05	4620	10.60	**5300**	<100	**380**	**320**	**12**	**7.8**
	Upper Sand	9/28/2011	09/11 indicator	7.71	4100	13.70	**5000**	<250	**260**	**280**	**12**	**8.4**
	Upper Sand	9/27/2012	09/12 indicator	7.38	3260	12.50	**6100**	<250	**340**	**450**	**16**	**15**
	Upper Sand	9/27/2013	09/13 indicator	7.2	3450	10.6	**6400**	<250	**440**	**360**	**24**	**20**
	Upper Sand	9/22/2014	09/14 indicator	7.43	2210	10.8	**220**	<250	<25	<75	<5	**11**
MW-I	Till	5/12/1997	5/97 Baseline	NM	NM	NM	<0.50	<0.50	<0.50	**0.38**	**0.027**	**0.72**
	Till	5/10/2000	5/00 Indicator	7	2600	0.08	<0.50	<0.50	<0.50	<0.50	**0.013**	**0.98**
	Till	10/17/2000	10/00 Indicator	2.1	350	11	<0.50	<0.50	<0.50	<0.50	<0.01	**2.3**
	Till	5/16/2001	5/01 Indicator	7.9	2910	9	<0.50	<0.50	<0.50	<0.50	**0.022**	**2.8**
	Till	10/8/2001	10/01 Indicator	6.9	1410	10.9	<0.50	<0.50	<0.50	<0.50	<0.01	<0.1
	Till	5/1/2002	5/02 Indicator	7.5	2370	5.4	<0.50	<0.50	<0.50	<0.50	<0.01	**1.6**
	Till	10/12/2002	10/02 Indicator	7.7	3227	9.4	<0.50	<0.50	<0.50	<0.50	<0.01	<0.10
	Till	4/26/2003	5/03 Indicator	7.3	3720	7.6	<0.50	<0.50	<0.50	<0.50	<0.010	**0.13**
	Till	10/5/2003	10/03 Indicator	7.4	2400	10.9	<0.50	<0.50	<0.50	<0.50	<0.010	**0.130**
	Till	5/18/2004	5/04 Indicator	8.32	3180	9.3	<0.50UJ	<0.50	<0.50UJ	<0.50	<0.010	<0.010
	Till	10/14/2004	10/04 Indicator	7.50	1574	10.3	<0.50	<0.50	<0.50	<0.50	<0.010	<0.25
	Till	10/12/2005	10/05 Indicator	8.29	3570	10.5	<0.50	<5	<0.50	<1.5	<0.100	**0.2**
	Till	10/24/2006	10/06 Indicator	7.5	3000	9	<0.5	<0.5	<0.5	<0.5	<0.01	<0.25
	Till	10/17/2007	10/07 Indicator	6.95	3280	11.3	<0.5	**0.51**	<0.5	<0.5	<0.01	<0.25
	Till	10/23/2008	10/08 Indicator	Insufficient water to collect sample.								
	Till	10/28/2009	10/09 Indicator	7.0	4600	8.60	<0.50	<0.50	<0.50	<0.50	<0.01	<0.25
MW-M	Till	5/12/1997	5/97 Baseline	NM	NM	NM	**2600**	<100	**800**	**2800**	**12**	**54**
	Till	10/10/1997	10/97 Indicator	7.4	1200	10.0	**1600**	**120**	**360**	**1300**	**6.2**	**13**
	Till	5/11/1998	5/98 Indicator	7.5	3180	9.0	**2500**	<50	**840**	**2300**	**8.6**	**8.1**
	Till	10/26/1998	10/98 Indicator	7.4	2600	12.0	**1800**	<50	**1100**	**1400**	**16**	**35**
	Till	5/2/1999	5/99 Indicator	8.0	2800	8.0	**1500**	<50	**770**	**3770**	**6.4**	**7.5**
	Till	10/13/1999	10/99 Indicator	7.0	2300	11.0	**1200**	<50	**580**	**790**	**4.4**	**5.0**
	Till	5/10/2000	5/00 Indicator	6.7	3400	0.12	**1000**	<25	**620**	**650**	**4.4**	**4.8**
	Till	10/17/2000	10/00 Indicator	10.2	2400	11	**830**	**99**	**590**	**760**	**4.3**	**13.0**
	Till	5/15/2001	5/01 Indicator	6.6	3820	11	**680**	**29**	**710**	**1300**	**5.6**	**43.0**
	Till	10/8/2001	10/01 Indicator	6.0	2801	17	**340**	<25	**420**	**630**	**4.2**	**19.0**
	Till	5/1/2002	5/02 Indicator	6.9	6460	6	**230**	<25	**540**	**480**	**3.4**	**4.5**
	Till	10/12/2002	10/02 Indicator	7.4	4030	11.8	**230**	<25	**280**	**72**	**0.88**	**16.0**
	Till	5/14/2003	5/03 Indicator (dup)	6.9	6380	8.1	**1800**	<0.50	**420**	**210**	**4.3**	**4.6**
	Till	10/4/2003	10/03 Indicator	6.9	5140	14.2	**2000**	<100	**430**	<100	**2.80**	**2.20**

Table 9
Summary of Historical Analytical Results for CMI Groundwater Performance Monitoring, 1997-2014

Well	Formation	Date	Event	pH	Conductivity (mmhos)	Temperature (°C)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)
MW-M	Till	5/19/2004	5/04 Indicator	7.37	3690	9.3	**92J**	<2.5	<2.5UJ	**12**	**0.63**	**8.8**
(cont'd)	p	10/13/2004	10/04 Indicator	7.33	3550	12.2	**310**	**18**	**98**	**100**	**1**	**16**
	Till	10/14/2005	10/05 Indicator	7.97	2394	9	NA	NA	NA	NA	NA	**4.3**
	Till	10/19/2005[1]	10/05 Indicator	NM	NM	NM	**1300**	<250	**290**	**310**	**8.2**	NA
	Till	10/25/2006	10/06 Indicator	7.38	2920	12	**1100**	<25	**63**	<25	**2.1**	**7.1**
	Till	10/18/2007	10/07 Indicator	7.12	2480	11.3	**1200**	<25	**63**	<25	**2.5**	**5.9**
	Till	10/27/2008	10/08 Indicator	7.28	3320	11.7	**770**	<25	**58**	<25	**2.1**	**5.3**
	Till	10/28/2009	10/09 Indicator	7.14	4940	10.00	**490**	<10	**110**	**50**	**1.8**	**5.4**
	Till	9/28/2011	09/11 indicator	7.6	4140	14.00	**1100**	<25	**130**	**100**	**5.2**	**9.6**
	Till	9/26/2012	09/12 indicator	7.31	2730	13.31	**2200**	<50	**66**	<1.50	**5.4**	**15**
	Till	9/28/2013	09/13 indicator	7.3	3610	12.5	**1600**	<50	**49**	**81**	**5.4**	**10**
	Till	9/22/2014	09/14 indicator	7.44	3140	12.3	**700**	**6.4**	<0.50	**24**	**1.9**	**4.1**
MW-Q1 R	Till	5/13/1997	5/97 Baseline	NM	NM	NM	<0.50	<0.50	<0.50	<0.50	<0.01	**0.79**
MW-Q2	Till	5/9/1997	5/97 Baseline	NM	NM	NM	<0.50	<0.50	<0.50	<0.50	**0.017**	**0.77**
MW-R	Till	5/9/1997	5/97 Baseline	NM	NM	NM	<0.50	<0.50	<0.50	<0.50	**0.0073**	**1.1**
	Till	10/10/1997	10/97 Indicator	NA	NA	NA	<0.50	<0.50	<0.50	<0.50	**0.011**	**1.6**
	Till	5/11/1998	5/98 Indicator	7.6	2750	6.5	<0.50	<0.50	<0.50	<0.50	<0.01	**1.1**
	Till	5/11/1998	5/98 Indicator (dup)	7.6	2750	6.5	<0.50	<0.50	<0.50	<0.50	**0.0096**	**0.63**
	Till	10/26/1998	10/98 Indicator	7.6	3420	10.0	<0.50	<0.50	<0.50	**0.98**	**0.019**	**1.1**
	Till	10/26/1998	10/98 Indicator (dup)	7.6	3420	10.0	<0.50	<0.50	<0.50	**0.98**	**0.012**	**1.3**
	Till	5/2/1999	5/99 Indicator	8.2	2900	6.0	<0.50	<0.50	<0.50	<0.50	<0.01	**0.81**
	Till	5/2/1999	5/99 Indicator (dup)	NM	NM	NM	<0.50	<0.50	<0.50	<0.50	<0.01	**0.96**
	Till	10/13/1999	10/99 Indicator	6.8	3375	10.0	<0.50	<0.50	<0.50	<0.50	<0.01	**0.6**
	Till	5/10/2000	5/00 Indicator	6.9	3700	0.08	<0.50	<0.50	<0.50	<0.50	<0.01	**0.37**
	Till	5/10/2000	5/00 Indicator (dup)	6.9	3700	0.08	<0.50	<0.50	<0.50	<0.50	<0.01	**0.27**
	Till	10/17/2000	10/00 Indicator	6.2	3400	12.0	<0.50	<0.50	<0.50	<0.50	<0.01	**0.54**
	Till	5/15/2001	5/01 Indicator (dup)	6.6	3440	10.0	<0.50	<0.50	<0.50	<0.50	<0.01	**0.91**
	Till	10/8/2001	10/01 Indicator	6.7	3600	10.1	<0.50	<0.50	<0.50	**0.98**	<0.01	**0.81**
	Till	10/8/2001	10/01 Indicator (dup)	6.7	3600	10.1	<0.50	<0.50	<0.50	<0.50	<0.01	**0.86**
	Till	4/30/2002	5/02 Indicator	7.3	3650	6.7	<0.50	<0.50	<0.50	<0.50	<0.01	**0.72**
	Till	4/30/2002	5/02 Indicator (dup)	7.3	3650	6.7	<0.50	<0.50	<0.50	<0.50	<0.01	**0.76**
	Till	10/12/2002	10/02 Indicator	7.3	4749	11.8	<0.50	<0.50	<0.50	<0.50	<0.01	**1.0**
	Till	10/12/2002	10/02 Indicator (dup)	7.3	4749	11.8	<0.50	<0.50	<0.50	<0.50	<0.01	**1.1**
	Till	4/26/2003	5/03 Indicator	7.2	5210	5.2	<0.50	<0.50	**0.76**	**0.76**	<10	**0.89**
	Till	4/26/2003	5/03 Indicator (dup)	7.2	5210	5.2	<0.50	<0.50	**0.76**	**0.76**	**0.025 J**	**0.76**
	Till	10/4/2003	10/03 Indicator	7.1	4300	14.6	<0.50	<0.50	<0.50	<0.50	<0.01 UJ	**0.92**
	Till	5/18/2004	5/04 Indicator	7.36	3280	10.2	<0.50UJ	<0.50	<0.50UJ	**0.96**	<0.010	**0.89**
	Till	10/13/2004	10/04 Indicator	7.38	3970	10.8	<0.50	<0.50	<0.50	<0.50	<0.010	**0.6**
	Till	10/13/2004	10/04 Indicator (dup)	7.52	3880	10.2	<0.50	<0.50	<0.50	<0.50	<0.010	**0.67**
	Till	10/12/2005	10/05 Indicator	7.59	3070	13	<0.50	<5	<0.50	<1.5	<0.100	**2.1**
	Till	10/12/2005	10/05 Indicator (dup)	7.59	3070	13	<0.50	<5	<0.50	<1.5	<0.100	**1.8**
	Till	10/25/2006	10/06 Indicator	7.48	3390	10.4	<0.5	<0.5	<0.5	<0.5	<0.01	**0.99**
	Till	10/17/2007	10/07 Indicator	6.94	4160	11.4	<0.5	<0.5	<0.5	<0.5	<0.01	**0.88**
	Till	10/17/2007	10/07 Indicator (dup)	6.94	4160	11.4	<0.5	<0.5	<0.5	<0.5	<0.01	**0.91**
	Till	10/27/2008	10/08 Indicator	7.1	4380	10.8	<0.50	<0.50	<0.50	**0.68**	<0.01	**0.9**
	Till	10/28/2009	10/09 Indicator	6.8	6590	9.60	<0.50	**0.82**	<0.50	**0.58**	<0.01	**0.53**

Table 9
Summary of Historical Analytical Results for CMI Groundwater Performance Monitoring, 1997-2014

Well	Formation	Date	Event	pH	Conductivity (mmhos)	Temperature (^oC)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)
MW-T1 R	Lower Sand	5/13/1997	5/97 Baseline	NM	NM	NM	**220**	<5.0	**15**	**4.2**	**0.39**	**0.8**
	Lower Sand	10/9/1997	10/97 Indicator	7.3	2825	10.0	**1200**	**52**	**68**	**72**	**1.9**	**0.84**
	Lower Sand	10/9/1997	10/97 Indicator (dup)	7.3	2825	10.0	**1500**	**52**	**94**	**160**	**2.5**	**0.63**
	Lower Sand	5/11/1998	5/98 Indicator	8.1	3050	9.5	**460**	<12	**18**	**12**	**0.7**	**0.36**
	Lower Sand	5/11/1998	5/98 Indicator (dup)	8.1	3050	9.5	**390**	<12	**14**	**7.9**	**0.63**	**0.34**
	Lower Sand	10/26/1998	10/98 Indicator	7.6	2900	10.5	**1000**	<50	<50	<50	**2.2**	**0.57**
	Lower Sand	10/26/1998	10/98 Indicator (dup)	7.6	2900	10.5	**1100**	<50	<50	<50	**1.8**	**0.48**
	Lower Sand	5/2/1999	5/99 Indicator	8.4	3000	10.0	**350**	<12	**16**	**12**	**0.52**	**0.63**
	Lower Sand	10/13/1999	10/99 Indicator	6.9	2400	10.0	**2100**	<50	**220**	**12**	**3.6**	**0.41**
	Lower Sand	5/9/2000	5/00 Indicator	6.7	2800	0.12	**1300**	<50	**70**	**120**	**2.3**	**0.42**
	Lower Sand	10/17/2000	10/00 Indicator	NR	2400	11	**2100**	<100	<100	<100	**2.1**	**0.24**
	Lower Sand	5/14/2001	5/01 Indicator	6.5	3630	16	**850**	<25	**68**	<25	**0.96**	**0.28**
	Lower Sand	10/8/2001	10/01 Indicator	6.9	2910	12	**2100**	<120	<120	**200**	**2.7**	**0.45**
	Lower Sand	4/29/2002	5/02 Indicator	7.5	5390	13	**890**	<50	**55**	**83**	<1.0	**0.18**
	Lower Sand	10/12/2002	10/02 Indicator	7.4	3856	10.6	**2000**	<50	<50	<50	**1.3**	**0.25**
	Lower Sand	4/26/2003	5/03 Indicator	7.2	4810	11.5	**240**	<50	**12**	**11**	**0.39**	**0.25**
	Lower Sand	10/4/2003	10/03 Indicator	7.4	4430	13.7	**130**	<5.0	**9.4**	**53**	**0.23**	**0.14**
	Lower Sand	5/19/2004	5/04 Indicator	7.59	1949	12.8	**200J**	<6.2	<6.2UJ	**14**	**0.22**	**0.26**
	Lower Sand	10/13/2004	10/04 Indicator	7.65	3290	10.8	**1900**	<50	**54**	**68**	**1.6**	**0.28**
	Lower Sand	10/14/2005	10/05 Indicator	7.88	2981	9.8	**0.55**	<5	<0.50	<1.5	<0.100	<0.10
	Lower Sand	10/24/2006	10/06 indicator	7.86	3.85	10.8	**8.6**	<0.5	<0.5	<0.5	**0.08**	<0.25
	Lower Sand	10/18/2007	10/07 indicator	7.3	3910	10.8	<0.5	<0.5	<0.5	<0.5	<0.010	<0.25
	Lower Sand	10/23/2008	10/08 Indicator	7.52	4700	9.8	**16**	<0.50	**0.79**	<0.50	**0.074**	<0.25
	Lower Sand	10/28/2009	10/09 Indicator	6.73	4687	10.00	**590**	<0.50	**18**	**18**	**1**	<0.25
	Lower Sand	9/28/2011	09/11 indicator	7.97	4390	14.40	**230**	<10	**9.4**	<3	**0.46**	**0.29**
	Lower Sand	9/26/2012	09/12 indicator	7.66	3430	11.10	**1300**	<5	**19**	**14**	**2.8**	**1.2**
	Lower Sand	9/27/2013	09/13indicator	7.57	3320	9.7	**1700**	<5	**39**	**38**	**3.6**	**0.84**
	Lower Sand	9/22/2014	09/14indicator	7.7	2400	11.6	**1000**	<100	**28**	**39**	<2	**0.23**
MW-T3	Upper Sand	4/30/2002	5/02 Indicator	7.4	4300	11	**36**	<0.50	**98**	**310**	**1.6**	NM
	Upper Sand	10/12/2002	10/02 Indicator	7.4	2609	12.4	**34**	<2.5	**110**	**170**	**2.9**	**14.0**
	Upper Sand	4/26/2003	5/03 Indicator	7.2	2510	13.3	**15**	<12	**200**	**360**	**2.70**	NA
	Upper Sand	10/4/2003	10/03 Indicator	7.1	2340	16.9	**30**	**50**	**250**	**440**	**2.40**	NA
	Upper Sand	5/19/2004	5/04 Indicator	7.07	1189	11.3	<12UJ	<12	**21J**	**110**	**1.9**	**3.3**
	Upper Sand	10/13/2004	10/04 Indicator	7.47	1718	13.4	**15**	<5.0	**130**	**450**	**2.2**	NA
	Upper Sand	10/14/2005	10/05 Indicator	8.52	1798	10.8	<0.50UJ	<5UJ	<0.50UJ	<1.5UJ	**0.6 J**	**2.8**
	Upper Sand	10/24/2006	10/06 indicator	Insufficient water to collect samples								
	Upper Sand	10/18/2007	10/07 Indicator	7.05	2370	11.9	**8.7**	<5.0	**140**	**120**	**1.3**	**2.2**
	Upper Sand	10/23/2008	10/08 Indicator	Insufficient water to collect samples								
	Upper Sand	10/28/2009	10/09 Indicator	7.0	6190	9.60	<0.50	<0.50	<0.50	<0.50	**0.018**	<0.25
	Upper Sand	9/28/2011	09/11 indicator	7.8	5200	13.20	<0.5	<5	<0.5	<1.5	**<0.1**	0.34
	Upper Sand	9/27/2012	09/12 indicator	7.4	4200	13.30	**4.5**	<5	**3.5**	**9.2**	**0.2**	**26**
	Upper Sand	9/27/2013	09/13 indicator	7.16	4060	11.3	**4.2**	<5	**5.8**	**7.1**	**0.5**	**37**
	Upper Sand	9/23/2014	09/14 indicator	7.16	2860	13.3	**2.8**	<5.0	**5.2**	**8.2**	<0.1	**30J**
MW-U1 R	Lower Sand	5/13/1997	5/97 Baseline	NM	NM	NM	<0.50	**1.1**	<0.50	<0.50	**0.046**	**1.3**
	Lower Sand	10/9/1997	10/97 Indicator	7.5	2500	9.0	<0.50	**3.1**	**1.1**	**4**	**0.048**	**1.5**
	Lower Sand	5/11/1998	5/98 Indicator	7.5	1950	9.0	**0.27**	<0.5	<0.5	<0.5	**0.035**	**0.58**

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Summary of Historical Analytical Results for CMI Groundwater Performance Monitoring, 1997-2014

Well	Formation	Date	Event	pH	Conductivity (mmhos)	Temperature (^oC)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)
MW-U1 R	Lower Sand	10/26/1998	10/98 Indicator	7.7	2100	9.8	**1.6**	**5.2**	**4.8**	**22**	**0.13**	**2.1**
(cont'd)	Lower Sand	5/2/1999	5/99 Indicator	8.3	1825	8.0	<0.50	<0.50	<0.50	<0.50	**0.026**	**0.91**
	Lower Sand	5/2/1999	5/99 Indicator (dup)	8.3	1825	8.0	<0.50	**0.55**	<0.50	**1.6**	**0.029**	**0.86**
	Lower Sand	10/13/1999	10/99 Indicator	6.8	2600	8.0	**1.1**	**1.0**	**0.8**	<0.50	**0.03**	**1.8**
	Lower Sand	5/9/2000	5/00 Indicator	6.8	2000	0.08	<0.50	<0.50	<0.50	<0.50	**0.018**	**0.62**
	Lower Sand	10/17/2000	10/00 Indicator	7.4	2400	9	**32**	**150**	**57**	**380**	**1.9**	**3.4**
	Lower Sand	5/14/2000	5/01 Indicator	7.0	2700	13	<0.50	<0.50	<0.50	<0.50	<0.01	**1**
	Lower Sand	10/8/2001	10/01 Indicator	6.8	2650	11	<0.50	**1.6**	<0.50	**4**	**0.016**	**0.87**
	Lower Sand	4/29/2002	5/02 Indicator	8.0	2900	9	**2**	<0.50	<0.50	**0.62**	**0.036**	**0.64**
	Lower Sand	10/12/2002	10/02 Indicator	7.5	3066	8.3	**3.1**	**8.6**	**6.6**	**45**	**0.13**	**6.2**
	Lower Sand	4/26/2003	5/03 Indicator	7.3	3140	10	<0.50	<0.50	<0.50	<0.50	<0.010	**0.95**
	Lower Sand	10/4/2003	10/03 Indicator	7.3	2680	11.7	**7.5**	**0.52**	**3.8**	**27**	**0.20**	**1.20**
	Lower Sand	5/18/2004	5/04 Indicator	7.42	1411	10.4	<0.50UJ	<0.50	<0.50UJ	**0.93**	<0.010	**0.7**
	Lower Sand	10/13/2004	10/04 Indicator	7.62	2630	9.4	<0.50	<0.50	<0.50	<0.50	<0.010	**0.61**
	Lower Sand	10/14/2005	10/05 Indicator	7.92	1994	9	<0.50	<5	<0.50	<1.5	<0.100	**0.3**
	Lower Sand	10/24/2006	10/06 Indicator	7.67	2520	8.2	**0.5**	**0.72**	**1.3**	**5.5**	**0.023**	**1.4**
	Lower Sand	10/18/2007	10/07 Indicator	7.49	2460	9.5	<0.50	<0.50	<0.50	<0.50	<0.010	<0.25
	Lower Sand	10/27/2008	10/08 Indicator	7.42	2900	9	<0.50	<0.50	<0.50	**2.9**	**0.023**	**0.64**
	Lower Sand	10/27/2009	10/09 Indicator	6.7	3621	8.40	<0.50UJ	<0.50UJ	<0.50UJ	<0.50UJ	**0.039 J**	**0.46**
	Lower Sand	9/28/2011	09/11 indicator	7.96	3710	11.30	<0.5	<5	<0.5	<1.5	<0.1	**0.45**
	Lower Sand	9/26/2012	09/12 indicator	7.63	2500	9.60	**1**	<5	<0.5	<1.5	<0.1	**1.1**
	Lower Sand	9/27/2013	09/13 indicator	7.2	2570	8.8	**14**	<5	**0.69**	<1.5	<0.1	**0.74**
	Lower Sand	9/23/2014	09/14 indicator	7.39	2520	10.7	<0.50	<5.0	<0.50	<1.5	<0.1	**0.81**
MW-U2	Upper Sand	5/9/2000	5/00 Baseline	6.9	7000	0.07	<0.50	<0.50	<0.50	<0.50	<0.01	**0.28**
	Upper Sand	10/17/2000	10/00 Indicator	8.4	3500	11	<0.50	<0.50	<0.50	<0.50	<0.01	**0.38**
	Upper Sand	10/17/2000	10/00 Indicator (dup)	8.4	3500	11	<0.50	<0.50	<0.50	<0.50	**0.027**	**0.20**
	Upper Sand	5/15/2001	5/01 Indicator	6.7	6360	10	<0.50	<0.50	<0.50	<0.50	**0.011**	**8.00**
	Upper Sand	10/8/2001	10/01 Indicator	7.1	6890	14	<0.50	<0.50	<0.50	<0.50	**0.01**	**2.00**
	Upper Sand	4/29/2002	5/02 Indicator	7.2	9800	6	<0.50	<0.50	<0.50	<0.50	<0.01	**7.70**
	Upper Sand	10/12/2002	10/02 Indicator	7.2	8262	10.0	<0.50	<0.50	<0.50	<0.50	<0.01	**8.3**
	Upper Sand	4/26/2003	5/03 Indicator	7.1	8830	6.6	<0.50	<0.50	<0.50	<0.50	<0.010	**2.3**
	Upper Sand	10/5/2003	10/03 Indicator	7.0	4760	11.9	<0.50	<0.50	<0.50	<0.50	<0.010	**0.85 J**
	Upper Sand	5/19/2004	5/04 Indicator	7.01	4350	8.1	<0.50UJ	<0.50	<0.50UJ	**0.84**	<0.010	**0.16**
	Upper Sand	10/13/2004	10/04 Indicator	7.15	6100	10.1	<0.50	<0.50	<0.50	**0.71**	<0.010	**0.8**
	Upper Sand	10/12/2005	10/05 Indicator	7.26	4950	8.9	<0.50	<5	<0.50	<1.5	<0.100	**1.1**
	Upper Sand	10/24/2006	10/06 Indicator	7.33	5510	10.0	<0.5	**0.6**	<0.5	**0.9**	<0.01	**1**
	Upper Sand	10/17/2007	10/07 Indicator	6.83	6120	11.7	<0.5	<0.5	<0.5	<0.5	<0.01	<0.25
	Upper Sand	10/27/2008	10/08 Indicator	7.08	6190	10.5	<0.50	<0.50	<0.50	<0.50	<0.01	<0.25
	Upper Sand	10/27/2009	10/09 Indicator	6.68	9386	9.97	<0.50	<0.50	<0.50	<0.50	<0.01	**1.2**
MW-V1	Till	5/12/1997	5/97 Baseline	NM	NM	NM	**0.65**	**0.62**	**1.5**	**3.9**	**0.19**	**1.9**
MW-X1 R	Lower Sand	5/13/1997	5/97 Baseline	NM	NM	NM	**24**	<1.0	<1.0	<1.0	**0.042**	**0.74**
	Lower Sand	10/9/1997	10/97 Indicator	7.6	1975	10.0	<0.50	**1.7**	<0.50	**1.3**	**0.027**	**0.29**
	Lower Sand	5/11/1998	5/98 Indicator	8.3	1950	9.0	<0.50	<0.50	<0.50	<0.50	**0.022**	<0.10
	Lower Sand	10/26/1998	10/98 Indicator	8.0	1900	10.0	**3.1**	**38**	**18**	**82**	**0.42**	**0.82**
	Lower Sand	5/2/1999	5/99 Indicator	9.0	1850	8.0	**32**	<1.0	<1.0	<1.0	**0.042**	**0.42**
	Lower Sand	10/13/1999	10/99 Indicator	7.0	1750	7.0	<0.50	<0.50	<0.50	<1.0	<0.01	**0.28**

Table 9
Summary of Historical Analytical Results for CMI Groundwater Performance Monitoring, 1997-2014

Well	Formation	Date	Event	pH	Conductivity (mmhos)	Temperature (^oC)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)
MW-X1 R	Lower Sand	10/13/1999	10/99 Indicator (dup)	7.0	1750	7.0	<0.50	<0.050	<0.050	<0.050	<0.01	**0.32**
(cont'd)	Lower Sand	5/9/2000	5/00 Indicator	7.2	1800	0.11	**3800**	**150**	**540**	**2100**	**0.01**	<0.10
	Lower Sand	10/17/2000	10/00 Indicator	NR	1800	10	<0.50	**1.3**	**3.3**	**16**	**0.065**	<0.10
	Lower Sand	5/14/2001	5/01 Indicator	7.1	2650	15	<0.50	<0.50	<0.50	<0.50	<0.10	<0.10
	Lower Sand	10/8/2001	10/01 Indicator	7.3	2030	10	<0.50	**1.8**	**1.5**	**6.3**	**0.015**	**0.46**
	Lower Sand	4/29/2002	5/02 Indicator	7.7	2440	13	**100**	<0.50	<0.50	<0.50	<0.10	**0.27**
	Lower Sand	4/29/2002	5/02 Indicator (dup)	7.7	2440	13	**100**	<0.50	<0.50	<0.50	<0.10	**0.14**
	Lower Sand	10/12/2002	10/02 Indicator	7.7	2734	9.3	<0.50	**0.83 J**	**0.77 J**	**5.5 J**	<0.01 UJ	**0.15 J**
	Lower Sand	10/12/2002	10/02 Indicator (dup)	7.7	2734	9.3	<0.50	**2.1 J**	**1.7 J**	**2.3 J**	**0.021 J**	**0.11 J**
	Lower Sand	4/27/2003	5/03 Indicator	9.5	3180	9.8	**3.3**	**32**	**16**	**140**	**0.26**	**0.25**
	Lower Sand	10/4/2003	10/03 Indicator	8.2	3060	9.9	**1.2**	**33**	**16**	**9.3**	**0.19**	**0.19**
	Lower Sand	5/19/2004	5/04 Indicator	9.82	2890	11.1	<0.50UJ	**1.6**	**4.5J**	**20**	**0.098**	**0.91**
	Lower Sand	10/13/2004	10/04 Indicator	8.24	2620	9.6	<0.50	**3.9 J**	**1.2 J**	**11 J**	**0.036 J**	**0.77 J**
	Lower Sand	10/13/2004	10/04 Indicator (dup)	8.24	7620	9.6	<0.50	**9.4 J**	**3.1 J**	**25 J**	**0.088 J**	**0.47 J**
	Lower Sand	10/14/2005	10/05 Indicator	9.88	2974	9.2	<0.50	<5	<0.50	<1.5	<0.100	**0.92**
	Lower Sand	10/24/2006	10/06 Indicator	10.45	3340	10.4	<0.5	<0.5	<0.5	<0.5	<0.01	**0.56**
	Lower Sand	10/18/2007	10/07 Indicator	9.44	3150	10.4	<0.5	<0.5	<0.5	<0.5	<0.01	**1.3**
	Lower Sand	10/23/2008	10/08 Indicator	9.26	3180	9.5	<0.50	<0.50	<0.50	<0.50	<0.01	**0.55**
	Lower Sand	10/27/2009	10/09 Indicator	LNAPL in well - no sample collected								
	Lower Sand	9/28/2011	09/11 indicator	8.72	3600	13.8	<0.5	<5	<0.5	<1.5	<0.1	<0.1
	Lower Sand	9/26/2012	09/12 indicator	7.75	2500	10.7	**13**	<5	<0.5	<1.5	<0.1	**0.24**
	Lower Sand	9/27/2013	09/13 indicator	7.78	2520	9.6	**0.73**	<5	<0.5	<1.5	<0.1	**0.11**
	Lower Sand	9/22/2014	09/14 indicator	7.6	2350	11.8	<0.50	<5.0	<0.50	<1.5	<0.1	<0.1
MW-X3	Upper Sand	4/29/2002	5/02 Indicator	8.0	7330	10	**1300**	<50	**390**	**470**	**2.5**	NM
	Upper Sand	10/12/2002	10/02 Indicator	7.39	3768	10.6	**1100**	<25	**510**	**880**	**7.2**	NM
	Upper Sand	10/4/2003	10/03 Indicator	7.13	3910	13.2	NM	NM	NM	NM	NM	NM
	Upper Sand	5/19/2004	5/04 Indicator	7.23	2810	9.5	**1700J**	<<62	**600J**	**490**	**3.7**	NA
	Upper Sand	10/13/2004	10/04 Indicator	7.64	3010	12.4	**1500**	<<50	**490**	**700**	**2.5**	NA
	Upper Sand	10/14/2005	10/05 Indicator	7.64	2879	11	**14**	<5	**2.7**	**63**	**0.84**	**10**
	Upper Sand	10/25/2006	10/06 Indicator	7.55	2910	10.5	**1700**	<50	**390**	**630**	**4.5**	na
	Upper Sand	10/18/2007	10/07 Indicator	7.12	3320	12.3	**1800**	**250**	**910**	**1100**	**5.4**	NA
	Upper Sand	10/23/2008	10/08 Indicator	7.15	3700	10.5	**1300**	**120**	**1000**	**380**	**5.6**	NA[3]
	Upper Sand	10/27/2009	10/09 Indicator	LNAPL in well - no sample collected								
	Upper Sand	9/27/2012	9/12 Indicator	NM	NM	NM	**900**	<50	**470**	**180**	**3.8**	**42**
	Upper Sand	9/27/2013	09/13 indicator	NM	NM	NM	**1300**	<500	**370**	**420**	<10	**17**
	Upper Sand	9/23/2014	09/14 indicator	NM	NM	NM	**150**	<500	**200**	<150	<10	**24**
MW-00-16	Lower Sand	5/25/2000	5/00 Baseline	7.5	2700	12.5	**2500**	**8400**	**880**	**5000**	**21**	**5.9**
	Lower Sand	11/21/2000	1/0/1900	7.8	2300	10.0	**1800**	**1100**	**820**	**2200**	**8.2**	**54.0**
	Lower Sand	5/14/2001	5/01 Indicator	6.5	3440	15.0	**800**	**1100**	**600**	**120**	**4.8**	**11.0**
	Lower Sand	10/8/2001	10/01 Indicator	6.5	2870	7.3	**2000**	**1100**	**520**	**1400**	**6**	**1.7**
	Lower Sand	10/8/2001	10/01 Indicator (dup)	6.5	2870	7.3	**1700**	**1100**	**720**	**1800**	**7.6**	**4.1**
	Lower Sand	4/30/2002	5/02 Indicator	7.1	3360	12.8	**680**	**100**	**460**	**470**	**1.6**	**1.3**
	Lower Sand	10/12/2002	10/02 Indicator	7.8	2755	9.6	**3800**	**1400**	**1100**	**2500**	**12**	**6.7**
	Lower Sand	4/26/2003	5/03 Indicator	7.1	4280	10.6	**310**	**71**	**380**	**230**	**2.8**	**1.0**
	Lower Sand	10/4/2003	10/03 Indicator	7.8	3180	9.4	**3900**	<100	**1100**	<100	**8.10**	**0.340**

Table 9
Summary of Historical Analytical Results for CMI Groundwater Performance Monitoring, 1997-2014

Well	Formation	Date	Event	pH	Conductivity (mmhos)	Temperature (°C)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)	GRO (mg/L)	DRO (mg/L)
MW-00-16	Lower Sand	5/18/2004	5/04 Indicator	7.50	3110	11.3	**2800J**	<120UJ	**1100J**	**990J**	**7.2J**	**1.3**
(cont'd)	Lower Sand	10/13/2004	10/04 Indicator	7.41	3260	10.7	**200**	**15**	**340**	**180**	**0.86**	**1**
	Lower Sand	10/14/2005	10/05 Indicator	8.41	2681	9	**1200**	<250	**300**	**510**	**7.2**	**1.3**
	Lower Sand	10/14/2005	10/05 Indicator (dup)	8.41	2681	9	**1200**	<250	**270**	**450**	**6.6**	**1.2**
	Lower Sand	10/25/2006	10/06 Indicator	7.6	2660	9.7	**1400**	<50	**560**	**230J**	**4.1**	**1.1J**
	Lower Sand	10/25/2006	10/06 Indicator (dup)	7.6	2660	9.7	**1600**	<50	**650**	**360J**	**4.8**	**1.7J**
	Lower Sand	10/18/2007	10/07 Indicator	7.2	3620	10	**2700J**	<100UJ	**1000J**	**110**	**7.8 J**	**0.92J**
	Lower Sand	10/18/2007	10/07 Indicator (dup)	7.2	3620	10	**980J**	**54J**	**410J**	**110**	**2.6 J**	**1.3J**
	Lower Sand	10/23/2008	10/08 Indicator	7.35	3500	8.5	**3200**	<100	**450**	<100	**7.4**	**1.5**
	Lower Sand	10/23/2008	10/08 Indicator (dup)	7.35	3500	8.5	**3000**	<100	**390**	<100	**5.8**	**1.9**
	Lower Sand	10/27/2009	10/09 Indicator	6.89	5027	9.5	**3**	<0.50	**4.0J**	<0.50	**0.35**	**1.2J**
	Lower Sand	10/27/2009	10/09 Indicator dup	6.89	5027	9.5	**2.7**	<0.50	**2.6J**	<0.50	**0.33**	**1.7J**
	Lower Sand	9/14/2010	10/10 Indicator	7.36	4510	10.9	**150**	<5.0	**0.82**	**1.5**	**0.28**	**0.59**
	Lower Sand	9/28/2011	09/11 indicator	7.3	4440	13.5	**12**	<5	**1.3**	<1.5	**0.21**	**0.21**
	Lower Sand	9/25/2012	09/12 indicator	7.14	3890	10.5	**1.8**	<5	**1.2**	<1.5	**0.11**	**0.51**
	Lower Sand	9/26/2013	09/13 indicator	7.04	3830	10.9	**6**	<5	**0.71**	<1.5	**0.24**	**0.23**
	Lower Sand	9/22/2014	09/14 indicator	7.14	2720	12.7	**1**	<5.0	<0.50	<1.5	<0.1	**0.15**
MW-00-17	Lower Sand	5/25/2000	5/00 Baseline	7.40	2550	11.2	**2.3**	**1100**	**10**	**73**	**0.24**	**0.49**
	Lower Sand	11/21/2000	10/00 Indicator	7.6	2700	12.0	<0.50	**1100**	<0.50	**15**	**0.12**	**2.1**
	Lower Sand	5/14/2001	5/01 Indicator	7.0	4010	13.0	<0.50	**1100**	<0.50	<0.50	**0.016**	**0.59**
	Lower Sand	10/8/2001	10/01 Indicator	6.7	3310	7.3	<0.50	**1100**	**1.5**	**25**	**1**	**3.2**
	Lower Sand	4/30/2002	5/02 Indicator	6.9	3880	10.5	<0.50	<0.50	<0.50	**0.58**	<0.01	**0.1**
	Lower Sand	10/12/2002	10/02 Indicator	7.2	4430	7.6	**1.0**	<0.50	<0.50	**12**	**0.052**	**1.6**
	Lower Sand	4/26/2003	5/03 Indicator	7.1	4880	10.6	<0.50	<0.50	<0.50	<0.50	**0.013**	**0.31 J**
	Lower Sand	4/26/2003	5/03 Indicator (dup)	7.1	4800	10.6	<0.50	<0.50	<0.50	<0.50	**0.016**	**0.65 J**
	Lower Sand	10/4/2003	10/03 Indicator	7.0	4650	8.9	<0.50	<0.50	<0.50	**0.72 U**	**0.013**	**0.190**
	Lower Sand	5/18/2004	5/04 Indicator	6.90	1932	9.5	<0.50UJ	<0.50	<0.50UJ	<0.50	<0.010	**0.2**
	Lower Sand	10/12/2004	10/04 Indicator	7.44	4220	10.0	<0.50	<0.50	<0.50	<0.50	<0.010	<0.25
	Lower Sand	10/12/2004	10/04 Indicator (dup)	7.44	NM	10.0	**24 J**	**0.57**	**17 J**	**28**	**0.089 J**	<0.25
	Lower Sand	10/12/2005	10/05 Indicator	8.10	3470	8.9	<0.50	<5	<0.50	<1.5	<0.100	**0.11**
	Lower Sand	10/24/2006	10/06 Indicator	7.10	4490	7.4	<0.5	<0.5	<0.5	<0.5	<0.01	<0.25
	Lower Sand	10/24/2006	10/06 Indicator (dup)	7.10	4490	7.4	<0.5	<0.05	<0.05	<0.05	<0.01	<0.25
	Lower Sand	10/17/2007	10/07 Indicator	6.91	4880	8.8	<0.5	<0.5	<0.5	<0.5	<0.01	<0.25
	Lower Sand	10/17/2007	10/07 Indicator (dup)	6.91	4880	8.8	<0.5	<0.5	<0.5	<0.5	<0.01	<0.25
	Lower Sand	10/23/2008	10/08 Indicator	6.84	5780	7.1	<0.50	<0.50	<0.50	<0.50	<0.01	**1.6**

Notes:

[1] Sample bottle broken during shipping, sample recollected on given date
[2] Sample not collected during initial sampling, sample collected on given date
[3] Insufficient sample volume to complete DRO analysis
Detections are shown in bold.
°C = degrees Celsius
µg/L = micrograms per liter
J = Estimated concentration.

mg/L = milligrams per liter
NA = Not Analyzed
NM = Not Measured
NR = Not Reliable (field notes show pH>14)
U = Evaluated to be undetected at the reported concentration; result is considered to be a false positive.
UJ = Undetected, reporting limit is estimated.
<0.01 = Less than laboratory MDL

Table 10
Summary of 2014 Analytical Results for Monitored Natural Attenuation

Well	Plume Location	Sample Date	Benzene (µg/L)	Ethyl-benzene (µg/L)	Toluene (µg/L)	Xylenes (µg/L)	Gasoline Range Organics (mg/L)	Diesel Range Organics (mg/L)
Upper Sand/Till								
MW-87-14	Middle	9/23/2014	6400	150	ND(250)	99	12	1.1
MW-87-16	Perimeter	9/23/2014	ND(0.5)	ND(0.5)	ND(5)	ND(1.5)	ND(0.1)	1.7J
MW-87-16 (Dup)	Perimeter	9/23/2014	ND(0.5)	ND(0.5)	ND(5)	ND(1.5)	ND(0.1)	0.26J
MW-87-24	Perimeter	Plugged and Abandoned in April 2009						
MW-87-28	Middle	Plugged and Abandoned in April 2009						
MW-89-05	Middle	9/22/2014	220	8.2	ND(50)	19	1.3	8.8
MW-C2	Middle	9/22/2014	220	ND(25)	ND(250)	ND(75)	ND(5)	11
MW-M	Middle	9/22/2014	700	ND(0.5)	6.4	24	1.9	4.1
MW-T3	Middle	9/23/2014	2.8	5.2	ND(5)	8.2	ND(0.1)	30J
MW-X3	Middle	9/23/2014	150	200	ND(500)	ND(150)	ND(10)	24
Lower Sand								
MW-00-16	Middle	9/22/2014	1	ND(0.5)	ND(5)	ND(1.5)	ND(0.1)	0.15J
MW-89-07	Perimeter	9/22/2014	5300	100	ND(500)	300	ND(10)	2.4
MW-T1R	Middle	9/22/2014	1000	28	ND(100)	39	ND(2)	230
MW-U1R	Perimeter	9/23/2014	ND(0.5)	ND(0.5)	ND(5)	ND(1.5)	ND(0.1)	0.81
MW-X1R	Perimeter	9/22/2014	ND(0.5)	ND(0.5)	ND(5)	ND(1.5)	ND(0.1)	ND(0.1)

Notes:

µg/L = micrograms per liter
J = Estimated concentration.
mg/L = milligrams per liter
NA = Not analyzed
ND(0.5) = Not detected above given reporting limit.
UJ = Not detected; reporting limit is estimated.

Table 11
Summary of Analytical Results for Post-Closure Groundwater Monitoring Wells
Replaced 09/2013 Quarterly Sampling for 2 Years to Establish Baseline

Well Number	Duplicate Sample ID	Date of Sampling	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	DRO (mg/l)	GRO (mg/l)
Upper Sand and Till Wells								
MW-87-08R		9/28/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	**0.62**	ND(0.1)
	Duplicate	9/28/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	**0.6**	ND(0.1)
		12/12/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	**0.12**	ND(0.1)
		3/15/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	**0.39**	ND(0.1)
		6/11/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	**0.42**	ND(0.1)
		9/22/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	**0.53J**	ND(0.1)
	Duplicate	9/22/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	**0.28J**	ND(0.1)
		12/10/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	**0.28**	ND(0.1)
MW-90-01R		9/26/2013	IN	IN	IN	IN	IN	IN
		12/12/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	ND(0.1)	ND(0.1)
		3/15/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	ND(0.2)	ND(0.1)
		6/11/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	**0.17**	ND(0.1)
		9/23/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	**0.31**	ND(0.1)
		12/10/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	**0.11**	ND(0.1)
	Duplicate	12/10/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	ND(0.1)	ND(0.1)
Lower Sand Wells								
MW-8BRR		9/28/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	**0.44**	ND(0.1)
		12/12/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	ND(0.10)	ND(0.1)
		3/15/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	**0.27**	ND(0.1)
		6/11/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	**0.35**	ND(0.1)
		9/22/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	**0.29**	ND(0.1)
		12/10/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	**0.37**	ND(0.1)
MW-9R		9/28/2013	**2.6**	ND(5)	ND(0.5)	**1.7**	**1.7**	ND(0.1)
		12/12/2013	**1.6**	ND(5)	ND(0.5)	ND(1.5)	**0.73J**	ND(0.1)
	Duplicate	12/12/2013	**1.7**	ND(5)	ND(0.5)	ND(1.5)	**1.2J**	ND(0.1)
		3/15/2014	ND(0.50)	ND(5)	ND(0.5)	ND(1.5)	**0.84**	ND(0.1)
	Duplicate	3/15/2014	ND(0.50)	ND(5)	ND(0.5)	ND(1.5)	**0.96**	ND(0.1)
		6/11/2014	**0.57**	ND(5)	ND(0.5)	ND(1.5)	**0.67**	ND(0.1)
	Duplicate	6/11/2014	**0.51**	ND(5)	ND(0.5)	ND(1.5)	**0.55**	ND(0.1)
		9/22/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	**0.55**	ND(0.1)
		12/10/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	**0.44**	ND(0.1)
MW-10R		9/28/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	**0.37**	ND(0.1)
		12/12/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	ND(0.10)	ND(0.1)
		3/15/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	**0.16**	ND(0.1)
		6/11/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	**0.2**	ND(0.1)
		9/22/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	**0.1**	ND(0.1)
		12/10/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	ND(0.1)	ND(0.1)

Notes:

[1] Matrix interference caused higher detection limit.

[2] Sample was recollected on June 29, 2004 due to a laboratory error and analyzed for 1,2-dichloroethane only.

[3] No longer analyzed in accordance with 2004 permit.

J = Estimated value.

IN = Insufficient water in well to collect sample. Not sampled.

ND(0.5) = not detected above given reporting limit

U = Detection reported in associated trip blank, sample has been qualified.

UJ = Estimated reporting limit.

FIGURES

SOURCE: GOOGLE EARTH, 2013
IMAGE DATE: 09/07/11

Job No:
Drawn By: pjs
Date: 01/27/2015
QC:
PE:
File:

Johnston Leigh Inc.
(801) 726-6363

2014 ANNUAL REPORT
REFINERY LOCATION MAP

FLYING J PETROLEUMS INC.
WILLISTON REFINERY, ND

FIGURE
1

Job No.:

Drawn By: PJS

Date: 01/29/2015

File:

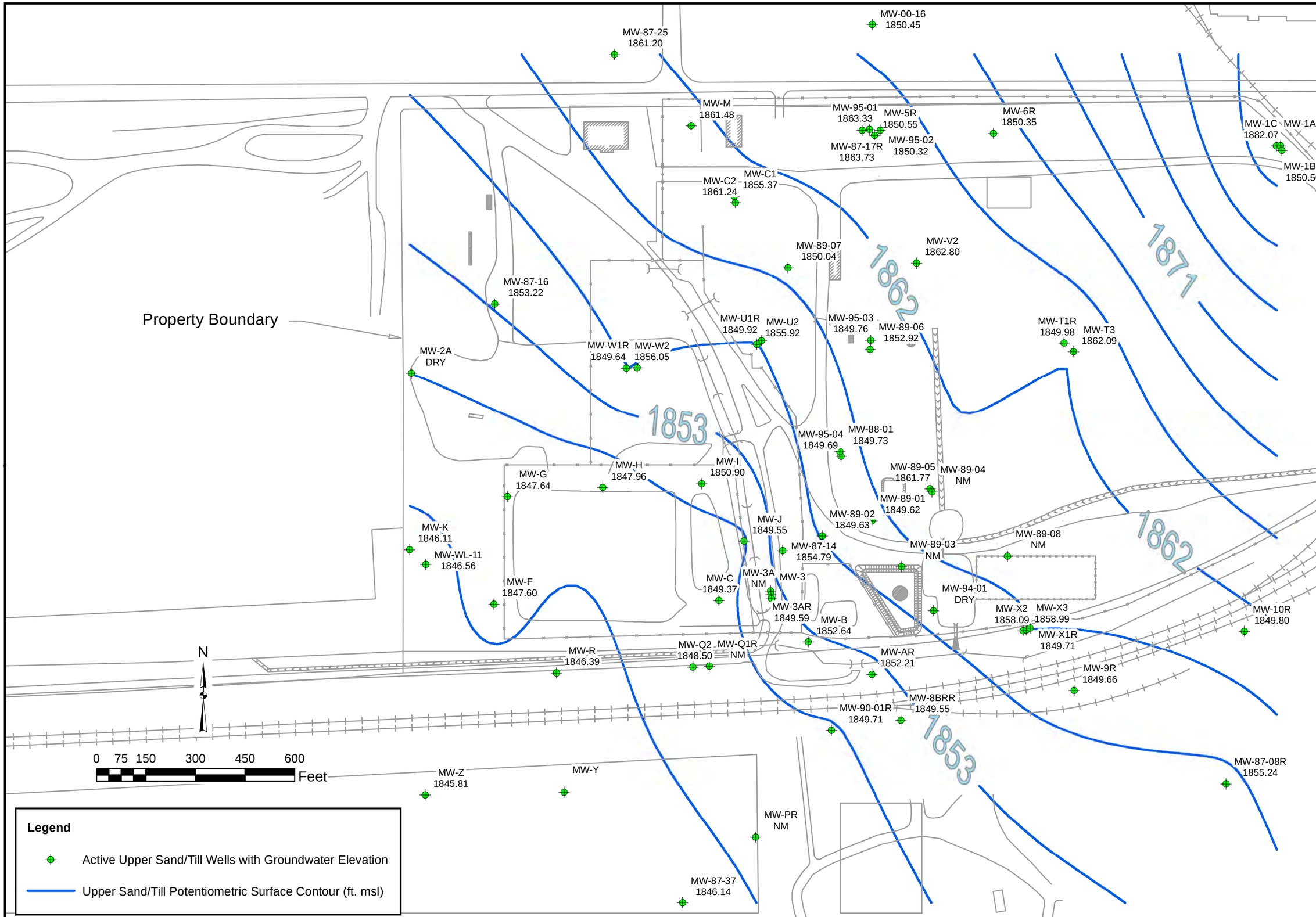
Joshnston Leigh Inc.
(801) 726-6845

MONITORING WELL LOCATIONS

FLYING J PETROLEUMS INC.
WILLISTON REFINERY
WILLISTON, ND

FIGURE

2



Job No.:

Drawn By: PJS

Date: 01/29/2015

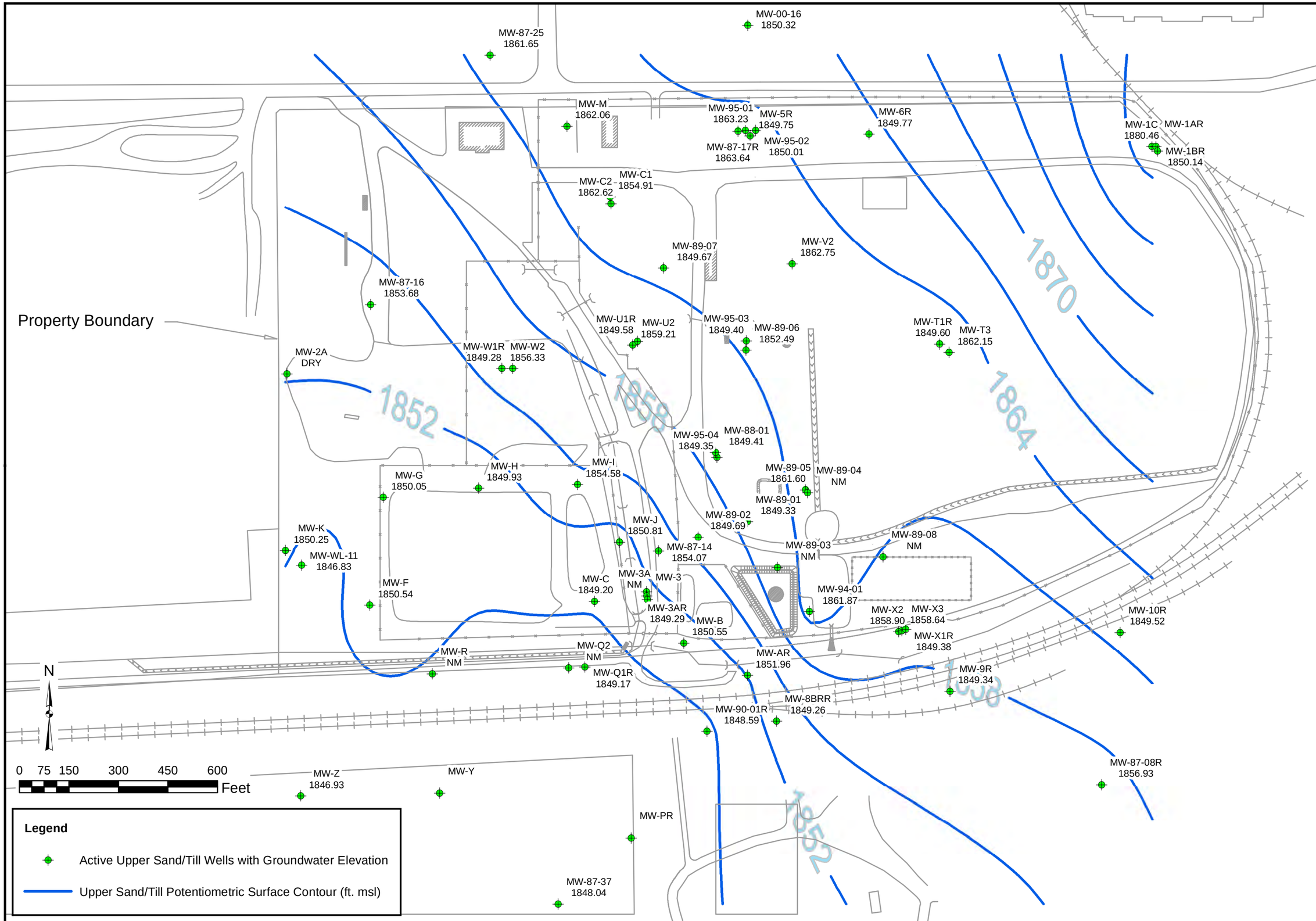
File:

Joshnston Leigh Inc.
(801) 726-6845

APRIL 2014 UPPER SAND/TILL GROUNDWATER ELEVATIONS

FLYING J PETROLEUMS INC.
WILLISTON REFINERY
WILLISTON, ND

FIGURE
3



Job No.:

Drawn By: PJS

Date: 01/29/2015

File:

Joshnston Leigh Inc.
(801) 726-6845

SEPT 2014 UPPER SAND/TILL GROUNDWATER ELEVATIONS

FLYING J PETROLEUMS INC.
WILLISTON REFINERY
WILLISTON, ND

FIGURE

4

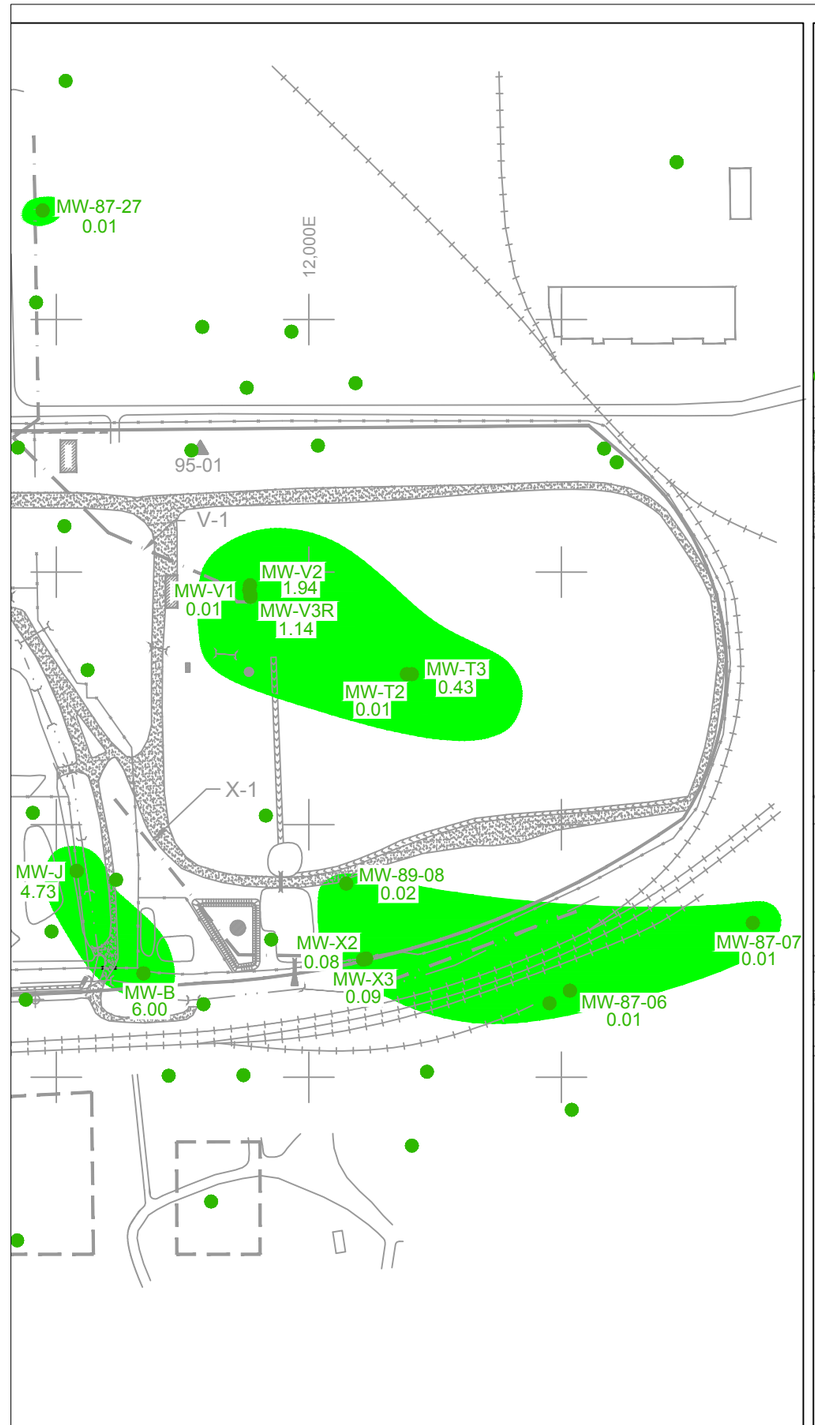
LEGEND

- UPPER SAND/TILL MONITORING WELL LOCATION WITH NO MEASURABLE LNAPL
- MW-J — UPPER SAND/TILL MONITORING WELL LOCATION WITH MEASURABLE LNAPL
- 0.03 — MEASURABLE LNAPL THICKNESS (ft.)
- EXTENT OF MEASURABLE LNAPL PLUME ≥ 0.01 ft. AND <1.0 ft.
- EXTENT OF MEASURABLE LNAPL PLUME ≥1.0 ft.
- ABANDONED WELL
- 95-01 — UPPER SAND RECOVERY WELL
- UPPER SAND RECOVERY TRENCH

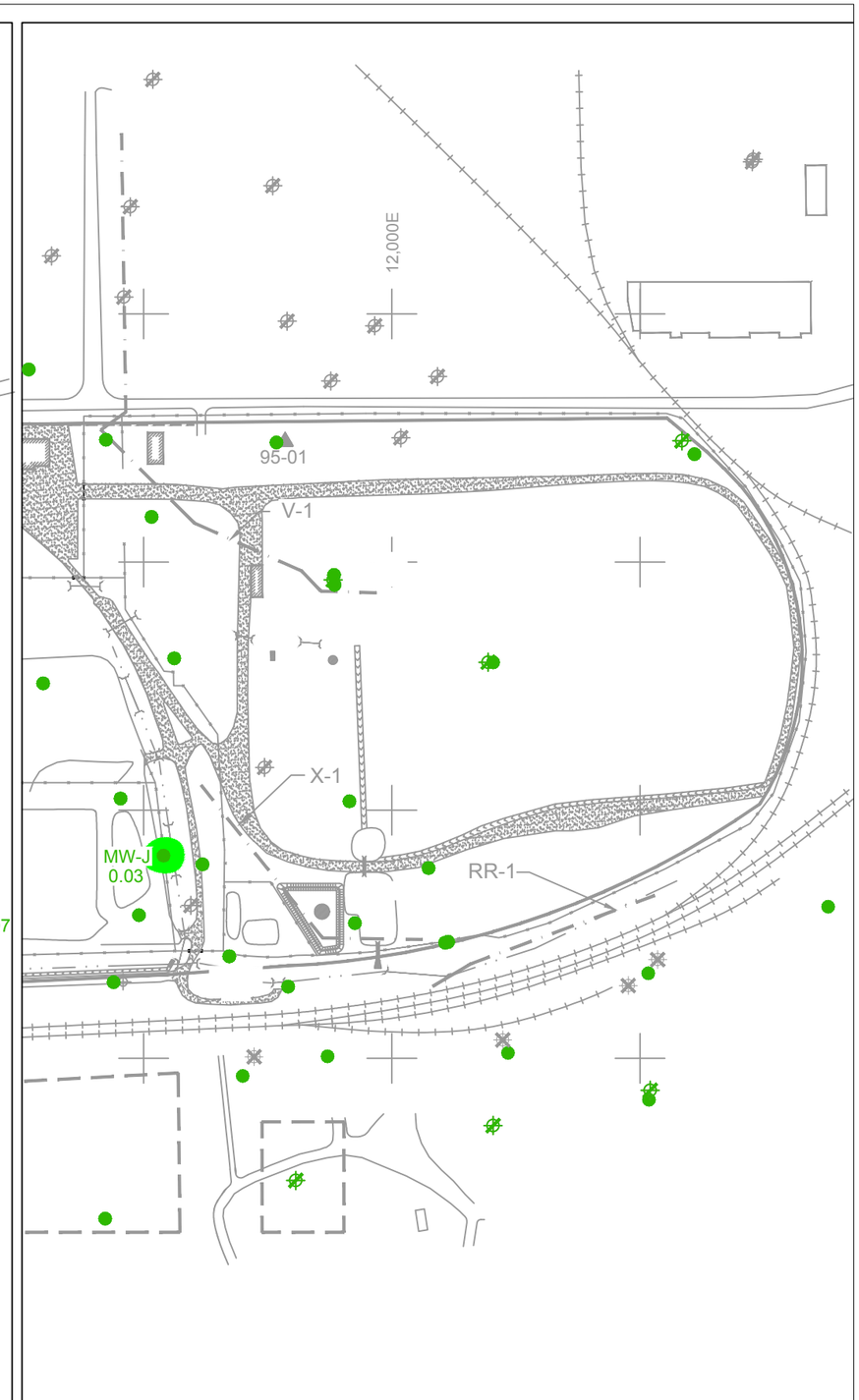
150 0 300
1"=300'

N

MAY 1997 EXTENT OF MEASURABLE LNAPL IN UPPER SAND/TILL



APRIL 2014 EXTENT OF MEASURABLE LNAPL IN UPPER SAND/TILL



Job No:
Drawn By: pjs
Date: 01/27/2015
QC:
PE:
File:

Johnston Leigh Inc.
(801) 726-6083

EXTENT OF MEASURABLE LNAPL IN UPPER SAND / TILL MAY 1997 / APRIL 2014

FLYING J PETROLEUMS INC.
WILLISTON REFINERY, ND

FIGURE
5

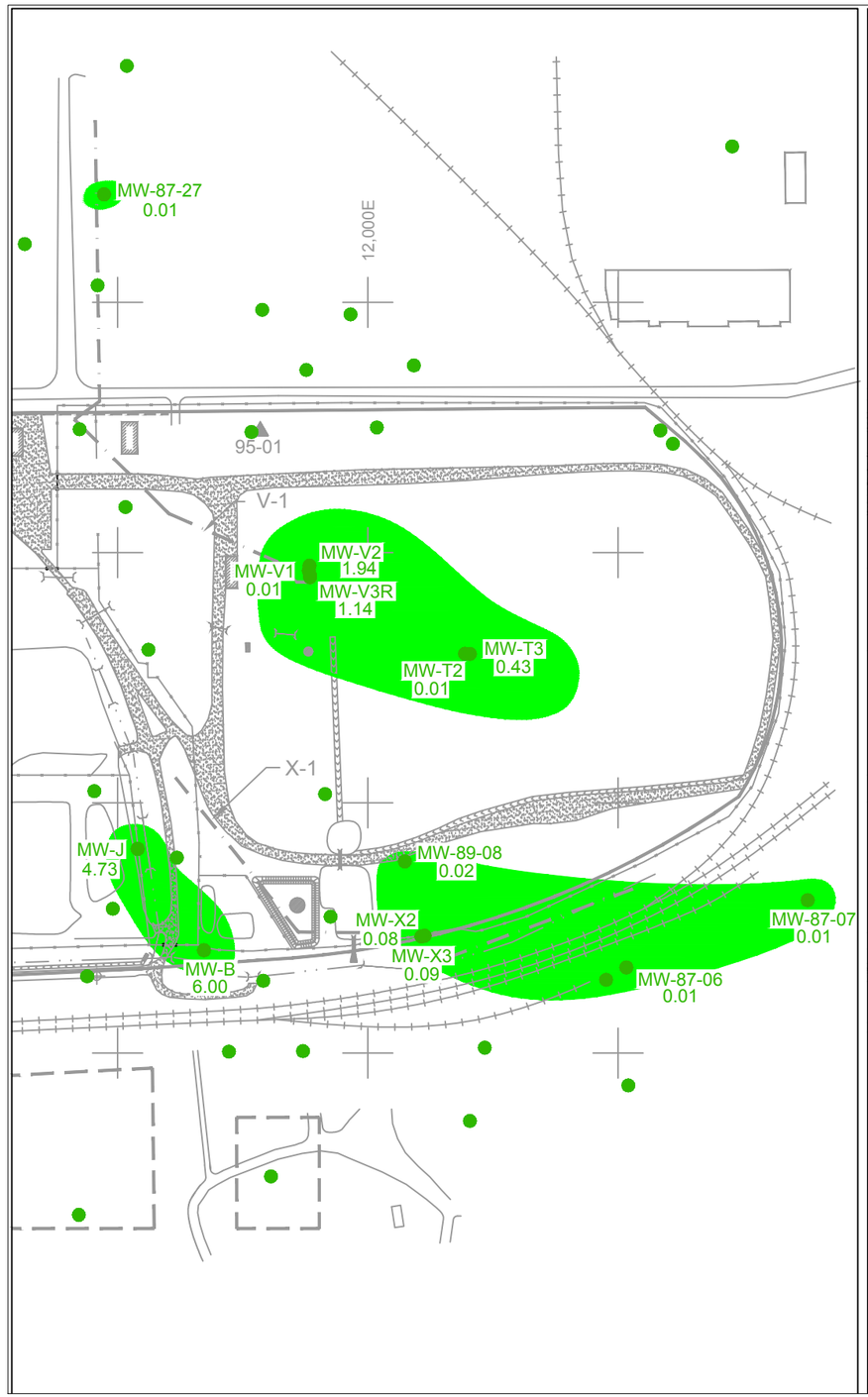
LEGEND

- UPPER SAND/TILL MONITORING WELL LOCATION WITH NO MEASURABLE LNAPL
- MW-J — UPPER SAND/TILL MONITORING WELL LOCATION WITH MEASURABLE LNAPL
- 0.02 — MEASURABLE LNAPL THICKNESS (ft.)
- EXTENT OF MEASURABLE LNAPL PLUME ≥ 0.01 ft. AND <1.0 ft.
- EXTENT OF MEASURABLE LNAPL PLUME ≥1.0 ft.
- ABANDONED WELL
- 95-01 — UPPER SAND RECOVERY WELL
- UPPER SAND RECOVERY TRENCH

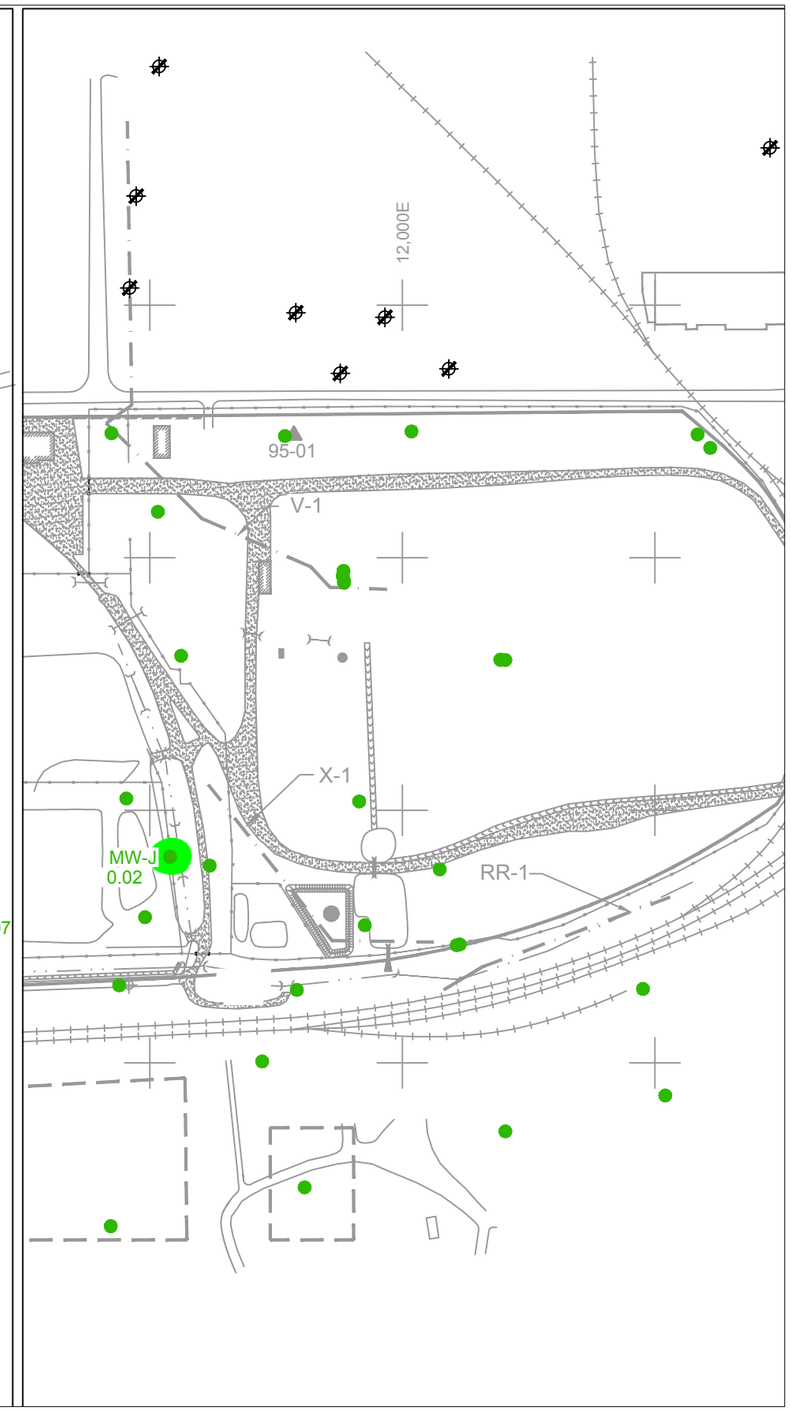
150 0 300
1"=300'

N

MAY 1997 EXTENT OF MEASURABLE LNAPL IN UPPER SAND/TILL



SEPTEMBER 2014 EXTENT OF MEASURABLE LNAPL IN UPPER SAND/TILL



Job No:
Drawn By: pjs
Date: 01/27/2015
QC:
PE:
File:

Johnston Leigh Inc.
(801) 726-6063

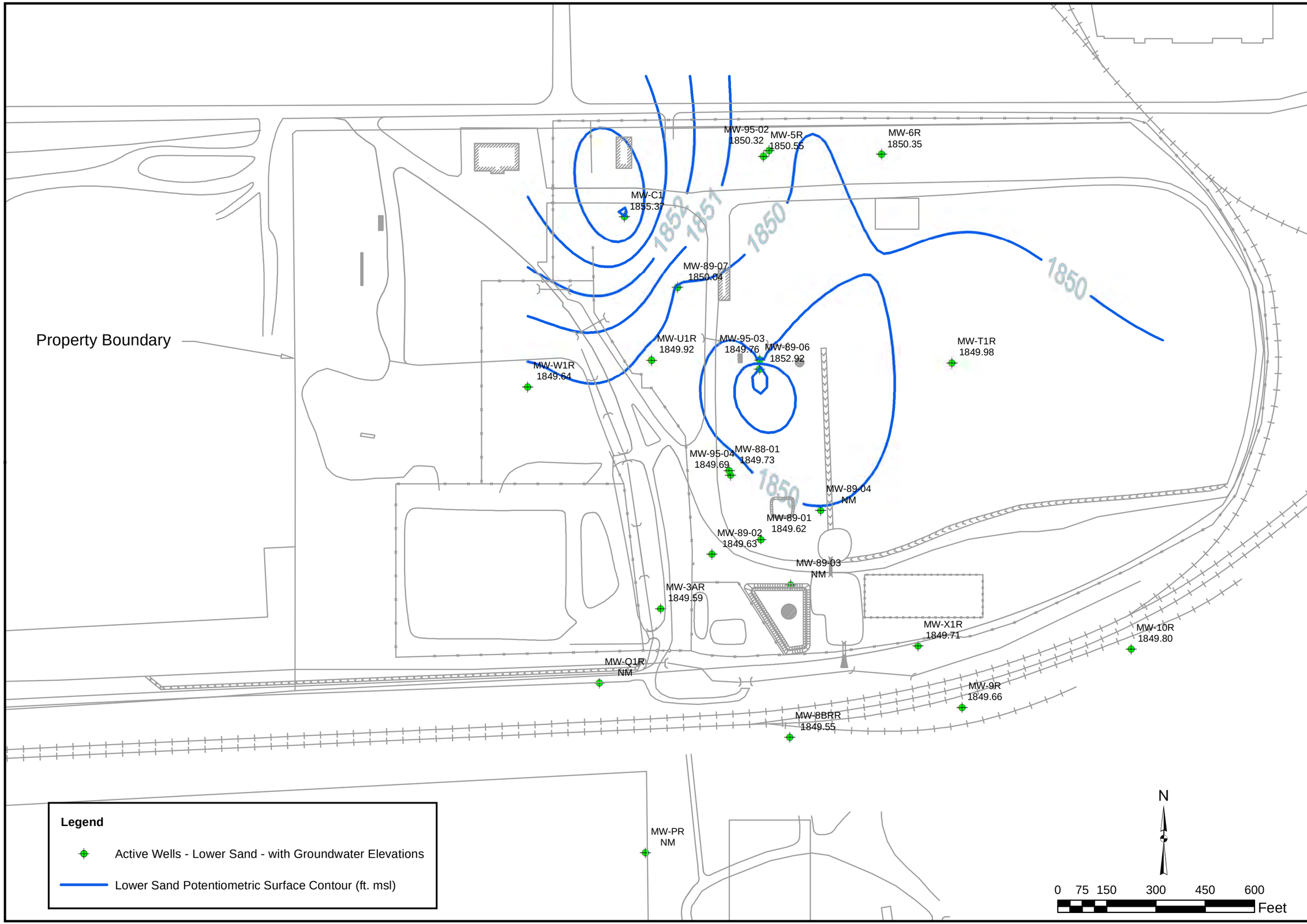
EXTENT OF MEASURABLE LNAPL IN UPPER SAND / TILL MAY 1997 / SEPTEMBER 2014

FLYING J PETROLEUMS INC.

WILLISTON REFINERY, ND

FIGURE

6



Job No.:

Drawn By: PJS

Date: 01/29/2015

File:

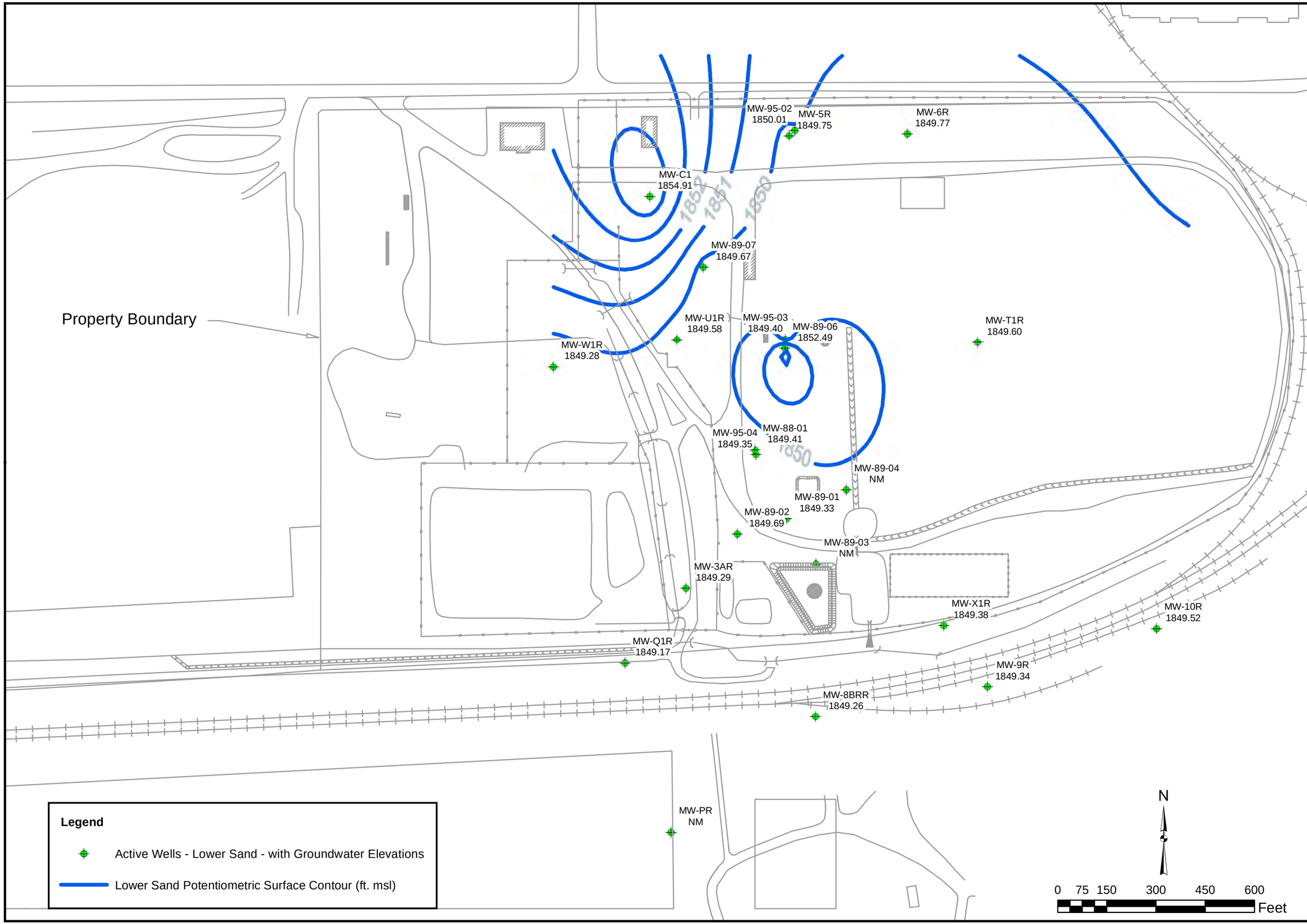
Joshnston Leigh Inc.
(801) 726-6845

APRIL 2014 LOWER SAND
GROUNDWATER ELEVATIONS

FLYING J PETROLEUMS INC.
WILLISTON REFINERY
WILLISTON, ND

FIGURE

7



Job No.:

Drawn By: PJS

Date: 01/29/2015

File:

Joshnston Leigh Inc.
(801) 726-6845

AUGUST 2014 LOWER SAND GROUNDWATER ELEVATIONS

FLYING J PETROLEUMS INC.
WILLISTON REFINERY
WILLISTON, ND

FIGURE

8

LEGEND

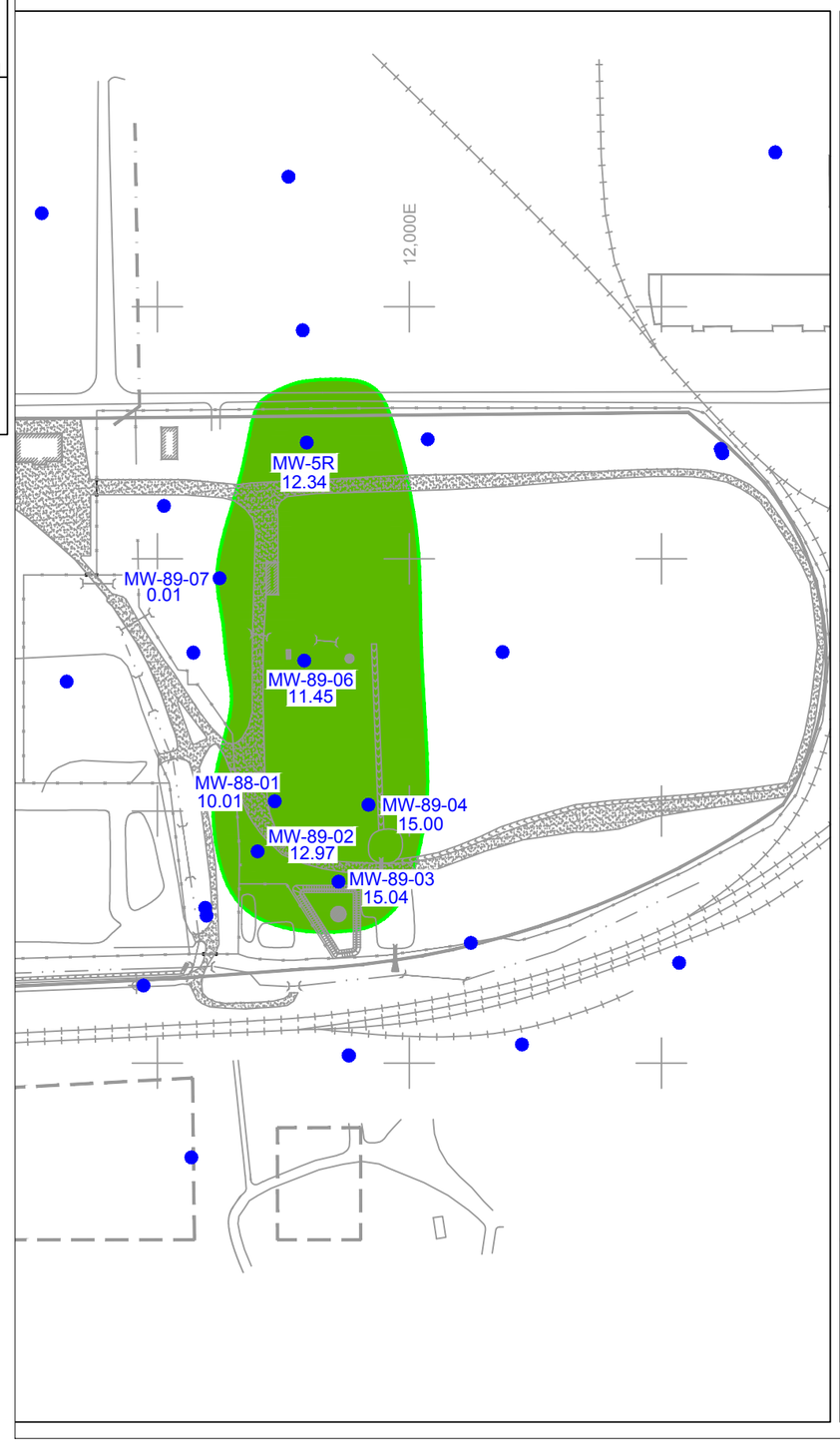
- LOWER SAND MONITORING WELL LOCATION WITH NO MEASURABLE LNAPL
- MW-89-07 — LOWER SAND MONITORING WELL LOCATION WITH MEASURABLE LNAPL
- 0.07 — MEASURABLE LNAPL THICKNESS (ft.)
- EXTENT OF MEASURABLE LNAPL PLUME ≥ 0.01 ft. AND <1.0 ft.
- EXTENT OF MEASURABLE LNAPL PLUME ≥1.0 ft.
- 89-01 — LOWER SAND RECOVERY WELL (INACTIVE)

150 0 300

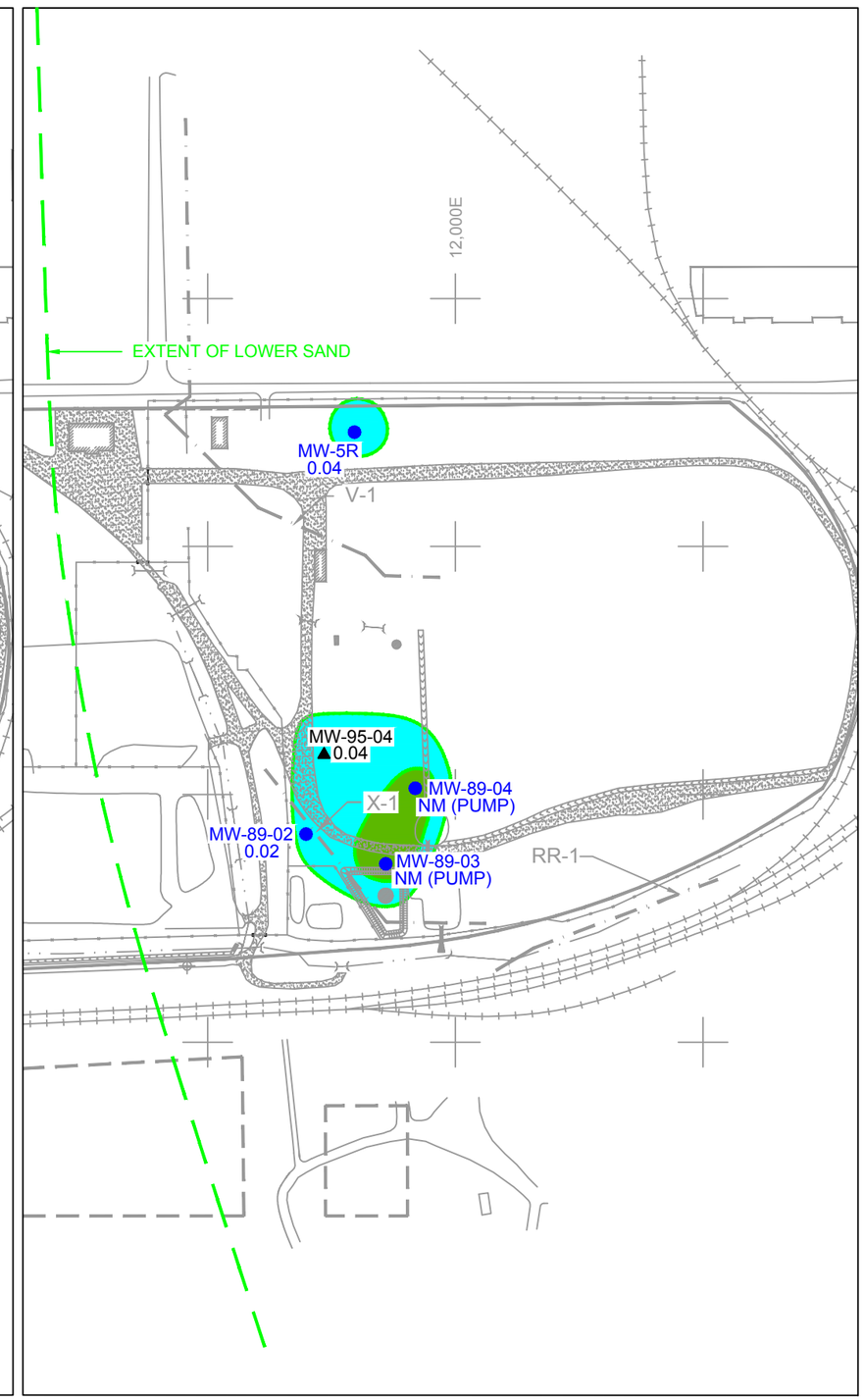
1"=300'

N

MAY 1997 EXTENT OF MEASURABLE LNAPL IN LOWER SAND



APRIL 2014 EXTENT OF MEASURABLE LNAPL IN LOWER SAND



Job No:
Drawn By: pjs
Date: 01/27/2015
QC:
PE:
File:

Johnston Leigh Inc.
(801) 726-6083

EXTENT OF MEASURABLE LNAPL IN LOWER SAND MAY 1997 / APRIL 2014

FLYING J PETROLEUMS INC.

WILLISTON REFINERY, ND

FIGURE

9

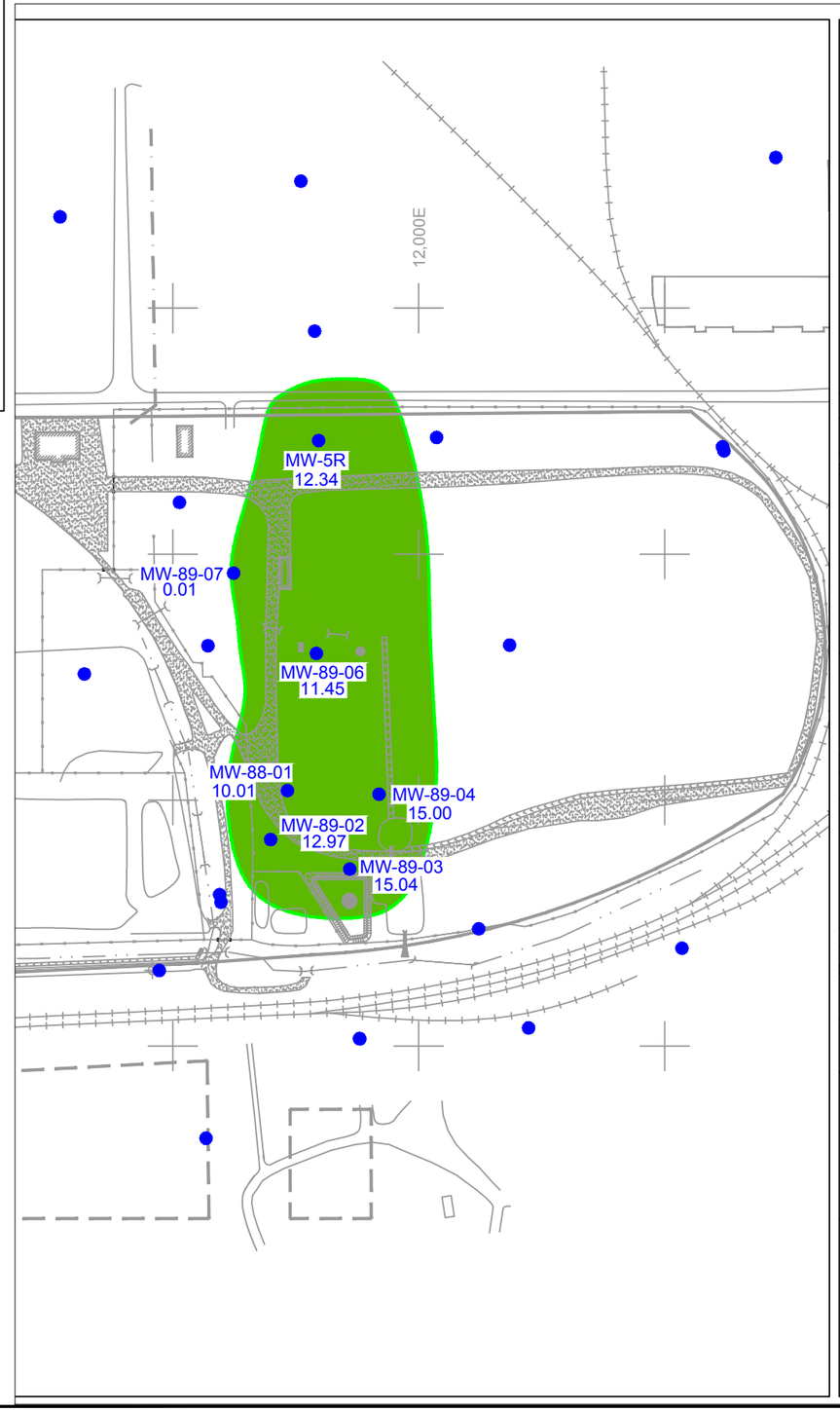
LEGEND

- LOWER SAND MONITORING WELL LOCATION WITH NO MEASURABLE LNAPL
- MW-89-07 LOWER SAND MONITORING WELL LOCATION WITH MEASURABLE LNAPL
- 4.2 MEASURABLE LNAPL THICKNESS (ft.)
- EXTENT OF MEASURABLE LNAPL PLUME ≥ 0.01 ft. AND <1.0 ft.
- EXTENT OF MEASURABLE LNAPL PLUME ≥1.0 ft.
- 89-01 LOWER SAND RECOVERY WELL (INACTIVE)

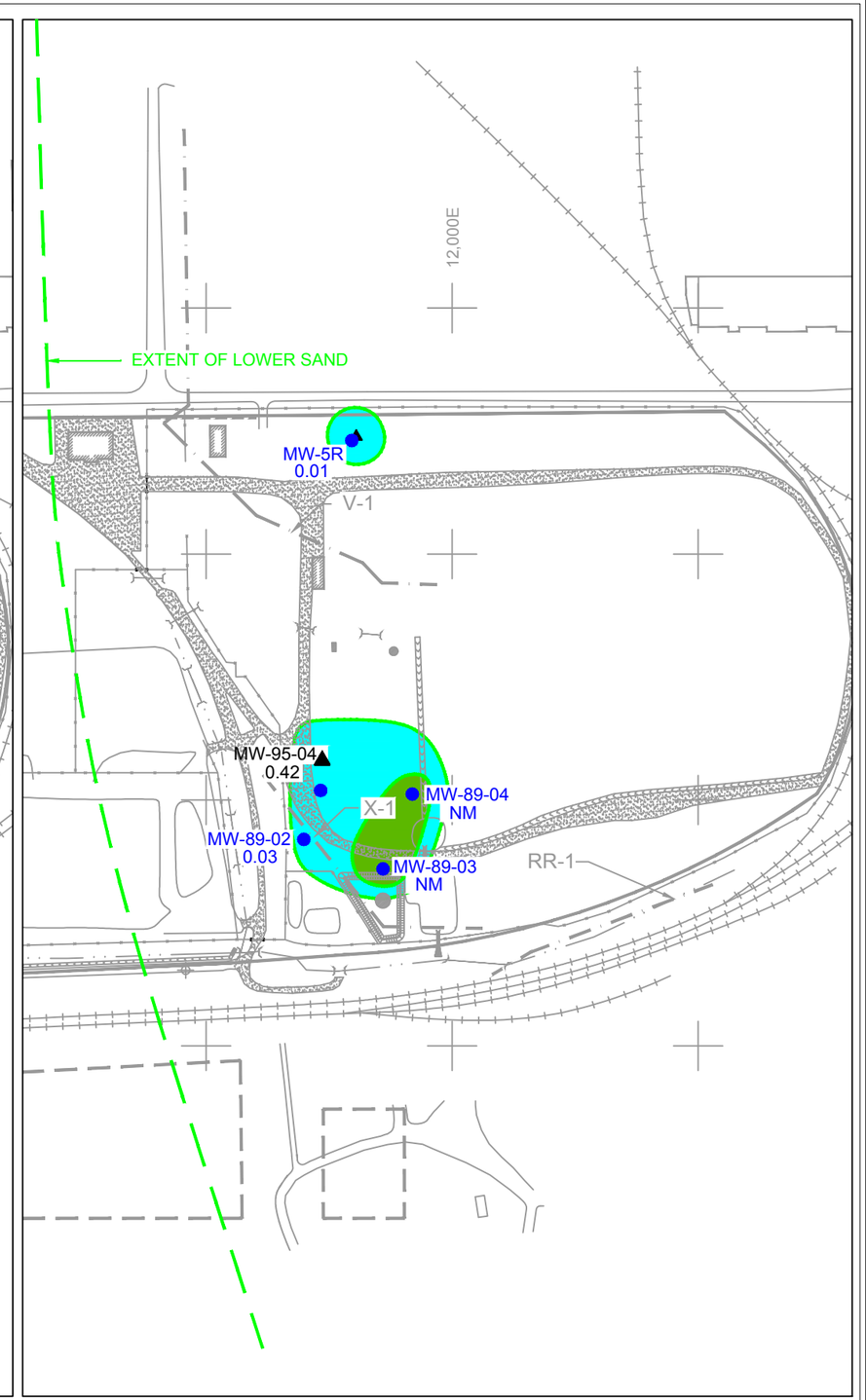
150 0 300
1"=300'

N

MAY 1997 EXTENT OF MEASURABLE LNAPL IN LOWER SAND



SEPTEMBER 2014 EXTENT OF MEASURABLE LNAPL IN LOWER SAND



Job No:
Drawn By: pjs
Date: 01/27/2015
QC: PE:
File:

Johnston Leigh Inc.
(801) 726-6083

EXTENT OF MEASURABLE LNAPL IN LOWER SAND
MAY 1997 / SEPTEMBER 2014

FLYING J PETROLEUMS INC.
WILLISTON REFINERY, ND

FIGURE
10

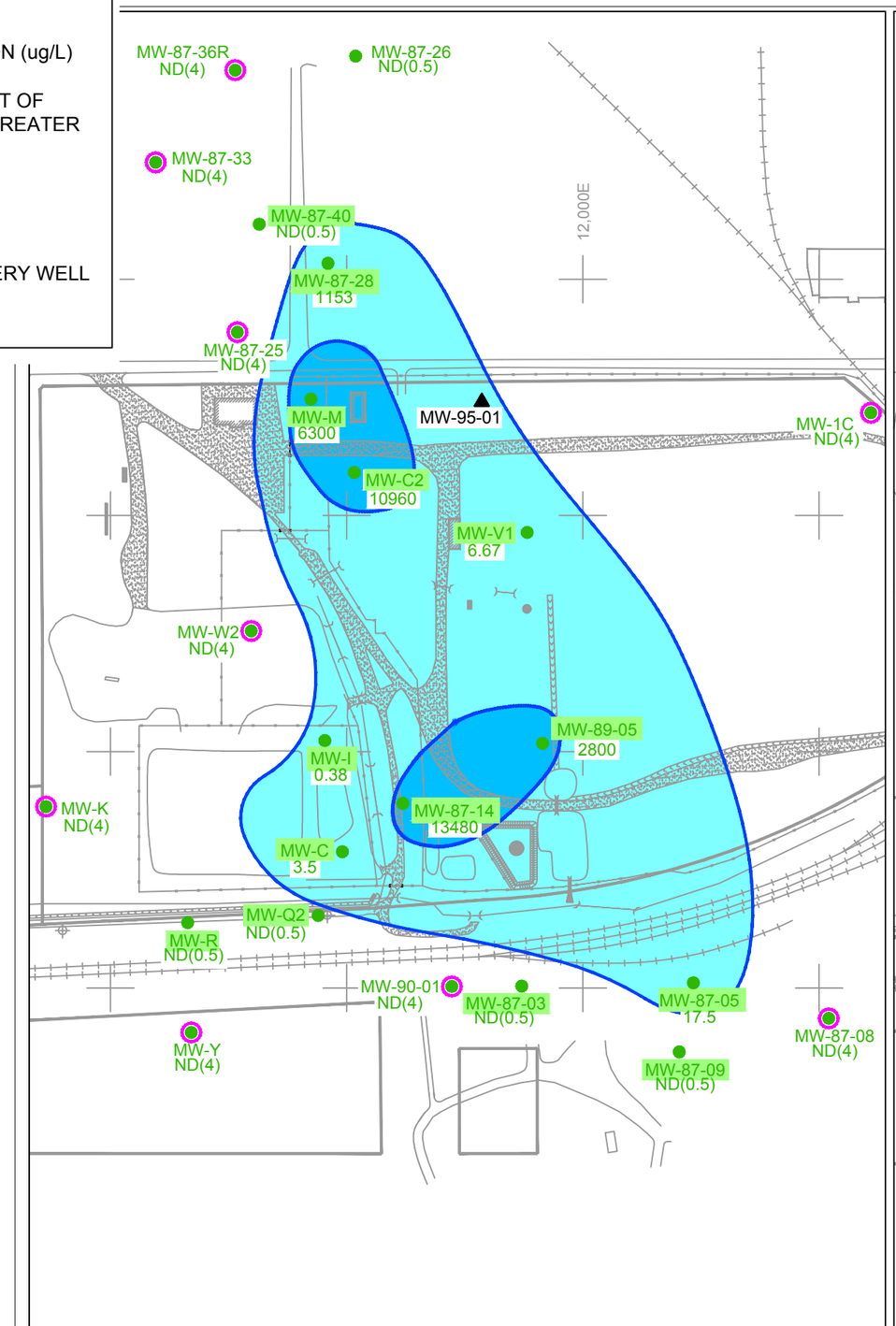
LEGEND

- PCGWM WELL LOCATION
- MW M — PERFORMANCE MONITORING WELL
- 730.4 — BTEX CONCENTRATION (ug/L)
- APPROXIMATE EXTENT OF TOTAL BTEX PLUME GREATER THAN
  - 0 ug/l
  - 2000 ug/l
- 95-01 — UPPER SAND RECOVERY WELL
- ABANDONED WELL

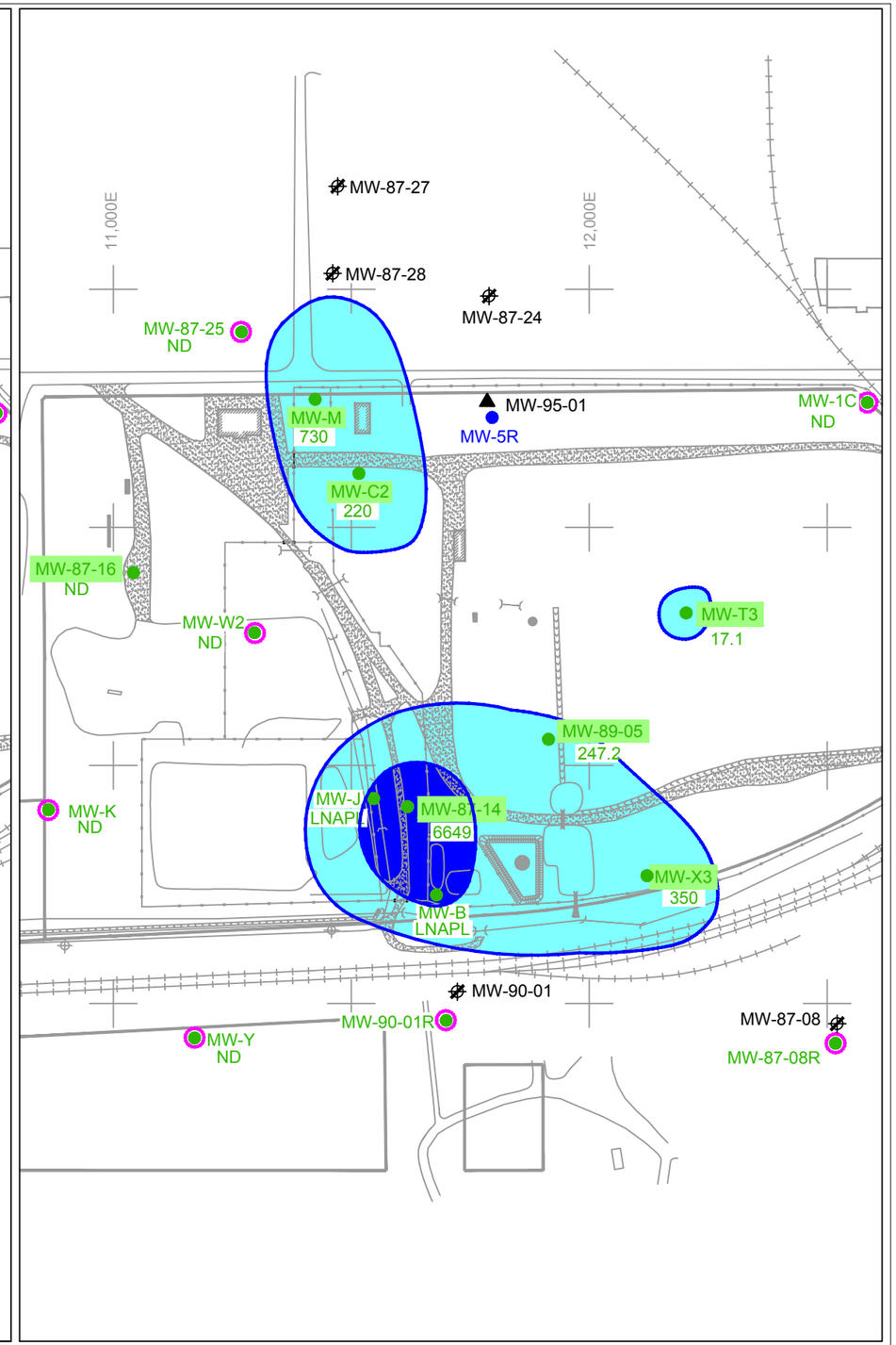
150 0 300
1"=300'

N

MAY 1997 EXTENT OF TOTAL BTEX IN UPPER SAND/TILL



SEPTEMBER 2014 APPROXIMATE EXTENT OF TOTAL BTEX IN UPPER SAND/TILL



Job No:
Drawn By: pjs
Date: 01/27/2015
QC:
PE:
File:

Johnston Leigh Inc.
(801) 726-6363

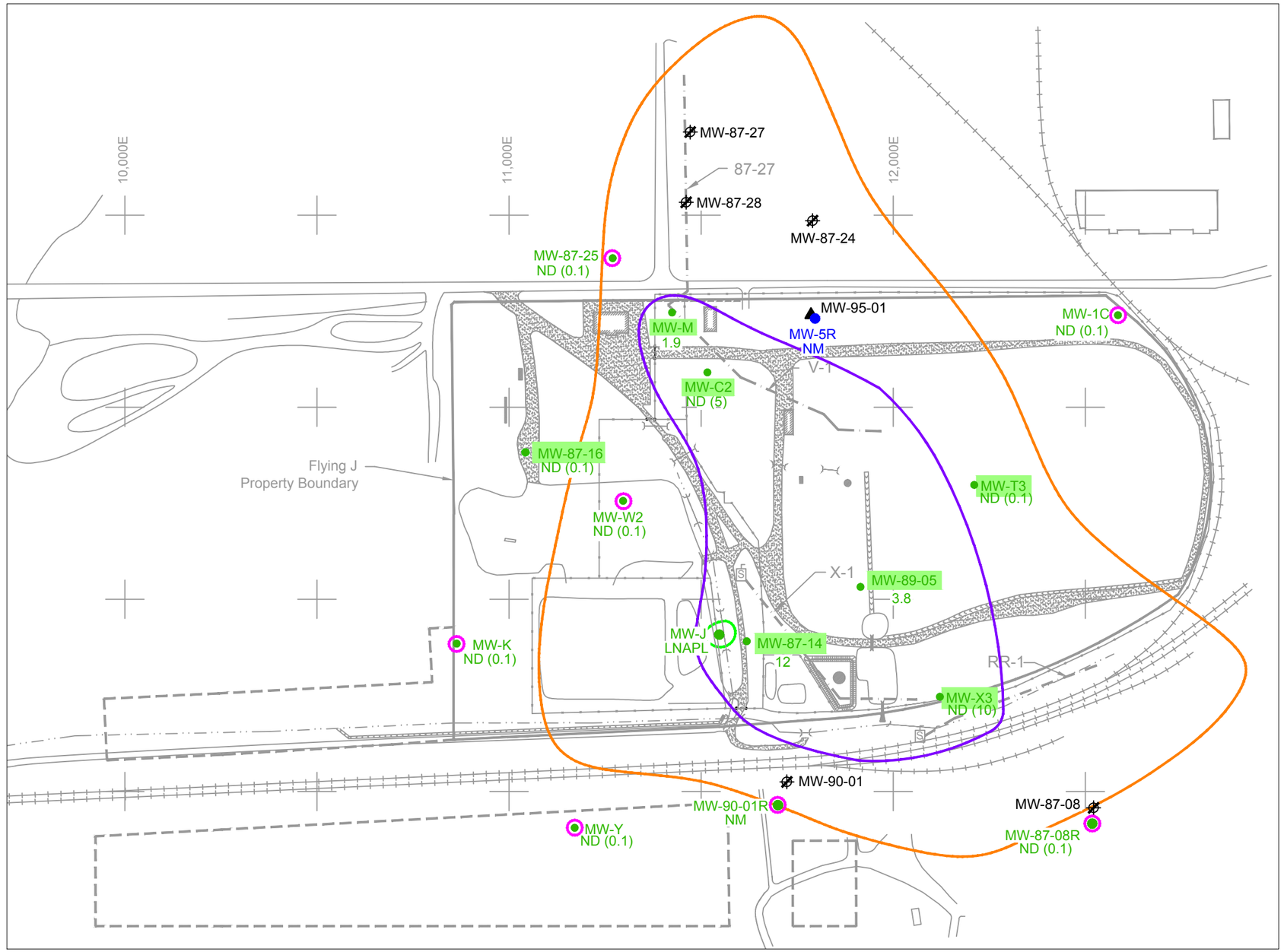
EXTENT OF TOTAL BTEX
IN UPPER SAND / TILL
MAY 1997 / SEPTEMBER 2014

FLYING J PETROLEUMS INC.
WILLISTON REFINERY, ND

FIGURE
11

LEGEND

- PCGWM WELL LOCATION
- MW M — PERFORMANCE MONITORING WELL
- 1.9 — TPH-GRO CONCENTRATION (mg/L)
- APPROXIMATE EXTENT OF DETECTABLE TPH-GRO (SEPTEMBER 2014)
- APPROXIMATE EXTENT OF DETECTABLE TPH-GRO PLUME (MAY 1997)
- SUMP
- UPPER SAND RECOVERY TRENCH
- 95-01 — UPPER SAND RECOVERY WELL
- ABANDONED WELL



150 0 300
1"=300'

N

Job No:
Drawn By: pjs
Date: 01/27/2015
QC:
PE:
File:

Johnston Leigh Inc.
(801) 726-6363

EXTENT OF TPH-GRO IN UPPER SAND / TILL MAY 1997 / SEPTEMBER 2014

FLYING J PETROLEUMS INC.

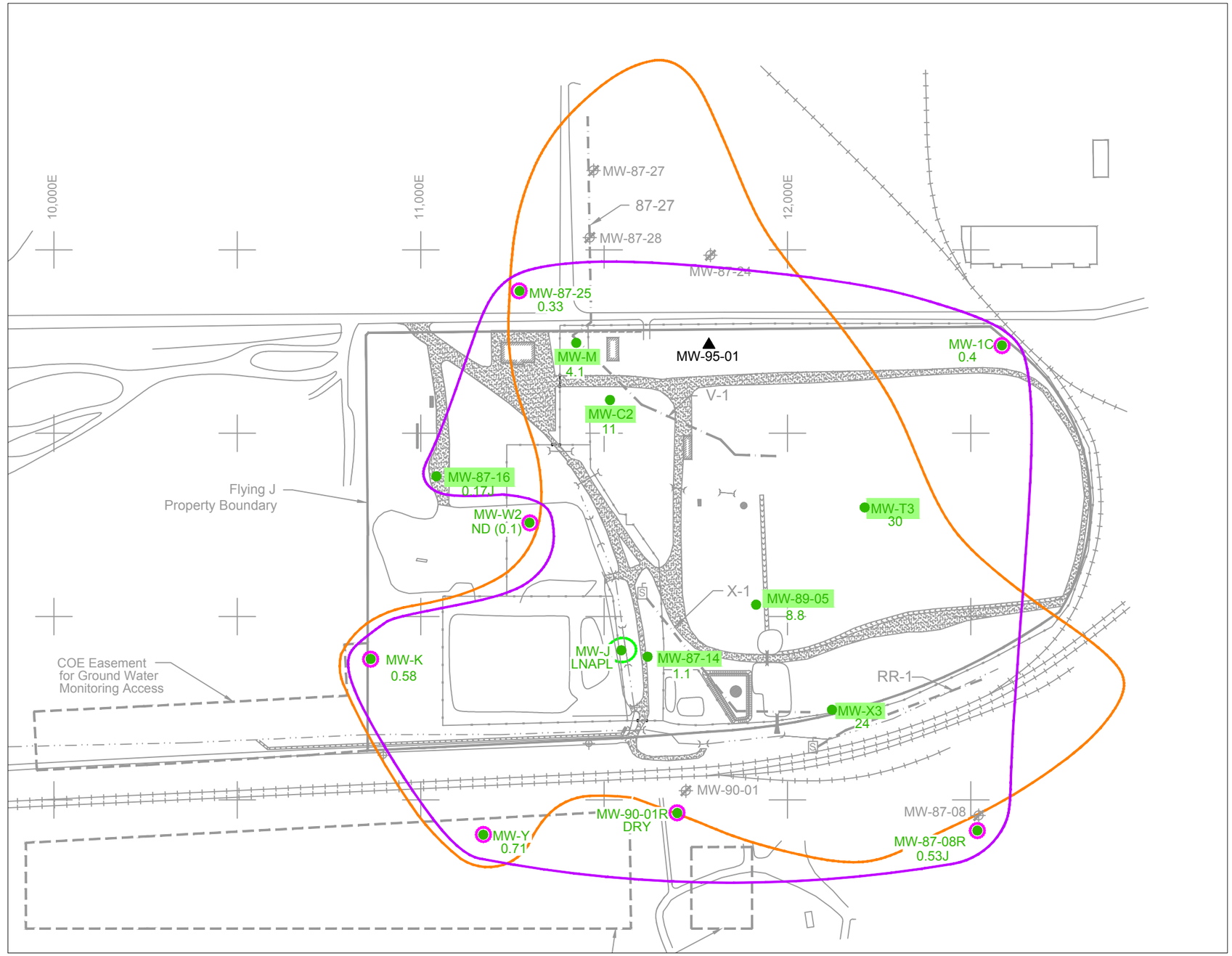
WILLISTON REFINERY, ND

FIGURE

12

LEGEND

- PCGWM WELL LOCATION
- MW M — PERFORMANCE MONITORING WELL
- 10 — TPH-DRO CONCENTRATION (mg/L)
- APPROXIMATE EXTENT OF DETECTABLE TPH-DRO (SEPTEMBER 2014)
- APPROXIMATE EXTENT OF DETECTABLE TPH-DRO PLUME (MAY 1997)
- SUMP
- UPPER SAND RECOVERY TRENCH
- 95-01 — UPPER SAND RECOVERY WELL
- ABANDONED WELL



150 0 300
1"=300'

N

Job No:
Drawn By: pjs
Date: 01/27/2015
QC:
PE:
File:

Johnston Leigh Inc.
(801) 726-6363

EXTENT OF TPH-DRO
IN UPPER SAND / TILL
MAY 1997 / SEPTEMBER 2014

FLYING J PETROLEUMS INC.

WILLISTON REFINERY, ND

FIGURE
13

LEGEND

PCGWM WELL LOCATION

MW-T1R PERFORMANCE MONITORING WELL

1067 BTEX CONCENTRATION (ug/L)

APPROXIMATE EXTENT OF TOTAL BTEX PLUME GREATER THAN:

10 ug/l

2000 ug/l

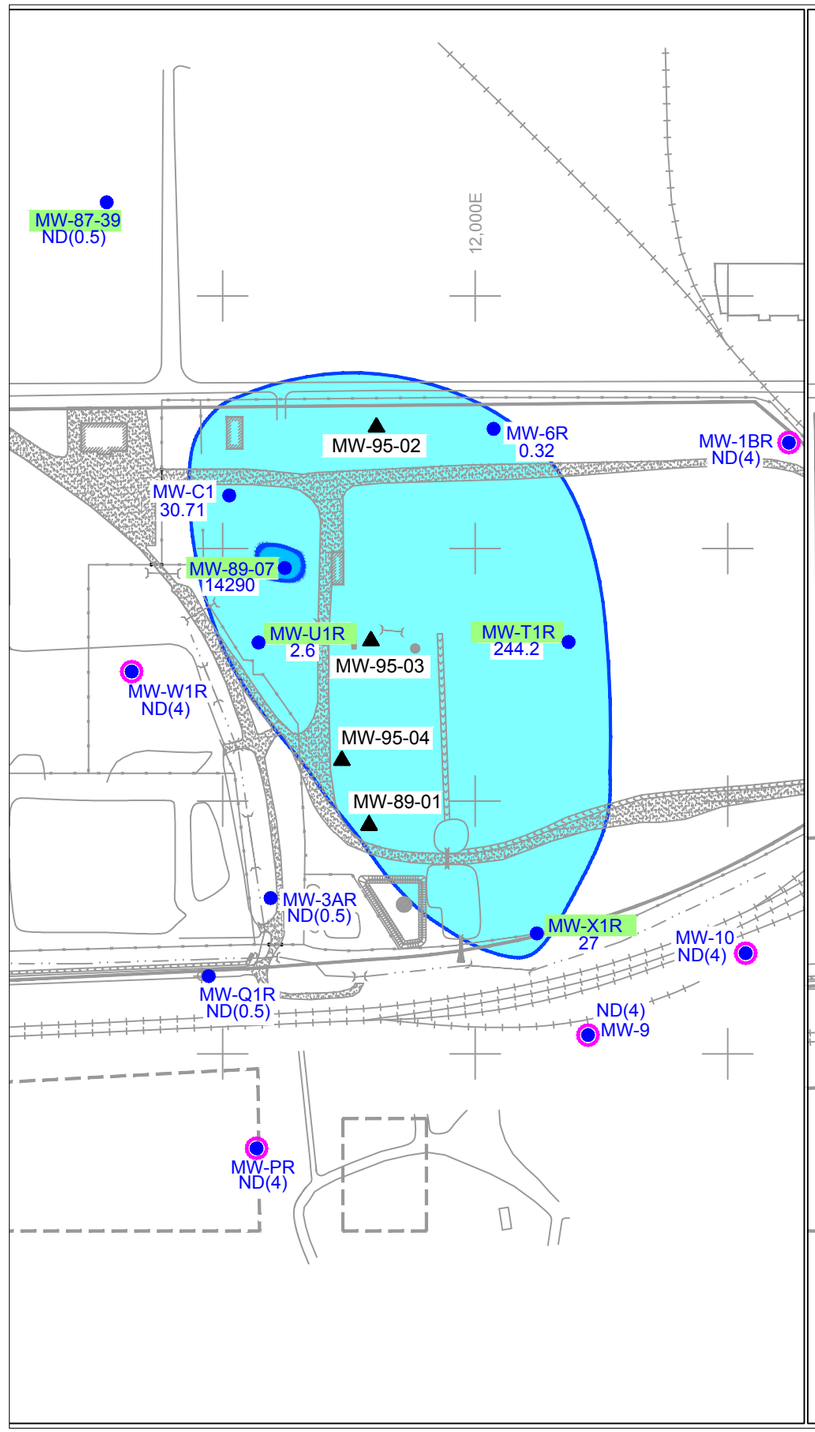
89-01 LOWER SAND RECOVERY WELL

150 0 300

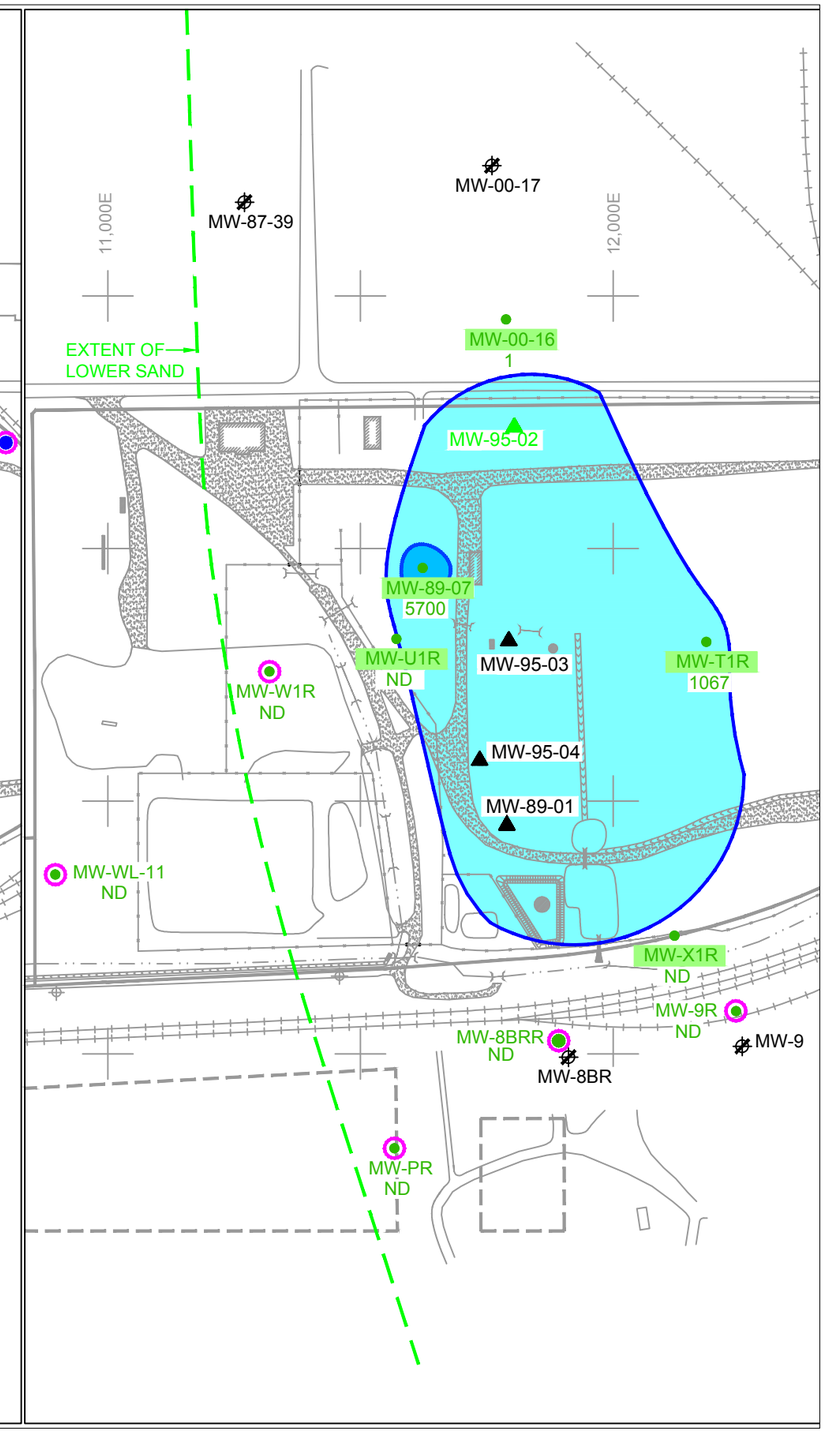
1"=300'

N

MAY 1997 EXTENT OF TOTAL BTEX IN LOWER SAND



SEPTEMBER 2014 APPROXIMATE EXTENT OF TOTAL BTEX IN LOWER SAND



Job No:

Drawn By: pjs

Date: 01/27/2015

QC: PE:

File:

Johnston Leigh Inc.
(801) 726-6363

EXTENT OF TOTAL BTEX
IN LOWER SAND
MAY 1997 / SEPTEMBER 2014

FLYING J PETROLEUMS INC.

WILLISTON REFINERY, ND

FIGURE

14

LEGEND

PCGWM WELL LOCATION

MW 87-39 PERFORMANCE MONITORING WELL

ND (0.1) TPH-GRO CONCENTRATION (mg/L)

LNAPL LNAPL OBSERVED IN WELL - NOT SAMPLED

APPROXIMATE EXTENT OF DETECTABLE TPH-GRO PLUME (SEPTEMBER 2014)

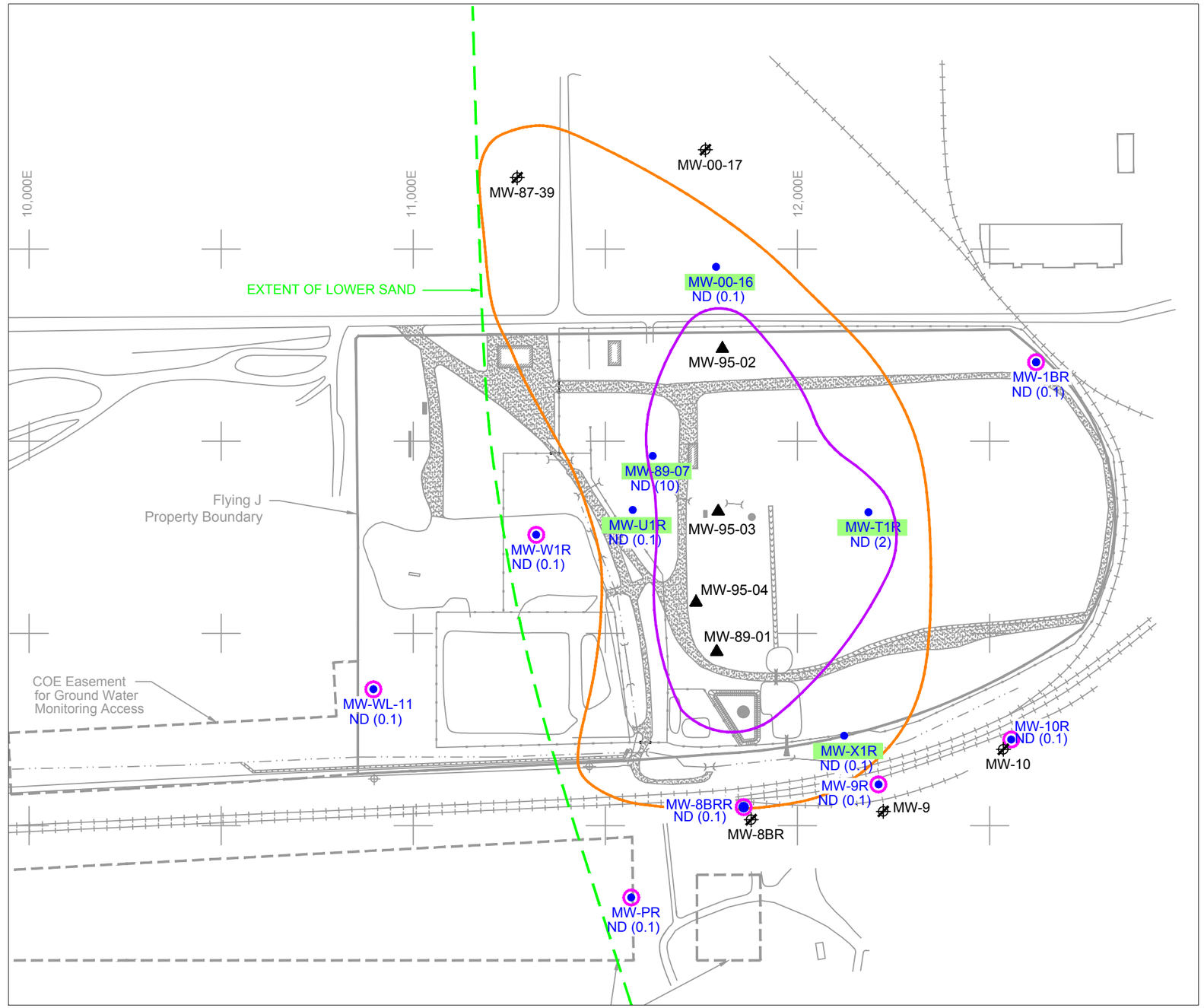
APPROXIMATE EXTENT OF DETECTABLE TPH-GRO PLUME (MAY 1997)

89-01 LOWER SAND RECOVERY WELL

150 0 300

1"=300'

N



Job No:

Drawn By: pjs

Date: 01/27/2015

QC: PE:

File:

Johnston Leigh Inc.
(801) 726-6363

EXTENT OF TPH-GRO
IN LOWER SAND
MAY 1997 / SEPTEMBER 2014

FLYING J PETROLEUMS INC.

WILLISTON REFINERY, ND

FIGURE

15

LEGEND

PCGWM WELL LOCATION

MW 87-39 PERFORMANCE MONITORING WELL

0.29 TPH-GRO CONCENTRATION (mg/L)

LNAPL LNAPL OBSERVED IN WELL - NOT SAMPLED

APPROXIMATE EXTENT OF DETECTABLE TPH-DRO

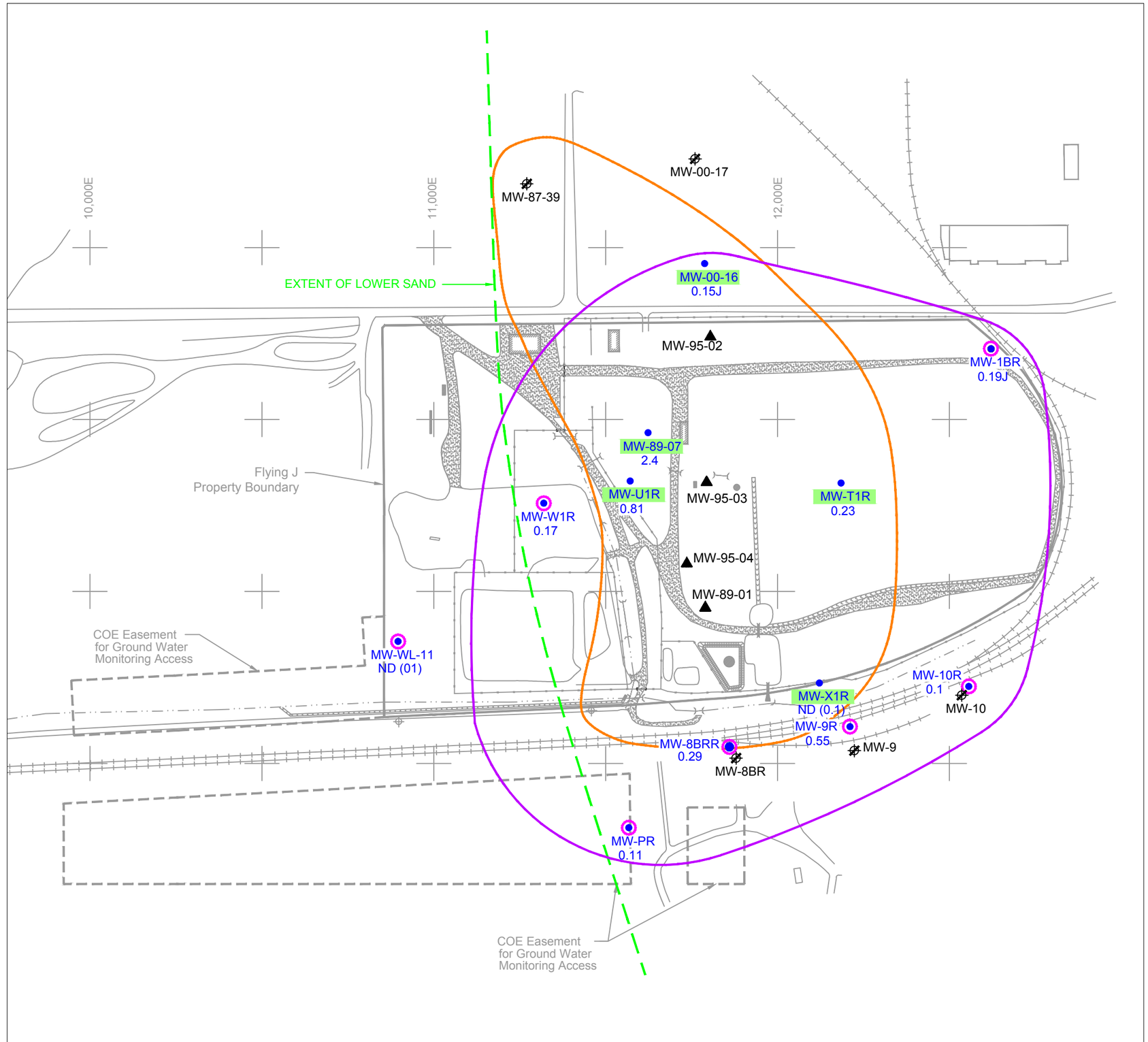
APPROXIMATE EXTENT OF DETECTABLE TPH-DRO PLUME (MAY 1997)

89-01 LOWER SAND RECOVERY WELL

150 0 300

1"=300'

N



Job No:

Drawn By: pjs

Date: 01/27/2015

QC: PE:

File:

Johnston Leigh Inc.
(801) 726-6083

EXTENT OF TPH-DRO
IN LOWER SAND
MAY 1997 / SEPTEMBER 2014

FLYING J PETROLEUMS INC.

WILLISTON REFINERY, ND

FIGURE

16

APPENDIX A

Clean Harbor Waste Manifest 1/21/14

DQ8970779 SC PPW 12/11/2013 V14012154

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number: NDT390010049
2. Page 1 of 1
3. Emergency Response Phone: (800) 483-3718
4. Manifest Tracking Number: 006060560 FLE

5. Generator's Name and Mailing Address
Flying J Petroleums Inc
333 West Center Street
North Salt Lake, UT 84054
Generator's Phone: (801) 296-7700 ATTN:Molly Gregersen P.G.

Generator's Site Address (if different than mailing address)
Hwy 1804 - 1 Mile East of Town
Williston,ND 58801

6. Transporter 1 Company Name: Clean Harbors Environmental Services Inc — U.S. EPA ID Number: MAD039322250

7. Transporter 2 Company Name: Pioneer Tank Lines — U.S. EPA ID Number: MND044176113

8. Designated Facility Name and Site Address
Clean Harbors Env Services Inc
2247 South Highway 71
Kimball, NE 69145
Facility's Phone: (308) 235-4012
U.S. EPA ID Number: NED981723513

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes		
X	1. UN1203. WASTE GASOLINE. 3. PG II	1D	DM	2500	P	D001	D018	
	2.							
	3.							
	4.							

14. Special Handling Instructions and Additional Information
1_CH732380 ERG#128 1D x 55 TRUCK 5394

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Pete Richter — Signature: [signature] — Month 1 Day 21 Year 14

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

17. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: August Foss — Signature: [signature] — Month 1 Day 21 Year 14
Transporter 2 Printed/Typed Name: Ryan W. Canfield — Signature: Ryan W. Canfield — Month 1 Day 29 Year 14

18. Discrepancy
18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:

18b. Alternate Facility (or Generator) U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator) Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)
1. H040 2. 3. 4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a
Printed/Typed Name: Loretta A. Simms — Signature: Loretta A. Simms — Month 1 Day 30 Year 14

GENERATOR / INT'L / TRANSPORTER / DESIGNATED FACILITY

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

Clean Harbors has the appropriate permits for and will accept the waste the generator is shipping.

APPENDIX B

2014 Field Forms and Analytical Reports

Date 3-15-14

Well MW-5R Recovery Tank Measurements

	Depth to NAPL in Tank
Previous Depth-to-NAPL (ft)	
Current Depth-to-NAPL (ft)	
Volume Recovered (gal)	

Well MW-89-04 Recovery Tank Measurements

	Depth to NAPL in Tank
Previous Measurement (ft)	
Current Measurement (ft)	
Volume Recovered (gal)	

Well MW-89-03 Recovery Tank Measurements

	Depth to NAPL in Tank
Previous Measurement (ft)	
Current Measurement (ft)	
Volume Recovered (gal)	

Weekly Summary of Activities LNAPL Recovery Lower Sand

	DTP	DTW
MW5R	30.21	30.23
95-02	NA	30.4
89-03	14.50	29.45

↳ Reel was removed on last visit for repairs. Sent to clean earth

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston ~~Annual~~ Qtly - New Wells GW Sample

Well ID: MW-10R MS/MSD

Project Number: FJP Williston

Sampler: SFJ

Date: 3/15/14

Weather: High 20's Snowing lightly

Depth to Water (DTW ft)): 20.82 TOC

Depth to Product (DTP (ft): NA

Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =

(gal., 1" ID: (TD-DTW) x 0.041 =

(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =

Purge Method: low flow

Instrumentation:

pH Meter: YSI ~~556~~ 6055 — Time: 0930

Calibrated with buffers at pH: 4, 7, and 10 — Date: 3/15/14

SC Meter: YSI ~~556~~ 6055 — Time:

Standard solution used: 10,000ug/cm — Date

DO/ORP Meter: YSI ~~556~~ 6055/55 — Time:

Standard solution used: Atm, factory — Date

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.05	5	36.2	7.26	2.0	3.5	-23.0	
0.5 ~~0.25~~	20	44.4	7.24	2.16	1.2	-99.5	
0.8 ~~0.35~~	30	44.3	7.26	2.15	1.12	-98.3	
1	35	44.1	7.26	2.17	1.20	-92.4	
	40	44.3	7.26	2.20	1.17	-95.5	
				Sample Time 1200			

Field Observations, Problems Encountered: MW10R MS & MSD

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:

Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston ~~Annual~~ Qrtly-New Wells GW Sample
Project Number: FJP Williston

Well ID: MW9R ☆ Duplicate

Sampler: SFS
Date: 3-15-14
Weather: 30° overcast/light snow breezy

Depth to Water (DTW ft)): 18.85
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =
Purge Method: low flow

Instrumentation:
pH Meter: YSI ~~556~~ 6055
Calibrated with buffers at pH: 4, 7, and 10
Time: 0930
Date: 3-15-14

SC Meter: YSI ~~556~~ 6055
Standard solution used: 10,000ug/cm
Time:
Date

DO/ORP Meter: ~~YSI 556~~ 55/6055
Standard solution used: Atm, factory
Time:
Date

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.3	5	45.2	7.21	3.22	0.87	-59.3	
1.2	20	41.3	7.07	3.05	0.37	-72.6	
1.5	30	40.2	7.06	3.00	0.35	-77.3	
1.7	40	40.0	7.05	3.00	0.35	-76.9	
				Sample Time	1300		

Field Observations, Problems Encountered: MW9R + MW9R Dup ☆

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date):
Time:
Via:
Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston ~~Annual~~ Qrtly - Near wells GW Sample
Project Number: FJP Williston

Well ID: MW8BRR

Sampler: SFJ
Date: 3-15-14
Weather: 30° Breezy overcast

Depth to Water (DTW ft)): 16.57
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =
Purge Method: low flow

Instrumentation:

pH Meter: YSI ~~556~~ 6055
Calibrated with buffers at pH: 4, 7, and 10
Time: 3/15/14
Date: 0930

SC Meter: YSI ~~556~~ 6055
Standard solution used: 10,000ug/cm
Time:
Date

DO/ORP Meter: YSI ~~556~~ 55/6055
Standard solution used: Atm, factory
Time:
Date

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.3	5	44.8	7.21	2.43	1.27	-83.2	
1	15	44.9	7.23	2.40	1.15	-88.8	
1.75	25	44.6	7.28	2.35	1.11	-95.3	
2.5	35	44.4	7.30	2.33	1.06	-97.9	
3.2	45	44.6	7.30	2.35	1.07	-98.8	
				Sample Time	1400		

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): ~
Time:
Via:
Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston ~~Annual~~ Qrtly - New Wells GW Sample

Project Number: FJP Williston

Well ID: MW90-01R

Sampler: SFS

Date: 3-15-14

Weather: ~30° overcast

Depth to Water (DTW ft)): 16.09

Depth to Product (DTP (ft):

Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =

(gal., 1" ID: (TD-DTW) x 0.041 =

(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =

Purge Method: peristaltic - low flow

Instrumentation:

pH Meter: YSI 556 — Time:

Calibrated with buffers at pH: 4, 7, and 10 — Date:

SC Meter: YSI 556 — Time:

Standard solution used: 10,000ug/cm — Date

DO/ORP Meter: YSI 556 — Time:

Standard solution used: Atm, factory — Date

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.2	5	40.6	7.84	3.62	1.05	94.1	
0.5	15	39.5	7.50	3.65	1.10	93.9	
1	25	40.7	7.47	4.73	2.16	98.3	
1.5	35	41.4	7.50	4.71	2.17	100.3	
2	45	41.7	7.49	4.76	2.10	102.4	
				Sample Time	1800		

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:

Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

5R ~~25.02~~ ~~30.21~~ 30.23 ~~NOTP~~ ~~31.03~~ 14.50 ~~29.45~~

AECOM

Johnston Leigh Inc.

Qrtly - New wells

Project Name: FJP Williston ~~Annual~~ GW Sample

Project Number: FJP Williston

Well ID: MW87-08R

Sampler: SFJ

Date: 3-15-14

Weather: 38° overcast

Depth to Water (DTW ft)): 9.63

Depth to Product (DTP (ft):

Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =

(gal., 1" ID: (TD-DTW) x 0.041 =

(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =

Purge Method: low flow

Instrumentation:

pH Meter: YSI ~~556~~ 6055

Calibrated with buffers at pH: 4, 7, and 10

Time: 0930

Date: 3-15-14

SC Meter: YSI ~~556~~ 6055

Standard solution used: 10,000ug/cm

Time:

Date

DO/ORP Meter: YSI 556 55/6055

Standard solution used: Atm, factory

Time:

Date

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
~~80~~.5	5	40.5	7.37	5.37	2.06	32.0	
1.	15	40.7	7.28	5.39	0.65	57.8	
	25	40.6	7.16	5.39	0.47	55.0	
	35	40.5	7.16	5.38	0.45	54.3	
				Sample Time	1600		

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date):

Time:

Via:

Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

Big West Oil, LLC.

333 West Center Street
North Salt Lake, UT 84054

Billing Information:
Molly Gregersen
~~Steve Johnston~~
333 West Center St.
North Salt Lake, UT 84054

Report to: **Molly Gregersen**

Email To: **leigh@johnstonleighinc.com**

Project Description: **Williston Refinery**

City/State Collected: Williston ND

Phone: **801-296-7711**
Fax:

Client Project #

Lab Project # **BIGWESTUT-WILLISTON**

Collected by (print): Steve Johnston

Site/Facility ID # **WILLISTON, ND**

P.O. #

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day 200%
____ Next Day 100%
____ Two Day 50%
____ Three Day 25%

Date Results Needed

Email? ___No X__Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

ESC LAB SCIENCES
YOUR LAB OF CHOICE
1206S Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L #

Table #

Acctnum: **BIGWESTUT**
Template: **T92364**
Prelogin: **P459514**
TSR: **341 - John Hawkins**
PB: 2 26 14

Shipped Via: **FedEX Ground**

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Ctrs	BTEX 40mlAmb-HCl	DRO 100ml Amb-HCl	GRO 40mlAmb HCl								Rem./Contaminant	Sample # (lab only)
MW8BRR	G	GW		3-15-14	1400	6	X	X	X									
MW9R		GW			1300	6	X	X	X									
MW10R		GW			1200	6	X	X	X									
MW87-08R		GW			1600	6	X	X	X									
MW90-01R		GW			1800	6	X	X	X									
DUPLICATE MW9R-Dup		GW		1200	1300	6	X	X	X									
MS MW10R-MS		GW			1200	6	X	X	X									
MSD MW10R-MSD	G	GW		3-15-14	1200	6	X	X	X									
		GW				6	X	X	X									
		GW				6	X	X	X									

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Hold #

Samples returned via: ☐ UPS ☐ FedEx ☐

Condition: NA

Relinquished by : (Signature)	Date: 3/10/14	Time: 1720	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Invo: BIGWESTUT-WILLI Date : 26Feb14
Customer : P459514 Weight : 10 LBS
Phone : (615)758-5858 COD :
Sat Del : N DV :
Svcs: STANDARD OVERNIGHT
TRCK: 5851 4721 2573

Shipping : 0.00
Special : 0.00
Handling : 0.00
0.00 Total : 0.00

FLYING J PETROLEUMS, INC, - WILLISTON, ND

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DAILY FIELD ACTIVITIES LOG

Date 3-16-14 Project No. Williston Field Eng. SFJ / LIB

Client Flying J Petroleums, Inc. Project Name. PCGWM Location Williston, ND

Personnel On Site:

Name	Company	PPE Level
Steve Johnston	JLI	D - cold weather
Leigh Beem	JLI	D - cold weather

Weather Conditions_____

Temperature 28 → 45 Wind Direction S Wind Speed 10-20

Task(s) to be Conducted Inspect SSC Impoundments, Mouse proof shed MW89-03, ~~install~~ install pump/reel MW5R - survey MW87-08R & MW1R

PERSONAL PROTECTIVE EQUIPMENT

Indicate personnel initials next to each piece of PPE equipment utilized by that individual:

Suits: _____ Gloves: SFJ Boots: SFJ

Hard Hat: _____ Eye Protection: SFJ Hearing Protection: _____

Respirator: _____ If respirator, indicate cartridge type: _____

Other:_____

MONITORING EQUIPMENT

Air/Soil/Water Monitoring Equipment Used (and ID numbers):_____

Engineering Controls Used for Safety:_____

Accidents/Injuries (fill out accident report form):_____

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DAILY FIELD ACTIVITIES LOG

Date 3/15/14 Project No. Williston Field Eng. SFJ/LNB

Client Flying J Petroleums, Inc. Project Name. PCGWM Location Williston, ND

Personnel On Site:

Name	Company	PPE Level
Steve Johnston	Johnston Leight Inc	D - Cold weather
Leigh Been	Johnston Leight Inc	D - " " Snow

Weather Conditions High 20's Snowing, windy

Temperature 25-30 Wind Direction NE Wind Speed 10-20

Task(s) to be Conducted Qrtly Sample Red River New Wells, Sft. Impound inspection, re-install prod recovery pumps, rinse proof sheds, survey MW 87-08R & MW-PR

PERSONAL PROTECTIVE EQUIPMENT

Indicate personnel initials next to each piece of PPE equipment utilized by that individual:

Suits: _____ Gloves: SFJ Boots: SFJ

Hard Hat: _____ Eye Protection: SFJ Hearing Protection: _____

Respirator: _____ If respirator, indicate cartridge type: _____

Other: _____

MONITORING EQUIPMENT

Air/Soil/Water Monitoring Equipment Used (and ID numbers): YSI 1055/55

Engineering Controls Used for Safety: _____

Accidents/Injuries (fill out accident report form): _____

3/15/14

FLYING J PETROLEUMS, INC. - WILLISTON, ND

SUMMARY OF FIELD ACTIVITIES

pg._____ of____

Visitors (ALSO Sign in on Safety Log)_____

Important Phone Calls & Events/Summarize changes from plans:_____

Time/Duration/Description of Daily Activities and Events:

Sampled Red River Wells
MW8BRR - 1400
MW9R (&Dup) - 1300
MW10R (&MS/MSD) - 1200
MW87-08R - 1600
MW90-01R - 1800
MW90-01R had 8" of ice in well head, up over cap. Also had rim of ice inside of casing. Unable to install pump or bail. Used peristaltic to purge & sample

Cleaned up & mouse proofed shed for ~~MW~~ MW5R & MW89-04.

FF-2 **Site Wide Groundwater/Free Product Measurements at Startup and Shutdown**

Date: 4-22-14 Measurements taken by: Steve Johnston

Weather conditions: Breezy, clear, high 70, low 40's

Well	Time	Depth to Free Product	Depth to Groundwater	Constructed Well Depth	Measured Well Depth	Comments
Upper Sand Wells						
MW-C2	1757	NA	4.67	16.8	NA	
MW-T3	1702	NA	10.97	14.62	NA	
MW-U2	1747	NA	5.83	19.94	NA	
MW-V2	1655	NA	13.46	25.41	NA	
MW-X3	1707	NA	8.40	12.99	NA	
MW-87-17R	1652	NA	16.39	22.68	NA	IP
MW-89-08	1710	NA	8.71	14.99	NA	
MW-WL-2						COE
MW-WL-3						COE
MW-WL-4						COE
GRW-95-01				30.80	NA	(sheen5/13)
MW-WL-1						COE
Till Wells						
MW-AR	1520	NA	10.75	20.06	NA	FP 5/13 IP
MW-B	1530	9.04	9.05	22.89	NA	IP - Dark brown F.P. not resp. to IP
MW-C	1615	NA	9.09	19.09	NA	
MW-F	1440	NA	2.70	12.04	3.25	silted in (ice?)
MW-G	1445	NA	7.10	16.65	NA	
MW-H	1612	NA	7.73	19.94	NA	
MW-I	1610	NA	6.48	16.66	NA	
MW-J	1555	11.05	11.08	22.51	NA	
MW-K	1450	NA	2.84	31.70	NA	unable to remove pump - ice
MW-M	1800	NA	4.55	23.01	NA	
MW-Q2	1500	NA	NA - ice	19.94	4.9	ice plug
MW-R	1435	NA	NA - ice	20.14	5.5	ice plug
MW-W2	1600	NA	7.43	28.20	27.4	

FF-2 **Site Wide Groundwater/Free Product Measurements at Startup and Shutdown**

Date: 4-22-14 Measurements taken by: Steve Johnston

Weather conditions: Breezy clear, high 70 - low 40's

Well	Time	Depth to Free Product	Depth to Groundwater	Constructed Well Depth	Measured Well Depth	Comments
Upper Sand Wells						
MW-X2	1705	NA	8.30	31.00	NA	
MW-Y	1300	NA	4.42	23.02	20.65	
MW-Z	1055	NA	6.91	17.24	NA	
MW-1C	1635	NA	9.58	36.50	3.64	
MW-2A	1618	NA	Dry	9.02	Dry @ 8.9'	
MW-87-08R	1200	NA	8.18	21.13	25.3	Survey
MW-87-10	Abandoned			10.79		
MW-87-14	1545	NA	10.66	21.09	NA	
MW-87-16	1620	NA	11.30	17.50	18.8	
MW-87-25	1000	NA	6.02	20.30	NA	
MW-87-37	1045	NA	4.76	22.19	NA	
MW-89-05	1715	NA	8.76	14.56	NA	
MW-90-01R	1310	NA	16.86		25.05	
MW-94-01	1707	NA	5.43	10.04	NA	
MW-WL-5						COE
MW-WL-9						COE
MW-WL-12						COE
MW-WL-13						COE
MW-WL-14B						COE
MW-WL-15B						COE
MW-WL-16						COE
MW-WL-17						COE

FF-2 **Site Wide Groundwater/Free Product Measurements at Startup and Shutdown**

Date: 4-22-14 Measurements taken by: Steve Johnson

Weather conditions: Breezy, clear, high 70, low 40's

Well	Time	Depth to Free Product	Depth to Groundwater	Constructed Well Depth	Measured Well Depth	Comments
Lower Sand Wells						
MW-C1	1755	NA	11.65	39.94	NA	
MW-PR				30.90		
MW-Q1R	1505	NA	iced up	22.23	5.05	iced up
MW-T1R	1700	NA	25.73	47.36	NA	
MW-U1R	1745	NA	15.56	37.33	NA	
MW-W1R	1605	NA	14.49	36.70	36.2	
MW-X1R	1705	NA	18.32	47.88	NA	
MW-1BR	1630	NA	39.51	62.05	61.0	
MW-3AR	1535	NA	11.75	29.39	NA	
MW-5R	1647	29.52	29.56	47.43	NA	Active NAPL Pump IP
MW-6R	1640	NA	31.93	51.53	NA	Survey
MW-8BRR	1315	NA	16.48		42.4	
MW-9R	1330	NA	18.67		57.3	
MW-10R	1340	NA	20.70		57.4	
MW-88-01	1735	18.23	18.30	NA	NA	IP
MW-89-01	1720	NA	17.48	39.60	NA	~~FP IP~~ SFJ
MW-89-02	1725	15.60	15.62	32.63	NA	FP- IP
MW-89-03	—			35.32		Active NAPL Pump
MW-89-04	—			38.42		Active NAPL Pump
MW-89-06	1740	NA	17.75	34.37	NA	Sheen 5/13
MW-89-07	1750	NA	18.91	35.05	NA	
GRW-95-02	1650	NA	30.79		NA	IP
GRW-95-03	1735	NA	20.79		NA	IP
GRW-95-04	1730	17.44	17.48		NA	IP
MW-00-16	1005	NA	28.29		43.6	
Bedrock Wells						
MW-1AR	1625	NA	39.78	72.56	NA	
MW-2	Abandoned			61.51		
MW-3	1540	NA	11.37	62.45	NA	w/broken casing installed
MW-4	1430	NA	2.63	61.36	NA	
MW-WL-6	—	—				COE
MW-WL-7	—	—				COE
MW-WL-8	—	—				COE
MW-WL-11	1455	NA	8.85	38.53	~~36.7~~ 38.6	

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DAILY FIELD ACTIVITIES LOG

Date 6-10-14 Project No. Williston Field Eng. SFJ

Client Flying J Petroleums, Inc. Project Name. PCGWM Location Williston, ND

Personnel On Site:

Name	Company	PPE Level
Steve Johnson	JLT	Level D
Hilary Allex		Level D

Weather Conditions Mid 70's partially cloudy

Temperature Mid 70's Wind Direction _____ Wind Speed _____

Task(s) to be Conducted - Install Pump in MW5R, Troubleshoot pump MW89-03, Repair well casing MW-PR

PERSONAL PROTECTIVE EQUIPMENT

Indicate personnel initials next to each piece of PPE equipment utilized by that individual:

Suits: _____ Gloves: SFJ Boots: SFJ

Hard Hat: _____ Eye Protection: SFJ Hearing Protection: _____

Respirator: _____ If respirator, indicate cartridge type: _____

Other: _____

MONITORING EQUIPMENT

Air/Soil/Water Monitoring Equipment Used (and ID numbers): NA

Engineering Controls Used for Safety: Slips Trips falls, ticks, mosquitos

Accidents/Injuries (fill out accident report form): _____

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample

Project Number: FJP Williston

Well ID: MW90-01R

Sampler: Steve Johnston

Date: 6-11-14

Weather: Overcast - mid 60's

Depth to Water (DTW ft)): 15.67

Depth to Product (DTP (ft):

Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =

(gal., 1" ID: (TD-DTW) x 0.041 =

(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =

Purge Method: low flow ~~peristaltic~~ Peristaltic

Instrumentation:

pH Meter: YSI ~~556~~ 6055 — Time: 0930

Calibrated with buffers at pH: 4, 7, and 10 — Date: 6-11-14

SC Meter: YSI ~~556~~ — Time:

Standard solution used: 10,000ug/cm — Date

DO/ORP Meter: YSI ~~556~~ — Time:

Standard solution used: Atm, factory — Date

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.25	5	8.7	7.5	4.3	2.1	67	clear
0.5	10	8.5	7.4	3.9	1.8	71	
0.75	15	8.6	7.4	4.3	1.5	72	
1.0	20	9.4	7.5	5.0	0.3	70	
1.25	25	9.6	7.5	5.1	0.29	70	

Sample Time 1600

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:

Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample

Project Number: FJP Williston

Well ID: MW87-08R

Sampler: Steve Johnston

Date: 6-11-14

Weather: Light Rain - mid 60's

Depth to Water (DTW ft)): 8.05

Depth to Product (DTP (ft): NA

Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =

(gal., 1" ID: (TD-DTW) x 0.041 =

(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =

Purge Method: low flow

Instrumentation:

pH Meter: ~~YSI 556~~ 6055 — Time: 0900

Calibrated with buffers at pH: 4, 7, and 10 — Date: 6-11-14

SC Meter: ~~YSI 556~~ 6055 — Time:

Standard solution used: 10,000ug/cm — Date

DO/ORP Meter: ~~YSI 556~~ 6055 — Time:

Standard solution used: Atm, factory — Date

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.25	5	8.7	7.4	4.7	2.4	100	slightly cloudy
0.5	10	8.1	7.3	4.4	0.75	91.6	
0.75	15	7.9	7.3	4.2	0.62	87	
1	20	7.8	7.3	4.1	0.56	86	
1.25	25	7.7	7.3	4.1	0.66	86	clear
				Sample Time	1000		

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): 6-11-14 Time: 1400

Via: Fed Ex Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample

Project Number: FJP Williston

Well ID: MW-10R ☆ MS/MSD

Sampler: SFJ

Date: 6-11-14

Weather: mid-60s overcast

Depth to Water (DTW ft)): 19.99

Depth to Product (DTP (ft):

Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =

(gal., 1" ID: (TD-DTW) x 0.041 =

(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =

Purge Method: low flow

Instrumentation:

pH Meter: YSI ~~556~~ 6055 — Time: 0930

Calibrated with buffers at pH: 4, 7, and 10 — Date: 6-11-14

SC Meter: YSI ~~556~~ — Time:

Standard solution used: 10,000ug/cm — Date

DO/ORP Meter: YSI ~~556~~ — Time:

Standard solution used: Atm, factory — Date

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.25	5	11.0	7.93	2.0	3.3	-45	slightly cloudy
0.5	10	10.9	7.64	1.8	0.73	-73	
0.75	15	10.5	7.58	1.7	0.31	-60	
1.0	20	10.4	7.52	1.7	0.24	-50	clear
1.25	25	10.6	7.52	1.7	0.24	-42	
				Sample Time	1400		

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): 6-11-14 Time: ~~1400~~ 1600

Via: FedEx Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample

Project Number: FJP Williston

Well ID: MW-9R Duplicate

Sampler: Steve Johnston

Date: 6-11-14

Weather: overcast mid 60's

Depth to Water (DTW ft)): 17.96

Depth to Product (DTP (ft):

Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =

(gal., 1" ID: (TD-DTW) x 0.041 =

(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =

Purge Method: low flow

Instrumentation:

pH Meter: YSI ~~556~~ 6055 — Time: 6-11-14

Calibrated with buffers at pH: 4, 7, and 10 — Date: 0930

SC Meter: YSI ~~556~~ — Time:

Standard solution used: 10,000ug/cm — Date

DO/ORP Meter: YSI ~~556~~ — Time:

Standard solution used: Atm, factory — Date

Gallons Removed	ΔT (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.25	5	9.7	7.3	2.6	0.17	-78	
0.5	10	10.5	7.2	2.6	0.32	-89	
0.75	15	10.7	7.2	2.6	0.30	-86	
1.	20	10.6	7.2	~~0.20~~ 2.6	0.21	-84	
1.25	25	10.7	7.2	~~0.20~~ 2.6	0.20	-86	
				Sample Time 1200			

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): 6-11-14 Time: 1600

Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample

Project Number: FJP Williston

Well ID: MW 8BRR

Sampler: Steve Johnston

Date: 6-11-14

Weather: Overcast - mid 60s

Depth to Water (DTW ft)): 15.68

Depth to Product (DTP (ft):

Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =

(gal., 1" ID: (TD-DTW) x 0.041 =

(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =

Purge Method: low flow

Instrumentation:

pH Meter: YSI ~~556~~ 6050 — Time: 0930

Calibrated with buffers at pH: 4, 7, and 10 — Date: 6-11-14

SC Meter: YSI ~~556~~ — Time:

Standard solution used: 10,000ug/cm — Date

DO/ORP Meter: YSI ~~556~~ — Time:

Standard solution used: Atm, factory — Date

Gallons Removed	ΔT (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.25	5	10.4	7.4	2.0	0.85	-40.3	grey
0.5	10	10.6	7.4	2.0	0.35	-38	
0.75	15	10.6	7.4	2.0	0.26	-36	
1.0	20	10.6	7.4	2.0	0.26	-52	
1.25	25	10.6	7.4	2.0	0.24	-56	clear
				Sample Time		1300	

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): 6-11-14 Time: 1600

Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

Big West Oil, LLC.

333 West Center Street
North Salt Lake, UT 84054

Billing Information:
Steve Johnston
333 West Center St.
North Salt Lake, UT 84054

Report to: Molly Gregersen

Email To: leigh@johnstonleighinc.com

Project Description: Williston Refinery

City/State Collected: Williston ND

Phone: 801-296-7711
Fax:

Client Project #

Lab Project #: BIGWESTUT-WILLISTON

Collected by (print): Steve Johnston

Site/Facility ID #: WILLISTON, ND

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No X__Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

ESC LABS SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L #

Table #

Acctnum: BIGWESTUT
Template: T92364
Prelogin: P469432
TSR: 341 - John Hawkins
PB: 5.23 11:8
Shipped Via: FedEX Ground

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	BTEX 40mlAmb-HCl	DRO 100ml Amb-HCl	GRO 40mlAmb HCl							Rem./Contaminant	Sample # (lab only)
MW8BRR		GW		6-11-14	1300	6	X	X	X								
MW9R		GW			1200	6	X	X	X								
MW10R		GW			1400	6	X	X	X								
MW87-08R		GW			1000	6	X	X	X								
MW90-01R		GW			1600	6	X	X	X								
DUPLICATE MW9R		GW			1200	6	X	X	X								
MS MW-10R		GW			1400	6	X	X	X								
MSD MW-10R		GW		6-11-14	1400	6	X	X	X								
		GW				6	X	X	X								
		GW				6	X	X	X								

Invo: BIGWESTUT-WILLI Date : 23May14
Customer : P469432 Weight : 10 LBS
Phone : (615)758-5858 COD :
Sat Del : N DV :
Svcs: STANDARD OVERNIGHT
TRCK: 5990 1137 3217
Shipping : 0.00
Special : 0.00
Handling : 0.00
Total : 0.00

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Relinquished by: (Signature)	Date: 6-12-14	Time: 1000	Received by: (Signature)	Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____	Hold #
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	Condition: (lab use only) COC Seal Intact: ___Y ___N ___NA
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	pH Checked: NCF:

Big West Oil, LLC.

765 3rd Ave
Salt Lake City, UT 84098

Billing Information:
Molly Gregersen
333 West Center St.
North Salt Lake, UT 84054

Report to:
Steve Johnston

Email To: **leigh@johnstonleighinc.com**

Project Description:

City/State Collected:

Phone: **801-296-7711**
Fax:

Client Project #

Lab Project #
BIGWESTUT-HARVE

Collected by (print): Steve Johnston

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ____ Y ____

Rush? (Lab MUST Be Notified)
____ Same Day 200%
____ Next Day 100%
____ Two Day 50%
____ Three Day 25%

Date Results Needed

Email? ___No X__Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

ESC LAB SCIENCES
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12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L #

Table #

Acctnum: **BIGWESTUT**
Template: **T93379**
Prelogin: **P469433**
TSR: **341 - John Hawkins**
PB: 5.23.14
Shipped Via: **FedEX Ground**

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	VPHMT 40mlAmb HCl								Rem./Contaminant	Sample # (lab only)
MW9		GW	12	6-10-14	0800	2	X									
RW1		GW	12	6-10-14	0830	2	X									

Invo: BIGWESTUT-HARVE Date : 23May14
Customer : P469433 Weight : 10 LBS
Phone : (615)758-5858 COD :
Sat Del : N DV :
Svcs: STANDARD OVERNIGHT
TRCK: 5990 1137 3261

Shipping : 0.00
Special : 0.00
Handling : 0.00
0.00 Total : 0.00

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____	Condition: (lab use only)
	6-12-14	1000			
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: °C Bottles Received:	COC Seal Intact: ____Y ____N ____NA
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: Time:	pH Checked: NCF:

Table E-3

PCGWM Monitoring Well Redevelopment Checklist Former Refinery, Williston, ND

Well Number	Sample Date	Original Total Depth	Current Total Depth	Difference in Depths	Difference Greater Than 2 feet? 2
Upper Sand and Till Wells					
MW-1C		36.50	36.1		
MW-87-08 R		~~21.13~~ 25.25	25.3		
MW-87-25		20.30	20.3		
MW-90-01 R		~~19.60~~ 25.0	25.0		
MW-K		31.70	30.0		
MW-W2		28.77	27.1		
MW-Y – Casing shortened – need survey		23.02 ~~A~~	20.6		
Lower Sand Wells					
MW-10R3		~~52.10~~ 57.3	57.3		
MW-1BR		62.05	61.15		
MW-8BR R		~~34.52~~ 42.4	42.4		
MW-9R3		~~48.20~~ 57.2	57.2		
MW-PR		30.90	30.5		
MW-W1R		36.70	35.9		
MW-WL-11 1		38.53	38.3		

Notes:

1 Total depth measured in October 2009 were greater than original total depth measurements, therefore October 2009 total depth measurements used as original total depth for comparison

2 If PCGWM well has accumulated more than 2' of sediment, it will be redeveloped prior to the next annual sampling event

3 Wells MW9 and MW10 were abandoned in March 2013 and will be replaced with MW9R and MW10R in September 2013.

DAILY FIELD ACTIVITIES LOG

Date 9/21/14 Project No. Williston Field Eng. Steve Johnston/Leigh Beem

Client Flying J Petroleums, Inc. Project Name. PCGWM Location Williston, ND

Personnel On Site:

Name	Company	PPE Level
Steve Johnston	JLI	D
Leigh Beem	"	"

Weather Conditions Mid 70's Clear, light wind

Temperature Mid 70's Wind Direction W Wind Speed 0-10

Task(s) to be Conducted DTW

PERSONAL PROTECTIVE EQUIPMENT

Indicate personnel initials next to each piece of PPE equipment utilized by that individual:

Suits: _____ Gloves: SFJ/LIB Boots: _____

Hard Hat: _____ Eye Protection: SFJ/LIB Hearing Protection: _____

Respirator: _____ If respirator, indicate cartridge type: _____

Other: _____

MONITORING EQUIPMENT

Air/Soil/Water Monitoring Equipment Used (and ID numbers): Solinist Water Meters x2 IP

Engineering Controls Used for Safety: _____

Accidents/Injuries (fill out accident report form): _____

FLYING J PETROLEUMS, INC, - WILLISTON, ND

9/21

SUMMARY OF FIELD ACTIVITIES

Visitors (ALSO Sign in on Safety Log) NA

Important Phone Calls & Events/Summarize changes from plans:

Time/Duration/Description of Daily Activities and Events:

~~S~~FJ onsite 1230 (drive from Billings)
L1B onsite 1330 (Flight)
- Unload truck, prep for GW measurements
- Measure DTW in all wells onsite
- Measure TD in wells listed for sediment check
- Found well head destroyed MW90-01

Offsite 2000 hrs

FF-2 **Site Wide Groundwater/Free Product Measurements at Startup and Shutdown**

Date: 9/21/14 Measurements taken by: SFJ/LIB

Weather conditions: Mid 70's clear, light breeze

Well	Time	Depth to Free Product	Depth to Groundwater	Constructed Well Depth	Measured Well Depth	Comments
Upper Sand Wells						
MW-C2	1650	NA	6.05	16.8	NA	
MW-T3	1625	NA	11.03	14.62	NA	
MW-U2	1700	NA	9.12	19.94	NA	
MW-V2	1715	NA	13.41	25.41	NA	
MW-X3	1632	NA	8.75	12.99	NA	
MW-87-17R	1911	NA	16.30	22.68	NA	
MW-89-08	1638	NA	8.92	14.99	NA	
GRW-95-01	1918	NA	16.56	30.80	NA	(sheen 5&9/13)
Till Wells						
MW-AR	1820	NA	10.50	20.06	NA	FP 5/13 sheen 9/13
MW-B	1822	NA	6.95	22.89	NA	FP 4/14
MW-C	1730	NA	8.92	19.09	NA	
MW-F	1725	NA	5.64	12.04	NA	silted in 4/14
MW-G	1720	NA	9.51	16.65	NA	
MW-H	1715	NA	9.70	19.94	NA	
MW-I	1710	NA	10.16	16.66	NA	
MW-J	1836	9.80	9.82	22.51	NA	FP 9/14 IP/Damage Concrete
MW-K	1610	NA	6.98	31.70	30.0	unable to remove pump 4/14
MW-M	1753	NA	5.13	23.01	NA	(sheen in bailer 9/13)
MW-Q2	1800	NA	4.84	19.94	NA	
MW-R	1810	NA	6.35	20.14	NA	
MW-W2	1552	NA	7.71	28.20	27.1	No bladder pump
Upper Sand Wells						
MW-X2		NA	9.11	31.00	NA	
MW-Y	1540	NA	6.03	23.02	20.6	Needs survey
MW-Z	1520	NA	8.03	17.24	NA	
MW-1C	1550	NA	7.97	36.50	36.1	
MW-2A	1705	NA	Dry	9.02	8.9	dry at 8.9 4/14 9/14
~~MW-87-04~~	Abandoned			~~20.98~~		
MW-87-08R	1400	NA	9.87	25.25	25.3	Survey/Repair tubing
~~MW-87-09R~~	Abandoned			20.17		
MW-87-14	1800	NA	9.94	21.09	NA	
MW-87-16	1600	NA	11.76	17.50	NA	
MW-87-25	1600	NA	6.47	20.30	20.3	
MW-87-37	1615	NA	6.66	22.19	NA	
MW-89-05	1922	NA	8.59	14.56	NA	
MW-90-01R	1420	NA	15.87		25.0	Well head needs repair
MW-94-01	1848		Dry	10.04		☆ Abandon this well

MW3A - Needs to be abandoned

FF-2 **Site Wide Groundwater/Free Product Measurements at Startup and Shutdown**

Date: 9/21/14 Measurements taken by: SFJ/LIB

Weather conditions:

Well	Time	Depth to Free Product	Depth to Groundwater	Constructed Well Depth	Measured Well Depth	Comments
Lower Sand Wells						
MW-C1	1649	NA	12.11	39.94	NA	
MW-PR	1630	NA	SFJ ~~4.86~~ 8.32	30.90	~~NA~~ 30.5	
MW-Q1R	1735	NA	4.86	22.23	NA	
MW-T1R	1624	NA	26.11	47.36	NA	
MW-U1R	1658	NA	15.90	37.33	NA	
MW-W1R	1555	NA	14.85	36.70	35.90	switched on some maps w/MWW2
MW-X1R	1630	NA	18.65	47.88	NA	
MW-1BR	1548	NA	39.87	62.05	61.15	
MW-3AR	1809	NA	12.05	29.39	NA	
MW-5R	1909	30.33	30.34	47.43	NA	Active NAPL Pump
MW-6R	1712	NA	32.51	51.53	NA	Survey
MW-8BRR	1440	NA	16.77	42.31	42.4	
MW-9R	1640	NA	18.99	57.15	57.2	
MW-10R	1500	NA	20.98	57.30	57.3	
MW-88-01	1742	18.54	18.65	NA	NA	
MW-89-01	1925	NA	17.77	39.60	NA	sheen on IP 9/13
MW-89-02	1738	15.53	15.56	32.63	NA	FP 9/13
MW-89-03				35.32	NA	Active NAPL Pump
MW-89-04				38.42	NA	Active NAPL Pump
MW-89-06	1720	NA	18.18	34.37	NA	Sheen IP 5&9/13 IP 9/14
MW-89-07	1705	NA	19.28	35.05	NA	
GRW-95-02	1914	NA	31.10		NA	FP 9/13
GRW-95-03	1723	NA	21.15		NA	sheen on IP 9/13 IP 9/14
GRW-95-04	1747	17.79	17.82		NA	FP 9/13 / FP 9/14 IP
MW-00-16	1720	NA	28.42		NA	
Bedrock Wells						
MW-1AR	1549	NA	39.90	72.56	NA	
~~MW-2~~	Abandoned			~~61.51~~		
MW-3	1612	NA	11.47	62.45		Broken @ Grnd sfc
MW-4	1730	NA	2.45	61.36	NA	Well head concrete loose
MW-WL-11	1611	NA	8.58	38.53	38.3	COE

DAILY FIELD ACTIVITIES LOG

Date 9/22/14 Project No. Williston Field Eng. SFJ/LIB

Client Flying J Petroleums, Inc. Project Name. PCGWM Location Williston, ND

Personnel On Site:

Name	Company	PPE Level
Steve Johnston	JLI	D
Leigh Boem	JLI	D

Weather Conditions Clear

Temperature mid 70's Wind Direction _____ Wind Speed light

Task(s) to be Conducted Begin drawdown/Recovery Test MW89-04 MW89-03
Begin GW sampling

PERSONAL PROTECTIVE EQUIPMENT

Indicate personnel initials next to each piece of PPE equipment utilized by that individual:

Suits: _____ Gloves: _____ Boots: _____

Hard Hat: _____ Eye Protection: _____ Hearing Protection: _____

Respirator: _____ If respirator, indicate cartridge type: _____

Other: _____

MONITORING EQUIPMENT

Air/Soil/Water Monitoring Equipment Used (and ID numbers): _____

Engineering Controls Used for Safety: _____

Accidents/Injuries (fill out accident report form): _____

FLYING J PETROLEUMS, INC, - WILLISTON, ND

SUMMARY OF FIELD ACTIVITIES pg. 2 of 2

9/23/14

Visitors (ALSO Sign in on Safety Log)

Important Phone Calls & Events/Summarize changes from plans:

Time/Duration/Description of Daily Activities and Events:

→ Started drawdown test on MW89-04 & MW89-03
→ Started GW ~~mon~~ sampling.
→ Installed bladder pump in MW-PR
→ Attempted to install bladder pump in MW90-01R. Barbed fitting broke & lost check valve ball. - Will bail well.
→ MW90-0R has broken wellhead. Ordered smaller wellhead to install this trip.
→ MW87-08R wellhead has been rebuilt. Casing bent but functional. Needs survey.
→ Talked w/ Rich Vestal of Red River re: removal of ASTs.
→ Replaced barrier on MW00-16
→ Talked to Hilary re: office.

Sampled the following wells MW89-05, MW-C2, MW-M, MW89-07, MW00-16, MW-T1R, MW87-08, MW-Y, MW-8BRR, MW-9R, MW-10R, MW-PR
Did Dup/MS/MSD on MW87-08

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: MW10R

Sampler: Steve Johnston
Weather: mid 70 Clear Breezy

Date: 9-22-14

Depth to Water (DTW ft)): 20.98
Depth to Product (DTP (ft): NA
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =
Purge Method: low flow bladder

Instrumentation:

pH Meter: YSI 6055 — Time: 1000
Calibrated with buffers at pH: 4, 7, and 10 — Date: 9-22-14

SC Meter: YSI 6055 — Time: 1000
Standard solution used: 1,413ug/cm — Date 9-22-14

DO/ORP Meter: YSI 6055 — Time: 1000
Standard solution used: Atm, factory — Date 9-22-14

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.25	5	55.6	7.23	2.18	0.99	-64.5	clear
0.5	10	54.7	7.22	2.18	0.31	-74.7	"
0.75	15	54.5	7.22	2.19 (2.19)	0.27	-76.5	
1	20	55.0	7.22	2.19	0.25	-71.3	clear
				Sample Time	1700		

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:
Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: MW87-08 1330
Dup 1330
MS 1340
MSD 1345

Sampler: Steve Johnston
Weather:

Date: 9-22-14

Depth to Water (DTW ft)): 9.87
Depth to Product (DTP (ft): ~~25~~ NA
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 = NA
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =
Purge Method: low flow bladder

Instrumentation:

pH Meter — YSI 6055 — Time: 1000
Calibrated with buffers at pH: 4, 7, and 10 — Date: 9-22-14

SC Meter — YSI 6055 — Time: 1000
Standard solution used: 1,413ug/cm — Date 9-22-14

DO/ORP Meter — YSI 6055 — Time: 1000
Standard solution used: Atm, factory — Date 9-22-14

2 35 55 7.07 4.95 0.28 57.6 clear

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.5	8	12.4	7.02	5.2	0.33	75.6	clear
1	15	12.6	7.03	5.02	0.35	72.0	"
1.25	20	12.7	7.04	4.96	0.33	67.1	"
1.5	~~25~~	12.9/55	7.04	4.96	0.22	62.8	"
1.75	30	55	7.06	4.96	0.26	59.4	
				Sample Time	1330/Dup	1335/MS	1340/MSD 1345

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:
Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: MW4

Sampler: Steve Johnston
Date: 9-22-14
Weather: Mid 70s clear light breeze

Depth to Water (DTW ft)): 6.03
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =
Purge Method: Low flow bladder

Instrumentation:

pH Meter: YSI 6055 — Time: 1000
Calibrated with buffers at pH: 4, 7, and 10 — Date: 9-22-14

SC Meter: YSI 6055 — Time: 1000
Standard solution used: 1,413ug/cm — Date 9-22-14

DO/ORP Meter: YSI 6055 — Time: 1000
Standard solution used: Atm, factory — Date 9-22-14

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.25	5	54	6.95	4.24	0.12	-139	clear
0.5	10	54	6.94	4.24	0.09	-148	Dark gray
0.75	15	54	6.94	4.23	0.07	-151	gray
1	20	54	6.94	4.23	0.08	-157	light gray
				Sample Time	1430		

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:
Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston
Well ID: MW9R

Sampler: Steve Johnston
Date: 9-22-14
Weather: Mid 70s clear breezy

Depth to Water (DTW ft)): 18.99
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =
Purge Method: low flow bladder pump

Instrumentation:

pH Meter: YSI 6055 — Time: 9-22-14
Calibrated with buffers at pH: 4, 7, and 10 — Date: 1000

SC Meter: YSI 6055 — Time: 1000
Standard solution used: 1,413ug/cm — Date 9-22-14

DO/ORP Meter: YSI 6055 — Time: 1000
Standard solution used: Atm, factory — Date 9-22-14

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.25	5	53.2	7.16	2.80	0.30	-47.8	clear
0.5	10	53.0	7.12	2.79	0.20	-55.2	"
0.75	15	52.9	7.11	2.80	0.16	-68.5	"
1.0	20	52.9	7.09	2.81	0.14	-75.5	"
1.25	25	53.1	7.16	2.80	0.13	-78.7	
				Sample Time 1740			

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:
Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: MW8BRR

Sampler: Steve Johnston
Date: 9-22-14
Weather: Mid 70s, clear, light breeze

Depth to Water (DTW ft)): 16.77
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =
Purge Method: low flow bladder

Instrumentation:

pH Meter: YSI 6055 — Time: 1000
Calibrated with buffers at pH: 4, 7, and 10 — Date: 9-22-14

SC Meter: YSI 6055 — Time: 1000
Standard solution used: 1,413ug/cm — Date 9-22-14

DO/ORP Meter: YSI 6055 — Time: 1000
Standard solution used: Atm, factory — Date 9-22-14

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.25	5	54.4	7.2	2.41	0.23	-46.5	
0.5	10	54.9	7.2	2.40	0.17	-59.6	
0.75	15	54.1	7.4	2.38	0.09	-63.6	
1	20	54.3	7.23	2.38	0.09	-67.1	
				Sample Time	1630		

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): SFJ
Time: 1630
Via:
Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: MW PR

Sampler: Steve Johnston
Weather: mid 70's, clear light breeze

Date: 9-22-14

Depth to Water (DTW ft)): 8.32
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume)=
Purge Method: low flow bladder

Instrumentation:

pH Meter: YSI 6055 — Time: 1000
Calibrated with buffers at pH: 4, 7, and 10 — Date: 9-22-14

SC Meter: YSI 6055 — Time: 1000
Standard solution used: 1,413ug/cm — Date 9-22-14

DO/ORP Meter: YSI 6055 — Time: 1000
Standard solution used: Atm, factory — Date 9-22-14

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.25	5	54.6	7.2	2.98	0.4	-132	lt. grey
0.5	10	53.6	7.2	2.99	0.25	-132	"
0.75	15	53.4	7.2	3.03	0.14	-139	
1	20	53.3	7.2	3.05	0.12	-141	
				Sample Time	1500		

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:
Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

621A

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston
Well ID: MW X3

Sampler: Leigh Beam
Date: 9/22/2014 // Sampled 9/23/2014
Weather: Clear 70-80° F

Depth to Water (DTW ft)): 8.74 TD = 12.65 = 3.91
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 = 0.63 gal
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) = 1.9 gal
Purge Method:

Instrumentation:

pH Meter	YSI 6055	Time:	9/22/2014
Calibrated with buffers at pH:	4, 7, and 10	Date:	0900
SC Meter	YSI 6055	Time:	0906
Standard solution used:	1,413ug/cm	Date	9/22/2014
DO/ORP Meter	YSI 6055	Time:	0900
Standard solution used:	Atm, factory	Date	9/22/2014

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.5							
1.0							
1.9							

Sample Time 0950 9/23/14

Field Observations, Problems Encountered: Bailed dry in 0.50 gallons
Let set 24 hours
Sampled 9/23/2014 @

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:
Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: MW 1BR 1545
MW-1BR Dup 1550

Sampler: Steve Johnston
Date: 9-23-14
Weather: Mid 80's, clear, light Breeze

Depth to Water (DTW ft)): 39.87
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =
Purge Method: low flow bladder

Instrumentation:

pH Meter: YSI 6055 — Time: 0930
Calibrated with buffers at pH: 4, 7, and 10 — Date: 9-23-14

SC Meter: YSI 6055 — Time: 0930
Standard solution used: 1,413ug/cm — Date 9-23-14

DO/ORP Meter: YSI 6055 — Time: 0930
Standard solution used: Atm, factory — Date 9-23-14

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.25	5	54.1	6.97	3.80	0.81	96.6	
0.5	10	53.9	6.94	3.80	0.47	98.4	
0.75	15	53.8	6.95	3.82	0.45	99.7	
1	20	53.3	6.91	3.81	0.34	104.9	

Sample Time MW-1BR - 1545
MW-1BR Dup - 1550

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:
Via: Shipping Number:

Samples sent to:

ESC Laboratory
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Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: MW-W1R

Sampler: Steve Johnston
Weather: low 80s clear lt breeze

Date: 9-23-14

Depth to Water (DTW ft)): 14.85
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =
Purge Method: low flow bladder pump

Instrumentation:

pH Meter — YSI 6055 — Time: 0930
Calibrated with buffers at pH: 4, 7, and 10 — Date: 9-25-13

SC Meter — YSI 6055 — Time: 0930
Standard solution used: 1,413ug/cm — Date 9-25-13

DO/ORP Meter — YSI 6055 — Time: 0930
Standard solution used: Atm, factory — Date 9-25-13

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.25	5	52.2	7.02	2.98	0.36	-36.3	
0.5	10	51.9	7.01	3.0	0.29	-56.5	
0.75	15	51.9	7.03	3.01	0.31	-63.7	
1	20	52.0	7.01	3.00	0.27	-65.5	
				Sample Time	1330		

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:
Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: MW87-16 1225
MW-87-16 Dup 1230

Sampler: Steve Johnston
Weather: low 80s clear lt. Breeze

Date: 9-23-14

Depth to Water (DTW ft)): 11.76
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =
Purge Method: low flow bladder pump

Instrumentation:

pH Meter: YSI 6055 — Time: 0930
Calibrated with buffers at pH: 4, 7, and 10 — Date: 9-23-14

SC Meter: YSI 6055 — Time: 0930
Standard solution used: 1,413ug/cm — Date: 9-23-14

DO/ORP Meter: YSI 6055 — Time: 0930
Standard solution used: Atm, factory — Date: 9-23-14

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.25	5	54.1	7.19	11.44	1.06	73.4	clear
0.5	10	54.4	7.18	10.27	1.73	73.0	
0.75	15	54.1	7.18	10.16	1.60	73.5	
1	20	54.2	7.17	10.13	1.54	74.1	
1.25	25	54.3	7.17	10.11	1.47	74.6	
				Sample Time	1230 → Dup		

Field Observations, Problems Encountered: MW-87-16 → 1225 → Regular

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil - 2	HCL
GRO	8015D	40-mil - 2	HCL
DRO	3511/8015	40-mil - 3	HCL
DO/ORP			

Samples Shipped on (date): Time:
Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: MW-K

Sampler: Steve Johnston
Weather: Clear, low 80's, light breeze

Date: 9-23-14

Depth to Water (DTW ft)): 6.98
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =
Purge Method: low flow bladder

Instrumentation:

pH Meter: YSI 6055 — Time: 0930
Calibrated with buffers at pH: 4, 7, and 10 — Date: 9-23-14

SC Meter: YSI 6055 — Time: 0930
Standard solution used: 1,413ug/cm — Date 9-23-14

DO/ORP Meter: YSI 6055 — Time: 0930
Standard solution used: Atm, factory — Date 9-23-14

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.3	7	52.9	6.98	8.6	0.39	109.7	clear
0.55	11	53.1	6.97	8.6	0.39	111.8	
0.80	18	53.4	6.97	8.59	0.39	114.5	
				Sample Time	1050		

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:
Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

1010

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: MW-WL11

Sampler: Steve Johnston
Weather: Low 80's, clear, light breeze

Date: 9-23-14

Depth to Water (DTW ft)): 8.58
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =
Purge Method: low flow bladder

Instrumentation:

pH Meter: YSI 6055 — Time: 0930
Calibrated with buffers at pH: 4, 7, and 10 — Date: 9-23-14

SC Meter: YSI 6055 — Time: 0930
Standard solution used: 1,413ug/cm — Date 9-23-14

DO/ORP Meter: YSI 6055 — Time: 0930
Standard solution used: Atm, factory — Date 9-23-14

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.25	5	52.3	7.03	2.91	0.26	-79	clear
0.6	12	52.0	7.00	2.88	0.28	-83.6	
0.8	17	52.0	7.01	2.88	0.28	-83.6	
1	22	52.2	7.01	2.87	0.25	83.9	
				Sample Time 1130			

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:
Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: MW 89-05

Sampler: Leigh
Weather: Clear 70° F

Date: 9/22/2014

Depth to Water (DTW ft)): 8.56 TD = 13.3 = 4.74
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 = 0.77
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) = 2.3
Purge Method:

Instrumentation:

pH Meter: YSI 6055 — Time: 0900
Calibrated with buffers at pH: 4, 7, and 10 — Date: 9/22/2014

SC Meter: YSI 6055 — Time: 0900
Standard solution used: 1,413ug/cm — Date 9/22/2014

DO/ORP Meter: YSI 6055 — Time: 0900
Standard solution used: Atm, factory — Date 9/22/2014

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.75		13.3	6.90	3.70	3.16	-105	Clear
1.50		12.9	6.86	4.47	1.51	-104	
2.3		12.6	6.97	2.46	3.07	-107	Slow Recovery
				Sample Time 1930			

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:
Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: MW-0016

Sampler:
Weather:

Date:

Depth to Water (DTW ft)): 28.15 TD = 43.2 = 15.05
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 = 2.45
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 = 7.

Bailer Purge Volume (gal): (3 x 1 casing volume) = 7.3 gallons
Purge Method:

Instrumentation:

pH Meter	YSI 6055	Time:	0900
Calibrated with buffers at pH:	4, 7, and 10	Date:	9/22/2014
SC Meter	YSI 6055	Time:	0900
Standard solution used:	1,413ug/cm	Date	9/22/2014
DO/ORP Meter	YSI 6055	Time:	0900
Standard solution used:	Atm, factory	Date	9/22/2014

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
2.5		12.9	7.61	2.27	2.17	-127	clear
5.0		12.2	7.15	2.69	1.67	-121	"
7.5		12.7	7.14	2.72	1.48	-109	"

Sample Time 1830

Field Observations, Problems Encountered: Needs new barricade

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:
Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: MW TIR

Sampler: Leigh
Weather: Clear 70-80° F

Date: 9/22/2014

Depth to Water (DTW ft)): 25.82 TD = 45.23 = 19.41
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 = 3.1
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) = 9.5
Purge Method:

Instrumentation:

pH Meter: YSI 6055 — Time: 0900
Calibrated with buffers at pH: 4, 7, and 10 — Date: 9/22/14

SC Meter: YSI 6055 — Time: 0900
Standard solution used: 1,413ug/cm — Date 9/22/14

DO/ORP Meter: YSI 6055 — Time: 0900
Standard solution used: Atm, factory — Date 9/22/14

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
3.1		10.7	7.53	2.78	2.29	-121	Slight Yellow
6.3		11.0	7.60	2.54	2.23	-154	" "
9.5		11.6	7.70	2.40	1.57	-143	" "
				Sample Time 1730			

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:
Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: 89-07

Sampler: Leigh
Weather: Clear 70° F

Date: 9/22/2014

Depth to Water (DTW ft)): 19.03 35.09 - 19.03 = 16.06
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 = 2.6
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) = 7.8
Purge Method:

Instrumentation:

pH Meter: YSI 6055 — Time: 0900
Calibrated with buffers at pH: 4, 7, and 10 — Date: 9/22/14

SC Meter: YSI 6055 — Time: 0900
Standard solution used: 1,413ug/cm — Date 9/22/14

DO/ORP Meter: YSI 6055 — Time: 0900
Standard solution used: Atm, factory — Date 9/22/14

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
2.6		10.20	7.39	1.61	2.92	-171	Sheen/ Mostly clear
5.2		9.4	7.53	1.66	1.46	-168	" "
7.8		9.6	7.57	1.66	1.57	-160	" "
				Sample Time	1545		

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:
Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: MW-M

Sampler: Leigh
Weather: Clear 70°

Date: 9/22/2014

Depth to Water (DTW ft)): 5.05 TD = 20 = 14.95
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 = 2.4 gal
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) = 7.3
Purge Method:

Instrumentation:

pH Meter: YSI 6055 — Time: 0900
Calibrated with buffers at pH: 4, 7, and 10 — Date: 9/22/14

SC Meter: YSI 6055 — Time: 0900
Standard solution used: 1,413ug/cm — Date 9/22/14

DO/ORP Meter: YSI 6055 — Time: 0900
Standard solution used: Atm, factory — Date 9/22/14

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
2.5		12.2	7.38	3.22	5.01	-128	Sheen Brownish Color H_2O
5.0		12.7	7.33	3.18	4.20	-115	Sheen, Silty
7.5		12.3	7.44	3.14	5.05	-112	Silty w/ Sheen
							Clear @ Sampling
				Sample Time	1430		

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:
Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: MW-T3

Sampler:
Weather:

Date:

Depth to Water (DTW ft)): 11.03 TD → 14.62 (constructed)
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 = 3.59 ≈ 0.58
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) = 1.75
Purge Method:

Instrumentation:

pH Meter: YSI 6055 — Time: 0800
Calibrated with buffers at pH: 4, 7, and 10 — Date: 9/23/14

SC Meter: YSI 6055 — Time: 0800
Standard solution used: 1,413ug/cm — Date: 9/23/14

DO/ORP Meter: YSI 6055 — Time: 0800
Standard solution used: Atm, factory — Date: 9/23/14

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.5		14.0	7.09	2.93	4.37	24	clear
1.0		13.5	7.19	2.85	5.16	-30	"
1.75		13.3	7.16	2.86	5.3	-36	"
				Sample Time			

Field Observations, Problems Encountered: Bailed dry @ 1 gallon @ 1900. Recharged to get sample and third parameter measurement

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time: 1930
Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature: MR

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: MW C2

Sampler:
Weather:

Date: 9/22/2014

Depth to Water (DTW ft)): 5.9 TD = 16.8 = 10.9
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 = 1.77 gal
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) = 5.3 gal
Purge Method:

Instrumentation:

pH Meter	YSI 6055	Time:	0900
Calibrated with buffers at pH:	4, 7, and 10	Date:	9/22/2014
SC Meter	YSI 6055	Time:	0900
Standard solution used:	1,413ug/cm	Date	9/22/2014
DO/ORP Meter	YSI 6055	Time:	0900
Standard solution used:	Atm, factory	Date	9/22/2014

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
1.5	5	11.1	7.27	2.23	1.68	-161	Brown
3.5	15	10.9	7.40	2.20	2.44	-152	Tan
5.5	25	10.8	7.43	2.21	2.82	-162	Light tan
				Sample Time	1300		

Field Observations, Problems Encountered: Slow purge or well goes dry

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:
Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

DAILY FIELD ACTIVITIES LOG

Date 9-23-14 Project No. Williston Field Eng. Steve Johnston/Leigh Beem

Client Flying J Petroleums, Inc. Project Name. PCGWM Location Williston, ND

Personnel On Site:

Name	Company	PPE Level
Steve Johnston	JLI	D
Leigh Beem	JLI	D

Weather Conditions ~~#~~ Clear

Temperature low 80's Wind Direction South Wind Speed 8-10 mph

Task(s) to be Conducted Continue Drawdown

PERSONAL PROTECTIVE EQUIPMENT

Indicate personnel initials next to each piece of PPE equipment utilized by that individual:

Suits: _____ Gloves: SFJ/LIB Boots: SFJ/LIB

Hard Hat: _____ Eye Protection: SFJ/LIB Hearing Protection: _____

Respirator: _____ If respirator, indicate cartridge type: _____

Other: _____

MONITORING EQUIPMENT

Air/Soil/Water Monitoring Equipment Used (and ID numbers): _____

Engineering Controls Used for Safety: _____

Accidents/Injuries (fill out accident report form): _____

FLYING J PETROLEUMS, INC, - WILLISTON, ND

9/23/14

SUMMARY OF FIELD ACTIVITIES

Visitors (ALSO Sign in on Safety Log) Christine Roob ND Dept of Health

Important Phone Calls & Events/Summarize changes from plans: Molly talked to LIB re: conversation w/Chuck re: disposition of office.

Time/Duration/Description of Daily Activities and Events:

Onsite 0730
- Sampled remaining wells → MWT3, MW-W2, MW-X3, MW-U1R
- Continued drawdown test MW1BR, MW-W1R, MW-W11
offsite 2000 hrs MWX1R, MW1BR-dup, MW1C,
after prepping samples MW87-14, MW87-16, MW87-25
for shipping MW90-01R, MW-K, MW87-14
MW87-16, MW-T3, MW-X3
MW-U1R, MW-X1R, MW87-16-Dup,
MW-U1R-MS, MW-U1R-MSD,
MW87-16dup, MW-U1R MS,
MW-U1R MSD

15.5

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: MW-1C

Sampler: Steve Johnston
Weather:

Date: 9-23-14

Depth to Water (DTW ft)): 7.97
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 = (36.1-7.97=) x0.163 = 4.58
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) = 13.8 gal
Purge Method: Bladderpump 600 ml/min ~ 4 min to lower 3 ft

Instrumentation:

pH Meter: YSI 6055 — Time: 09 30
Calibrated with buffers at pH: 4, 7, and 10 — Date: 9-23-14

SC Meter: YSI 6055 — Time: 09 30
Standard solution used: 1,413ug/cm — Date 9-23-14

DO/ORP Meter: YSI 6055 — Time: 0930
Standard solution used: Atm, factory — Date 9-23-14

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
6	120 min	54.3	7.22	4.52	1.85	36.6	

Sample Time 1700

Field Observations, Problems Encountered: Well Pumped well dry w/dedicated bladder pump Returned 2 hrs later & sampled

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:
Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: MW-U1R 1900
MW-U1R MS 1905
MW-U1R MSD 1910

Sampler: Steve Johnston
Date: 9-23-14
Weather: low 80's, clear, 14 breeze

Depth to Water (DTW ft)): 15.9
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =
Purge Method: low flow bladder

Instrumentation:

pH Meter: YSI 6055 — Time:
Calibrated with buffers at pH: 4, 7, and 10 — Date:

SC Meter: YSI 6055 — Time:
Standard solution used: 1,413ug/cm — Date

DO/ORP Meter: YSI 6055 — Time:
Standard solution used: Atm, factory — Date

1.5 30 51.3 7.39 2.52 0.20 -117

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.25	5	53.3	7.41	2.33	0.51	38.0	clear
0.5	10	52.8	7.40	2.36	0.35	-22.0	
0.75	15	52.5	7.37	2.42	0.35	-67.5	
1	20	52.3	7.38	2.47	0.27	-97.3	
1.25	25	51.3	7.38	2.51	0.22	-113	
				Sample Time	MW-U1R- 1900		

Field Observations, Problems Encountered:
MW-U1R MS 1905
MW-U1R MSD 1910

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:
Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: MW87-25

Sampler: Steve Johnston
Weather: low 80s clear, lt breeze

Date: 9-23-14

Depth to Water (DTW ft)): 6.47
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =
Purge Method: low flow bladder pump

Instrumentation:

pH Meter	YSI 6055	Time:	0930
Calibrated with buffers at pH:	4, 7, and 10	Date:	9-23-14
SC Meter	YSI 6055	Time:	0930
Standard solution used:	1,413ug/cm	Date	9-23-14
DO/ORP Meter	YSI 6055	Time:	0930
Standard solution used:	Atm, factory	Date	9-23-14

Gallons Removed	Δ T (min)	Temperature (F of C)	pH 7.23	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.25	5	56.8	~~7.27~~	7.67	0.15	82.9	
0.5	10	56.4	7.22	7.57	0.13	73.0	
0.71	15	56.5	7.22	7.44	0.14	68.3	
1	20	56.7	7.22	7.38	0.19	~~64.6~~ 62	
				Sample Time	1815		

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:
Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample

Project Number: FJP Williston

Well ID: MW-XIR

Sampler: Steve Johnston

Date: 9-23-14

Weather: mid 80's clear light breeze

Depth to Water (DTW ft)): 18.65

Depth to Product (DTP (ft):

Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =

(gal., 1" ID: (TD-DTW) x 0.041 =

(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =

Purge Method: low flow bladder

Instrumentation:

pH Meter: YSI 6055 — Time: 0930

Calibrated with buffers at pH: 4, 7, and 10 — Date: 9-23-14

SC Meter: YSI 6055 — Time: 0930

Standard solution used: 1,413ug/cm — Date 9-23-14

DO/ORP Meter: YSI 6055 — Time: 0930

Standard solution used: Atm, factory — Date 9-23-14

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.25	5	53.4	7.75	2.34	0.39	-159.9	
0.5	10	53.0	7.69	2.33	0.19	-169	
0.75	15	53.4	7.61	2.34	0.17	-166	
1	20	53.2	7.60	2.35	0.18	-165	
				Sample Time	1650		

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:

Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample

Project Number: FJP Williston

Well ID: MW-W2

Sampler: Leigh

Date: 9/23/14

Weather: Clear 80°F

Depth to Water (DTW ft)): DTW= 7.71 TD 27

Depth to Product (DTP (ft):

Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 = ~~3.50 - .57~~ 3.14

(gal., 1" ID: (TD-DTW) x 0.041 =

(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) = 9.4

Purge Method:

Instrumentation:

pH Meter: YSI 6055 — Time: 0800

Calibrated with buffers at pH: 4, 7, and 10 — Date: 9/23/14

SC Meter: YSI 6055 — Time: 0800

Standard solution used: 1,413ug/cm — Date 9/23/14

DO/ORP Meter: YSI 6055 — Time: 0800

Standard solution used: Atm, factory — Date 9/23/14

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
3		9.4	7.09	11.11	2.76	-22	clear
6		8.2	7.06	11.06	2.25	13	clear
9		8.3	7.06	11.11	1.98	29	clear
				Sample Time	1400		

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:

Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: MW 9001R

Sampler: Leigh
Weather: Clear 60-70°

Date: 9/23/2014

Depth to Water (DTW ft)): 15.87 TD = 25' = 9.13
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 = 1.4 gallons
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) = 4.5 gallons
Purge Method:

Instrumentation:

pH Meter	YSI 6055	Time:	0800
Calibrated with buffers at pH:	4, 7, and 10	Date:	9/23/14
SC Meter	YSI 6055	Time:	0800
Standard solution used:	1,413ug/cm	Date	9/23/14
DO/ORP Meter	YSI 6055	Time:	0800
Standard solution used:	Atm, factory	Date	9/23/14

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
1.5		10.9	7.26	5.12	1.54	96	clear
3.0		9.7	7.30	5.50	1.65	104	Cloudy
4.5		10.9	7.31	5.50	2.5	93	Cloudy
				Sample Time	1300		

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:
Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: MW 87-14

Sampler: Leigh Beam
Weather: Clear 60-70°

Date: 9/23/2014

Depth to Water (DTW ft)): 9.94 TD = 21.09 = 11.15
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 = 1.81
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) = 5.4 gal
Purge Method:

Instrumentation:

pH Meter	YSI 6055	Time:	0800
Calibrated with buffers at pH:	4, 7, and 10	Date:	9/23/2014
SC Meter	YSI 6055	Time:	0800
Standard solution used:	1,413ug/cm	Date	9/23/2014
DO/ORP Meter	YSI 6055	Time:	0800
Standard solution used:	Atm, factory	Date	9/23/2014

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
1.8		13.2	7.22	6.17	1.20	68	slightly cloudy
3.6		12.3	7.16	6.36	3.80	-14	" "
5.4		11.0	6.84	7.71	2.31	-79	" "
				Sample Time	1045		

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): Time:
Via: Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

FLYING J PETROLEUMS, INC, - WILLISTON, ND

9/24/14

SUMMARY OF FIELD ACTIVITIES

pg. 1 of 1

Visitors (ALSO Sign in on Safety Log)

Important Phone Calls & Events/Summarize changes from plans:

Time/Duration/Description of Daily Activities and Events:

SFJ on site - office 0630 - offsite 0800
Pack up gear, dispose of garbage, demobe.
Ship samples from Minot.

DAILY FIELD ACTIVITIES LOG

Date 12/10/14 Project No. _____ Field Eng. Steve Johnston

Client Flying J Petroleums, Inc. Project Name. PCGWM Location Williston, ND

Personnel On Site:

Name	Company	PPE Level
Steve Johnston	JLI	D - cold weather

Weather Conditions _____

Temperature 30-40 Wind Direction W Wind Speed 5-10

Task(s) to be Conducted Sample MW8BRR, MW9R, MW10R, MW90-01R, and MW87-08R - Inspect impoundments, check NAPL recovery systems

PERSONAL PROTECTIVE EQUIPMENT

Indicate personnel initials next to each piece of PPE equipment utilized by that individual:

Suits: _____ Gloves: SFS Boots: SFJ

Hard Hat: _____ Eye Protection: SFJ Hearing Protection: _____

Respirator: _____ If respirator, indicate cartridge type: _____

Other: _____

MONITORING EQUIPMENT

Air/Soil/Water Monitoring Equipment Used (and ID numbers): YSI 6055

Engineering Controls Used for Safety: _____

Accidents/Injuries (fill out accident report form): _____

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample

Project Number: FJP Williston

Well ID: MW8BRR

Sampler: SFJ

Date: 12-10-14

Weather: 21° clear

Depth to Water (DTW ft)): 17.28

Depth to Product (DTP (ft): NA

Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =

(gal., 1" ID: (TD-DTW) x 0.041 =

(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =

Purge Method: low flow bladder

Instrumentation:

pH Meter: YSI 6055 — Time: 0730

Calibrated with buffers at pH: 4, 7, and 10 — Date: 12/10/14

SC Meter: YSI 6055 — Time: 0730

Standard solution used: 1,413ug/cm — Date: 12/10/14

DO/ORP Meter: YSI 6055 — Time: 0730

Standard solution used: Atm, factory — Date: 12/10/14

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.25	5	6.7	7.49	2.87	0.42	-44.8	clear
0.5	10	6.6	7.42	2.84	1.23	-61.6	
0.75	15	6.7	7.38	2.82	1.18	-78.2	
1	20	6.6	7.40	2.80	1.10	-82.4	
				Sample Time	1000		

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): 12/10/14 Time: 1600

Via: FedEx Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: MW9R
MW9R MS/MSD

Sampler: SFJ
Date: 12-10-14
Weather: 24° clear

Depth to Water (DTW ft)): 19.33
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =
Purge Method: low flow bladder

Instrumentation:

pH Meter: YSI 6055 — Time: 12-10-14
Calibrated with buffers at pH: 4, 7, and 10 — Date: 0730

SC Meter: YSI 6055 — Time:
Standard solution used: 1,413ug/cm — Date

DO/ORP Meter: YSI 6055 — Time:
Standard solution used: Atm, factory — Date

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.25	5	7.4	7.36	3.12	0.47	103.4	clear
0.5	10	7.5	7.34	3.12	0.44	-119.2	
0.75	15	7.5	7.32	3.12	0.36	-119.9	
1	20	7.4	7.33	3.12	0.35	-121.1	

Sample Time 1200 / 1205 / 1210
MS MSD

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): 12-10-14 Time: 1600
Via: FedEx Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample

Project Number: FJP Williston

Well ID: MW10R

Sampler: SFS

Date: 12-10-14

Weather: 21° clear

Depth to Water (DTW ft)): 21.35

Depth to Product (DTP (ft):

Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =

(gal., 1" ID: (TD-DTW) x 0.041 =

(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =

Purge Method: low flow bladder

Instrumentation:

pH Meter: YSI 6055 — Time: 0730

Calibrated with buffers at pH: 4, 7, and 10 — Date: 12-10-14

SC Meter: YSI 6055 — Time:

Standard solution used: 1,413ug/cm — Date

DO/ORP Meter: YSI 6055 — Time:

Standard solution used: Atm, factory — Date

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.25	5	7.1	7.73	2.59	1.86	-79.0	Clear
0.5	10	7.1	7.52	2.66	0.62	-81.9	
0.75	15	7.2	7.49	2.67	0.43	-85.8	
1	20	7.1	7.48	2.68	0.40	-88.8	
				Sample Time	1100		

Field Observations, Problems Encountered:

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): 12-10-14 Time: 1600

Via: FedEx Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: MW90-01R
MW90-01R Duplicate

Sampler: SFJ
Date: 12-10-14
Weather: Clear high 30

Depth to Water (DTW ft)): 15.98
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =
Purge Method: Peristaltic low flow -

Instrumentation:

pH Meter: YSI 6055 — Time: 0730
Calibrated with buffers at pH: 4, 7, and 10 — Date: 12-10-14

SC Meter: YSI 6055 — Time:
Standard solution used: 1,413ug/cm — Date

DO/ORP Meter: YSI 6055 — Time:
Standard solution used: Atm, factory — Date

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.25	5	8.9	7.40	5.93	3.68	57.0	clear
0.5	10	9.1	7.40	5.30	3.23	56.8	"
0.75	15	9.2	7.40	4.76	2.83	56.7	
1	20	9.3	7.40	4.63	6.70	56.7	

Sample Time 1400 / 1405

Field Observations, Problems Encountered: Wellhead not installed by RR

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): 12-10-14 Time: 1600
Via: Fed Ex Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

AECOM

Johnston Leigh Inc.

Project Name: FJP Williston Annual GW Sample
Project Number: FJP Williston

Well ID: MW87-08R

Sampler: SFJ
Date: 12-10-14
Weather: clear 30°

Depth to Water (DTW ft)): 9.82
Depth to Product (DTP (ft):
Calculated Casing Volume (gal., 2" ID: (TD-DTW) x 0.163 =
(gal., 1" ID: (TD-DTW) x 0.041 =
(gal., 4" ID: (TD-DTW) x 0.652 =

Bailer Purge Volume (gal): (3 x 1 casing volume) =
Purge Method: low flow bladder

Instrumentation:

pH Meter	YSI 6055	Time:	0730
Calibrated with buffers at pH:	4, 7, and 10	Date:	12-10-14
SC Meter	YSI 6055	Time:	
Standard solution used:	1,413ug/cm	Date	
DO/ORP Meter	YSI 6055	Time:	
Standard solution used:	Atm, factory	Date	

1.5 35 8.5 7.34 5.42 0.57 31.9

Gallons Removed	Δ T (min)	Temperature (F of C)	pH	Conductivity (ms/cm)	DO (mg/l)	ORP (mv)	Appearance
0.25	~~0.25~~ 5	8.2	7.28	5.92	0.82	-3.1	clear
0.5	10	8.3	7.30	5.46	0.75	5.9	
0.75	15	8.3	7.31	5.45	0.74	11.9	
1	20	8.4	7.31	5.44	0.64	18.1	
1.25	25	8.4	7.31	5.43	0.61	24.7	
				Sample Time	1300		

Field Observations, Problems Encountered: well head needs replacing
SS Fitting on top needs replacing

Analyte	Analytical Method	Container, Qty.	Preservative
BTEX	8021	40-mil	HCL
GRO	8015D	40-mil	HCL
DRO	3511/8015	40-mil	HCL

Samples Shipped on (date): 12-10-14 Time: 1600
Via: FedEx Shipping Number:

Samples sent to:

ESC Laboratory
12065 LeBanon Pike
Mount Juliet, TN 37122
(615) 758-5858

Sampler Signature:

12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

Molly Gregersen
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

Report Summary

Thursday December 26, 2013

Report Number: L674007
Samples Received: 12/14/13
Client Project:

Description: Williston Refinery

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By: John Hawkins

John Hawkins , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197, FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1, TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364, EPA - TN002

Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.
Note: The use of the preparatory EPA Method 3511 is not approved or endorsed by the CA ELAP.

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Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

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Molly Gregersen
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

Case Narrative

Thursday December 26, 2013

Report Number: L674007
Samples Received: 12/14/13
Client Project:

Description: Williston Refinery

Data

All samples were treated according to method protocol, no other treatment was necessary.

All Samples were extracted and analyzed within appropriate holding times.

QA/QC was within acceptable ranges. See Qualifiers where applicable.

I certify that, for other than the conditions detailed herein, this data package is in compliance with the terms and conditions of this Agreement, both technically and for completeness. Release of this data has been authorized by the Laboratory Manager or his designee.

Other Comments

L674007-05 MW90-01R DRO had low surrogate recovery. Verification re-extract and re-analysis confirmed BDL. JVH 12-26-13

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REPORT OF ANALYSIS

Molly Gregersen
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

December 26, 2013

ESC Sample # : L674007-01

Date Received : December 14, 2013
Description : Williston Refinery

Site ID : WILLISTON ND

Sample ID : MW8BRR

Project # :

Collected By : Steve Johnston
Collection Date : 12/12/13 14:30

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021/8015	12/16/13	1
Toluene	BDL	0.0050	mg/l	8021/8015	12/16/13	1
Ethylbenzene	BDL	0.00050	mg/l	8021/8015	12/16/13	1
Total Xylene	BDL	0.0015	mg/l	8021/8015	12/16/13	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	GRO	12/16/13	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	105.		% Rec.	8021/8015	12/16/13	1
a,a,a-Trifluorotoluene(PID)	105.		% Rec.	8021/8015	12/16/13	1
TPH (GC/FID) High Fraction	BDL	0.10	mg/l	3510C / DRO	12/21/13	1
Surrogate recovery(%)						
o-Terphenyl	52.5		% Rec.	3510C / DRO	12/21/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
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Reported: 12/26/13 16:17 Printed: 12/26/13 16:18

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REPORT OF ANALYSIS

Molly Gregersen
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

December 26, 2013

ESC Sample # : L674007-02

Date Received : December 14, 2013
Description : Site Investigation

Site ID : WILLISTON ND

Sample ID : MW9R

Project # :

Collected By : Steve Johnston
Collection Date : 12/12/13 13:30

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.0016	0.00050	mg/l	8021/8015	12/16/13	1
Toluene	BDL	0.0050	mg/l	8021/8015	12/16/13	1
Ethylbenzene	BDL	0.00050	mg/l	8021/8015	12/16/13	1
Total Xylene	BDL	0.0015	mg/l	8021/8015	12/16/13	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	GRO	12/16/13	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	104.		% Rec.	8021/8015	12/16/13	1
a,a,a-Trifluorotoluene(PID)	106.		% Rec.	8021/8015	12/16/13	1
TPH (GC/FID) High Fraction	0.73	0.10	mg/l	3510C / DRO	12/21/13	1
Surrogate recovery(%)						
o-Terphenyl	67.6		% Rec.	3510C / DRO	12/21/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
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Reported: 12/26/13 16:17 Printed: 12/26/13 16:18

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REPORT OF ANALYSIS

Molly Gregersen
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

December 26, 2013

ESC Sample # : L674007-03

Date Received : December 14, 2013
Description : Site Investigation

Site ID : WILLISTON ND

Sample ID : MW10R

Project # :

Collected By : Steve Johnston
Collection Date : 12/12/13 12:30

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021/8015	12/16/13	1
Toluene	BDL	0.0050	mg/l	8021/8015	12/16/13	1
Ethylbenzene	BDL	0.00050	mg/l	8021/8015	12/16/13	1
Total Xylene	BDL	0.0015	mg/l	8021/8015	12/16/13	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	GRO	12/16/13	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	105.		% Rec.	8021/8015	12/16/13	1
a,a,a-Trifluorotoluene(PID)	105.		% Rec.	8021/8015	12/16/13	1
TPH (GC/FID) High Fraction	BDL	0.10	mg/l	3510C / DRO	12/21/13	1
Surrogate recovery(%)						
o-Terphenyl	59.0		% Rec.	3510C / DRO	12/21/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
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REPORT OF ANALYSIS

Molly Gregersen
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

December 26, 2013

ESC Sample # : L674007-04

Date Received : December 14, 2013
Description : Site Investigation

Site ID : WILLISTON ND

Sample ID : MW87-08R

Project # :

Collected By : Steve Johnston
Collection Date : 12/12/13 15:30

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021/8015	12/16/13	1
Toluene	BDL	0.0050	mg/l	8021/8015	12/16/13	1
Ethylbenzene	BDL	0.00050	mg/l	8021/8015	12/16/13	1
Total Xylene	BDL	0.0015	mg/l	8021/8015	12/16/13	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	GRO	12/16/13	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	105.		% Rec.	8021/8015	12/16/13	1
a,a,a-Trifluorotoluene(PID)	105.		% Rec.	8021/8015	12/16/13	1
TPH (GC/FID) High Fraction	0.12	0.10	mg/l	3510C / DRO	12/21/13	1
Surrogate recovery(%)						
o-Terphenyl	58.8		% Rec.	3510C / DRO	12/21/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
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Reported: 12/26/13 16:17 Printed: 12/26/13 16:18

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REPORT OF ANALYSIS

Molly Gregersen
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

December 26, 2013

ESC Sample # : L674007-05

Date Received : December 14, 2013
Description : Site Investigation

Site ID : WILLISTON ND

Sample ID : MW90-01R

Project # :

Collected By : Steve Johnston
Collection Date : 12/12/13 16:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021/8015	12/16/13	1
Toluene	BDL	0.0050	mg/l	8021/8015	12/16/13	1
Ethylbenzene	BDL	0.00050	mg/l	8021/8015	12/16/13	1
Total Xylene	BDL	0.0015	mg/l	8021/8015	12/16/13	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	GRO	12/16/13	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	106.		% Rec.	8021/8015	12/16/13	1
a,a,a-Trifluorotoluene(PID)	106.		% Rec.	8021/8015	12/16/13	1
TPH (GC/FID) High Fraction	BDL	0.20	mg/l	3510C / DRO	12/20/13	2
Surrogate recovery(%)						
o-Terphenyl	48.7		% Rec.	3510C / DRO	12/20/13	2

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
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L674007-05 (DRO) - Second extraction also had low SURR recovery. Matrix effect.

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REPORT OF ANALYSIS

Molly Gregersen
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

December 26, 2013

ESC Sample # : L674007-06

Date Received : December 14, 2013
Description : Site Investigation

Site ID : WILLISTON ND

Sample ID : MW9R

Project # :

Collected By : Steve Johnston
Collection Date : 12/12/13 13:30

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.0017	0.00050	mg/l	8021/8015	12/16/13	1
Toluene	BDL	0.0050	mg/l	8021/8015	12/16/13	1
Ethylbenzene	BDL	0.00050	mg/l	8021/8015	12/16/13	1
Total Xylene	BDL	0.0015	mg/l	8021/8015	12/16/13	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	GRO	12/16/13	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	105.		% Rec.	8021/8015	12/16/13	1
a,a,a-Trifluorotoluene(PID)	106.		% Rec.	8021/8015	12/16/13	1
TPH (GC/FID) High Fraction	1.2	0.10	mg/l	3510C / DRO	12/21/13	1
Surrogate recovery(%)						
o-Terphenyl	80.4		% Rec.	3510C / DRO	12/21/13	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
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Reported: 12/26/13 16:17 Printed: 12/26/13 16:18

Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L674007-05	WG697734	SAMP	o-Terphenyl	R2871211	J2

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
J2	Surrogate recovery limits have been exceeded; values are outside lower control limits

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods,it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.

Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Differrence.

Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromotography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.

TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

Summary of Remarks For Samples Printed
12/26/13 at 16:18:04

TSR Signing Reports: 341
R5 - Desired TAT

EDD = Geotracker JVH 7-14-2011 QC4 EDD = 4-file EQuIS Format JVH 12-13-12

Sample: L674007-01 Account: BIGWESTUT Received: 12/14/13 12:00 Due Date: 12/24/13 00:00 RPT Date: 12/26/13 16:17
MS/MSD sample
Sample: L674007-02 Account: BIGWESTUT Received: 12/14/13 12:00 Due Date: 12/24/13 00:00 RPT Date: 12/26/13 16:17

Sample: L674007-03 Account: BIGWESTUT Received: 12/14/13 12:00 Due Date: 12/24/13 00:00 RPT Date: 12/26/13 16:17

Sample: L674007-04 Account: BIGWESTUT Received: 12/14/13 12:00 Due Date: 12/24/13 00:00 RPT Date: 12/26/13 16:17

Sample: L674007-05 Account: BIGWESTUT Received: 12/14/13 12:00 Due Date: 12/24/13 00:00 RPT Date: 12/26/13 16:17

Sample: L674007-06 Account: BIGWESTUT Received: 12/14/13 12:00 Due Date: 12/24/13 00:00 RPT Date: 12/26/13 16:17

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Big West Oil, LLC.
Molly Gregersen
333 West Center Street

North Salt Lake, UT 84054

Quality Assurance Report
Level II

L674007

December 26, 2013

Laboratory Blank

Analyte	Result	Units	% Rec	Limit	Batch	Date Analyzed
Benzene	< .0005	mg/l			WG697439	12/16/13 16:37
Ethylbenzene	< .0005	mg/l			WG697439	12/16/13 16:37
Toluene	< .005	mg/l			WG697439	12/16/13 16:37
TPH (GC/FID) Low Fraction	< .1	mg/l			WG697439	12/16/13 16:37
Total Xylene	< .0015	mg/l			WG697439	12/16/13 16:37
a,a,a-Trifluorotoluene(FID)		% Rec.	105.0	62-128	WG697439	12/16/13 16:37
a,a,a-Trifluorotoluene(PID)		% Rec.	107.0	55-122	WG697439	12/16/13 16:37
TPH (GC/FID) High Fraction	< .1	mg/l			WG697398	12/19/13 16:46
o-Terphenyl		% Rec.	71.70	50-150	WG697398	12/19/13 16:46
TPH (GC/FID) High Fraction	< .1	mg/l			WG697734	12/20/13 14:52
o-Terphenyl		% Rec.	76.10	50-150	WG697734	12/20/13 14:52

Laboratory Control Sample

Analyte	Units	Known Val	Result	% Rec	Limit	Batch
Benzene	mg/l	.05	0.0487	97.4	70-130	WG697439
Ethylbenzene	mg/l	.05	0.0463	92.6	70-130	WG697439
Toluene	mg/l	.05	0.0460	92.1	70-130	WG697439
Total Xylene	mg/l	.15	0.141	94.0	70-130	WG697439
a,a,a-Trifluorotoluene(PID)				104.0	55-122	WG697439
TPH (GC/FID) Low Fraction	mg/l	5.5	5.80	105.	67-132	WG697439
a,a,a-Trifluorotoluene(FID)				106.0	62-128	WG697439
TPH (GC/FID) High Fraction	mg/l	1.5	1.26	84.3	50-150	WG697398
o-Terphenyl				80.80	50-150	WG697398
TPH (GC/FID) High Fraction	mg/l	1.5	1.08	72.2	50-150	WG697734
o-Terphenyl				80.30	50-150	WG697734

Laboratory Control Sample Duplicate

Analyte	Units	Result	Ref	%Rec	Limit	RPD	Limit	Batch
Benzene	mg/l	0.0477	0.0487	95.0	70-130	2.04	20	WG697439
Ethylbenzene	mg/l	0.0459	0.0463	92.0	70-130	0.850	20	WG697439
Toluene	mg/l	0.0450	0.0460	90.0	70-130	2.27	20	WG697439
Total Xylene	mg/l	0.138	0.141	92.0	70-130	1.97	20	WG697439
a,a,a-Trifluorotoluene(PID)				105.0	55-122			WG697439
TPH (GC/FID) Low Fraction	mg/l	5.90	5.80	107.	67-132	1.81	20	WG697439
a,a,a-Trifluorotoluene(FID)				105.0	62-128			WG697439
TPH (GC/FID) High Fraction	mg/l	1.22	1.26	81.0	50-150	3.77	20	WG697398
o-Terphenyl				80.70	50-150			WG697398
TPH (GC/FID) High Fraction	mg/l	1.03	1.08	69.0	50-150	4.64	20	WG697734
o-Terphenyl				76.20	50-150			WG697734

Matrix Spike

Analyte	Units	MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
Benzene	mg/l	0.0506	0.0	.05	100.	57.2-131	L674007-01	WG697439
Ethylbenzene	mg/l	0.0487	0.0	.05	98.0	67.5-135	L674007-01	WG697439

* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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Molly Gregersen
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Quality Assurance Report
Level II

L674007

December 26, 2013

Analyte	Units	MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
		Matrix Spike						
Toluene	mg/l	0.0485	0.000296	.05	96.0	63.7-134	L674007-01	WG697439
Total Xylene	mg/l	0.147	0.000433	.15	97.0	65.9-138	L674007-01	WG697439
a,a,a-Trifluorotoluene(PID)					104.0	55-122		WG697439
TPH (GC/FID) Low Fraction	mg/l	5.43	0.0	5.5	99.0	50-143	L674007-01	WG697439
a,a,a-Trifluorotoluene(FID)					105.0	62-128		WG697439
TPH (GC/FID) High Fraction	mg/l	1.09	0.0609	1.5	68.0	50-150	L674007-01	WG697398
o-Terphenyl					64.80	50-150		WG697398

Analyte	Units	MSD	Ref	%Rec	Limit	RPD	Limit	Ref Samp	Batch
		Matrix Spike Duplicate							
Benzene	mg/l	0.0530	0.0506	106.	57.2-131	4.65	20	L674007-01	WG697439
Ethylbenzene	mg/l	0.0509	0.0487	102.	67.5-135	4.37	20	L674007-01	WG697439
Toluene	mg/l	0.0499	0.0485	99.3	63.7-134	3.00	20	L674007-01	WG697439
Total Xylene	mg/l	0.152	0.147	101.	65.9-138	3.83	20	L674007-01	WG697439
a,a,a-Trifluorotoluene(PID)				105.0	55-122				WG697439
TPH (GC/FID) Low Fraction	mg/l	5.72	5.43	104.	50-143	5.10	20	L674007-01	WG697439
a,a,a-Trifluorotoluene(FID)				105.0	62-128				WG697439
TPH (GC/FID) High Fraction	mg/l	0.898	1.09	55.8	50-150	19.2	20	L674007-01	WG697398
o-Terphenyl				58.00	50-150				WG697398

Batch number /Run number / Sample number cross reference

WG697439: R2869184: L674007-01 02 03 04 05 06
WG697398: R2871151 R2871209: L674007-01 02 03 04
WG697734: R2871211: L674007-05 06

* * Calculations are performed prior to rounding of reported values.
* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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Quality Assurance Report
Level II

L674007

December 26, 2013

The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.

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Molly Gregersen
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

Report Summary

Wednesday March 26, 2014

Report Number: L689057
Samples Received: 03/20/14
Client Project:

Description: Williston Refinery

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By: John Hawkins

John Hawkins , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197, FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1, TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364, EPA - TN002

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REPORT OF ANALYSIS

Molly Gregersen
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

March 26, 2014

ESC Sample # : L689057-01

Date Received : March 20, 2014
Description : Williston Refinery

Site ID : WILLISTON, ND

Sample ID : MW8BRR

Project # :

Collected By : Steve Johnson
Collection Date : 03/15/14 14:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021/8015	03/22/14	1
Toluene	BDL	0.0050	mg/l	8021/8015	03/22/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021/8015	03/22/14	1
Total Xylene	BDL	0.0015	mg/l	8021/8015	03/22/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	GRO	03/22/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	100.		% Rec.	8021/8015	03/22/14	1
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021/8015	03/22/14	1
TPH (GC/FID) High Fraction	0.27	0.11	mg/l	3510C / DRO	03/25/14	1.11
Surrogate recovery(%)						
o-Terphenyl	98.6		% Rec.	3510C / DRO	03/25/14	1.11

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
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L689057-01 (DRO) - Cannot run at a lower dilution, dilution due to extractions process.

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REPORT OF ANALYSIS

Molly Gregersen
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

March 26, 2014

ESC Sample # : L689057-02

Date Received : March 20, 2014
Description : Williston Refinery

Site ID : WILLISTON, ND

Sample ID : MW9R

Project # :

Collected By : Steve Johnson
Collection Date : 03/15/14 13:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021/8015	03/22/14	1
Toluene	BDL	0.0050	mg/l	8021/8015	03/22/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021/8015	03/22/14	1
Total Xylene	BDL	0.0015	mg/l	8021/8015	03/22/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	GRO	03/22/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	100.		% Rec.	8021/8015	03/22/14	1
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021/8015	03/22/14	1
TPH (GC/FID) High Fraction	0.84	0.11	mg/l	3510C / DRO	03/25/14	1.11
Surrogate recovery(%)						
o-Terphenyl	95.7		% Rec.	3510C / DRO	03/25/14	1.11

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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L689057-02 (DRO) - Cannot run at a lower dilution, dilution due to extractions process

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REPORT OF ANALYSIS

Molly Gregersen
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

March 26, 2014

ESC Sample # : L689057-03

Date Received : March 20, 2014
Description : Williston Refinery

Site ID : WILLISTON, ND

Sample ID : MW10R

Project # :

Collected By : Steve Johnson
Collection Date : 03/15/14 12:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021/8015	03/22/14	1
Toluene	BDL	0.0050	mg/l	8021/8015	03/22/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021/8015	03/22/14	1
Total Xylene	BDL	0.0015	mg/l	8021/8015	03/22/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	GRO	03/22/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	100.		% Rec.	8021/8015	03/22/14	1
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021/8015	03/22/14	1
TPH (GC/FID) High Fraction	0.16	0.10	mg/l	3510C / DRO	03/25/14	1
Surrogate recovery(%)						
o-Terphenyl	94.9		% Rec.	3510C / DRO	03/25/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Molly Gregersen
Big West Oil, LLC.
333 West Center Street
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March 26, 2014

ESC Sample # : L689057-04

Date Received : March 20, 2014
Description : Williston Refinery

Site ID : WILLISTON, ND

Sample ID : MW87-08R

Project # :

Collected By : Steve Johnson
Collection Date : 03/15/14 16:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021/8015	03/23/14	1
Toluene	BDL	0.0050	mg/l	8021/8015	03/23/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021/8015	03/23/14	1
Total Xylene	BDL	0.0015	mg/l	8021/8015	03/23/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	GRO	03/23/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	99.9		% Rec.	8021/8015	03/23/14	1
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021/8015	03/23/14	1
TPH (GC/FID) High Fraction	0.39	0.10	mg/l	3510C / DRO	03/25/14	1
Surrogate recovery(%)						
o-Terphenyl	103.		% Rec.	3510C / DRO	03/25/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Molly Gregersen
Big West Oil, LLC.
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March 26, 2014

ESC Sample # : L689057-05

Date Received : March 20, 2014
Description : Williston Refinery

Site ID : WILLISTON, ND

Sample ID : MW90-01R

Project # :

Collected By : Steve Johnson
Collection Date : 03/15/14 18:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021/8015	03/23/14	1
Toluene	BDL	0.0050	mg/l	8021/8015	03/23/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021/8015	03/23/14	1
Total Xylene	BDL	0.0015	mg/l	8021/8015	03/23/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	GRO	03/23/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	100.		% Rec.	8021/8015	03/23/14	1
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021/8015	03/23/14	1
TPH (GC/FID) High Fraction	0.18	0.11	mg/l	3510C / DRO	03/25/14	1.11
Surrogate recovery(%)						
o-Terphenyl	100.		% Rec.	3510C / DRO	03/25/14	1.11

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
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REPORT OF ANALYSIS

Molly Gregersen
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

March 26, 2014

ESC Sample # : L689057-06

Date Received : March 20, 2014
Description : Williston Refinery

Site ID : WILLISTON, ND

Sample ID : DUPLICATE

Project # :

Collected By : Steve Johnson
Collection Date : 03/15/14 13:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021/8015	03/23/14	1
Toluene	BDL	0.0050	mg/l	8021/8015	03/23/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021/8015	03/23/14	1
Total Xylene	BDL	0.0015	mg/l	8021/8015	03/23/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	GRO	03/23/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	101.		% Rec.	8021/8015	03/23/14	1
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021/8015	03/23/14	1
TPH (GC/FID) High Fraction	0.96	0.10	mg/l	3510C / DRO	03/26/14	1
Surrogate recovery(%)						
o-Terphenyl	106.		% Rec.	3510C / DRO	03/26/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
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Reported: 03/26/14 15:41 Printed: 03/26/14 15:41

Summary of Remarks For Samples Printed
03/26/14 at 15:41:58

TSR Signing Reports: 341
R5 - Desired TAT

EDD = Geotracker JVH 7-14-2011 QC4 EDD = 4-file EQuIS Format JVH 12-13-12

Sample: L689057-01 Account: BIGWESTUT Received: 03/20/14 09:30 Due Date: 03/31/14 00:00 RPT Date: 03/26/14 15:41

Sample: L689057-02 Account: BIGWESTUT Received: 03/20/14 09:30 Due Date: 03/31/14 00:00 RPT Date: 03/26/14 15:41

Sample: L689057-03 Account: BIGWESTUT Received: 03/20/14 09:30 Due Date: 03/31/14 00:00 RPT Date: 03/26/14 15:41
MS/MSD this sample
Sample: L689057-04 Account: BIGWESTUT Received: 03/20/14 09:30 Due Date: 03/31/14 00:00 RPT Date: 03/26/14 15:41

Sample: L689057-05 Account: BIGWESTUT Received: 03/20/14 09:30 Due Date: 03/31/14 00:00 RPT Date: 03/26/14 15:41

Sample: L689057-06 Account: BIGWESTUT Received: 03/20/14 09:30 Due Date: 03/31/14 00:00 RPT Date: 03/26/14 15:41

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Big West Oil, LLC.
Molly Gregersen
333 West Center Street

North Salt Lake, UT 84054

Quality Assurance Report
Level II

L689057

March 26, 2014

Laboratory Blank

Analyte	Result	Units	% Rec	Limit	Batch	Date Analyzed
Benzene	< .0005	mg/l			WG712305	03/22/14 21:09
Ethylbenzene	< .0005	mg/l			WG712305	03/22/14 21:09
Toluene	< .005	mg/l			WG712305	03/22/14 21:09
TPH (GC/FID) Low Fraction	< .1	mg/l			WG712305	03/22/14 21:09
Total Xylene	< .0015	mg/l			WG712305	03/22/14 21:09
a,a,a-Trifluorotoluene(FID)		% Rec.	101.0	62-128	WG712305	03/22/14 21:09
a,a,a-Trifluorotoluene(PID)		% Rec.	100.0	55-122	WG712305	03/22/14 21:09
TPH (GC/FID) High Fraction	< .1	mg/l			WG711947	03/24/14 17:14
o-Terphenyl		% Rec.	90.60	50-150	WG711947	03/24/14 17:14

Laboratory Control Sample

Analyte	Units	Known Val	Result	% Rec	Limit	Batch
Benzene	mg/l	.05	0.0478	95.6	70-130	WG712305
Ethylbenzene	mg/l	.05	0.0496	99.2	70-130	WG712305
Toluene	mg/l	.05	0.0469	93.8	70-130	WG712305
Total Xylene	mg/l	.15	0.145	96.8	70-130	WG712305
a,a,a-Trifluorotoluene(PID)				101.0	55-122	WG712305
TPH (GC/FID) Low Fraction	mg/l	5.5	5.00	91.0	67-132	WG712305
a,a,a-Trifluorotoluene(FID)				100.0	62-128	WG712305
TPH (GC/FID) High Fraction	mg/l	1.5	1.13	75.1	50-150	WG711947
o-Terphenyl				97.60	50-150	WG711947

Laboratory Control Sample Duplicate

Analyte	Units	Result	Ref	%Rec	Limit	RPD	Limit	Batch
Benzene	mg/l	0.0490	0.0478	98.0	70-130	2.54	20	WG712305
Ethylbenzene	mg/l	0.0507	0.0496	101.	70-130	2.19	20	WG712305
Toluene	mg/l	0.0478	0.0469	96.0	70-130	1.81	20	WG712305
Total Xylene	mg/l	0.148	0.145	98.0	70-130	1.72	20	WG712305
a,a,a-Trifluorotoluene(PID)				103.0	55-122			WG712305
TPH (GC/FID) Low Fraction	mg/l	5.10	5.00	93.0	67-132	1.93	20	WG712305
a,a,a-Trifluorotoluene(FID)				100.0	62-128			WG712305
TPH (GC/FID) High Fraction	mg/l	1.18	1.13	79.0	50-150	4.82	20	WG711947
o-Terphenyl				103.0	50-150			WG711947

Matrix Spike

Analyte	Units	MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
Benzene	mg/l	0.0495	0.000103	.05	99.0	57.2-131	L689057-03	WG712305
Ethylbenzene	mg/l	0.0515	0.0000663	.05	100.	67.5-135	L689057-03	WG712305
Toluene	mg/l	0.0491	0.000193	.05	98.0	63.7-134	L689057-03	WG712305
Total Xylene	mg/l	0.151	0.000267	.15	100.	65.9-138	L689057-03	WG712305
a,a,a-Trifluorotoluene(PID)					101.0	55-122		WG712305
TPH (GC/FID) Low Fraction	mg/l	4.84	0.0	5.5	88.0	50-143	L689057-03	WG712305
a,a,a-Trifluorotoluene(FID)					99.10	62-128		WG712305
TPH (GC/FID) High Fraction	mg/l	1.18	0.159	1.5	68.0	50-150	L689057-03	WG711947
o-Terphenyl					81.00	50-150		WG711947

* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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Big West Oil, LLC.
Molly Gregersen
333 West Center Street

North Salt Lake, UT 84054

Quality Assurance Report
Level II

L689057

March 26, 2014

Analyte	Units	Matrix Spike MSD	Ref	Duplicate %Rec	Limit	RPD	Limit	Ref Samp	Batch
Benzene	mg/l	0.0508	0.0495	101.	57.2-131	2.75	20	L689057-03	WG712305
Ethylbenzene	mg/l	0.0529	0.0515	106.	67.5-135	2.58	20	L689057-03	WG712305
Toluene	mg/l	0.0498	0.0491	99.1	63.7-134	1.31	20	L689057-03	WG712305
Total Xylene	mg/l	0.154	0.151	102.	65.9-138	2.13	20	L689057-03	WG712305
a,a,a-Trifluorotoluene(PID)				101.0	55-122				WG712305
TPH (GC/FID) Low Fraction	mg/l	5.18	4.84	94.1	50-143	6.71	20	L689057-03	WG712305
a,a,a-Trifluorotoluene(FID)				100.0	62-128				WG712305
TPH (GC/FID) High Fraction	mg/l	1.13	1.18	65.0	50-150	3.65	20	L689057-03	WG711947
o-Terphenyl				78.90	50-150				WG711947

Batch number /Run number / Sample number cross reference

WG712305: R2897260: L689057-01 02 03 04 05 06
WG711947: R2897447 R2897792: L689057-01 02 03 04 05 06

* * Calculations are performed prior to rounding of reported values.
* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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Quality Assurance Report
Level II

L689057

March 26, 2014

The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.

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Molly Gregersen
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

Report Summary

Friday June 20, 2014

Report Number: L704679
Samples Received: 06/13/14
Client Project:

Description: Williston Refinery

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By: John Hawkins

John Hawkins , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197, FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1, TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364, EPA - TN002

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REPORT OF ANALYSIS

Molly Gregersen
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

June 20, 2014

ESC Sample # : L704679-01

Date Received : June 13, 2014
Description : Williston Refinery

Site ID : WILLISTON, ND

Sample ID : MW8BRR

Project # :

Collected By : Steve Johnston
Collection Date : 06/11/14 13:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021B	06/18/14	1
Toluene	BDL	0.0050	mg/l	8021B	06/18/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021B	06/18/14	1
Total Xylene	BDL	0.0015	mg/l	8021B	06/18/14	1
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	104.		% Rec.	8021B	06/18/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015D/GRO	06/18/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	98.5		% Rec.	8015D/GRO	06/18/14	1
TPH (GC/FID) High Fraction	0.35	0.10	mg/l	3510C / DRO	06/18/14	1
Surrogate recovery(%)						
o-Terphenyl	88.6		% Rec.	3510C / DRO	06/18/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
The reported analytical results relate only to the sample submitted.
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REPORT OF ANALYSIS

Molly Gregersen
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

June 20, 2014

ESC Sample # : L704679-02

Date Received : June 13, 2014
Description : Williston Refinery

Site ID : WILLISTON, ND

Sample ID : MW9R

Project # :

Collected By : Steve Johnston
Collection Date : 06/11/14 12:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.00057	0.00050	mg/l	8021B	06/18/14	1
Toluene	BDL	0.0050	mg/l	8021B	06/18/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021B	06/18/14	1
Total Xylene	BDL	0.0015	mg/l	8021B	06/18/14	1
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	103.		% Rec.	8021B	06/18/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015D/GRO	06/18/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	98.3		% Rec.	8015D/GRO	06/18/14	1
TPH (GC/FID) High Fraction	0.67	0.10	mg/l	3510C / DRO	06/18/14	1
Surrogate recovery(%)						
o-Terphenyl	92.1		% Rec.	3510C / DRO	06/18/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Molly Gregersen
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

June 20, 2014

ESC Sample # : L704679-03

Date Received : June 13, 2014
Description : Williston Refinery

Site ID : WILLISTON, ND

Sample ID : MW10R

Project # :

Collected By : Steve Johnston
Collection Date : 06/11/14 14:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021B	06/19/14	1
Toluene	BDL	0.0050	mg/l	8021B	06/19/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021B	06/19/14	1
Total Xylene	BDL	0.0015	mg/l	8021B	06/19/14	1
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	105.		% Rec.	8021B	06/19/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015D/GRO	06/19/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	99.2		% Rec.	8015D/GRO	06/19/14	1
TPH (GC/FID) High Fraction	0.20	0.10	mg/l	3510C / DRO	06/18/14	1
Surrogate recovery(%)						
o-Terphenyl	100.		% Rec.	3510C / DRO	06/18/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Molly Gregersen
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

June 20, 2014

ESC Sample # : L704679-04

Date Received : June 13, 2014
Description : Williston Refinery

Site ID : WILLISTON, ND

Sample ID : MW87-08R

Project # :

Collected By : Steve Johnston
Collection Date : 06/11/14 10:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021B	06/18/14	1
Toluene	BDL	0.0050	mg/l	8021B	06/18/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021B	06/18/14	1
Total Xylene	BDL	0.0015	mg/l	8021B	06/18/14	1
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	103.		% Rec.	8021B	06/18/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015D/GRO	06/18/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	97.9		% Rec.	8015D/GRO	06/18/14	1
TPH (GC/FID) High Fraction	0.42	0.10	mg/l	3510C / DRO	06/18/14	1
Surrogate recovery(%)						
o-Terphenyl	96.6		% Rec.	3510C / DRO	06/18/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Molly Gregersen
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

June 20, 2014

ESC Sample # : L704679-05

Date Received : June 13, 2014
Description : Williston Refinery

Site ID : WILLISTON, ND

Sample ID : MW90-01R

Project # :

Collected By : Steve Johnston
Collection Date : 06/11/14 16:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021B	06/18/14	1
Toluene	BDL	0.0050	mg/l	8021B	06/18/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021B	06/18/14	1
Total Xylene	BDL	0.0015	mg/l	8021B	06/18/14	1
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	103.		% Rec.	8021B	06/18/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015D/GRO	06/18/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	98.1		% Rec.	8015D/GRO	06/18/14	1
TPH (GC/FID) High Fraction	0.17	0.10	mg/l	3510C / DRO	06/18/14	1
Surrogate recovery(%)						
o-Terphenyl	78.4		% Rec.	3510C / DRO	06/18/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Molly Gregersen
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

June 20, 2014

ESC Sample # : L704679-06

Date Received : June 13, 2014
Description : Williston Refinery

Site ID : WILLISTON, ND

Sample ID : DUPLICATE

Project # :

Collected By : Steve Johnston
Collection Date : 06/11/14 12:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.00051	0.00050	mg/l	8021B	06/18/14	1
Toluene	BDL	0.0050	mg/l	8021B	06/18/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021B	06/18/14	1
Total Xylene	BDL	0.0015	mg/l	8021B	06/18/14	1
Surrogate Recovery(%)						
a,a,a-Trifluorotoluene(PID)	104.		% Rec.	8021B	06/18/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015D/GRO	06/18/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	98.7		% Rec.	8015D/GRO	06/18/14	1
TPH (GC/FID) High Fraction	0.55	0.10	mg/l	3510C / DRO	06/18/14	1
Surrogate recovery(%)						
o-Terphenyl	79.2		% Rec.	3510C / DRO	06/18/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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Summary of Remarks For Samples Printed
06/20/14 at 10:20:56

TSR Signing Reports: 341
R5 - Desired TAT

EDD = Geotracker JVH 7-14-2011 QC4 EDD = 4-file EQuIS Format JVH 12-13-12

Sample: L704679-01 Account: BIGWESTUT Received: 06/13/14 09:00 Due Date: 06/24/14 00:00 RPT Date: 06/20/14 10:20

Sample: L704679-02 Account: BIGWESTUT Received: 06/13/14 09:00 Due Date: 06/24/14 00:00 RPT Date: 06/20/14 10:20

Sample: L704679-03 Account: BIGWESTUT Received: 06/13/14 09:00 Due Date: 06/24/14 00:00 RPT Date: 06/20/14 10:20
MS/MSD
Sample: L704679-04 Account: BIGWESTUT Received: 06/13/14 09:00 Due Date: 06/24/14 00:00 RPT Date: 06/20/14 10:20

Sample: L704679-05 Account: BIGWESTUT Received: 06/13/14 09:00 Due Date: 06/24/14 00:00 RPT Date: 06/20/14 10:20

Sample: L704679-06 Account: BIGWESTUT Received: 06/13/14 09:00 Due Date: 06/24/14 00:00 RPT Date: 06/20/14 10:20

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Big West Oil, LLC.
Molly Gregersen
333 West Center Street

North Salt Lake, UT 84054

Quality Assurance Report
Level II

L704679

June 20, 2014

Laboratory Blank

Analyte	Result	Units	% Rec	Limit	Batch	Date Analyzed
Benzene	< .0005	mg/l			WG726834	06/17/14 18:12
Ethylbenzene	< .0005	mg/l			WG726834	06/17/14 18:12
Toluene	< .005	mg/l			WG726834	06/17/14 18:12
TPH (GC/FID) Low Fraction	< .1	mg/l			WG726834	06/17/14 18:12
Total Xylene	< .0015	mg/l			WG726834	06/17/14 18:12
a,a,a-Trifluorotoluene(FID)		% Rec.	99.50	62-128	WG726834	06/17/14 18:12
a,a,a-Trifluorotoluene(PID)		% Rec.	105.0	55-122	WG726834	06/17/14 18:12
TPH (GC/FID) High Fraction	< .1	mg/l			WG726810	06/18/14 12:19
o-Terphenyl		% Rec.	94.40	50-150	WG726810	06/18/14 12:19
Benzene	< .0005	mg/l			WG727390	06/19/14 15:04
Ethylbenzene	< .0005	mg/l			WG727390	06/19/14 15:04
Toluene	< .005	mg/l			WG727390	06/19/14 15:04
TPH (GC/FID) Low Fraction	< .1	mg/l			WG727390	06/19/14 15:04
Total Xylene	< .0015	mg/l			WG727390	06/19/14 15:04
a,a,a-Trifluorotoluene(FID)		% Rec.	99.50	62-128	WG727390	06/19/14 15:04
a,a,a-Trifluorotoluene(PID)		% Rec.	105.0	55-122	WG727390	06/19/14 15:04

Laboratory Control Sample

Analyte	Units	Known Val	Result	% Rec	Limit	Batch
Benzene	mg/l	.05	0.0484	96.7	70-130	WG726834
Ethylbenzene	mg/l	.05	0.0495	99.0	70-130	WG726834
Toluene	mg/l	.05	0.0497	99.3	70-130	WG726834
Total Xylene	mg/l	.15	0.151	101.	70-130	WG726834
a,a,a-Trifluorotoluene(FID)				99.40	62-128	WG726834
a,a,a-Trifluorotoluene(PID)				104.0	55-122	WG726834
TPH (GC/FID) Low Fraction	mg/l	5.5	4.81	87.4	67-132	WG726834
a,a,a-Trifluorotoluene(FID)				99.60	62-128	WG726834
a,a,a-Trifluorotoluene(PID)				113.0	55-122	WG726834
TPH (GC/FID) High Fraction	mg/l	1.5	1.27	84.8	50-150	WG726810
o-Terphenyl				101.0	50-150	WG726810
Benzene	mg/l	.05	0.0495	98.9	70-130	WG727390
Ethylbenzene	mg/l	.05	0.0511	102.	70-130	WG727390
Toluene	mg/l	.05	0.0510	102.	70-130	WG727390
Total Xylene	mg/l	.15	0.156	104.	70-130	WG727390
a,a,a-Trifluorotoluene(PID)				104.0	55-122	WG727390
TPH (GC/FID) Low Fraction	mg/l	5.5	5.00	90.9	67-132	WG727390
a,a,a-Trifluorotoluene(FID)				101.0	62-128	WG727390

Laboratory Control Sample Duplicate

Analyte	Units	Result	Ref	%Rec	Limit	RPD	Limit	Batch
Benzene	mg/l	0.0475	0.0484	95.0	70-130	1.87	20	WG726834
Ethylbenzene	mg/l	0.0484	0.0495	97.0	70-130	2.35	20	WG726834
Toluene	mg/l	0.0483	0.0497	97.0	70-130	2.69	20	WG726834
Total Xylene	mg/l	0.148	0.151	98.0	70-130	2.40	20	WG726834
a,a,a-Trifluorotoluene(FID)				99.40	62-128			WG726834
a,a,a-Trifluorotoluene(PID)				104.0	55-122			WG726834
TPH (GC/FID) Low Fraction	mg/l	4.71	4.81	86.0	67-132	2.16	20	WG726834
a,a,a-Trifluorotoluene(FID)				99.20	62-128			WG726834
a,a,a-Trifluorotoluene(PID)				113.0	55-122			WG726834

* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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Big West Oil, LLC.
Molly Gregersen
333 West Center Street

North Salt Lake, UT 84054

Quality Assurance Report
Level II

L704679

June 20, 2014

Analyte	Units	Laboratory Control Sample Duplicate Result	Ref	%Rec	Limit	RPD	Limit	Batch
TPH (GC/FID) High Fraction	mg/l	1.22	1.27	81.0	50-150	4.60	20	WG726810
o-Terphenyl				97.70	50-150			WG726810
Benzene	mg/l	0.0460	0.0495	92.0	70-130	7.21	20	WG727390
Ethylbenzene	mg/l	0.0473	0.0511	95.0	70-130	7.81	20	WG727390
Toluene	mg/l	0.0471	0.0510	94.0	70-130	7.99	20	WG727390
Total Xylene	mg/l	0.144	0.156	96.0	70-130	8.07	20	WG727390
a,a,a-Trifluorotoluene(PID)				104.0	55-122			WG727390
TPH (GC/FID) Low Fraction	mg/l	4.95	5.00	90.0	67-132	1.06	20	WG727390
a,a,a-Trifluorotoluene(FID)				100.0	62-128			WG727390

Analyte	Units	Matrix Spike MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
Benzene	mg/l	0.0512	0.0127	.05	77.0	57.2-131	L704765-01	WG726834
Ethylbenzene	mg/l	0.0680	0.0	.05	140.*	67.5-135	L704765-01	WG726834
Toluene	mg/l	0.0725	0.0392	.05	67.0	63.7-134	L704765-01	WG726834
Total Xylene	mg/l	0.200	0.0856	.15	76.0	65.9-138	L704765-01	WG726834
a,a,a-Trifluorotoluene(FID)					129.0*	62-128		WG726834
a,a,a-Trifluorotoluene(PID)					165.0*	55-122		WG726834
TPH (GC/FID) Low Fraction	mg/l	6.62	4.40	5.5	40.0*	50-143	L704765-01	WG726834
a,a,a-Trifluorotoluene(FID)					130.0*	62-128		WG726834
a,a,a-Trifluorotoluene(PID)					171.0*	55-122		WG726834
TPH (GC/FID) High Fraction	mg/l	1.37	0.199	1.5	78.0	50-150	L704679-03	WG726810
o-Terphenyl					96.20	50-150		WG726810
Benzene	mg/l	0.0491	0.000116	.05	98.0	57.2-131	L704679-03	WG727390
Ethylbenzene	mg/l	0.0515	0.0000708	.05	100.	67.5-135	L704679-03	WG727390
Toluene	mg/l	0.0515	0.000356	.05	100.	63.7-134	L704679-03	WG727390
Total Xylene	mg/l	0.158	0.000441	.15	100.	65.9-138	L704679-03	WG727390
a,a,a-Trifluorotoluene(PID)					104.0	55-122		WG727390
TPH (GC/FID) Low Fraction	mg/l	4.91	0.0	5.5	89.0	50-143	L704679-03	WG727390
a,a,a-Trifluorotoluene(FID)					101.0	62-128		WG727390

Analyte	Units	Matrix Spike Duplicate MSD	Ref	%Rec	Limit	RPD	Limit	Ref Samp	Batch
Benzene	mg/l	0.0538	0.0512	82.2	57.2-131	4.83	20	L704765-01	WG726834
Ethylbenzene	mg/l	0.0769	0.0680	154.*	67.5-135	12.3	20	L704765-01	WG726834
Toluene	mg/l	0.0813	0.0725	84.2	63.7-134	11.4	20	L704765-01	WG726834
Total Xylene	mg/l	0.245	0.200	106.	65.9-138	20.4*	20	L704765-01	WG726834
a,a,a-Trifluorotoluene(FID)				134.0*	62-128				WG726834
a,a,a-Trifluorotoluene(PID)				175.0*	55-122				WG726834
TPH (GC/FID) Low Fraction	mg/l	5.38	6.62	17.8*	50-143	20.6*	20	L704765-01	WG726834
a,a,a-Trifluorotoluene(FID)				128.0	62-128				WG726834
a,a,a-Trifluorotoluene(PID)				168.0*	55-122				WG726834
TPH (GC/FID) High Fraction	mg/l	1.45	1.37	83.2	50-150	5.72	20	L704679-03	WG726810
o-Terphenyl				102.0	50-150				WG726810
Benzene	mg/l	0.0480	0.0491	95.8	57.2-131	2.26	20	L704679-03	WG727390
Ethylbenzene	mg/l	0.0495	0.0515	98.9	67.5-135	3.85	20	L704679-03	WG727390
Toluene	mg/l	0.0493	0.0515	98.0	63.7-134	4.34	20	L704679-03	WG727390

* Performance of this Analyte is outside of established criteria.
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Level II

L704679

June 20, 2014

Analyte	Units	MSD	Matrix Spike Duplicate Ref	%Rec	Limit	RPD	Limit	Ref Samp	Batch
Total Xylene	mg/l	0.152	0.158	101.	65.9-138	4.21	20	L704679-03	WG727390
a,a,a-Trifluorotoluene(PID)				104.0	55-122				WG727390
TPH (GC/FID) Low Fraction	mg/l	4.38	4.91	79.6	50-143	11.5	20	L704679-03	WG727390
a,a,a-Trifluorotoluene(FID)				99.00	62-128				WG727390

Batch number /Run number / Sample number cross reference

WG726834: R2943407: L704679-01 02 04 05 06
WG726810: R2944206: L704679-01 02 03 04 05 06
WG727390: R2945029: L704679-03

* * Calculations are performed prior to rounding of reported values.
* Performance of this Analyte is outside of established criteria.
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June 20, 2014

The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.

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Quality Control Summary
SDG: L723764

For: Big West Oil, LLC.
Williston Refinery Groundwater Monitoring

L723764

Lab SampleID.	Client ID
L723764-01	MW-T3
L723764-02	MW-W2
L723764-03	MW-X3
L723764-04	MW-Y
L723764-05	MW-1BR
L723764-06	MW-8BRR
L723764-07	MW-9R
L723764-08	MW-10R
L723764-09	MW-89-07
L723764-10	MW-00-16
L723764-11	MW-PR
L723764-12	MW-T1R
L723764-13	MW-U1R
L723764-14	MW-W1R
L723764-15	MW-WL-11
L723764-16	MW-X1R
L723764-17	MW-87-08 DUP
L723764-18	MW-1BR DUP
L723764-22	MW-87-16 DUP
L723764-23	MW-1C

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Quality Control Summary
SDG: L723764

For: Big West Oil, LLC.
Williston Refinery Groundwater Monitoring

L723764

Lab SampleID.	Client ID
L723764-24	MW-87-08
L723764-25	MW-87-14
L723764-26	MW-87-16
L723764-27	MW-87-25
L723764-28	MW-89-05
L723764-29	MW-90-01R
L723764-30	MW-C2
L723764-31	MW-K
L723764-32	MW-M

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Quality Control Summary
SDG: L723764

For: Big West Oil, LLC.
Project: Williston Refinery Groundwater
October 13, 2014

Sample Receiving and Handling

All sample aliquots were received at the correct temperature, in the proper containers, and with the appropriate preservatives. All method specified holding times were met.

Volatile TPH by Method 8015 and Method 8021

Laboratory Control Sample

Samples L723764-01, -02, -03, -04, -05, -06, -07, -08, -09, -10, -11, -12, -13, -14, -15, -16, -17, -18, -22, and -23 were analyzed in analytical batch WG745111. The laboratory control sample associated with these samples was within the laboratory control limits for all target analytes reported from this batch. The relative percent difference was within laboratory limits for all target analytes reported from this batch.

Samples L723764-25, -26, -27, and -28 were analyzed in analytical batch WG745112. The laboratory control sample associated with these samples was within the laboratory control limits for all target analytes reported from this batch. The relative percent difference was within laboratory limits for all target analytes reported from this batch.

Samples L723764-24, -29, -30, and -31 were analyzed in analytical batch WG746730. The laboratory control sample associated with these samples was within the laboratory control limits for all target analytes reported from this batch. The relative percent difference was within laboratory limits for all target analytes reported from this batch.

Sample L723764-32 was analyzed in analytical batch WG746853. The laboratory control sample associated with this sample was within the laboratory control limits for all target analytes reported from this batch. The relative percent difference was within laboratory limits for all target analytes reported from this batch.

Matrix Spike/Matrix Spike Duplicate

For analytical batch WG745111 matrix spike/matrix spike duplicate analysis was performed on sample L723764-13. The matrix spike recoveries and relative percent differences were within laboratory control limits for all target analytes reported from this batch.

For analytical batch WG745112 matrix spike/matrix spike duplicate analysis was performed on sample L723592-05. The matrix spike recoveries and relative percent differences were within laboratory control limits for all target analytes reported from this batch.

For analytical batch WG746730 matrix spike/matrix spike duplicate analysis was performed on sample L723764-24. The matrix spike recoveries and relative percent differences were within laboratory control limits for all target analytes reported from this batch.

For analytical batch WG746853 matrix spike/matrix spike duplicate analysis was performed on sample L724977-06. The matrix spike recoveries and relative percent differences were within laboratory control limits for all target analytes reported from this batch.

Blank Analysis

The method blank, the initial, and all continuing calibration blanks contained no analytes at concentrations above the method reporting limit.

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Quality Control Summary
SDG: L723764

For: Big West Oil, LLC.
Project: Williston Refinery Groundwater
October 13, 2014

Calibration Summary
Instrument VOCGC6 was calibrated on 8/22/2014. The initial calibration and continuing calibration verification standards were within method limits.

Instrument VOCGC1 was calibrated on 9/9/2014. The initial calibration and continuing calibration verification standards were within method limits.

Instrument VOCGC10 was calibrated on 9/24/2014. The initial calibration and continuing calibration verification standards were within method limits.

Surrogate Summary
The surrogate recoveries were within method limits for all samples.

Internal Standards
The internal standard responses and retention times were within method limits for all samples and quality control samples.

Diesel Range Organics by Method 3511/8015
Laboratory Control Sample
Samples L723764-04, -06, -07, -08, -09, -10, -11, -12, -16, and -17 were analyzed in analytical batch WG744850. The laboratory control sample associated with these samples was within the laboratory control limits for all target analytes reported from this batch. The relative percent difference was within laboratory limits for all target analytes reported from this batch.

Samples L723764-13, -14, -15, -18, -22, -23, -25, -26, -27, -28, -29, -30, -31, -32, -01, -02, -03, and -05 were analyzed in analytical batch WG745252. The laboratory control sample associated with these samples was within the laboratory control limits for all target analytes reported from this batch. The relative percent difference was within laboratory limits for all target analytes reported from this batch.

Sample L723764-24 was analyzed in analytical batch WG745389. The laboratory control sample associated with this sample was within the laboratory control limits for all target analytes reported from this batch. The relative percent difference was within laboratory limits for all target analytes reported from this batch.

Matrix Spike/Matrix Spike Duplicate
Precision for batch WG744850 was evaluated using the LCS/LCSD. The RPDs were within method limits.

For analytical batch WG745252 matrix spike/matrix spike duplicate analysis was performed on sample L723764-13. The matrix spike recoveries and relative percent differences were within laboratory control limits for all target analytes reported from this batch.

For analytical batch WG745389 matrix spike/matrix spike duplicate analysis was performed on sample L723764-24. The matrix spike recoveries and relative percent differences were within laboratory control limits for all target analytes reported from this batch.

Blank Analysis
The method blank, the initial, and all continuing calibration blanks contained no analytes at concentrations above the method reporting limit.

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Quality Control Summary
SDG: L723764

For: Big West Oil, LLC.
Project: Williston Refinery Groundwater
October 13, 2014

Calibration Summary
Instrument SVGC21 was calibrated on 9/10/2014. The initial calibration and continuing calibration verification standards were within method limits.

Surrogate Summary
Surrogate recovery in sample L723764-01 20x and L723764-03 20x could not be evaluated due to sample dilution. The surrogate recoveries were outside the laboratory control limits for L723764-10. The surrogate recoveries for the remaining samples were within method limits.

Nancy F. McLain
ESC Representative
ESC Lab Sciences

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Liegh Beem
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

Report Summary

Thursday October 09, 2014

Report Number: L723764
Samples Received: 09/25/14
Client Project:

Description: Williston Refinery

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By: John Hawkins

John Hawkins , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197, FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1, TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364, EPA - TN002

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REPORT OF ANALYSIS

Liegh Beem
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

October 09, 2014

ESC Sample # : L723764-01

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-T3

Project # :

Collected By : Steve Johnston
Collection Date : 09/23/14 19:30

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.0028	0.00050	mg/l	8021	10/06/14	1
Toluene	BDL	0.0050	mg/l	8021	10/06/14	1
Ethylbenzene	0.0052	0.00050	mg/l	8021	10/06/14	1
Total Xylene	0.0082	0.0015	mg/l	8021	10/06/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	10/06/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	101.		% Rec.	8015	10/06/14	1
a,a,a-Trifluorotoluene(PID)	102.		% Rec.	8021	10/06/14	1
TPH (GC/FID) High Fraction	30.	2.0	mg/l	3511/8015	09/27/14	20
Surrogate recovery(%)						
o-Terphenyl	247.		% Rec.	3511/8015	09/27/14	20

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Liegh Beem
Big West Oil, LLC.
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October 09, 2014

ESC Sample # : L723764-02

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-W2

Project # :

Collected By : Steve Johnston
Collection Date : 09/23/14 14:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	10/06/14	1
Toluene	BDL	0.0050	mg/l	8021	10/06/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	10/06/14	1
Total Xylene	BDL	0.0015	mg/l	8021	10/06/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	10/06/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	100.		% Rec.	8015	10/06/14	1
a,a,a-Trifluorotoluene(PID)	103.		% Rec.	8021	10/06/14	1
TPH (GC/FID) High Fraction	BDL	0.10	mg/l	3511/8015	09/27/14	1
Surrogate recovery(%)						
o-Terphenyl	101.		% Rec.	3511/8015	09/27/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Liegh Beem
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October 09, 2014

ESC Sample # : L723764-03

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-X3

Project # :

Collected By : Steve Johnston
Collection Date : 09/23/14 09:50

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.15	0.050	mg/l	8021	10/06/14	100
Toluene	BDL	0.50	mg/l	8021	10/06/14	100
Ethylbenzene	0.20	0.050	mg/l	8021	10/06/14	100
Total Xylene	BDL	0.15	mg/l	8021	10/06/14	100
TPH (GC/FID) Low Fraction	BDL	10.	mg/l	8015	10/06/14	100
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	99.8		% Rec.	8015	10/06/14	100
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021	10/06/14	100
TPH (GC/FID) High Fraction	24.	2.0	mg/l	3511/8015	09/27/14	20
Surrogate recovery(%)						
o-Terphenyl	1260		% Rec.	3511/8015	09/27/14	20

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

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October 09, 2014

ESC Sample # : L723764-04

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-Y

Project # :

Collected By : Steve Johnston
Collection Date : 09/22/14 14:30

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	10/06/14	1
Toluene	BDL	0.0050	mg/l	8021	10/06/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	10/06/14	1
Total Xylene	BDL	0.0015	mg/l	8021	10/06/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	10/06/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	100.		% Rec.	8015	10/06/14	1
a,a,a-Trifluorotoluene(PID)	104.		% Rec.	8021	10/06/14	1
TPH (GC/FID) High Fraction	0.12	0.10	mg/l	3511/8015	09/30/14	1
Surrogate recovery(%)						
o-Terphenyl	59.6		% Rec.	3511/8015	09/30/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Liegh Beem
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

October 09, 2014

ESC Sample # : L723764-05

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-1BR

Project # :

Collected By : Steve Johnston
Collection Date : 09/23/14 15:45

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	10/06/14	1
Toluene	BDL	0.0050	mg/l	8021	10/06/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	10/06/14	1
Total Xylene	BDL	0.0015	mg/l	8021	10/06/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	10/06/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	100.		% Rec.	8015	10/06/14	1
a,a,a-Trifluorotoluene(PID)	102.		% Rec.	8021	10/06/14	1
TPH (GC/FID) High Fraction	0.19	0.10	mg/l	3511/8015	09/27/14	1
Surrogate recovery(%)						
o-Terphenyl	106.		% Rec.	3511/8015	09/27/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Liegh Beem
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

October 09, 2014

ESC Sample # : L723764-06

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-8BRR

Project # :

Collected By : Steve Johnston
Collection Date : 09/22/14 16:30

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	10/06/14	1
Toluene	BDL	0.0050	mg/l	8021	10/06/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	10/06/14	1
Total Xylene	BDL	0.0015	mg/l	8021	10/06/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	10/06/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	99.6		% Rec.	8015	10/06/14	1
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021	10/06/14	1
TPH (GC/FID) High Fraction	0.29	0.10	mg/l	3511/8015	09/30/14	1
Surrogate recovery(%)						
o-Terphenyl	106.		% Rec.	3511/8015	09/30/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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Liegh Beem
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

October 09, 2014

ESC Sample # : L723764-07

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-9R

Project # :

Collected By : Steve Johnston
Collection Date : 09/22/14 17:40

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	10/06/14	1
Toluene	BDL	0.0050	mg/l	8021	10/06/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	10/06/14	1
Total Xylene	BDL	0.0015	mg/l	8021	10/06/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	10/06/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	100.		% Rec.	8015	10/06/14	1
a,a,a-Trifluorotoluene(PID)	102.		% Rec.	8021	10/06/14	1
TPH (GC/FID) High Fraction	0.55	0.10	mg/l	3511/8015	09/30/14	1
Surrogate recovery(%)						
o-Terphenyl	113.		% Rec.	3511/8015	09/30/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Liegh Beem
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

October 09, 2014

ESC Sample # : L723764-08

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-10R

Project # :

Collected By : Steve Johnston
Collection Date : 09/22/14 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	10/06/14	1
Toluene	BDL	0.0050	mg/l	8021	10/06/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	10/06/14	1
Total Xylene	BDL	0.0015	mg/l	8021	10/06/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	10/06/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	99.6		% Rec.	8015	10/06/14	1
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021	10/06/14	1
TPH (GC/FID) High Fraction	0.10	0.10	mg/l	3511/8015	09/30/14	1
Surrogate recovery(%)						
o-Terphenyl	106.		% Rec.	3511/8015	09/30/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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Liegh Beem
Big West Oil, LLC.
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October 09, 2014

ESC Sample # : L723764-09

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-89-07

Project # :

Collected By : Steve Johnston
Collection Date : 09/22/14 15:45

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	5.3	0.050	mg/l	8021	10/06/14	100
Toluene	BDL	0.50	mg/l	8021	10/06/14	100
Ethylbenzene	0.10	0.050	mg/l	8021	10/06/14	100
Total Xylene	0.30	0.15	mg/l	8021	10/06/14	100
TPH (GC/FID) Low Fraction	BDL	10.	mg/l	8015	10/06/14	100
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	98.1		% Rec.	8015	10/06/14	100
a,a,a-Trifluorotoluene(PID)	103.		% Rec.	8021	10/06/14	100
TPH (GC/FID) High Fraction	2.4	0.10	mg/l	3511/8015	09/30/14	1
Surrogate recovery(%)						
o-Terphenyl	80.0		% Rec.	3511/8015	09/30/14	1

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Det. Limit - Practical Quantitation Limit(PQL)
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Liegh Beem
Big West Oil, LLC.
333 West Center Street
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October 09, 2014

ESC Sample # : L723764-10

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-00-16

Project # :

Collected By : Steve Johnston
Collection Date : 09/22/14 18:30

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.0010	0.00050	mg/l	8021	10/06/14	1
Toluene	BDL	0.0050	mg/l	8021	10/06/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	10/06/14	1
Total Xylene	BDL	0.0015	mg/l	8021	10/06/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	10/06/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	98.0		% Rec.	8015	10/06/14	1
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021	10/06/14	1
TPH (GC/FID) High Fraction	0.15	0.10	mg/l	3511/8015	09/30/14	1
Surrogate recovery(%)						
o-Terphenyl	164.		% Rec.	3511/8015	09/30/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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Liegh Beem
Big West Oil, LLC.
333 West Center Street
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October 09, 2014

ESC Sample # : L723764-11

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-PR

Project # :

Collected By : Steve Johnston
Collection Date : 09/22/14 15:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	10/06/14	1
Toluene	BDL	0.0050	mg/l	8021	10/06/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	10/06/14	1
Total Xylene	BDL	0.0015	mg/l	8021	10/06/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	10/06/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	99.6		% Rec.	8015	10/06/14	1
a,a,a-Trifluorotoluene(PID)	102.		% Rec.	8021	10/06/14	1
TPH (GC/FID) High Fraction	0.11	0.10	mg/l	3511/8015	09/30/14	1
Surrogate recovery(%)						
o-Terphenyl	55.3		% Rec.	3511/8015	09/30/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Liegh Beem
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

October 09, 2014

ESC Sample # : L723764-12

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-T1R

Project # :

Collected By : Steve Johnston
Collection Date : 09/22/14 15:45

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	1.0	0.010	mg/l	8021	10/06/14	20
Toluene	BDL	0.10	mg/l	8021	10/06/14	20
Ethylbenzene	0.028	0.010	mg/l	8021	10/06/14	20
Total Xylene	0.039	0.030	mg/l	8021	10/06/14	20
TPH (GC/FID) Low Fraction	BDL	2.0	mg/l	8015	10/06/14	20
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	99.6		% Rec.	8015	10/06/14	20
a,a,a-Trifluorotoluene(PID)	103.		% Rec.	8021	10/06/14	20
TPH (GC/FID) High Fraction	0.23	0.10	mg/l	3511/8015	09/30/14	1
Surrogate recovery(%)						
o-Terphenyl	52.9		% Rec.	3511/8015	09/30/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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Liegh Beem
Big West Oil, LLC.
333 West Center Street
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October 09, 2014

ESC Sample # : L723764-13

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-U1R

Project # :

Collected By : Steve Johnston
Collection Date : 09/23/14 19:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	10/06/14	1
Toluene	BDL	0.0050	mg/l	8021	10/06/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	10/06/14	1
Total Xylene	BDL	0.0015	mg/l	8021	10/06/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	10/06/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	100.		% Rec.	8015	10/06/14	1
a,a,a-Trifluorotoluene(PID)	102.		% Rec.	8021	10/06/14	1
TPH (GC/FID) High Fraction	0.81	0.10	mg/l	3511/8015	09/26/14	1
Surrogate recovery(%)						
o-Terphenyl	114.		% Rec.	3511/8015	09/26/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Liegh Beem
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

October 09, 2014

ESC Sample # : L723764-14

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-W1R

Project # :

Collected By : Steve Johnston
Collection Date : 09/23/14 13:30

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	10/06/14	1
Toluene	BDL	0.0050	mg/l	8021	10/06/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	10/06/14	1
Total Xylene	BDL	0.0015	mg/l	8021	10/06/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	10/06/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	99.7		% Rec.	8015	10/06/14	1
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021	10/06/14	1
TPH (GC/FID) High Fraction	0.17	0.10	mg/l	3511/8015	09/26/14	1
Surrogate recovery(%)						
o-Terphenyl	108.		% Rec.	3511/8015	09/26/14	1

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REPORT OF ANALYSIS

Liegh Beem
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

October 09, 2014

ESC Sample # : L723764-15

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-WL-11

Project # :

Collected By : Steve Johnston
Collection Date : 09/23/14 11:30

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	10/06/14	1
Toluene	BDL	0.0050	mg/l	8021	10/06/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	10/06/14	1
Total Xylene	BDL	0.0015	mg/l	8021	10/06/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	10/06/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	99.6		% Rec.	8015	10/06/14	1
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021	10/06/14	1
TPH (GC/FID) High Fraction	BDL	0.10	mg/l	3511/8015	09/26/14	1
Surrogate recovery(%)						
o-Terphenyl	106.		% Rec.	3511/8015	09/26/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Liegh Beem
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

October 09, 2014

ESC Sample # : L723764-16

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-X1R

Project # :

Collected By : Steve Johnston
Collection Date : 09/22/14 16:50

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	10/06/14	1
Toluene	BDL	0.0050	mg/l	8021	10/06/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	10/06/14	1
Total Xylene	BDL	0.0015	mg/l	8021	10/06/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	10/06/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	99.5		% Rec.	8015	10/06/14	1
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021	10/06/14	1
TPH (GC/FID) High Fraction	BDL	0.10	mg/l	3511/8015	09/30/14	1
Surrogate recovery(%)						
o-Terphenyl	107.		% Rec.	3511/8015	09/30/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

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Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

October 09, 2014

ESC Sample # : L723764-17

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-87-08 DUP

Project # :

Collected By : Steve Johnston
Collection Date : 09/22/14 13:35

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	10/06/14	1
Toluene	BDL	0.0050	mg/l	8021	10/06/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	10/06/14	1
Total Xylene	BDL	0.0015	mg/l	8021	10/06/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	10/06/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	99.9		% Rec.	8015	10/06/14	1
a,a,a-Trifluorotoluene(PID)	103.		% Rec.	8021	10/06/14	1
TPH (GC/FID) High Fraction	0.28	0.10	mg/l	3511/8015	09/30/14	1
Surrogate recovery(%)						
o-Terphenyl	109.		% Rec.	3511/8015	09/30/14	1

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Big West Oil, LLC.
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North Salt Lake, UT 84054

October 09, 2014

ESC Sample # : L723764-18

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-1BR DUP

Project # :

Collected By : Steve Johnston
Collection Date : 09/22/14 15:50

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	10/06/14	1
Toluene	BDL	0.0050	mg/l	8021	10/06/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	10/06/14	1
Total Xylene	BDL	0.0015	mg/l	8021	10/06/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	10/06/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	99.5		% Rec.	8015	10/06/14	1
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021	10/06/14	1
TPH (GC/FID) High Fraction	1.4	0.10	mg/l	3511/8015	09/26/14	1
Surrogate recovery(%)						
o-Terphenyl	107.		% Rec.	3511/8015	09/26/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Liegh Beem
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

October 09, 2014

ESC Sample # : L723764-22

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-87-16 DUP

Project # :

Collected By : Steve Johnston
Collection Date : 09/23/14 12:30

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	10/07/14	1
Toluene	BDL	0.0050	mg/l	8021	10/07/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	10/07/14	1
Total Xylene	BDL	0.0015	mg/l	8021	10/07/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	10/07/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	100.		% Rec.	8015	10/07/14	1
a,a,a-Trifluorotoluene(PID)	104.		% Rec.	8021	10/07/14	1
TPH (GC/FID) High Fraction	0.26	0.10	mg/l	3511/8015	09/26/14	1
Surrogate recovery(%)						
o-Terphenyl	110.		% Rec.	3511/8015	09/26/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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Liegh Beem
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

October 09, 2014

ESC Sample # : L723764-23

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-1C

Project # :

Collected By : Steve Johnston
Collection Date : 09/23/14 17:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	10/07/14	1
Toluene	BDL	0.0050	mg/l	8021	10/07/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	10/07/14	1
Total Xylene	BDL	0.0015	mg/l	8021	10/07/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	10/07/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	100.		% Rec.	8015	10/07/14	1
a,a,a-Trifluorotoluene(PID)	102.		% Rec.	8021	10/07/14	1
TPH (GC/FID) High Fraction	0.40	0.10	mg/l	3511/8015	09/27/14	1
Surrogate recovery(%)						
o-Terphenyl	105.		% Rec.	3511/8015	09/27/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Liegh Beem
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

October 09, 2014

ESC Sample # : L723764-24

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-87-08

Project # :

Collected By : Steve Johnston
Collection Date : 09/22/14 13:30

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	10/06/14	1
Toluene	BDL	0.0050	mg/l	8021	10/06/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	10/06/14	1
Total Xylene	BDL	0.0015	mg/l	8021	10/06/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	10/06/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	95.8		% Rec.	8015	10/06/14	1
a,a,a-Trifluorotoluene(PID)	103.		% Rec.	8021	10/06/14	1
TPH (GC/FID) High Fraction	0.53	0.10	mg/l	3511/8015	09/30/14	1
Surrogate recovery(%)						
o-Terphenyl	104.		% Rec.	3511/8015	09/30/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Liegh Beem
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

October 09, 2014

ESC Sample # : L723764-25

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-87-14

Project # :

Collected By : Steve Johnston
Collection Date : 09/23/14 10:45

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	6.4	0.025	mg/l	8021	09/27/14	50
Toluene	BDL	0.25	mg/l	8021	09/27/14	50
Ethylbenzene	0.15	0.025	mg/l	8021	09/27/14	50
Total Xylene	0.099	0.075	mg/l	8021	09/27/14	50
TPH (GC/FID) Low Fraction	12.	5.0	mg/l	8015	09/27/14	50
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	97.5		% Rec.	8015	09/27/14	50
a,a,a-Trifluorotoluene(PID)	101.		% Rec.	8021	09/27/14	50
TPH (GC/FID) High Fraction	1.1	0.10	mg/l	3511/8015	09/27/14	1
Surrogate recovery(%)						
o-Terphenyl	96.1		% Rec.	3511/8015	09/27/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Liegh Beem
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

October 09, 2014

ESC Sample # : L723764-26

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-87-16

Project # :

Collected By : Steve Johnston
Collection Date : 09/23/14 12:25

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	09/27/14	1
Toluene	BDL	0.0050	mg/l	8021	09/27/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	09/27/14	1
Total Xylene	BDL	0.0015	mg/l	8021	09/27/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	09/27/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	97.0		% Rec.	8015	09/27/14	1
a,a,a-Trifluorotoluene(PID)	102.		% Rec.	8021	09/27/14	1
TPH (GC/FID) High Fraction	1.7	0.10	mg/l	3511/8015	09/27/14	1
Surrogate recovery(%)						
o-Terphenyl	108.		% Rec.	3511/8015	09/27/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

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North Salt Lake, UT 84054

October 09, 2014

ESC Sample # : L723764-27

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-87-25

Project # :

Collected By : Steve Johnston
Collection Date : 09/23/14 18:15

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	09/27/14	1
Toluene	BDL	0.0050	mg/l	8021	09/27/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	09/27/14	1
Total Xylene	BDL	0.0015	mg/l	8021	09/27/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	09/27/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	97.4		% Rec.	8015	09/27/14	1
a,a,a-Trifluorotoluene(PID)	102.		% Rec.	8021	09/27/14	1
TPH (GC/FID) High Fraction	0.33	0.10	mg/l	3511/8015	09/27/14	1
Surrogate recovery(%)						
o-Terphenyl	102.		% Rec.	3511/8015	09/27/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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333 West Center Street
North Salt Lake, UT 84054

October 09, 2014

ESC Sample # : L723764-28

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-89-05

Project # :

Collected By : Steve Johnston
Collection Date : 09/22/14 19:30

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.22	0.0050	mg/l	8021	09/27/14	10
Toluene	BDL	0.050	mg/l	8021	09/27/14	10
Ethylbenzene	0.0082	0.0050	mg/l	8021	09/27/14	10
Total Xylene	0.019	0.015	mg/l	8021	09/27/14	10
TPH (GC/FID) Low Fraction	1.3	1.0	mg/l	8015	09/27/14	10
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	96.9		% Rec.	8015	09/27/14	10
a,a,a-Trifluorotoluene(PID)	102.		% Rec.	8021	09/27/14	10
TPH (GC/FID) High Fraction	8.8	0.10	mg/l	3511/8015	09/27/14	1
Surrogate recovery(%)						
o-Terphenyl	113.		% Rec.	3511/8015	09/27/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Liegh Beem
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October 09, 2014

ESC Sample # : L723764-29

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-90-01R

Project # :

Collected By : Steve Johnston
Collection Date : 09/23/14 13:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	10/06/14	1
Toluene	BDL	0.0050	mg/l	8021	10/06/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	10/06/14	1
Total Xylene	BDL	0.0015	mg/l	8021	10/06/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	10/06/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	95.7		% Rec.	8015	10/06/14	1
a,a,a-Trifluorotoluene(PID)	103.		% Rec.	8021	10/06/14	1
TPH (GC/FID) High Fraction	0.31	0.20	mg/l	3511/8015	09/27/14	2
Surrogate recovery(%)						
o-Terphenyl	77.9		% Rec.	3511/8015	09/27/14	2

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

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333 West Center Street
North Salt Lake, UT 84054

October 09, 2014

ESC Sample # : L723764-30

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-C2

Project # :

Collected By : Steve Johnston
Collection Date : 09/22/14 13:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.22	0.025	mg/l	8021	10/06/14	50
Toluene	BDL	0.25	mg/l	8021	10/06/14	50
Ethylbenzene	BDL	0.025	mg/l	8021	10/06/14	50
Total Xylene	BDL	0.075	mg/l	8021	10/06/14	50
TPH (GC/FID) Low Fraction	BDL	5.0	mg/l	8015	10/06/14	50
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	95.8		% Rec.	8015	10/06/14	50
a,a,a-Trifluorotoluene(PID)	103.		% Rec.	8021	10/06/14	50
TPH (GC/FID) High Fraction	11.	0.20	mg/l	3511/8015	09/27/14	2
Surrogate recovery(%)						
o-Terphenyl	102.		% Rec.	3511/8015	09/27/14	2

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Liegh Beem
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

October 09, 2014

ESC Sample # : L723764-31

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-K

Project # :

Collected By : Steve Johnston
Collection Date : 09/23/14 10:50

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	10/06/14	1
Toluene	BDL	0.0050	mg/l	8021	10/06/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	10/06/14	1
Total Xylene	BDL	0.0015	mg/l	8021	10/06/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	10/06/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	95.9		% Rec.	8015	10/06/14	1
a,a,a-Trifluorotoluene(PID)	103.		% Rec.	8021	10/06/14	1
TPH (GC/FID) High Fraction	0.58	0.10	mg/l	3511/8015	09/27/14	1
Surrogate recovery(%)						
o-Terphenyl	104.		% Rec.	3511/8015	09/27/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Liegh Beem
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

October 09, 2014

ESC Sample # : L723764-32

Date Received : September 25, 2014
Description : Williston Refinery Groundwater Monitoring

Site ID : WILLISTON, ND

Sample ID : MW-M

Project # :

Collected By : Steve Johnston
Collection Date : 09/22/14 14:30

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	0.70	0.00050	mg/l	8021	10/06/14	1
Toluene	0.0064	0.0050	mg/l	8021	10/06/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	10/06/14	1
Total Xylene	0.024	0.0015	mg/l	8021	10/06/14	1
TPH (GC/FID) Low Fraction	1.9	0.10	mg/l	8015	10/06/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	93.5		% Rec.	8015	10/06/14	1
a,a,a-Trifluorotoluene(PID)	104.		% Rec.	8021	10/06/14	1
TPH (GC/FID) High Fraction	4.1	0.20	mg/l	3511/8015	09/27/14	2
Surrogate recovery(%)						
o-Terphenyl	99.5		% Rec.	3511/8015	09/27/14	2

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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Attachment A
List of Analytes with QC Qualifiers

Sample Number	Work Group	Sample Type	Analyte	Run ID	Qualifier
L723764-01	WG745252	SAMP	o-Terphenyl	R2993335	J7
L723764-03	WG745252	SAMP	o-Terphenyl	R2993335	J7
L723764-10	WG744850	SAMP	o-Terphenyl	R2994107	J1
L723764-32	WG746853	SAMP	Benzene	R2995598	E

Attachment B
Explanation of QC Qualifier Codes

Qualifier	Meaning
E	GTL (EPA) - Greater than upper calibration limit: Actual value is known to be greater than the upper calibration range.
J1	Surrogate recovery limits have been exceeded; values are outside upper control limits
J7	Surrogate recovery cannot be used for control limit evaluation due to dilution.

Qualifier Report Information

ESC utilizes sample and result qualifiers as set forth by the EPA Contract Laboratory Program and as required by most certifying bodies including NELAC. In addition to the EPA qualifiers adopted by ESC, we have implemented ESC qualifiers to provide more information pertaining to our analytical results. Each qualifier is designated in the qualifier explanation as either EPA or ESC. Data qualifiers are intended to provide the ESC client with more detailed information concerning the potential bias of reported data. Because of the wide range of constituents and variety of matrices incorporated by most EPA methods,it is common for some compounds to fall outside of established ranges. These exceptions are evaluated and all reported data is valid and useable "unless qualified as 'R' (Rejected)."

Definitions

Accuracy - The relationship of the observed value of a known sample to the true value of a known sample. Represented by percent recovery and relevant to samples such as: control samples, matrix spike recoveries, surrogate recoveries, etc.

Precision - The agreement between a set of samples or between duplicate samples. Relates to how close together the results are and is represented by Relative Percent Differrence.

Surrogate - Organic compounds that are similar in chemical composition, extraction, and chromotography to analytes of interest. The surrogates are used to determine the probable response of the group of analytes that are chemically related to the surrogate compound. Surrogates are added to the sample and carried through all stages of preparation and analyses.

TIC - Tentatively Identified Compound: Compounds detected in samples that are not target compounds, internal standards, system monitoring compounds, or surrogates.

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test:	Volatile TPH by Method 8021		
Project No:		Matrix:	Water - mg/L
Project:	Williston Refinery Groundwater Monitoring	EPA ID:	TN00003
Collection Date:	9/23/2014	**Analytic Batch:**	**WG745111**
Analysis Date:	10/6/2014	Analyst:	621
Instrument ID:	VOCGC6		
Sample Numbers:	L723764-01, -02, -03, -04, -05, -06, -07, -08, -09, -10, -11, -12, -13, -14, -15, -16, -17, -18, -22, -23		

Method Blank

Analyte	CAS	RDL	Qualifier
Benzene	71-43-2	< 0.000500	
Ethylbenzene	100-41-4	< 0.000500	
Toluene	108-88-3	< 0.00500	
TPH (GC/FID) Low Fraction	8006-61-9	< 0.100	
Total Xylene	1330-20-7	< 0.00150	

Parameters in bold text are reported in this SDG

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test:	Volatile TPH by Method 8015		
Project No:		Matrix:	Water - mg/L
Project:	Williston Refinery Groundwater Monitoring	EPA ID:	TN00003
Collection Date:	9/23/2014	**Analytic Batch:**	**WG745112**
Analysis Date:	9/27/2014	Analyst:	621
Instrument ID:	VOCGC1		
Sample Numbers:	L723764-25, -26, -27, -28		

Method Blank

Analyte	CAS	RDL	Qualifier
Benzene	71-43-2	< 0.000500	
Ethylbenzene	100-41-4	< 0.000500	
Toluene	108-88-3	< 0.00500	
TPH (GC/FID) Low Fraction	8006-61-9	< 0.100	
Total Xylene	1330-20-7	< 0.00150	

Parameters in bold text are reported in this SDG

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test:	Volatile TPH by Method 8021		
Project No:		Matrix:	Water - mg/L
Project:	Williston Refinery Groundwater Monitoring	EPA ID:	TN00003
Collection Date:	9/23/2014	**Analytic Batch:**	**WG746730**
Analysis Date:	10/6/2014	Analyst:	621
Instrument ID:	VOCGC10		
Sample Numbers:	L723764-24, -29, -30, -31		

Method Blank

Analyte	CAS	RDL	Qualifier
Benzene	71-43-2	< 0.000500	
Ethylbenzene	100-41-4	< 0.000500	
Toluene	108-88-3	< 0.00500	
TPH (GC/FID) Low Fraction	8006-61-9	< 0.100	
Total Xylene	1330-20-7	< 0.00150	

Parameters in bold text are reported in this SDG

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test:	Volatile TPH by Method 8015		
Project No:		Matrix:	Water - mg/L
Project:	Williston Refinery Groundwater Monitoring	EPA ID:	TN00003
Collection Date:	9/23/2014	**Analytic Batch:**	**WG746853**
Analysis Date:	10/6/2014	Analyst:	621
Instrument ID:	VOCGC1		
Sample Numbers:	L723764-32		

Method Blank

Analyte	CAS	RDL	Qualifier
Benzene	71-43-2	< 0.000500	
Ethylbenzene	100-41-4	< 0.000500	
Toluene	108-88-3	< 0.00500	
TPH (GC/FID) Low Fraction	8006-61-9	< 0.100	
Total Xylene	1330-20-7	< 0.00150	

Parameters in bold text are reported in this SDG

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test:	Volatile TPH by Method 8021		
Project No:		Matrix:	Water - mg/L
Project:	Williston Refinery Groundwater Monitoring	EPA ID:	TN00003
Collection Date:	9/23/2014	**Analytic Batch:**	**WG745111**
Analysis Date:	10/6/2014	Analyst:	621
Instrument ID:	VOCGC6		
Sample Numbers:	L723764-01, -02, -03, -04, -05, -06, -07, -08, -09, -10, -11, -12, -13, -14, -15, -16, -17, -18, -22, -23		

Laboratory Control Sample (LCS)

Analyte	Dil	True Value	Found	% Rec	Control Limits	Qual
Benzene	1	0.05	0.0462	92.5	70 - 130	
Ethylbenzene	1	0.05	0.0479	95.7	70 - 130	
Toluene	1	0.05	0.0470	94.1	70 - 130	
TPH (GC/FID) Low Fraction	1	5.5	6.0598	110	67 - 132	
Total Xylene	1	0.15	0.1410	94	70 - 130	

Laboratory Control Sample Duplicate (LCSD)

Analyte	Dil	True Value	Found	% Rec	Control Limits	Qual
Benzene	1	0.05	0.0459	91.8	70 - 130	
Ethylbenzene	1	0.05	0.0475	95.1	70 - 130	
Toluene	1	0.05	0.0465	92.9	70 - 130	
TPH (GC/FID) Low Fraction	1	5.5	5.1378	93.4	67 - 132	
Total Xylene	1	0.15	0.1395	93	70 - 130	

Laboratory Control Sample / Laboratory Control Sample Duplicate

Analyte	Dil	Spike	LCS	% Rec	LCSD	% Rec	Control Limits	% Rec Qual	% RPD	Control Limits	RPD Qual
Benzene	1	0.05	0.0462	92.5	0.0459	91.8	70 - 130		0.77	20	
Ethylbenzene	1	0.05	0.0479	95.7	0.0475	95.1	70 - 130		0.7	20	
Toluene	1	0.05	0.0470	94.1	0.0465	92.9	70 - 130		1.23	20	
TPH (GC/FID) Low Fraction	1	5.5	6.0598	110	5.1378	93.4	67 - 132		16.5	20	
Total Xylene	1	0.15	0.1410	94	0.1395	93	70 - 130		1.07	20	

Parameters in bold text are reported in this SDG

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test:	Volatile TPH by Method 8015		
Project No:		Matrix:	Water - mg/L
Project:	Williston Refinery Groundwater Monitoring	EPA ID:	TN00003
Collection Date:	9/23/2014	**Analytic Batch:**	**WG745112**
Analysis Date:	9/27/2014	Analyst:	621
Instrument ID:	VOCGC1		
Sample Numbers:	L723764-25, -26, -27, -28		

Laboratory Control Sample (LCS)

Analyte	Dil	True Value	Found	% Rec	Control Limits	Qual
Benzene	1	0.05	0.0496	99.3	70 - 130	
Ethylbenzene	1	0.05	0.0516	103	70 - 130	
Toluene	1	0.05	0.0510	102	70 - 130	
TPH (GC/FID) Low Fraction	1	5.5	4.6784	85.1	67 - 132	
Total Xylene	1	0.15	0.1565	104	70 - 130	

Laboratory Control Sample Duplicate (LCSD)

Analyte	Dil	True Value	Found	% Rec	Control Limits	Qual
Benzene	1	0.05	0.0518	104	70 - 130	
Ethylbenzene	1	0.05	0.0532	106	70 - 130	
Toluene	1	0.05	0.0525	105	70 - 130	
TPH (GC/FID) Low Fraction	1	5.5	4.6119	83.9	67 - 132	
Total Xylene	1	0.15	0.1605	107	70 - 130	

Laboratory Control Sample / Laboratory Control Sample Duplicate

Analyte	Dil	Spike	LCS	% Rec	LCSD	% Rec	Control Limits	% Rec Qual	% RPD	Control Limits	RPD Qual
Benzene	1	0.05	0.0496	99.3	0.0518	104	70 - 130		4.25	20	
Ethylbenzene	1	0.05	0.0516	103	0.0532	106	70 - 130		2.99	20	
Toluene	1	0.05	0.0510	102	0.0525	105	70 - 130		2.86	20	
TPH (GC/FID) Low Fraction	1	5.5	4.6784	85.1	4.6119	83.9	67 - 132		1.43	20	
Total Xylene	1	0.15	0.1565	104	0.1605	107	70 - 130		2.54	20	

Parameters in bold text are reported in this SDG

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test:	Volatile TPH by Method 8021		
Project No:		Matrix:	Water - mg/L
Project:	Williston Refinery Groundwater Monitoring	EPA ID:	TN00003
Collection Date:	9/23/2014	**Analytic Batch:**	**WG746730**
Analysis Date:	10/6/2014	Analyst:	621
Instrument ID:	VOCGC10		
Sample Numbers:	L723764-24, -29, -30, -31		

Laboratory Control Sample (LCS)

Analyte	Dil	True Value	Found	% Rec	Control Limits	Qual
Benzene	1	0.05	0.0536	107	70 - 130	
Ethylbenzene	1	0.05	0.0526	105	70 - 130	
Toluene	1	0.05	0.0525	105	70 - 130	
TPH (GC/FID) Low Fraction	1	5.5	4.9322	89.7	67 - 132	
Total Xylene	1	0.15	0.1587	106	70 - 130	

Laboratory Control Sample Duplicate (LCSD)

Analyte	Dil	True Value	Found	% Rec	Control Limits	Qual
Benzene	1	0.05	0.0542	108	70 - 130	
Ethylbenzene	1	0.05	0.0535	107	70 - 130	
Toluene	1	0.05	0.0532	106	70 - 130	
TPH (GC/FID) Low Fraction	1	5.5	4.9295	89.6	67 - 132	
Total Xylene	1	0.15	0.1615	108	70 - 130	

Laboratory Control Sample / Laboratory Control Sample Duplicate

Analyte	Dil	Spike	LCS	% Rec	LCSD	% Rec	Control Limits	% Rec Qual	% RPD	Control Limits	RPD Qual
Benzene	1	0.05	0.0536	107	0.0542	108	70 - 130		1.05	20	
Ethylbenzene	1	0.05	0.0526	105	0.0535	107	70 - 130		1.79	20	
Toluene	1	0.05	0.0525	105	0.0532	106	70 - 130		1.44	20	
TPH (GC/FID) Low Fraction	1	5.5	4.9322	89.7	4.9295	89.6	67 - 132		0.05	20	
Total Xylene	1	0.15	0.1587	106	0.1615	108	70 - 130		1.76	20	

Parameters in bold text are reported in this SDG

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test:	Volatile TPH by Method 8015		
Project No:		Matrix:	Water - mg/L
Project:	Williston Refinery Groundwater Monitoring	EPA ID:	TN00003
Collection Date:	9/23/2014	**Analytic Batch:**	**WG746853**
Analysis Date:	10/6/2014	Analyst:	621
Instrument ID:	VOCGC1		
Sample Numbers:	L723764-32		

Laboratory Control Sample (LCS)

Analyte	Dil	True Value	Found	% Rec	Control Limits	Qual
Benzene	1	0.05	0.0527	105	70 - 130	
Ethylbenzene	1	0.05	0.0546	109	70 - 130	
Toluene	1	0.05	0.0544	109	70 - 130	
TPH (GC/FID) Low Fraction	1	5.5	5.0071	91	67 - 132	
Total Xylene	1	0.15	0.1656	110	70 - 130	

Laboratory Control Sample Duplicate (LCSD)

Analyte	Dil	True Value	Found	% Rec	Control Limits	Qual
Benzene	1	0.05	0.0512	102	70 - 130	
Ethylbenzene	1	0.05	0.0524	105	70 - 130	
Toluene	1	0.05	0.0520	104	70 - 130	
TPH (GC/FID) Low Fraction	1	5.5	5.1790	94.2	67 - 132	
Total Xylene	1	0.15	0.1580	105	70 - 130	

Laboratory Control Sample / Laboratory Control Sample Duplicate

Analyte	Dil	Spike	LCS	% Rec	LCSD	% Rec	Control Limits	% Rec Qual	% RPD	Control Limits	RPD Qual
Benzene	1	0.05	0.0527	105	0.0512	102	70 - 130		2.85	20	
Ethylbenzene	1	0.05	0.0546	109	0.0524	105	70 - 130		4.08	20	
Toluene	1	0.05	0.0544	109	0.0520	104	70 - 130		4.5	20	
TPH (GC/FID) Low Fraction	1	5.5	5.0071	91	5.1790	94.2	67 - 132		3.38	20	
Total Xylene	1	0.15	0.1656	110	0.1580	105	70 - 130		4.68	20	

Parameters in bold text are reported in this SDG

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test:	Volatile TPH by Method 8021		
Project No:		Matrix:	Water - mg/L
Project:	Williston Refinery Groundwater Monitoring	EPA ID:	TN00003
Collection Date:	9/23/2014	**Analytic Batch:**	**WG745111**
Analysis Date:	10/6/2014	Analyst:	621
Instrument ID:	VOCGC6		
Sample Numbers:	L723764-01, -02, -03, -04, -05, -06, -07, -08, -09, -10, -11, -12, -13, -14, -15, -16, -17, -18, -22, -23		

Matrix Spike / Matrix Spike Duplicate

L723764-13

Analyte	Dil	Spike Value	Sample	MS	% Rec	MSD	% Rec	Control Limits	% Rec Qual	RPD	Control Limits	RPD Qual
Benzene	1	0.05	0.0003	0.0452	89.8	0.0464	92.2	57.2 - 131		2.54	20	
Ethylbenzene	1	0.05	0.0002	0.0479	95.4	0.0486	96.8	67.5 - 135		1.44	20	
Toluene	1	0.05	0.0008	0.0478	94	0.0481	94.5	63.7 - 134		0.56	20	
TPH (GC/FID) Low Fraction	1	5.5	0.0	6.4220	117	6.1276	111	50 - 143		4.69	20	
Total Xylene	1	0.15	0.0002	0.1402	93.4	0.1423	94.7	65.9 - 138		1.43	20	

Parameters in bold text are reported in this SDG

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test:	Volatile TPH by Method 8015		
Project No:		Matrix:	Water - mg/L
Project:	Williston Refinery Groundwater Monitoring	EPA ID:	TN00003
Collection Date:	9/23/2014	**Analytic Batch:**	**WG745112**
Analysis Date:	9/27/2014	Analyst:	621
Instrument ID:	VOCGC1		
Sample Numbers:	L723764-25, -26, -27, -28		

Matrix Spike / Matrix Spike Duplicate

L723592-05

Analyte	Dil	Spike Value	Sample	MS	% Rec	MSD	% Rec	Control Limits	% Rec Qual	RPD	Control Limits	RPD Qual
Benzene	1	0.05	0.0014	0.0531	103	0.0552	108	57.2 - 131		3.92	20	
Ethylbenzene	1	0.05	0.0001	0.0539	108	0.0545	109	67.5 - 135		1.2	20	
Toluene	1	0.05	0.0006	0.0539	107	0.0545	108	63.7 - 134		1.14	20	
TPH (GC/FID) Low Fraction	1	5.5	0.0284	4.4532	80.4	4.7939	86.6	50 - 143		7.37	20	
Total Xylene	1	0.15	0.0003	0.1630	108	0.1640	109	65.9 - 138		0.62	20	

Parameters in bold text are reported in this SDG

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test:	Volatile TPH by Method 8021		
Project No:		Matrix:	Water - mg/L
Project:	Williston Refinery Groundwater Monitoring	EPA ID:	TN00003
Collection Date:	9/23/2014	**Analytic Batch:**	**WG746730**
Analysis Date:	10/6/2014	Analyst:	621
Instrument ID:	VOCGC10		
Sample Numbers:	L723764-24, -29, -30, -31		

Matrix Spike / Matrix Spike Duplicate

L723764-24

Analyte	Dil	Spike Value	Sample	MS	% Rec	MSD	% Rec	Control Limits	% Rec Qual	RPD	Control Limits	RPD Qual
Benzene	1	0.05	.00010	0.0458	91.4	0.0464	92.7	57.2 - 131		1.4	20	
Ethylbenzene	1	0.05	.00010	0.0463	92.4	0.0469	93.6	67.5 - 135		1.31	20	
Toluene	1	0.05	0.0002	0.0462	92	0.0462	92	63.7 - 134		0.03	20	
TPH (GC/FID) Low Fraction	1	5.5	0.0	6.0615	110	5.8899	107	50 - 143		2.87	20	
Total Xylene	1	0.15	0.0004	0.1402	93.2	0.1420	94.3	65.9 - 138		1.23	20	

Parameters in bold text are reported in this SDG

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test:	Volatile TPH by Method 8015		
Project No:		Matrix:	Water - mg/L
Project:	Williston Refinery Groundwater Monitoring	EPA ID:	TN00003
Collection Date:	9/23/2014	**Analytic Batch:**	**WG746853**
Analysis Date:	10/6/2014	Analyst:	621
Instrument ID:	VOCGC1		
Sample Numbers:	L723764-32		

Matrix Spike / Matrix Spike Duplicate

L724977-06

Analyte	Dil	Spike Value	Sample	MS	% Rec	MSD	% Rec	Control Limits	% Rec Qual	RPD	Control Limits	RPD Qual
Benzene	1	0.05	0.0005	0.0517	102	0.0559	111	57.2 - 131		7.85	20	
Ethylbenzene	1	0.05	0.0005	0.0537	106	0.0576	114	67.5 - 135		6.99	20	
Toluene	1	0.05	0.0005	0.0536	106	0.0570	113	63.7 - 134		6.16	20	
TPH (GC/FID) Low Fraction	1	5.5	0.0363	4.9616	89.5	4.9769	89.8	50 - 143		0.31	20	
Total Xylene	1	0.15	0.0011	0.1634	108	0.1739	115	65.9 - 138		6.24	20	

Parameters in bold text are reported in this SDG

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test:	Volatile TPH by Method 8021		
Project No:		Matrix:	Water - mg/L
Project:	Williston Refinery Groundwater Monitoring	EPA ID:	TN00003
Collection Date:	9/23/2014	**Analytic Batch:**	**WG745111**
Analysis Date:	10/6/2014	Analyst:	621
Instrument ID:	VOCGC6		
Sample Numbers:	L723764-01, -02, -03, -04, -05, -06, -07, -08, -09, -10, -11, -12, -13, -14, -15, -16, -17, -18, -22, -23		

Surrogate Summary

Laboratory Sample ID	Instrument	File ID	ppm	% Rec	ppm	% Rec
L723764-01	VOCGC6	1006_15	0.201	101	0.204	102
L723764-02	VOCGC6	1006_16	0.200	100	0.206	103
L723764-03 100x	VOCGC6	1006_17	0.200	99.8	0.203	101
L723764-04	VOCGC6	1006_18	0.201	100	0.207	104
L723764-05	VOCGC6	1006_19	0.201	100	0.203	102
L723764-06	VOCGC6	1006_20	0.199	99.6	0.202	101
L723764-07	VOCGC6	1006_21	0.201	100	0.204	102
L723764-08	VOCGC6	1006_22	0.199	99.6	0.202	101
L723764-09 100x	VOCGC6	1006_23	0.196	98.1	0.206	103
L723764-10	VOCGC6	1006_28	0.196	98.0	0.203	101
L723764-11	VOCGC6	1006_29	0.199	99.6	0.203	102
L723764-12 20x	VOCGC6	1006_30	0.199	99.6	0.206	103
L723764-13	VOCGC6	1006_14	0.201	100	0.204	102
L723764-14	VOCGC6	1006_31	0.199	99.7	0.203	101
L723764-15	VOCGC6	1006_36	0.199	99.6	0.203	101
L723764-16	VOCGC6	1006_33	0.199	99.5	0.202	101
L723764-17	VOCGC6	1006_34	0.200	99.9	0.206	103
L723764-18	VOCGC6	1006_35	0.199	99.5	0.203	101
L723764-22	VOCGC6	1006_37	0.200	100	0.208	104
L723764-23	VOCGC6	1006_38	0.200	100	0.203	102
LCS WG745111	VOCGC6	1006_04	0.199	99.7	0.203	102
LCSD WG745111	VOCGC6	1006_05	0.200	99.8	0.205	102
LCS WG745111	VOCGC6	1006_06	0.200	99.9	0.206	103
LCSD WG745111	VOCGC6	1006_07	0.199	99.4	0.204	102
MS WG745111	VOCGC6	1006_08	0.200	100	0.206	103
MSD WG745111	VOCGC6	1006_09	0.199	99.5	0.206	103
MS WG745111	VOCGC6	1006_10	0.206	103	0.193	96.3
MSD WG745111	VOCGC6	1006_11	0.205	103	0.193	96.7
BLANK WG745111	VOCGC6	1006_13	0.200	99.8	0.205	102

--A,A,A-TRIFLUOROTOLUENE(FID) True Value: 0.2 ppm Limits: 62 - 128

--A,A,A-TRIFLUOROTOLUENE(PID) True Value: 0.2 ppm Limits: 55 - 122

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test:	Volatile TPH by Method 8015		
Project No:		Matrix:	Water - mg/L
Project:	Williston Refinery Groundwater Monitoring	EPA ID:	TN00003
Collection Date:	9/23/2014	**Analytic Batch:**	**WG745112**
Analysis Date:	9/27/2014	Analyst:	621
Instrument ID:	VOCGC1		
Sample Numbers:	L723764-25, -26, -27, -28		

Surrogate Summary

Laboratory Sample ID	Instrument	File ID	ppm	% Rec	ppm	% Rec
L723764-25 50x	VOCGC1	0926_82	0.195	97.5	0.202	101
L723764-26	VOCGC1	0926_83	0.194	97.0	0.203	102
L723764-27	VOCGC1	0926_84	0.195	97.4	0.204	102
L723764-28 10x	VOCGC1	0926_85	0.194	96.9	0.205	102
LCS WG745112	VOCGC1	0926_50	0.197	98.6	0.203	102
LCSD WG745112	VOCGC1	0926_51	0.197	98.4	0.203	102
LCS WG745112	VOCGC1	0926_52	0.196	98.2	0.223	112
LCSD WG745112	VOCGC1	0926_53	0.200	99.8	0.223	111
MS WG745112	VOCGC1	0926_54	0.194	96.9	0.200	100
MSD WG745112	VOCGC1	0926_55	0.194	96.8	0.200	100
MS WG745112	VOCGC1	0926_56	0.194	97.0	0.219	109
MSD WG745112	VOCGC1	0926_57	0.192	95.9	0.220	110
BLANK WG745112	VOCGC1	0926_60	0.197	98.3	0.206	103

--A,A,A-TRIFLUOROTOLUENE(FID) True Value: 0.2 ppm Limits: 62 - 128

--A,A,A-TRIFLUOROTOLUENE(PID) True Value: 0.2 ppm Limits: 55 - 122

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test:	Volatile TPH by Method 8021		
Project No:		Matrix:	Water - mg/L
Project:	Williston Refinery Groundwater Monitoring	EPA ID:	TN00003
Collection Date:	9/23/2014	**Analytic Batch:**	**WG746730**
Analysis Date:	10/6/2014	Analyst:	621
Instrument ID:	VOCGC10		
Sample Numbers:	L723764-24, -29, -30, -31		

Surrogate Summary

Laboratory Sample ID	Instrument	File ID	ppm	% Rec	ppm	% Rec
L723764-24	VOCGC10	1006_15	0.192	95.8	0.206	103
L723764-29	VOCGC10	1006_18	0.191	95.7	0.207	103
L723764-30 50x	VOCGC10	1006_19	0.192	95.8	0.207	103
L723764-31	VOCGC10	1006_20	0.192	95.9	0.207	103
LCS WG746730	VOCGC10	1006_04	0.192	95.9	0.206	103
LCSD WG746730	VOCGC10	1006_05	0.192	95.9	0.207	103
LCS WG746730	VOCGC10	1006_07	0.207	103	0.226	113
LCSD WG746730	VOCGC10	1006_08	0.206	103	0.227	113
MS WG746730	VOCGC10	1006_09	0.193	96.3	0.206	103
MSD WG746730	VOCGC10	1006_10	0.192	96.1	0.206	103
MS WG746730	VOCGC10	1006_11	0.213	106	0.236	118
MSD WG746730	VOCGC10	1006_12	0.210	105	0.235	117
BLANK WG746730	VOCGC10	1006_14	0.192	96.1	0.207	104

--A,A,A-TRIFLUOROTOLUENE(FID) True Value: 0.2 ppm Limits: 62 - 128

--A,A,A-TRIFLUOROTOLUENE(PID) True Value: 0.2 ppm Limits: 55 - 122

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test:	Volatile TPH by Method 8015		
Project No:		Matrix:	Water - mg/L
Project:	Williston Refinery Groundwater Monitoring	EPA ID:	TN00003
Collection Date:	9/23/2014	**Analytic Batch:**	**WG746853**
Analysis Date:	10/6/2014	Analyst:	621
Instrument ID:	VOCGC1		
Sample Numbers:	L723764-32		

Surrogate Summary

Laboratory Sample ID	Instrument	File ID	ppm	% Rec	ppm	% Rec
L723764-32	VOCGC1	1006_36	0.187	93.5	0.208	104
LCS WG746853	VOCGC1	1006_24	0.197	98.5	0.204	102
LCSD WG746853	VOCGC1	1006_25	0.197	98.6	0.203	101
LCS WG746853	VOCGC1	1006_26	0.196	98.1	0.225	113
LCSD WG746853	VOCGC1	1006_27	0.197	98.4	0.226	113
MS WG746853	VOCGC1	1006_28	0.193	96.4	0.203	101
MSD WG746853	VOCGC1	1006_29	0.192	96.0	0.202	101
MS WG746853	VOCGC1	1006_30	0.198	98.9	0.225	113
MSD WG746853	VOCGC1	1006_31	0.198	98.9	0.225	113
BLANK WG746853	VOCGC1	1006_33	0.197	98.3	0.207	103

--A,A,A-TRIFLUOROTOLUENE(FID) True Value: 0.2 ppm Limits: 62 - 128

--A,A,A-TRIFLUOROTOLUENE(PID) True Value: 0.2 ppm Limits: 55 - 122

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test: Method 8021
Project No:
Project: Williston Refinery Groundwater Monitoring EPA ID: TN00003
Collection Date: 9/23/2014
Instrument ID: VOCGC6

Continuing Calibration Verification Standard (CCV)

Filename: 1006_02.D
Date Analyzed: 10/6/2014
Time Analyzed: 9:24 AM

Analyte	True Value	Found	Recovery %	Limits
Benzene	0.0500	0.0438	87.5	85 - 115
Toluene	0.0500	0.0458	91.5	85 - 115
Ethylbenzene	0.0500	0.0475	95	85 - 115
m&p-Xylene	0.100	0.0890	89	85 - 115
o-Xylene	0.0500	0.0482	96.5	85 - 115

Continuing Calibration Verification Standard (CCV)

Filename: 1006_03.D
Date Analyzed: 10/6/2014
Time Analyzed: 9:47 AM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) Low	5.50	5.81	106	85 - 115

*** - calibrated by linear regression*

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test: Method 8021
Project No:
Project: Williston Refinery Groundwater Monitoring EPA ID: TN00003
Collection Date: 9/23/2014
Instrument ID: VOCGC6

Continuing Calibration Verification Standard (CCV)

Filename: 1006_25.D
Date Analyzed: 10/6/2014
Time Analyzed: 6:54 PM

Analyte	True Value	Found	Recovery %	Limits
Benzene	0.0500	0.0443	88.6	85 - 115
Toluene	0.0500	0.0478	95.7	85 - 115
Ethylbenzene	0.0500	0.0475	95	85 - 115
m&p-Xylene	0.100	0.0879	87.9	85 - 115
o-Xylene	0.0500	0.0483	96.5	85 - 115

Continuing Calibration Verification Standard (CCV)

Filename: 1006_26.D
Date Analyzed: 10/6/2014
Time Analyzed: 7:17 PM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) Low	5.50	5.64	102	85 - 115

*** - calibrated by linear regression*

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test: Method 8015
Project No:
Project: Williston Refinery Groundwater Monitoring EPA ID: TN00003
Collection Date: 9/23/2014
Instrument ID: VOCGC1

Continuing Calibration Verification Standard (CCV)

Filename: 0926_02.D
Date Analyzed: 9/26/2014
Time Analyzed: 5:06 AM

Analyte	True Value	Found	Recovery %	Limits
Benzene	0.0500	0.0520	104	85 - 115
Toluene	0.0500	0.0538	108	85 - 115
Ethylbenzene	0.0500	0.0547	109	85 - 115
m&p-Xylene	0.100	0.108	108	85 - 115
o-Xylene	0.0500	0.0531	106	85 - 115

Continuing Calibration Verification Standard (CCV)

Filename: 0926_03.D
Date Analyzed: 9/26/2014
Time Analyzed: 5:28 AM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) Low	5.50	5.01	91.1	85 - 115

*** - calibrated by linear regression*

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test: Method 8015
Project No:
Project: Williston Refinery Groundwater Monitoring EPA ID: TN00003
Collection Date: 9/23/2014
Instrument ID: VOCGC1

Continuing Calibration Verification Standard (CCV)

Filename: 0926_34.D
Date Analyzed: 9/26/2014
Time Analyzed: 2:18 PM

Analyte	True Value	Found	Recovery %	Limits
Benzene	0.0500	0.0499	99.8	85 - 115
Toluene	0.0500	0.0519	104	85 - 115
Ethylbenzene	0.0500	0.0522	104	85 - 115
m&p-Xylene	0.100	0.103	103	85 - 115
o-Xylene	0.0500	0.0513	103	85 - 115

Continuing Calibration Verification Standard (CCV)

Filename: 0926_35.D
Date Analyzed: 9/26/2014
Time Analyzed: 2:40 PM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) Low	5.50	4.95	90	85 - 115

*** - calibrated by linear regression*

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test: Method 8015
Project No:
Project: Williston Refinery Groundwater Monitoring EPA ID: TN00003
Collection Date: 9/23/2014
Instrument ID: VOCGC1

Continuing Calibration Verification Standard (CCV)

Filename: 0926_48.D
Date Analyzed: 9/26/2014
Time Analyzed: 11:53 PM

Analyte	True Value	Found	Recovery %	Limits
Benzene	0.0500	0.0506	101	85 - 115
Toluene	0.0500	0.0527	105	85 - 115
Ethylbenzene	0.0500	0.0537	107	85 - 115
m&p-Xylene	0.100	0.106	106	85 - 115
o-Xylene	0.0500	0.0527	105	85 - 115

Continuing Calibration Verification Standard (CCV)

Filename: 0926_49.D
Date Analyzed: 9/27/2014
Time Analyzed: 12:15 AM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) Low	5.50	4.81	87.4	85 - 115

*** - calibrated by linear regression*

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test: Method 8015
Project No:
Project: Williston Refinery Groundwater Monitoring EPA ID: TN00003
Collection Date: 9/23/2014
Instrument ID: VOCGC1

Continuing Calibration Verification Standard (CCV)

Filename: 0926_72.D
Date Analyzed: 9/27/2014
Time Analyzed: 10:26 AM

Analyte	True Value	Found	Recovery %	Limits
Benzene	0.0500	0.0465	93	85 - 115
Toluene	0.0500	0.0500	100	85 - 115
Ethylbenzene	0.0500	0.0504	101	85 - 115
m&p-Xylene	0.100	0.100	100	85 - 115
o-Xylene	0.0500	0.0499	99.8	85 - 115

Continuing Calibration Verification Standard (CCV)

Filename: 0926_74.D
Date Analyzed: 9/27/2014
Time Analyzed: 11:47 AM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) Low	5.50	4.94	89.8	85 - 115

*** - calibrated by linear regression*

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test: Method 8021
Project No:
Project: Williston Refinery Groundwater Monitoring EPA ID: TN00003
Collection Date: 9/23/2014
Instrument ID: VOCGC10

Continuing Calibration Verification Standard (CCV)

Filename: 1006_03.D
Date Analyzed: 10/6/2014
Time Analyzed: 9:58 AM

Analyte	True Value	Found	Recovery %	Limits
Benzene	0.0500	0.0533	107	85 - 115
Toluene	0.0500	0.0540	108	85 - 115
Ethylbenzene	0.0500	0.0545	109	85 - 115
m&p-Xylene	0.100	0.108	108	85 - 115
o-Xylene	0.0500	0.0532	106	85 - 115

Continuing Calibration Verification Standard (CCV)

Filename: 1006_06.D
Date Analyzed: 10/6/2014
Time Analyzed: 11:16 AM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) Low	5.50	5.67	103	85 - 115

*** - calibrated by linear regression*

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test: Method 8021
Project No:
Project: Williston Refinery Groundwater Monitoring EPA ID: TN00003
Collection Date: 9/23/2014
Instrument ID: VOCGC10

Continuing Calibration Verification Standard (CCV)

Filename: 1006_26.D
Date Analyzed: 10/6/2014
Time Analyzed: 7:39 PM

Analyte	True Value	Found	Recovery %	Limits
Benzene	0.0500	0.0536	107	85 - 115
Toluene	0.0500	0.0543	109	85 - 115
Ethylbenzene	0.0500	0.0546	109	85 - 115
m&p-Xylene	0.100	0.108	108	85 - 115
o-Xylene	0.0500	0.0540	108	85 - 115

Continuing Calibration Verification Standard (CCV)

Filename: 1006_28.D
Date Analyzed: 10/6/2014
Time Analyzed: 9:44 PM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) Low	5.50	5.66	103	85 - 115

*** - calibrated by linear regression*

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test: Method 8015
Project No:
Project: Williston Refinery Groundwater Monitoring EPA ID: TN00003
Collection Date: 9/23/2014
Instrument ID: VOCGC1

Continuing Calibration Verification Standard (CCV)

Filename: 1006_03.D
Date Analyzed: 10/6/2014
Time Analyzed: 9:41 AM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) Low	5.50	4.84	88.1	85 - 115

Continuing Calibration Verification Standard (CCV)

Filename: 1006_22.D
Date Analyzed: 10/6/2014
Time Analyzed: 5:39 PM

Analyte	True Value	Found	Recovery %	Limits
Benzene	0.0500	0.0512	102	85 - 115
Toluene	0.0500	0.0531	106	85 - 115
Ethylbenzene	0.0500	0.0536	107	85 - 115
m&p-Xylene	0.100	0.106	106	85 - 115
o-Xylene	0.0500	0.0526	105	85 - 115

*** - calibrated by linear regression*

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test: Method 8015
Project No:
Project: Williston Refinery Groundwater Monitoring EPA ID: TN00003
Collection Date: 9/23/2014
Instrument ID: VOCGC1

Continuing Calibration Verification Standard (CCV)

Filename: 1006_23.D
Date Analyzed: 10/6/2014
Time Analyzed: 6:02 PM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) Low	5.50	4.71	85.6	85 - 115

Continuing Calibration Verification Standard (CCV)

Filename: 1006_45.D
Date Analyzed: 10/7/2014
Time Analyzed: 9:16 AM

Analyte	True Value	Found	Recovery %	Limits
Benzene	0.0500	0.0489	97.9	85 - 115
Toluene	0.0500	0.0511	102	85 - 115
Ethylbenzene	0.0500	0.0517	103	85 - 115
m&p-Xylene	0.100	0.102	102	85 - 115
o-Xylene	0.0500	0.0506	101	85 - 115

*** - calibrated by linear regression*

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test: Method 8015
Project No:
Project: Williston Refinery Groundwater Monitoring EPA ID: TN00003
Collection Date: 9/23/2014
Instrument ID: VOCGC1

Continuing Calibration Verification Standard (CCV)

Filename: 1006_46.D
Date Analyzed: 10/7/2014
Time Analyzed: 9:38 AM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) Low	5.50	5.28	96.1	85 - 115

*** - calibrated by linear regression*

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test:	Diesel Range Organics by Method 3511/8015		
Project No:		Matrix:	Water - mg/L
Project:	Williston Refinery Groundwater Monitoring	EPA ID:	TN00003
Collection Date:	9/23/2014	**Analytic Batch:**	**WG744850**
Analysis Date:	9/29/2014	Analyst:	546
Instrument ID:	SVGC21	Prep Date:	9/24/2014
Sample Numbers:	L723764-04, -06, -07, -08, -09, -10, -11, -12, -16, -17		

Method Blank

Analyte	CAS	RDL	Qualifier
TPH (GC/FID) High Fraction	68334-30-5	< 0.100	

Laboratory Control Sample (LCS)

Analyte	Dil	True Value	Found	% Rec	Control Limits	Qual
TPH (GC/FID) High Fraction	1	1.5	1.5602	104	50 - 150	

Laboratory Control Sample Duplicate (LCSD)

Analyte	Dil	True Value	Found	% Rec	Control Limits	Qual
TPH (GC/FID) High Fraction	1	1.5	1.4262	95.1	50 - 150	

Laboratory Control Sample / Laboratory Control Sample Duplicate

Analyte	Dil	Spike	LCS	% Rec	LCSD	% Rec	Control Limits	% Rec Qual	% RPD	Control RPD Limits	Qual
TPH (GC/FID) High Fraction	1	1.5	1.5602	104	1.4262	95.1	50 - 150		8.97	20	

Parameters in bold text are reported in this SDG

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test:	Diesel Range Organics by Method 3511/8015		
Project No:		Matrix:	Water - mg/L
Project:	Williston Refinery Groundwater Monitoring	EPA ID:	TN00003
Collection Date:	9/23/2014	**Analytic Batch:**	**WG745252**
Analysis Date:	9/26/2014	Analyst:	546
Instrument ID:	SVGC21	Prep Date:	9/26/2014
Sample Numbers:	L723764-13, -14, -15, -18, -22, -23, -25, -26, -27, -28, -29, -30, -31, -32, -01, -02, -03, -05		

Method Blank

Analyte	CAS	RDL	Qualifier
TPH (GC/FID) High Fraction	68334-30-5	< 0.100	

Laboratory Control Sample (LCS)

Analyte	Dil	True Value	Found	% Rec	Control Limits	Qual
TPH (GC/FID) High Fraction	1	1.5	1.5207	101	50 - 150	

Laboratory Control Sample Duplicate (LCSD)

Analyte	Dil	True Value	Found	% Rec	Control Limits	Qual
TPH (GC/FID) High Fraction	1	1.5	1.4914	99.4	50 - 150	

Laboratory Control Sample / Laboratory Control Sample Duplicate

Analyte	Dil	Spike	LCS	% Rec	LCSD	% Rec	Control Limits	% Rec Qual	% RPD	Control Limits	RPD Qual
TPH (GC/FID) High Fraction	1	1.5	1.5207	101	1.4914	99.4	50 - 150		1.95	20	

Parameters in bold text are reported in this SDG

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test:	Diesel Range Organics by Method 3511/8015		
Project No:		Matrix:	Water - mg/L
Project:	Williston Refinery Groundwater Monitoring	EPA ID:	TN00003
Collection Date:	9/23/2014	**Analytic Batch:**	**WG745389**
Analysis Date:	9/30/2014	Analyst:	546
Instrument ID:	SVGC21	Prep Date:	9/26/2014
Sample Numbers:	L723764-24		

Method Blank

Analyte	CAS	RDL	Qualifier
TPH (GC/FID) High Fraction	68334-30-5	< 0.100	

Laboratory Control Sample (LCS)

Analyte	Dil	True Value	Found	% Rec	Control Limits	Qual
TPH (GC/FID) High Fraction	1	1.5	1.4089	93.9	50 - 150	

Laboratory Control Sample Duplicate (LCSD)

Analyte	Dil	True Value	Found	% Rec	Control Limits	Qual
TPH (GC/FID) High Fraction	1	1.5	1.4209	94.7	50 - 150	

Laboratory Control Sample / Laboratory Control Sample Duplicate

Analyte	Dil	Spike	LCS	% Rec	LCSD	% Rec	Control Limits	% Rec Qual	% RPD	Control Limits	RPD Qual
TPH (GC/FID) High Fraction	1	1.5	1.4089	93.9	1.4209	94.7	50 - 150		0.85	20	

Parameters in bold text are reported in this SDG

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test:	Diesel Range Organics by Method 3511/8015		
Project No:		Matrix:	Water - mg/L
Project:	Williston Refinery Groundwater Monitoring	EPA ID:	TN00003
Collection Date:	9/23/2014	**Analytic Batch:**	**WG745252**
Analysis Date:	9/26/2014	Analyst:	546
Instrument ID:	SVGC21	Prep Date:	9/26/2014
Sample Numbers:	L723764-13, -14, -15, -18, -22, -23, -25, -26, -27, -28, -29, -30, -31, -32, -01, -02, -03, -05		

Matrix Spike / Matrix Spike Duplicate

L723764-13

Analyte	Dil	Spike Value	Sample	MS	% Rec	MSD	% Rec	Control Limits	% Rec Qual	RPD	Control Limits	RPD Qual
TPH (GC/FID) High Fraction	1	1.5	0.8118	2.2480	95.7	2.0728	84.1	50 - 150		8.11	20	

Parameters in bold text are reported in this SDG

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test:	Diesel Range Organics by Method 3511/8015		
Project No:		Matrix:	Water - mg/L
Project:	Williston Refinery Groundwater Monitoring	EPA ID:	TN00003
Collection Date:	9/23/2014	**Analytic Batch:**	**WG745389**
Analysis Date:	9/30/2014	Analyst:	546
Instrument ID:	SVGC21	Prep Date:	9/26/2014
Sample Numbers:	L723764-24		

Matrix Spike / Matrix Spike Duplicate

L723764-24

Analyte	Dil	Spike Value	Sample	MS	% Rec	MSD	% Rec	Control Limits	% Rec Qual	RPD	Control Limits	RPD Qual
TPH (GC/FID) High Fraction	1	1.5	0.5279	2.0447	101	2.0569	102	50 - 150		0.6	20	

Parameters in bold text are reported in this SDG

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Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test:	Diesel Range Organics by Method 3511/8015		
Project No:		Matrix:	Water - mg/L
Project:	Williston Refinery Groundwater Monitoring	EPA ID:	TN00003
Collection Date:	9/23/2014	**Analytic Batch:**	**WG744850**
Analysis Date:	9/29/2014	Analyst:	546
Instrument ID:	SVGC21	Prep Date:	9/24/2014
Sample Numbers:	L723764-04, -06, -07, -08, -09, -10, -11, -12, -16, -17		

Surrogate Summary

Laboratory Sample ID	Instrument	File ID	o-Terphenyl ppm	o-Terphenyl % Rec
L723764-04	SVGC21	0930_16	0.0119	59.6
L723764-06	SVGC21	0930_17	0.0211	106
L723764-07	SVGC21	0930_22	0.0225	113
L723764-08	SVGC21	0930_23	0.0211	106
L723764-09	SVGC21	0930_24	0.0160	80.0
L723764-10	SVGC21	0930_25	0.0328	164 J1
L723764-11	SVGC21	0930_26	0.0111	55.3
L723764-12	SVGC21	0930_27	0.0106	52.9
L723764-16	SVGC21	0930_28	0.0213	107
L723764-17	SVGC21	0930_29	0.0217	109
BLANK WG744850	SVGC21	0929_09	0.0236	118
LCS WG744850	SVGC21	0929_10	0.0229	115
LCSD WG744850	SVGC21	0929_11	0.0215	107

o-Terphenyl --O-TERPHENYL True Value: 0.02 ppm Limits: 50 - 150

12065 Lebanon Rd
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Fax (615) 758-5859
Tax I.D 62-0814289
Est. 1970

Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test:	Diesel Range Organics by Method 3511/8015		
Project No:		Matrix:	Water - mg/L
Project:	Williston Refinery Groundwater Monitoring	EPA ID:	TN00003
Collection Date:	9/23/2014	**Analytic Batch:**	**WG745252**
Analysis Date:	9/26/2014	Analyst:	546
Instrument ID:	SVGC21	Prep Date:	9/26/2014
Sample Numbers:	L723764-13, -14, -15, -18, -22, -23, -25, -26, -27, -28, -29, -30, -31, -32, -01, -02, -03, -05		

Surrogate Summary

Laboratory Sample ID	Instrument	File ID	o-Terphenyl ppm	o-Terphenyl % Rec
L723764-01 20x	SVGC21	0927_08	0.0494	247 J7
L723764-02	SVGC21	0927_06	0.0202	101
L723764-03 20x	SVGC21	0927_09	0.251	1260 J7
L723764-05	SVGC21	0927_07	0.0211	106
L723764-13	SVGC21	0924_36	0.0228	114
L723764-14	SVGC21	0924_39	0.0216	108
L723764-15	SVGC21	0924_40	0.0213	106
L723764-18	SVGC21	0924_41	0.0215	107
L723764-22	SVGC21	0924_42	0.0220	110
L723764-23	SVGC21	0924_47	0.0211	105
L723764-25	SVGC21	0924_48	0.0192	96.1
L723764-26	SVGC21	0924_49	0.0216	108
L723764-27	SVGC21	0924_50	0.0203	102
L723764-28	SVGC21	0924_51	0.0225	113
L723764-29 2x	SVGC21	0924_52	0.0156	77.9
L723764-30 2x	SVGC21	0924_53	0.0205	102
L723764-31	SVGC21	0924_54	0.0209	104
L723764-32 2x	SVGC21	0924_55	0.0199	99.5
BLANK WG745252	SVGC21	0924_26	0.0221	111
LCS WG745252	SVGC21	0924_27	0.0223	112
LCSD WG745252	SVGC21	0924_28	0.0220	110
MS WG745252	SVGC21	0924_37	0.0203	101
MSD WG745252	SVGC21	0924_38	0.0182	90.9

o-Terphenyl --O-TERPHENYL True Value: 0.02 ppm Limits: 50 - 150

12065 Lebanon Rd
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Fax (615) 758-5859
Tax I.D 62-0814289
Est. 1970

Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test:	Diesel Range Organics by Method 3511/8015		
Project No:		Matrix:	Water - mg/L
Project:	Williston Refinery Groundwater Monitoring	EPA ID:	TN00003
Collection Date:	9/23/2014	**Analytic Batch:**	**WG745389**
Analysis Date:	9/30/2014	Analyst:	546
Instrument ID:	SVGC21	Prep Date:	9/26/2014
Sample Numbers:	L723764-24		

Surrogate Summary

Laboratory Sample ID	Instrument	File ID	o-Terphenyl ppm	o-Terphenyl % Rec
L723764-24	SVGC21	0930_41	0.0208	104
BLANK WG745389	SVGC21	0930_05	0.0193	96.4
LCS WG745389	SVGC21	0930_06	0.0198	99.1
LCSD WG745389	SVGC21	0930_07	0.0199	99.7
MS WG745389	SVGC21	0930_42	0.0201	100
MSD WG745389	SVGC21	0930_43	0.0201	101

o-Terphenyl --O-TERPHENYL True Value: 0.02 ppm Limits: 50 - 150

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Tax I.D 62-0814289
Est. 1970

Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test: Diesel Range Organics
Project No:
Project: Williston Refinery Groundwater Monitoring EPA ID: TN00003
Collection Date: 9/23/2014
Instrument ID: SVGC21

Continuing Calibration Verification Standard (CCV)

File ID: 0929_04.d
Date Analyzed: 9/29/2014
Time Analyzed: 10:17 AM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) HIGH FRACTION	60.0	57.9	96.5	85 - 115

Continuing Calibration Verification Standard (CCV)

File ID: 0929_07.d
Date Analyzed: 9/29/2014
Time Analyzed: 11:15 AM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) HIGH FRACTION	60.0	58.9	98.2	85 - 115

Continuing Calibration Verification Standard (CCV)

File ID: 0929_16.d
Date Analyzed: 9/29/2014
Time Analyzed: 2:31 PM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) HIGH FRACTION	60.0	59.7	99.5	85 - 115

*** - calibrated by linear regression*

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Fax (615) 758-5859
Tax I.D 62-0814289
Est. 1970

Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test: Diesel Range Organics
Project No:
Project: Williston Refinery Groundwater Monitoring EPA ID: TN00003
Collection Date: 9/23/2014
Instrument ID: SVGC21

Continuing Calibration Verification Standard (CCV)

File ID: 0930_03.d
Date Analyzed: 9/30/2014
Time Analyzed: 10:46 AM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) HIGH FRACTION	60.0	58.4	97.3	85 - 115

Continuing Calibration Verification Standard (CCV)

File ID: 0930_20.d
Date Analyzed: 9/30/2014
Time Analyzed: 4:10 PM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) HIGH FRACTION	60.0	61.9	103	85 - 115

Continuing Calibration Verification Standard (CCV)

File ID: 0930_34.d
Date Analyzed: 9/30/2014
Time Analyzed: 8:34 PM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) HIGH FRACTION	60.0	67.5	113	85 - 115

*** - calibrated by linear regression*

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Est. 1970

Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test: Diesel Range Organics
Project No:
Project: Williston Refinery Groundwater Monitoring EPA ID: TN00003
Collection Date: 9/23/2014
Instrument ID: SVGC21

Continuing Calibration Verification Standard (CCV)

File ID: 0924_03.d
Date Analyzed: 9/26/2014
Time Analyzed: 10:47 AM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) HIGH FRACTION	60.0	60.0	100	85 - 115

Continuing Calibration Verification Standard (CCV)

File ID: 0924_09.d
Date Analyzed: 9/26/2014
Time Analyzed: 12:41 PM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) HIGH FRACTION	60.0	60.7	101	85 - 115

Continuing Calibration Verification Standard (CCV)

File ID: 0924_24.d
Date Analyzed: 9/26/2014
Time Analyzed: 6:07 PM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) HIGH FRACTION	60.0	64.8	108	85 - 115

*** - calibrated by linear regression*

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Fax (615) 758-5859
Tax I.D 62-0814289
Est. 1970

Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test: Diesel Range Organics
Project No:
Project: Williston Refinery Groundwater Monitoring EPA ID: TN00003
Collection Date: 9/23/2014
Instrument ID: SVGC21

Continuing Calibration Verification Standard (CCV)

File ID: 0924_45.d
Date Analyzed: 9/27/2014
Time Analyzed: 12:40 AM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) HIGH FRACTION	60.0	60.0	100	85 - 115

Continuing Calibration Verification Standard (CCV)

File ID: 0924_59.d
Date Analyzed: 9/27/2014
Time Analyzed: 5:01 AM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) HIGH FRACTION	60.0	61.5	103	85 - 115

Continuing Calibration Verification Standard (CCV)

File ID: 0927_04.d
Date Analyzed: 9/27/2014
Time Analyzed: 10:19 AM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) HIGH FRACTION	60.0	57.4	95.7	85 - 115

*** - calibrated by linear regression*

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Fax (615) 758-5859
Tax I.D 62-0814289
Est. 1970

Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test: Diesel Range Organics
Project No:
Project: Williston Refinery Groundwater Monitoring EPA ID: TN00003
Collection Date: 9/23/2014
Instrument ID: SVGC21

Continuing Calibration Verification Standard (CCV)

File ID: 0927_12.d
Date Analyzed: 9/27/2014
Time Analyzed: 12:49 PM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) HIGH FRACTION	60.0	62.3	104	85 - 115

*** - calibrated by linear regression*

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Fax (615) 758-5859
Tax I.D 62-0814289
Est. 1970

Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test: Diesel Range Organics
Project No:
Project: Williston Refinery Groundwater Monitoring EPA ID: TN00003
Collection Date: 9/23/2014
Instrument ID: SVGC21

Continuing Calibration Verification Standard (CCV)

File ID: 0930_03.d
Date Analyzed: 9/30/2014
Time Analyzed: 10:46 AM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) HIGH FRACTION	60.0	58.4	97.3	85 - 115

Continuing Calibration Verification Standard (CCV)

File ID: 0930_20.d
Date Analyzed: 9/30/2014
Time Analyzed: 4:10 PM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) HIGH FRACTION	60.0	61.9	103	85 - 115

Continuing Calibration Verification Standard (CCV)

File ID: 0930_34.d
Date Analyzed: 9/30/2014
Time Analyzed: 8:34 PM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) HIGH FRACTION	60.0	67.5	113	85 - 115

*** - calibrated by linear regression*

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(800) 767-5859
Fax (615) 758-5859
Tax I.D 62-0814289
Est. 1970

Quality Control Summary
SDG: L723764
Big West Oil, LLC.

Test: Diesel Range Organics
Project No:
Project: Williston Refinery Groundwater Monitoring EPA ID: TN00003
Collection Date: 9/23/2014
Instrument ID: SVGC21

Continuing Calibration Verification Standard (CCV)

File ID: 0930_50.d
Date Analyzed: 10/1/2014
Time Analyzed: 1:34 AM

Analyte	True Value	Found	Recovery %	Limits
TPH (GC/FID) HIGH FRACTION	60.0	67.3	112	85 - 115

*** - calibrated by linear regression*

Big West Oil, LLC.

333 West Center Street
North Salt Lake, UT 84054

Billing Information:
Steve Johnston
333 West Center St.
North Salt Lake, UT 84054

Report to: Liegh Beem
Email To: leigh@johnstonleighinc.com

Project Description: Williston Refinery
City/State Collected:

Phone: 801-296-7711
Fax:
Client Project #
Lab Project # BIGWESTUT-WILLISTON

Collected by (print): Steve Johnston
Site/Facility ID # WILLISTON, ND
P.O. #

Collected by (signature):
Immediately Packed on Ice N ___ Y ___

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed
Email? ___No X__Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

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Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L723764
C236
Acctnum: BIGWESTUT
Template: T96747
Prelogin: P482497
TSR: 341 - John Hawkins
PB: 9-4 KW
Shipped Via: FedEX 2nd Day

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	BTEX 40mlAmb-HCl	Biomonitoring 125mlHDPE-NoPres	DROLVI 40mlAmb-HCl-BT	GRO 40mlAmb HCl						Rem./Contaminant	Sample # (lab only)
MW-T3		GW		9/23/14	1930	7	X		X	X							01
MW-W2		GW		9-23-14	1400	7	X		X	X							02
MW-X3		GW		9-23-14	0950	7	X		X	X							03
MW-Y		GW		9-22-14	1430	7	X		X	X							04
MW-1BR		GW		9-23-14	1545	7	X		X	X							05
MW-8BRR		GW		9-22-14	1630	7	X		X	X							06
MW-9R		GW		9-22-14	1740	7	X		X	X							07
MW-10R		GW		9-22-14	1700	7	X		X	X							08
MW-89-07 SFS		GW		9-22-14	1545	7	X		X	X							09
MW-00-16		GW		9-22-14	1830	7	X		X	X							10

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ___

Remarks: 5990 1137 3228
6171 2086 6798
6171 2086 6804

pH ___ Temp ___
Flow ___ Other ___

Hold #

Relinquished by : (Signature)	Date: 9-24-14	Time: 1200	Received by: (Signature)	Samples returned via: ☐ UPS ☒ FedEx ☐ Courier ☐ ___	Condition: (lab use only) ✓ 303
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 2.2 °C Bottles Received: 246 + 4 TB	COC Seal Intact: ✓ Y ___N ___NA
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 9/25/14 Time: 09:00	pH Checked: NCF:

Big West Oil, LLC.

333 West Center Street
North Salt Lake, UT 84054

Billing Information:
Steve Johnston
333 West Center St.
North Salt Lake, UT 84054

Report to: Liegh Beem

Email To: leigh@johnstonleighinc.com

Project Description: Williston Refinery

City/State Collected:

Phone: 801-296-7711
Fax:

Client Project #

Lab Project # BIGWESTUT-WILLISTON

Collected by (print): Steve Johnston

Site/Facility ID # WILLISTON, ND

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No X__Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

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Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 1723364

Table #

Acctnum: BIGWESTUT
Template: T96747
Prelogin: P482497
TSR: 341 - John Hawkins
PB: 9-4 KW

Shipped Via: FedEx 2nd Day

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	BTEX 40mlAmb-HCl	Biomonitoring 125mlHDPE-NoPres	DROLVI 40mlAmb-HCl-BT	GRO 40mlAmb HCl							Rem./Contaminant	Sample # (lab only)
MW-PR		GW		9-22-14	1500	7	X		X	X								11
MW-T1R		GW		9-22-14	1545	7	X		X	X								12
MW-U1R		GW		9-23-14	1900	7	X		X	X								13
MW-W1R		GW		9-23-14	1330	7	X		X	X								14
MW-WL-11		GW		9-23-14	1130	7	X		X	X								15
MW-X1R		GW		9-23-14	1650	7	X		X	X								16
MW-87-08 Dup		GW		9-22-14	1335	7	X		X	X								17
MW-87-08 MS		GW		9-22-14	1340	7	X		X	X								24
MW-87-08 MSD		GW		9-22-14	1345	7	X		X	X								24
MW-1BR Dup		GW		9-23-14	1550	7	X		X	X								18

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Samples returned via: ☐ UPS ☒ FedEx ☐ Courier ☐ _____	Condition: (lab use only)
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 2.2 °C Bottles Received: 246+4TB	COC Seal Intact: ✓ Y ___N ___NA
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 9/25/14 Time: 09:00	pH Checked: NCF:

Big West Oil, LLC.

333 West Center Street
North Salt Lake, UT 84054

Billing Information:
Steve Johnston
333 West Center St.
North Salt Lake, UT 84054

Report to: Liegh Beem

Email To: leigh@johnstonleighinc.com

Project Description: Williston Refinery

City/State Collected:

Phone: 801-296-7711
Fax:

Client Project #

Lab Project # BIGWESTUT-WILLISTON

Collected by (print): Steve Johnston

Site/Facility ID # WILLISTON, ND

P.O. #

Collected by (signature):

Immediately Packed on Ice N ____ Y ____

Rush? (Lab MUST Be Notified)
____ Same Day 200%
____ Next Day 100%
____ Two Day 50%
____ Three Day 25%

Date Results Needed

Email? ___No X__Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

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Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L723764
Table #
Acctnum: BIGWESTUT
Template: T96747
Prelogin: P482497
TSR: 341 - John Hawkins
PB: 9-4 KW
Shipped Via: FedEX 2nd Day

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	BTEX 40mlAmb-HCl	Biomonitoring 125mlHDPE-NoPres	DROLVI 40mlAmb-HCl-BT	GRO 40mlAmb HCl						Rem./Contaminant	Sample # (lab only)
MW-U1R		GW		9-23-14	1900	1		X									16
MW-X1R		GW		9-23-14	1650	1		X									20
MW-8716 Dup		GW		9-23-14	1230	1		X									21
MW-U1R MS		GW		9-23-14	1905	1		X									18
MW-U1R MSD		GW		9-23-14	1910	1		X									19
MW-87-16 Dup		GW		9-23-14	1230	7	X		X	X							22
MW-U1R MS		GW		9-23-14	1905	7	X		X	X							13
MW-U1R MSD		GW		9-23-14	1910	7	X		X	X							13

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	9-24-14	1200	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____

Temp: 2.2 °C Bottles Received: 24G + 4TB

Date: 9/25/14 Time: 09:00

Condition: (lab use only) 303

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

Big West Oil, LLC.

333 West Center Street
North Salt Lake, UT 84054

Billing Information:
Steve Johnston
333 West Center St.
North Salt Lake, UT 84054

Report to: Liegh Beem

Email To: leigh@johnstonleighinc.com

Project Description: Williston Refinery

City/State Collected:

Phone: 801-296-7711
Fax:

Client Project #

Lab Project # BIGWESTUT-WILLISTON

Collected by (print): Steve Johnston

Site/Facility ID # WILLISTON, ND

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day 200%
___ Next Day 100%
___ Two Day 50%
___ Three Day 25%

Date Results Needed

Email? ___No X__Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

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Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L723764
Table #
Acctnum: BIGWESTUT
Template: T96747
Prelogin: P482497
TSR: 341 - John Hawkins
PB: 9-4 KW
Shipped Via: FedEx 2nd Day

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	BTEX 40mlAmb-HCl	Biomonitoring 125mlHDPE-NoPres	DROLVI 40mlAmb-HCl-BT	GRO 40mlAmb HCl						Rem./Contaminant	Sample # (lab only)
MW-1C		GW		9-23-14	1700	7	X		X	X							23
MW-87-08		GW		9-22-14	1330	7	X		X	X							24
MW-87-14		GW		9-23-14	1045	7	X		X	X							25
MW-87-16		GW		9-23-14	1225	7	X		X	X							26
MW-87-25		GW		9-23-14	1815	7	X		X	X							27
MW-89-05		GW		9-22-14	1930	7	X		X	X							28
MW-90-01R		GW		9-23-14	1300	7	X		X	X							29
MW-C2		GW		9-22-14	1300	7	X		X	X							30
MW-K		GW		9-23-14	1050	7	X		X	X							31
MW-M		GW		9-22-14	1430	7	X		X	X							32

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	9-24-14	1200	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Samples returned via: ☐ UPS ☑ FedEx ☐ Courier ☐ _____

Temp: 2.2 °C Bottles Received: 246 + 4 TB

Date: 9/25/14 Time: 09:00

Condition: (lab use only) JB3

COC Seal Intact: ___Y ___N ___NA

pH Checked: NCF:

Big West Oil, LLC.

333 West Center Street
North Salt Lake, UT 84054

Billing Information:
Steve Johnston
333 West Center St.
North Salt Lake, UT 84054

Report to: Liegh Beem

Email To: leigh@johnstonleighinc.com

Project Description: Williston Refinery

City/State Collected:

Phone: 801-296-7711
Fax:

Client Project #

Lab Project # BIGWESTUT-WILLISTON

Collected by (print): Steve Johnston

Site/Facility ID # WILLISTON, ND

P.O. #

Collected by (signature):

Immediately Packed on Ice N ____ Y ____

Rush? (Lab MUST Be Notified)
____ Same Day 200%
____ Next Day 100%
____ Two Day 50%
____ Three Day 25%

Date Results Needed

Email? ___No X__Yes
FAX? ___No ___Yes

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

ESC LAB SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 723764

Table #

Acctnum: BIGWESTUT
Template: T96747
Prelogin: P482497
TSR: 341 - John Hawkins
PB: 9-4 (W)
Shipped Via: FedEX 2nd Day

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	BTEX 40mlAmb-HCl	Biomonitoring 125mlHDPE-NoPres	DROLVI 40mlAmb-HCl-BT	GRO 40mlAmb HCl						Rem./Contaminant	Sample # (lab only)
MW-87-14		GW		9-23-14	1045	1		X									
MW-87-16		GW		9-23-14	1225	1		X									
MW-89-05		GW		9-22-14	1930	1		X									
MW-C2		GW		9-22-14	1300	1		X									
MW-M		GW		9-22-14	1430	1		X									
MW-T3		GW		9-23-14	1930	1		X									
MW-X3		GW		9-23-14	0950	1		X									
MW-89-07		GW		9-22-14	1545	1		X									
MW-00-16		GW		9/22/14	1830	1		X									
MW-T1R		GW		9-22-14	1545	1		X									

* Matrix: SS - Soil GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Hold #

Relinquished by : (Signature)	Date: 9-24-14	Time: 1200	Received by: (Signature)	Samples returned via: ☐ UPS ☒ FedEx ☐ Courier ☐ _____
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 2.2 °C Bottles Received: 24G + 4TB
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 9/25/14 Time: 09:00

Condition: (lab use only) 503

COC Seal Intact: ✓ Y ___N ___NA

pH Checked: NCF:

Andy Vann

From: John V. Hawkins
Sent: Friday, September 26, 2014 1:20 PM
To: Login; Andy Vann
Subject: FW: ESC Lab Sciences Login for Williston Refinery Groundwater Monitoring L723764

Please delete any DO and ORP samples for L723764

Scan email to COC

Thanks

John

-----Original Message-----
From: Leigh Beem [mailto:leigh@johnstonleighinc.com]
Sent: Friday, September 26, 2014 12:59 PM
To: John V. Hawkins
Cc: steve@johnstonleighinc.com
Subject: RE: ESC Lab Sciences Login for Williston Refinery Groundwater Monitoring L723764

John:
We DO NOT need analyses of DO and ORP on the samples ID's MW-U1R, MW-X1R, MW-8716 dup, MW87-14, MW87-16, MW89-05, MW-C2, MW-M, MW-T3, MW-X3, MW-8907, MW-0016, MW-T1R.
Call with questions

Leigh Beem, P.G.
Johnston Leigh, Inc.
(801) 726-6845
leigh@johnstonleighinc.com

-----Original Message-----
From: John Hawkins [mailto:jhawkins@esclabsciences.com]
Sent: Friday, September 26, 2014 1:44 AM
To: leigh@johnstonleighinc.com
Subject: ESC Lab Sciences Login for Williston Refinery Groundwater Monitoring L723764

Thank you for choosing ESC Lab Sciences! Please find enclosed PDF files containing your laboratory login confirmation and chain of custody.

ESC is leading the laboratory industry with our On-line Data Management tools. Please contact your Technical Service Representative to learn how to create historical Excel tables or access data in real time using powerful and intuitive software that is only available at http://www.esclabsciences.com.

Visit ESC's secure data management web site - myESC - for all your reporting and data management needs at https://myesc.esclabsciences.com.

ESC ... "Your Lab of Choice"

John Hawkins
Technical Service Representative

ESC Lab Sciences

Login Confirmation Report

September 26, 2014 - 15:53

YOUR LAB OF CHOICE

Account: BIGWESTUT - Big West Oil, LLC.

Login #	**L723764**	Receive Date: 09/25/2014	TSR: John Hawkins
Template #	T96747	Entered: 09/25/2014	By: Matt Shacklock
Report to:	Liegh Beem	Lab Project Number: BIGWESTUT-WILLISTON	**Report MDL: N**
	333 West Center Street	Client Project #	**HDC: N**
	North Salt Lake, UT 84054	Project Description: Williston Refinery	PO #
		Collected By: Steve Johnston	PO Req: N
Phone:	(801) 296-7711 FAX:	Reg. State: ND	Terms: 30
Email:	leigh@johnstonleighinc.com		Quote #

Proj/Acct Comments: **EDD = Geotracker JVH 7-14-2011**
QC4
EDD = 4-file EQuIS Format JVH 12-13-12

Matrix	Test	Sample ID	Collection Date	Design ID	Method	Unit Price
L723764-01		**MW-T3**	**09/23/2014 19:30**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
			Sample Comments: Deleted DO/ORP from all per JH. AV 9/26			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00
Misc	DISPOSAL	Sample Disposal Charge				$ 0.00
Misc	ENERGY	Energy Surcharge				$ 10.00
Misc	HARDCOPY	Hardcopy Report Charge				$ 0.00
Misc	SAMPLEKIT	Sample Kit / Supplies Fee				$ 0.00
Misc	SHIPPING	Inbound Transport Charge				$ 0.00
Misc	SHIPPINGPR	Outbound Transport Charge				$ 229.73
L723764-02		**MW-W2**	**09/23/2014 14:00**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00
L723764-03		**MW-X3**	**09/23/2014 09:50**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00
L723764-04		**MW-Y**	**09/22/2014 14:30**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00

L723764-05		**MW-1BR**	**09/23/2014 15:45**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00
L723764-06		**MW-8BRR**	**09/22/2014 16:30**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00
L723764-07		**MW-9R**	**09/22/2014 17:40**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00
L723764-08		**MW-10R**	**09/22/2014 17:00**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00
L723764-09		**MW-89-07**	**09/22/2014 15:45**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00
L723764-10		**MW-00-16**	**09/22/2014 18:30**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00
L723764-11		**MW-PR**	**09/22/2014 15:00**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00
L723764-12		**MW-T1R**	**09/22/2014 15:45**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00

L723764-13		**MW-U1R**	**09/23/2014 19:00**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
			Sample Comments: MS/MSD			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00
L723764-14		**MW-W1R**	**09/23/2014 13:30**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00
L723764-15		**MW-WL-11**	**09/23/2014 11:30**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00
L723764-16		**MW-X1R**	**09/22/2014 16:50**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00
L723764-17		**MW-87-08 DUP**	**09/22/2014 13:35**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00
L723764-18		**MW-1BR DUP**	**09/22/2014 15:50**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00
L723764-22		**MW-87-16 DUP**	**09/23/2014 12:30**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00
L723764-23		**MW-1C**	**09/23/2014 17:00**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00

L723764-24		**MW-87-08**	**09/22/2014 13:30**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
			Sample Comments: MSMSD			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00
L723764-25		**MW-87-14**	**09/23/2014 10:45**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00
L723764-26		**MW-87-16**	**09/23/2014 12:25**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00
L723764-27		**MW-87-25**	**09/23/2014 18:15**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00
L723764-28		**MW-89-05**	**09/22/2014 19:30**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00
L723764-29		**MW-90-01R**	**09/23/2014 13:00**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00
L723764-30		**MW-C2**	**09/22/2014 13:00**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00
L723764-31		**MW-K**	**09/23/2014 10:50**	**Site: WILLISTON, ND**	**Est. Due Date*: 10/06/2014 - R5**	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00

L723764-32		MW-M	09/22/2014 14:30	Site: WILLISTON, ND	Est. Due Date*: 10/06/2014 - R5	
			Sample Description: Williston Refinery Groundwater Monitoring			
GW	BTEXGRO	BTEX/GRO		DEFAULT	8021/8015	$ 40.00
GW	DROLVI	TPH High Fraction		DEFAULT	3511/8015	$ 40.00
GW	EDD	Electronic Data Deliverable				$ 0.00
GW	QC3	QC Package				$ 0.00

Information Only - Not An Invoice - Do Not Pay! Total: $ 2,559.73

*** Due Date listed is an estimate based on average workloads. Please communicate required dates to your TSR.**

APPENDIX B – QA/QC WILLISTON REFINERY 10/14 EVENT

PRECISION, ACCURACY, METHOD COMPLIANCE, AND COMPLETENESS ASSESSMENT

Precision

Precision is the measure of variability of individual sample measurements. Field precision was determined by comparison of field duplicate sample results (where applicable). Laboratory precision was determined by examination of laboratory duplicate results. Evaluation of laboratory duplicates for precision was done using the Relative Percent Difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. The RPD limits referenced EPA published QC limits. Overall field and laboratory precision is acceptable since majority of the data is unqualified and no data is rejected based on these measurements.

Data that required qualification based on laboratory and calculated field duplicate RPDs, are as follows:

The RPDs for target analytes in project-specific MS/MSD pairs and laboratory duplicate samples were within data validation QC limits.

Field duplicate RPDs were within data validation QC limits of 0-30% for water matrices, except as noted.

Method	Unit	Analyte	RL	RPD	MW-1BR	MW-1BR DUP	Qualifier
8015D	**mg/l**	**TPH (as Diesel)**	**0.1**	**152**	**0.19**	**1.4**	**J/J**
Method	**Unit**	**Analyte**	**RL**	**RPD**	**MW-87-08R**	**MW-87-08R DUP**	**Qualifier**
8015D	**mg/l**	**TPH (as Diesel)**	**0.1**	**62**	**0.53**	**0.28**	**J/J**
Method	Unit	Analyte	RL	RPD	MW-87-16	MW-87-16 DUP	Qualifier
8015D	**mg/l**	**TPH (as Diesel)**	**0.1**	**147**	**1.7**	**0.26**	**J/J**

RL = Reporting Limit
RPD = Relative Percent Difference
J= Estimated Value

The target analytes above required J qualification in the native sample and in the field duplicate sample to indicate estimated concentrations due to variability between field duplicate results (RPD exceeded QC limit). Overall field and laboratory precision is acceptable since majority of the data is unqualified and no data is rejected based on these measurements.

Accuracy

Field accuracy, a measure of the sampling bias, was determined by reviewing field blank and trip blank results (when collected) for evidence of sample contamination stemming from sampling activities and/or sample transport/bottle contamination. Laboratory accuracy is a measure of the system bias, and was measured by evaluating laboratory control sample/laboratory control sample duplicate (LCS/LCSD),

matrix spike/matrix spike duplicate (MS/MSD), and organic system monitoring compounds (surrogate) percent recoveries. The LCS/LCSD percent recoveries, which demonstrated the overall performance of the analytical procedure, were compared to published or recommended EPA QC limits. The MS/MSD percent recoveries, which provided information on sample matrix interferences, were compared to EPA published QC limits or laboratory control charted limits. System monitoring compound or surrogate recoveries, which measured system performance and efficiency during organic analysis, were compared to EPA published QC limits.

Data that required qualification based on matrix spike outliers are as follows:

Surrogate percent recoveries for organic analyses were within laboratory control-charted QC limits (as allowed for SW-846 methods) for all project samples and associated laboratory QC with the exception of those shown below.

SDG	Sample ID	Lab Sample ID	Method	DF	Analyte	Recovery	LCL	UCL	Qualifier
WG745252	MW-T3	L723764-01	8015D	20	o-Terphenyl	247	50	150	
WG745252	MW-X3	L723764-0**3**	8015D	20	o-Terphenyl	1260	50	150	
WG744850	**MW-00-16**	**L723764-10**	**8015D**	**1**	**o-Terphenyl**	**164**	**50**	**150**	**J**

DF = Dilution Factor
LCL/UCL + Lower and Upper Control Limits
J = Estimated Value

While there was exceedance of surrogate recovery control limits for o-Terphenyl in two samples, these samples (MW-T3 and MW-X3) had DFs of 20 indicating that the surrogate was diluted out and so data qualification was not required. The sample from MW-00-16 required J qualification to indicate estimated concentrations due to surrogate recoveries outside the control limits.

Overall field and laboratory accuracy is acceptable since majority of the data is unqualified and no data is rejected based on these measurements

Method Compliance

For this sample set, method compliance was determined by evaluating sample integrity, holding time, laboratory blanks against method specified requirements, while applying EPA data validation guidelines. No data require qualification based on method compliance measurements and overall method compliance is acceptable based on the data reported.

Completeness

Completeness is the overall ratio of the number of samples planned versus the number of samples with valid analyses. Completeness goals are set at 90-100%. Determination of completeness included a review of chain of custody records, laboratory analytical methods and detection limits, laboratory case narratives, and project requirements. Completeness also included 100% review of the laboratory sample data results, and electronic data deliverables (EDDs). All of the data received from the laboratory are useable without qualification. Completeness of the data is calculated to be 100% and is acceptable.

12065 Lebanon Rd.
Mt. Juliet, TN 37122
(615) 758-5858
1-800-767-5859
Fax (615) 758-5859

Tax I.D. 62-0814289

Est. 1970

Liegh Beem
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

Report Summary

Tuesday December 23, 2014

Report Number: L738270
Samples Received: 12/11/14
Client Project:

Description: Williston Refinery

The analytical results in this report are based upon information supplied by you, the client, and are for your exclusive use. If you have any questions regarding this data package, please do not hesitate to call.

Entire Report Reviewed By: _____

Jeff Carr , ESC Representative

Laboratory Certification Numbers

A2LA - 1461-01, AIHA - 100789, AL - 40660, CA - 01157CA, CT - PH-0197, FL - E87487, GA - 923, IN - C-TN-01, KY - 90010, KYUST - 0016, NC - ENV375/DW21704/BIO041, ND - R-140. NJ - TN002, NJ NELAP - TN002, SC - 84004, TN - 2006, VA - 460132, WV - 233, AZ - 0612, MN - 047-999-395, NY - 11742, WI - 998093910, NV - TN000032011-1, TX - T104704245-11-3, OK - 9915, PA - 68-02979, IA Lab #364, EPA - TN002

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REPORT OF ANALYSIS

Liegh Beem
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

December 23, 2014

ESC Sample # : L738270-01

Date Received : December 11, 2014
Description : Williston Refinery

Site ID : WILLISTON, ND

Sample ID : MW8BRR

Project # :

Collected By : Steve Johnston
Collection Date : 12/10/14 10:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	12/21/14	1
Toluene	BDL	0.0050	mg/l	8021	12/21/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	12/21/14	1
Total Xylene	BDL	0.0015	mg/l	8021	12/21/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	12/23/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	97.3		% Rec.	8015	12/23/14	1
a,a,a-Trifluorotoluene(PID)	96.8		% Rec.	8021	12/21/14	1
TPH (GC/FID) High Fraction	0.37	0.10	mg/l	3510C / DRO	12/13/14	1
Surrogate recovery(%)						
o-Terphenyl	83.5		% Rec.	3510C / DRO	12/13/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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REPORT OF ANALYSIS

Liegh Beem
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

December 23, 2014

ESC Sample # : L738270-02

Date Received : December 11, 2014
Description : Williston Refinery

Site ID : WILLISTON, ND

Sample ID : MW9R

Project # :

Collected By : Steve Johnston
Collection Date : 12/10/14 12:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	12/12/14	1
Toluene	BDL	0.0050	mg/l	8021	12/12/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	12/12/14	1
Total Xylene	BDL	0.0015	mg/l	8021	12/12/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	12/12/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	97.6		% Rec.	8015	12/12/14	1
a,a,a-Trifluorotoluene(PID)	100.		% Rec.	8021	12/12/14	1
TPH (GC/FID) High Fraction	0.44	0.10	mg/l	3510C / DRO	12/13/14	1
Surrogate recovery(%)						
o-Terphenyl	78.1		% Rec.	3510C / DRO	12/13/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Liegh Beem
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

December 23, 2014

ESC Sample # : L738270-03

Date Received : December 11, 2014
Description : Williston Refinery

Site ID : WILLISTON, ND

Sample ID : MW10R

Project # :

Collected By : Steve Johnston
Collection Date : 12/10/14 11:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	12/21/14	1
Toluene	BDL	0.0050	mg/l	8021	12/21/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	12/21/14	1
Total Xylene	BDL	0.0015	mg/l	8021	12/21/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	12/23/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	97.1		% Rec.	8015	12/23/14	1
a,a,a-Trifluorotoluene(PID)	96.1		% Rec.	8021	12/21/14	1
TPH (GC/FID) High Fraction	BDL	0.10	mg/l	3510C / DRO	12/13/14	1
Surrogate recovery(%)						
o-Terphenyl	77.1		% Rec.	3510C / DRO	12/13/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Liegh Beem
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

December 23, 2014

ESC Sample # : L738270-04

Date Received : December 11, 2014
Description : Williston Refinery

Site ID : WILLISTON, ND

Sample ID : MW87-08R

Project # :

Collected By : Steve Johnston
Collection Date : 12/10/14 13:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	12/21/14	1
Toluene	BDL	0.0050	mg/l	8021	12/21/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	12/21/14	1
Total Xylene	BDL	0.0015	mg/l	8021	12/21/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	12/23/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	96.8		% Rec.	8015	12/23/14	1
a,a,a-Trifluorotoluene(PID)	95.2		% Rec.	8021	12/21/14	1
TPH (GC/FID) High Fraction	0.28	0.10	mg/l	3510C / DRO	12/13/14	1
Surrogate recovery(%)						
o-Terphenyl	73.5		% Rec.	3510C / DRO	12/13/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Liegh Beem
Big West Oil, LLC.
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North Salt Lake, UT 84054

December 23, 2014

ESC Sample # : L738270-05

Date Received : December 11, 2014
Description : Williston Refinery

Site ID : WILLISTON, ND

Sample ID : MW90-01R

Project # :

Collected By : Steve Johnston
Collection Date : 12/10/14 14:00

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	12/21/14	1
Toluene	BDL	0.0050	mg/l	8021	12/21/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	12/21/14	1
Total Xylene	BDL	0.0015	mg/l	8021	12/21/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	12/23/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	97.4		% Rec.	8015	12/23/14	1
a,a,a-Trifluorotoluene(PID)	96.5		% Rec.	8021	12/21/14	1
TPH (GC/FID) High Fraction	0.11	0.10	mg/l	3510C / DRO	12/13/14	1
Surrogate recovery(%)						
o-Terphenyl	77.2		% Rec.	3510C / DRO	12/13/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
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REPORT OF ANALYSIS

Liegh Beem
Big West Oil, LLC.
333 West Center Street
North Salt Lake, UT 84054

December 23, 2014

ESC Sample # : L738270-06

Date Received : December 11, 2014
Description : Williston Refinery

Site ID : WILLISTON, ND

Sample ID : DUPLICATE MW90-01R

Project # :

Collected By : Steve Johnston
Collection Date : 12/10/14 14:05

Parameter	Result	Det. Limit	Units	Method	Date	Dil.
Benzene	BDL	0.00050	mg/l	8021	12/21/14	1
Toluene	BDL	0.0050	mg/l	8021	12/21/14	1
Ethylbenzene	BDL	0.00050	mg/l	8021	12/21/14	1
Total Xylene	BDL	0.0015	mg/l	8021	12/21/14	1
TPH (GC/FID) Low Fraction	BDL	0.10	mg/l	8015	12/23/14	1
Surrogate Recovery-%						
a,a,a-Trifluorotoluene(FID)	97.2		% Rec.	8015	12/23/14	1
a,a,a-Trifluorotoluene(PID)	95.6		% Rec.	8021	12/21/14	1
TPH (GC/FID) High Fraction	BDL	0.10	mg/l	3510C / DRO	12/15/14	1
Surrogate recovery(%)						
o-Terphenyl	80.1		% Rec.	3510C / DRO	12/15/14	1

BDL - Below Detection Limit
Det. Limit - Practical Quantitation Limit(PQL)
Note:
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Summary of Remarks For Samples Printed
12/23/14 at 16:56:39

TSR Signing Reports: 341
R5 - Desired TAT

EDD = Geotracker JVH 7-14-2011 QC4 EDD = 4-file EQuIS Format JVH 12-13-12

Sample: L738270-01 Account: BIGWESTUT Received: 12/11/14 09:00 Due Date: 12/23/14 00:00 RPT Date: 12/23/14 16:56
Changed BTEX/GRO to BTEXGRO. AV 12/22
Sample: L738270-02 Account: BIGWESTUT Received: 12/11/14 09:00 Due Date: 12/23/14 00:00 RPT Date: 12/23/14 16:56
MS/MSD,Changed BTEX/GRO to BTEXGRO. AV 12/22
Sample: L738270-03 Account: BIGWESTUT Received: 12/11/14 09:00 Due Date: 12/23/14 00:00 RPT Date: 12/23/14 16:56
Changed BTEX/GRO to BTEXGRO. AV 12/22
Sample: L738270-04 Account: BIGWESTUT Received: 12/11/14 09:00 Due Date: 12/23/14 00:00 RPT Date: 12/23/14 16:56
Changed BTEX/GRO to BTEXGRO. AV 12/22
Sample: L738270-05 Account: BIGWESTUT Received: 12/11/14 09:00 Due Date: 12/23/14 00:00 RPT Date: 12/23/14 16:56
Changed BTEX/GRO to BTEXGRO. AV 12/22
Sample: L738270-06 Account: BIGWESTUT Received: 12/11/14 09:00 Due Date: 12/23/14 00:00 RPT Date: 12/23/14 16:56
Changed BTEX/GRO to BTEXGRO. AV 12/22. 1 vial broke in lab accident MS 12/11/14

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Big West Oil, LLC.
Liegh Beem
333 West Center Street

North Salt Lake, UT 84054

Quality Assurance Report
Level II

L738270

December 23, 2014

Laboratory Blank

Analyte	Result	Units	% Rec	Limit	Batch	Date Analyzed
Benzene	< .0005	mg/l			WG759559	12/12/14 14:08
Ethylbenzene	< .0005	mg/l			WG759559	12/12/14 14:08
Toluene	< .005	mg/l			WG759559	12/12/14 14:08
TPH (GC/FID) Low Fraction	< .1	mg/l			WG759559	12/12/14 14:08
Total Xylene	< .0015	mg/l			WG759559	12/12/14 14:08
a,a,a-Trifluorotoluene(FID)		% Rec.	97.30	62-128	WG759559	12/12/14 14:08
a,a,a-Trifluorotoluene(PID)		% Rec.	99.80	55-122	WG759559	12/12/14 14:08
TPH (GC/FID) High Fraction	< .1	mg/l			WG759191	12/13/14 14:00
o-Terphenyl		% Rec.	73.80	50-150	WG759191	12/13/14 14:00
Benzene	< .0005	mg/l			WG761271	12/21/14 12:14
Ethylbenzene	< .0005	mg/l			WG761271	12/21/14 12:14
Toluene	< .005	mg/l			WG761271	12/21/14 12:14
Total Xylene	< .0015	mg/l			WG761271	12/21/14 12:14
a,a,a-Trifluorotoluene(PID)		% Rec.	96.80	55-122	WG761271	12/21/14 12:14
TPH (GC/FID) Low Fraction	< .1	mg/l			WG761716	12/23/14 13:36
a,a,a-Trifluorotoluene(FID)		% Rec.	98.40	62-128	WG761716	12/23/14 13:36
a,a,a-Trifluorotoluene(PID)		% Rec.	104.0	55-122	WG761716	12/23/14 13:36

Laboratory Control Sample

Analyte	Units	Known Val	Result	% Rec	Limit	Batch
Benzene	mg/l	.05	0.0465	93.1	70-130	WG759559
Ethylbenzene	mg/l	.05	0.0457	91.4	70-130	WG759559
Toluene	mg/l	.05	0.0458	91.6	70-130	WG759559
Total Xylene	mg/l	.15	0.136	90.9	70-130	WG759559
a,a,a-Trifluorotoluene(PID)				100.0	55-122	WG759559
TPH (GC/FID) Low Fraction	mg/l	5.5	4.48	81.5	67-132	WG759559
a,a,a-Trifluorotoluene(FID)				96.90	62-128	WG759559
TPH (GC/FID) High Fraction	mg/l	1.5	1.17	77.9	50-150	WG759191
o-Terphenyl				80.00	50-150	WG759191
Benzene	mg/l	.05	0.0467	93.4	70-130	WG761271
Ethylbenzene	mg/l	.05	0.0489	97.7	70-130	WG761271
Toluene	mg/l	.05	0.0467	93.4	70-130	WG761271
Total Xylene	mg/l	.15	0.137	91.2	70-130	WG761271
a,a,a-Trifluorotoluene(PID)				103.0	55-122	WG761271
TPH (GC/FID) Low Fraction	mg/l	5.5	4.58	83.3	67-132	WG761716
a,a,a-Trifluorotoluene(FID)				97.50	62-128	WG761716
a,a,a-Trifluorotoluene(PID)				111.0	55-122	WG761716

Laboratory Control Sample Duplicate

Analyte	Units	Result	Ref	%Rec	Limit	RPD	Limit	Batch
Benzene	mg/l	0.0534	0.0465	107.	70-130	13.8	20	WG759559
Ethylbenzene	mg/l	0.0511	0.0457	102.	70-130	11.1	20	WG759559
Toluene	mg/l	0.0508	0.0458	102.	70-130	10.3	20	WG759559
Total Xylene	mg/l	0.152	0.136	101.	70-130	10.6	20	WG759559
a,a,a-Trifluorotoluene(PID)				101.0	55-122			WG759559

* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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Big West Oil, LLC.
Liegh Beem
333 West Center Street

North Salt Lake, UT 84054

Quality Assurance Report
Level II

L738270

December 23, 2014

Analyte	Units	Laboratory Control Sample Duplicate Result	Ref	%Rec	Limit	RPD	Limit	Batch
TPH (GC/FID) Low Fraction	mg/l	4.71	4.48	86.0	67-132	4.88	20	WG759559
a,a,a-Trifluorotoluene(FID)				97.30	62-128			WG759559
TPH (GC/FID) High Fraction	mg/l	1.03	1.17	69.0	50-150	12.2	20	WG759191
o-Terphenyl				72.40	50-150			WG759191
Benzene	mg/l	0.0461	0.0467	92.0	70-130	1.25	20	WG761271
Ethylbenzene	mg/l	0.0483	0.0489	96.0	70-130	1.24	20	WG761271
Toluene	mg/l	0.0461	0.0467	92.0	70-130	1.25	20	WG761271
Total Xylene	mg/l	0.135	0.137	90.0	70-130	1.25	20	WG761271
a,a,a-Trifluorotoluene(PID)				104.0	55-122			WG761271
TPH (GC/FID) Low Fraction	mg/l	4.63	4.58	84.0	67-132	1.06	20	WG761716
a,a,a-Trifluorotoluene(FID)				99.00	62-128			WG761716
a,a,a-Trifluorotoluene(PID)				111.0	55-122			WG761716

Analyte	Units	Matrix Spike MS Res	Ref Res	TV	% Rec	Limit	Ref Samp	Batch
Benzene	mg/l	0.0543	0.000255	.05	110.	57.2-131	L738270-02	WG759559
Ethylbenzene	mg/l	0.0528	0.0000973	.05	100.	67.5-135	L738270-02	WG759559
Toluene	mg/l	0.0528	0.000313	.05	100.	63.7-134	L738270-02	WG759559
Total Xylene	mg/l	0.156	0.000460	.15	100.	65.9-138	L738270-02	WG759559
a,a,a-Trifluorotoluene(FID)					98.00	62-128		WG759559
a,a,a-Trifluorotoluene(PID)					102.0	55-122		WG759559
TPH (GC/FID) Low Fraction	mg/l	4.56	0.0199	5.5	82.0	50-143	L738270-02	WG759559
a,a,a-Trifluorotoluene(FID)					97.30	62-128		WG759559
TPH (GC/FID) High Fraction	mg/l	1.58	0.442	1.5	76.0	50-150	L738270-02	WG759191
o-Terphenyl					77.60	50-150		WG759191
Benzene	mg/l	0.0473	0.0000792	.05	94.0	57.2-131	L739058-06	WG761271
Ethylbenzene	mg/l	0.0495	0.0	.05	99.0	67.5-135	L739058-06	WG761271
Toluene	mg/l	0.0474	0.000220	.05	94.0	63.7-134	L739058-06	WG761271
Total Xylene	mg/l	0.138	0.000270	.15	92.0	65.9-138	L739058-06	WG761271
a,a,a-Trifluorotoluene(PID)					104.0	55-122		WG761271
TPH (GC/FID) Low Fraction	mg/l	5.04	0.314	5.5	86.0	50-143	L739944-01	WG761716
a,a,a-Trifluorotoluene(FID)					98.80	62-128		WG761716
a,a,a-Trifluorotoluene(PID)					111.0	55-122		WG761716

Analyte	Units	Matrix Spike Duplicate MSD	Ref	%Rec	Limit	RPD	Limit	Ref Samp	Batch
Benzene	mg/l	0.0538	0.0543	107.	57.2-131	1.00	20	L738270-02	WG759559
Ethylbenzene	mg/l	0.0514	0.0528	103.	67.5-135	2.63	20	L738270-02	WG759559
Toluene	mg/l	0.0510	0.0528	101.	63.7-134	3.49	20	L738270-02	WG759559
Total Xylene	mg/l	0.151	0.156	100.	65.9-138	3.09	20	L738270-02	WG759559
a,a,a-Trifluorotoluene(PID)				101.0	55-122				WG759559
TPH (GC/FID) Low Fraction	mg/l	4.83	4.56	87.4	50-143	5.82	20	L738270-02	WG759559
a,a,a-Trifluorotoluene(FID)				97.90	62-128				WG759559

* Performance of this Analyte is outside of established criteria.
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Liegh Beem
333 West Center Street

North Salt Lake, UT 84054

Quality Assurance Report
Level II

L738270

December 23, 2014

Analyte	Units	MSD	Matrix Spike Duplicate Ref	%Rec	Limit	RPD	Limit	Ref Samp	Batch
TPH (GC/FID) High Fraction	mg/l	1.53	1.58	72.3	50-150	3.53	20	L738270-02	WG759191
o-Terphenyl				72.60	50-150				WG759191
Benzene	mg/l	0.0477	0.0473	95.2	57.2-131	0.820	20	L739058-06	WG761271
Ethylbenzene	mg/l	0.0501	0.0495	100.	67.5-135	1.20	20	L739058-06	WG761271
Toluene	mg/l	0.0480	0.0474	95.5	63.7-134	1.12	20	L739058-06	WG761271
Total Xylene	mg/l	0.140	0.138	92.8	65.9-138	0.780	20	L739058-06	WG761271
a,a,a-Trifluorotoluene(PID)				103.0	55-122				WG761271
TPH (GC/FID) Low Fraction	mg/l	5.11	5.04	87.2	50-143	1.32	20	L739944-01	WG761716
a,a,a-Trifluorotoluene(FID)				97.30	62-128				WG761716
a,a,a-Trifluorotoluene(PID)				111.0	55-122				WG761716

Batch number /Run number / Sample number cross reference

WG759559: R3009781: L738270-02
WG759191: R3009935 R3010111: L738270-01 02 03 04 05 06
WG761271: R3011360: L738270-01 03 04 05 06
WG761716: R3011716: L738270-01 03 04 05 06

* * Calculations are performed prior to rounding of reported values.
* Performance of this Analyte is outside of established criteria.
For additional information, please see Attachment A 'List of Analytes with QC Qualifiers.'

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Quality Assurance Report
Level II

L738270

December 23, 2014

The data package includes a summary of the analytic results of the quality control samples required by the SW-846 or CWA methods. The quality control samples include a method blank, a laboratory control sample, and the matrix spike/matrix spike duplicate analysis. If a target parameter is outside the method limits, every sample that is effected is flagged with the appropriate qualifier in Appendix B of the analytic report.

Method Blank - an aliquot of reagent water carried through the entire analytic process. The method blank results indicate if any possible contamination exposure during the sample handling, digestion or extraction process, and analysis. Concentrations of target analytes above the reporting limit in the method blank are qualified with the "B" qualifier.

Laboratory Control Sample - is a sample of known concentration that is carried through the digestion/extraction and analysis process. The percent recovery, expressed as a percentage of the theoretical concentration, has statistical control limits indicating that the analytic process is "in control". If a target analyte is outside the control limits for the laboratory control sample or any other control sample, the parameter is flagged with a "J4" qualifier for all effected samples.

Matrix Spike and Matrix Spike Duplicate - is two aliquots of an environmental sample that is spiked with known concentrations of target analytes. The percent recovery of the target analytes also has statistical control limits. If any recoveries that are outside the method control limits, the sample that was selected for matrix spike/matrix spike duplicate analysis is flagged with either a "J5" or a "J6". The relative percent difference (%RPD) between the matrix spike and the matrix spike duplicate recoveries is all calculated. If the RPD is above the method limit, the effected samples are flagged with a "J3" qualifier.

APPENDIX C

Historical Groundwater Elevation Data

Appendix C
Water Level Elevations in Post-Closure Groundwater Monitoring Wells, from April 1991 through September 2014

Location	Apr-91	May-91	Oct-91	May-92	Jun-92	Oct-92	Dec-92	Mar-93	Jun-93	Sep-93	Dec-93	Mar-94	Jun-94	Sep-94	Dec-94	Mar-95	Jun-95	Oct-95	May-96	Oct-96
Upper Sand and Till Wells																				
MW-1C	1874.41	1874.36	1877.28	1876.96	1878.31	1876.99	1876.91	1875.90	NM	1880.41	1880.13	1879.21	1881.15	1881.16	1879.17	1878.76	1880.04	1877.97	1877.76	1877.36
MW-87-08	1853.21	1853.46	1853.04	1854.03	1853.40	1853.19	1853.51	1852.61	1853.98	1844.83	1854.97	1856.01	1857.42	1852.86	1854.11	1854.66	1854.90	1853.71	1855.06	1853.22
MW-87-08R																				
MW-87-25	1856.77	1857.06	1856.26	1857.39	1857.18	1856.45	1856.41	1856.85	NM	1859.43	1859.53	1860.11	1859.13	1859.12	1857.16	1857.57	1857.58	1856.39	1857.47	1856.26
MW-87-36	1846.86	1846.76	1845.90	1846.76	1847.05	1845.87	1846.44	1847.00	1847.30	1847.67	1847.59	1848.07	NM	NM	NM	NM	NM	NM	NM	NM
MW-87-36R	---	---	---	---	---	---	---	---	---	---	---	---	DRY	DRY	1846.34	DRY	DRY	1847.04	1847.42	1845.42
MW-90-01	1844.81	1845.06	1844.99	DRY	1846.46	1844.92	1843.80	1845.06	1846.43	1847.71	1846.19	1849.11	1847.97	1845.86	1845.66	1847.57	1846.63	1848.61	1848.69	1847.32
MW-90-01R																				
MW-K	1846.35	1847.36	1847.23	1848.61	1847.05	1846.72	1847.11	1845.84	1847.84	1848.60	1847.69	NM	1850.60	1846.29	1846.28	1847.96	1847.97	1848.86	1850.20	1846.39
MW-W2	1848.10	1849.41	1855.47	1852.66	1853.95	1846.52	DRY	1843.48	NM	1853.62	1853.74	1853.82	1856.64	1856.63	1854.58	1851.78	1851.76	1854.00	1851.76	1854.27
MW-Y	1844.31	1844.52	1844.70	1845.42	1845.00	1844.97	1845.02	1844.49	1845.15	1847.02	1845.61	1847.35	1848.34	1845.55	1845.02	1845.97	1846.32	NM	1843.39 [1]	1846.49
Lower Sand Wells																				
MW-1BR	1846.41	1846.48	1845.68	1846.56	1846.82	1845.64	1846.24	1846.42	1846.70	1847.10	1847.34	1847.56	1847.73	1847.41	1847.18	1847.70	1847.68	1848.84	1848.74	1848.22
MW-8BR	1845.80	1845.90	1844.82	1846.21	1846.27	1844.71	1845.80	1845.89	1846.36	1846.99	1846.25	1847.23	1847.61	1845.90	1846.35	1847.70	1846.90	1848.65	1848.54	1847.35
MW-8BRR																				
MW-9	1845.92	1845.98	1844.96	1846.31	1846.55	1845.00	1845.75	1846.14	1846.49	1847.11	1846.41	1847.35	1847.61	1846.09	1846.36	1847.81	1846.80	1848.75	1848.61	1847.35
MW-9R																				
MW-10	1845.98	1846.04	1845.01	1846.38	1846.58	1845.09	1845.83	1846.20	1846.51	1847.07	1846.49	1847.36	1847.62	1846.18	1846.39	1847.83	1846.85	1848.73	1848.64	1847.36
MW-10R																				
MW-PR	1845.74	1845.84	1844.84	1846.13	1846.22	1844.68	1845.79	1845.85	1846.32	1849.86	1846.23	1847.21	1847.52	1845.72	1846.20	1847.63	1846.61	1848.56	1848.44	1847.26
MW-W1R	1845.94	1846.08	1844.93	1846.28	1846.45	1845.20	1845.56	1846.12	1846.77	1847.22	1846.45	1847.35	1847.41	1846.31	1846.53	1847.46	1846.93	1848.53	1848.73	1847.55
MW-WL-11	1844.23	NM	NM	NM	1844.88	1843.15	1843.53	1844.74	1844.95	1845.25	1844.45	1845.65	1846.79	1844.30	1844.66	1845.85	1846.06	1847.56	1847.36	1846.05

Appendix C
Water Level Elevations in Post-Closure Groundwater Monitoring Wells, from April 1991 through September 2014

Location	May-97	Oct-97	May-98	Oct-98	Apr-99	Oct-99	Apr-00	Oct-00	May-01	Oct-01	Apr-02	Sep-02	Apr-03	Oct-03	May-04	Sep-04	May-05	Sep-05	Apr-06	Oct-06
Upper Sand and Till Wells																				
MW-1C	1879.16	1879.01	1878.40	1878.73	1880.50	1879.62	1878.70	1879.75	1882.15	1880.99	1880.44	1881.16	1881.22	1880.70	1882.15	1881.44	1881.17	1880.31	1883.53	1880.11
MW-87-08	1855.62	1853.69	1855.64	1853.09	1856.49	1852.85	1855.02	1853.58	1862.09	1853.20	1855.75	1852.93	1855.54	1853.05	1855.07	1853.04	1854.25	1852.11	1855.72	1852.53
MW-87-08R																				
MW-87-25	1858.26	1856.70	1858.93	1857.53	1859.64	1857.63	1858.26	1858.20	1860.41	1857.61	1858.78	1858.33	1859.07	1858.49	1861.25	1859.70	1859.58	1858.37	1860.51	1858.66
MW-87-36	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
MW-87-36R	1846.68	1846.10	1846.94	1846.31	1846.76	1846.63	1847.13	1846.22	1846.81	1845.11	1846.26	1845.82	1846.30	1845.41	1846.20	1845.08	1846.28	1846.74	1846.80	NM
MW-90-01	1849.23	1847.43	1848.78	1845.31	1848.32	1845.51	1847.04	1844.36	1848.35	1844.06	1846.48	1843.52	1847.25	1843.53	1846.36	1843.22	1846.04	1843.15	1846.93	1844.20
MW-90-01R																				
MW-K	1849.22	1848.97	1849.46	1845.01	1849.13	1845.31	1846.60	1844.58	1850.16	1845.38	1847.11	1844.74	1848.76	1844.17	1847.89	1847.29	1845.99	1844.03	1849.35	1843.60
MW-W2	1852.37	NM	1851.45	1854.27	1853.72	1855.29	1851.51	1853.32	1854.22	1855.24	1851.63	1853.53	1851.56	1854.20	1852.89	1854.11	1853.71	1857.79	1852.89	1854.55
MW-Y	1847.96	NM	1848.78	1845.09	1847.20	1845.26	1845.70	1844.44	1847.98	1844.93	1845.08	1843.97	1846.11	1843.96	1845.09	1843.53	1843.95	1843.31	1844.87	1842.95
Lower Sand Wells																				
MW-1BR	1849.52	1847.75	1850.36	1846.61	1848.73	1846.36	1847.92	1845.53	1847.86	1845.70	1847.30	1845.36	1847.58	1844.69	1846.93	1844.22	1846.64	1844.34	1846.54	1845.64
MW-8BR	1849.21	1846.97	1848.70	1845.01	1848.03	1845.16	1847.28	1843.70	1847.91	1843.99	1846.58	1843.48	1847.26	1843.63	1846.48	1843.52	1846.09	1843.24	1845.87	1844.14
MW-8BRR																				
MW-9	1849.21	1846.98	1848.81	1845.14	1848.38	1845.24	1847.37	1843.83	1847.98	1844.13	1846.69	1843.60	1847.34	1843.78	1846.68	1843.65	1846.26	1843.41	1845.98	1844.27
MW-9R																				
MW-10	1849.31	1847.12	1848.90	1845.31	1848.51	1845.44	1847.42	1843.94	1848.01	1844.27	1846.79	1843.73	1847.45	1843.91	1846.85	1843.83	1846.39	1843.61	1846.09	1844.44
MW-10R																				
MW-PR	1849.14	1846.98	1848.49	1844.94	1848.05	1845.12	1847.20	1843.67	1847.87	1843.97	1846.44	1843.48	1847.12	1843.59	1846.31	1843.39	1845.96	1843.09	1845.74	1843.94
MW-W1R	1849.48	1847.14	1851.83	1845.52	1848.46	1845.01	1847.49	1843.53	1848.07	1843.91	1846.70	1843.79	1847.29	1843.77	1846.82	1843.31	1846.44	1843.25	1846.25	1844.55
MW-WL-11	1848.44	1847.53	1847.07	1845.26	1846.75	1845.42	1846.09	1843.40	1846.61	1843.26	1844.85	1842.95	1845.71	1842.68	1845.03	1842.32	1844.83	1842.46	1844.73	1842.99

Appendix C
Water Level Elevations in Post-Closure Groundwater Monitoring Wells, from April 1991 through September 2014

Location	Apr-07	Oct-07	Oct-08	May-09	Oct-09	May-10	Sep-10	Apr-11	Sep-11	Apr-12	Sep-12	May-13	Sep-13	Apr-14	Sep-14
Upper Sand and Till Wells															
MW-1C	1881.72	1881.46	1881.65	1882.50	1881.28	1883.27	1882.84	1884.89	1882.66	1882.13	1880.99	1882.29	1883.40	1880.46	1882.07
MW-87-08	1853.68	1851.89	1851.83	1852.21	1852.44	1854.84	1853.59	1858.16	1854.53	1853.87	1852.09	1855.18	*NA* [2]	*NA* [2]	*NA* [2]
MW-87-08R													1855.42	1856.93	1855.24
MW-87-25	1859.17	1859.34	1861.19	1860.84	1860.36	1860.46	1858.59	1858.02	1861.40	1861.35	1861.08	1861.26	1861.67	1861.65	1861.20
MW-87-36	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	Abd	Abd
MW-87-36R	NM	1848.69	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	Abd	Abd
MW-90-01	1845.55	1843.02	1843.46	1847.16	1845.86	1846.18	1848.97	1850.56	1851.50	1849.68	*NA* [2]	*NA* [2]	*NA* [2]	*NA* [2]	*NA* [2]
MW-90-01R													Dry	1848.59	1849.71
MW-K	1845.40	1843.12	1842.76	1849.36	1846.09	1848.69	1848.64	1851.22	1850.17	1849.09	1844.35	1861.26	1848.31	1850.25	1846.11
MW-W2	1852.08	1855.56	1854.33	1852.61	1856.26	1856.84	1847.64	1858.76	1857.14	1855.99	1856.31	1855.34	1857.28	1856.33	1856.05
MW-Y	1843.37	1842.80	1842.16	1846.26	1844.70	1845.18	1848.00	NM	NM	1848.33	1845.21	1846.54	1847.15	NS	NS
Lower Sand Wells															
MW-1BR	1846.35	1844.37	1844.03	1846.60	1846.61	1846.85	1848.26	1850.19	1852.52	1851.12	1849.92	1849.99	1850.79	1850.50	1850.14
MW-8BR	1845.52	1842.86	1843.56	1847.09	1845.90	1846.25	1849.06	1850.34	1851.38	1849.74	*NA* [2]	*NA* [2]	*NA* [2]	*NA* [2]	*NA* [2]
MW-8BRR													1849.31	1849.55	1849.26
MW-9	1845.69	1843.03	1843.59	1847.19	1845.97	1846.44	1849.05	1850.31	1851.49	1850.31	*NA* [2]	*NA* [2]	*NA* [2]	*NA* [2]	*NA* [2]
MW-9R													1846.87	1849.66	1849.34
MW-10	1845.76	1843.15	1843.72	1846.97	1846.06	1846.56	1849.06	1850.30	1852.57	1849.98	*NA* [2]	*NA* [2]	*NA* [2]	*NA* [2]	*NA* [2]
MW-10R													1849.62	1849.80	1849.52
MW-PR	1845.35	1842.75	1843.56	1846.86	1845.88	1846.31	1849.14	1850.40	1851.33	1847.64	1848.05	1849.21	1849.21	NM	NS
MW-W1R	1845.60	1842.87	1843.65	1846.05	1846.07	1846.38	1849.03	1850.43	1851.55	1850.04	1848.44	1849.44	1849.61	1849.64	1849.28
MW-WL-11	1843.91	1842.70	1843.25	1848.75	1844.03	1844.55	1848.55	1849.25	1849.12	1847.02	1845.03	1846.80	1845.95	1846.56	1846.83

Notes:

NS= Not Surveyed

NM = Not Measured

1 Measurement obtained June 6, 1996

2 Monitoring wells MW-8BR, MW-9, MW-10, MW-87-08, and MW-90-01 were replaced in 2013.

APPENDIX D

Historical PCGWM Analytical Data and Statistical Evaluation

Table D-1
Summary of Post-Closure Groundwater Monitoring Analytical Results Since 1992

Well Number	Duplicate Sample ID	Date of Sampling	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	1-Methyl Naphthalene (µg/l)	2-Methyl Naphthalene (µg/l)	1,2-Dichloro ethane (µg/l)	Phenol (µg/l)	2-Methyl-4, 6-Dinitro phenol (µg/l)	p-Nitro phenol (µg/l)	Chromium dissolved (µg/l)	Lead dissolved (µg/l)	Chloride (mg/l)	Sulfate (mg/l)	TDS (mg/l)	TOC (mg/l)	DRO (mg/l)	GRO (mg/l)
Upper Sand and Till Wells																				
MW-1C		6/24/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	172	2630	7620	40.8	NA	NA
		10/7/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.006)	ND(0.0024)	194	2920	7343	30.5	NA	NA
		12/11/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.0024)	158	2730	7490	33.8	NA	NA
		3/8/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	168	2580	7060	31	NA	NA
		6/23/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	154	2880	7430	24.8	NA	NA
		9/13/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	132	2880	7145	31.2	NA	NA
		11/30/1993	ND(4)	ND(4)	ND(4)	**5 B**	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	140	3076	7250	30.1	NA	NA
		3/22/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	147	2830	7527	29.7	NA	NA
		6/20/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	133	3220	7320	30.6	NA	NA
		9/15/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(160)	ND(160)	ND(0.3)	ND(2)	ND(7)	ND(7)	**0.006**	ND(0.005)	126	3620	6820	31.3	NA	NA
		12/14/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	136	3140	7260	28.5	NA	NA
		3/23/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	145	3030	6940	30.6	NA	NA
		6/14/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	134	3610	6850	31.8	NA	NA
		10/10/1995	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	154	2910	7330	32.4	NA	NA
		5/9/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	146	3290	7180	37	NA	NA
		10/9/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.0017)	ND(0.0023)	95.4	3530	6750	31.8	NA	NA
		5/7/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(9.4)	ND(47)	ND(47)	ND(0.005)	ND(0.02)	138	3620	6640	34.5	NA	NA
		10/6/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(9.5)	ND(47)	ND(47)	ND(0.005)	ND(0.015)	133	3240	6560	31.3	NA	NA
		5/6/1998	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	ND(0.0050)	ND(0.0030)	138	3470	6400 B	31.9	NA	NA
		10/22/1998	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	**0.053**	ND(0.0030)	129	3250	6640	33.2	NA	NA
		5/3/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**9**	ND(0.025)
		10/5/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		5/4/2000	**0.34**	**0.63**	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.18**	**0.01**
		10/11/2000	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.0054**
		5/9/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.17**	ND(0.01)
		10/2/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		5/14/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/6/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.14**	ND(0.010)
		5/14/2003	ND(0.50)	ND(0.50)	**0.72**	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	3800	NA	NA	ND(0.10)	ND(0.010)
		10/12/2003	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	3700	NA	NA	**0.15**	ND(0.010)
		5/17/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/12/2004	ND(0.50)	**0.58**	ND(0.50)	ND(2.0) U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.010)
		10/4/2005	ND(0.50)	ND(0.50)	**1.1**	**6.4**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	**0.022**
		10/23/2006	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/16/2007	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/22/2008	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/26/2009	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01) UJ
		9/14/2010	ND(0.50)	ND(5)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.1)	ND(0.1)
		9/27/2011	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.1**	ND(0.1)
		9/25/2012	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.42**	ND(0.1)
		9/26/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.18**	ND(0.1)
		9/23/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.4**	ND(0.1)
MW-87-08		6/25/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	NA	NA	ND(0.005)	ND(0.005)	2100	1380	7220	26.8	NA	NA
		10/5/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.006)	ND(0.0024)	2120	1375	5870	18.5	NA	NA
		12/11/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.0024)	2200	1255	6080	14.9	NA	NA
		3/10/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	2421	1225	6580	23.9	NA	NA
		6/23/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	2577	1244	6644	17.1	NA	NA
		9/14/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	2790	1830	7651	21.7	NA	NA
		12/2/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	2690	2010	7980	22.3	NA	NA
		3/21/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	2500	1650	7370	20.2	NA	NA
		6/21/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	2290	2050	7720	21.9	NA	NA
		9/14/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(160)	ND(160)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	2180	1620	6500	21	NA	NA
		12/13/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	1750	1870	6610	19.7	NA	NA
		3/22/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	1880	1880	6400	16.1	NA	NA

Table D-1
Summary of Post-Closure Groundwater Monitoring Analytical Results Since 1992

Well Number	Duplicate Sample ID	Date of Sampling	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	1-Methyl Naphthalene (µg/l)	2-Methyl Naphthalene (µg/l)	1,2-Dichloro ethane (µg/l)	Phenol (µg/l)	2-Methyl-4, 6-Dinitro phenol (µg/l)	p-Nitro phenol (µg/l)	Chromium dissolved (µg/l)	Lead dissolved (µg/l)	Chloride (mg/l)	Sulfate (mg/l)	TDS (mg/l)	TOC (mg/l)	DRO (mg/l)	GRO (mg/l)
MW-87-08		6/14/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	1420	2020	6280	18.6	NA	NA
continued		10/10/1995	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	1130	2230	5870	18.8	NA	NA
		5/9/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	871	2740	5910	20.7	NA	NA
		10/8/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.0017)	ND(0.0023)	798	2480	5350	17.9	NA	NA
		5/6/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(10)	ND(51)	ND(51)	ND(0.005)	ND(0.01)	603	2670	5440	17.3	NA	NA
		10/6/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(10)	ND(51)	ND(51)	ND(0.005)	ND(0.015)	716	2250	5210	18.3	NA	NA
		5/6/1998	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	ND(0.0050)	**0.0052**	749	2210	4900 B	18.4	NA	NA
		10/22/1998	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	**0.053**	ND(0.0030)	726	1940	4900	17.7	NA	NA
		5/4/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.037**
		10/6/1999	ND(0.50) [1]	ND(0.50) [1]	ND(0.50) [1]	ND(0.50) [1]	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01) [1]
		5/3/2000	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		10/11/2000	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		5/10/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		10/1/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		5/15/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/6/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		5/14/2003	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/11/2003	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		5/17/2004	ND(0.50)	ND(0.50)	ND(0.50)	**0.65**	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/12/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.010)
		10/4/2005	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/23/2006	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/17/2007	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/22/2008	**1.2**	ND(0.50)	**1.7**	**0.5**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/26/2009	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		9/14/2010	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.10)
		9/27/2011	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.1)	ND(0.1)
		9/26/2012	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.58**	ND(0.1)
MW-87-08R		9/28/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.62**	ND(0.1)
	Duplicate	9/28/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.6**	ND(0.1)
		12/12/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.12**	ND(0.1)
		3/15/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.39**	ND(0.1)
		6/11/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.42**	ND(0.1)
		9/22/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.53J**	ND(0.1)
	Duplicate	9/22/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.28J**	ND(0.1)
		12/10/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.28**	ND(0.1)
MW-87-25		6/25/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	**0.006**	155	6790	12400	41.2	NA	NA
		10/7/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.012) [1]	ND(0.0024)	184	10200	10861	31.9	NA	NA
		12/11/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.0024)	140	6640	11130	29.7	NA	NA
		3/9/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	126	6891	9950	15.6	NA	NA
		6/23/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	11	3847	6590	12.2	NA	NA
		9/15/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	95.4	1000	3017	14.8	NA	NA
		12/6/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	120	4558	4944	17.5	NA	NA
		3/23/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	99.8	2010	3660	12.8	NA	NA
		6/22/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	118	5840	10500	17.9	NA	NA
		9/15/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(160)	ND(160)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	124	5500	10200	23.9	NA	NA
		12/15/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	127	5940	10100	21.9	NA	NA
		3/22/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	102	1980	3900	12.7	NA	NA
		6/15/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	111	4410	6950	17	NA	NA
		10/11/1995	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	137	6690	9460	23.4	NA	NA
		5/9/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	96.1	1950	4840	14.6	NA	NA
		10/9/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.0017)	ND(0.0023)	155	6180	8860	21.8	NA	NA
		5/8/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(9.7)	ND(48)	ND(48)	ND(0.005)	ND(0.01)	105	2910	4910	17.2	NA	NA
		10/6/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(10)	ND(51)	ND(51)	ND(0.005)	ND(0.015)	130	6150	9780	25.3	NA	NA
		5/6/1998	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	ND(0.0050)	ND(0.0030)	104	2710	4620 B	13.4	NA	NA

Table D-1
Summary of Post-Closure Groundwater Monitoring Analytical Results Since 1992

Well Number	Duplicate Sample ID	Date of Sampling	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	1-Methyl Naphthalene (µg/l)	2-Methyl Naphthalene (µg/l)	1,2-Dichloro ethane (µg/l)	Phenol (µg/l)	2-Methyl-4, 6-Dinitro phenol (µg/l)	p-Nitro phenol (µg/l)	Chromium dissolved (µg/l)	Lead dissolved (µg/l)	Chloride (mg/l)	Sulfate (mg/l)	TDS (mg/l)	TOC (mg/l)	DRO (mg/l)	GRO (mg/l)
MW-87-25		10/22/1998	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	**0.064**	ND(0.0030)	112	4560	7970	16.4	NA	NA
continued		5/5/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.6**	ND(0.025)
		10/6/1999	ND(0.50) [1]	ND(0.50) [1]	ND(0.50) [1]	**17** [1]	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01) [1]
		5/4/2000	ND(0.50)	**0.6**	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.076**
		10/11/2000	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.019**
		5/10/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.011**
		10/2/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.025**
		5/15/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10) UJ	ND(0.010)
		10/6/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		5/14/2003	ND(0.50)	ND(0.50)	ND(0.50)	**0.83**	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	940	NA	NA	ND(0.10)	ND(0.010)
		10/12/2003	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	2700	NA	NA	ND(0.10)	**0.011**
		5/17/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)[2]	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/12/2004	**0.55**	ND(0.50)	**0.68**	ND(1.7) U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.010)
		10/10/2005	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.01**
		10/19/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	NA
		10/23/2006	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	na	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/17/2007	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	**0.038**
		10/22/2008	ND(0.50)	**0.94**	ND(0.50)	**1.3**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	**0.012**
		10/26/2009	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		9/14/2010	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.10)
		9/27/2011	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.1**	ND(0.1)
		9/25/2012	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.14**	ND(0.1)
		9/26/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.21**	ND(0.1)
		9/23/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.33**	ND(0.1)
MW-87-33		6/25/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	NA	NA	ND(0.005)	ND(0.005)	110	3210	5710	130	NA	NA
		10/7/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.006)	ND(0.0024)	118	3070	4545	27.5	NA	NA
		12/11/1992	**11**	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	**2.6**	ND(7)	ND(7)	ND(0.005)	ND(0.0024)	109	3200	5640	21.6	NA	NA
		3/9/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	107	2984	6880	16.5	NA	NA
		6/23/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	104	2933	5478	18	NA	NA
		9/15/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	90.7	2600	5142	22.9	NA	NA
		11/30/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	145	4324	6770	25.2	NA	NA
		6/20/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	107	3420	5160	23.3	NA	NA
		9/14/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(160)	ND(160)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	128	3550	4610	28	NA	NA
		11/30/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	95.1	2840	7290	24.2	NA	NA
		12/13/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	**3.4**	ND(7)	ND(7)	ND(0.005)	ND(0.005)	156	4380	7860	27.9	NA	NA
		3/23/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	**0.009**	ND(0.005)	103	3080	5680	23.4	NA	NA
		6/14/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	96.1	2620	4910	24.2	NA	NA
		10/11/1995	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	148	4420	7340	26.9	NA	NA
		5/8/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	91	2780	6190	21.2	NA	NA
		10/9/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.0017)	ND(0.0023)	87	2460	4250	28.2	NA	NA
		5/8/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(9.4)	ND(47)	ND(47)	ND(0.005)	ND(0.01)	85.1	2700	4610	25.1	NA	NA
		10/6/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(9.5)	ND(48)	ND(48)	ND(0.005)	ND(0.015)	134	3470	6500	25.8	NA	NA
		5/6/1998	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	ND(0.0050)	ND(0.0030)	102	3070	5460 B	23.7	NA	NA
		10/22/1998	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	**0.077**	ND(0.0030)	83.9	2540	4950	27.2	NA	NA
		5/5/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.23**
	MW-19-45	5/5/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.18**	**0.2**
		10/6/1999	ND(0.50) SR [1]	ND(0.50) SR [1]	**0.95 SR** [1]	**5.9 SR** [1]	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1**	**0.12 SR** [1]
		5/4/2000	**0.77**	ND(0.50) [1]	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.21**	**0.027**
		10/11/2000	ND(12)	ND(12)	ND(12)	ND(12)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.43**
		5/10/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		10/2/2001	**0.38**	**0.88**	**0.16**	**0.78**	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.011**
		5/15/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/5/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		5/14/2003	ND(0.50)	ND(0.50)	**0.71**	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/11/2003	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)

Table D-1
Summary of Post-Closure Groundwater Monitoring Analytical Results Since 1992

Well Number	Duplicate Sample ID	Date of Sampling	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	1-Methyl Naphthalene (µg/l)	2-Methyl Naphthalene (µg/l)	1,2-Dichloro ethane (µg/l)	Phenol (µg/l)	2-Methyl-4, 6-Dinitro phenol (µg/l)	p-Nitro phenol (µg/l)	Chromium dissolved (µg/l)	Lead dissolved (µg/l)	Chloride (mg/l)	Sulfate (mg/l)	TDS (mg/l)	TOC (mg/l)	DRO (mg/l)	GRO (mg/l)
MW-87-33		5/17/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)[2]	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
continued		10/12/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.59) U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.010)
		10/10/2005	ND(0.50)	ND(0.50)	ND(0.50)	**0.58**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/23/2006	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/17/2007	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/22/2008	Well destroyed																	
MW-87-36		6/24/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	NA	NA	ND(0.005)	ND(0.005)	65.2	3710	5664	21.9	NA	NA
		10/7/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.006)	ND(0.0024)	66	3740	5338	23.5	NA	NA
		12/10/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.0024)	60.2	3470	5900	29	NA	NA
		3/9/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	60	3449	5730	16.4	NA	NA
		6/22/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	58.3	3290	5796	15.1	NA	NA
		9/15/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	55.8	3215	5685	20.5	NA	NA
		11/30/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	**0.017**	ND(0.005)	55.4	3273	5760	22	NA	NA
		3/23/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	60.6	3640	6350	24.5	NA	NA
MW-87-36R		6/20/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NA
		9/14/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NA
		12/14/1994	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NA
		3/22/1995	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NA
		6/12/1995	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NA
		10/10/1995	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NA
		6/10/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	NA	NA	NA	ND(0.005)	ND(0.005)	107	3670	6220	30.3	NA	NA
		10/9/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.0017)	ND(0.0023)	106	3740	5860	30.2	NA	NA
		5/8/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(9.9)	ND(50)	ND(50)	ND(0.005)	ND(0.02)	115	3700	6040	31	NA	NA
		10/6/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(9.6)	ND(48)	ND(48)	ND(0.005)	ND(0.015)	112	3230	6160	27.4	NA	NA
		5/6/1998	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	ND(0.0050)	ND(0.0030)	112	3660	6060 B	27.9	NA	NA
		10/22/1998	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	**0.058**	ND(0.0030)	98.8	3430	6070	27.9	NA	NA
		5/5/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.025)
		10/6/1999	ND(0.50) [1]	**1.4** [1]	**1.2** [1]	**5.7** [1]	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.02** [1]
		5/4/2000	ND(0.50)	**0.85**	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.013**
		10/11/2000	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.049**	**0.0053**
		5/10/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.22**	ND(0.01)
		10/2/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.0042**
		5/15/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/6/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		5/14/2003	ND(0.50)	ND(0.50)	**0.75**	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/11/2003	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		5/17/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)[2]	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/12/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.010)
		10/10/2005	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.01)
		10/19/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	NA
		10/9/2006	Well Destroyed																	
MW-90-01		6/24/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	80.4	5925	10784	17.2	NA	NA
	MW-87-99	6/24/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	80.8	6500	10650	20.4	NA	NA
		10/5/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.012) *	ND(0.0024)	80.3	7610	10850	18.8	NA	NA
		12/9/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.0024)	66.9	5740	10358	17.1	NA	NA
		3/9/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	**0.007**	**0.005**	75.7	7006	10400	21.3	NA	NA
		6/22/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	73.6	6440	10618	8.46	NA	NA
	MW-87-55	6/22/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	73.8	6670	642	9.57	NA	NA
		9/13/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	69	6440	10588	14.4	NA	NA
	MW-19-84	9/13/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	70	6670	10621	15.7	NA	NA
		11/2/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	62.2	6600	10089	15.1	NA	NA
		3/21/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	56.2	6220	10200	16	NA	NA
		6/21/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	27.5	4900	8280	9.8	NA	NA
		9/13/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(160)	ND(160)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	45.6	5850	9520	15.7	NA	NA
		12/12/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	45.1	6720	9590	13.7	NA	NA

Table D-1
Summary of Post-Closure Groundwater Monitoring Analytical Results Since 1992

Well Number	Duplicate Sample ID	Date of Sampling	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	1-Methyl Naphthalene (µg/l)	2-Methyl Naphthalene (µg/l)	1,2-Dichloro ethane (µg/l)	Phenol (µg/l)	2-Methyl-4, 6-Dinitro phenol (µg/l)	p-Nitro phenol (µg/l)	Chromium dissolved (µg/l)	Lead dissolved (µg/l)	Chloride (mg/l)	Sulfate (mg/l)	TDS (mg/l)	TOC (mg/l)	DRO (mg/l)	GRO (mg/l)
MW-90-01		3/21/1995	ND(4)	ND(4)	ND(4)	**15.7**	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	49.7	6520	9900	14.3	NA	NA
continued		6/12/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	48.1	6450	9700	13.2	NA	NA
		10/10/1995	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	**0.005**	ND(0.005)	64.7	6310	9950	14.9	NA	NA
		5/8/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	**0.005**	52.1	5940	9120	13.4	NA	NA
		10/9/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	**0.0017 J**	**0.0023**	49.7	6070	9060	16.1	NA	NA
		5/6/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(9.4)	ND(47)	ND(47)	**0.0062**	ND(0.002)	27.6	4880	7710	10.3	NA	NA
		10/6/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(9.4)	ND(47)	ND(47)	ND(0.005)	ND(0.015)	23.9	4550	7640	9.5	NA	NA
		5/6/1998	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	ND(0.025)	ND(0.0030)	23.1	4560	7100 B	10.3	NA	NA
		10/22/1998	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	**0.053**	ND(0.0030)	32.2	5290	8560	12.1	NA	NA
		5/4/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.025)
		10/5/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10) SH	ND(0.01)
		5/3/2000	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		10/10/2000	**0.094**	**0.13**	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.0051**
		5/8/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		10/1/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.011**
		5/15/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/23/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		5/13/2003	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	5000	NA	NA	ND(0.10)	ND(0.010)
		10/12/2003	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	6000	NA	NA	ND(0.10)	ND(0.010)
		5/17/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/12/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.010)
		10/4/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	NA
		10/10/2005	ND(0.50)	ND(0.50)	ND(0.50)	**1.4**	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.01)
		10/23/2006	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/16/2007	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/22/2008	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**2.4**	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/26/2009	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		9/14/2010	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.10)
		9/27/2011	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.1)	ND(0.1)
		9/26/2012	ND(0.50)	ND(5.0)	ND(0.50)	**2**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.1)	ND(0.1)
MW-90-01R		9/26/2013	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NA
		12/12/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.1)	ND(0.1)
		3/15/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.2)	ND(0.1)
		6/11/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.17**	ND(0.1)
		9/23/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.31**	ND(0.1)
		12/10/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.11**	ND(0.1)
	Duplicate	12/10/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.1)	ND(0.1)
MW-K		6/26/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	**4.1**	ND(7)	ND(7)	ND(0.005)	ND(0.005)	471	4910	8344	111	NA	NA
		10/6/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.006)	ND(0.0024)	443	5590	8280	19.2	NA	NA
	MW-69	10/6/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.006)	ND(0.0024)	462	5370	8365	18.5	NA	NA
		12/10/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.0024)	449	4950	8545	22.1	NA	NA
	MW-87-57	12/10/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.0024)	456	4920	8760	16.1	NA	NA
		3/11/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	**0.006**	887	3860	7840	10.7	NA	NA
		6/22/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	400	4880	8701	10.4	NA	NA
		9/13/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	487	4880	8485	15.5	NA	NA
		12/2/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	484	4370	8272	18.9	NA	NA
		5/5/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	510	4660	8520	18.2	NA	NA
		6/21/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	486	4690	8400	20	NA	NA
		9/14/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(160)	ND(160)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	444	5050	8260	22.6	NA	NA
		12/14/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	431	3780	8380	19.1	NA	NA
		3/23/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	487	4420	8000	18.9	NA	NA
		6/13/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	434	5310	8040	18.2	NA	NA
		10/11/1995	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	551	4920	8810	20.8	NA	NA
		5/7/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	579	4870	8750	18.2	NA	NA
	MW-19-19	5/7/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	**0.005**	560	4840	8760	19.2	NA	NA
		10/8/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.0017)	ND(0.0023)	462	5040	8380	20.3	NA	NA

Table D-1
Summary of Post-Closure Groundwater Monitoring Analytical Results Since 1992

Well Number	Duplicate Sample ID	Date of Sampling	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	1-Methyl Naphthalene (µg/l)	2-Methyl Naphthalene (µg/l)	1,2-Dichloro ethane (µg/l)	Phenol (µg/l)	2-Methyl-4, 6-Dinitro phenol (µg/l)	p-Nitro phenol (µg/l)	Chromium dissolved (µg/l)	Lead dissolved (µg/l)	Chloride (mg/l)	Sulfate (mg/l)	TDS (mg/l)	TOC (mg/l)	DRO (mg/l)	GRO (mg/l)
MW-K		5/7/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(10)	ND(52)	ND(52)	ND(0.005)	ND(0.025)	502	4330	7650	19.4	NA	NA
continued		10/6/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(10)	ND(51)	ND(51)	ND(0.005)	ND(0.015)	501	3210	7940	19.9	NA	NA
		5/5/1998	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	NA	NA	ND(1.0)	ND(9.4)	ND(47)	ND(47)	ND(0.0050)	ND(0.0030)	501	4510	8070	22.3	NA	NA
	MW-19-19	5/5/1998	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	NA	NA	ND(1.0)	ND(9.4)	ND(47)	ND(47)	ND(0.0050)	ND(0.0030)	490	4410	7920	21.7	NA	NA
		10/22/1998	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	**0.074**	ND(0.0030)	463	4290	8470	23.6	NA	NA
		5/4/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.025)
		10/5/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.31**	ND(0.01)
	MW-19-19	10/5/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.31**	ND(0.01)
		5/3/2000	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
	MW-19-19	5/3/2000	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		10/10/2000	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
	MW-19-57	10/10/2000	ND(0.50)	**0.12**	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.0074**
		5/9/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
	MW-19-44	5/9/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		10/1/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.0039**
		5/14/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
	MW-G3	5/14/2002	ND(0.50)	**0.61**	ND(0.50)	**0.7**	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/5/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.11**	ND(0.010)
	MW-84-18	10/5/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.13**	ND(0.010)
		5/13/2003	ND(0.50)	ND(0.50)	**0.60**	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/11/2003	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.14**	ND(0.010)
		5/17/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)[2]	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.17**	ND(0.010)
		10/12/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.010)
	MW-19-19	10/12/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.010)
	MW-19-44	10/4/2005	ND(0.50)	ND(0.50)	ND(0.50)	**0.89**	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/4/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	NA
		10/10/2005	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.01)
		10/23/2006	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/23/2006	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/16/2007	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
	MW-19-44	10/16/2007	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/22/2008	ND(0.50)	ND(0.50)	ND(0.50)	**0.51**	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
	MW-19-44	10/22/2008	ND(0.50)	ND(0.50)	ND(0.50)	**0.6**	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.25**	ND(0.01)
		10/26/2009	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
	MW-1944	10/26/2009	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		9/15/2010	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.15**	ND(0.10)
		9/28/2011	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.22**	ND(0.1)
		9/26/2012	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.5**	ND(0.1)
		9/25/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.54**	ND(0.1)
		9/23/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.58**	ND(0.1)
MW-W2		6/23/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	**0.017**	74	7980	14700	22.7	NA	NA
		10/8/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.006)	ND(0.0024)	76.7	12000	14450	109	NA	NA
		12/9/1992	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NA
		3/11/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	118	10100	14900	12.7	NA	NA
		6/23/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	66.6	9269	15180	13.6	NA	NA
		9/15/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	**0.008**	79	10600	16395	23.2	NA	NA
		12/6/1993	**5**	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	**0.009 B**	75.7	11054	15888	21.9	NA	NA
		3/17/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	71.9	9550	16000	20.6	NA	NA
		6/22/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	79.5	9990	16500	20.2	NA	NA
		9/15/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(160)	ND(160)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	84.1	9830	16500	25.9	NA	NA
		12/15/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	72.5	9910	16200	20.9	NA	NA
		3/22/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	83.6	8990	15800	19.8	NA	NA
		6/14/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	81.7	9850	16700	21.3	NA	NA
		10/10/1995	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	**13**	ND(7)	ND(7)	ND(0.005)	ND(0.005)	77.3	9650	15400	41.3	NA	NA
		5/9/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	81.3	10100	16000	24.5	NA	NA

Table D-1
Summary of Post-Closure Groundwater Monitoring Analytical Results Since 1992

Well Number	Duplicate Sample ID	Date of Sampling	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	1-Methyl Naphthalene (µg/l)	2-Methyl Naphthalene (µg/l)	1,2-Dichloro ethane (µg/l)	Phenol (µg/l)	2-Methyl-4, 6-Dinitro phenol (µg/l)	p-Nitro phenol (µg/l)	Chromium dissolved (µg/l)	Lead dissolved (µg/l)	Chloride (mg/l)	Sulfate (mg/l)	TDS (mg/l)	TOC (mg/l)	DRO (mg/l)	GRO (mg/l)
MW-W2		10/8/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.0017)	**0.0056**	95.4	10900	15000	57.8	NA	NA
continued		5/8/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(9.4)	ND(47)	ND(47)	ND(0.005)	ND(0.025)	74.4	10600	15400	23	NA	NA
		10/6/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(9.3)	ND(47)	ND(47)	ND(0.005)	ND(0.015)	58.6	8330	13000	16.2	NA	NA
		5/5/1998	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	NA	NA	ND(1.0)	ND(9.5)	ND(47)	ND(47)	ND(0.0050)	ND(0.0030)	ND(300)	9440	14900	20.1	NA	NA
		10/22/1998	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	**0.073**	ND(0.0030)	68	9170	15600	21.9	NA	NA
		5/5/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.025)
		10/5/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.024**
		5/2/2000	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		10/11/2000	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.01**
		5/9/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		10/2/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.0038**
		5/15/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/6/2002	**0.83**	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		5/14/2003	ND(0.50)	ND(0.50)	**0.73**	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	10000	NA	NA	ND(0.10)	ND(0.010)
		10/12/2003	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	10000	NA	NA	ND(0.10)	ND(0.010)
		5/17/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)[2]	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
	9/14/2010	10/12/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.010)
	11/13/2010	10/4/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	NA
		10/10/2005	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.01)
		10/16/2006	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/17/2007	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/22/2008	ND(0.50)	ND(0.50)	ND(0.50)	**0.57**	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/27/2009	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		9/14/2010	**5.2**	ND(5.0)	ND(0.50)	ND(1.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.10)
		9/26/2012	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.27**	ND(0.1)
		9/27/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.1)	ND(0.1)
		9/23/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.1)	ND(0.1)
MW-Y		6/25/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	337	2100	4300	21.2	NA	NA
		10/6/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.006)	ND(0.0024)	366	2180	4306	18.5	NA	NA
		12/9/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.0024)	304	1965	4493	16	NA	NA
		3/10/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	294	2030	4390	15.1	NA	NA
		6/22/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	291	1910	24313	10.4	NA	NA
		9/14/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	298	1910	4361	15.8	NA	NA
		12/1/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	308	1890	4290	17.2	NA	NA
		3/21/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	273	1780	4090	16.3	NA	NA
		6/21/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	269	1760	4100	16	NA	NA
		9/13/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(160)	ND(160)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	276	1860	4250	19.4	NA	NA
		12/12/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	268	1890	4302	15.8	NA	NA
		3/22/1995	ND(4)	ND(4)	ND(4)	**6.5**	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	283	1940	4300	14.8	NA	NA
		6/13/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	293	1850	4060	16.6	NA	NA
		10/11/1995	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NA
		6/10/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	338	1960	4360	16.3	NA	NA
		10/8/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.0017)	ND(0.0023)	276	2190	4390	16.3	NA	NA
		5/8/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(9.9)	ND(50)	ND(50)	ND(0.005)	ND(0.005)	270	2270	4530	13.3	NA	NA
		10/6/1997	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NA	NA
		5/6/1998	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	ND(0.0050)	ND(0.0030)	176	2380	3700	15.7	NA	NA
		10/22/1998	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	**0.074**	ND(0.0030)	175	2290	4750	15.6	NA	NA
		5/4/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.025)
		10/4/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.64 SH**	ND(0.01)
		5/3/2000	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		10/10/2000	**0.11**	**0.075**	**0.071**	**0.23**	NA	NA	**0.89**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.48**	**0.0092**
		5/8/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.38**	ND(0.01)
		10/1/2001	ND(0.50)	ND(0.50)	ND(0.50)	**1.1**	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.32**	ND(0.01)
	MW-1933	10/1/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.31**	ND(0.01)
		5/14/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.37**	ND(0.010)

Table D-1
Summary of Post-Closure Groundwater Monitoring Analytical Results Since 1992

Well Number	Duplicate Sample ID	Date of Sampling	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	1-Methyl Naphthalene (µg/l)	2-Methyl Naphthalene (µg/l)	1,2-Dichloro ethane (µg/l)	Phenol (µg/l)	2-Methyl-4, 6-Dinitro phenol (µg/l)	p-Nitro phenol (µg/l)	Chromium dissolved (µg/l)	Lead dissolved (µg/l)	Chloride (mg/l)	Sulfate (mg/l)	TDS (mg/l)	TOC (mg/l)	DRO (mg/l)	GRO (mg/l)
MW-Y continued		10/5/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.54**	ND(0.010)
		5/13/2003	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	2400	NA	NA	**0.41**	ND(0.010)
	MW-19-50-N	5/13/2003	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	2400	NA	NA	**0.41**	ND(0.010)
		10/12/2003	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	2700	NA	NA	**0.53**	ND(0.010)
		5/17/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)[2]	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.24**	ND(0.010)
		10/12/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.33**	ND(0.010)
		10/4/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.32**	NA
		10/10/2005	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.01)
		10/23/2006	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.37**	ND(0.01)
		10/17/2007	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/22/2008	ND(0.50)	ND(0.50)	ND(0.50)	**0.53**	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.42**	ND(0.01)
		10/26/2009	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.26**	ND(0.01)
		9/14/2010	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.31**	ND(0.10)
	MW-YD	9/14/2010	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.29**	ND(0.10)
		9/28/2011	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.1)	ND(0.1)
		9/26/2012	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.57**	ND(0.1)
		9/27/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.71**	ND(0.1)
		9/22/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.12**	ND(0.1)
Lower Sand Wells																				
MW-1BR		6/23/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	87.4	1830	4438	20.2	NA	NA
		10/7/1992	**18**	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.006)	ND(0.0024)	67.8	1880	4338	21.1	NA	NA
		12/11/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	**0.011**	56.1	1780	4455	17.3	NA	NA
		3/8/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	54	1667	4500	28.5	NA	NA
	MW-19-44	3/8/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	57.7	1707	4450	16.2	NA	NA
		6/21/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	42.1	1580	4372	16.2	NA	NA
	MW-19-84	6/21/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	49.3	1560	4450	14.4	NA	NA
		9/13/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	48	1580	4195	18.4	NA	NA
	MW-87-55	9/13/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	46.7	1560	4204	17.2	NA	NA
		11/30/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	49.9	1613	4150	16.3	NA	NA
	MW-87-55	11/30/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	51.2	1594	4280	17.2	NA	NA
		3/22/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	46.1	1520	4129	16.4	NA	NA
	MW-19-44	3/22/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	45.8	1500	4095	17.8	NA	NA
		6/20/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	49.5	1570	4270	16.8	NA	NA
	MW-19-44	6/20/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	51.6	1540	4300	17.4	NA	NA
		9/14/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(160)	ND(160)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	58.5	1660	4320	18.1	NA	NA
		12/14/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	57.9	1590	4360	16.3	NA	NA
		3/23/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	49.4	1510	4080	17.4	NA	NA
		6/13/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	60.3	1680	4340	18.5	NA	NA
		10/10/1995	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	51	1500	3920	19	NA	NA
		5/7/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	51.7	1630	4320	19.1	NA	NA
		10/7/1996	ND(4)	ND(4)	ND(4)	**6.4**	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.0017)	ND(0.0023)	55.9	1690	4320	18.3	NA	NA
		5/7/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(9.6)	ND(48)	ND(48)	ND(0.005)	ND(0.01)	61.5	1760	4180	18.5	NA	NA
		10/6/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(9.5)	ND(47)	ND(47)	ND(0.005)	ND(0.003)	60.7	1750	4220	18	NA	NA
		5/4/1998	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	NA	NA	ND(1.0)	ND(9.4)	ND(47)	ND(47)	ND(0.0050)	ND(0.0030)	59.2	1780	3810	19.4	NA	NA
	MW-19-44	5/4/1998	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	NA	NA	ND(1.0)	ND(9.4)	ND(47)	ND(47)	ND(0.0050)	ND(0.0030)	56.7	1490	4200	18.1	NA	NA
		10/22/1998	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	ND(0.025)	ND(0.0030)	67	1290	4000	19.6	NA	NA
	MW-19-44	10/22/1998	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	ND(0.025)	ND(0.0030)	56.9	1190	4190	18.5	NA	NA
		5/3/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.2**	ND(0.025)
		10/4/1999	**0.2**	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		5/2/2000	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.14**	ND(0.01)
		10/10/2000	**0.26**	**0.078**	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		5/9/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		10/1/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		5/14/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/5/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)

Table D-1
Summary of Post-Closure Groundwater Monitoring Analytical Results Since 1992

Well Number	Duplicate Sample ID	Date of Sampling	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	1-Methyl Naphthalene (µg/l)	2-Methyl Naphthalene (µg/l)	1,2-Dichloro ethane (µg/l)	Phenol (µg/l)	2-Methyl-4, 6-Dinitro phenol (µg/l)	p-Nitro phenol (µg/l)	Chromium dissolved (µg/l)	Lead dissolved (µg/l)	Chloride (mg/l)	Sulfate (mg/l)	TDS (mg/l)	TOC (mg/l)	DRO (mg/l)	GRO (mg/l)
MW-1BR		5/13/2003	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	1400	NA	NA	ND(0.10)	ND(0.010)
continued		10/12/2003	ND(0.50)	ND(0.50)	ND(0.50)	**0.72**	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	840	NA	NA	ND(0.10)	ND(0.010)
		5/17/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/12/2004	ND(0.50)	ND(0.50)	**0.73**	ND(3.2) U	NA	NA	NA [3]	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	**0.011**
		10/4/2005	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/23/2006	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/16/2007	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/22/2008	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/26/2009	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/26/2009	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		9/14/2010	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.10)
		9/28/2011	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.1)	ND(0.1)
		9/25/2012	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.18**	ND(0.1)
		9/25/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.16**	ND(0.1)
	Duplicate	9/25/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.17**	ND(0.1)
		9/23/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.19J**	ND(0.1)
	Duplicate	9/22/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.4J**	ND(0.1)
MW-8BR		6/25/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	53.1	366	2470	86.9	NA	NA
	MW-GZ	6/25/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	52.7	366	2340	42.7	NA	NA
		10/6/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.006)	ND(0.0024)	55.7	387	1975	19.4	NA	NA
		12/9/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.0024)	50.2	365	2044	14.1	NA	NA
		3/10/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	52.4	392	2000	19	NA	NA
		6/21/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	46.8	364	1973	11	NA	NA
		9/14/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	58.7	513	2121	11	NA	NA
		12/1/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	59	492	2080	15.2	NA	NA
		3/21/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	55.3	513	2160	14.8	NA	NA
		6/21/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	55.9	543	2210	13.8	NA	NA
		9/13/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(160)	ND(160)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	63	437	2050	17	NA	NA
		12/13/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	62.3	371	2050	15.3	NA	NA
		3/21/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	**0.4**	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	60.9	382	1970	15.9	NA	NA
		6/13/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	69.9	492	2120	15.5	NA	NA
		10/9/1995	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	**0.4**	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	67.1	474	2090	20	NA	NA
		5/8/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	61.5	395	2040	15	NA	NA
		10/8/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.0017)	ND(0.0023)	60.9	401	1920	15.3	NA	NA
		5/6/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(9.5)	ND(47)	ND(47)	ND(0.005)	ND(0.005)	63.7	403	2030	15.4	NA	NA
		10/6/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(9.5)	ND(47)	ND(47)	ND(0.005)	ND(0.003)	62.5	476	2110	14.2	NA	NA
		5/4/1998	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	NA	NA	ND(1.0)	ND(9.4)	ND(47)	ND(47)	ND(0.0050)	ND(0.0030)	ND(60.0)	530	1120	14.6	NA	NA
		10/22/1998	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	**0.13**	ND(0.0030)	52.2	480	2210	14.9	NA	NA
		5/5/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.97**	ND(0.025)
		10/4/1999	ND(0.50)	ND(0.50)	**0.054**	ND(0.50)	NA	NA	**1.0 SR**	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10) SH	ND(0.01)
		5/2/2000	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	ND(0.0050)	ND(0.0030)	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		10/9/2000	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**1.4**	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		5/8/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**0.31**	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		10/1/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**0.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.016**
		5/14/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**1.1**	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/5/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		5/13/2003	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	580	NA	NA	ND(0.10)	ND(0.010)
	MW-19-51-N	5/13/2003	ND(0.50)	ND(0.50)	ND(0.50)	**0.78**	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	570	NA	NA	ND(0.10)	ND(0.010)
		10/12/2003	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	760	NA	NA	ND(0.10)	ND(0.010)
		5/17/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/12/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.83) U	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.010)
		10/4/2005	ND(0.50)	ND(0.50)	ND(0.50)	**0.89**	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/23/2006	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/16/2007	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/22/2008	ND(0.50)	ND(0.50)	ND(0.50)	**0.61**	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.33**	ND(0.01)

Table D-1
Summary of Post-Closure Groundwater Monitoring Analytical Results Since 1992

Well Number	Duplicate Sample ID	Date of Sampling	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	1-Methyl Naphthalene (µg/l)	2-Methyl Naphthalene (µg/l)	1,2-Dichloro ethane (µg/l)	Phenol (µg/l)	2-Methyl-4, 6-Dinitro phenol (µg/l)	p-Nitro phenol (µg/l)	Chromium dissolved (µg/l)	Lead dissolved (µg/l)	Chloride (mg/l)	Sulfate (mg/l)	TDS (mg/l)	TOC (mg/l)	DRO (mg/l)	GRO (mg/l)
MW-8BR		10/26/2009	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
continued		9/14/2010	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.10)
		9/27/2011	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.1)	ND(0.1)
		9/26/2012	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.39**	ND(0.1)
MW-8BRR		9/28/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.44**	ND(0.1)
		12/12/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.1)
		3/15/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.27**	ND(0.1)
		6/11/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.35**	ND(0.1)
		9/22/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.29**	ND(0.1)
		12/10/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.37**	ND(0.1)
MW-9		7/9/1992	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	**2.3**	ND(7)	ND(7)	ND(0.005)	ND(0.005)	20.1	616	1990	32.3	NA	NA
		10/5/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.006)	ND(0.0024)	17.5	668	1900	13.4	NA	NA
		12/11/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.0024)	15.7	562	1840	8.92	NA	NA
		3/10/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	17.7	670	1870	19.5	NA	NA
		6/21/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	**11**	ND(7)	ND(7)	ND(0.005)	ND(0.005)	19.2	566	2518	6.61	NA	NA
		9/14/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	18	530	1831	10.2	NA	NA
		12/1/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	20.4	544	1790	10.5	NA	NA
		3/21/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	22.5	530	1830	10	NA	NA
		6/22/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	18.3	530	1840	10.5	NA	NA
		9/13/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(160)	ND(160)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	17	595	1870	12	NA	NA
	MW-19-44	9/13/1994	ND(4)	**4.1**	ND(4)	ND(4)	ND(160)	ND(160)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	16.8	583	1870	12	NA	NA
		12/12/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	17.9	584	1946	10.3	NA	NA
	MW-19-44	12/12/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	18.3	577	1870	10.4	NA	NA
		3/21/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	17.1	631	1880	10	NA	NA
	MW-19-44	3/21/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	**0.007**	ND(0.005)	16.9	609	1880	11	NA	NA
		6/12/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	18.2	657	1910	11.1	NA	NA
	MW-19-19	6/12/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	18.5	650	1910	10.3	NA	NA
		10/9/1995	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	21.1	656	1950	11.1	NA	NA
	MW-19-19	10/9/1995	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	21.6	680	1940	10.7	NA	NA
		5/8/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	20.4	676	1770	10.2	NA	NA
		10/7/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.0017)	ND(0.0023)	18.3	699	2000	10.2	NA	NA
	MW-19-19	10/7/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.0017)	ND(0.0023)	18.5	694	1990	10.3	NA	NA
		5/6/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(9.5)	ND(48)	ND(48)	ND(0.005)	ND(0.005)	17.9	731	1930	11.2	NA	NA
		10/6/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(9.5)	ND(48)	ND(48)	ND(0.005)	ND(0.003)	15.9	668	1780	8.5	NA	NA
		5/4/1998	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	NA	NA	ND(1.0)	ND(9.5)	ND(47)	ND(47)	ND(0.0050)	**0.0097**	ND(60.0)	800	1910	9.6	NA	NA
		10/22/1998	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	**0.081**	ND(0.0030)	14.3	682	2010	10.6	NA	NA
		5/3/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.41**	ND(0.025)
		10/4/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.31**	ND(0.025)
		5/2/2000	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	ND(0.0050)	ND(0.0030)	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		10/9/2000	ND(0.50)	**0.14**	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		5/8/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		10/1/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.0031**
		5/14/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/5/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		5/13/2003	ND(0.50)	ND(0.50)	**0.62**	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/11/2003	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		5/17/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/12/2004	ND(0.50)	ND(0.50)	**1.7**	**7.3**	NA	NA	NA [3]	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	**0.024**
		10/4/2005	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/23/2006	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/16/2007	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/22/2008	ND(0.50)	ND(0.50)	ND(0.50)	**0.57**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/26/2009	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		9/14/2010	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.10)
		9/27/2011	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.1)	ND(0.1)

Table D-1
Summary of Post-Closure Groundwater Monitoring Analytical Results Since 1992

Well Number	Duplicate Sample ID	Date of Sampling	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	1-Methyl Naphthalene (µg/l)	2-Methyl Naphthalene (µg/l)	1,2-Dichloro ethane (µg/l)	Phenol (µg/l)	2-Methyl-4, 6-Dinitro phenol (µg/l)	p-Nitro phenol (µg/l)	Chromium dissolved (µg/l)	Lead dissolved (µg/l)	Chloride (mg/l)	Sulfate (mg/l)	TDS (mg/l)	TOC (mg/l)	DRO (mg/l)	GRO (mg/l)
MW-9R		9/28/2013	**2.6**	ND(5)	ND(0.5)	**1.7**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.7**	ND(0.1)
		12/12/2013	**1.6**	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.73**	ND(0.1)
	Duplicate	12/12/2013	**1.7**	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.2**	ND(0.1)
		3/15/2014	ND(0.50)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.84**	ND(0.1)
	Duplicate	3/15/2014	ND(0.50)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.96**	ND(0.1)
		6/11/2014	**0.57**	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.67**	ND(0.1)
	Duplicate	6/11/2014	**0.51**	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.55**	ND(0.1)
		9/22/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.55**	ND(0.1)
		12/10/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.44**	ND(0.1)
MW-10		6/24/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	19.1	624	1790	9.58	NA	NA
		10/5/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.006)	ND(0.0024)	15.9	702	1900	37.1	NA	NA
		12/11/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.0024)	13.4	631	1860	9.02	NA	NA
		3/10/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	**0.006**	14.1	684	1920	18	NA	NA
		6/21/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	17.2	652	1927	4.96	NA	NA
		9/14/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	16	641	1932	8.76	NA	NA
		12/1/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	15.4	660	1920	11.9	NA	NA
		3/21/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	18.2	680	1950	9.55	NA	NA
		6/22/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	15.5	633	1940	11	NA	NA
		9/13/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(160)	ND(160)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	14.6	658	1940	10.9	NA	NA
	MW-19-19	9/13/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(160)	ND(160)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	14.5	657	1930	11.4	NA	NA
		12/12/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	16.8	661	1880	9.8	NA	NA
	MW-19-19	12/12/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.007)	ND(0.005)	16.7	626	1860	9.84	NA	NA
		3/21/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	14.9	647	1900	9.9	NA	NA
	MW-19-19	3/21/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.007)	ND(0.005)	15	655	1890	9.8	NA	NA
		6/12/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	16.6	682	1920	10.1	NA	NA
		10/9/1995	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	23	693	1960	11	NA	NA
	MW-19-44	10/9/1995	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	22.4	741	1970	11	NA	NA
		5/8/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	18.4	702	1920	11.3	NA	NA
		10/7/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.0017)	ND(0.0023)	18.8	656	1910	13.3	NA	NA
	MW-19-44	10/7/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.0017)	ND(0.0023)	18	653	1920	11.4	NA	NA
		5/6/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(9.5)	ND(47)	ND(47)	**0.0065**	ND(0.005)	17.4	719	1870	11.1	NA	NA
		10/6/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(9.5)	ND(47)	ND(47)	ND(0.005)	ND(0.003)	18.5	589	1990	9.5	NA	NA
		5/4/1998	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	NA	NA	ND(1.0)	ND(9.5)	ND(47)	ND(47)	ND(0.0050)	ND(0.0030)	ND(60.0)	749	1840	10.2	NA	NA
		10/22/1998	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	**0.081**	ND(0.0030)	16	632	1940	10.6	NA	NA
		5/3/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.025)
		10/4/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.32**	ND(0.01)
		5/2/2000	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		10/9/2000	**0.12**	**0.17**	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.11**	ND(0.01)
	MW-19-44	10/9/2000	ND(0.50)	**0.22**	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.16**	ND(0.01)
		5/8/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		10/1/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.019**
		5/14/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/5/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.2**	ND(0.010)
		5/13/2003	ND(0.50)	ND(0.50)	**0.73**	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/11/2003	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		5/17/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/12/2004	**11**	ND(0.50)	**8.7**	**15**	NA	NA	NA [3]	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	**0.048**
	(resampled)	11/3/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA [3]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.010)
		10/4/2005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	NA
		10/10/2005	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.01)
		10/23/2006	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/16/2007	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/22/2008	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/26/2009	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		9/14/2010	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.10)

Table D-1
Summary of Post-Closure Groundwater Monitoring Analytical Results Since 1992

Well Number	Duplicate Sample ID	Date of Sampling	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	1-Methyl Naphthalene (µg/l)	2-Methyl Naphthalene (µg/l)	1,2-Dichloro ethane (µg/l)	Phenol (µg/l)	2-Methyl-4, 6-Dinitro phenol (µg/l)	p-Nitro phenol (µg/l)	Chromium dissolved (µg/l)	Lead dissolved (µg/l)	Chloride (mg/l)	Sulfate (mg/l)	TDS (mg/l)	TOC (mg/l)	DRO (mg/l)	GRO (mg/l)
MW-10		9/28/2011	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.1)	ND(0.1)
continued		9/26/2012	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.13**	ND(0.1)
MW-10R		9/28/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.37**	ND(0.1)
		12/12/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.1)
		3/15/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.16**	ND(0.1)
		6/11/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.2**	ND(0.1)
		9/22/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.1**	ND(0.1)
		12/10/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.1)	ND(0.1)
MW-PR		6/25/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	**3.3**	**2.7**	ND(7)	ND(7)	ND(0.005)	ND(0.005)	193	551	2650	29.6	NA	NA
		10/6/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	**3**	ND(2)	ND(7)	ND(7)	ND(0.006)	ND(0.0024)	198	616	2437	22.5	NA	NA
	MW-88	10/6/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	**2.8**	ND(2)	ND(7)	ND(7)	ND(0.006)	ND(0.0024)	206	632	2413	21.9	NA	NA
		12/9/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	**3**	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.0024)	181	541	2840	20.7	NA	NA
	MW-87-44	12/9/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	**3.2**	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.0024)	182	547	2486	21.7	NA	NA
		3/10/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	**4.1**	ND(2)	ND(7)	ND(7)	ND(0.005)	**0.007**	183	541	2440	23.9	NA	NA
		6/21/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	172	501	1862	17.8	NA	NA
		9/14/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	166	485	2499	20.2	NA	NA
		12/1/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	164	513	2410	19	NA	NA
	MW-19	12/1/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	**0.005 B**	165	496	2460	19.6	NA	NA
		3/21/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	79.2	1470	3089	10.1	NA	NA
		6/21/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	**3.6**	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	153	611	2590	18.5	NA	NA
		9/13/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(160)	ND(160)	**0.5**	ND(2)	ND(7)	ND(7)	**0.005**	ND(0.005)	158	563	2510	22.9	NA	NA
		12/13/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	**0.8**	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	151	546	2530	19.9	NA	NA
		3/22/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	**2.3**	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	153	614	2580	19.3	NA	NA
		6/12/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	**3.6**	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	158	630	2600	19.6	NA	NA
	MW-19-44	6/12/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	**3.1**	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	159	633	2600	19.9	NA	NA
		10/9/1995	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	**2**	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	158	647	2590	21.8	NA	NA
		5/7/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	**2.1**	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	178	852	2940	18.9	NA	NA
	MW-19-44	5/7/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	**1.4**	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	179	841	2950	21.5	NA	NA
		10/6/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	**3**	ND(2)	ND(7)	ND(7)	ND(0.0017)	ND(0.0023)	181	1040	3020	20.8	NA	NA
		5/6/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	**2.4**	ND(9.4)	ND(47)	ND(47)	ND(0.005)	ND(0.005)	163	917	2940	20.2	NA	NA
		10/6/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	**3.4**	ND(9.4)	ND(47)	ND(47)	ND(0.005)	ND(0.003)	170	1010	3060	18.8	NA	NA
	MW-19-62	10/6/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	**3.4**	ND(9.7)	ND(48)	ND(48)	ND(0.005)	ND(0.003)	173	995	3080	19	NA	NA
		5/4/1998	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	NA	NA	**3**	ND(9.5)	ND(48)	ND(48)	ND(0.0050)	ND(0.0030)	247	1570	1670	20	NA	NA
		10/22/1998	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**2.6**	ND(10)	ND(50)	ND(50)	ND(0.025)	ND(0.0030)	195	1400	3870	19.3	NA	NA
	MW-19-19	10/22/1998	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	**0.027**	ND(0.0030)	197	1240	3710	19.4	NA	NA
		5/3/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**2.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.025)
	MW-19-44	5/3/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**2.7**	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.025)
		10/4/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**3.9**	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
	MW-19-44	10/4/1999	ND(0.50)	ND(0.50)	**0.27**	ND(0.50)	NA	NA	**4.3**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.32**	ND(0.01)
		5/2/2000	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**4.5**	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
	MW-19-44	5/2/2000	ND(0.50)	ND(0.50)	ND(0.50)	**0.92**	NA	NA	**4**	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		10/10/2000	ND(0.50)	**0.11**	ND(0.50)	ND(0.50)	NA	NA	**4.2**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.18**	ND(0.01)
		5/8/2001	ND(0.50)	ND(0.50)	ND(0.50)	**0.76**	NA	NA	**3.8**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.13**	ND(0.01)
	MW-19-33	5/8/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**3.6**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.33**	ND(0.01)
		10/1/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**3.3**	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
	MW-1944	10/1/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**3.1**	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.0052**
		5/14/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**2.9 J**	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
	MW-G4	5/14/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0) UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/5/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**3.1**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.15**	ND(0.010)
	MW-79-18	10/5/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**2.8**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.14**	ND(0.010)
		5/13/2003	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**3.0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.17**	ND(0.010)
		10/11/2003	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**2.4**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.20**	ND(0.010)
	MW-19-44-N	10/11/2003	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**2.4**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.16**	ND(0.010)
		5/17/2004	ND(0.50)	ND(0.50)	ND(0.50)	**0.57**	NA	NA	**3.0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.19**	ND(0.010)
		10/12/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**2.4**	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.010)
		10/4/2005	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**3.1**	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)

Table D-1
Summary of Post-Closure Groundwater Monitoring Analytical Results Since 1992

Well Number	Duplicate Sample ID	Date of Sampling	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	1-Methyl Naphthalene (µg/l)	2-Methyl Naphthalene (µg/l)	1,2-Dichloro ethane (µg/l)	Phenol (µg/l)	2-Methyl-4, 6-Dinitro phenol (µg/l)	p-Nitro phenol (µg/l)	Chromium dissolved (µg/l)	Lead dissolved (µg/l)	Chloride (mg/l)	Sulfate (mg/l)	TDS (mg/l)	TOC (mg/l)	DRO (mg/l)	GRO (mg/l)
MW-PR		10/23/2006	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**2.7**	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
continued		10/16/2007	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**3.5**	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/22/2008	ND(0.50)	ND(0.50)	ND(0.50)	**0.56**	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.25**	ND(0.01)
		10/26/2009	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**2**	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		9/14/2010	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.14**	ND(0.10)
		9/27/2011	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.1)	ND(0.1)
		9/26/2012	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.53**	ND(0.1)
		9/27/2013	**0.78**	ND(5)	ND(0.5)	**10**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.38**	**0.43**
		9/22/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.11**	ND(0.1)
MW-W1R		6/23/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	119	1310	174	7.81	NA	NA
		10/8/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.006)	ND(0.0024)	103	1650	3080	55.1	NA	NA
		12/10/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	**0.0058**	90.7	1530	2980	13.8	NA	NA
		3/8/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	**0.005**	90.6	1476	3090	9.2	NA	NA
	MW-19-19	3/8/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	90.1	1449	3090	11.1	NA	NA
		6/22/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	80.5	1430	3079	5.77	NA	NA
		9/15/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	81.2	1380	3051	10.3	NA	NA
		12/2/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	88.7	842	3119	10.8	NA	NA
		3/22/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	79.2	1470	3089	10.1	NA	NA
	MW-19-19	3/22/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	79.5	1490	3085	10.3	NA	NA
		6/20/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	74.8	1490	3100	9.8	NA	NA
	MW-19-19	6/20/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	74.2	1490	3100	9.2	NA	NA
		9/14/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(160)	ND(160)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	80.2	1510	3070	11.2	NA	NA
		12/14/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	82.2	1470	3150	9.56	NA	NA
		3/23/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	83.3	1460	3060	10.3	NA	NA
		6/14/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	78.5	1560	3060	11.6	NA	NA
		10/10/1995	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	80.3	1520	3080	12.2	NA	NA
		5/7/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	74	1570	3110	8.7	NA	NA
		10/7/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.0017)	ND(0.0023)	76.9	1580	3100	10.9	NA	NA
		5/7/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(9.5)	ND(47)	ND(47)	ND(0.005)	ND(0.01)	76.9	1710	3060	9.9	NA	NA
		10/6/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(9.6)	ND(48)	ND(48)	ND(0.005)	ND(0.015)	76.8	1430	3000	8.5	NA	NA
		5/5/1998	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	NA	NA	ND(1.0)	ND(9.4)	ND(47)	ND(47)	ND(0.0050)	ND(0.0030)	73.6	1730	3040	9.8	NA	NA
		10/22/1998	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	ND(0.025)	ND(0.0030)	56.4	1510	3270	10	NA	NA
		5/4/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.025)
		10/5/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		5/3/2000	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		10/10/2000	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	**0.83**	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.011**
		5/9/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		10/1/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		5/14/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/5/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.2**	ND(0.010)
		5/13/2003	ND(0.50)	ND(0.50)	**0.69**	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	1800	NA	NA	ND(0.10)	ND(0.010)
		10/12/2003	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	1700	NA	NA	ND(0.10)	ND(0.010)
MW-19-57-N		10/12/2003	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	1500	NA	NA	ND(0.10)	ND(0.010)
		5/17/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA		NA	NA	ND(0.10)	ND(0.010)
		10/12/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(1.6) U	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.010)
		10/4/2005	ND(0.50)	ND(0.50)	ND(0.50)	**0.76**	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	**0.027**
		10/23/2006	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.01)
		10/17/2007	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/22/2008	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/26/2009	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		9/15/2010	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.10)
		9/28/2011	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.1)	ND(0.1)
		9/26/2012	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.13**	ND(0.1)
		9/26/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.1)	ND(0.1)
		9/23/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.17**	ND(0.1)

Table D-1
Summary of Post-Closure Groundwater Monitoring Analytical Results Since 1992

Well Number	Duplicate Sample ID	Date of Sampling	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	1-Methyl Naphthalene (µg/l)	2-Methyl Naphthalene (µg/l)	1,2-Dichloro ethane (µg/l)	Phenol (µg/l)	2-Methyl-4, 6-Dinitro phenol (µg/l)	p-Nitro phenol (µg/l)	Chromium dissolved (µg/l)	Lead dissolved (µg/l)	Chloride (mg/l)	Sulfate (mg/l)	TDS (mg/l)	TOC (mg/l)	DRO (mg/l)	GRO (mg/l)
MW-WL-11		6/26/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	30	1370	2898	91.7	NA	NA
		10/8/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(8)	ND(8)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.006)	ND(0.0024)	42.2	1870	3370	18.5	NA	NA
		12/10/1992	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	**0.0037**	32.8	1620	3280	11.1	NA	NA
		3/11/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	**1**	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	54	2990	3130	3.6	NA	NA
		6/22/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	27.8	1320	2908	5.21	NA	NA
		9/13/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(10)	ND(10)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	27.5	1320	2966	6.4	NA	NA
		12/2/1993	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	33.6	1400	3044	8.68	NA	NA
		3/23/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	33.5	1500	3120	8.18	NA	NA
		6/21/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	32.4	1470	3090	9.24	NA	NA
		9/14/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(160)	ND(160)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	28.7	1410	2960	11.6	NA	NA
		12/15/1994	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	30.7	1380	3000	7.59	NA	NA
		3/23/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(40)	ND(40)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	25.5	1270	2810	7.9	NA	NA
		6/13/1995	ND(4)	ND(4)	ND(4)	ND(4)	ND(16)	ND(16)	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	27.2	1430	2920	9.4	NA	NA
		10/11/1995	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	36.3	1540	3160	8.9	NA	NA
		5/7/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.005)	ND(0.005)	27.5	1380	2920	7.9	NA	NA
		10/8/1996	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(0.3)	ND(2)	ND(7)	ND(7)	ND(0.0017)	ND(0.0023)	30.8	1430	2860	8.7	NA	NA
		5/7/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(9.3)	ND(47)	ND(47)	ND(0.005)	ND(0.005)	22.6	1450	2800	8.8	NA	NA
		10/6/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	ND(0.005)	ND(0.003)	28.9	1580	2900	7.8	NA	NA
	MW-19-44	10/6/1997	ND(4)	ND(4)	ND(4)	ND(4)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	ND(0.005)	ND(0.003)	28.8	1950	2900	7.8	NA	NA
		5/5/1998	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	NA	NA	ND(1.0)	ND(9.4)	ND(47)	ND(47)	ND(0.025)	ND(0.0030)	ND(60.0)	1540	2800	8.3	NA	NA
		10/22/1998	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	ND(10)	ND(50)	ND(50)	**0.082**	ND(0.0030)	25.1	1300	2900	8.6	NA	NA
		5/4/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.025)
		10/5/1999	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		5/3/2000	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		10/11/2000	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.03**
		5/9/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.01)
		10/1/2001	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	**0.0097**
		5/14/2002	ND(0.50)	**0.64**	ND(0.50)	**0.89**	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/5/2002	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		5/13/2003	ND(0.50)	ND(0.50)	**0.78**	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/11/2003	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		5/17/2004	ND(0.50)	ND(0.50)	ND(0.50)	**1.0**	NA	NA	ND(1.0)[2]	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.010)
		10/12/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.010)
	MW-19-44	10/12/2004	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.010)
	MW-19-57	10/4/2005	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/4/2005	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/23/2006	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/23/2006	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/16/2007	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	**0.012**
	MW-19-57	10/16/2007	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		10/22/2008	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
	MW-19-57	10/22/2008	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	NA	NA	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
	MW-19-57	10/22/2008	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	ND(1.0)	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.25)	ND(0.01)
		9/15/2010	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.10)
	MW-WL-11D	9/15/2010	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.50)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.10)	ND(0.10)
		9/28/2011	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.1)	ND(0.1)
		9/26/2012	ND(0.50)	ND(5.0)	ND(0.50)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**0.17**	ND(0.1)
		9/25/2013	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.1)	ND(0.1)
		9/23/2014	ND(0.5)	ND(5)	ND(0.5)	ND(1.5)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND(0.1)	ND(0.1)

Notes:

[1] Matrix interference caused higher detection limit.

[2] Sample was recollected on June 29, 2004 due to a laboratory error and analyzed for 1,2-dichloroethane only.

[3] No longer analyzed in accordance with 2004 permit.

Table D-1
Summary of Post-Closure Groundwater Monitoring Analytical Results Since 1992

Well Number	Duplicate Sample ID	Date of Sampling	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	1-Methyl Naphthalene (µg/l)	2-Methyl Naphthalene (µg/l)	1,2-Dichloro ethane (µg/l)	Phenol (µg/l)	2-Methyl-4, 6-Dinitro phenol (µg/l)	p-Nitro phenol (µg/l)	Chromium dissolved (µg/l)	Lead dissolved (µg/l)	Chloride (mg/l)	Sulfate (mg/l)	TDS (mg/l)	TOC (mg/l)	DRO (mg/l)	GRO (mg/l)

B = Detected in method blank.
J = Estimated value.
NA = Not Analyzed.
ND = Not detected with limit in parentheses.
NS = Not sampled.
SH = Sample holding times were exceeded.
SR = Surrogate recovery outside acceptance limits due to demonstrated matrix effects.
The laboratory changed the analytical method for dissolved chromium from Method 7191 (Atomic Absorption, Graphite Furnace) to Method 6020 (Inductive Coupied Plasma-MS)
U = Detection reported in associated trip blank, sample has been qualified.
UJ = Estimated reporting limit.

Table D-2
Kruskal-Wallis Statistical Analysis Test

Number				Benzene		Ethylbenzene		Toluene		Xylenes	
Group	Cumulative	Well	Date	µg/L	Rank	µg/L	Rank	µg/L	Rank	µg/L	Rank
Upper Sand				Upper Sand and Till Wells							
Data Group 1 of 9		Background Well									
1	1	MW-1C	6/24/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
2	2	MW-1C	10/7/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
3	3	MW-1C	12/11/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
4	4	MW-1C	3/8/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
5	5	MW-1C	6/23/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
6	6	MW-1C	9/13/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
7	7	MW-1C	11/30/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	**5 B**	337.00
8	8	MW-1C	3/22/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
9	9	MW-1C	6/20/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
10	10	MW-1C	9/15/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
11	11	MW-1C	12/14/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
12	12	MW-1C	3/23/1995	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
13	13	MW-1C	6/14/1995	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
14	14	MW-1C	10/10/1995	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
15	15	MW-1C	5/9/1996	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
16	16	MW-1C	10/9/1996	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
17	17	MW-1C	5/7/1997	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
18	18	MW-1C	10/6/1997	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
19	19	MW-1C	5/6/1998	ND(1.0)	184.00	ND(1.0)	183.00	ND(1.0)	159.00	ND(1.0)	151.00
20	20	MW-1C	10/22/1998	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
21	21	MW-1C	5/3/1999	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
22	22	MW-1C	10/5/1999	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
23	23	MW-1C	5/4/2000	**0.34**	3.00	ND(0.50)	87.00	**0.63**	151.00	ND(0.50)	69.00
24	24	MW-1C	10/11/2000	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
25	25	MW-1C	5/9/2001	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
26	26	MW-1C	10/2/2001	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
27	27	MW-1C	5/14/2002	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
28	28	MW-1C	10/6/2002	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
29	29	MW-1C	5/14/2003	ND(0.50)	90.50	**0.72**	175.00	ND(0.50)	75.50	ND(0.50)	69.00
30	30	MW-1C	10/12/2003	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
31	31	MW-1C	5/17/2004	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
32	32	MW-1C	10/12/2004	ND(0.50)	90.50	ND(0.50)	87.00	**0.58**	149.00	ND(2.0) U	185.00
33	33	MW-1C	10/4/2005	ND(0.50)	90.50	**1.1**	188.00	ND(0.50)	75.50	**6.4**	340.00
34	34	MW-1C	10/23/2006	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
35	35	MW-1C	10/16/2007	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
36	36	MW-1C	10/22/2008	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
37	37	MW-1C	10/26/2009	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
38	38	MW-1C	9/14/2010	ND(0.50)	90.50	ND(0.50)	87.00	ND(5)	330.50	ND(1.5)	171.00
39	39	MW-1C	9/27/2011	ND(0.50)	90.50	ND(0.50)	87.00	ND(5.0)	330.50	ND(1.5)	171.00
40	40	MW-1C	9/25/2012	ND(0.50)	90.50	ND(0.50)	87.00	ND(5.0)	330.50	ND(1.5)	171.00
41	41	MW-1C	9/26/2013	ND(0.5)	90.50	ND(0.5)	87.00	ND(5)	330.50	ND(1.5)	171.00
42	42	MW-1C	9/23/2014	ND(0.5)	90.50	ND(0.5)	87.00	ND(5)	330.50	ND(1.5)	171.00
			N_1		42.00		42.00		42.00		42.00
			Rank Sum (R_1)		6948.00		7179.00		7657.50		7417.50
			Avg. Rank (AR_1)		165.43		170.93		182.32		176.61
			R_1^2/N_1		1149397.71		1227096.214		1396126.3		1309983.48

Table D-2
Kruskal-Wallis Statistical Analysis Test

Number				Benzene		Ethylbenzene		Toluene		Xylenes	
Group	Cumulative	Well	Date	µg/L	Rank	µg/L	Rank	µg/L	Rank	µg/L	Rank
Upper Sand				Upper Sand and Till Wells							
Data Group 2 of 9		Compliance Wells									
1	43	MW-87-08	6/25/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
2	44	MW-87-08	10/5/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
3	45	MW-87-08	12/11/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
4	46	MW-87-08	3/10/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
5	47	MW-87-08	6/23/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
6	48	MW-87-08	9/14/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
7	49	MW-87-08	12/2/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
8	50	MW-87-08	3/21/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
9	51	MW-87-08	6/21/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
10	52	MW-87-08	9/14/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
11	53	MW-87-08	12/13/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
12	54	MW-87-08	3/22/1995	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
13	55	MW-87-08	6/14/1995	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
14	56	MW-87-08	10/10/1995	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
15	57	MW-87-08	5/9/1996	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
16	58	MW-87-08	10/8/1996	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
17	59	MW-87-08	5/6/1997	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
18	60	MW-87-08	10/6/1997	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
19	61	MW-87-08	5/6/1998	ND(1.0)	184.00	ND(1.0)	183.00	ND(1.0)	159.00	ND(1.0)	151.00
20	62	MW-87-08	10/22/1998	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
21	63	MW-87-08	5/4/1999	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
22	64	MW-87-08	10/6/1999	ND(0.50) [1]	90.50	ND(0.50) [1]	87.00	ND(0.50) [1]	75.50	ND(0.50) [1]	69.00
23	65	MW-87-08	5/3/2000	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
24	66	MW-87-08	10/11/2000	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
25	67	MW-87-08	5/10/2001	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
26	68	MW-87-08	10/1/2001	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
27	69	MW-87-08	5/15/2002	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
28	70	MW-87-08	10/6/2002	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
29	71	MW-87-08	5/14/2003	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
30	72	MW-87-08	10/11/2003	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
31	73	MW-87-08	5/17/2004	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	**0.65**	143.00
32	74	MW-87-08	10/12/2004	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
33	75	MW-87-08	10/4/2005	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
34	76	MW-87-08	10/23/2006	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
35	77	MW-87-08	10/17/2007	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
36	78	MW-87-08	10/22/2008	**1.2**	189.00	**1.7**	190.00	ND(0.50)	75.50	**0.5**	137.00
37	79	MW-87-08	10/26/2009	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
38	80	MW-87-08	9/14/2010	ND(0.50)	90.50	ND(0.50)	87.00	ND(5.0)	330.50	ND(1.5)	171.00
39	81	MW-87-08	9/27/2011	ND(0.50)	90.50	ND(0.50)	87.00	ND(5.0)	330.50	ND(1.5)	171.00
40	82	MW-87-08	9/26/2012	ND(0.50)	90.50	ND(0.50)	87.00	ND(5.0)	330.50	ND(1.5)	171.00
41	83	MW-87-08R	9/28/2013	ND(0.5)	90.50	ND(0.5)	87.00	ND(5)	330.50	ND(1.5)	171.00
42	84	MW-87-08R	9/22/2014	ND(0.5)	90.50	ND(0.5)	87.00	ND(5)	330.50	ND(1.5)	171.00

N_2	42.00	42.00	42.00	42.00
Rank Sum (R_2)	7134.00	7093.00	7508.50	7097.00
Avg. Rank (AR_2)	169.86	168.88	178.77	168.98
R_2^2/N_2	1211760.86	1197872.595	1342323.1	1199224.02
$AR_2 - AR_1$	4.43	-2.05	-3.55	-7.63
$\chi 2$	51.51	51.51	51.51	51.51
$(AR_2 - AR_1) > \chi 2$ = Significant Contamination	No	No	No	No

Table D-2
Kruskal-Wallis Statistical Analysis Test

Number				Benzene		Ethylbenzene		Toluene		Xylenes	
Group	Cumulative	Well	Date	µg/L	Rank	µg/L	Rank	µg/L	Rank	µg/L	Rank
Upper Sand				Upper Sand and Till Wells							
Data Group 3 of 9		Compliance Wells									
1	85	MW-87-25	6/25/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
2	86	MW-87-25	10/7/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
3	87	MW-87-25	12/11/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
4	88	MW-87-25	3/9/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
5	89	MW-87-25	6/23/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
6	90	MW-87-25	9/15/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
7	91	MW-87-25	12/6/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
8	92	MW-87-25	3/23/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
9	93	MW-87-25	6/22/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
10	94	MW-87-25	9/15/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
11	95	MW-87-25	12/15/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
12	96	MW-87-25	3/22/1995	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
13	97	MW-87-25	6/15/1995	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
14	98	MW-87-25	10/11/1995	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
15	99	MW-87-25	5/9/1996	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
16	100	MW-87-25	10/9/1996	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
17	101	MW-87-25	5/8/1997	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
18	102	MW-87-25	10/6/1997	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
19	103	MW-87-25	5/6/1998	ND(1.0)	184.00	ND(1.0)	183.00	ND(1.0)	159.00	ND(1.0)	151.00
20	104	MW-87-25	10/22/1998	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
21	105	MW-87-25	5/5/1999	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
22	106	MW-87-25	10/6/1999	ND(0.50) [1]	90.50	ND(0.50) [1]	87.00	ND(0.50) [1]	75.50	**17** [1]	344.00
23	107	MW-87-25	5/4/2000	ND(0.50)	90.50	ND(0.50)	87.00	**0.6**	150.00	ND(0.50)	69.00
24	108	MW-87-25	10/11/2000	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
25	109	MW-87-25	5/10/2001	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
26	110	MW-87-25	10/2/2001	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
27	111	MW-87-25	5/15/2002	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
28	112	MW-87-25	10/6/2002	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
29	113	MW-87-25	5/14/2003	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	**0.83**	145.00
30	114	MW-87-25	10/12/2003	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
31	115	MW-87-25	5/17/2004	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
32	116	MW-87-25	10/12/2004	**0.55**	177.00	**0.68**	173.00	ND(0.50)	75.50	ND(1.7) U	184.00
33	117	MW-87-25	10/10/2005	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
34	118	MW-87-25	10/23/2006	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
35	119	MW-87-25	10/17/2007	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
36	120	MW-87-25	10/22/2008	ND(0.50)	90.50	ND(0.50)	87.00	**0.94**	154.00	**1.3**	157.00
37	121	MW-87-25	10/26/2009	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
38	122	MW-87-25	9/14/2010	ND(0.50)	90.50	ND(0.50)	87.00	ND(5.0)	330.50	ND(1.50)	171.00
39	123	MW-87-25	9/27/2011	ND(0.50)	90.50	ND(0.50)	87.00	ND(5.0)	330.50	ND(1.5)	171.00
40	124	MW-87-25	9/25/2012	ND(0.50)	90.50	ND(0.50)	87.00	ND(5.0)	330.50	ND(1.5)	171.00
41	125	MW-87-25	9/26/2013	ND(0.5)	90.50	ND(0.5)	87.00	ND(5)	330.50	ND(1.5)	171.00
42	126	MW-87-25	9/23/2014	ND(0.5)	90.50	ND(0.5)	87.00	ND(5)	330.50	ND(1.5)	171.00

N_3	42.00	42.00	42.00	42.00
Rank Sum (R_3)	7122.00	7076.00	7661.50	7509.00
Avg. Rank (AR_3)	169.57	168.48	182.42	178.79
R_3^2/N_3	1207687.71	1192137.524	1397585.3	1342501.93
AR_3 - AR_1	4.14	-2.45	0.10	2.18
$\chi 3$	51.51	51.51	51.51	51.51
(AR_3 - AR_1) > $\chi 3$ = Significant Contamination	No	No	No	No

Table D-2
Kruskal-Wallis Statistical Analysis Test

Number				Benzene		Ethylbenzene		Toluene		Xylenes	
Group	Cumulative	Well	Date	µg/L	Rank	µg/L	Rank	µg/L	Rank	µg/L	Rank
Upper Sand				Upper Sand and Till Wells							
Data Group 4 of 9		Compliance Wells									
1	127	MW-87-33	6/25/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
2	128	MW-87-33	10/7/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
3	129	MW-87-33	12/11/1992	**11**	343.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
4	130	MW-87-33	3/9/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
5	131	MW-87-33	6/23/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
6	132	MW-87-33	9/15/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
7	133	MW-87-33	11/30/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
8	134	MW-87-33	6/20/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
9	135	MW-87-33	9/14/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
10	136	MW-87-33	11/30/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
11	137	MW-87-33	12/13/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
12	138	MW-87-33	3/23/1995	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
13	139	MW-87-33	6/14/1995	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
14	140	MW-87-33	10/11/1995	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
15	141	MW-87-33	5/8/1996	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
16	142	MW-87-33	10/9/1996	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
17	143	MW-87-33	5/8/1997	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
18	144	MW-87-33	10/6/1997	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
19	145	MW-87-33	5/6/1998	ND(1.0)	184.00	ND(1.0)	183.00	ND(1.0)	159.00	ND(1.0)	151.00
20	146	MW-87-33	10/22/1998	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
21	147	MW-87-33	5/5/1999	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
22	148	MW-87-33	10/6/1999	ND(0.50) SR [1]	90.50	**0.95 SR** [1]	178.00	ND(0.50) SR	75.50	**5.9 SR** [1]	339.00
23	149	MW-87-33	5/4/2000	**0.77**	178.00	ND(0.50)	87.00	ND(0.50) [1]	75.50	ND(0.50)	69.00
24	150	MW-87-33	10/11/2000	ND(12)	344.00	ND(12)	344.00	ND(12)	344.00	ND(12)	342.00
25	151	MW-87-33	5/10/2001	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
26	152	MW-87-33	10/2/2001	**0.38**	4.00	**0.16**	2.00	**0.88**	153.00	**0.78**	144.00
27	153	MW-87-33	5/15/2002	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
28	154	MW-87-33	10/5/2002	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
29	155	MW-87-33	5/14/2003	ND(0.50)	90.50	**0.71**	174.00	ND(0.50)	75.50	ND(0.50)	69.00
30	156	MW-87-33	10/11/2003	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
31	157	MW-87-33	5/17/2004	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
32	158	MW-87-33	10/12/2004	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.59)	142.00
33	159	MW-87-33	10/10/2005	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	**0.58**	141.00
34	160	MW-87-33	10/23/2006	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
35	161	MW-87-33	10/17/2007	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
					Well Destroyed						

N_4	35.00	35.00	35.00	35.00
Rank Sum (R_4)	6734.50	6731.00	6051.00	6725.00
Avg. Rank (AR_4)	192.41	192.31	172.89	192.14
R_4^2/N_4	1295814.01	1294467.457	1046131.5	1292160.71
$AR_4 - AR_1$	26.99	21.39	-9.44	15.54
χ_4	54.02	54.02	54.02	54.02
$(AR_4 - AR_1) > \chi_4$ = Significant Contamination	No	No	No	No

Table D-2
Kruskal-Wallis Statistical Analysis Test

Number				Benzene		Ethylbenzene		Toluene		Xylenes	
Group	Cumulative	Well	Date	µg/L	Rank	µg/L	Rank	µg/L	Rank	µg/L	Rank
Upper Sand				Upper Sand and Till Wells							
Data Group 5 of 9		Compliance Wells									
1	162	MW-87-36	6/24/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
2	163	MW-87-36	10/7/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
3	164	MW-87-36	12/10/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
4	165	MW-87-36	3/9/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
5	166	MW-87-36	6/22/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
6	167	MW-87-36	9/15/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
7	168	MW-87-36	11/30/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
8	169	MW-87-36	3/23/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
9	170	MW-87-36R	6/10/1996	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
10	171	MW-87-36R	10/9/1996	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
11	172	MW-87-36R	5/8/1997	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
12	173	MW-87-36R	10/6/1997	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
13	174	MW-87-36R	5/6/1998	ND(1.0)	184.00	ND(1.0)	183.00	ND(1.0)	159.00	ND(1.0)	151.00
14	175	MW-87-36R	10/22/1998	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
15	176	MW-87-36R	5/5/1999	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
16	177	MW-87-36R	10/6/1999	ND(0.50) [1]	90.50	**1.2** [1]	189.00	**1.4** [1]	164.00	**5.7** [1]	338.00
17	178	MW-87-36R	5/4/2000	ND(0.50)	90.50	ND(0.50)	87.00	**0.85**	152.00	ND(0.50)	69.00
18	179	MW-87-36R	10/11/2000	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
19	180	MW-87-36R	5/10/2001	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
20	181	MW-87-36R	10/2/2001	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
21	182	MW-87-36R	5/15/2002	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
22	183	MW-87-36R	10/6/2002	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
23	184	MW-87-36R	5/14/2003	ND(0.50)	90.50	**0.75**	177.00	ND(0.50)	75.50	ND(0.50)	69.00
24	185	MW-87-36R	10/11/2003	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
25	186	MW-87-36R	5/17/2004	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
26	187	MW-87-36R	10/12/2004	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
27	188	MW-87-36R	10/10/2005	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
					Well Destroyed						

N_5	27.00	27.00	27.00	27.00
Rank Sum (R_5)	4631.00	4797.00	4273.00	4524.00
Avg. Rank (AR_5)	171.52	177.67	158.26	167.56
R_5^2/N_5	794302.26	852267	676241.81	758021.33
$AR_5 - AR_1$	6.09	6.74	-24.06	-9.05
χ_5	58.23	58.23	58.23	58.23
$(AR_5 - AR_1) > \chi_5$ = Significant Contamination	No	No	No	No

Table D-2
Kruskal-Wallis Statistical Analysis Test

Number				Benzene		Ethylbenzene		Toluene		Xylenes	
Group	Cumulative	Well	Date	µg/L	Rank	µg/L	Rank	µg/L	Rank	µg/L	Rank
Upper Sand				Upper Sand and Till Wells							
Data Group 6 of 9		Compliance Wells									
1	189	MW-90-01	6/24/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
2	190	MW-90-01	10/5/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
3	191	MW-90-01	12/9/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
4	192	MW-90-01	3/9/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
5	193	MW-90-01	6/22/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
6	194	MW-90-01	9/13/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
7	195	MW-90-01	11/2/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
8	196	MW-90-01	3/21/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
9	197	MW-90-01	6/21/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
10	198	MW-90-01	9/13/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
11	199	MW-90-01	12/12/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
12	200	MW-90-01	3/21/1995	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	**15.7**	343.00
13	201	MW-90-01	6/12/1995	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
14	202	MW-90-01	10/10/1995	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
15	203	MW-90-01	5/8/1996	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
16	204	MW-90-01	10/9/1996	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
17	205	MW-90-01	5/6/1997	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
18	206	MW-90-01	10/6/1997	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
19	207	MW-90-01	5/6/1998	ND(1.0)	184.00	ND(1.0)	183.00	ND(1.0)	159.00	ND(1.0)	151.00
20	208	MW-90-01	10/22/1998	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
21	209	MW-90-01	5/4/1999	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
22	210	MW-90-01	10/5/1999	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
23	211	MW-90-01	5/3/2000	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
24	212	MW-90-01	10/10/2000	**0.094**	1.00	ND(0.50)	87.00	**0.13**	2.00	ND(0.50)	69.00
25	213	MW-90-01	5/8/2001	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
26	214	MW-90-01	10/1/2001	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
27	215	MW-90-01	5/15/2002	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
28	216	MW-90-01	10/23/2002	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
29	217	MW-90-01	5/13/2003	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
30	218	MW-90-01	10/12/2003	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
31	219	MW-90-01	5/17/2004	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
32	220	MW-90-01	10/12/2004	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
33	221	MW-90-01	10/10/2005	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	**1.4**	158.00
34	222	MW-90-01	10/23/2006	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
35	223	MW-90-01	10/16/2007	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
36	224	MW-90-01	10/22/2008	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
37	225	MW-90-01	10/26/2009	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
38	226	MW-90-01	9/14/2010	ND(0.50)	90.50	ND(0.50)	87.00	ND(5.0)	330.50	ND(1.50)	171.00
39	227	MW-90-01	9/27/2011	ND(0.50)	90.50	ND(0.50)	87.00	ND(5.0)	330.50	ND(1.5)	171.00
40	228	MW-90-01	9/26/2012	ND(0.50)	90.50	ND(0.50)	87.00	ND(5.0)	330.50	**2**	186.00
41	229	MW-90-01	9/23/2014	ND(0.50)	90.50	ND(0.50)	87.00	ND(5.0)	330.50	ND(1.5)	171.00

N_6	41.00	41.00	41.00	41.00
Rank Sum (R_6)	6855.50	6903.00	7104.50	6969.50
Avg. Rank (AR_6)	167.21	168.37	173.28	169.99
R_6^2/N_6	1146289.76	1162229.488	1231071.2	1184730.01
$AR_6 - AR_1$	1.78	-2.56	-9.04	-6.62
χ_6	51.82	51.82	51.82	51.82
$(AR_6 - AR_1) > \chi_6$= Significant Contamination	No	No	No	No

Table D-2
Kruskal-Wallis Statistical Analysis Test

Number				Benzene		Ethylbenzene		Toluene		Xylenes	
Group	Cumulative	Well	Date	µg/L	Rank	µg/L	Rank	µg/L	Rank	µg/L	Rank
Upper Sand				Upper Sand and Till Wells							
Data Group 7 of 9		Compliance Wells									
1	230	MW-K	6/26/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
2	231	MW-K	10/6/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
3	232	MW-K	12/10/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
4	233	MW-K	3/11/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
5	234	MW-K	6/22/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
6	235	MW-K	9/13/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
7	236	MW-K	12/2/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
8	237	MW-K	5/5/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
9	238	MW-K	6/21/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
10	239	MW-K	9/14/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
11	240	MW-K	12/14/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
12	241	MW-K	3/23/1995	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
13	242	MW-K	6/13/1995	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
14	243	MW-K	10/11/1995	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
15	244	MW-K	5/7/1996	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
16	245	MW-K	10/8/1996	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
17	246	MW-K	5/7/1997	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
18	247	MW-K	10/6/1997	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
19	248	MW-K	5/5/1998	ND(1.0)	184.00	ND(1.0)	183.00	ND(1.0)	159.00	ND(1.0)	151.00
20	249	MW-K	10/22/1998	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
21	250	MW-K	5/4/1999	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
22	251	MW-K	10/5/1999	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
23	252	MW-K	5/3/2000	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
24	253	MW-K	10/10/2000	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
25	254	MW-K	5/9/2001	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
26	255	MW-K	10/1/2001	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
27	256	MW-K	5/14/2002	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
28	257	MW-K	10/5/2002	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
29	258	MW-K	5/13/2003	ND(0.50)	90.50	**0.60**	172.00	ND(0.50)	75.50	ND(0.50)	69.00
30	259	MW-K	10/11/2003	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
31	260	MW-K	5/17/2004	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
32	261	MW-K	10/12/2004	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
33	262	MW-K	10/4/2005	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	**0.89**	146.00
34	263	MW-K	10/23/2006	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
35	264	MW-K	10/16/2007	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
36	265	MW-K	10/22/2008	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	**0.51**	138.00
37	266	MW-K	10/26/2009	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
38	267	MW-K	9/15/2010	ND(0.50)	90.50	ND(0.50)	87.00	ND(5.0)	330.50	ND(1.50)	171.00
39	268	MW-K	9/28/2011	ND(0.50)	90.50	ND(0.50)	87.00	ND(5.0)	330.50	ND(1.5)	171.00
40	269	MW-K	9/26/2012	ND(0.50)	90.50	ND(0.50)	87.00	ND(5.0)	330.50	ND(1.5)	171.00
41	270	MW-K	9/25/2013	ND(0.5)	90.50	ND(0.5)	87.00	ND(5)	330.50	ND(1.5)	171.00
42	271	MW-K	9/23/2014	ND(0.5)	90.50	ND(0.5)	87.00	ND(5)	330.50	ND(1.5)	171.00

N_7	42.00	42.00	42.00	42.00
Rank Sum (R_7)	7035.50	7075.00	7508.50	7101.00
Avg. Rank (AR_7)	167.51	168.45	178.77	169.07
R_7^2/N_7	1178530.01	1191800.595	1342323.1	1200576.21
$AR_7 - AR_1$	2.08	-2.48	-3.55	-7.54
χ_7	51.51	51.51	51.51	51.51
$(AR_7 - AR_1) > \chi_7$ = Significant Contamination	No	No	No	No

Table D-2
Kruskal-Wallis Statistical Analysis Test

Number				Benzene		Ethylbenzene		Toluene		Xylenes	
Group	Cumulative	Well	Date	µg/L	Rank	µg/L	Rank	µg/L	Rank	µg/L	Rank
Upper Sand				Upper Sand and Till Wells							
Data Group 8 of 9		Compliance Wells									
1	272	MW-W2	6/23/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
2	273	MW-W2	10/8/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
3	274	MW-W2	3/11/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
4	275	MW-W2	6/23/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
5	276	MW-W2	9/15/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
6	277	MW-W2	12/6/1993	**5**	341.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
7	278	MW-W2	3/17/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
8	279	MW-W2	6/22/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
9	280	MW-W2	9/15/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
10	281	MW-W2	12/15/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
11	282	MW-W2	3/22/1995	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
12	283	MW-W2	6/14/1995	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
13	284	MW-W2	10/10/1995	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
14	285	MW-W2	5/9/1996	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
15	286	MW-W2	10/8/1996	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
16	287	MW-W2	5/8/1997	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
17	288	MW-W2	10/6/1997	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
18	289	MW-W2	5/5/1998	ND(1.0)	184.00	ND(1.0)	183.00	ND(1.0)	159.00	ND(1.0)	151.00
19	290	MW-W2	10/22/1998	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
20	291	MW-W2	5/5/1999	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
21	292	MW-W2	10/5/1999	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
22	293	MW-W2	5/2/2000	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
23	294	MW-W2	10/11/2000	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
24	295	MW-W2	5/9/2001	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
25	296	MW-W2	10/2/2001	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
26	297	MW-W2	5/15/2002	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
27	298	MW-W2	10/6/2002	**0.83**	179.00	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
28	299	MW-W2	5/14/2003	ND(0.50)	90.50	**0.73**	176.00	ND(0.50)	75.50	ND(0.50)	69.00
29	300	MW-W2	10/12/2003	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
30	301	MW-W2	5/17/2004	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
31	302	MW-W2	10/12/2004	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
32	303	MW-W2	10/10/2005	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
33	304	MW-W2	10/16/2006	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
34	305	MW-W2	10/17/2007	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
35	306	MW-W2	10/22/2008	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	**0.57**	140.00
36	307	MW-W2	10/27/2009	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
37	308	MW-W2	9/14/2010	**5.2**	342.00	ND(0.50)	87.00	ND(5.0)	330.50	ND(1.50)	171.00
38	309	MW-W2	9/26/2012	ND(0.50)	90.50	ND(0.50)	87.00	ND(5.0)	330.50	ND(1.5)	171.00
39	310	MW-W2	9/27/2013	ND(0.5)	90.50	ND(0.5)	87.00	ND(5)	330.50	ND(1.5)	171.00
40	311	MW-W2	9/23/2014	ND(0.5)	90.50	ND(0.5)	87.00	ND(5)	330.50	ND(1.5)	171.00

N_8	40.00	40.00	40.00	40.00
Rank Sum (R_8)	7096.00	6725.00	6937.00	6593.50
Avg. Rank (AR_8)	177.40	168.13	173.43	164.84
R_8^2/N_8	1258830.40	1130640.625	1203049.2	1086856.06
$AR_8 - AR_1$	11.97	-2.80	-8.90	-11.77
$\chi 8$	52.15	52.15	52.15	52.15
$(AR_8 - AR_1) > \chi 8$ = Significant Contamination	No	No	No	No

Table D-2
Kruskal-Wallis Statistical Analysis Test

Number				Benzene		Ethylbenzene		Toluene		Xylenes	
Group	Cumulative	Well	Date	µg/L	Rank	µg/L	Rank	µg/L	Rank	µg/L	Rank
Upper Sand				Upper Sand and Till Wells							
Data Group 9 of 9		Compliance Wells									
1	312	MW-Y	6/25/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
2	313	MW-Y	10/6/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
3	314	MW-Y	12/9/1992	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
4	315	MW-Y	3/10/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
5	316	MW-Y	6/22/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
6	317	MW-Y	9/14/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
7	318	MW-Y	12/1/1993	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
8	319	MW-Y	3/21/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
9	320	MW-Y	6/21/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
10	321	MW-Y	9/13/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
11	322	MW-Y	12/12/1994	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
12	323	MW-Y	3/22/1995	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	**6.5**	341.00
13	324	MW-Y	6/13/1995	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
14	325	MW-Y	6/10/1996	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
15	326	MW-Y	10/8/1996	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
16	327	MW-Y	5/8/1997	ND(4)	265.00	ND(4)	267.00	ND(4)	241.00	ND(4)	261.50
17	328	MW-Y	5/6/1998	ND(1.0)	184.00	ND(1.0)	183.00	ND(1.0)	159.00	ND(1.0)	151.00
18	329	MW-Y	10/22/1998	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
19	330	MW-Y	5/4/1999	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
20	331	MW-Y	10/4/1999	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
21	332	MW-Y	5/3/2000	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
22	333	MW-Y	10/10/2000	**0.11**	2.00	**0.071**	1.00	**0.075**	1.00	**0.23**	1.00
23	334	MW-Y	5/8/2001	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
24	335	MW-Y	10/1/2001	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	**1.1**	156.00
25	336	MW-Y	5/14/2002	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
26	337	MW-Y	10/5/2002	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
27	338	MW-Y	5/13/2003	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
28	339	MW-Y	10/12/2003	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
29	340	MW-Y	5/17/2004	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
30	341	MW-Y	10/12/2004	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
31	342	MW-Y	10/10/2005	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
32	343	MW-Y	10/23/2006	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
33	344	MW-Y	10/17/2007	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
34	345	MW-Y	10/22/2008	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	**0.53**	139.00
35	346	MW-Y	10/26/2009	ND(0.50)	90.50	ND(0.50)	87.00	ND(0.50)	75.50	ND(0.50)	69.00
36	347	MW-Y	9/14/2010	ND(0.50)	90.50	ND(0.50)	87.00	ND(5.0)	330.50	ND(1.50)	171.00
37	348	MW-Y	9/28/2011	ND(0.50)	90.50	ND(0.50)	87.00	ND(5.0)	330.50	ND(1.5)	171.00
38	349	MW-Y	9/26/2012	ND(0.50)	90.50	ND(0.50)	87.00	ND(5.0)	330.50	ND(1.5)	171.00
39	350	MW-Y	9/27/2013	ND(0.5)	90.50	ND(0.5)	87.00	ND(5)	330.50	ND(1.5)	171.00
40	351	MW-Y	9/22/2014	ND(0.5)	90.50	ND(0.5)	87.00	ND(5)	330.50	ND(1.5)	171.00

	N_9	40.00	40.00	40.00	40.00
	Rank Sum (R_9)	6417.00	6370.00	6952.00	6600.50
	Avg. Rank (AR_9)	160.43	159.25	173.80	165.01
	R_9^2/N_9	1029447.23	1014422.5	1208257.6	1089165.01
	$AR_9 - AR_1$	-5.00	-11.68	-8.52	-11.59
	C_9	52.15	52.15	52.15	52.15
	$(AR_9 - AR_1) > C_9$ = Significant Contamination	No	No	No	No
Upper Sand Calculation	K	9.00	9.00	9.00	9.00
	N	351.00	351.00	351.00	351.00
	H	-58.33	-59.21	-2.86	-39.76
	H'	-72.66	-73.50	-3.39	-45.98
	$\chi^2_{8,.05}$	15.51	15.51	15.51	15.51
	H' > χ^2 = Contamination at the 5% level.	No	No	No	No

Table D-2
Kruskal-Wallis Statistical Analysis Test

Number				Benzene		Ethylbenzene		Toluene		Xylenes	
Group	Cumulative	Well	Date	µg/L	Rank	µg/L	Rank	µg/L	Rank	µg/L	Rank
Lower Sand											
Data Group 1 of 7		Background Well									
1	1	MW-1BR	6/23/1992	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
2	2	MW-1BR	10/7/1992	**18**	286.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
3	3	MW-1BR	12/11/1992	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
4	4	MW-1BR	3/8/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
5	5	MW-1BR	6/21/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
6	6	MW-1BR	9/13/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
7	7	MW-1BR	11/30/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
8	8	MW-1BR	3/22/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
9	9	MW-1BR	6/20/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
10	10	MW-1BR	9/14/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
11	11	MW-1BR	12/14/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
12	12	MW-1BR	3/23/1995	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
13	13	MW-1BR	6/13/1995	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
14	14	MW-1BR	10/10/1995	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
15	15	MW-1BR	5/7/1996	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
16	16	MW-1BR	10/7/1996	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	**6.4**	283.00
17	17	MW-1BR	5/7/1997	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
18	18	MW-1BR	10/6/1997	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
19	19	MW-1BR	5/4/1998	ND(1.0)	155.00	ND(1.0)	155.00	ND(1.0)	130.00	ND(1.0)	125.00
20	20	MW-1BR	10/22/1998	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
21	21	MW-1BR	5/3/1999	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
22	22	MW-1BR	10/4/1999	**0.2**	2.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
23	23	MW-1BR	5/2/2000	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
24	24	MW-1BR	10/10/2000	**0.26**	3.00	ND(0.50)	74.00	**0.078**	1.00	ND(0.50)	56.00
25	25	MW-1BR	5/9/2001	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
26	26	MW-1BR	10/1/2001	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
27	27	MW-1BR	5/14/2002	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
28	28	MW-1BR	10/5/2002	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
29	29	MW-1BR	5/13/2003	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
30	30	MW-1BR	10/12/2003	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	**0.72**	116.00
31	31	MW-1BR	5/17/2004	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
32	32	MW-1BR	10/12/2004	ND(0.50)	77.00	**0.73**	149.50	ND(0.50)	65.00	ND(3.2) U	157.00
33	33	MW-1BR	10/4/2005	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
34	34	MW-1BR	10/23/2006	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
35	35	MW-1BR	10/16/2007	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
36	36	MW-1BR	10/22/2008	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
37	37	MW-1BR	10/26/2009	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
38	38	MW-1BR	9/14/2010	ND(0.50)	77.00	ND(0.50)	74.00	ND(5.0)	273.00	ND(1.50)	142.00
39	39	MW-1BR	9/28/2011	ND(0.50)	77.00	ND(0.50)	74.00	ND(5.0)	273.00	ND(1.5)	142.00
40	40	MW-1BR	9/25/2012	ND(0.50)	77.00	ND(0.50)	74.00	ND(5.0)	273.00	ND(1.5)	142.00
41	41	MW-1BR	9/25/2013	ND(0.5)	77.00	ND(0.50)	74.00	ND(5)	273.00	ND(1.5)	142.00
42	42	MW-1BR	9/23/2014	ND(0.5)	77.00	ND(0.50)	74.00	ND(5)	273.00	ND(1.5)	142.00

N_1	42	42	42	42
Rank Sum (R_1)	5837.00	5937.50	6138.00	5987.90
Avg. Rank (AR_1)	138.98	141.37	146.14	142.57
R_1^2/N_1	811204	839379	897025	853689

Table D-2
Kruskal-Wallis Statistical Analysis Test

Number				Benzene		Ethylbenzene		Toluene		Xylenes	
Group	Cumulative	Well	Date	µg/L	Rank	µg/L	Rank	µg/L	Rank	µg/L	Rank
Lower Sand				Lower Sand							
Data Group 2 of 7		Compliance Well									
1	43	MW-10	6/24/1992	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
2	44	MW-10	10/5/1992	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
3	45	MW-10	12/11/1992	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
4	46	MW-10	3/10/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
5	47	MW-10	6/21/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
6	48	MW-10	9/14/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
7	49	MW-10	12/1/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
8	50	MW-10	3/21/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
9	51	MW-10	6/22/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
10	52	MW-10	9/13/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
11	53	MW-10	12/12/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
12	54	MW-10	3/21/1995	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
13	55	MW-10	6/12/1995	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
14	56	MW-10	10/9/1995	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
15	57	MW-10	5/8/1996	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
16	58	MW-10	10/7/1996	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
17	59	MW-10	5/6/1997	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
18	60	MW-10	10/6/1997	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
19	61	MW-10	5/4/1998	ND(1.0)	155.00	ND(1.0)	155.00	ND(1.0)	130.00	ND(1.0)	125.00
20	62	MW-10	10/22/1998	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
21	63	MW-10	5/3/1999	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
22	64	MW-10	10/4/1999	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
23	65	MW-10	5/2/2000	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
24	66	MW-10	10/9/2000	**0.12**	1.00	ND(0.50)	74.00	**0.17**	4.00	ND(0.50)	56.00
25	67	MW-10	5/8/2001	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
26	68	MW-10	10/1/2001	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
27	69	MW-10	5/14/2002	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
28	70	MW-10	10/5/2002	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
29	71	MW-10	5/13/2003	ND(0.50)	77.00	**0.73**	149.50	ND(0.50)	65.00	ND(0.50)	56.00
30	72	MW-10	10/11/2003	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
31	73	MW-10	5/17/2004	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
32	74	MW-10	10/12/2004	**11**	285.00	**8.7**	286.00	ND(0.50)	65.00	**15**	286.00
33	75	MW-10	11/3/2004	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
34	76	MW-10	10/10/2005	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
35	77	MW-10	10/23/2006	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
36	78	MW-10	10/16/2007	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
37	79	MW-10	10/22/2008	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
38	80	MW-10	10/26/2009	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
39	81	MW-10	9/14/2010	ND(0.50)	77.00	ND(0.50)	74.00	ND(5.0)	273.00	ND(1.50)	142.00
40	82	MW-10	9/28/2011	ND(0.50)	77.00	ND(0.50)	74.00	ND(5.0)	273.00	ND(1.50)	142.00
41	83	MW-10	9/26/2012	ND(0.50)	77.00	ND(0.50)	74.00	ND(5.0)	273.00	ND(1.50)	142.00
42	84	MW-10R	9/28/2013	ND(0.5)	77.00	ND(0.50)	74.00	ND(5)	273.00	ND(1.50)	142.00
43	85	MW-10R	9/22/2014	ND(0.5)	77.00	ND(0.50)	74.00	ND(5)	273.00	ND(1.50)	142.00

N_2	43	43	43	43
Rank Sum (R_2)	6131.00	6223.50	6206.00	6047.60
Avg. Rank (AR_2)	142.58	144.73	144.33	140.64
R_2^2/N_2	874167	900743	895685	850546
$AR_2 - AR_1$	3.61	3.36	-1.82	-1.93
$\chi 2$	42.76	42.76	42.76	42.76
$(AR_2 - AR_1) > \chi 2$ = Significant Contamination	No	No	No	No

Table D-2
Kruskal-Wallis Statistical Analysis Test

Number				Benzene		Ethylbenzene		Toluene		Xylenes	
Group	Cumulative	Well	Date	µg/L	Rank	µg/L	Rank	µg/L	Rank	µg/L	Rank
Lower Sand				Lower Sand							
Data Group 3 of 7		Compliance Well									
1	86	MW-8BR	6/25/1992	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
2	87	MW-8BR	10/6/1992	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
3	88	MW-8BR	12/9/1992	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
4	89	MW-8BR	3/10/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
5	90	MW-8BR	6/21/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
6	91	MW-8BR	9/14/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
7	92	MW-8BR	12/1/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
8	93	MW-8BR	3/21/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
9	94	MW-8BR	6/21/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
10	95	MW-8BR	9/13/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
11	96	MW-8BR	12/13/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
12	97	MW-8BR	3/21/1995	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
13	98	MW-8BR	6/13/1995	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
14	99	MW-8BR	10/9/1995	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
15	100	MW-8BR	5/8/1996	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
16	101	MW-8BR	10/8/1996	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
17	102	MW-8BR	5/6/1997	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
18	103	MW-8BR	10/6/1997	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
19	104	MW-8BR	5/4/1998	ND(1.0)	155.00	ND(1.0)	155.00	ND(1.0)	130.00	ND(1.0)	125.00
20	105	MW-8BR	10/22/1998	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
21	106	MW-8BR	5/5/1999	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
22	107	MW-8BR	10/4/1999	ND(0.50)	77.00	**0.054**	1.00	ND(0.50)	65.00	ND(0.50)	56.00
23	108	MW-8BR	5/2/2000	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
24	109	MW-8BR	10/9/2000	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
25	110	MW-8BR	5/8/2001	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
26	111	MW-8BR	10/1/2001	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
27	112	MW-8BR	5/14/2002	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
28	113	MW-8BR	10/5/2002	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
29	114	MW-8BR	5/13/2003	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
30	115	MW-8BR	10/12/2003	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
31	116	MW-8BR	5/17/2004	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
32	117	MW-8BR	10/12/2004	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.83)	119.00
33	118	MW-8BR	10/4/2005	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	**0.89**	120.50
34	119	MW-8BR	10/23/2006	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
35	120	MW-8BR	10/16/2007	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
36	121	MW-8BR	10/22/2008	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	**0.61**	115.00
37	122	MW-8BR	10/26/2009	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
38	123	MW-8BR	9/14/2010	ND(0.50)	77.00	ND(0.50)	74.00	ND(5.0)	273.00	ND(0.50)	56.00
39	124	MW-8BR	9/27/2011	ND(0.50)	77.00	ND(0.50)	74.00	ND(5.0)	273.00	ND(1.5)	142.00
40	125	MW-8BR	9/26/2012	ND(0.50)	77.00	ND(0.50)	74.00	ND(5.0)	273.00	ND(1.5)	142.00
41	126	MW-8BRR	9/28/2013	ND(0.5)	77.00	ND(0.50)	74.00	ND(5)	273.00	ND(1.5)	142.00
42	127	MW-8BRR	9/22/2014	ND(0.5)	77.00	ND(0.50)	74.00	ND(5)	273.00	ND(1.5)	142.00

N_3	42.00	42.00	42.00	42.00
Rank Sum (R_3)	5922.00	5789.00	6202.00	5862.10
Avg. Rank (AR_3)	141.00	137.83	147.67	139.57
R_3^2/N_3	835002	797917	915829	818196
$AR_3 - AR_1$	2.02	-3.54	1.52	-3.00
$\chi 3$	43.01	43.01	43.01	43.01
$(AR_3 - AR_1) > \chi 3$ = Significant Contamination	No	No	No	No

Table D-2
Kruskal-Wallis Statistical Analysis Test

Number				Benzene		Ethylbenzene		Toluene		Xylenes	
Group	Cumulative	Well	Date	µg/L	Rank	µg/L	Rank	µg/L	Rank	µg/L	Rank
Lower Sand				Lower Sand							
Data Group 4 of 7		Compliance Well									
1	128	MW-9	7/9/1992	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
2	129	MW-9	10/5/1992	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
3	130	MW-9	12/11/1992	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
4	131	MW-9	3/10/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
5	132	MW-9	6/21/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
6	133	MW-9	9/14/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
7	134	MW-9	12/1/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
8	135	MW-9	3/21/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
9	136	MW-9	6/22/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
10	137	MW-9	9/13/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
11	138	MW-9	12/12/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
12	139	MW-9	3/21/1995	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
13	140	MW-9	6/12/1995	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
14	141	MW-9	10/9/1995	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
15	142	MW-9	5/8/1996	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
16	143	MW-9	10/7/1996	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
17	144	MW-9	5/6/1997	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
18	145	MW-9	10/6/1997	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
19	146	MW-9	5/4/1998	ND(1.0)	155.00	ND(1.0)	155.00	ND(1.0)	130.00	ND(1.0)	125.00
20	147	MW-9	10/22/1998	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
21	148	MW-9	5/3/1999	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
22	149	MW-9	10/4/1999	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
23	150	MW-9	5/2/2000	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
24	151	MW-9	10/9/2000	ND(0.50)	77.00	ND(0.50)	74.00	**0.14**	3.00	ND(0.50)	56.00
25	152	MW-9	5/8/2001	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
26	153	MW-9	10/1/2001	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
27	154	MW-9	5/14/2002	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
28	155	MW-9	10/5/2002	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
29	156	MW-9	5/13/2003	ND(0.50)	77.00	**0.62**	147.00	ND(0.50)	65.00	ND(0.50)	56.00
30	157	MW-9	10/11/2003	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
31	158	MW-9	5/17/2004	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
32	159	MW-9	10/12/2004	ND(0.50)	77.00	**1.7**	159.00	ND(0.50)	65.00	**7.3**	284.00
33	160	MW-9	10/4/2005	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
34	161	MW-9	10/23/2006	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
35	162	MW-9	10/16/2007	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
36	163	MW-9	10/22/2008	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	**0.57**	113.50
37	164	MW-9	10/26/2009	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
38	165	MW-9	9/14/2010	ND(0.50)	77.00	ND(0.50)	74.00	ND(5.0)	273.00	ND(1.50)	142.00
39	166	MW-9	9/27/2011	ND(0.50)	77.00	ND(0.50)	74.00	ND(5.0)	273.00	ND(1.5)	142.00
40	167	MW-9R	9/28/2013	**2.6**	159.00	ND(0.5)	74.00	ND(5)	273.00	**1.7**	156.00
41	168	MW-9R	9/22/2014	ND(0.50)	77.00	ND(0.5)	74.00	ND(5)	273.00	ND(1.5)	142.00

N_4	41.00	41.00	41.00	41.00
Rank Sum (R_4)	5927.00	5946.00	5867.00	5919.10
Avg. Rank (AR_4)	144.56	145.02	143.10	144.37
R_4^2/N_4	856812.90	862315.02	839553.39	854530.36
$AR_4 - AR_1$	5.58	3.66	-3.05	1.80
χ_4	43.27	43.27	43.27	43.27
$(AR_4 - AR_1) > \chi_4$ = Significant Contamination	No	No	No	No

Table D-2
Kruskal-Wallis Statistical Analysis Test

Number				Benzene		Ethylbenzene		Toluene		Xylenes	
Group	Cumulative	Well	Date	µg/L	Rank	µg/L	Rank	µg/L	Rank	µg/L	Rank
Lower Sand				Lower Sand							
Data Group 5 of 7		Compliance Well									
1	169	MW-PR	6/25/1992	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
2	170	MW-PR	10/6/1992	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
3	171	MW-PR	12/9/1992	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
4	172	MW-PR	3/10/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
5	173	MW-PR	6/21/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
6	174	MW-PR	9/14/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
7	175	MW-PR	12/1/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
8	176	MW-PR	3/21/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
9	177	MW-PR	6/21/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
10	178	MW-PR	9/13/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
11	179	MW-PR	12/13/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
12	180	MW-PR	3/22/1995	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
13	181	MW-PR	6/12/1995	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
14	182	MW-PR	10/9/1995	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
15	183	MW-PR	5/7/1996	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
16	184	MW-PR	10/6/1996	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
17	185	MW-PR	5/6/1997	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
18	186	MW-PR	10/6/1997	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
19	187	MW-PR	5/4/1998	ND(1.0)	155.00	ND(1.0)	155.00	ND(1.0)	130.00	ND(1.0)	125.00
20	188	MW-PR	10/22/1998	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
21	189	MW-PR	5/3/1999	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
22	190	MW-PR	10/4/1999	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
23	191	MW-PR	5/2/2000	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
24	192	MW-PR	10/10/2000	ND(0.50)	77.00	ND(0.50)	74.00	**0.11**	2.00	ND(0.50)	56.00
25	193	MW-PR	5/8/2001	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	**0.76**	117.50
26	194	MW-PR	10/1/2001	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
27	195	MW-PR	5/14/2002	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
28	196	MW-PR	10/5/2002	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
29	197	MW-PR	5/13/2003	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
30	198	MW-PR	10/11/2003	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
31	199	MW-PR	5/17/2004	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	**0.57**	113.50
32	200	MW-PR	10/12/2004	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
33	201	MW-PR	10/4/2005	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
34	202	MW-PR	10/23/2006	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
35	203	MW-PR	10/16/2007	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
36	204	MW-PR	10/22/2008	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	**0.56**	112.00
37	205	MW-PR	10/26/2009	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
38	206	MW-PR	9/14/2010	ND(0.50)	77.00	ND(0.50)	74.00	ND(5.0)	273.00	ND(1.50)	142.00
39	207	MW-PR	9/27/2011	ND(0.50)	77.00	ND(0.50)	74.00	ND(5.0)	273.00	ND(1.5)	142.00
40	208	MW-PR	9/26/2012	ND(0.50)	77.00	ND(0.50)	74.00	ND(5.0)	273.00	ND(1.5)	142.00
41	209	MW-PR	9/27/2013	**0.78**	151.00	ND(0.5)	74.00	ND(5)	273.00	**10**	285.00
42	210	MW-PR	9/22/2014	ND(0.50)	77.00	ND(0.5)	74.00	ND(5)	273.00	ND(1.5)	142.00

N_5	42.00	42.00	42.00	42.00
Rank Sum (R_5)	5996.00	5862.00	6139.00	6079.60
Avg. Rank (AR_5)	142.76	139.57	146.17	144.75
R_5^2/N_5	856000.38	818167.71	897317.17	880036.58
$AR_5 - AR_1$	3.79	-1.80	0.02	2.18
χ_5	43.01	43.01	43.01	43.01
$(AR_5 - AR_1) > \chi_5$ = Significant Contamination	No	No	No	No

Table D-2
Kruskal-Wallis Statistical Analysis Test

Number				Benzene		Ethylbenzene		Toluene		Xylenes	
Group	Cumulative	Well	Date	µg/L	Rank	µg/L	Rank	µg/L	Rank	µg/L	Rank
Lower Sand				Lower Sand							
Data Group 6 of 7		Compliance Well									
1	211	MW-W1R	6/23/1992	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
2	212	MW-W1R	10/8/1992	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
3	213	MW-W1R	12/10/1992	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
4	214	MW-W1R	3/8/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
5	215	MW-W1R	6/22/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
6	216	MW-W1R	9/15/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
7	217	MW-W1R	12/2/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
8	218	MW-W1R	3/22/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
9	219	MW-W1R	6/20/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
10	220	MW-W1R	9/14/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
11	221	MW-W1R	12/14/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
12	222	MW-W1R	3/23/1995	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
13	223	MW-W1R	6/14/1995	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
14	224	MW-W1R	10/10/1995	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
15	225	MW-W1R	5/7/1996	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
16	226	MW-W1R	10/7/1996	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
17	227	MW-W1R	5/7/1997	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
18	228	MW-W1R	10/6/1997	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
19	229	MW-W1R	5/5/1998	ND(1.0)	155.00	ND(1.0)	155.00	ND(1.0)	130.00	ND(1.0)	125.00
20	230	MW-W1R	10/22/1998	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
21	231	MW-W1R	5/4/1999	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
22	232	MW-W1R	10/5/1999	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
23	233	MW-W1R	5/3/2000	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
24	234	MW-W1R	10/10/2000	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
25	235	MW-W1R	5/9/2001	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
26	236	MW-W1R	10/1/2001	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
27	237	MW-W1R	5/14/2002	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
28	238	MW-W1R	10/5/2002	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
29	239	MW-W1R	5/13/2003	ND(0.50)	77.00	**0.69**	148.00	ND(0.50)	65.00	ND(0.50)	56.00
30	240	MW-W1R	10/12/2003	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
31	241	MW-W1R	5/17/2004	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
32	242	MW-W1R	10/12/2004	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(1.6) U	155.00
33	243	MW-W1R	10/4/2005	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	**0.76**	117.50
34	244	MW-W1R	10/23/2006	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
35	245	MW-W1R	10/17/2007	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
36	246	MW-W1R	10/22/2008	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
37	247	MW-W1R	10/26/2009	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
38	248	MW-W1R	9/15/2010	ND(0.50)	77.00	ND(0.50)	74.00	ND(5.0)	273.00	ND(1.50)	142.00
39	249	MW-W1R	9/28/2011	ND(0.50)	77.00	ND(0.50)	74.00	ND(5.0)	273.00	ND(1.5)	142.00
40	250	MW-W1R	9/26/2012	ND(0.50)	77.00	ND(0.50)	74.00	ND(5.0)	273.00	ND(1.5)	142.00
41	251	MW-W1R	9/26/2013	ND(0.5)	77.00	ND(0.50)	74.00	ND(5)	273.00	ND(1.5)	142.00
42	252	MW-W1R	9/23/2014	ND(0.5)	77.00	ND(0.50)	74.00	ND(5)	273.00	ND(1.5)	142.00

N_6	42.00	42.00	42.00	42.00
Rank Sum (R_6)	5922.00	5936.00	6202.00	5922.10
Avg. Rank (AR_6)	141.00	141.33	147.67	141.00
R_6^2/N_6	835002.00	838954.67	915828.67	835030.20
$AR_6 - AR_1$	2.02	-0.04	1.52	-1.57
χ_6	43.01	43.01	43.01	43.01
$(AR_6 - AR_1) > \chi_6$= Significant Contamination	No	No	No	No

Table D-2
Kruskal-Wallis Statistical Analysis Test

Number				Benzene		Ethylbenzene		Toluene		Xylenes	
Group	Cumulative	Well	Date	µg/L	Rank	µg/L	Rank	µg/L	Rank	µg/L	Rank
Lower Sand				Lower Sand							
Data Group 7 of 7		Compliance Well									
1	253	MW-WL-11	6/26/1992	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
2	254	MW-WL-11	10/8/1992	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
3	255	MW-WL-11	12/10/1992	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
4	256	MW-WL-11	3/11/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
5	257	MW-WL-11	6/22/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
6	258	MW-WL-11	9/13/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
7	259	MW-WL-11	12/2/1993	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
8	260	MW-WL-11	3/23/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
9	261	MW-WL-11	6/21/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
10	262	MW-WL-11	9/14/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
11	263	MW-WL-11	12/15/1994	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
12	264	MW-WL-11	3/23/1995	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
13	265	MW-WL-11	6/13/1995	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
14	266	MW-WL-11	10/11/1995	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
15	267	MW-WL-11	5/7/1996	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
16	268	MW-WL-11	10/8/1996	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
17	269	MW-WL-11	5/7/1997	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
18	270	MW-WL-11	10/6/1997	ND(4)	222.00	ND(4)	222.50	ND(4)	196.50	ND(4)	217.70
19	271	MW-WL-11	5/5/1998	ND(1.0)	155.00	ND(1.0)	155.00	ND(1.0)	130.00	ND(1.0)	125.00
20	272	MW-WL-11	10/22/1998	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
21	273	MW-WL-11	5/4/1999	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
22	274	MW-WL-11	10/5/1999	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
23	275	MW-WL-11	5/3/2000	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
24	276	MW-WL-11	10/11/2000	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
25	277	MW-WL-11	5/9/2001	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
26	278	MW-WL-11	10/1/2001	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
27	279	MW-WL-11	5/14/2002	ND(0.50)	77.00	ND(0.50)	74.00	**0.64**	126.00	**0.89**	120.50
28	280	MW-WL-11	10/5/2002	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
29	281	MW-WL-11	5/13/2003	ND(0.50)	77.00	**0.78**	151.00	ND(0.50)	65.00	ND(0.50)	56.00
30	282	MW-WL-11	10/11/2003	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
31	283	MW-WL-11	5/17/2004	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	**1.0**	129.00
32	284	MW-WL-11	10/12/2004	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
33	285	MW-WL-11	10/4/2005	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
34	286	MW-WL-11	10/23/2006	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
35	287	MW-WL-11	10/16/2007	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
36	288	MW-WL-11	10/22/2008	ND(0.50)	77.00	ND(0.50)	74.00	ND(0.50)	65.00	ND(0.50)	56.00
37	289	MW-WL-11	9/15/2010	ND(0.50)	77.00	ND(0.50)	74.00	ND(5.0)	273.00	ND(1.50)	142.00
38	290	MW-WL-11	9/28/2011	ND(0.50)	77.00	ND(0.50)	74.00	ND(5.0)	273.00	ND(1.50)	142.00
39	291	MW-WL-11	9/26/2012	ND(0.50)	77.00	ND(0.50)	74.00	ND(5.0)	273.00	ND(1.50)	142.00
40	292	MW-WL-11	9/25/2013	ND(0.5)	77.00	ND(0.50)	74.00	ND(5)	273.00	ND(1.50)	142.00
41	293	MW-WL-11	9/23/2014	ND(0.5)	77.00	ND(0.50)	74.00	ND(5)	273.00	ND(1.50)	142.00

	N_7	41.00	41.00	41.00	41.00
	Rank Sum (R_7)	5845.00	5865.00	6198.00	5843.10
	Avg. Rank (AR_7)	142.56	143.05	151.17	142.51
	R_7^2/N_7	833268.90	838981.10	936956.20	832727.26
	$AR_7 - AR_1$	3.58	1.68	5.03	-0.05
	χ_7	43.27	43.27	43.27	43.27
	($AR_7 - AR_1$) > χ_7 = Significant Contamination	No	No	No	No
Lower Sand Calculation	K	7.00	7.00	7.00	7.00
	N	293.00	293.00	293.00	293.00
	H	-59.90	-60.59	-4.63	-56.65
	H'	-75.24	-75.81	-5.45	-65.32
	$\chi^2_{6,.05}$	12.56	12.56	12.56	12.56
	H' > χ^2 = Contamination at the 5% level	No	No	No	No

Notes:

(1) Matrix interference caused higher detection limit.

* = Multiple groups of ties in dataset.

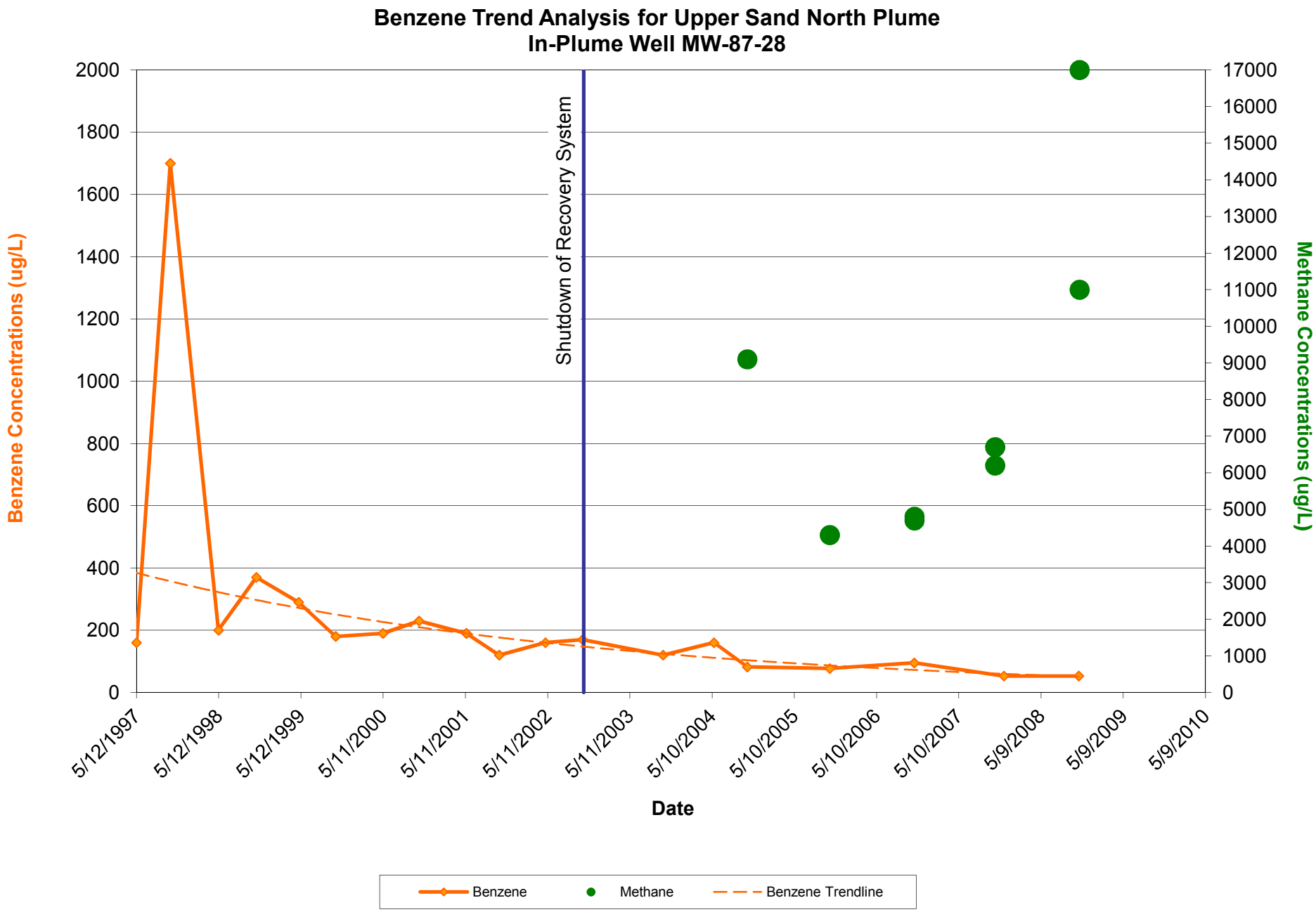
B = Detected in Method Blank.

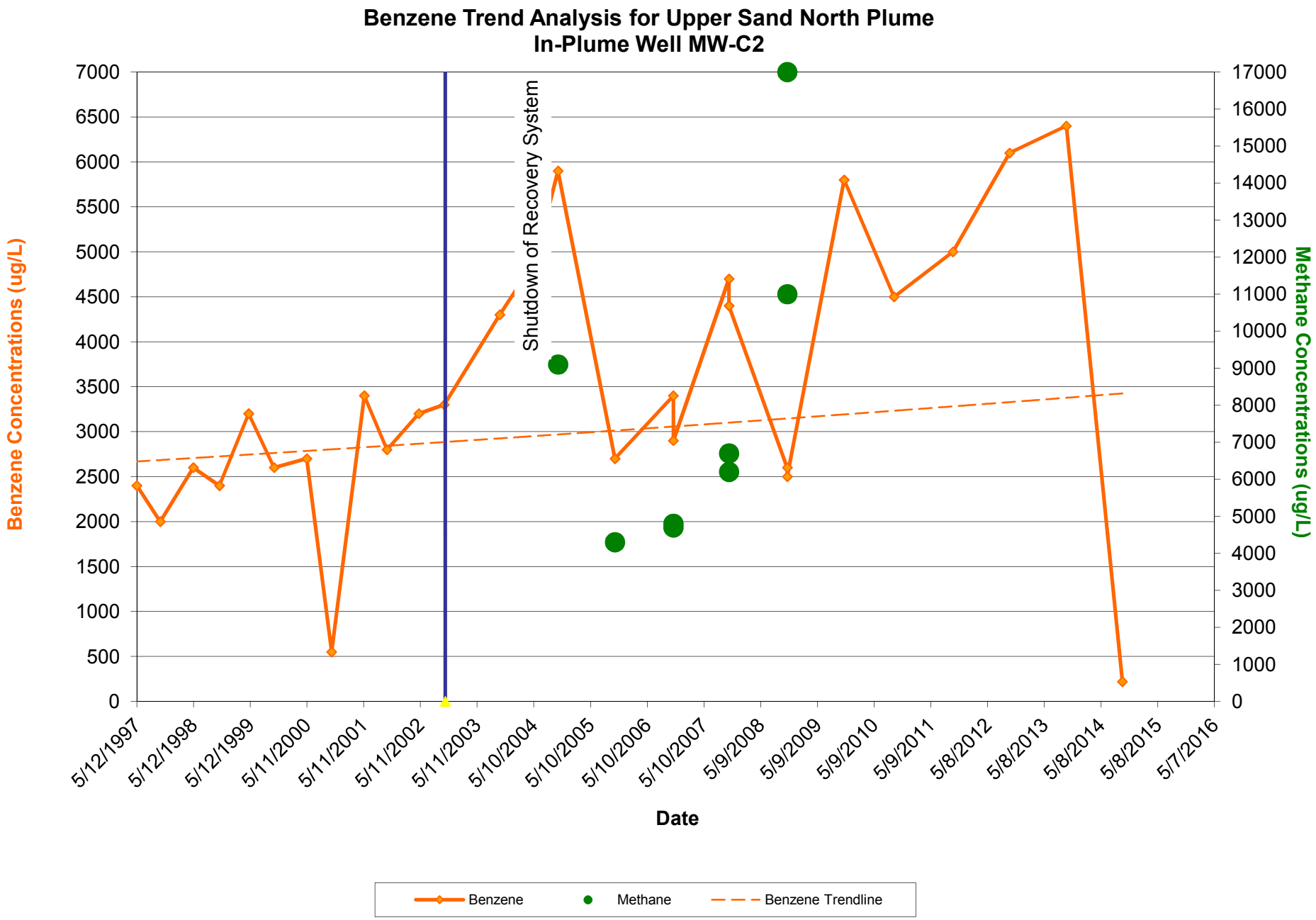
Detections above the PQL (Practical Quantitation Limit) are bolded.

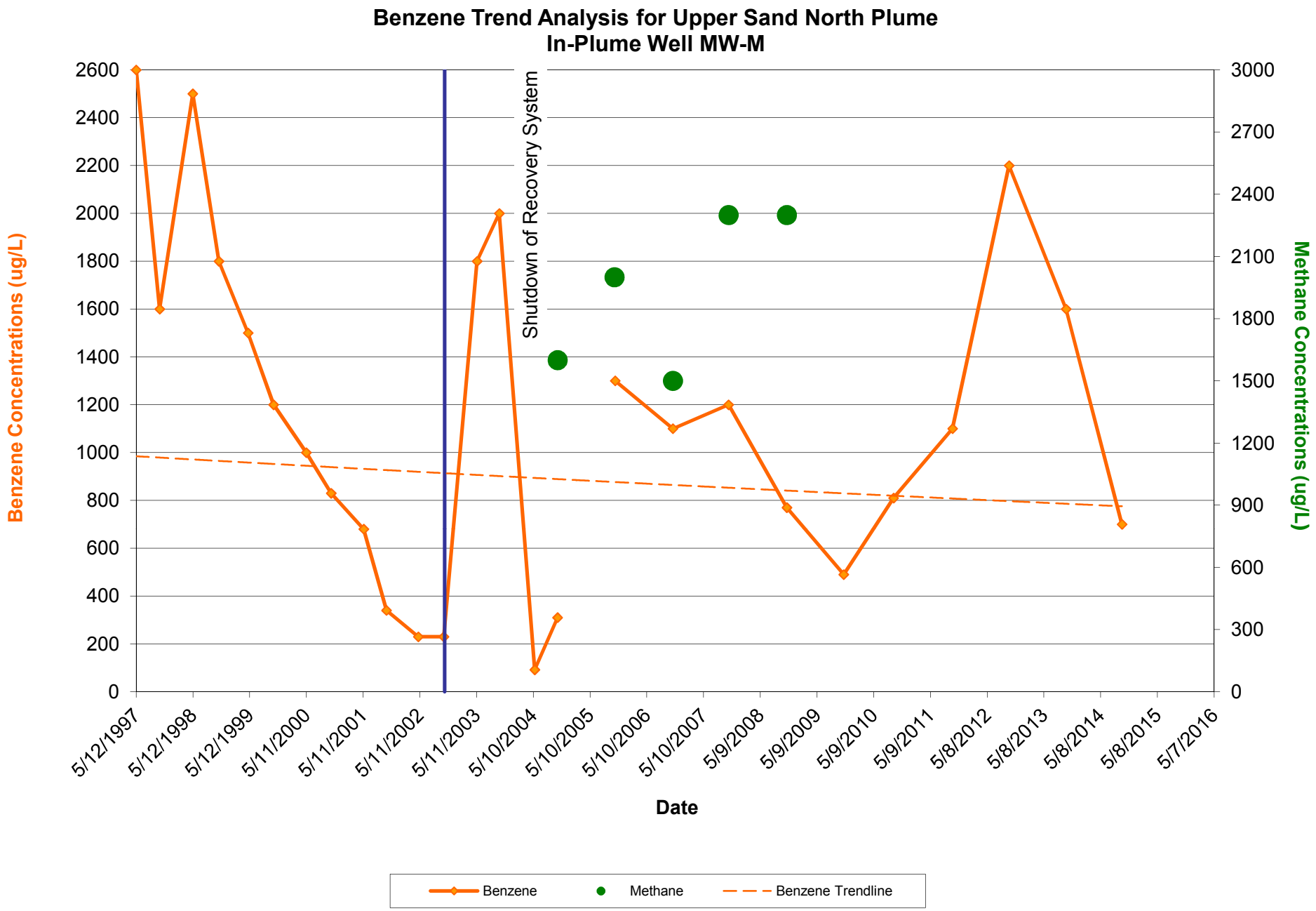
ND (PQL) = Not detected above given PQL.

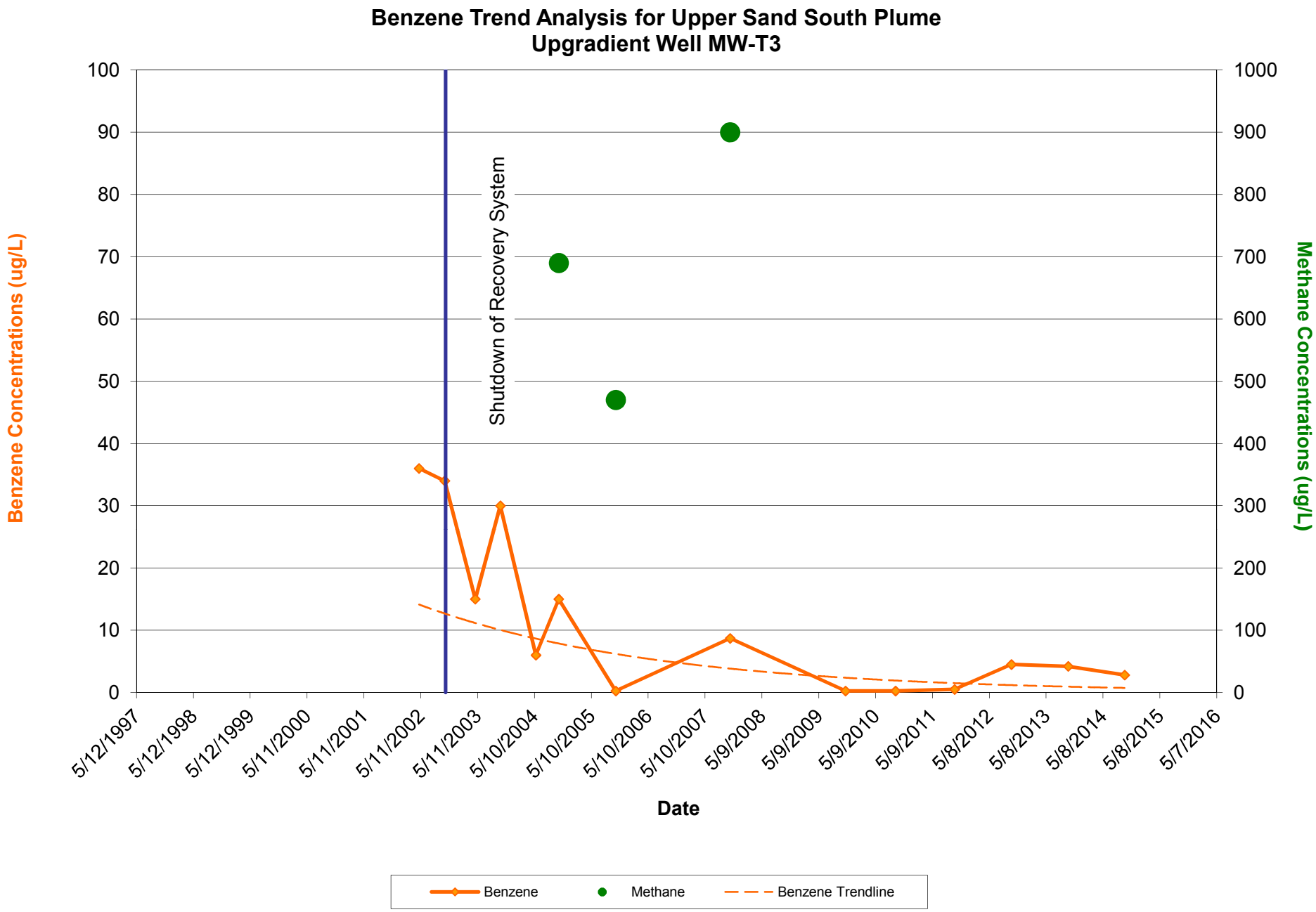
APPENDIX E

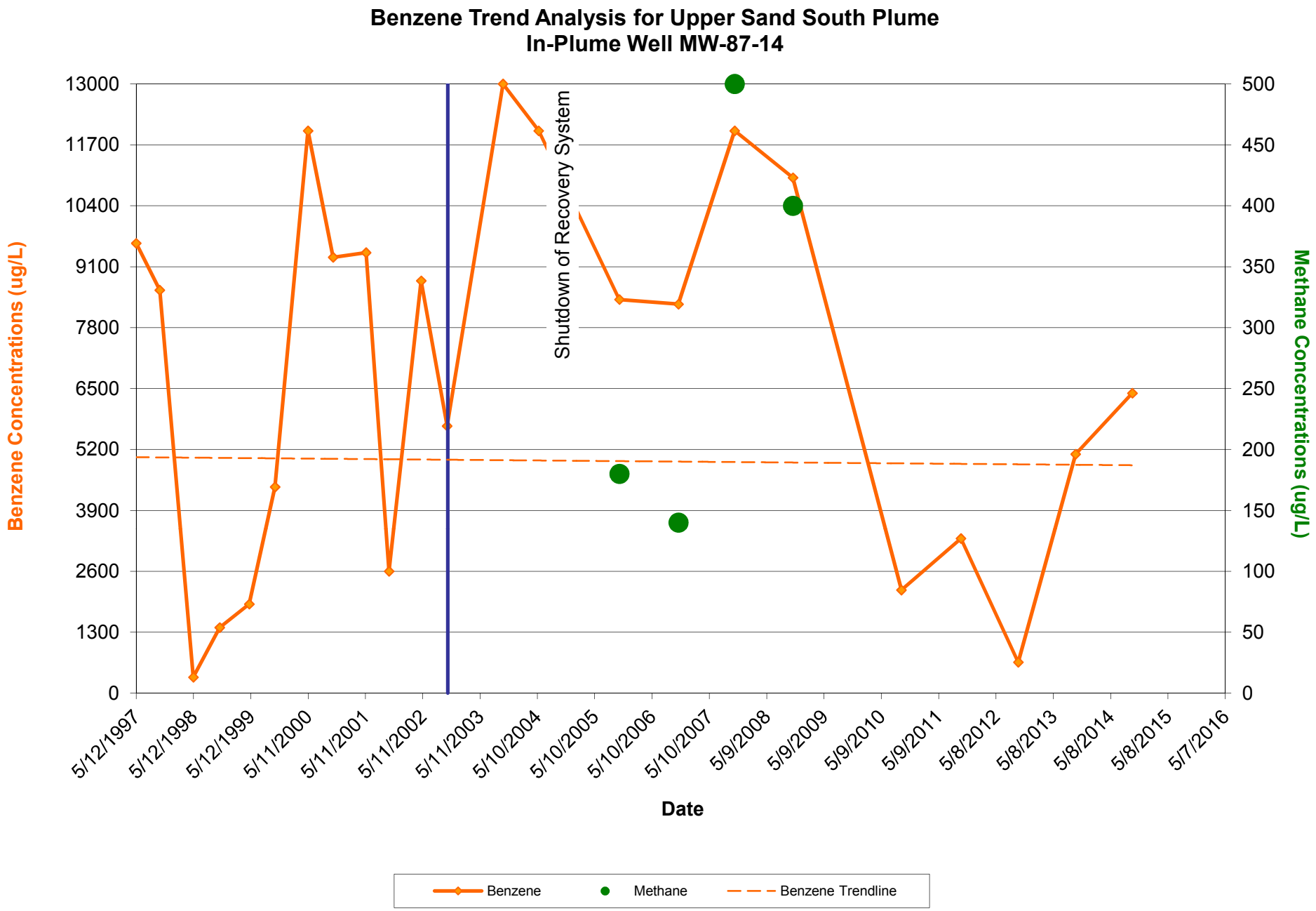
MNA Time Series Graph

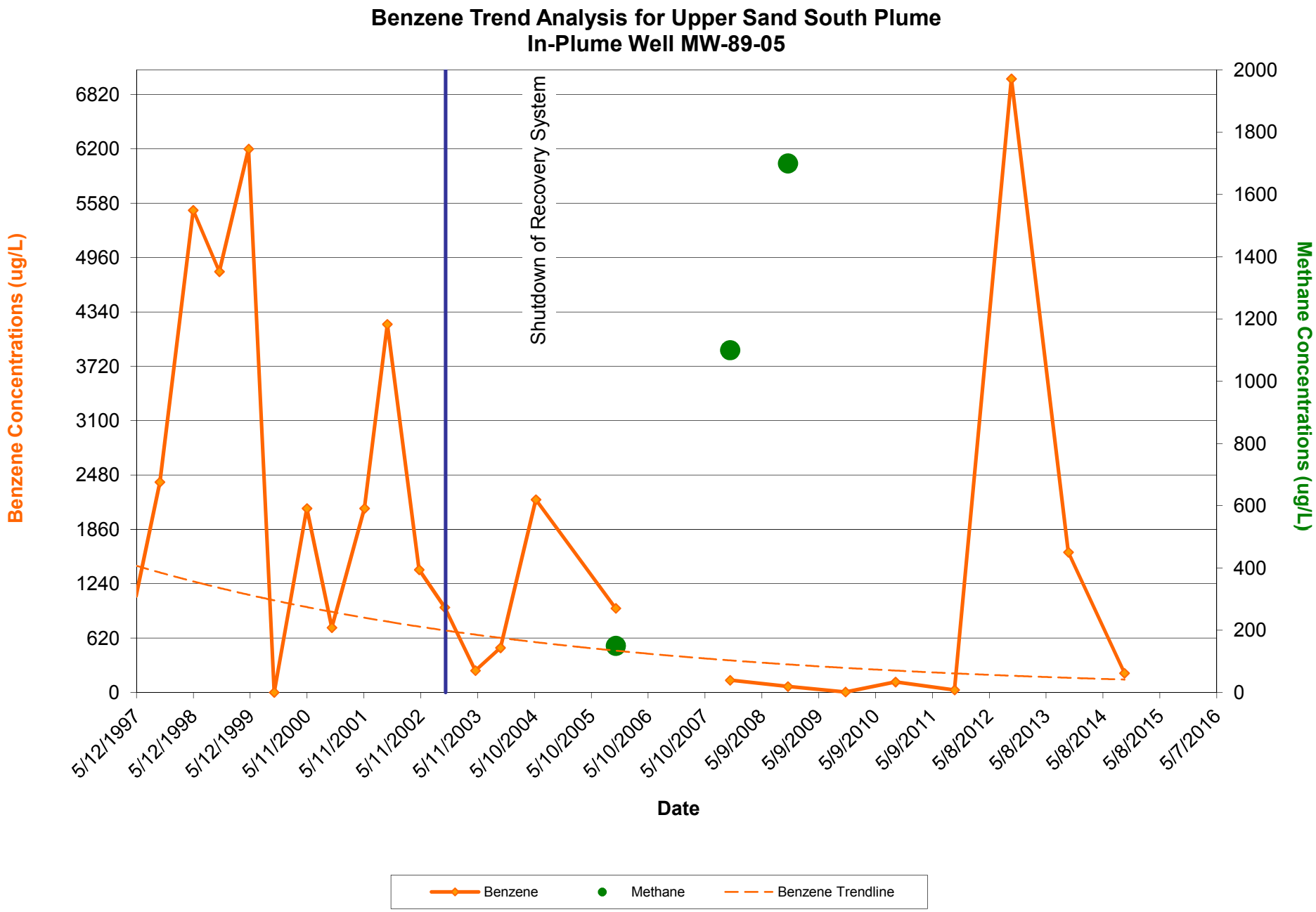

Benzene Trend Analysis for Upper Sand North Plume
In-Plume Well MW-87-28
Benzene Concentrations (ug/L)
Methane Concentrations (ug/L)
Shutdown of Recovery System
2000
1800
1600
1400
1200
1000
800
600
400
200
0
17000
16000
15000
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
5/12/1997
5/12/1998
5/12/1999
5/11/2000
5/11/2001
5/11/2002
5/11/2003
5/10/2004
5/10/2005
5/10/2006
5/10/2007
5/9/2008
5/9/2009
5/9/2010
Date
Benzene
Methane
Benzene Trendline

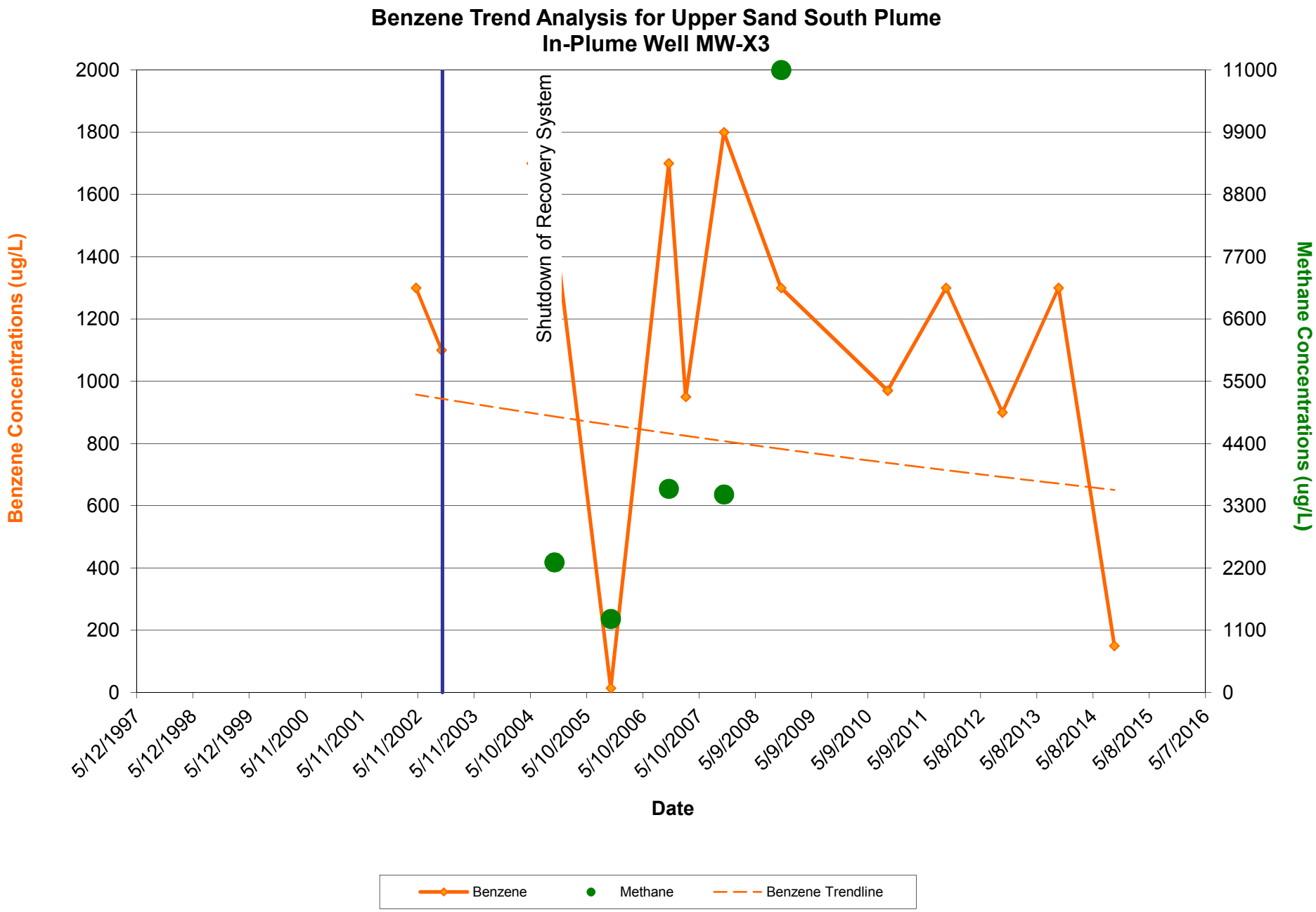

Benzene Trend Analysis for Upper Sand North Plume
In-Plume Well MW-C2
Benzene Concentrations (ug/L)
Methane Concentrations (ug/L)
Shutdown of Recovery System
7000
6500
6000
5500
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
17000
16000
15000
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
5/12/1997
5/12/1998
5/12/1999
5/11/2000
5/11/2001
5/11/2002
5/11/2003
5/10/2004
5/10/2005
5/10/2006
5/10/2007
5/9/2008
5/9/2009
5/9/2010
5/9/2011
5/8/2012
5/8/2013
5/8/2014
5/8/2015
5/7/2016
Date
Benzene
Methane
Benzene Trendline

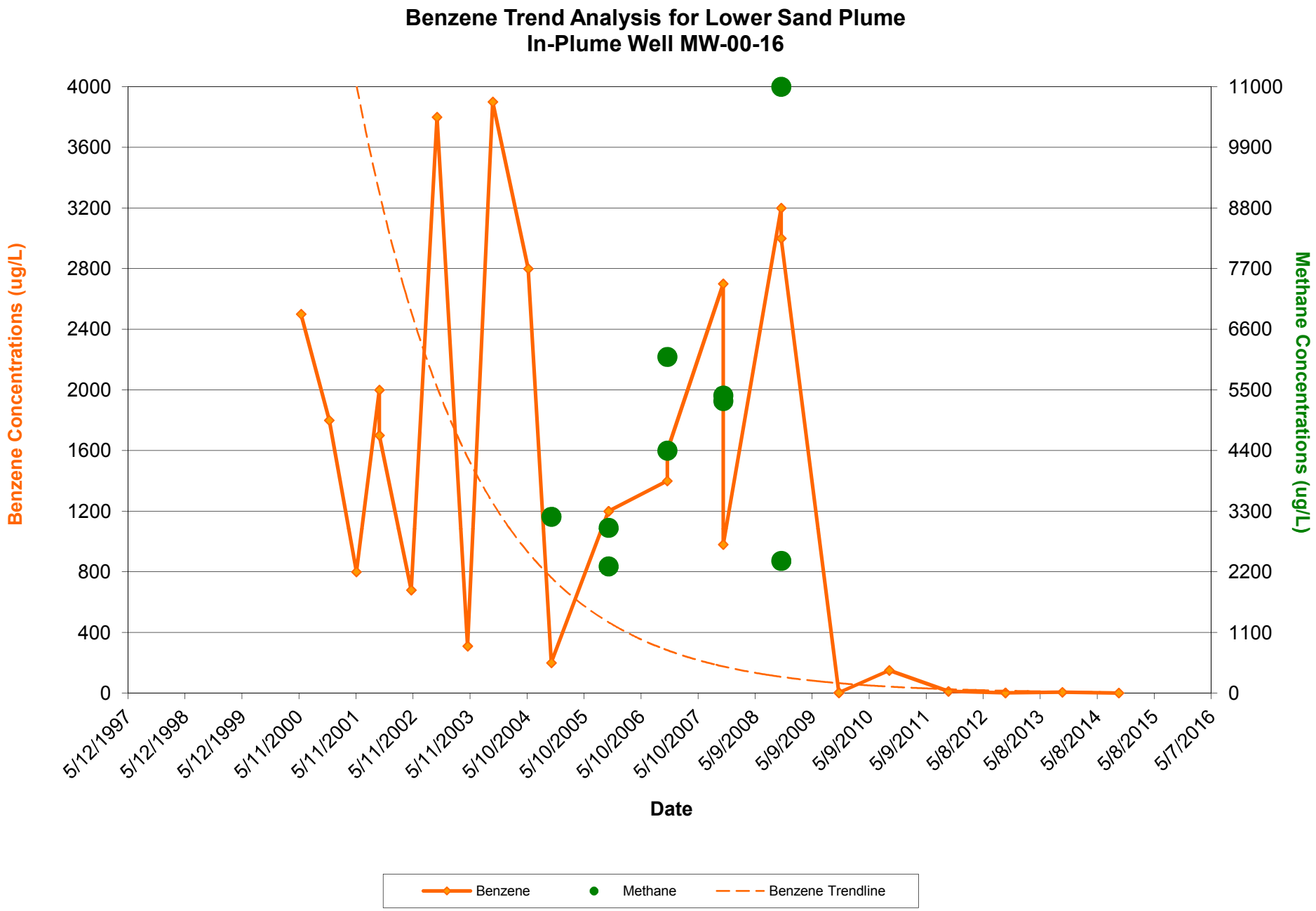

Benzene Trend Analysis for Upper Sand North Plume
In-Plume Well MW-M
Benzene Concentrations (ug/L)
Methane Concentrations (ug/L)
Shutdown of Recovery System
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
3000
2700
2400
2100
1800
1500
1200
900
600
300
0
5/12/1997
5/12/1998
5/12/1999
5/11/2000
5/11/2001
5/11/2002
5/11/2003
5/10/2004
5/10/2005
5/10/2006
5/10/2007
5/9/2008
5/9/2009
5/9/2010
5/9/2011
5/8/2012
5/8/2013
5/8/2014
5/8/2015
5/7/2016
Date
Benzene
Methane
Benzene Trendline

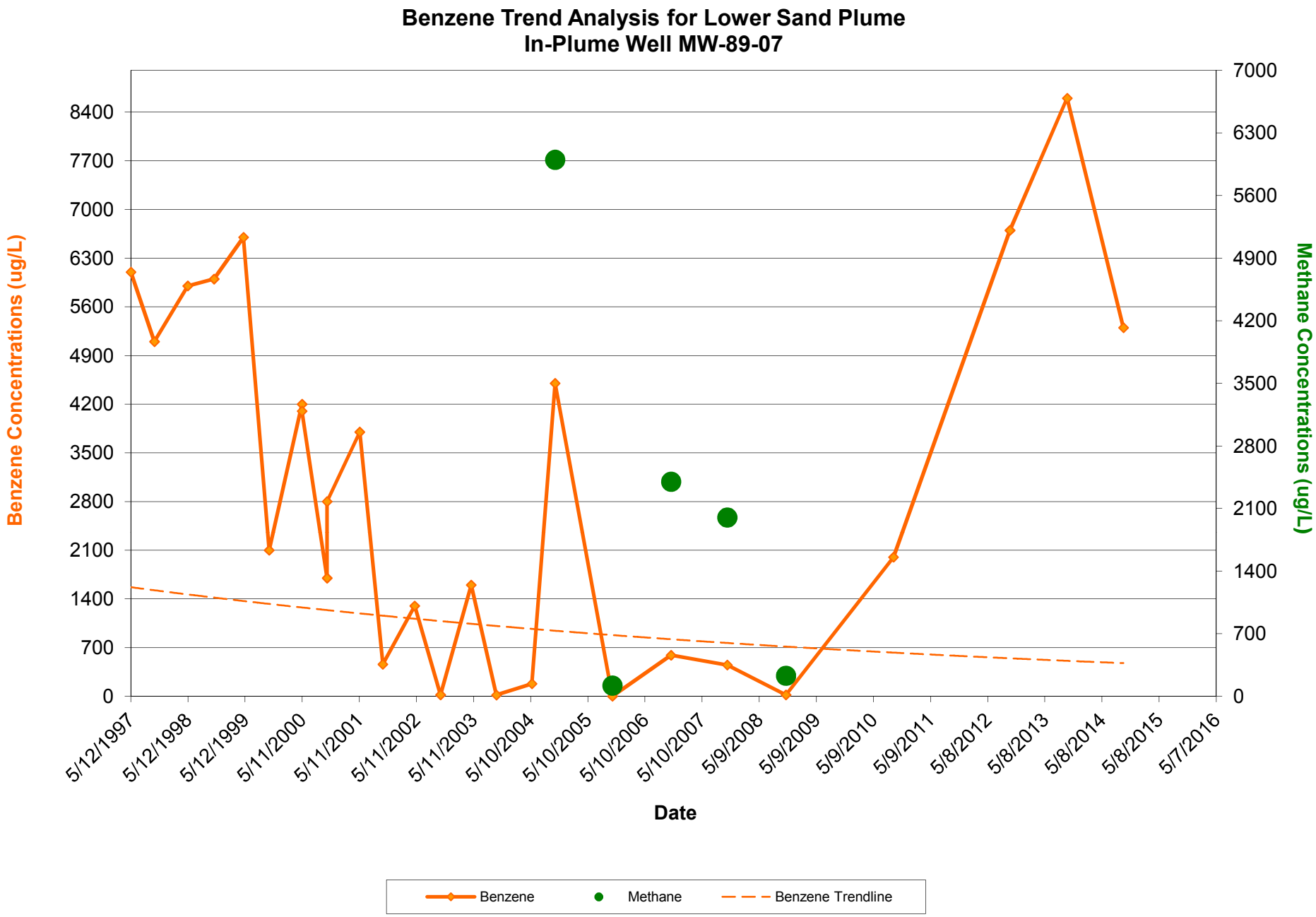

Benzene Trend Analysis for Upper Sand South Plume
Upgradient Well MW-T3
Benzene Concentrations (ug/L)
Methane Concentrations (ug/L)
Shutdown of Recovery System
100
90
80
70
60
50
40
30
20
10
0
1000
900
800
700
600
500
400
300
200
100
0
5/12/1997
5/12/1998
5/12/1999
5/11/2000
5/11/2001
5/11/2002
5/11/2003
5/10/2004
5/10/2005
5/10/2006
5/10/2007
5/9/2008
5/9/2009
5/9/2010
5/9/2011
5/8/2012
5/8/2013
5/8/2014
5/8/2015
5/7/2016
Date
Benzene
Methane
Benzene Trendline

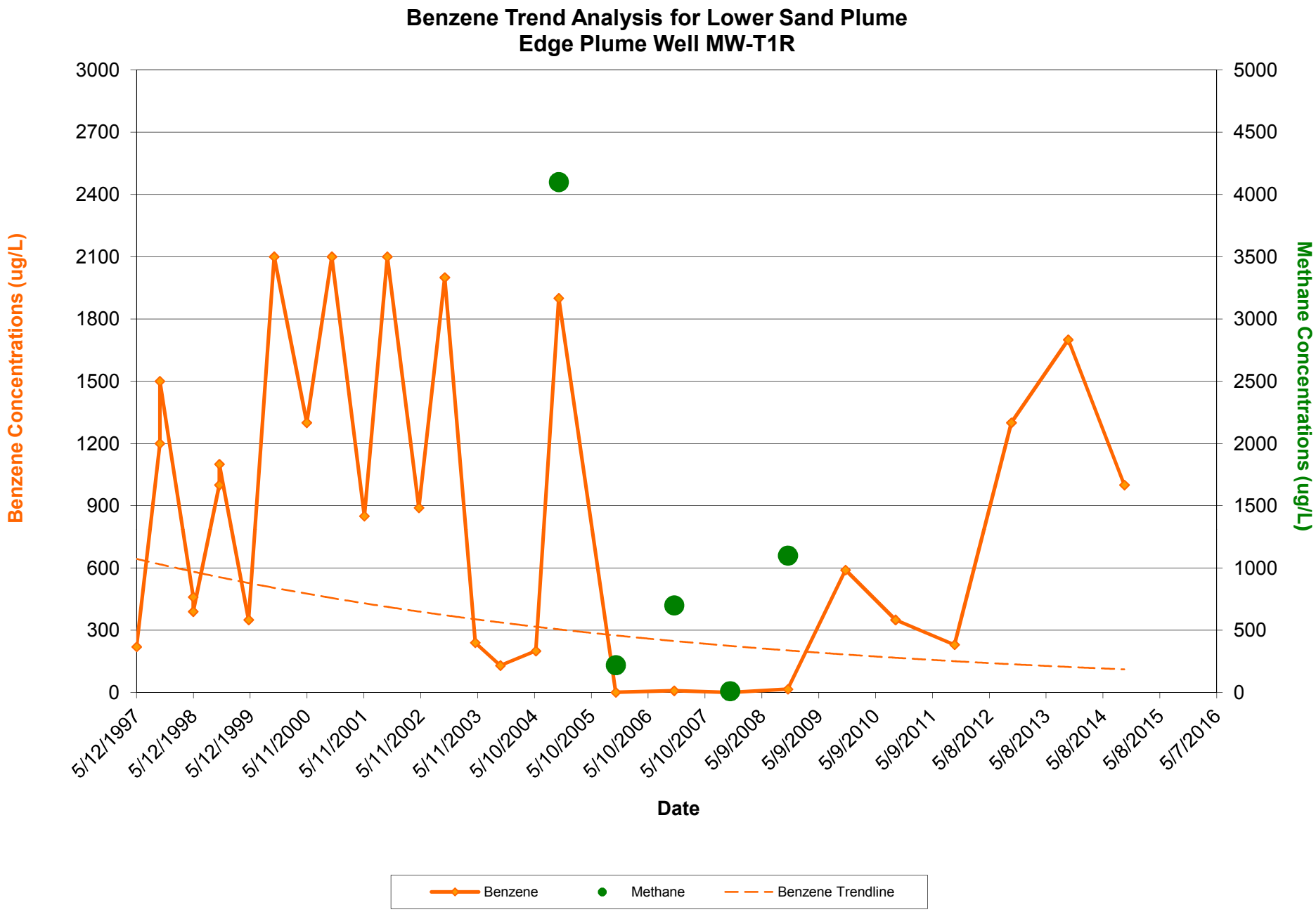

Benzene Trend Analysis for Upper Sand South Plume
In-Plume Well MW-87-14
Benzene Concentrations (ug/L)
Methane Concentrations (ug/L)
Shutdown of Recovery System
13000
11700
10400
9100
7800
6500
5200
3900
2600
1300
0
500
450
400
350
300
250
200
150
100
50
0
5/12/1997
5/12/1998
5/12/1999
5/11/2000
5/11/2001
5/11/2002
5/11/2003
5/10/2004
5/10/2005
5/10/2006
5/10/2007
5/9/2008
5/9/2009
5/9/2010
5/9/2011
5/8/2012
5/8/2013
5/8/2014
5/8/2015
5/7/2016
Date
Benzene
Methane
Benzene Trendline

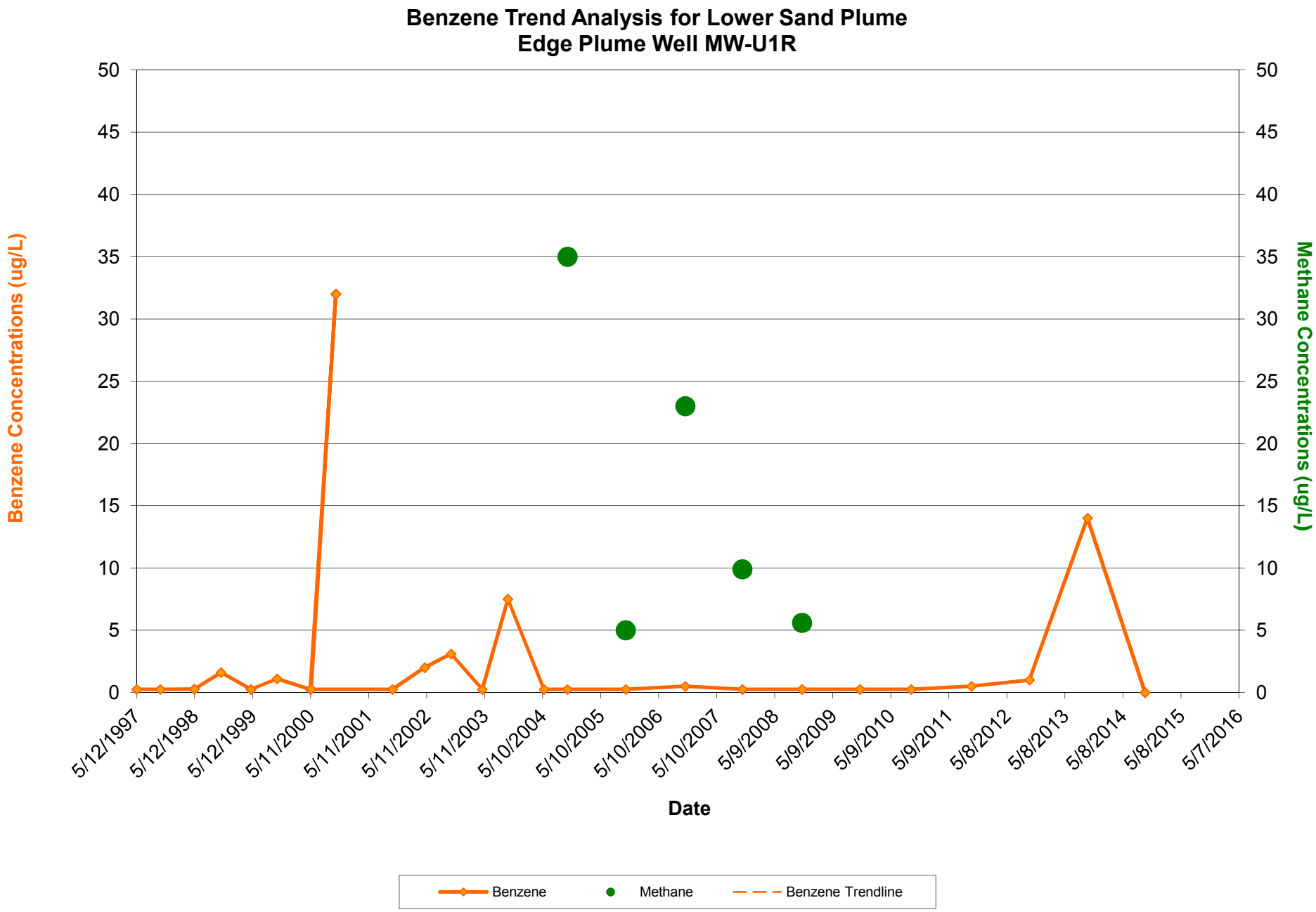

Benzene Trend Analysis for Upper Sand South Plume
In-Plume Well MW-89-05
Benzene Concentrations (ug/L)
Methane Concentrations (ug/L)
Shutdown of Recovery System
6820
6200
5580
4960
4340
3720
3100
2480
1860
1240
620
0
2000
1800
1600
1400
1200
1000
800
600
400
200
0
5/12/1997
5/12/1998
5/12/1999
5/11/2000
5/11/2001
5/11/2002
5/11/2003
5/10/2004
5/10/2005
5/10/2006
5/10/2007
5/9/2008
5/9/2009
5/9/2010
5/9/2011
5/8/2012
5/8/2013
5/8/2014
5/8/2015
5/7/2016
Date
Benzene
Methane
Benzene Trendline

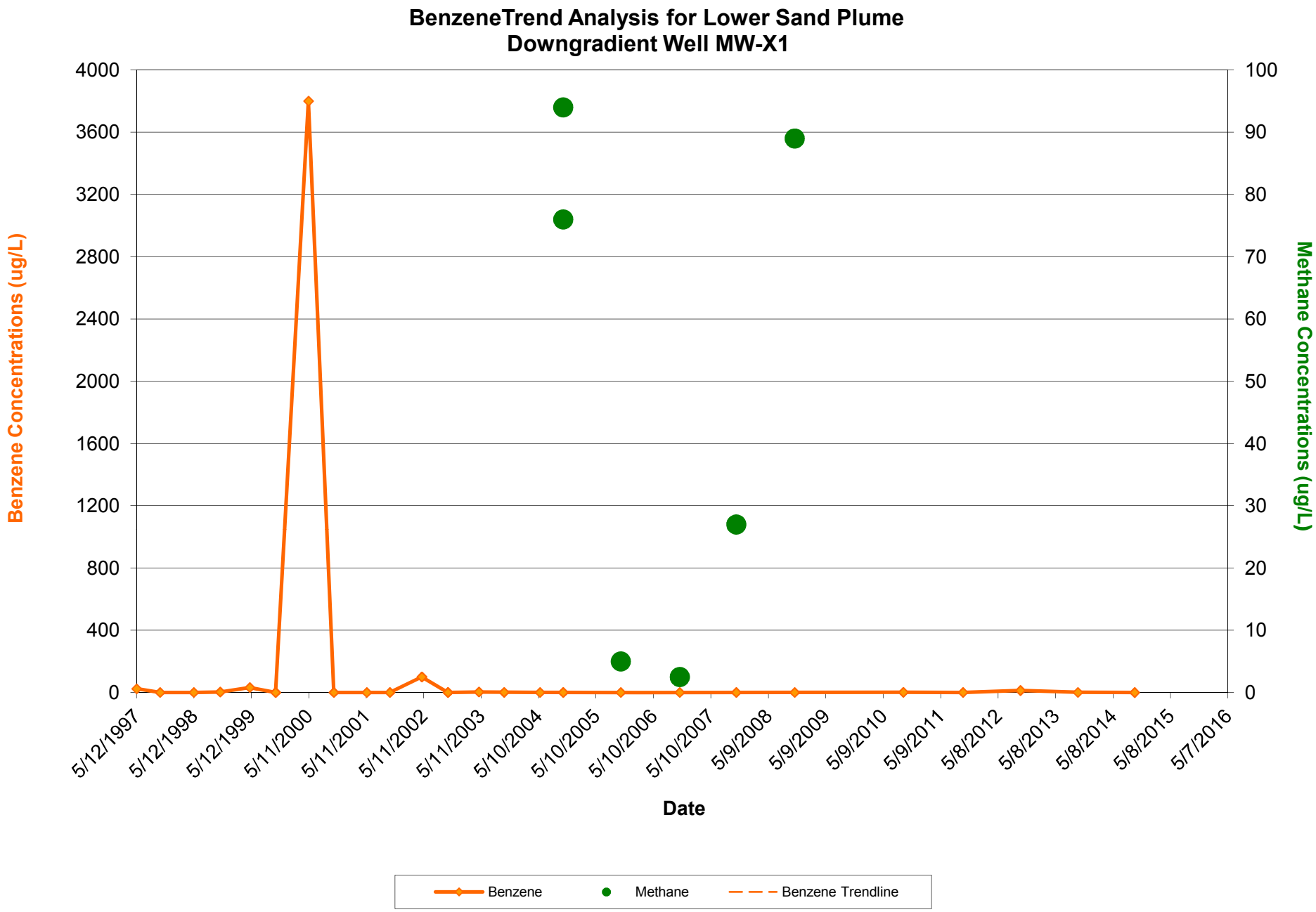

Benzene Trend Analysis for Upper Sand South Plume
In-Plume Well MW-X3
Shutdown of Recovery System
Benzene Concentrations (ug/L)
Methane Concentrations (ug/L)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
11000
9900
8800
7700
6600
5500
4400
3300
2200
1100
0
5/12/1997
5/12/1998
5/12/1999
5/11/2000
5/11/2001
5/11/2002
5/11/2003
5/10/2004
5/10/2005
5/10/2006
5/10/2007
5/9/2008
5/9/2009
5/9/2010
5/9/2011
5/8/2012
5/8/2013
5/8/2014
5/8/2015
5/7/2016
Date
Benzene
Methane
Benzene Trendline


Benzene Trend Analysis for Lower Sand Plume
In-Plume Well MW-00-16
Benzene Concentrations (ug/L)
Methane Concentrations (ug/L)
4000
3600
3200
2800
2400
2000
1600
1200
800
400
0
11000
9900
8800
7700
6600
5500
4400
3300
2200
1100
0
5/12/1997
5/12/1998
5/12/1999
5/11/2000
5/11/2001
5/11/2002
5/11/2003
5/10/2004
5/10/2005
5/10/2006
5/10/2007
5/9/2008
5/9/2009
5/9/2010
5/9/2011
5/8/2012
5/8/2013
5/8/2014
5/8/2015
5/7/2016
Date
Benzene
Methane
Benzene Trendline


Benzene Trend Analysis for Lower Sand Plume
In-Plume Well MW-89-07
Benzene Concentrations (ug/L)
Methane Concentrations (ug/L)
8400
7700
7000
6300
5600
4900
4200
3500
2800
2100
1400
700
0
7000
6300
5600
4900
4200
3500
2800
2100
1400
700
0
5/12/1997
5/12/1998
5/12/1999
5/11/2000
5/11/2001
5/11/2002
5/11/2003
5/10/2004
5/10/2005
5/10/2006
5/10/2007
5/9/2008
5/9/2009
5/9/2010
5/9/2011
5/8/2012
5/8/2013
5/8/2014
5/8/2015
5/7/2016
Date
Benzene
Methane
Benzene Trendline


Benzene Trend Analysis for Lower Sand Plume
Edge Plume Well MW-T1R
Benzene Concentrations (ug/L)
Methane Concentrations (ug/L)
3000
2700
2400
2100
1800
1500
1200
900
600
300
0
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
5/12/1997
5/12/1998
5/12/1999
5/11/2000
5/11/2001
5/11/2002
5/11/2003
5/10/2004
5/10/2005
5/10/2006
5/10/2007
5/9/2008
5/9/2009
5/9/2010
5/9/2011
5/8/2012
5/8/2013
5/8/2014
5/8/2015
5/7/2016
Date
Benzene
Methane
Benzene Trendline


Benzene Trend Analysis for Lower Sand Plume
Edge Plume Well MW-U1R
Benzene Concentrations (ug/L)
Methane Concentrations (ug/L)
50
45
40
35
30
25
20
15
10
5
0
5/12/1997
5/12/1998
5/12/1999
5/11/2000
5/11/2001
5/11/2002
5/11/2003
5/10/2004
5/10/2005
5/10/2006
5/10/2007
5/9/2008
5/9/2009
5/9/2010
5/9/2011
5/8/2012
5/8/2013
5/8/2014
5/8/2015
5/7/2016
Date
Benzene
Methane
Benzene Trendline


BenzeneTrend Analysis for Lower Sand Plume
Downgradient Well MW-X1
Benzene Concentrations (ug/L)
Methane Concentrations (ug/L)
4000
3600
3200
2800
2400
2000
1600
1200
800
400
0
100
90
80
70
60
50
40
30
20
10
0
5/12/1997
5/12/1998
5/12/1999
5/11/2000
5/11/2001
5/11/2002
5/11/2003
5/10/2004
5/10/2005
5/10/2006
5/10/2007
5/9/2008
5/9/2009
5/9/2010
5/9/2011
5/8/2012
5/8/2013
5/8/2014
5/8/2015
5/7/2016
Date
Benzene
Methane
Benzene Trendline