

**2016 System Operation and
Remedial Action Progress
Griggs-Walnut Ground Water Plume
Superfund Site**

Prepared for

Las Cruces Utilities

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Daniel B. Stephens & Associates, Inc.

6020 Academy NE, Suite 100 • Albuquerque, New Mexico 87109



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List of Acronyms and Abbreviations

µg/L	microgram(s) per liter
CLC	City of Las Cruces
COC	contaminant of concern
DAC	Doña Ana County
DACTD	Doña Ana County Transportation Department
DBS&A	Daniel B. Stephens & Associates, Inc.
DCE	dichloroethene
EPA	U.S. Environmental Protection Agency
FS	feasibility study
gpm	gallons per minute
GWP site	Griggs and Walnut Ground Water Plume Superfund Site
I-25	Interstate Highway 25
JSAI	John Shomaker & Associates, Inc.
JSP	Joint Superfund Project
lb/gal	pounds per gallon
lb/hr	pounds per hour
MAO	Modified Administrative Order
MCL	maximum contaminant level
NMED	New Mexico Environment Department
NPL	National Priorities List
NPR	no permit required
O&M	operation and maintenance
OSE	New Mexico Office of the State Engineer



List of Acronyms and Abbreviations (Continued)

PCE	perchloroethene (also tetrachloroethene)
RAO	remedial action objective
RD	remedial design
RI	remedial investigation
ROD	record of decision
SAP	sampling and analysis plan
SCADA	supervisory control and data acquisition
SDWA	Safe Drinking Water Act
SOW	scope of work
TCE	trichloroethene
VOC	volatile organic compound



1. Introduction

The Joint Superfund Project (JSP), which consists of the City of Las Cruces (CLC) and Doña Ana County (DAC), has prepared this fourth annual report to summarize the progress made during the fourth year of operation of the groundwater remedy at the Griggs-Walnut Ground Water Plume Superfund Site (the GWP site) in Las Cruces, New Mexico. The JSP has prepared this annual report in accordance with Paragraph 29 of the Statement of Work (SOW) included as Appendix C of the proposed Modified Administrative Order (MAO) governing remedial action at the GWP site that was issued by the U.S. Environmental Protection Agency (EPA) (U.S. EPA, 2011). The signed MAO issued for the site only covered construction; preparation and submittal of this annual report is a proactive effort of the JSP to keep all parties informed of remedial progress. The JSP has been officially operating a groundwater remediation system as designed at the GWP site since September 2012, after a three-month shake-down period starting in April 2012. The GWP site is located in south-central New Mexico in the City of Las Cruces, within Doña Ana County (Figure 1); it is impacted by contaminants of concern (COCs) in groundwater beneath the site, primarily dissolved-phase perchloroethene (PCE, also known as tetrachloroethene).

As detailed in the record of decision (ROD), the remedial action objectives (RAOs) for the GWP site are as follow:

- Prevent human exposure to contaminated groundwater with PCE concentrations above the maximum contaminant level (MCL) (5 micrograms per liter [$\mu\text{g/L}$]).
- Maintain capture of the PCE-contaminated groundwater plume above the MCL (5 $\mu\text{g/L}$).
- Restore groundwater to its beneficial use as a drinking water supply with PCE concentrations no greater than the MCL (5 $\mu\text{g/L}$).

As defined in the ROD, prior to remedial action, the groundwater plume was located generally between East Griggs Avenue and East Hadley Avenue, extending east to near Interstate Highway 25 (I-25) and west to beyond North Solano Drive in the City of Las Cruces. The extent



of the plume at the beginning of the remedial action is shown in Figure 2. The property uses in this area are predominantly recreational, light industrial/commercial, and residential.

The project includes pumping contaminated groundwater from existing CLC public supply wells CLC 18 and CLC 27 to a centralized treatment facility on DAC property adjacent to CLC 18, treating the water to remove the PCE and other volatile organic compounds (VOCs) that may be present, and returning the treated groundwater to the drinking water distribution system after disinfection. The treatment facility is located immediately west of the current Doña Ana County Transportation Department (DACTD) maintenance facility. The project area also extends about 1,500 feet east of the DACTD maintenance facility to the location of well CLC 27. The project area is shown on Figure 1. This report covers the period from January 2016 through December 2016, and details the operation of the system, data collected during system operation, progress toward performance standards, and progress toward RAOs.

1.1 Background

Between 1993 and 1995, trace amounts of PCE, a chlorinated solvent commonly used as a degreaser and as a dry cleaning agent, was detected in five wells during routine sampling performed by the New Mexico Environment Department (NMED). CLC Utilities took the wells offline—specifically CLC 18 in 1996 and CLC 27 in 2000—due to PCE levels approaching the MCL of 5 µg/L detected during subsequent testing.

The GWP site was added to EPA’s National Priorities List (NPL) of Superfund sites on June 14, 2001. At the time of listing, PCE had been detected at a concentration above the MCL of 5 µg/L for PCE established by the Safe Drinking Water Act (SDWA) in one CLC municipal drinking water supply well (CLC 18). PCE had been detected in four additional CLC municipal wells (CLC 19, 21, 24, and 27) at concentrations below the MCL.

The remedial investigation (RI) and feasibility study (FS) were performed by CH2M Hill under contract to the EPA (CH2M Hill, 2006a and 2006b). The Proposed Plan prepared in December 2006 (U.S. EPA, 2006) and the ROD issued by EPA on June 14, 2007 (U.S. EPA, 2007) set forth the selected remedy for the GWP site, which identified groundwater pumping from existing wells and treatment at the CLC 18 site as the preferred remedy. The maximum PCE



concentrations measured during sampling for the remedial design (RD) in CLC 18 and CLC 27 were 56 and 13 µg/L, respectively (Terracon, 2010).

Construction of the remedy began in September 2011. During the next six months, tanks were constructed, the building and treatment system were installed, and wells CLC 18 and CLC 27 were reconfigured to work more efficiently as extraction wells and were connected to the treatment system. A pre-final inspection was conducted on April 16, 2012 for Substantial Completion, and was attended by representatives of EPA, NMED, DBS&A, CLC, and Highland Enterprises. A punchlist of items requiring completion was developed as a result of the pre-final inspection. All items on the punchlist were relatively minor and were corrected by the Contractor to the satisfaction of the EPA, NMED, the Owner, and DBS&A. On June 13, 2012, a final inspection was completed to verify that all punchlist items were addressed, which was signed off on by representatives from EPA, NMED, DBS&A, CLC, and Highland Enterprises (the construction Contractor). A preliminary close-out report was completed and signed June 22, 2012 by EPA.

In September 2016, the EPA issued the first Five Year Review (FYR) for the GWP site (U.S. EPA, 2016). In the FYR, the EPA stated that FLUTE wells should be purged three times prior to sampling (consistent with manufacturer recommendations) and requested scanned copies of the field notes from sampling activities. Both of these comments have been addressed in this annual report (Appendix A). A discussion of items highlighted by the EPA in the FYR is provided in Section 2.2. Additionally, the FYR stated that EPA delayed the protectiveness determination until additional information is evaluated. The groundwater modeling performed as part of this report includes additional analysis, including particle tracking, and indicates that the area of groundwater containing detections of PCE in both the upper and lower hydrogeologic zones is being captured by remediation wells CLC 18 and CLC 27.

1.2 Purpose

The purpose of this report is to summarize the progress that has been made in addressing the groundwater contamination at the GWP site. Between January 2016 and December 2016, approximately 97,366,000 gallons of water containing PCE has been treated to a non-detect



level and used for public water supply. Figure 3 shows the general extent of the PCE plume. John Shomaker & Associates, Inc. (JSAI) completed *Assessment of the Griggs and Walnut PCE Plume and Capture Wells* (Appendix B) in January 2017 based on the most recent groundwater monitoring event. Figures 7 and 8 of the JSAI report (Appendix B) show the general extent of the PCE plume in the upper hydrogeologic zone and the lower hydrogeologic zone, respectively. Over the course of this reporting period, approximately 11 pounds of PCE was removed from the groundwater.



2. Site Activities

In 2016, the groundwater extraction and treatment system was operated continuously, except for two days of scheduled preventive maintenance on April 12 and October 27, 2016. Operation of the selected remedy has included the following tasks:

- Sampling CLC 18 and CLC 27 monthly for PCE concentration
- Sampling system raw (extracted) and finished (treated) water monthly for monitoring of PCE concentration
- Normal operation and maintenance (O&M) of the extraction wells, conveyance system, and treatment equipment
- Groundwater monitoring (results discussed in Section 2.2)

2.1 Treatment System Operation

Operation of the treatment system includes monitoring the extracted (raw) and treated (finished) groundwater for VOCs and total metals. The volume of water extracted and treated is also recorded. To ensure that air quality standards are not exceeded during the removal of VOCs via air stripping, air quality samples are also collected from the waste stream that exits the GWP site. Tables 1a and 1b summarize the analytes that are being monitored.

2.1.1 Treated Groundwater

Table 2 summarizes the sampling frequency of the remediation system sampling. Table 3 summarizes the monthly volume pumped from CLC 18 and CLC 27 as reported to the New Mexico Office of the State Engineer (OSE), as well as the PCE concentration in each well. Table 4 summarizes the concentration of PCE in the raw water as it is combined before treatment. Table 4 also provides finished water PCE concentrations and monthly totals of the treated water volume. The reported concentrations are weighted to take into account the pumping strategy at CLC 18, as it only runs 4 hours per day. This allows the mass removal calculation to be completed on samples taken directly from the well along with known volumes



of extracted water, rather than considering the raw water concentration, which includes irregular mixing along with impacts of volatilization in the storage tank. It should be noted that the raw volume and finished volumes will not match due to time differences between readings for the OSE and supervisory control and data acquisition (SCADA) system downloads, storage, and demand.

The weighted concentration of PCE entering the treatment system remained relatively constant throughout the reporting period, with a minimum concentration of 12 µg/L in February and March 2016 and a maximum concentration of 16.2 µg/L in November 2016 (Figure 4). As shown in Figure 4, the concentration of PCE in CLC 18 continues to exhibit wider monthly fluctuations, with a high of 22 µg/L in May 2016 and a low of 6.5 µg/L in February 2016. The PCE concentration in CLC 27 remained stable for the majority of the year at approximately 13 µg/L. Steps taken to evaluate system optimization are discussed in Section 2.3.

The treatment system is operating as designed, and is effectively removing PCE; the finished water concentration was consistently below detection limits over the reporting period (Table 4).

2.1.2 Air Emissions

All of the COCs removed from the groundwater are assumed to be released to the atmosphere. Potential air emissions from the air strippers were calculated based on the raw and finished concentrations of each contaminant. The NMED Air Quality Bureau emissions standards for a no permit required (NPR) designation are 10 pounds per hour (lb/hr) and 10 tons per year. The pounds per hour emission rate is calculated by dividing the calculated monthly mass of PCE removed in pounds by the number of hours in a month. The emission rate in tons per year was calculated by summing the calculated mass of PCE removed for the calendar year. The results of these calculations are summarized in Tables 5 and 6.

The calculated emission rate for PCE is well below limits and the NPR designation is still valid.



2.2 Groundwater Monitoring

Results of water quality samples collected from existing monitoring wells are used to evaluate progress toward the attainment of the RAOs. Table 7 lists sampling wells identified in the sampling and analysis plan (SAP) (DBS&A, 2011) and the number of samples collected during this period of operation. GWMW16 was installed in 2015, and was included in the monitoring well sample list. Wells MW-SF2 and MW-SF3 could not be located, and therefore were not sampled. Prior to next year's sampling event, efforts will be made to locate and repair MW-SF2 as needed. Four of the wells—MW-2, MW-6, MWSF-1, and MWSF-4—have collapsed or breached and can no longer be sampled. Three of the wells—MW-3, MW-4, and MW-5—could not be sampled due to insufficient water in the well casing. The port tubing for gas feed lines 1 and 2 of GWMW08 have been damaged and were not sampled. The wells identified as missing and damaged are consistent with the last several years of sampling; no new wells were identified as missing or damaged. Future groundwater monitoring events will include monitoring wells and the sampling frequency detailed in the SOW currently under negotiation.

Table 8 lists the analyses performed on the groundwater samples. One round of sampling occurred during this reporting period in December 2016/January 2017. Table 9 summarizes the results from the December 2016/January 2017 sampling event. Complete analytical reports for the sampling event are included in Terracon's groundwater monitoring report (Appendix A). The groundwater monitoring report includes details regarding well conditions, samples collected, and tests conducted regarding sampling method. As required in the FYR, FLUTE wells were purged three times during sampling. Moving forward, FLUTE wells will continue to be purged a minimum of three times.

In addition to improving FLUTE sampling methods, Terracon performed sampling comparisons between Hydrasleeve methods, low-flow sampling methods, and purging three casing volumes. As detailed in the Terracon report (Appendix A), all sampling methods provided similar results, consistent with research completed by others (e.g., U.S. Army Corps of Engineers [USACE] and U.S. Geological Survey [USGS]), as summarized and cited by Terracon (Appendix A).



Trichloroethene (TCE) was the only PCE degradation product detected in groundwater. Analytical results for cis-1,2-dichloroethene (cis-1,2-DCE) and trans-1,2-DCE were below the reporting limits for all samples collected in 2016. TCE was detected in MW-SF10 at a concentration of 1.4 µg/L and in port 3 of well GWMW-01 and port 5 of well GWMW9 at concentrations of 1.3 and 1.9 µg/L, respectively; all detected concentrations were below the MCL of 5 µg/L. The remaining compounds detected were fuel hydrocarbons. Benzene was detected in 8 samples at three wells as opposed to 14 samples in five wells in 2015, and toluene was detected in 25 samples at five wells, as opposed to 28 samples in five wells in 2015. Acetone was also identified in multiport wells GWMW01, GWMW08, and GWMW09, but not in any of the standard wells at the site. The acetone detected in these wells is thought to be related to well construction activities, and is not indicative of a contaminant release.

Figure 3 shows the approximate area of PCE detections greater than 5 µg/L. The general shape of the plume remained the same. Figures 7 and 8 of the JSAI report (Appendix B) show the extent of the PCE plume boundary in the upper hydrogeologic zone and the lower hydrogeologic zone, respectively, based on the most recent groundwater monitoring event. The upper and lower hydrogeologic zones are connected and act as one hydrogeologic unit east of CLC 18, where the absence of fine-grained units separating the two units is demonstrated in boring logs. The extent of the PCE plume in the upper hydrogeologic zone was adjusted to include the results observed at GWMW-10; it primarily lies between Hadley and Griggs and extends west to CLC 18 near Cottonwood and east to GWMW09 near Sheryl. The extent of the PCE plume in the lower hydrogeologic zone was also adjusted to incorporate the positive results at GWMW-10, but otherwise remains similar to previous reporting periods. PCE in the lower hydrogeologic zone has been periodically detected at low levels just above the MCL in GWMW15I east of I-25. Several wells that have been used as a boundary for the west end of the plume were not sampled during this monitoring event; therefore, there is a dashed line denoting the unknown extent of the plume.

2.3 System Optimization

As described in earlier annual reports, system optimization tests were completed in early 2013 on wells CLC 18 and CLC 27 to maximize the removal of PCE and minimize the extraction of



clean water. Based on these tests, for the last several years 4 hours per day at 170 gallons per minute (gpm), resulting in an increased PCE concentration while minimizing the volume of treated water. The initial optimization strategy at CLC 27 was to maintain a steady pumping rate of 170 gpm; JSAI (2016) recommended increasing the rate to 200 gpm. Due to pump limitations, the pumping of CLC 27 has not been increased during 2016; however, the PCE concentrations have remained consistent or slightly increasing.

The current pumping operation appears to be capturing the plume based on the cone of depression (Appendix B); however, JSAI recommends that pumping operation increase to 200 gpm. Purchase of a new pump to increase pumping capacity is in progress.

The system results for the past four years were analyzed to determine a mass removal rate. From August 2012 through July 2013, 181,325,776 gallons of water was treated and 8.9 pounds of PCE was removed, resulting in a mass removal rate of 4.9×10^{-8} pounds per gallon (lb/gal). From August 2013 to July 2014, the total volume of water treated was 106,617,377 gallons with 10.25 pounds of PCE removed, resulting in a mass removal rate of 9.6×10^{-8} lb/gal. From August 2014 through December 2015, a volume of 142,781,048 gallons was treated with 16 pounds of PCE removed, resulting in a mass removal rate of 1.12×10^{-7} lb/gal. From January 2016 to December 2016, the total volume of water treated was 97,366,000 gallons with 11.1 pounds of PCE removed, resulting in a mass removal rate of 1.14×10^{-7} lb/gal.

These results document the success of the system optimization, as the PCE mass removal rate continues to show improvement in PCE removal efficiency with a greater mass being removed per gallon of water treated.

2.4 Progress Toward Attaining Performance Standards

The performance standards for this project include substantive requirements, criteria, and limitations that are specified in the ROD, the MAO, the SOW, the EPA-approved final remedial design, and other EPA-approved submissions, including the remedial action work plan. The JSP has met all substantive requirements to date, including submitting all documents required by the SOW from the proposed MAO. The JSP has consistently operated the remediation system to extract PCE-contaminated water and treat it to concentrations below the MCL.



The uranium concentrations in CLC 18 and CLC 27 are below the EPA MCL of 30 µg/L. Arsenic concentrations in wells CLC 18 and CLC 27 are below the EPA MCL of 10 µg/L. No additional treatment to remove these contaminants is required at this time.

Although PCE degradation products (i.e., TCE, cis-1,2-dichloroethene [DCE], and trans-1,2-DCE), benzene, and uranium were discussed in the ROD, the only remediation goal established was the SDWA MCL of 5 µg/L for PCE. Progress toward the remediation goal is being achieved through the removal of PCE from the groundwater by extraction and treatment (Table 4).

2.5 Progress Toward Remedial Action Objectives

As outlined in the site ROD, the RAOs for groundwater at the GWP site were established in accordance with the *Presumptive Response Strategy and Ex Situ Treatment Technologies for Contaminated Ground Water at CERCLA Sites*, and are provided as follows:

- RAO #1: Prevent human exposure to contaminated groundwater with PCE concentrations above the MCL (5 µg/L).
- RAO #2: Maintain capture of the PCE-contaminated groundwater plume above the MCL (5 µg/L).
- RAO #3: Restore groundwater to its beneficial use as a drinking water supply with PCE concentrations no greater than the MCL (5 µg/L).

To address the RAO #1, the JSP worked with the OSE to put a new well drilling moratorium in place for the area in and adjacent to the PCE plume at the GWP site. The CLC has also ceased pumping wells within the plume that are not part of the extraction system for the GWP site. These two measures, combined with treatment, are effectively addressing RAO #1. Pumping of CLC 27 and CLC 18 is meeting RAO #2 by capturing PCE-contaminated groundwater above 5 µg/L. Groundwater elevation and concentration data combine to provide evidence that the PCE plume is decreasing in mass and remedial progress is being made (Appendix B). Figure 8 of the JSAI report (Appendix B) shows the December 2016/January



2017 water level elevation contours for the lower hydrogeologic zone overlaid on the accompanying PCE concentrations in the lower hydrogeologic zone. Figure 7 of the JSAI report (Appendix B) shows the December 2016/January 2017 water-level elevation contours for the upper hydrogeologic zone overlaid on the accompanying PCE concentrations in the upper hydrogeologic zone. These figures demonstrate that the area of groundwater containing PCE concentrations above the MCL is being captured by the pumping of these two wells. Progress toward restoring groundwater to beneficial use as a drinking water supply (RAO #3) continues through removal of PCE mass from the aquifer, as shown in Table 4.



3. Conclusions and Recommendations

Significant progress has been made toward achieving RAOs, as follows:

- More than 528,090,000 gallons of groundwater has been extracted from the dissolved-phase plume at the GWP site.
- More than 46 pounds of PCE has been removed from the extracted groundwater.
- COCs have not been detected in the treated groundwater that has been returned to the public water supply distribution system at the Griggs Reservoir.
- Monitoring of groundwater elevations and groundwater modeling (Appendix B) indicate that the area of groundwater containing detections of PCE in both the upper and lower hydrogeologic zones is being captured by remediation wells CLC 18 and CLC 27.

Based on work performed this year and recommendations from the FYR, the following recommendations are made:

- Update the SAP to include the following information:
 - Provide standard operating procedures (SOPs) for Hydrasleeve™ and low-flow sampling methods.
 - Update the wells included in the groundwater monitoring program. In 2015, as part of negotiations for a new SOW for the GWP site, the JSP and EPA negotiated a new list of wells to be included in the groundwater monitoring program, as well as new sampling frequencies. The SAP should be updated to include these updated wells and sampling frequencies. These tables are provided in Appendix C.
 - System performance has been well demonstrated over the past three years, so some system sampling can be adjusted, including removing samples collected directly from the air strippers and reducing the frequency of air samples collected. COC concentrations in all system discharge samples have been below detection limits; therefore, the samples pulled from the air strippers themselves are not needed.



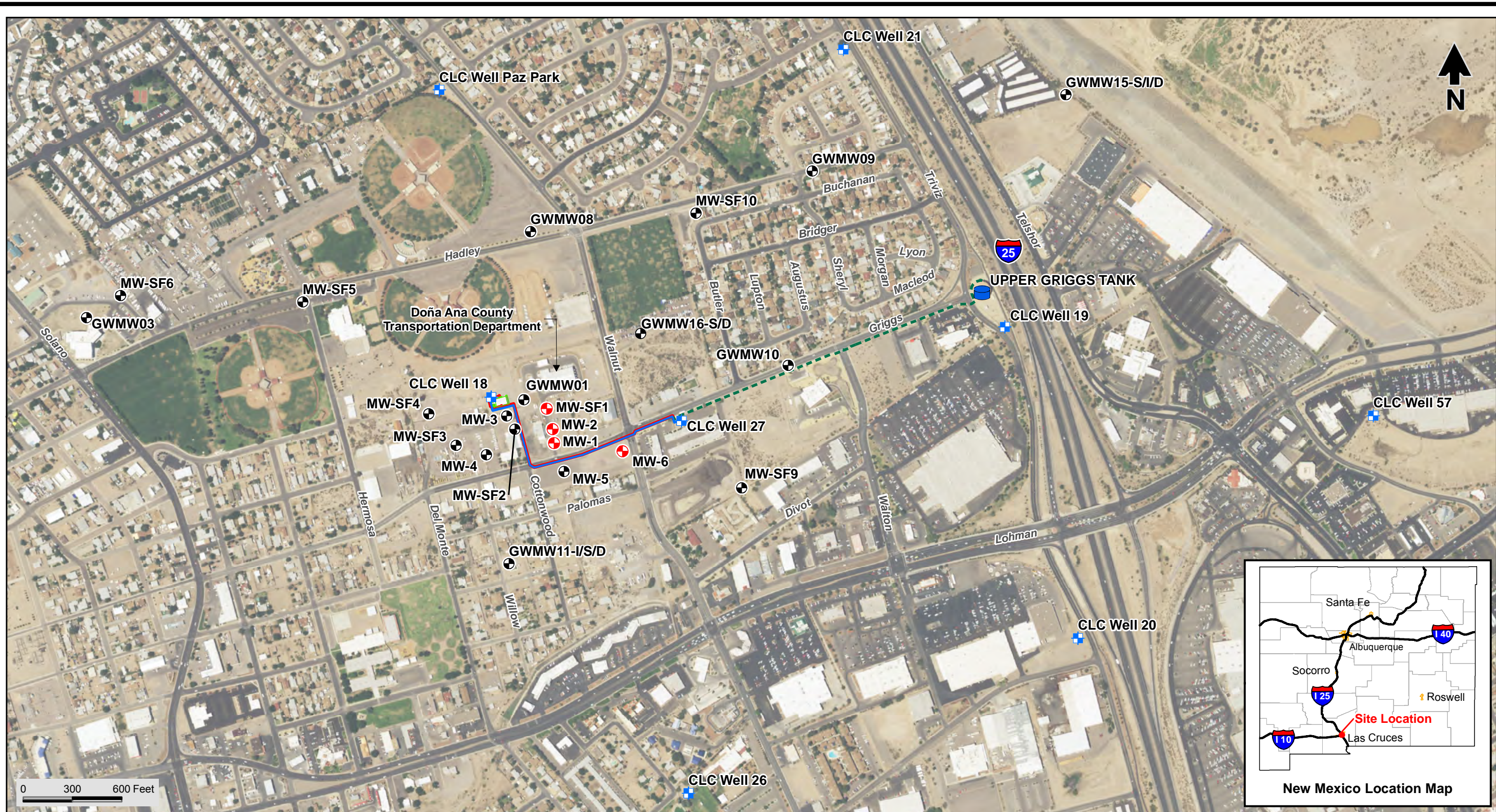
- Rehabilitate the area around GMMW-01, either by raising the well casing to match the new existing grade or by constructing a protective structure around the well to prevent surrounding soils from collapsing and covering the vault. If the well casing is raised to match existing grade, the well should be resurveyed.
- Conduct FLUTE well sample port connection maintenance, including repair or replacement of nitrogen quick connectors.
- Properly redevelop nested well GMMW-16S to properly remove fine-grained silts and clays from the filter pack. It should also be surveyed.
- Wells CLC 20 and CLC 26 contain a significant layer of nonaqueous turbine oil, reportedly from the pumps in the well, floating on top of groundwater in the well casing. An attempt to remove this oil should be considered. Surficial oil can be removed with an absorbent sock, skimming pumps, or by bailing.
- Plug and abandon monitoring wells MW-SF1, MW-SF3, and MW-SF4 in accordance with applicable regulations.



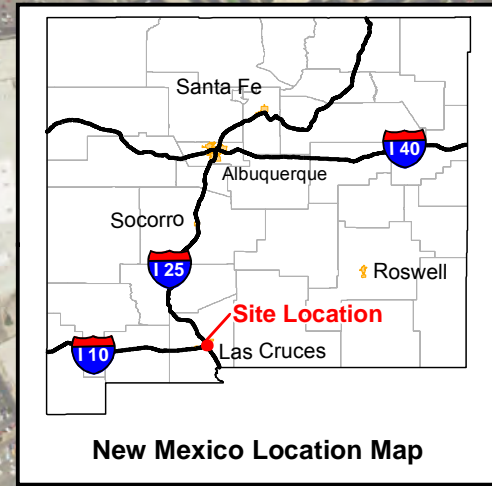
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Figures



0 300 600 Feet



Source: National Agricultural Imagery Program October 2014.

Explanation

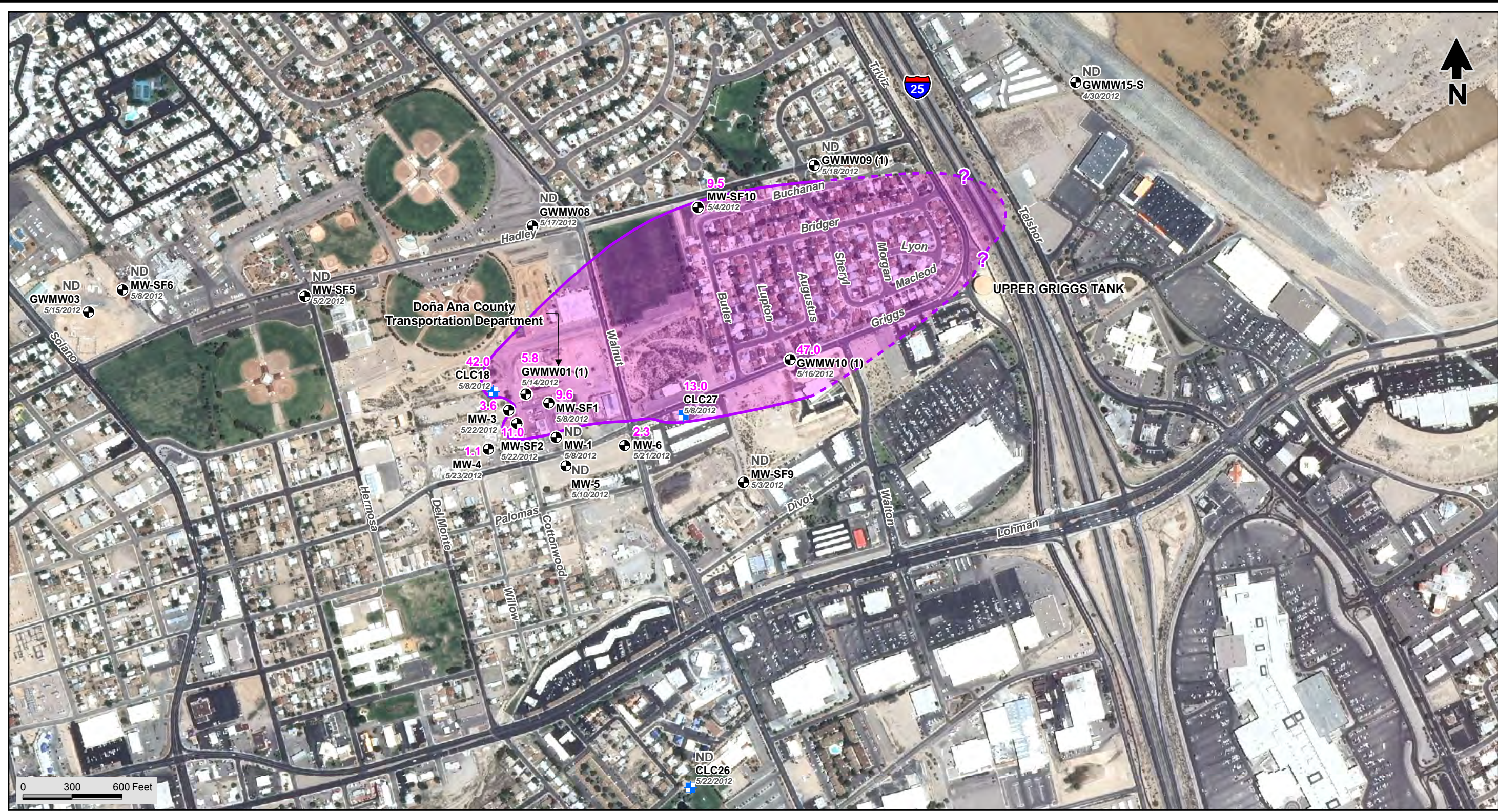
- Monitor well
- ⊕ CLC supply well
- ⊕ Collapsed well
- ⊕ CLC water reservoir
- Existing 10" water line to reservoir
- 6" raw water line
- 8" finished water line
- Treatment compound

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4/6/2016 JN ES09.0306

GRIGGS-WALNUT GROUND WATER PLUME SITE
REMEDIAL ACTION
Project Area Map

Figure 1

S:\PROJECTS\09_0306_GRIGGS-WALNUT\GIS\MSX\REPORTS\2015_ANNUAL\FIG01_SITE_MW_LOCS.MXD



Explanation

- Monitor well
- ⊕ CLC supply well
- PCE in groundwater, May 2012 (dashed where inferred)

- 2.3 Concentration (µg/L)
- MW-6 Well designation (port number)
- 5/21/2012 Sample date

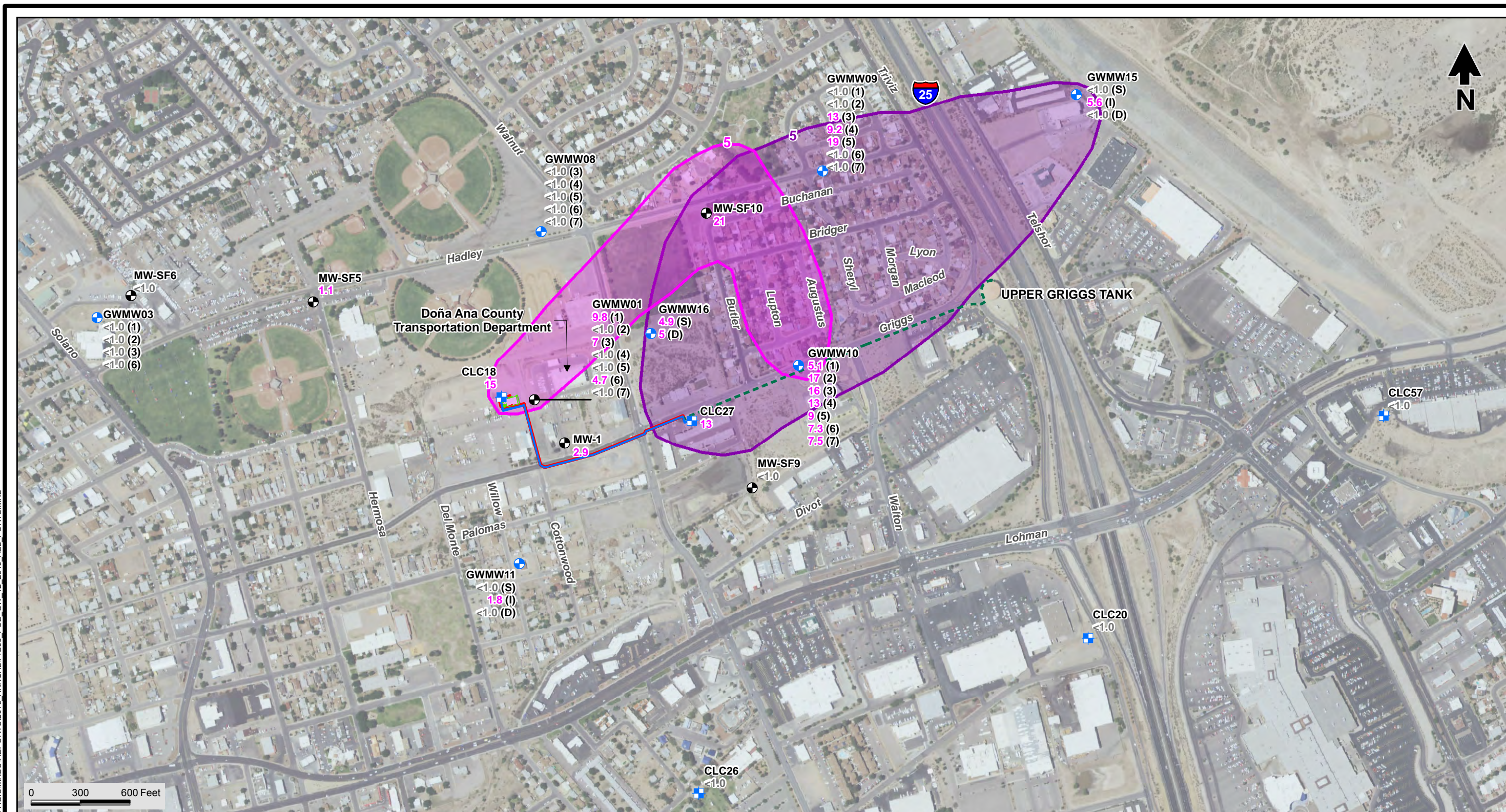
Note: 1. ND = Not detected above reporting limit
 2. Plume reflects PCE concentrations as expressed in wells completed across the water table and in the shallowest port in the GMMW wells (Port 1).

Source: National Agricultural Imagery Program August 2009. Downloaded from RGIS.

**GRIGGS-WALNUT GROUND WATER PLUME SITE
 REMEDIAL ACTION
 PCE in Groundwater, May 2012**

Figure 2

S:\PROJECTS\09.0306 GRIGGS-WALNUT\GIS\MXD\REPORTS\2015 ANNUAL\FIG02_PCE_GW_05_2012.MXD



S:\PROJECTS\09.0306 GRIGGS-WALNUT\GIS\MXD\REPORTS\2016 ANNUAL\FIG03_PCE_GW_12_2016_ALL_PORTS.MXD

Explanation

- Monitor well (Sampled 2017)
- Monitor well
- ⊕ Public supply well
- Existing 10" water line to reservoir
- 6" raw water line
- 8" finished water line
- Treatment compound
- PCE concentration contour (µg/L), upper
- PCE concentration contour (µg/L), lower

- CLC27 Well designation
- 14 Concentration (µg/L)
- < 1.0 Not detected above reporting limit

Note: 1. Plume area takes into account contamination from all depths.

Source: 1. National Agricultural Imagery Program May 2016.
2. PCE plume provided by Shoemaker and Associates.

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6/5/2017 JN ES13.0251

**GRIGGS-WALNUT GROUND WATER PLUME SITE
REMEDIAL ACTION
PCE in Groundwater, 2016**

Figure 3

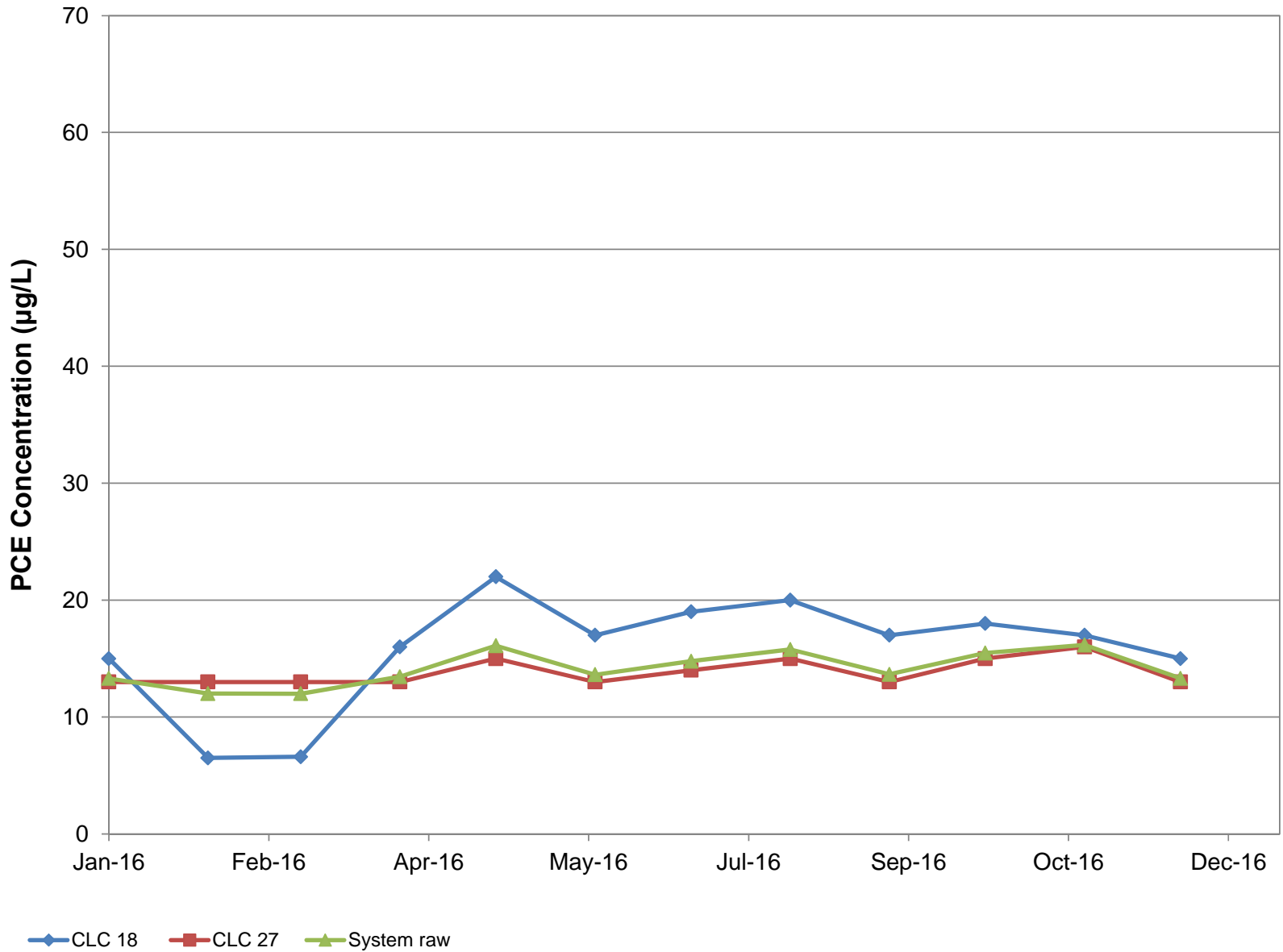


Figure 4



Tables



Table 1a. Air Analytical Method and NMED Air Quality No Permit Required Emissions Standards

Emission	Analytical Method	Maximum Rate	
		lb/hr	ton/yr
Air	8260B	10	10

lb/hr = Pounds per hour
ton/yr = Tons per year

Table 1b. Groundwater Analytical Methodologies and Screening Levels

Analyte Class	Analytical Method	Concentration (µg/L)		
		Method Detection Limit ^a	EPA MCL	NMWQCC Standard
PCE	8260B	0.39	5	20
TCE	8260B	0.24	5	100
DCE	8260B	0.27	5	10
Vinyl chloride	8260B	0.4	2	1
Arsenic	6020, ICPMS	0.07	10	100
Arsenic speciation	SM 3114B Mod.	2	10	100
Uranium	6020, ICPMS	0.011	30	30

^a Method detection limit does not imply reporting limit.

µg/L = Micrograms per liter

EPA = U.S. Environmental Protection Agency

MCL = Maximum contaminant level

NMWQCC = New Mexico Water Quality Control Commission

PCE = Perchloroethene

TCE = Trichloroethene

DCE = Dichloroethene

ICPMS = Inductively coupled plasma mass spectrometry



Table 2. Remediation System Sampling Frequency

Sample Location	Sample Matrix	Sample Point	Sample Method	Sample Analyses	Startup Sample Collection Schedule ^a	Normal Operation Sampling and Monitoring Schedule
Pump P-1 raw	Groundwater	IS1	Grab	EPA 8260B for VOCs, field temperature, pH, and conductivity	Sample after first hour of operation of pump P-1. Every other day for first 6 days of operation.	Sample once per week for weeks 2 through 8. Thereafter, sample once per month or as directed.
C-1 finished	Groundwater	C1	Grab	EPA 8260B for VOCs, field temperature, pH, and conductivity	Sample after first 2 hours of operation of pump P-1. Once per day for days 2 through 6 of system operation.	Sample once per week for weeks 2 through 8. Thereafter, sample once per month or as directed.
C-2 finished	Groundwater	C2	Grab	EPA 8260B for VOCs, field temperature, pH, and conductivity	Sample after first 2 hours of operation of pump P-1. Once per day for days 2 through 6 of system operation.	Sample once per week for weeks 2 through 8. Thereafter, sample once per month or as directed.
Finished downstream of chlorine disinfection	Groundwater	ES1	Grab	EPA 8260B for VOCs, field temperature, pH, and conductivity	Sample after first 2 hours of operation of pump P-1. Once per day for days 2 through 6 of system operation.	Sample once per week for weeks 2 through 8. Thereafter, sample once per month or as directed.
C-1 air stripper emissions	Air	AS1	Grab	EPA 8260B for VOCs	Sample once per day for the first 3 days and once per week during remaining startup.	Sample once per week for weeks 2 through 4. Thereafter, sample once per month or as directed.
C-2 air stripper emissions	Air	AS2	Grab	EPA 8260B for VOCs	Sample once per day for the first 3 days and once per week during remaining startup.	Sample once per week for weeks 2 through 4. Thereafter, sample once per month or as directed.

^a Plant will remain offline until startup is completed and normal operation is verified. A minimum of 4 weeks shakedown and startup will be accomplished prior to bringing system online.
 VOCs = Volatile organic compounds



**Table 3. Volume of Water Extracted and PCE Concentrations, 2016
CLC 18 and CLC 27**

Month	CLC 18		CLC 27	
	Groundwater Extracted (gallons)	Raw PCE Concentration (µg/L)	Groundwater Extracted (gallons)	Raw PCE Concentration (µg/L)
Jan 2016	1,284,000	15	7,254,000	13
Feb 2016	1,193,000	6.5	6,588,000	13
Mar 2016	1,325,000	6.6	7,116,000	13
Apr 2016	1,218,000	16	6,863,000	13
May 2016	1,287,000	22	6,883,000	15
Jun 2016	1,255,000	17	6,782,000	13
Jul 2016	1,291,000	19	6,969,000	14
Aug 2016	1,300,000	20	6,993,000	15
Sep 2016	1,252,000	17	6,443,000	13
Oct 2016	1,273,000	18	6,767,000	15
Nov 2016	1,253,000	17	6,459,000	16
Dec 2016	1,287,000	15	7,031,000	13
Total	15,218,000		82,148,000	

PCE = Perchloroethene
µg/L = Micrograms per liter



Table 4. Mass of PCE Removed from Groundwater, 2016

Month	PCE Concentration (µg/L)		Volume Treated (gallons)	Mass of PCE Removed (pounds)
	Raw	Finished		
Jan 2016	13.3	ND	8,538,000	0.9
Feb 2016	12.0	ND	7,781,000	0.7
Mar 2016	12.0	ND	8,441,000	0.8
Apr 2016	13.5	ND	8,081,000	0.9
May 2016	16.1	ND	8,170,000	1.1
Jun 2016	13.6	ND	8,037,000	0.9
Jul 2016	14.8	ND	8,260,000	1.0
Aug 2016	15.8	ND	8,293,000	1.1
Sep 2016	13.7	ND	7,695,000	0.8
Oct 2016	15.5	ND	8,040,000	1.0
Nov 2016	16.2	ND	7,712,000	1.0
Dec 2016	13.3	ND	8,318,000	0.9
Total			97,366,000	11.1

Note: For the purposes of mass removal calculations, non-detect results were assumed to be equal to half of the laboratory detection limit.

PCE = Perchloroethene
 µg/L = Micrograms per liter
 ND = Not detected



Table 5. Calculated Air Emissions Based on Measured Raw and Finished Concentrations

Month	PCE Concentration in Air (lb/hr)	Calculated PCE Indoor Air Concentration ($\mu\text{g}/\text{m}^3$)
Jan 2016	0.001	0.0005
Feb 2016	0.001	0.0005
Mar 2016	0.001	0.0005
Apr 2016	0.001	0.0005
May 2016	0.001	0.0005
Jun 2016	0.001	0.0005
Jul 2016	0.001	0.0005
Aug 2016	0.001	0.0005
Sep 2016	0.001	0.0005
Oct 2016	0.001	0.0005
Nov 2016	0.001	0.0005
Dec 2016	0.001	0.0005

Note: For a conservative calculation, it is assumed that all mass removed based on water samples (Table 4) is discharged to air.

PCE = Perchloroethene
 lb/hr = Pounds per hour
 $\mu\text{g}/\text{m}^3$ = Micrograms per cubic meter

Table 6. Calculated Air Emissions by Year Based on Measured Raw and Finished Concentrations

Contaminant of Concern	Calculated Air Emissions (tons/year)			
	2013	2014	2015	2016
PCE	4.76×10^{-3}	5.93×10^{-3}	5.45×10^{-3}	5.54×10^{-3}



Table 7. Wells Included in the Groundwater Monitoring Program

Sample Location	No. of Samples	Sample Location	No. of Samples
CLC 18	12	GMMW16-S	1
CLC 20	1	GMMW16-D	1
CLC 26	1	MW-1	1
CLC 27	12	MW-2	— ^a
CLC 57	1	MW-3	— ^b
CLC Paz Park Well	1	MW-4	— ^b
GMMW01 ^c	6	MW-5	— ^b
GMMW03 ^d	4	MW-6	— ^e
GMMW08 ^f	5	MW-SF1	— ^g
GMMW09	7	MW-SF2	— ^h
GMMW10	7	MW-SF3	— ^h
GMMW11-S	1	MW-SF4	— ⁱ
GMMW11-I	1	MW-SF5	1
GMMW11-D	1	MW-SF6	1
GMMW15-S	1	MW-SF9	1
GMMW15-I	1	MW-SF10	1
GMMW15-D	1		

Note: The large number of samples from GMMW01 through GMMW10 reflects the number of sample ports at those wells.

^a Unable to sample due to well casing breach at 14 inches below ground surface (bgs).

^b Unable to sample due to insufficient water within casing.

^c Port 2 did not recharge following first purge and was not sampled.

^d Ports 4 and 5 did not recharge following first purge and were not sampled.

^e Unable to sample due to well casing breach at 18 inches bgs.

^f Ports 1 and 2 not sampled due to N₂ leaks.

^g Unable to sample due to well casing breach at 59.90 feet bgs.

^h Unable to locate.

ⁱ Well casing plugged or breached at 81.3 feet bgs. A grab sample was collected from 40 feet of water found above this point.



Table 8. List of Analytes Reported in 8260 Analysis of Groundwater Samples

Analyte	Units	Analyte	Units
1,1,1,2-Tetrachloroethane	µg/L	Bromomethane	µg/L
1,1,1-Trichloroethane	µg/L	Carbon disulfide	µg/L
1,1,2,2-Tetrachloroethane	µg/L	Carbon tetrachloride	µg/L
1,1,2-Trichloroethane	µg/L	Chlorobenzene	µg/L
1,1-Dichloroethane	µg/L	Chloroethane	µg/L
1,1-Dichloroethene	µg/L	Chloroform	µg/L
1,1-Dichloropropene	µg/L	Chloromethane	µg/L
1,2,3-Trichlorobenzene	µg/L	cis-1,2-DCE	µg/L
1,2,3-Trichloropropane	µg/L	cis-1,3-Dichloropropene	µg/L
1,2,4-Trichlorobenzene	µg/L	Dibromochloromethane	µg/L
1,2,4-Trimethylbenzene	µg/L	Dibromomethane	µg/L
1,2-Dibromo-3-chloropropane	µg/L	Dichlorodifluoromethane	µg/L
1,2-Dibromoethane (EDB)	µg/L	Ethylbenzene	µg/L
1,2-Dichlorobenzene	µg/L	Hexachlorobutadiene	µg/L
1,2-Dichloroethane (EDC)	µg/L	Isopropylbenzene	µg/L
1,2-Dichloropropane	µg/L	Methyl tert-butyl ether (MTBE)	µg/L
1,3,5-Trimethylbenzene	µg/L	Methylene chloride	µg/L
1,3-Dichlorobenzene	µg/L	Naphthalene	µg/L
1,3-Dichloropropane	µg/L	n-Butylbenzene	µg/L
1,4-Dichlorobenzene	µg/L	n-Propylbenzene	µg/L
1-Methylnaphthalene	µg/L	sec-Butylbenzene	µg/L
2,2-Dichloropropane	µg/L	Styrene	µg/L
2-Butanone	µg/L	tert-Butylbenzene	µg/L
2-Chlorotoluene	µg/L	Tetrachloroethene (PCE)	µg/L
2-Hexanone	µg/L	Toluene	µg/L
2-Methylnaphthalene	µg/L	trans-1,2-DCE	µg/L
4-Chlorotoluene	µg/L	trans-1,3-Dichloropropene	µg/L
4-Isopropyltoluene	µg/L	Trichloroethene (TCE)	µg/L
4-Methyl-2-pentanone	µg/L	Trichlorofluoromethane	µg/L
Acetone	µg/L	Uranium	mg/L
Arsenic	mg/L	Vinyl chloride	µg/L
Benzene	µg/L	Xylenes, total	µg/L
Bromobenzene	µg/L	pH	s.u.
Bromodichloromethane	µg/L	Temperature	°C
Bromoform	µg/L	Electrical conductivity	µmhos/cm



Table 9. Analyte Detections, December 2016/January 2017
Page 1 of 2

Sample ID	Concentration (µg/L)														
	1,2,4-TMB	2-Methyl Naphthalene	Acetone	Benzene	cis-1,2-DCE	trans-1,2-DCE	Ethylbenzene	Isopropylbenzene	MEK	MTBE	Naphthalene	n-Propylbenzene	PCE	Toluene	TCE
CLC Well 18	—	—	—	—	—	—	—	—	—	—	—	—	15	—	—
CLC Well 20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CLC Well 26	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CLC Well 27	—	—	—	—	—	—	—	—	—	—	—	—	13	—	—
CLC Well 57	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CLC Paz Park Well	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MW-1	—	—	—	—	—	—	—	—	—	—	—	—	2.9	—	—
MW-SF5	—	—	—	—	—	—	—	—	—	—	—	—	1.1	—	—
MW-SF6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MW-SF9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
MW-SF10	—	—	—	—	—	—	—	—	—	—	—	—	21	—	1.4
GMMW-01 (1)	—	—	—	—	—	—	—	—	—	—	—	—	9.8	1.3	—
GMMW-01 (2)	—	—	16	—	—	—	—	—	—	—	—	—	—	4.5	—
GMMW-01 (3)	—	—	—	—	—	—	—	—	—	—	—	—	7	2.7	1.3
GMMW-01 (4)	—	—	—	—	—	—	—	—	—	—	—	—	—	1.8	—
GMMW-01 (5)	—	—	—	—	—	—	—	—	—	—	—	—	—	2.5	—
GMMW-01 (6)	—	—	—	—	—	—	—	—	—	—	—	—	4.7	3.2	—
GMMW-01 (7)	—	—	—	1.3	—	—	—	—	—	—	—	—	—	4.5	—
GMMW-03 (1)	—	—	—	—	—	—	—	—	—	—	—	—	—	4.3	—
GMMW-03 (1) Dup	—	—	—	—	—	—	—	—	—	—	—	—	—	4.5	—
GMMW-03 (2)	—	—	—	1.1	—	—	—	—	—	—	—	—	—	15	—
GMMW-03 (3)	—	—	—	—	—	—	—	—	11	—	—	—	—	8.9	—
GMMW-03 (6)	—	—	—	—	—	—	—	—	—	—	—	—	—	9.1	—
GMMW-08 (3)	—	—	—	—	—	—	—	—	—	10	—	—	—	4	—
GMMW-08 (4)	—	—	—	—	—	—	—	—	—	11	—	—	—	5.5	—
GMMW-08 (5)	—	—	11	—	—	—	—	—	—	8.2	—	—	—	4.1	—
GMMW-08 (6)	—	—	—	—	—	—	—	—	—	1.1	—	—	—	3.5	—
GMMW-08 (7)	—	—	46	—	—	—	—	—	—	7.3	—	—	—	4	—
GMMW-09 (1)	—	—	—	—	—	—	—	—	—	—	—	—	—	13	—
GMMW-09 (2)	—	—	—	1.9	—	—	—	—	—	—	—	—	—	48	—
GMMW-09 (3)	—	—	—	1.4	—	—	—	—	—	—	—	—	13	40	—
GMMW-09 (4)	—	—	—	2.1	—	—	—	—	—	—	—	—	9.2	51	—

µg/L = Micrograms per liter
 TMB = Trimethylbenzene
 DCE = Dichloroethene
 MEK = Methyl ethyl ketone
 MTBE = Methyl tertiary-butyl ether
 PCE = Perchloroethene
 TCE = Trichloroethene
 — = Not detected above laboratory reporting limit



Table 9. Analyte Detections, December 2016/January 2017
Page 2 of 2

Sample ID	Concentration (µg/L)														
	1,2,4-TMB	2-Methyl Naphthalene	Acetone	Benzene	cis-1,2-DCE	trans-1,2-DCE	Ethylbenzene	Isopropylbenzene	MEK	MTBE	Naphthalene	n-Propylbenzene	PCE	Toluene	TCE
GWMW-09 (5)	—	—	—	2.2	—	—	—	—	—	—	—	—	19	57	1.9
GWMW-09 (6)	—	—	61	6.8	—	—	—	—	49	—	—	—	—	110	—
GWMW-09 (7)	—	—	88	6.7	—	—	—	—	68	—	—	—	—	110	—
GWMW-10 (1)	—	—	—	—	—	—	—	—	—	—	—	—	5.1	—	—
GWMW-10 (2)	—	—	—	—	—	—	—	—	—	—	—	—	17	—	—
GWMW-10 (2) Dup	—	—	—	—	—	—	—	—	—	—	—	—	18	—	—
GWMW-10 (3)	—	—	—	—	—	—	—	—	—	—	—	—	16	—	—
GWMW-10 (4)	—	—	—	—	—	—	—	—	—	—	—	—	13	—	—
GWMW-10 (5)	—	—	—	—	—	—	—	—	—	—	—	—	9	—	—
GWMW-10 (6)	—	—	—	—	—	—	—	—	—	—	—	—	7.3	—	—
GWMW-10 (7)	—	—	—	—	—	—	—	—	—	—	—	—	7.5	—	—
GWMW-11-S	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
GWMW-11-I	—	—	—	—	—	—	—	—	—	—	—	—	1.8	—	—
GWMW-11-D	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
GWMW-15-S	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
GWMW-15-I	—	—	—	—	—	—	—	—	—	—	—	—	4.5	—	—
GWMW-15-I Dup	—	—	—	—	—	—	—	—	—	—	—	—	5.6	—	—
GWMW-15-D	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
GWMW-16-S	—	—	—	—	—	—	—	—	—	—	—	—	4.9	—	—
GWMW-16-D	—	—	—	—	—	—	—	—	—	—	—	—	5	1	—
GWMW-16-D Dup	—	—	—	—	—	—	—	—	—	—	—	—	5	—	—

µg/L = Micrograms per liter
TMB = Trimethylbenzene
DCE = Dichloroethene
MEK = Methyl ethyl ketone

MTBE = Methyl tertiary-butyl ether
PCE = Perchloroethene
TCE = Trichloroethene
— = Not detected above laboratory reporting limit



Table 10. PCE Concentrations in Groundwater
Page 1 of 2

Well	PCE Concentration (µg/L)				
	2012	2013	2014	2015	2016
CLC Paz Park Well	<1	<1	<1	<1	<1
CLC 18	56	2.7	6	13	15
CLC 20	NS	<1	<1	<1	<1
CLC 26	<1	<1	<1	<1	<1
CLC 27	13	14	11	14	13
CLC 57	NS	<1	<1	<1	<1
GMMW01-01	5.8	11	1.3	3.8	9.8
GMMW01-02	<1	<1	<1	<1	NS
GMMW01-03	2.7	3.2	2	1.6	7
GMMW01-04	<1	<1	<1	<1	<1
GMMW01-05	3.2	<1	<1	<1	<1
GMMW01-06	11	14	8	2.4	4.7
GMMW01-07	3.2	3.6	2.3	<1	<1
GMMW03-01	<1	<1	<1	<1	<1
GMMW03-02	<1	<1	<1	<1	<1
GMMW03-03	<1	<1	<1	<1	NS
GMMW03-04	NS	<1	<1	NS	NS
GMMW03-05	<1	<1	<1	NS	<1
GMMW03-06	<1	<1	<1	<1	<1
GMMW08-03	<1	<1	<1	<1	<1
GMMW08-04	<1	<1	<1	<1	<1
GMMW08-05	<1	<1	<1	<1	<1
GMMW08-06	<1	<1	<1	<1	<1
GMMW08-07	<1	<1	<1	<1	<1
GMMW09-01	<1	<10	<1	<1	<1
GMMW09-02	1.3	<20	<1	<1	13
GMMW09-03	<1	<10	1	5.1	9.2
GMMW09-04	1.2	<1	7.9	11	19
GMMW09-05	1.7	<10	1.5	16	<1
GMMW09-06	<1	<10	<1	<1	<1
GMMW09-07	<1	<10	<1	<1	5.1
GMMW10-01	47	<1	26	1.2	17
GMMW10-02	14	7.1	11	4.4	18
GMMW10-03	45	42	25	1.8	16

PCE = Perchloroethene
 µg/L = Micrograms per liter
 NS = Not sampled



Table 10. PCE Concentrations in Groundwater
Page 2 of 2

Well	PCE Concentration (µg/L)				
	2012	2013	2014	2015	2016
GWMW10-04	4.5	3.7	1.3	1.2	13
GWMW10-05	<1	<1	<1	<1	9
GWMW10-06	<1	<1	<1	<1	7.3
GWMW10-07	<1	<1	<1	4.2	7.5
GWMW11-D	<1	<1	<1	<1	<1
GWMW11-I	<1	<1	<1	2	1.8
GWMW11-S	<1	<1	<1	<1	<1
GWMW15-D	<1	<1	<1	<1	<1
GWMW15-I	2.3	<1	1.1	6.1	5.6
GWMW15-S	<1	<1	<1	<1	<1
GWMW16-S	NS	NS	NS	1.6	4.9
GWMW16-D	NS	NS	NS	3.1	5
MW-1	<10	<5	<1	2.1	2.9
MW-3	3.6	2.4	<1	NS	NS
MW-4	1.1	4.2	1.6	NS	NS
MW-5	<1	<1	<1	NS	NS
MW-6	2.3	NS	NS	NS	NS
MW-SF1	9.6	NS	NS	NS	NS
MW-SF10	9.5	12	NS	23	21
MW-SF2	11	7.5	NS	NS	NS
MW-SF4	NS	NS	<1	NS	NS
MW-SF5	<1	<1	<1	1.1	1.1
MW-SF6	<1	<1	<1	<1	<1
MW-SF9	<1	<1	<1	<1	<1

PCE = Perchloroethene
µg/L = Micrograms per liter
NS = Not sampled

Appendix A
Terracon
Groundwater
Sampling Report

Ground Water Monitoring Report

Griggs and Walnut Ground Water Plume

Las Cruces, New Mexico

February 15, 2017

Terracon Project No. 68167094

Prepared for:

The City of Las Cruces

and

The Joint Superfund Program Technical Team

Prepared by:

Terracon Consultants, Inc.

Las Cruces, New Mexico

Offices Nationwide
Employee-Owned

Established in 1965
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Terracon

Geotechnical ■ Environmental ■ Construction Materials ■ Facilities

February 15, 2017



City of Las Cruces
P.O. Box 20000
Las Cruces, New Mexico 88004

Attn: Ms. Adrienne Widmer, P.E.
P: (575) 528-3514
E: awidmer@las-cruces.org

Re: Ground Water Monitoring Report, January 2017
Griggs and Walnut Ground Water Plume,
Las Cruces, New Mexico
Terracon Project No. 68167094

Dear Ms. Widmer:

Terracon Consultants, Inc. (Terracon) is pleased to submit this Ground Water Monitoring Report. The report documents single round of ground water monitoring that occurred in December 2016 and January 2017 at the above referenced site. This investigation was performed in accordance with Terracon's Proposal No. P68167094 dated December 1, 2016.

We appreciate the opportunity to perform these services for you. Please contact Kyle Williams at (575) 527-1700 if you have questions regarding the information provided in the report.

Sincerely,
Terracon Consultants, Inc.

A handwritten signature in blue ink, appearing to read 'K. Williams', is positioned above the name and title of Kyle Williams.

Kyle Williams
Project Manager

A handwritten signature in blue ink, appearing to read 'K. Wheeler', is positioned above the name and title of Kent Wheeler.

Kent Wheeler
Regional Manager

Attachments

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APPENDICES

- Appendix A: Figure 1 Project Area Map (*Daniel B. Stephens & Associates, Inc., 2015*)
- Appendix B: Hydrasleeve™ Interim Field Manual
- Appendix C: Results of Laboratory Analyses
- Appendix D: Field Logs
- Appendix E: Evaluation of Hydrasleeve™ Method

GROUND WATER MONITORING REPORT GRIGGS AND WALNUT GROUND WATER PLUME

Las Cruces, New Mexico
Terracon Project No. 68167094
February 15, 2017

1.0 INTRODUCTION

The following Ground Water Monitoring report documents a single round of groundwater sampling of 22 monitoring wells and 6 production wells at the Griggs and Walnut Ground Water Plume Superfund Site, during December 2016 and January 2017. Terracon Consultants were retained by the City of Las Cruces (CLC), to evaluate the wells, and sample all intact wells according to approved Sampling and Analysis Plan (SAP, 2011). In addition, CLC also asked that 5 monitoring wells and 3 CLC production wells be sampled using Hydrasleeve™ technology. Due to the cost savings associated with this technology CLC wanted to demonstrate the comparability of the data collected using SAP methodology verses the Hydrasleeve™ technology.

1.1 Project Information

The Site consists of a ground water plume containing dissolved perchloroethylene (PCE). The plume is approximately 1.8 miles long by 0.5 miles wide and located within the City of Las Cruces (CLC), New Mexico. PCE contamination is present in the ground water at depths ranging from more than 100 ft. to 650 ft. below ground surface. A map depicting the project area and well locations is included as Figure 1 (Appendix A). The PCE contamination impacted several CLC municipal water supply wells. The Site was proposed to the NPL on January 11, 2001, to address contaminated ground water. Final listing was on June 14, 2001.

In 2006, the EPA completed the Remediation Investigation and Feasibility Study (RI/FS) relative to the PCE impacts to water supply wells within the City of Las Cruces. The next phase was the preparation and implementation of the Remedial Design/Remedial Action (RD/RA). The RD/RA was prepared by CLC and DAC Joint Superfund Program (JSP) Technical Team EPA issued the Record of Decision (ROD) for the remedy on June 19, 2007, selecting enhanced ground water extraction (pumping) with treatment of extracted ground water to remove PCE. The ROD required a groundwater extraction and treatment system, and a monitoring well network to evaluate the performance of the selected remedy.

The Ground Water Monitoring Program is being implemented by the JSP. Select monitoring wells and inactive CLC water supply wells have been sampled periodically since 2012 to evaluate the performance of the extraction system at achieving hydraulic capture of the PCE plume and reduction of PCE concentrations to below the MCL of 5 µg/L for PCE. These wells are identified in the RA Sampling and Analysis Plan (RA SAP) approved by EPA in 2011, with the exception of monitoring wells GMMW16-S and GMMW16-D which were installed in August, 2015, as part of the optimization effort.

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1.2 Scope of Services

Terracon performed project activities in accordance with the *Sampling and Analysis Plan, Griggs-Walnut Ground Water Plume Site*, (SAP) prepared by DBSA (August 25, 2011). Field activities were performed in accordance with the Site Specific Health and Safety Plan (HSP), the Quality Assurance Project Plan, the Field Sampling Plan and modified the Standard Operating Procedure (SOP) for the Water Flexible Underground Liner Technologies (FLUTE) wells. Terracon performed the following tasks, which are described in more detail in Section 2.0, associated with the above-referenced project.

- § Inspect the 27 original wells at the site and the recently install GMMW-16;
- § Measure the depth to static ground water in all accessible wells, as designated by the SAP;
- § Sample all accessible monitoring wells as designated by the SAP;
- § Collect water samples from CLC production wells designated by the SAP;
- § Sample 5 monitoring wells (MW-1, MW -SF5, -SF6, -SF9, and -SF10) for volatile organic compounds (VOCs) and metals using Hydrasleeve™ methodology, and the standard methods described in the SAP;
- § Submit the collected ground water samples for laboratory analyses of VOCs, total arsenic, arsenic speciation, and total uranium;
- § Compare the sample results from samples collected using the Hydrasleeve™ method with results from samples collected by purging and sampling in accordance with the SAP;
- § Provide results of laboratory analyses of all samples.

1.3 Standard of Care

Terracon's services were performed in a manner consistent with generally accepted practices of the profession undertaken in similar studies in the same geographical area during the same time period. Terracon makes no warranties, either express or implied, regarding the findings, conclusions or recommendations. Terracon does not warrant the work of laboratories, or other third parties supplying information used in the preparation of the report. These services were performed in accordance with the scope of work, as set forth in the proposal.

1.4 Additional Scope Limitations

Findings, conclusions and recommendations resulting from these services are based upon information derived from the on-site activities and other services performed under this scope of work; such information is subject to change over time. Certain indicators of the presence of hazardous substances, petroleum products, or other constituents may have been latent, inaccessible, unobservable, non-detectable or not present during these services. We cannot represent that the site contains no hazardous substances, toxic materials, petroleum products, or other latent conditions beyond those identified during this report. Our recommendations are based solely upon data obtained at the time and within the scope of these services.

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1.5 Reliance

This report has been prepared for the exclusive use of the City of Las Cruces, DBSA, and members of the JSP, and any authorization for use or reliance by any other party (except a governmental entity having jurisdiction over the site) is prohibited without the express written authorization of the City of Las Cruces and Terracon. Any unauthorized distribution or reuse is at the client's sole risk. The limitation of liability defined in the terms and conditions is the aggregate limit of Terracon's liability to the client and all relying parties unless otherwise agreed in writing.

2.0 GROUND WATER SAMPLING AND ANALYSES

2.1 Ground Water Monitoring Well Construction

FLUTe Wells

There are 5 FLUTe Wells at the site, each of these wells have multiple screened intervals connected to distinct sampling ports. Details of the FLUTe wells are shown in Table 2.1, screened Interval values are in feet below ground surface (ft bgs).

Table 2.1 FLUTe Well Screened Intervals

Well ID	Port ID	Screened Interval ft bgs	Port ID	Screened Interval ft bgs
GWMW-01	1	210 – 220	5	460 – 470
	2	270 – 280	6	515 – 525
	3	330 – 340	7	550 – 560
	4	420 – 430		
GWMW-03	1	140 – 150	4	320 – 330
	2	225 – 235	5	410 – 420
	3	270 – 280	6	460 - 470
GWMW-08	1	190 – 200	5	430 – 440
	2	255 – 265	6	490 – 500
	3	305 – 315	7	535 - 545
	4	380 – 390		
GWMW-09	1	240 – 250	5	480 – 490
	2	295 – 305	6	550 – 560
	3	355 – 365	7	630 – 640
	4	410 – 420		
GWMW-10	1	250 – 260	5	505 – 515
	2	320 – 330	6	560 – 570
	3	370 – 380	7	620 - 630
	4	440 – 450		

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Nested Wells

Each of the nested wells include multiple screened intervals. Wells GMMW-11 and GMMW-15 consist of three 3-inch nominal diameter cased monitoring wells, and have flush-mount surface completions consisting of a well vault and concrete apron that protects the three well casings. Well GMMW-16 consists of two individual 4-inch nominal diameter cased monitoring wells, with the casing extending approximately three feet above ground surface with protective locking covers, concrete aprons and bollards. Details of the nested well screen intervals are shown in Table 2.2, below

Table 2.2 Nested Well Screened Intervals

Well ID	Interval ID	Screen Interval in ft bgs
GMMW-11	GMMW-11S ¹	190 - 205
	GMMW-11I	299.1 - 314.1
	GMMW-11D	525 - 540
GMMW-15	GMMW-15S	289.2 - 304.2
	GMMW-15I	460 - 475
	GMMW-15D	580.6 - 595.6
GMMW-16	GMMW-16S	185 - 205
	GMMW-16D	350 - 370

1 – S denotes the shallow interval, I denotes the intermediate interval, and D denotes the deep interval

Monitoring Wells

Each monitoring well has a flush-mount surface completion consisting of a well vault and concrete apron that protects the well casing. Details of the monitoring well screened intervals are shown in Table 2.3, below

Table 2.3 Monitoring Well Screened Intervals

Well ID	Screen Interval in ft bgs		Well ID	Screen Interval in ft bgs
MW-1	187 – 197		MW-SF1	183.55 – 198.55
MW-2	190.2 – 200.2		MW-SF2	184.34 – 199.34
MW-3	180 – 190		MW-SF3	174.8 – 189.8
MW-4	175 – 185		MW-SF4	168.38 - 183.38
MW-5	181.8 – 191.8		MW-SF5	137.73 – 152.73
MW-6	188.2 – 198.2		MW-SF6	116.55 – 131.55
			MW-SF9	188.03 – 203.03
			MW-SF10	193.7 – 203.7

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City of Las Cruces Production Wells

Available details of the CLC Production wells, as provided by CLC, are shown in Table 2.4, below

Table 2.4 CLC Production Well Screened Intervals

Well ID	Screen Interval in ft bgs		Well ID	Screen Interval in ft bgs
CLC 18	380 – 516.5		CLC 27	327 – 730
CLC 20	Unknown		CLC 57	Unknown
CLC 26	Unknown		CLC Paz Park	Unknown

2.2 Depth to Ground Water

Terracon attempted to measure the depth to ground water in the 22 monitoring wells identified above. The depth to static ground water in the CLC production wells was measured by City personnel (with the exception of CLC-18 and CLC-27, which are being used for the treatment operation).

FLUTE Wells

The depth to water (DTW) measurements collected from the FLUTE wells was conducted in accordance with the SAP. The water level within the uppermost FLUTE port, labelled “port 1”, is assumed to be representative of the highest ground water level in any of the sampling ports. The FLUTE liner is filled with water to assure a seal between the liner and well casing, and this water level is measured using the “tag” port. The SAP requires the water level within the liner to be from 0.5 to 20 feet higher in the liner than in the formation to prevent leakage from the surface to the screened intervals of the FLUTE ports, and leakage between sampling ports. Water is added or removed from the liner to meet this criteria.

Table 2.5 FLUTE Well Water Levels

Well ID	Date Measured	DTW	Comments
GWMW-01	01/11/17	tag=182.33 port 1=190.05	The well vault is approximately 12” below the surrounding grade, and required removing overburden. The liner cover to the purge/sample ports has separated from the casing. Ports and sample tubing - fair condition.
GWMW-03	01/10/17	tag=117.70 port 1=127.90	Well vault intact. Ports and sample tubing - fair condition
GWMW-08	01/09/17	tag=171.50 port 1=173.80	Well vault intact. Ports and sample tubing - fair condition
GWMW-09	01/16/17	tag=206.50 port 1=208.10	Well vault intact. Ports and sample tubing - fair condition
GWMW-10	01/13/17	tag=220.80 port 1=222.24	Well vault intact. Ports and sample tubing - fair condition

Note: Depth to water (DTW) measurements are in feet below the top of the FLUTE well protective casing.

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Nested Wells

Table 2.6 Nested Well Water Levels

Well ID	Date Measured	DTW	TD	Comments
GWMW-11S	01/23/17	177.83	205	Well vault and casing intact.
GWMW-11I	01/23/17	183.73	314.1	Well vault and casing intact.
GWMW-11D	01/24/17	183.44	540	Well vault and casing intact.
GWMW-15S	01/26/17	240.60	304.2	Well vault and casing intact.
GWMW-15I	01/26/17	241.22	475	Well vault and casing intact.
GWMW-15D	01/27/17	241.20	595	Well vault and casing intact.
GWMW-16S	01/24/17	188.65	205	Well surface completion, bollards, and casing intact.
GWMW-16D	01/25/17	193.74	370	Well surface completion, bollards, and casing intact.

Note: DTW and total depth (TD) measurements are in feet below the established measuring point.

Monitoring Wells

Table 2.7 Monitoring Well Water Levels

Well ID	Date Measured	DTW	TD	Comments
MW-1	12/28/16	192.51	195.99	Well vault and casing intact.
MW-2	12/28/16			Unable to measure as the well casing is breached at 14" bgs. Well vault intact.
MW-3	12/28/16	189.55	189.71	Well vault cap cracked at bolt ears. Well casing intact.
MW-4	12/28/16	dry	185.71	Well vault and casing intact.
MW-5	12/29/19	dry	191.80	Well vault and casing intact.
MW-6	12/28/16			Unable to measure as the well casing is breached at 18" bgs. Well vault intact.
MW-SF1	12/28/16			Unable to measure as the well casing is blocked at 59.90' bgs. Well vault intact.
MW-SF2				Unable to locate.
MW-SF3				Unable to locate.
MW-SF4	12/29/16	39.14	81.31	Well vault intact. Well casing plugged or breached at 81.3' bgs.
MW-SF5	01/05/17	147.87	153.35	Well vault and casing intact.
MW-SF6	01/05/17	128.82	132.25	Well vault and casing intact.
MW-SF9	01/12/17	190.25	203.10	Well vault and casing intact.
MW-SF10	01/10/17	194.68	204.44	Well vault and casing intact.

Note: DTW and total depth (TD) measurements are in feet below the established measuring point.

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City of Las Cruces Production Wells

Table 2.7 City of Las Cruces Production Well Water Levels

Well ID	Date Measured	DTW	Comments
CLC 18	01/04/17	201.7	Wellhead and pump equipment were observed to be intact. No damage noted.
CLC 20	01/04/17	235.7	Well taken out of service. Pump removed.
CLC 26	01/04/17	175.5	Well taken out of service. Pump removed.
CLC 27	01/04/17	239.7	Wellhead and pump equipment were observed to be intact. No damage noted.
CLC 57	01/04/17	293.4	Well taken out of service. Pump removed.
CLC Paz Park	01/04/17	174.0	Wellhead and pump equipment were observed to be intact. No damage noted.

Note: DTW and total depth (TD) measurements are in feet below the established measuring point. The depth to water (DTW) measurements were obtained by City of Las Cruces personnel.

2.3 Ground Water Sampling

Once the depth to ground water measurements were collected, ground water samples were collected. Proper purging techniques were utilized prior to sample collection, and Terracon measured the water quality parameters during well purging activities, and recorded these measurements in the field logbook. Water quality parameters were measured using a YSI ProDSS multimeter, that was calibrated each morning prior to use. Terracon obtained field measurements of temperature, dissolved oxygen, specific conductance, resistivity, total dissolved solids, pH, oxidation-reduction potential, and turbidity.

Collected ground water samples were identified in accordance with the SAP. Each sample was assigned a unique sample number, i.e. GWMW03-1-170110, where "GWMW03" signifies the well, "1" signifies the port (FLUTE wells only), and "170110" signifies the date in the yymmdd format.

During sample collection activities, Terracon also performed quality control/quality assurance sample collection in accordance with the SAP, including sample duplicates (10% of total samples), trip blanks (1 per day), equipment blanks (1 per day for non-dedicated equipment), matrix spike (5% of total samples), and field blanks (10% of total samples).

FLUTE Wells

Appendix A of the SAP details the sampling procedures to be used at the Griggs and Walnut Ground Water Plume FLUTE wells. Each FLUTE well has been installed in a 6-inch diameter steel-cased well. Each well casing is perforated at multiple depths to open up different zones in the well to the formation. Each perforated zone is 10 feet in length. Each casing is sealed between each zone to ensure that the sampled water is representative of the sampled zone.

The FLUTE pumping system consists of a sampling port located at each perforated interval, a check valve, and a U-shaped tube set. The U-shaped tube set consists of a 1/2-inch diameter

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tube and a 1/8-inch tube to the surface. Water enters the sampling port through the check valve and fills both sides of the U-shaped tube. Compressed nitrogen gas (N₂) is applied to the 1/8-inch tube to displace the collected water and pump it to the surface.

The SAP recommends that each port of the FLUTE wells be purged from 2 to 3 times prior to sample collection. Terracon elected to purge each port 3 times prior to sample collections. Terracon performed these activities in accordance with the SAP, with the following exceptions:

- § GMMW-01, port 2 did not recharge following the first purge;
- § GMMW-03, ports 4 and 5 did not recharge following the first purge, and;
- § GMMW-08, ports 1 and 2 did not purge due to leaks within the downhole tubing.

Ground water samples were not collected from these ports, as directed by the Client. The remaining ports within each FLUTE well produced sufficient ground water to support purging and sampling activities.

Nested Wells

Due to the construction of the nested wells and the volume of water contained in each well, the low-flow purging and sampling techniques detailed in the SAP were used. Well purging was accomplished utilizing a bladder pump that was operated using N₂ as the compressed gas. The bladder pump and water level meter was decontaminated in accordance with the SAP prior to use at each well. Terracon connected the bladder pump to tubing sets (gas line and discharge line) dedicated for use at each well. The bladder pump was lowered to a depth approximately equal to the mid-point of the well screened interval.

Terracon then lowered a water level indicator to track drawdown throughout the purging process. The bladder pump was connected to the N₂ source, and the well was purged at a flow rate of less than 0.5 liters per minute. Each of the nested wells was purged at a flow rate of approximately 0.3 to 0.4 liters per minute during this sampling event.

Terracon purged a minimum of 5 gallons from each well prior to collection of ground water quality parameters measurements and the static water level measurements within the well. Generally, these measurements were collected once per each gallon of water purged, which corresponded to one reading every 10 minutes. Once water quality parameters and the static water level stabilized, well purging was considered complete, and a sample of ground water was collected.

Adverse conditions were not encountered at any of the nested wells with the following exception: well GMMW-16S produced highly turbid water, exhibited by elevated total dissolved solids and turbidity measurements while purging, and the discharged water appeared to contain a significant fraction of suspended clays.

Monitoring Wells

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The SAP identified 14 monitoring wells used for ground water monitoring activities in connection with the ground water plume. Of these wells, Terracon was able to collect samples from six of these wells including MW-1, MW-SF4, MW-SF5, MW-SF6, MW-SF9 and MW-SF10. As detailed in Section 2.1, the remaining wells were not sampled due to the wells being covered by recent earthmoving activities, damaged, or containing insufficient ground water to support sample collection.

The measured total depth of monitoring well MW-SF4 was 81.31 feet bgs, which is significantly higher in elevation than the remaining wells in the program, and well above the screened interval of 168.38 - 183.38 ft bgs. Terracon found that this well contained approximately 40 feet of water above this obstruction found at 81.31 feet bgs. The water within MW-SF4 is likely not representative of ground water in the area. For this reason, Terracon collected a grab sample for laboratory analyses using a Hydrasleeve™ sampler, but did not purge and sample this well in accordance with the SAP. Sample collection performed using the Hydrasleeve™ were performed in accordance with the *Hydrasleeve™ Interim Field Manual*, (Geolnsight, 2016) (Appendix B).

Terracon found a diffusion sampler in place in MW-SF6 during the inspection and water level measurement activities completed on December 29, 2016. Terracon submitted a sample from the diffusion sampler for laboratory analyses, then on January 3, 2017, collected a Hydrasleeve™ grab sample of ground water for comparative analyses, and then purged and sampled the well in accordance with the SAP on January 5, 2017.

Grab samples were collected from these wells during previous sampling events using Hydrasleeve™ samplers. The Client directed Terracon to duplicate the previous sampling procedures to collect ground water samples, then purge and sample these wells in accordance with the SAP so that comparison of results from these two methods may be accomplished. Ground water quality parameters of were field measured from a fraction of ground water contained in the Hydrasleeve™ samplers.

Following collection of the Hydrasleeve™ samples, the monitoring wells were allowed to equilibrate a minimum of two days prior to initiation of well purging and sampling activities as specified in the SAP. Well purging and sampling activities at these wells was accomplished using a new, disposable bailer that was connected to the dedicated sampling rope in place at each well. Ground water quality parameters were field measured at a rate of once per well volume.

City of Las Cruces Production Wells

City of Las Cruces personnel provided access to the production wells. Wells CLC 18, CLC 27 and CLC Paz Park are currently in production with pumps installed. In accordance with the SAP, Terracon collected grab samples from wells CLC-18, CLC-27 and CLC-Paz Park from the designated sample port.

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Wells CLC 20, CLC 26 and CLC 57 have been taken out of service. The pumps have been removed from these wells, and the well heads have been closed with installed 2-inch or 4-inch access ports. As equipment was not available to properly purge these wells for sampling, alternate sampling methods were used to obtain ground water samples. A significant layer of turbine oil was observed floating on top of the water within wells CLC 20 and CLC 26, and the Client directed Terracon to collect a grab sample from these two wells using a Hydrasleeve™ to minimize introduction of the turbine oil into the sample fraction. Well CLC 57 was sampled using a Hydrasleeve™, then by the low flow method using the bladder pump. Details of the collected ground water samples are provided in Table 2.8.

Table 2.8 Ground Water Sample Collection Information

Well ID		Date	Time	Sampling Method	Sample No.
<i>FLUTE</i> Wells	port				
GWMW-01	1	01/11/17	13:25	N ₂	GWMW01-01-170111
	2	<i>Unable to sample as port did not recharge following the first purge.</i>			
	3	01/11/17	13:35	N ₂	GWMW01-03-170111
	4	01/11/17	13:50	N ₂	GWMW01-04-170111
	5	01/11/17	14:00	N ₂	GWMW01-05-170111
	6	01/11/17	14:10	N ₂	GWMW01-06-170111
	7	01/11/17	14:25	N ₂	GWMW01-07-170111
GWMW-03	1	01/10/17	13:50	N ₂	GWMW03-01-170110
	2	01/10/17	13:55	N ₂	GWMW03-02-170110
	3	01/10/17	14:00	N ₂	GWMW03-03-170110
	4 & 5	<i>Unable to sample as ports did not recharge following the first purge.</i>			
	6	01/10/17	14:10	N ₂	GWMW06-01-170110
GWMW-08	1 & 2	<i>Unable to sample due to leaks in the downhole sample port tubing.</i>			
	3	01/09/17	14:45	N ₂	GWMW08-03-170109
	4	01/09/17	14:35	N ₂	GWMW08-04-170109
	5	01/09/17	14:25	N ₂	GWMW08-05-170109
	6	01/09/17	14:15	N ₂	GWMW08-06-170109
	7	01/09/17	14:05	N ₂	GWMW08-07-170109
GWMW-09	1	01/16/17	13:15	N ₂	GWMW09-01-170116
	2	01/16/17	13:25	N ₂	GWMW09-02-170116
	3	01/16/17	13:35	N ₂	GWMW09-03-170116
	4	01/16/17	13:45	N ₂	GWMW09-04-170116
	5	01/16/17	13:55	N ₂	GWMW09-05-170116
	6	01/16/17	14:05	N ₂	GWMW09-06-170116
	7	01/16/17	14:15	N ₂	GWMW09-07-170116
GWMW-10	1	01/13/17	14:10	N ₂	GWMW10-01-170113
	2	01/13/17	14:20	N ₂	GWMW10-02-170113

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Table 2.8 Ground Water Sample Collection Information (continued)

Well ID		Date	Time	Sampling Method	Sample No.
FLUTe Wells	port				
GWMW-10	3	01/13/17	14:40	N ₂	GWMW10-03-170113
	4	01/13/17	14:55	N ₂	GWMW10-04-170113
	5	01/13/17	15:05	N ₂	GWMW10-05-170113
	6	01/13/17	15:10	N ₂	GWMW10-06-170113
	7	01/13/17	15:20	N ₂	GWMW10-07-170113
Nested Wells					
GWMW-11S		01/23/17	11:30	Low Flow	GWMW11-S-170123
GWMW-11I		01/23/17	15:20	Low Flow	GWMW11-I-170123
GWMW-11D		01/24/17	13:10	Low Flow	GWMW11-O-170124
GWMW-15S		01/26/17	14:35	Low Flow	GWMW15-S-170126
GWMW-15I		01/26/17	11:30	Low Flow	GWMW15-I-170126
GWMW-15D		01/27/17	11:30	Low Flow	GWMW15-D-170127
GWMW-16S		01/24/17	16:20	Low Flow	GWMW16-S-170124
GWMW-16D		01/25/17	12:35	Low Flow	GWMW16-D-170125
Monitoring Wells					
MW-1		01/03/17	9:00	Hydrasleeve™	MW1-170103
		01/05/17	12:40	Bail 3WV ¹	MW1-170105
MW-2	<i>Unable to sample due to well casing breach at 14" bgs.</i>				
MW-3	<i>Unable to sample due to insufficient water within casing.</i>				
MW-4	<i>Unable to sample due to insufficient water within casing.</i>				
MW-5	<i>Unable to sample due to insufficient water within casing.</i>				
MW-6	<i>Unable to sample due to well casing breach at 18" bgs.</i>				
MW-SF1	<i>Unable to sample due to well casing block at 59.90' bgs.</i>				
MW-SF2	<i>Unable to locate.</i>				
MW-SF3	<i>Unable to locate.</i>				
MW-SF4		01/03/17	10:00	Hydrasleeve™	MWSF4-170103
MW-SF5		01/03/17	10:45	Hydrasleeve™	MWSF5-170103
		01/05/17	14:30	Bail 3WV	MWSF5-170105
MW-SF6		12/29/16	11:15	Diffusion sample	MWSF6-161229
		01/03/17	11:30	Hydrasleeve™	MWSF6-170103
MW-SF6		01/05/17	15:30	Bail 3WV	MWSF6-170105
MW-SF9		01/03/17	13:10	Hydrasleeve™	MWSF9-170103
		01/12/17	15:15	Bail 3WV	MW5F9-170112 ²
MW-SF10		01/03/17	14:30	Hydrasleeve™	MWSF10-170103
		01/10/17	15:30	Bail 3WV	GWSF10-170110 ²

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Table 2.8 Ground Water Sample Collection Information (continued)

Well ID	Date	Time	Sampling Method	Sample No.
CLC Production Wells				
CLC 18	01/04/17	11:50	Grab Sample	CLC18-170104
CLC 20	01/06/17	9:50	Hydrasleeve™	CLC20-170106
CLC 26	01/06/17	9:00	Hydrasleeve™	CLC26-170106
CLC 27	01/04/17	12:10	Grab Sample	CLC27-170104
CLC 57	01/06/17	10:15	Hydrasleeve™	CLC57-170106
	01/31/17	13:35	Low Flow	CLC57-170131
CLC Paz Park	01/04/17	12:50	Grab Sample	CLCPaz-170104

1 – Purged and sampled in accordance with the SAP by bailing a minimum of three well volumes (WV) prior to sample collection.

2 – Incorrect sample numbers. MW5F9-170112 should be MWSF9-170112, GWSF10-170110 should be MWSF10-170110 and GWMW11-O-170124 should be GWMW11-D-170124.

Quality Assurance/Quality Control Samples

Terracon collected Quality Assurance/Quality Control (QA/QC) samples in accordance with the requirements of the SAP. Trip blanks were submitted to the laboratory at a rate of one per day during sampling activities. A minimum of 10% Field Blanks and Duplicate samples were collected, a minimum of 5% Matrix Spike/Matrix Spike Duplicates were collected, and Equipment Blanks were collected at a rate of one per day while using non-dedicated equipment (bladder pump). All QA/QC samples were submitted to the analytical laboratory for analyses. Details of the collected QA/QC samples are provided in Table 2.9.

Table 2.9 QA/QC Sample Collection Information

Equipment Blanks	Field Blanks	Duplicates	MS/MSD
EB-170123	FB-170110	CLCPaz-170104 D	CLC18-170104 MS
EB-170124	FB-170113	MWSF5-170103 D	GWMW01-06-170111 MS
EB-170125	FB-170123	GWMW03-01-170110 D	GWMW03-06-170110 MS
EB-170126	FB-170125	GWMW10-02-170113 D	GWMW09-02-170116 MS
EB-170127	FB-170126	GWMW15-I-170126 D	
EB-170131	FB-170127	GWMW16-D-170125 D	

2.4 Analytical Program

All ground water samples were analyzed for VOCs following EPA Test Method 8260B, total arsenic and total uranium using EPA Test Method 200.8, ICPMS, and arsenic speciation using EPA Test Method E1632AM. The ground water samples were submitted to Hall Environmental Analysis Laboratory (HEAL) in Albuquerque, New Mexico via overnight courier. Results of sample analyses are provided in Appendix C.

3.0 RESULTS

3.1 Observations

Terracon recorded field activities, including observations of well conditions. Copies of the field logs, and previous field notes provided by City of Las Cruces personnel, are provided in Appendix D. Pertinent observations and field activities are summarized in the following sections.

FLUTE Wells

Terracon observed the condition of the FLUTE wells during field activities. The well vaults are in good condition at each well, however, the ground surface in the area of GMMW-01 has been re-graded, and is approximately one foot higher than the cover to the vault. The surrounding soils repeatedly collapse, covering the well vault. These soils must be hand dug to expose the vault during each sampling event. Consequently, access to the well ports is difficult, and requires field personnel to lay prone and reach down in order to perform sampling tasks. Terracon recommends that the ground surface surrounding GMMW-01 be re-graded to the same elevation as the well vault cover, and designed in a manner to prevent surrounding soils from collapsing and covering the vault, and prevent water from pooling at the well vault. This may involve construction of a concrete retaining structure to prevent collapse of the surrounding soils.

The sampling ports on the FLUTE wells are worn due to age and previous sampling activities. This wear made connection of the N₂ supply lines to the ports difficult. Many of the nitrogen quick connectors installed at the sample ports exhibited drying and cracking of the o-ring seals and minor damage to locking mechanism of the quick connection fittings. Terracon performed temporary repairs to these connections so that sampling could be performed. Likewise, some of the sample discharge lines were kinked with two of the lines requiring splices to repair leaks. These repairs were of a temporary nature, and should be examined prior to the next sampling event.

Terracon confirmed that sample ports 1 and 2 of GMMW-08 were leaking below the top of the well casing, as evidenced by hearing a leak when compressed nitrogen is applied to these ports. Visual confirmation of the location of these leaks was attempted, but field personnel could not see such evidence.

Nested Wells

The flush-mount surface completions of GMMW-11 and GMMW-15 were observed to be in good condition. Observations of the 3-inch diameter casings of each well did not identify any damage. Each well was observed to be properly capped.

The surface completions of GMMW-16S and GMMW-16D were observed to be in good condition. All appurtenances, including the well casing, protective locking cover, locks, concrete well pad and protective bollards, were in good condition.

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The purged ground water from GMMW-16S was observed to be very turbid. Purged ground water was allowed to settle, and fine-grained clay/silt material was observed in the bottom of the container. The observed sediment load is most likely due to improper or incomplete well development.

Monitoring Wells

Terracon observed the surface completions, well casings and well caps to be in good condition at monitoring wells MW-1, MW-3, MW-4, MW-5, MW-SF5, MW-SF6, MW-SF9 and MW-SF10. Terracon observed monitoring wells MW-3, MW-4 and MW-5 to be either dry or contain insufficient ground water to support sampling activities.

Terracon was not able to locate MW-SF2 and MW-SF3, which are located in the Dona Ana County Maintenance Yard. These two wells may have been covered or destroyed by equipment activity in the yard.

The 2-inch well casing in MW-2 was observed to be breached at approximately 14 inches below the top of casing. The breach was observed to cross the approximate center of the well casing and appears to be the result of grading activities in this area. Terracon was unable to drop the water level meter probe past this breach.

The 2-inch well casing in MW-6 was observed to be breached and/or broken at a depth of approximately 18 inches below the top of casing. The break in the casing has tilted the uppermost portion of the casing sufficiently to obstruct access to the lower portion. Terracon was unable to drop the water level indicator probe past this point.

Terracon encountered an obstruction in MW-SF1 at a depth of 59.90 feet below the top of casing. Repeated attempts at dropping the water level indicator probe past this breach were unsuccessful.

Terracon measured the DTW in MW-SF4 at 39.14 feet below the top of casing, and the total depth was measured as 81.31 feet below the top of casing. As with MW-SF2 and MW-SF3, this well may have been damaged and/or filled by earth moving activities in the Dona Ana County yard.

City of Las Cruces Production Wells

Observations of the CLC production wells CLC-18, CLC-27 and CLC-Paz Park indicate that these wells are in good working order. These wells are sampled in accordance with the SAP by obtaining grab samples from the established sampling ports at each well. These sampling ports are located adjacent to the wellhead and provide raw, untreated ground water while the well pump is operating.

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3.2 Sample Results

The results of the sampling found low concentrations of VOC in 12 of the wells sampled. PCE concentrations ranged from 1.7 ug/l to 19 ug/l in these samples. Low concentrations of other VOCS were also detected (TCE, toluene, benzene, acetone and 2-butanone). Laboratory results are presented in Appendix D.

In addition to VOCs, low concentrations of arsenic and uranium were detected. Because of the low concentrations of arsenic, the laboratory was not able to determine arsenic speciation at the concentrations observed. Laboratory results are presented in Appendix D.

3.2 Comparison of Results of Various Sampling Methods

The Client directed Terracon to perform a comparison of results from ground water samples collected using Hydrasleeve™ samplers and samples collected in accordance with the procedures detailed in the SAP. Three monitoring wells (MW-1, MW-SF9, and MW-SF10) were compared for volatile organic compounds (VOC), and five monitoring wells (MW-1, MW -SF5, -SF6, -SF9, and -SF10) were compared for metals.

A comparison of detected VOC constituents in the samples collected from MW-1 MW-SF5, MW-SF6, MW-SF9 and MW-SF10 are shown in Table 3.1.

Table 3.1 – Comparison of VOC Concentrations in Hydrasleeve™ and Bailed Samples

Sample method:	MW-1		MW-SF5		MW-SF6		MW-SF9		MW-SF10	
	H1	B2	H	B	H	B	H	B	H	B
	<i>(units are micrograms per liter, ug/L)</i>									
4-Methyl-2-pentanone	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Bromodichloromethane	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.2
Chloroform	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.4	<1.0	0.4
Chloromethane	<3.0	< 3.0	<3.0	< 3.0	<3.0	< 3.0	<3.0	0.3	<3.0	<3.0
Dichlorodifluoromethane	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.4
Naphthalene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene (PCE)	2.9	5.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	21	18
Trichloroethene (TCE)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.4	1.2

1 - Hydrasleeve™ grab sample.

2 – Bailed three well volumes (WV) in accordance with the SAP.

NOTE: The less than (<) sign denotes the analyte was not detected at a concentration greater than the laboratory detection limit.

The analytical results of metals concentrations in ground water samples collected from the monitoring wells MW-1. MW-SF5. MW-SF6, MW-SF9 and MW-SF10 are shown in Table 3.2.

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Table 3.2 – Comparison of Metals in Hydrasleeve™ and Bailed Samples

Well ID:	MW-1		MW-SF5			MW-SF6	
Sample method:	H ¹	B ²	H	H (Dup)	B	H	B
Metal Analyte:	<i>(units are milligrams per liter, mg/L)</i>						
Arsenic	0.0040	0.0061	0.0031	0.0033	0.0032	0.045	0.033
Uranium	0.019	0.022	0.020	0.020	0.021	0.028	0.010
Arsenic-III	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Arsenic-V	< 5.0	6.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0

Table 3.2 – Comparison of Metals in Hydrasleeve™ and Bailed Samples (continued)

Well ID:	MW-SF9		MW-SF10	
Sample method:	H	B	H	B
Metal Analyte:	<i>(units are milligrams per liter, mg/L)</i>			
Arsenic	0.0029	0.005	< 0.0050	0.004
Uranium	0.012	0.010	0.014	0.020
Arsenic-III	< 5.0	< 5.0	< 5.0	< 5.0
Arsenic-V	< 5.0	< 5.0	< 5.0	< 5.0

1 - Hydrasleeve™ grab sample.

2 – Bailed three well volumes (WV) in accordance with the SAP.

NOTE: The less than (<) sign denotes the analyte was not detected at a concentration greater than the laboratory detection limit. The (Dup) indicates a duplicate sample.

The analytical results of samples collected by the Hydrasleeve™ method and the bail method did not indicate significant difference and did not appear to be biased in either a positive or negative manner, but rather the differences appear to be the result of sampling non-homogeneity and/or sampling result variability. This comparison was not performed on duplicate ground water samples, as the timing of samples collected from each well separated by a minimum of two days. Documentation of the validity of the Hydrasleeve™ methodology is provided in Appendix E.

Terracon's review of the reports listed above indicate that the use of the Hydrasleeve™ sampling method in accordance with the Hydrasleeve™ Interim Field Manual (GeoInsight, 2016) will result in comparable analytical results to both low flow sampling methods and the three well volume purge sampling method.

4.0 RECOMMENDATIONS

Terracon has several recommendations in connection with field procedures associated with ground water sample collection of the wells used to monitor the Griggs and Walnut Ground Water Plume site. These recommendations address both the SAP approved field procedures and omission of wells from the program, rehabilitation or maintenance and repair of select monitoring wells, and execution of future ground water monitoring events.

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SAP Field Procedures

Based on the results of this ground water monitoring event, Terracon recommends JSP team enter into negotiations with the EPA to amend the approved SAP for the site. Terracon recommends the following:

- § Omission of FLUTe well GMMW-08 sample ports 1 and 2 from the sampling program, as the U-shaped tubing for these ports are leaking.
- § Inclusion of the grab sample method of ground water sample collection using the Hydrasleeve™ method, as analytical results indicate that results from grab samples compared with results from samples collected using methods approved in the SAP are comparable. Additionally, the reduction in the level of effort required to obtain grab samples will result in significant reduction of costs associated with the field sampling efforts. The Hydrasleeve™ sampling method is detailed in the Hydrasleeve™ Interim Field Manual, (GeolInsight, 2016), provided as Appendix B.
- § Use of grab sample collection methods for the CLC production wells taken out of service (CLC-20, CLC-26 and CLC-57), as these wells contain a significant layer of turbine oil floating on top of the water within these wells.
- § Omission of monitoring wells MW-SF1, MW-SF2, MW-SF3 and MW-SF4 from the sampling program, due to obstructions within the well casing above the reported screened interval (MW-SF1 and MW-SF4), or due to the well covering or destruction from earth moving activities within the DAC facility.
- § Continued observation of MW-3, MW-4 and MW-5 to see if the ground water level will raise sufficiently to support sampling activities.

Well Rehabilitation, Maintenance or Repair

Based on the results of this ground water monitoring event, Terracon recommends JSP team consider the following actions:

- § As the ground surface surrounding FLUTe well GMMW-01 is significantly higher than the well vault, the area should be re-graded to the same elevation as the well vault cover, and designed in a manner to prevent surrounding soils from collapsing and covering the vault. This may involve construction of a concrete retaining structure to prevent collapse of the surrounding soils
- § A majority of the FLUTe well sample port connections are worn, and most were difficult to properly connect. Many of the nitrogen quick connectors installed at the sample ports exhibited drying and cracking of the o-ring seals and minor damage to locking mechanism of the quick connection fittings. Terracon recommends that all sample port quick

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connection fittings and discharge lines be inspected for excessive wear and breaks, and that all worn or damaged equipment be repaired and/or replaced.

- § Nested well GMMW-16S produces highly turbid water during the purge process. This well should be re-developed to properly remove fine-grained silts and clays from the filter pack.
- § The JSP team should consider the importance of monitoring wells MW-2 and MW-6 in supporting the objectives of the monitoring program. Based on this decision, these wells should be repaired or properly plugged and abandoned by a State of New Mexico licensed well driller in accordance with applicable requirements.
- § Wells CLC-20 and CLC-26 have a significant layer of non-aqueous turbine oil floating on top of ground water in the well casing. An attempt to remove this oil should be considered.
- § Plug and abandon monitoring wells MW-SF1, MW-SF2, MW-SF3 and MW-SF4 in accordance with applicable regulations.

Future Ground Water Monitoring Events

Terracon reviewed and compared field activities performed during this event with field logs of sampling events from previous years, and has the following recommendations:

- § Previous monitoring events have been performed by CLC personnel, who have additional duties in addition to the ground water sampling for the site. As such, the duration of these monitoring events have taken a minimum of six weeks or longer to complete. The JSP team should consider using a consulting firm to perform future monitoring events as these firms have the ability to dedicate an experienced sampling team to the project. Dedicated sampling teams will be able to execute a single monitoring event within a one-month time frame or less.
- § Terracon recommends that the annual monitoring event be scheduled earlier to avoid the holiday season of late November and December. A scheduled start date of early October will assure that delays to sample collection and laboratory analyses will not be adversely impacted by holiday schedules.

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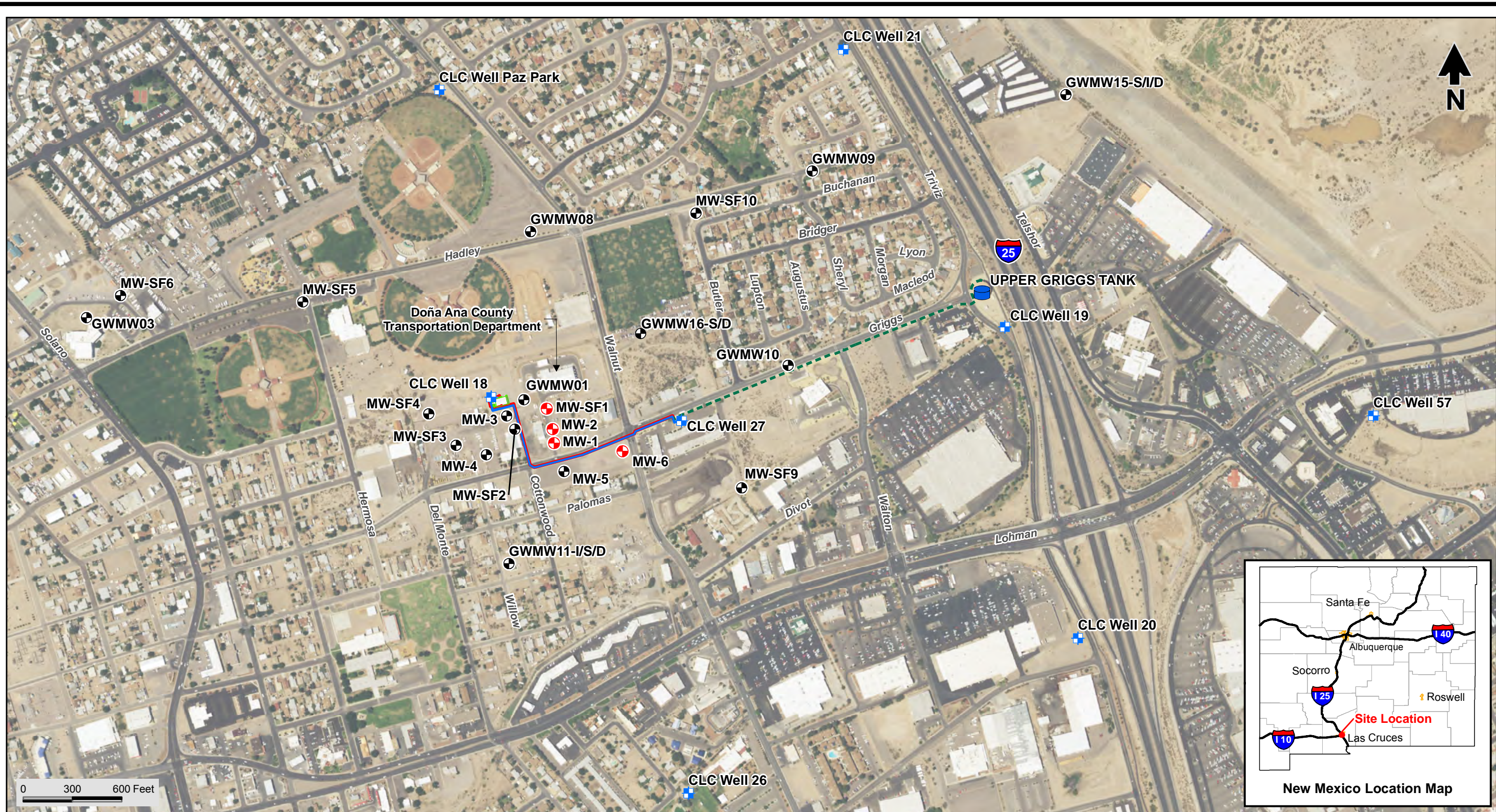


5.0 REFERENCES

- CDTSC, 2009; *Passive Sampling Pilot Study Report Stringfellow Hazardous Waste Site*, GeoLogic Associates for the California Department of Toxic Substances Control, July 2009.
- DBSA, 2016 *Griggs-Walnut ground Water Plume Site Remedial Action Project Area Map*, Daniel B. Stephens & Associates, Inc., April 2016.
- Geolnsight, 2016; *Hydrasleeve™ Interim Field Manual*, Geolnsight, 2016.
- NDCEE, 2010 *Novel In Situ Extraction Technologies for Contaminants in Groundwater (Task N.0441)*, National Defense Center for Energy and Environment, October 2010.
- USACE, 2005 *Results Report for the Demonstration of No-Purge Groundwater Sampling Devices at Former McClellan Air Force Base, California*, U.S. Army Corps of Engineers, October 2005.
- USGS, 2012 *Comparison of No-Purge and Pumped Sampling Methods for Monitoring Concentrations of Ordnance- Related Compounds in Groundwater, Camp Edwards, Massachusetts Military Reservation, Cape Cod, Massachusetts, 2009–2010*, U.S. Geological Survey Scientific Investigations Report 2012-5084, 2012.
- USGS, 2013 *Concentration Comparison of Selected Constituents between Groundwater Samples Collected within the Missouri River Alluvial Aquifer using Purge and Pump and Grab-Sampling Methods, near the City of Independence, Missouri, 2013*, U.S. Geological Survey Scientific Investigations Report 2015-5144, 2015.

APPENDIX A

Figure 1 – Project Area Map

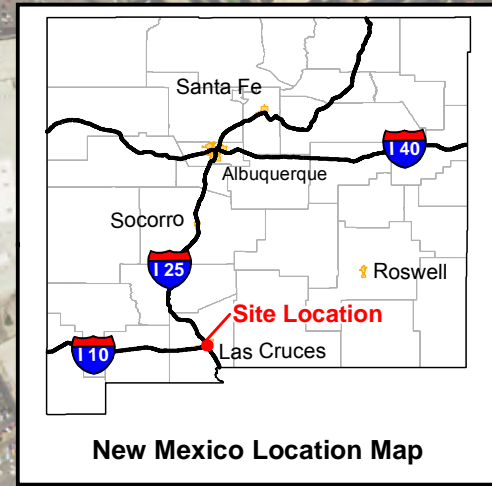


0 300 600 Feet

Explanation

- Monitor well
- ⊕ CLC supply well
- ⊕ Collapsed well
- ⊕ CLC water reservoir
- Existing 10" water line to reservoir
- 6" raw water line
- 8" finished water line
- Treatment compound

Source: National Agricultural Imagery Program October 2014.



GRIGGS-WALNUT GROUND WATER PLUME SITE
REMEDIAL ACTION
Project Area Map

S:\PROJECTS\09_0306_GRIGGS-WALNUT\GIS\MSX\REPORTS\2015_ANNUAL\FIG01_SITE_MW_LOCS.MXD

Daniel B. Stephens & Associates, Inc.
4/6/2016 JN ES09.0306

Figure 1

APPENDIX B

Hydrasleeve® Interim Field Manual

HYDRASleeve™

Simple by Design US Patents No. 6,481,300; No. 6,837,120; others pending

Interim Field Manual



The HydraSleeve is a simple tool. In keeping with the Simple by Design motto, these are the basic instructions. Please call if you have any questions.

800-996-2225

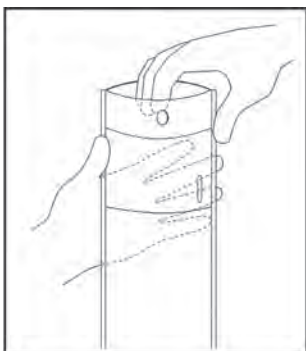
Introduction

Please read the manual in its entirety before sampling with HydraSleeve.

The HydraSleeve groundwater sampler can be used to collect a representative sample for most physical and chemical parameters without purging the well. It collects a whole water sample from a user-defined interval (typically within the well screen), without mixing fluid from other intervals. One or more HydraSleeves are placed within the screened interval of the monitoring well, and a period of time is allocated for the well to re-equilibrate. Hours to months later, the sealed HydraSleeve can be activated for sample collection. (Note: the new SpeedBags can be immediately deployed and recovered.) When activated by rapid upward motion, the check valve opens and the HydraSleeve collects a sample with no drawdown and minimal agitation or displacement of the water column. Once the sampler is full, the one-way reed valve collapses, preventing mixing of extraneous, non-representative fluid during recovery. HydraSleeves go in flat and closed and come out full and closed.

Assembly

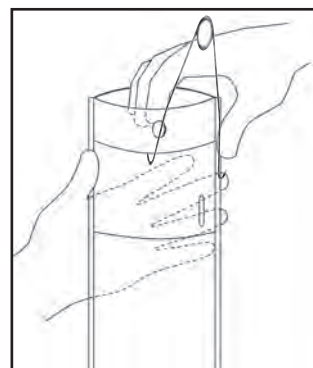
Assembling the HydraSleeve is simple, and can be done by one person in the field, taking only a minute or two.



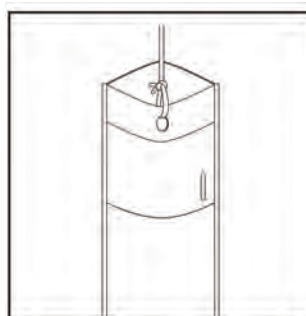
1 Remove HydraSleeve from package and grasp top to “pop” open. Remember to save the discharge tube for later.



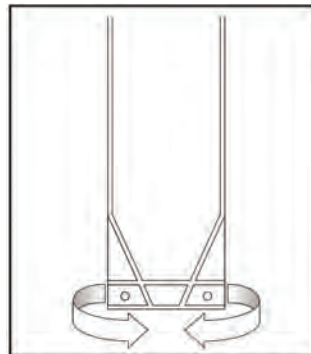
2 Squeeze side fins together at top to bend reinforcing strips outward. Crimp the corners to remain open



3 Preferred Attach the tethered spring clip (see separate spring clip instructions); or



4 Option B Alternatively attach the line to one side of the HydraSleeve if spring clips are not being used. Be sure the top is sharply crimped open.



5 Align the two holes at bottom of HydraSleeve together and attach weight with the weight clip.



6 Sampler is ready to be placed in the well.

Placing the HydraSleeve(s)

To collect a representative groundwater sample without purging, the well usually needs to be allowed time to equilibrate after placement of the sampler. When any device is lowered into a well, some mixing of the water column occurs. The diameter of the device, how tightly it fits in the well, and its shape greatly affect the degree of mixing. The flat cross-section of the empty HydraSleeve minimizes the disturbance to the water column as the sampler is lowered into position, reducing the time needed for the well to return to equilibrium. Using a SpeedBag HydraSleeve eliminates equilibration time for most wells.

There are several methods for holding a HydraSleeve in position as the well equilibrates.

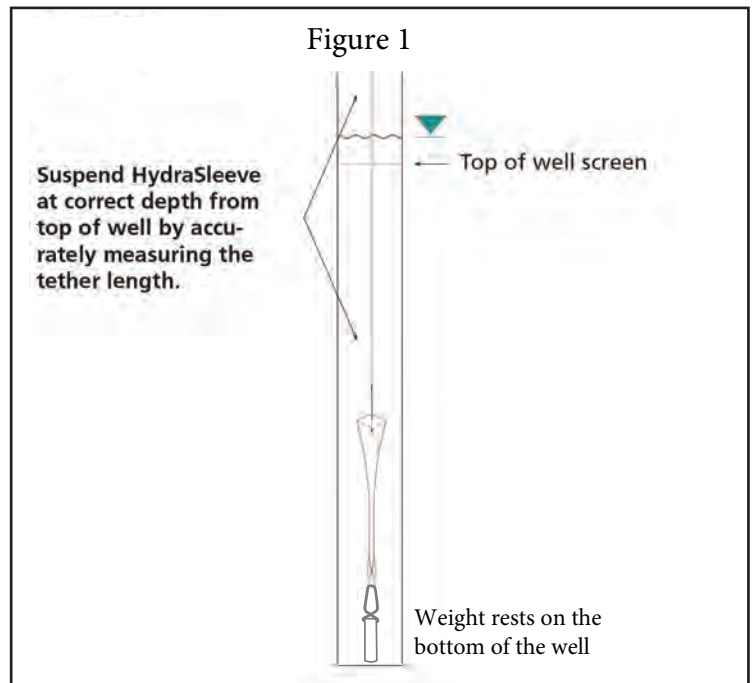
Most HydraSleeves and SuperSleeves are 3-5 feet long. The weight will go to the bottom of well but sample will come from upper half of well; because the sleeve will be suspended ~3-5 feet from the bottom up.

Most Common

TOP DOWN DEPLOYMENT (Figure 1)

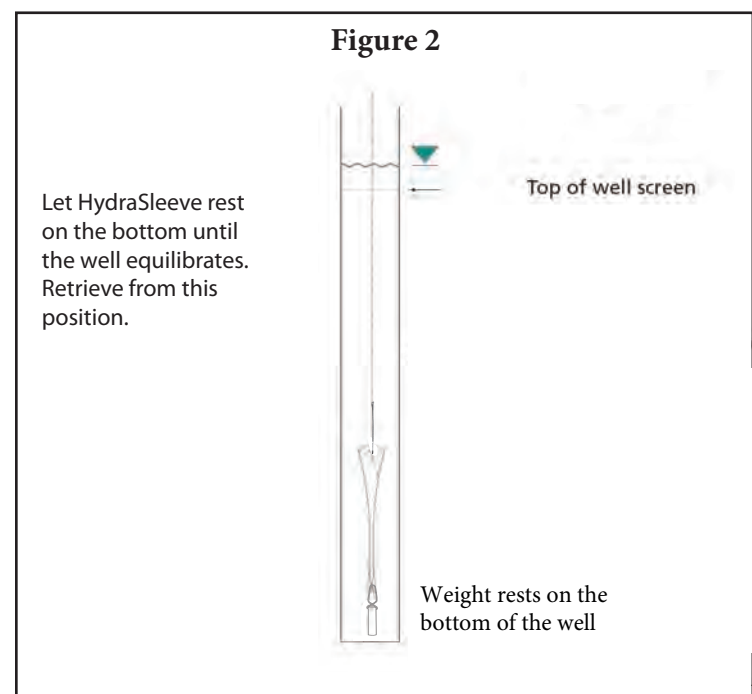
Measure the correct amount of suspension line needed to "hang" the top of the HydraSleeve(s) at the desired sampling depth (in most cases, this will be at the bottom of the sampling zone). The upper end of the tether can be connected to the well cap to suspend the HydraSleeve at the correct depth until activated for sampling.

Note: For deep settings, it may be difficult to accurately measure long segments of suspension line in the field. Using our optional calibrated tether (marked sequentially in feet) will help solve this problem.



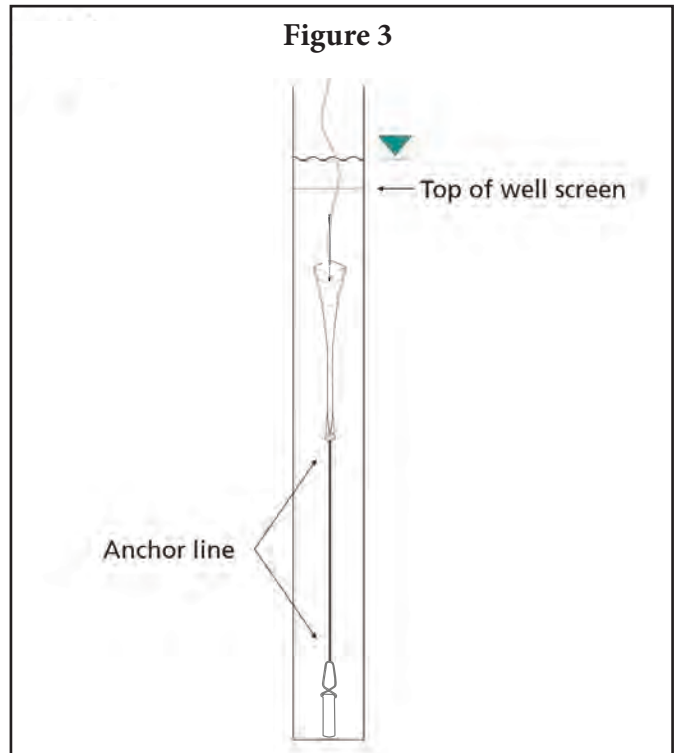
BOTTOM DEPLOYMENT (Figure 2)

Sound the well to determine the exact depth. Lower the weighted HydraSleeve into the well and let it rest on the bottom. The HydraSleeve sits suspended off the bottom & typically sample will be collected from the area directly above the top of the sleeve at this point without adjustment. Attach the suspension line to the top of the well to suspend it at this depth. (It is often easier to measure a few feet from the bottom of the well up to the sample point, than it is to measure many feet from the top of the well down.)



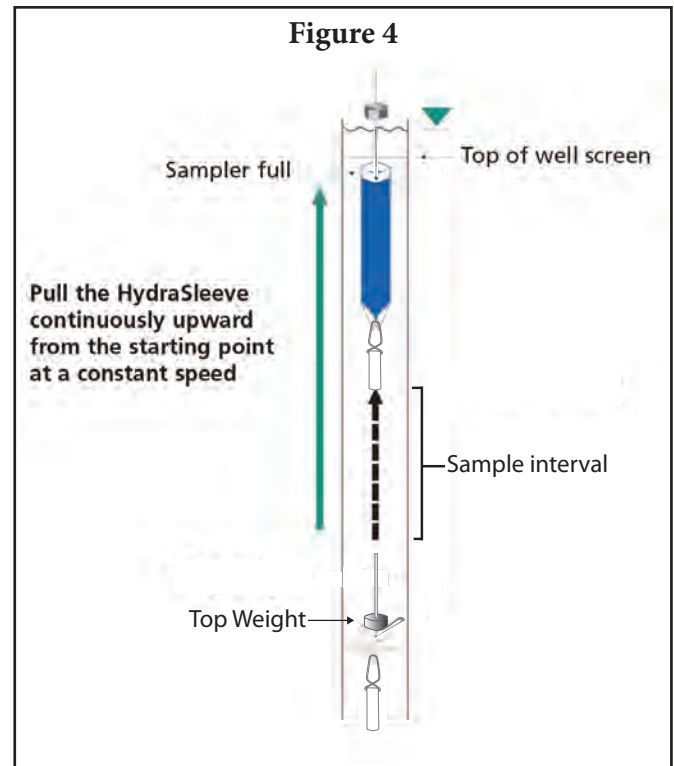
BOTTOM ANCHOR (Figure 3)

Determine the exact depth of the well.
Calculate the distance from the bottom of the well to the desired sampling depth.
Attach an appropriate length anchor line between the weight and the bottom of the sampler and lower the assembly until the weight rests on the bottom of the well, allowing the top of the sampler to float at the correct sampling depth.



TOP WEIGHTED ASSEMBLIES (Figure 4)

Using a top weight for short water columns will compress the HydraSleeve into the bottom of the well. This allows for sample collection to begin at the lowest point possible. It provides for more saturated screen above the check valve from which to collect the sample. Insert the top weighted assembly into the well. Allow it to reach the bottom. Be sure to leave enough slack (at least the length of the sampler) so that there is enough tether to allow the HydraSleeve to compress over a period of time. The length of time and compression area are determined by the type and size of HydraSleeve being used.



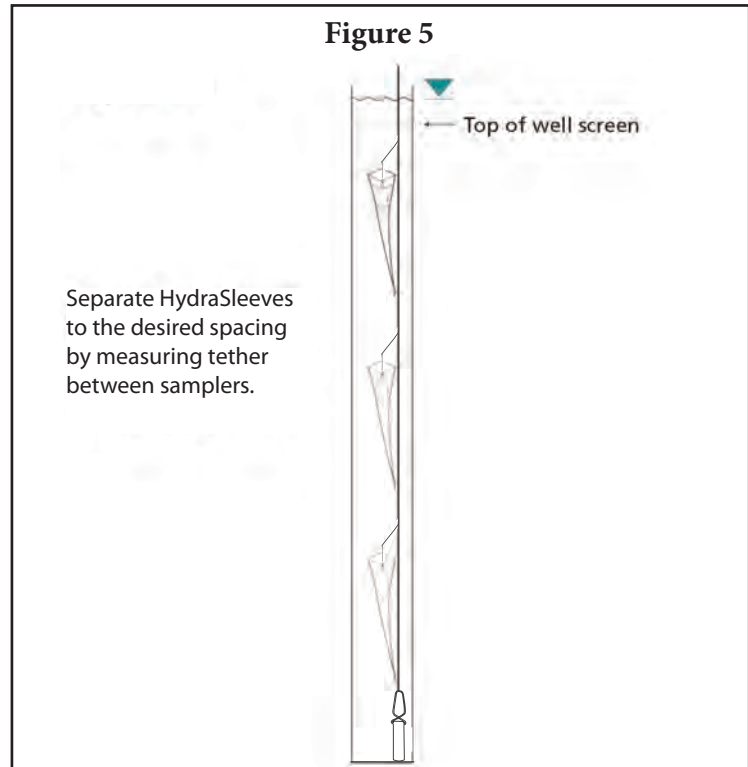
Multiple Interval Deployment

There are 3 basic methods for placing multiple HydraSleeves in a well to collect samples from different levels simultaneously.

ATTACHED TO A SINGLE TETHER (Figure 5)

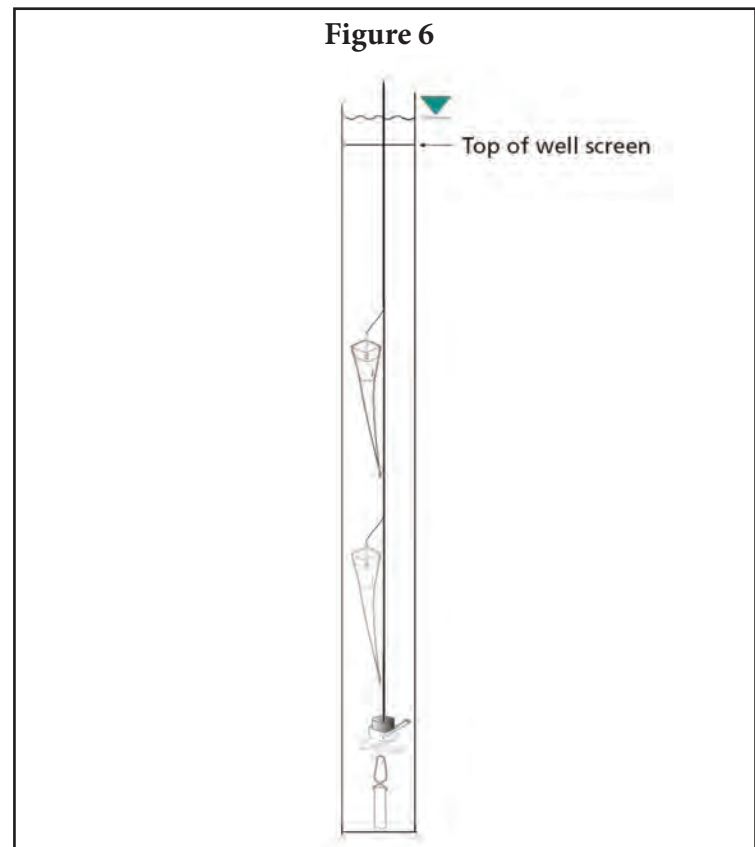
To use 3 or more samplers simultaneously, we recommend attaching them all to a tether for support to prevent the sampling string from pulling apart. The weight is attached to a single length of suspension line and allowed to rest on the bottom of the well. The top and bottom of each HydraSleeve are attached to the tether at the desired sample intervals. Cable tie or stainless steel clips (optional) work well for attaching the HydraSleeves to the line. Simply push one end of the clip between strands of the rope and tie a knot at the desired point before attaching the clip to the HydraSleeve.

Note: if many HydraSleeves are attached to a tether, more bottom weight will be required than with a single sampler.



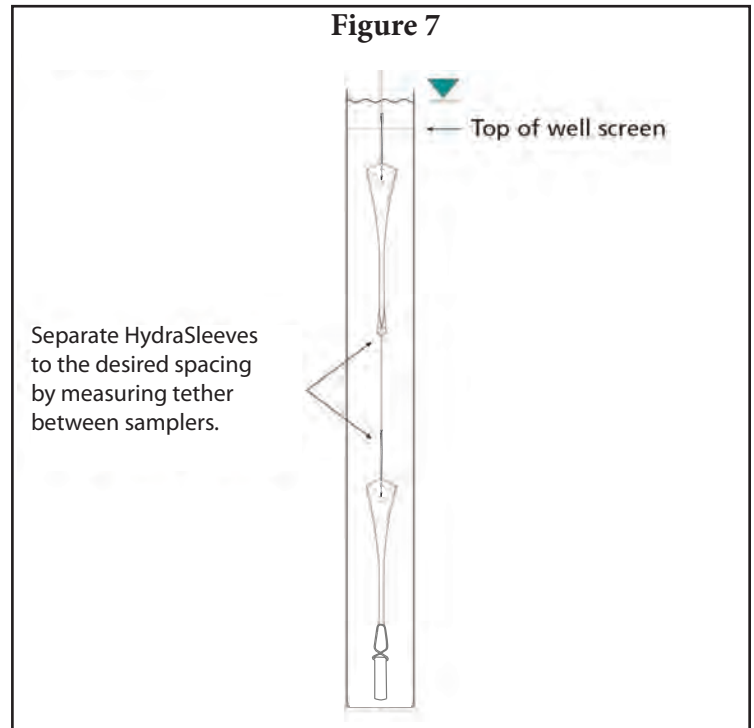
ATTACHED TO A SINGLE TETHER WITH A TOP WEIGHT ON THE BOTTOM (Figure 6)

Attach the HydraSleeves in the same manner as figure 5 but put a top weight on the bottom HydraSleeve. Remember to leave enough slack in the tether (at least the length of the bottom sleeve) so the assembly can be compressed into the bottom of the well.



ATTACHED END TO END (Figure 7)

To place 2 stacked HydraSleeves for vertical profiling, use one of the methods described above to locate where you want to place the bottom sampler. Attach the bottom of the top sampler to the top of the following HydraSleeve with a carefully measured length of suspension cable. Connect the weight to the bottom sampler. Heavier bottom weight will be required for this application.



NOTE: If multiple sleeves are being used solely to provide additional sample volume, consider a single longer (often top-weighted) custom sleeve instead of multiple shorter sleeves. It's simpler and more reliable.

Sample Collection

The HydraSleeve must move upward at a rate of one foot per second or faster (about the speed a bailer is usually pulled upward) for water to pass through the check valve into the sample sleeve. For most applications the HydraSleeve will fill within the length of the sampler. For example, a 30-inch HydraSleeve needs a total upward movement of 30 inches to fill.

There are times when the total upward distance the check valve must travel to fill the sample sleeve is longer. When using a smaller sleeve diameter in a larger diameter well the pull-to-fill distance will be longer. The upward motion can be accomplished using one of several variations of cycling or long continuous pull or any combination that moves the check valve the required distance within the saturated screen zone in the open position.

To ensure the Hydrosleeve is full and check valve closed we recommend one of the cycling methods is followed see below.

CONTINUOUS PULL (Figure 8)

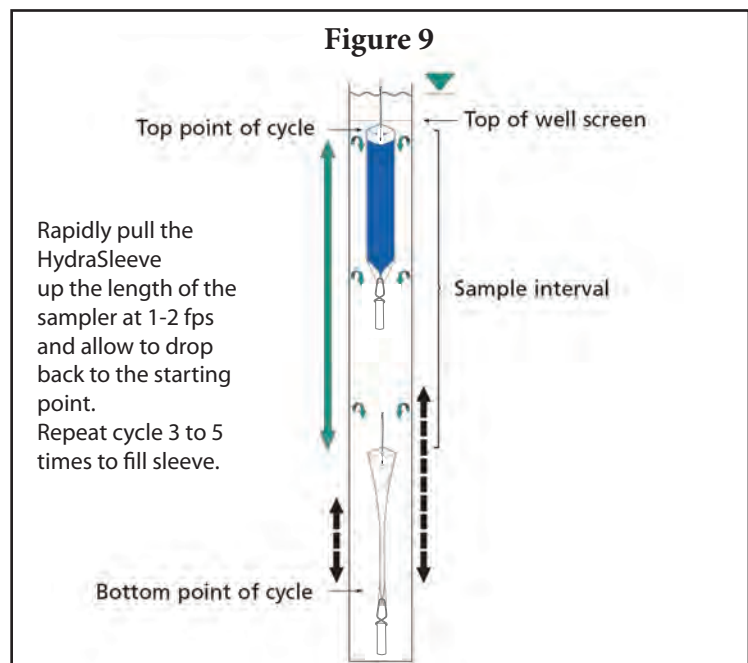
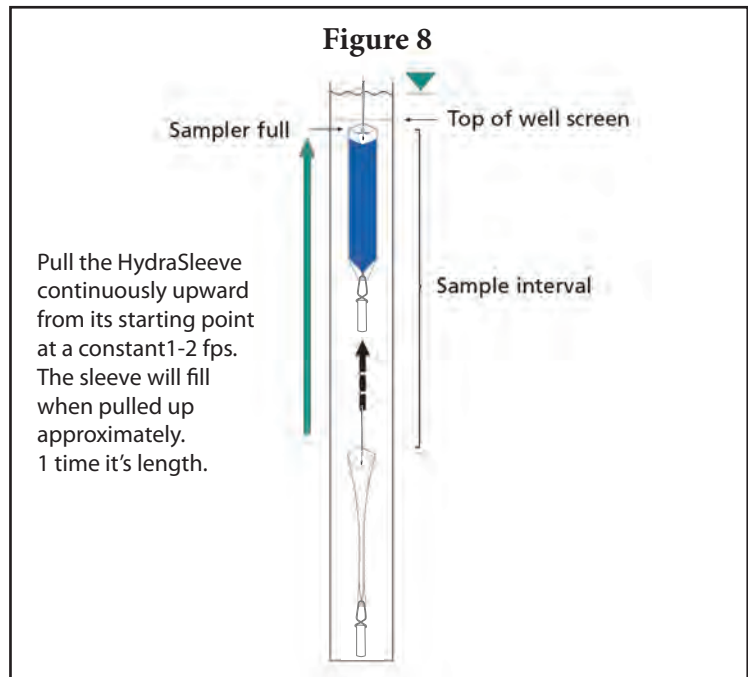
Pull the HydraSleeve continuously upward from its starting point at a constant 1 to 2 feet per second until full. This method is analogous to coring the water column from the bottom up.

Note: When using this method, the screen interval must be long enough so the sampler fills before exiting the top of the screen. Fill rate is dependent on the sleeve being sized for the well diameter. 2-inch sleeves for 2-inch wells. 4-inch sleeves for 4-inch wells. If using undersized sleeves please use a cycling method to assure the sleeve fills in the screened interval.

CYCLING THE SLEEVE (Figure 9)

Pull the sampler upward at about 1 to 2 feet or the length of the sampler and let it drop back to the starting point. Repeat the cycle 3 to 5 times.

This method provides a shorter sampling interval than the continuous pull method (above), and usually reduces the turbidity levels of the sample below that of numerous rapid, short cycles (below). The sample comes from between the top of the cycle and the bottom of the sampler at its lowest point.



Sample Discharge

The best way to remove a sample from the HydraSleeve with the least amount of aeration and agitation is with the short plastic discharge tube (included).

First, squeeze the full sampler just below the top to expel water resting above the flexible check valve. (Fig. 10, top right) Fold the stiffeners over to make sure all of the water is off the top of the check valve.

Then, push the pointed discharge tube through the outer polyethylene sleeve as desired but at least 3-4 inches below the white reinforcing strips. (Fig. 11, middle right)

Note: For some contaminants (VOC's/sinkers) the best location for discharge is the middle to bottom of the sampler. This would be representative of the deeper portion of the well screen.

Discharge the sample into the desired container.(Fig. 12, bottom right)

Raising and lowering the bottom of the sampler or pinching the sample sleeve just below the discharge tube will control the flow of the sample. The sample sleeve can also be squeezed, forcing fluid up through the discharge tube, similar to squeezing a tube of toothpaste. With a little practice, and using a flat surface to set the sample containers on, HydraSleeve sampling becomes a one-person operation.

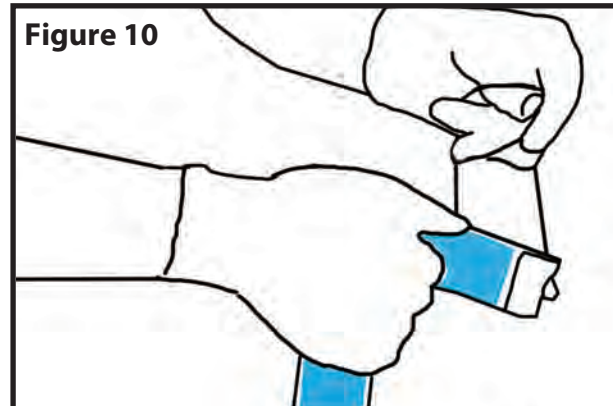


Figure 10

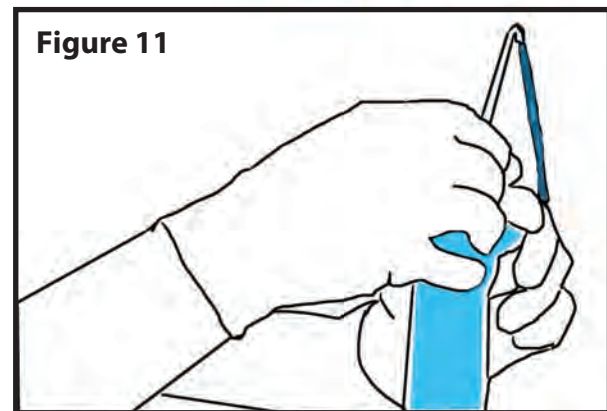


Figure 11

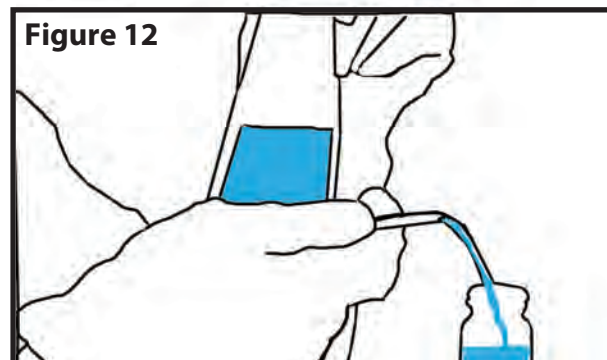


Figure 12



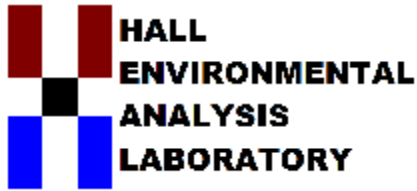
2007 Glass Road • Las Cruces, NM 88005

Phone: 1.800.996.2225 • 1.575.523.5799 • Fax: 1.575.523.0789

www.hydrasleeve.com info@hydrasleeve.com

APPENDIX C

Results of Laboratory Analyses



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

February 08, 2017

Kyle Williams

Terracon

4450 Bataan Memorial E

Las Cruces, NM 88005

TEL: (575) 527-1700

FAX (575) 527-1092

RE: Griggs & Walnut GW Plume

OrderNo.: 1701595

Dear Kyle Williams:

Hall Environmental Analysis Laboratory received 12 sample(s) on 1/14/2017 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued January 20, 2017.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

A handwritten signature in black ink, appearing to read "Andy Freeman", is written over a white background.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701595

Date Reported: 2/8/2017

CLIENT: Terracon

Client Sample ID: MWSF9-170112

Project: Griggs & Walnut GW Plume

Collection Date: 1/12/2017 3:15:00 PM

Lab ID: 1701595-001

Matrix: AQUEOUS

Received Date: 1/14/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0046	0.0010		mg/L	1	1/17/2017 2:36:34 PM	29713
Uranium	0.013	0.00050		mg/L	1	1/17/2017 2:36:34 PM	29713
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
Toluene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
Ethylbenzene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
Naphthalene	ND	2.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
1-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
2-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
Acetone	ND	10		µg/L	1	1/16/2017 2:37:36 PM	W40032
Bromobenzene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
Bromodichloromethane	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
Bromoform	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
Bromomethane	ND	3.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
2-Butanone	ND	10		µg/L	1	1/16/2017 2:37:36 PM	W40032
Carbon disulfide	ND	10		µg/L	1	1/16/2017 2:37:36 PM	W40032
Carbon Tetrachloride	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
Chlorobenzene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
Chloroethane	ND	2.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
Chloroform	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
Chloromethane	ND	3.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
2-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
4-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
cis-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
Dibromochloromethane	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
Dibromomethane	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
1,1-Dichloroethane	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
1,1-Dichloroethene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701595

Date Reported: 2/8/2017

CLIENT: Terracon

Client Sample ID: MWSF9-170112

Project: Griggs & Walnut GW Plume

Collection Date: 1/12/2017 3:15:00 PM

Lab ID: 1701595-001

Matrix: AQUEOUS

Received Date: 1/14/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
1,3-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
2,2-Dichloropropane	ND	2.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
1,1-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
Hexachlorobutadiene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
2-Hexanone	ND	10		µg/L	1	1/16/2017 2:37:36 PM	W40032
Isopropylbenzene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
4-Isopropyltoluene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
4-Methyl-2-pentanone	ND	10		µg/L	1	1/16/2017 2:37:36 PM	W40032
Methylene Chloride	ND	3.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
n-Butylbenzene	ND	3.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
n-Propylbenzene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
sec-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
Styrene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
tert-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
trans-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
Trichlorofluoromethane	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
Vinyl chloride	ND	1.0		µg/L	1	1/16/2017 2:37:36 PM	W40032
Xylenes, Total	ND	1.5		µg/L	1	1/16/2017 2:37:36 PM	W40032
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	1/16/2017 2:37:36 PM	W40032
Surr: 4-Bromofluorobenzene	94.7	70-130		%Rec	1	1/16/2017 2:37:36 PM	W40032
Surr: Dibromofluoromethane	102	70-130		%Rec	1	1/16/2017 2:37:36 PM	W40032
Surr: Toluene-d8	96.9	70-130		%Rec	1	1/16/2017 2:37:36 PM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701595

Date Reported: 2/8/2017

CLIENT: Terracon

Client Sample ID: Trip Blank

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701595-002

Matrix: AQUEOUS

Received Date: 1/14/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
Toluene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
Ethylbenzene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
Naphthalene	ND	2.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
1-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
2-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
Acetone	ND	10		µg/L	1	1/16/2017 4:06:21 PM	W40032
Bromobenzene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
Bromodichloromethane	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
Bromoform	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
Bromomethane	ND	3.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
2-Butanone	ND	10		µg/L	1	1/16/2017 4:06:21 PM	W40032
Carbon disulfide	ND	10		µg/L	1	1/16/2017 4:06:21 PM	W40032
Carbon Tetrachloride	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
Chlorobenzene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
Chloroethane	ND	2.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
Chloroform	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
Chloromethane	ND	3.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
2-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
4-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
cis-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
Dibromochloromethane	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
Dibromomethane	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
1,1-Dichloroethane	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
1,1-Dichloroethene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
1,2-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
1,3-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
2,2-Dichloropropane	ND	2.0		µg/L	1	1/16/2017 4:06:21 PM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701595

Date Reported: 2/8/2017

CLIENT: Terracon

Client Sample ID: Trip Blank

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701595-002

Matrix: AQUEOUS

Received Date: 1/14/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,1-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
Hexachlorobutadiene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
2-Hexanone	ND	10		µg/L	1	1/16/2017 4:06:21 PM	W40032
Isopropylbenzene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
4-Isopropyltoluene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
4-Methyl-2-pentanone	ND	10		µg/L	1	1/16/2017 4:06:21 PM	W40032
Methylene Chloride	ND	3.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
n-Butylbenzene	ND	3.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
n-Propylbenzene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
sec-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
Styrene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
tert-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
trans-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
Trichlorofluoromethane	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
Vinyl chloride	ND	1.0		µg/L	1	1/16/2017 4:06:21 PM	W40032
Xylenes, Total	ND	1.5		µg/L	1	1/16/2017 4:06:21 PM	W40032
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	1/16/2017 4:06:21 PM	W40032
Surr: 4-Bromofluorobenzene	93.9	70-130		%Rec	1	1/16/2017 4:06:21 PM	W40032
Surr: Dibromofluoromethane	102	70-130		%Rec	1	1/16/2017 4:06:21 PM	W40032
Surr: Toluene-d8	100	70-130		%Rec	1	1/16/2017 4:06:21 PM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701595

Date Reported: 2/8/2017

CLIENT: Terracon

Client Sample ID: Trip Blank

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701595-003

Matrix: AQUEOUS

Received Date: 1/14/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
Toluene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
Ethylbenzene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
Naphthalene	ND	2.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
1-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
2-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
Acetone	ND	10		µg/L	1	1/16/2017 4:35:50 PM	W40032
Bromobenzene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
Bromodichloromethane	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
Bromoform	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
Bromomethane	ND	3.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
2-Butanone	ND	10		µg/L	1	1/16/2017 4:35:50 PM	W40032
Carbon disulfide	ND	10		µg/L	1	1/16/2017 4:35:50 PM	W40032
Carbon Tetrachloride	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
Chlorobenzene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
Chloroethane	ND	2.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
Chloroform	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
Chloromethane	ND	3.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
2-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
4-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
cis-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
Dibromochloromethane	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
Dibromomethane	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
1,1-Dichloroethane	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
1,1-Dichloroethene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
1,2-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
1,3-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
2,2-Dichloropropane	ND	2.0		µg/L	1	1/16/2017 4:35:50 PM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701595

Date Reported: 2/8/2017

CLIENT: Terracon

Client Sample ID: Trip Blank

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701595-003

Matrix: AQUEOUS

Received Date: 1/14/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,1-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
Hexachlorobutadiene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
2-Hexanone	ND	10		µg/L	1	1/16/2017 4:35:50 PM	W40032
Isopropylbenzene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
4-Isopropyltoluene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
4-Methyl-2-pentanone	ND	10		µg/L	1	1/16/2017 4:35:50 PM	W40032
Methylene Chloride	ND	3.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
n-Butylbenzene	ND	3.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
n-Propylbenzene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
sec-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
Styrene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
tert-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
trans-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
Trichlorofluoromethane	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
Vinyl chloride	ND	1.0		µg/L	1	1/16/2017 4:35:50 PM	W40032
Xylenes, Total	ND	1.5		µg/L	1	1/16/2017 4:35:50 PM	W40032
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	1/16/2017 4:35:50 PM	W40032
Surr: 4-Bromofluorobenzene	96.3	70-130		%Rec	1	1/16/2017 4:35:50 PM	W40032
Surr: Dibromofluoromethane	104	70-130		%Rec	1	1/16/2017 4:35:50 PM	W40032
Surr: Toluene-d8	96.9	70-130		%Rec	1	1/16/2017 4:35:50 PM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701595

Date Reported: 2/8/2017

CLIENT: Terracon

Client Sample ID: FB-170113

Project: Griggs & Walnut GW Plume

Collection Date: 1/13/2017 1:00:00 PM

Lab ID: 1701595-004

Matrix: AQUEOUS

Received Date: 1/14/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
Toluene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
Ethylbenzene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
Naphthalene	ND	2.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
1-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
2-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
Acetone	ND	10		µg/L	1	1/16/2017 5:05:37 PM	W40032
Bromobenzene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
Bromodichloromethane	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
Bromoform	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
Bromomethane	ND	3.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
2-Butanone	ND	10		µg/L	1	1/16/2017 5:05:37 PM	W40032
Carbon disulfide	ND	10		µg/L	1	1/16/2017 5:05:37 PM	W40032
Carbon Tetrachloride	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
Chlorobenzene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
Chloroethane	ND	2.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
Chloroform	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
Chloromethane	ND	3.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
2-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
4-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
cis-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
Dibromochloromethane	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
Dibromomethane	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
1,1-Dichloroethane	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
1,1-Dichloroethene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
1,2-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
1,3-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
2,2-Dichloropropane	ND	2.0		µg/L	1	1/16/2017 5:05:37 PM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701595

Date Reported: 2/8/2017

CLIENT: Terracon

Client Sample ID: FB-170113

Project: Griggs & Walnut GW Plume

Collection Date: 1/13/2017 1:00:00 PM

Lab ID: 1701595-004

Matrix: AQUEOUS

Received Date: 1/14/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,1-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
Hexachlorobutadiene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
2-Hexanone	ND	10		µg/L	1	1/16/2017 5:05:37 PM	W40032
Isopropylbenzene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
4-Isopropyltoluene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
4-Methyl-2-pentanone	ND	10		µg/L	1	1/16/2017 5:05:37 PM	W40032
Methylene Chloride	ND	3.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
n-Butylbenzene	ND	3.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
n-Propylbenzene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
sec-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
Styrene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
tert-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
trans-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
Trichlorofluoromethane	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
Vinyl chloride	ND	1.0		µg/L	1	1/16/2017 5:05:37 PM	W40032
Xylenes, Total	ND	1.5		µg/L	1	1/16/2017 5:05:37 PM	W40032
Surr: 1,2-Dichloroethane-d4	104	70-130		%Rec	1	1/16/2017 5:05:37 PM	W40032
Surr: 4-Bromofluorobenzene	97.2	70-130		%Rec	1	1/16/2017 5:05:37 PM	W40032
Surr: Dibromofluoromethane	107	70-130		%Rec	1	1/16/2017 5:05:37 PM	W40032
Surr: Toluene-d8	93.5	70-130		%Rec	1	1/16/2017 5:05:37 PM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701595

Date Reported: 2/8/2017

CLIENT: Terracon

Client Sample ID: GWMW10-01-170113

Project: Griggs & Walnut GW Plume

Collection Date: 1/13/2017 2:10:00 PM

Lab ID: 1701595-005

Matrix: AQUEOUS

Received Date: 1/14/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	ND	0.0050		mg/L	5	1/17/2017 3:06:45 PM	29713
Uranium	0.021	0.00050		mg/L	1	1/17/2017 2:39:35 PM	29713
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
Toluene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
Ethylbenzene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
Naphthalene	ND	2.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
1-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
2-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
Acetone	ND	10		µg/L	1	1/16/2017 5:34:55 PM	W40032
Bromobenzene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
Bromodichloromethane	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
Bromoform	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
Bromomethane	ND	3.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
2-Butanone	ND	10		µg/L	1	1/16/2017 5:34:55 PM	W40032
Carbon disulfide	ND	10		µg/L	1	1/16/2017 5:34:55 PM	W40032
Carbon Tetrachloride	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
Chlorobenzene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
Chloroethane	ND	2.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
Chloroform	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
Chloromethane	ND	3.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
2-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
4-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
cis-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
Dibromochloromethane	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
Dibromomethane	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
1,1-Dichloroethane	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
1,1-Dichloroethene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701595

Date Reported: 2/8/2017

CLIENT: Terracon

Client Sample ID: GWMW10-01-170113

Project: Griggs & Walnut GW Plume

Collection Date: 1/13/2017 2:10:00 PM

Lab ID: 1701595-005

Matrix: AQUEOUS

Received Date: 1/14/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
1,3-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
2,2-Dichloropropane	ND	2.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
1,1-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
Hexachlorobutadiene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
2-Hexanone	ND	10		µg/L	1	1/16/2017 5:34:55 PM	W40032
Isopropylbenzene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
4-Isopropyltoluene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
4-Methyl-2-pentanone	ND	10		µg/L	1	1/16/2017 5:34:55 PM	W40032
Methylene Chloride	ND	3.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
n-Butylbenzene	ND	3.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
n-Propylbenzene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
sec-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
Styrene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
tert-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
Tetrachloroethene (PCE)	5.1	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
trans-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
Trichlorofluoromethane	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
Vinyl chloride	ND	1.0		µg/L	1	1/16/2017 5:34:55 PM	W40032
Xylenes, Total	ND	1.5		µg/L	1	1/16/2017 5:34:55 PM	W40032
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	1/16/2017 5:34:55 PM	W40032
Surr: 4-Bromofluorobenzene	90.9	70-130		%Rec	1	1/16/2017 5:34:55 PM	W40032
Surr: Dibromofluoromethane	104	70-130		%Rec	1	1/16/2017 5:34:55 PM	W40032
Surr: Toluene-d8	96.0	70-130		%Rec	1	1/16/2017 5:34:55 PM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701595

Date Reported: 2/8/2017

CLIENT: Terracon

Client Sample ID: GWMW10-02-170113

Project: Griggs & Walnut GW Plume

Collection Date: 1/13/2017 2:20:00 PM

Lab ID: 1701595-006

Matrix: AQUEOUS

Received Date: 1/14/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0017	0.0010		mg/L	1	1/17/2017 2:42:36 PM	29713
Uranium	ND	0.00050		mg/L	1	1/17/2017 2:42:36 PM	29713
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
Toluene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
Ethylbenzene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
Naphthalene	ND	2.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
1-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
2-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
Acetone	ND	10		µg/L	1	1/16/2017 11:12:24 AM	W40032
Bromobenzene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
Bromodichloromethane	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
Bromoform	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
Bromomethane	ND	3.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
2-Butanone	ND	10		µg/L	1	1/16/2017 11:12:24 AM	W40032
Carbon disulfide	ND	10		µg/L	1	1/16/2017 11:12:24 AM	W40032
Carbon Tetrachloride	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
Chlorobenzene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
Chloroethane	ND	2.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
Chloroform	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
Chloromethane	ND	3.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
2-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
4-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
cis-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
Dibromochloromethane	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
Dibromomethane	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
1,1-Dichloroethane	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
1,1-Dichloroethene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701595

Date Reported: 2/8/2017

CLIENT: Terracon

Client Sample ID: GWMW10-02-170113

Project: Griggs & Walnut GW Plume

Collection Date: 1/13/2017 2:20:00 PM

Lab ID: 1701595-006

Matrix: AQUEOUS

Received Date: 1/14/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
1,3-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
2,2-Dichloropropane	ND	2.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
1,1-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
Hexachlorobutadiene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
2-Hexanone	ND	10		µg/L	1	1/16/2017 11:12:24 AM	W40032
Isopropylbenzene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
4-Isopropyltoluene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
4-Methyl-2-pentanone	ND	10		µg/L	1	1/16/2017 11:12:24 AM	W40032
Methylene Chloride	ND	3.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
n-Butylbenzene	ND	3.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
n-Propylbenzene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
sec-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
Styrene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
tert-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
Tetrachloroethene (PCE)	17	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
trans-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
Trichlorofluoromethane	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
Vinyl chloride	ND	1.0		µg/L	1	1/16/2017 11:12:24 AM	W40032
Xylenes, Total	ND	1.5		µg/L	1	1/16/2017 11:12:24 AM	W40032
Surr: 1,2-Dichloroethane-d4	94.9	70-130		%Rec	1	1/16/2017 11:12:24 AM	W40032
Surr: 4-Bromofluorobenzene	99.1	70-130		%Rec	1	1/16/2017 11:12:24 AM	W40032
Surr: Dibromofluoromethane	95.7	70-130		%Rec	1	1/16/2017 11:12:24 AM	W40032
Surr: Toluene-d8	101	70-130		%Rec	1	1/16/2017 11:12:24 AM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701595

Date Reported: 2/8/2017

CLIENT: Terracon

Client Sample ID: GWMW10-03-170113

Project: Griggs & Walnut GW Plume

Collection Date: 1/13/2017 2:40:00 PM

Lab ID: 1701595-007

Matrix: AQUEOUS

Received Date: 1/14/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0017	0.0010		mg/L	1	1/17/2017 2:45:36 PM	29713
Uranium	ND	0.00050		mg/L	1	1/17/2017 2:45:36 PM	29713
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
Toluene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
Ethylbenzene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
Naphthalene	ND	2.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
1-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
2-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
Acetone	ND	10		µg/L	1	1/16/2017 11:41:44 AM	W40032
Bromobenzene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
Bromodichloromethane	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
Bromoform	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
Bromomethane	ND	3.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
2-Butanone	ND	10		µg/L	1	1/16/2017 11:41:44 AM	W40032
Carbon disulfide	ND	10		µg/L	1	1/16/2017 11:41:44 AM	W40032
Carbon Tetrachloride	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
Chlorobenzene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
Chloroethane	ND	2.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
Chloroform	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
Chloromethane	ND	3.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
2-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
4-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
cis-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
Dibromochloromethane	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
Dibromomethane	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
1,1-Dichloroethane	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
1,1-Dichloroethene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701595

Date Reported: 2/8/2017

CLIENT: Terracon

Client Sample ID: GWMW10-03-170113

Project: Griggs & Walnut GW Plume

Collection Date: 1/13/2017 2:40:00 PM

Lab ID: 1701595-007

Matrix: AQUEOUS

Received Date: 1/14/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
1,3-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
2,2-Dichloropropane	ND	2.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
1,1-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
Hexachlorobutadiene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
2-Hexanone	ND	10		µg/L	1	1/16/2017 11:41:44 AM	W40032
Isopropylbenzene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
4-Isopropyltoluene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
4-Methyl-2-pentanone	ND	10		µg/L	1	1/16/2017 11:41:44 AM	W40032
Methylene Chloride	ND	3.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
n-Butylbenzene	ND	3.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
n-Propylbenzene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
sec-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
Styrene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
tert-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
Tetrachloroethene (PCE)	16	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
trans-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
Trichlorofluoromethane	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
Vinyl chloride	ND	1.0		µg/L	1	1/16/2017 11:41:44 AM	W40032
Xylenes, Total	ND	1.5		µg/L	1	1/16/2017 11:41:44 AM	W40032
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	1/16/2017 11:41:44 AM	W40032
Surr: 4-Bromofluorobenzene	95.8	70-130		%Rec	1	1/16/2017 11:41:44 AM	W40032
Surr: Dibromofluoromethane	99.7	70-130		%Rec	1	1/16/2017 11:41:44 AM	W40032
Surr: Toluene-d8	96.6	70-130		%Rec	1	1/16/2017 11:41:44 AM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701595

Date Reported: 2/8/2017

CLIENT: Terracon

Client Sample ID: GWMW10-04-170113

Project: Griggs & Walnut GW Plume

Collection Date: 1/13/2017 2:55:00 PM

Lab ID: 1701595-008

Matrix: AQUEOUS

Received Date: 1/14/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0017	0.0010		mg/L	1	1/17/2017 2:54:42 PM	29713
Uranium	ND	0.00050		mg/L	1	1/17/2017 2:54:42 PM	29713
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
Toluene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
Ethylbenzene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
Naphthalene	ND	2.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
1-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
2-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
Acetone	ND	10		µg/L	1	1/16/2017 12:10:58 PM	W40032
Bromobenzene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
Bromodichloromethane	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
Bromoform	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
Bromomethane	ND	3.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
2-Butanone	ND	10		µg/L	1	1/16/2017 12:10:58 PM	W40032
Carbon disulfide	ND	10		µg/L	1	1/16/2017 12:10:58 PM	W40032
Carbon Tetrachloride	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
Chlorobenzene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
Chloroethane	ND	2.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
Chloroform	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
Chloromethane	ND	3.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
2-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
4-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
cis-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
Dibromochloromethane	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
Dibromomethane	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
1,1-Dichloroethane	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
1,1-Dichloroethene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701595

Date Reported: 2/8/2017

CLIENT: Terracon

Client Sample ID: GWMW10-04-170113

Project: Griggs & Walnut GW Plume

Collection Date: 1/13/2017 2:55:00 PM

Lab ID: 1701595-008

Matrix: AQUEOUS

Received Date: 1/14/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
1,3-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
2,2-Dichloropropane	ND	2.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
1,1-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
Hexachlorobutadiene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
2-Hexanone	ND	10		µg/L	1	1/16/2017 12:10:58 PM	W40032
Isopropylbenzene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
4-Isopropyltoluene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
4-Methyl-2-pentanone	ND	10		µg/L	1	1/16/2017 12:10:58 PM	W40032
Methylene Chloride	ND	3.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
n-Butylbenzene	ND	3.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
n-Propylbenzene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
sec-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
Styrene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
tert-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
Tetrachloroethene (PCE)	13	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
trans-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
Trichlorofluoromethane	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
Vinyl chloride	ND	1.0		µg/L	1	1/16/2017 12:10:58 PM	W40032
Xylenes, Total	ND	1.5		µg/L	1	1/16/2017 12:10:58 PM	W40032
Surr: 1,2-Dichloroethane-d4	100	70-130		%Rec	1	1/16/2017 12:10:58 PM	W40032
Surr: 4-Bromofluorobenzene	99.4	70-130		%Rec	1	1/16/2017 12:10:58 PM	W40032
Surr: Dibromofluoromethane	95.5	70-130		%Rec	1	1/16/2017 12:10:58 PM	W40032
Surr: Toluene-d8	100	70-130		%Rec	1	1/16/2017 12:10:58 PM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701595

Date Reported: 2/8/2017

CLIENT: Terracon

Client Sample ID: GWMW10-05-170113

Project: Griggs & Walnut GW Plume

Collection Date: 1/13/2017 3:05:00 PM

Lab ID: 1701595-009

Matrix: AQUEOUS

Received Date: 1/14/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0018	0.0010		mg/L	1	1/17/2017 2:57:42 PM	29713
Uranium	ND	0.00050		mg/L	1	1/17/2017 2:57:42 PM	29713
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
Toluene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
Ethylbenzene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
Naphthalene	ND	2.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
1-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
2-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
Acetone	ND	10		µg/L	1	1/16/2017 12:40:12 PM	W40032
Bromobenzene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
Bromodichloromethane	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
Bromoform	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
Bromomethane	ND	3.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
2-Butanone	ND	10		µg/L	1	1/16/2017 12:40:12 PM	W40032
Carbon disulfide	ND	10		µg/L	1	1/16/2017 12:40:12 PM	W40032
Carbon Tetrachloride	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
Chlorobenzene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
Chloroethane	ND	2.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
Chloroform	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
Chloromethane	ND	3.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
2-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
4-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
cis-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
Dibromochloromethane	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
Dibromomethane	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
1,1-Dichloroethane	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
1,1-Dichloroethene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701595

Date Reported: 2/8/2017

CLIENT: Terracon

Client Sample ID: GWMW10-05-170113

Project: Griggs & Walnut GW Plume

Collection Date: 1/13/2017 3:05:00 PM

Lab ID: 1701595-009

Matrix: AQUEOUS

Received Date: 1/14/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
1,3-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
2,2-Dichloropropane	ND	2.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
1,1-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
Hexachlorobutadiene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
2-Hexanone	ND	10		µg/L	1	1/16/2017 12:40:12 PM	W40032
Isopropylbenzene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
4-Isopropyltoluene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
4-Methyl-2-pentanone	ND	10		µg/L	1	1/16/2017 12:40:12 PM	W40032
Methylene Chloride	ND	3.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
n-Butylbenzene	ND	3.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
n-Propylbenzene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
sec-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
Styrene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
tert-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
Tetrachloroethene (PCE)	9.0	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
trans-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
Trichlorofluoromethane	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
Vinyl chloride	ND	1.0		µg/L	1	1/16/2017 12:40:12 PM	W40032
Xylenes, Total	ND	1.5		µg/L	1	1/16/2017 12:40:12 PM	W40032
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	1/16/2017 12:40:12 PM	W40032
Surr: 4-Bromofluorobenzene	94.2	70-130		%Rec	1	1/16/2017 12:40:12 PM	W40032
Surr: Dibromofluoromethane	103	70-130		%Rec	1	1/16/2017 12:40:12 PM	W40032
Surr: Toluene-d8	96.0	70-130		%Rec	1	1/16/2017 12:40:12 PM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701595

Date Reported: 2/8/2017

CLIENT: Terracon

Client Sample ID: GWMW10-06-170113

Project: Griggs & Walnut GW Plume

Collection Date: 1/13/2017 3:10:00 PM

Lab ID: 1701595-010

Matrix: AQUEOUS

Received Date: 1/14/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0023	0.0010		mg/L	1	1/17/2017 3:00:43 PM	29713
Uranium	ND	0.00050		mg/L	1	1/17/2017 3:00:43 PM	29713
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
Toluene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
Ethylbenzene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
Naphthalene	ND	2.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
1-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
2-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
Acetone	ND	10		µg/L	1	1/16/2017 1:09:20 PM	W40032
Bromobenzene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
Bromodichloromethane	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
Bromoform	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
Bromomethane	ND	3.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
2-Butanone	ND	10		µg/L	1	1/16/2017 1:09:20 PM	W40032
Carbon disulfide	ND	10		µg/L	1	1/16/2017 1:09:20 PM	W40032
Carbon Tetrachloride	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
Chlorobenzene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
Chloroethane	ND	2.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
Chloroform	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
Chloromethane	ND	3.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
2-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
4-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
cis-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
Dibromochloromethane	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
Dibromomethane	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
1,1-Dichloroethane	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
1,1-Dichloroethene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701595

Date Reported: 2/8/2017

CLIENT: Terracon

Client Sample ID: GWMW10-06-170113

Project: Griggs & Walnut GW Plume

Collection Date: 1/13/2017 3:10:00 PM

Lab ID: 1701595-010

Matrix: AQUEOUS

Received Date: 1/14/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
1,3-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
2,2-Dichloropropane	ND	2.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
1,1-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
Hexachlorobutadiene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
2-Hexanone	ND	10		µg/L	1	1/16/2017 1:09:20 PM	W40032
Isopropylbenzene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
4-Isopropyltoluene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
4-Methyl-2-pentanone	ND	10		µg/L	1	1/16/2017 1:09:20 PM	W40032
Methylene Chloride	ND	3.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
n-Butylbenzene	ND	3.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
n-Propylbenzene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
sec-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
Styrene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
tert-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
Tetrachloroethene (PCE)	7.3	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
trans-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
Trichlorofluoromethane	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
Vinyl chloride	ND	1.0		µg/L	1	1/16/2017 1:09:20 PM	W40032
Xylenes, Total	ND	1.5		µg/L	1	1/16/2017 1:09:20 PM	W40032
Surr: 1,2-Dichloroethane-d4	98.4	70-130		%Rec	1	1/16/2017 1:09:20 PM	W40032
Surr: 4-Bromofluorobenzene	96.7	70-130		%Rec	1	1/16/2017 1:09:20 PM	W40032
Surr: Dibromofluoromethane	103	70-130		%Rec	1	1/16/2017 1:09:20 PM	W40032
Surr: Toluene-d8	96.4	70-130		%Rec	1	1/16/2017 1:09:20 PM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701595

Date Reported: 2/8/2017

CLIENT: Terracon

Client Sample ID: GWMW10-07-170113

Project: Griggs & Walnut GW Plume

Collection Date: 1/13/2017 3:20:00 PM

Lab ID: 1701595-011

Matrix: AQUEOUS

Received Date: 1/14/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0026	0.0010		mg/L	1	1/17/2017 3:03:43 PM	29713
Uranium	ND	0.00050		mg/L	1	1/17/2017 3:03:43 PM	29713
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
Toluene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
Ethylbenzene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
Naphthalene	ND	2.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
1-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
2-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
Acetone	ND	10		µg/L	1	1/16/2017 1:38:41 PM	W40032
Bromobenzene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
Bromodichloromethane	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
Bromoform	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
Bromomethane	ND	3.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
2-Butanone	ND	10		µg/L	1	1/16/2017 1:38:41 PM	W40032
Carbon disulfide	ND	10		µg/L	1	1/16/2017 1:38:41 PM	W40032
Carbon Tetrachloride	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
Chlorobenzene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
Chloroethane	ND	2.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
Chloroform	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
Chloromethane	ND	3.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
2-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
4-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
cis-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
Dibromochloromethane	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
Dibromomethane	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
1,1-Dichloroethane	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
1,1-Dichloroethene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701595

Date Reported: 2/8/2017

CLIENT: Terracon

Client Sample ID: GWMW10-07-170113

Project: Griggs & Walnut GW Plume

Collection Date: 1/13/2017 3:20:00 PM

Lab ID: 1701595-011

Matrix: AQUEOUS

Received Date: 1/14/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
1,3-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
2,2-Dichloropropane	ND	2.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
1,1-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
Hexachlorobutadiene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
2-Hexanone	ND	10		µg/L	1	1/16/2017 1:38:41 PM	W40032
Isopropylbenzene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
4-Isopropyltoluene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
4-Methyl-2-pentanone	ND	10		µg/L	1	1/16/2017 1:38:41 PM	W40032
Methylene Chloride	ND	3.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
n-Butylbenzene	ND	3.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
n-Propylbenzene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
sec-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
Styrene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
tert-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
Tetrachloroethene (PCE)	7.5	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
trans-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
Trichlorofluoromethane	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
Vinyl chloride	ND	1.0		µg/L	1	1/16/2017 1:38:41 PM	W40032
Xylenes, Total	ND	1.5		µg/L	1	1/16/2017 1:38:41 PM	W40032
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	1/16/2017 1:38:41 PM	W40032
Surr: 4-Bromofluorobenzene	95.0	70-130		%Rec	1	1/16/2017 1:38:41 PM	W40032
Surr: Dibromofluoromethane	101	70-130		%Rec	1	1/16/2017 1:38:41 PM	W40032
Surr: Toluene-d8	95.8	70-130		%Rec	1	1/16/2017 1:38:41 PM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701595

Date Reported: 2/8/2017

CLIENT: Terracon

Client Sample ID: GWMW10-02-170113 DUP

Project: Griggs & Walnut GW Plume

Collection Date: 1/13/2017 2:20:00 PM

Lab ID: 1701595-012

Matrix: AQUEOUS

Received Date: 1/14/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0017	0.0010		mg/L	1	1/17/2017 3:09:47 PM	29713
Uranium	ND	0.00050		mg/L	1	1/17/2017 3:09:47 PM	29713
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
Toluene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
Ethylbenzene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
Naphthalene	ND	2.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
1-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
2-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
Acetone	ND	10		µg/L	1	1/16/2017 2:07:58 PM	W40032
Bromobenzene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
Bromodichloromethane	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
Bromoform	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
Bromomethane	ND	3.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
2-Butanone	ND	10		µg/L	1	1/16/2017 2:07:58 PM	W40032
Carbon disulfide	ND	10		µg/L	1	1/16/2017 2:07:58 PM	W40032
Carbon Tetrachloride	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
Chlorobenzene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
Chloroethane	ND	2.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
Chloroform	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
Chloromethane	ND	3.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
2-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
4-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
cis-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
Dibromochloromethane	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
Dibromomethane	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
1,1-Dichloroethane	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
1,1-Dichloroethene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701595

Date Reported: 2/8/2017

CLIENT: Terracon

Client Sample ID: GWMW10-02-170113 DUP

Project: Griggs & Walnut GW Plume

Collection Date: 1/13/2017 2:20:00 PM

Lab ID: 1701595-012

Matrix: AQUEOUS

Received Date: 1/14/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
1,3-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
2,2-Dichloropropane	ND	2.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
1,1-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
Hexachlorobutadiene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
2-Hexanone	ND	10		µg/L	1	1/16/2017 2:07:58 PM	W40032
Isopropylbenzene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
4-Isopropyltoluene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
4-Methyl-2-pentanone	ND	10		µg/L	1	1/16/2017 2:07:58 PM	W40032
Methylene Chloride	ND	3.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
n-Butylbenzene	ND	3.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
n-Propylbenzene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
sec-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
Styrene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
tert-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
Tetrachloroethene (PCE)	18	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
trans-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
Trichlorofluoromethane	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
Vinyl chloride	ND	1.0		µg/L	1	1/16/2017 2:07:58 PM	W40032
Xylenes, Total	ND	1.5		µg/L	1	1/16/2017 2:07:58 PM	W40032
Surr: 1,2-Dichloroethane-d4	100	70-130		%Rec	1	1/16/2017 2:07:58 PM	W40032
Surr: 4-Bromofluorobenzene	93.1	70-130		%Rec	1	1/16/2017 2:07:58 PM	W40032
Surr: Dibromofluoromethane	103	70-130		%Rec	1	1/16/2017 2:07:58 PM	W40032
Surr: Toluene-d8	97.5	70-130		%Rec	1	1/16/2017 2:07:58 PM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not indicated
Lab ID: H17010191-001
Client Sample ID: 1701595-001C MW5F9-170112

Report Date: 01/20/17
Collection Date: 01/12/17 15:15
Date Received: 01/17/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/18/17 16:07 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/18/17 16:07 / rgk

Report Definitions:
RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010191-002
Client Sample ID: 1701595-005C GWMW10-01-170113

Report Date: 01/20/17
Collection Date: 01/13/17 14:10
Date Received: 01/17/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/18/17 16:43 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/18/17 16:43 / rgk

Report Definitions:
 RL - Analyte reporting limit.
 QCL - Quality control limit.

MCL - Maximum contaminant level.
 ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010191-003
Client Sample ID: 1701595-006C GWMW10-02-170113

Report Date: 01/20/17
Collection Date: 01/13/17 14:20
Date Received: 01/17/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/18/17 16:55 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/18/17 16:55 / rgk

Report Definitions:
 RL - Analyte reporting limit.
 QCL - Quality control limit.

MCL - Maximum contaminant level.
 ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010191-004
Client Sample ID: 1701595-007C GMMW10-03-170113

Report Date: 01/20/17
Collection Date: 01/13/17 14:40
Date Received: 01/17/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/18/17 17:07 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/18/17 17:07 / rgk

Report Definitions: RL - Analyte reporting limit.
 QCL - Quality control limit.

MCL - Maximum contaminant level.
 ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010191-005
Client Sample ID: 1701595-008C GWMW10-04-170113

Report Date: 01/20/17
Collection Date: 01/13/17 14:55
Date Received: 01/17/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/18/17 17:19 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/18/17 17:19 / rgk

Report Definitions:
 RL - Analyte reporting limit.
 QCL - Quality control limit.

MCL - Maximum contaminant level.
 ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010191-006
Client Sample ID: 1701595-009C GWMW10-05-170113

Report Date: 01/20/17
Collection Date: 01/13/17 15:05
Date Received: 01/17/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/18/17 17:31 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/18/17 17:31 / rgk

Report Definitions:
 RL - Analyte reporting limit.
 QCL - Quality control limit.

MCL - Maximum contaminant level.
 ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010191-007
Client Sample ID: 1701595-0010C GMMW10-06-170113

Report Date: 01/20/17
Collection Date: 01/13/17 15:10
Date Received: 01/17/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/18/17 17:43 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/18/17 17:43 / rgk

Report Definitions:
 RL - Analyte reporting limit.
 QCL - Quality control limit.

MCL - Maximum contaminant level.
 ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010191-008
Client Sample ID: 1701595-0011C GMMW10-07-170113

Report Date: 01/20/17
Collection Date: 01/13/17 15:20
Date Received: 01/17/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/18/17 17:55 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/18/17 17:55 / rgk

Report Definitions:
 RL - Analyte reporting limit.
 QCL - Quality control limit.

MCL - Maximum contaminant level.
 ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental

Project: Not Indicated

Lab ID: H17010191-009

Client Sample ID: 1701595-0012C GWMW10-02-170113 DUP

Report Date: 01/20/17

Collection Date: 01/13/17 14:20

Date Received: 01/17/17

Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/18/17 18:07 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/18/17 18:07 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hall Environmental

Report Date: 01/20/17

Project: Not Indicated

Work Order: H17010191

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E1632AM							Analytical Run: ARSENIC SPECIATION_170118A		
Lab ID:	AS-ICV 25ppb-1/18/2017	Initial Calibration Verification Standard							01/18/17 15:07
Arsenic-III	25.2	ug/L	5.0	101	87.6	114			
Arsenic-V	24.7	ug/L	5.0	99	87	116			
Lab ID:	AS-50.0-1/18/2017	Continuing Calibration Verification Standard							01/18/17 15:19
Arsenic-III	45.9	ug/L	5.0	92	85	115			
Arsenic-V	53.9	ug/L	5.0	108	85	115			
Method: E1632AM							Batch: R122181		
Lab ID:	AS-LFB 50ppb-1/18/2017	Laboratory Fortified Blank							01/18/17 15:43
Arsenic-III	50.0	ug/L	5.0	100	55	146			
Arsenic-V	47.1	ug/L	5.0	94	55	146			
Lab ID:	ICB	Method Blank							01/18/17 15:55
Arsenic-III	ND	ug/L	0.2						
Arsenic-V	ND	ug/L	0.5						
Lab ID:	H17010191-001A MS	Sample Matrix Spike							01/18/17 16:19
Arsenic-III	53.0	ug/L	5.0	106	55	146			
Arsenic-V	53.1	ug/L	5.0	101	55	146			
Lab ID:	H17010191-001A MSD	Sample Matrix Spike Duplicate							01/18/17 16:31
Arsenic-III	47.9	ug/L	5.0	96	55	146	10	20	
Arsenic-V	52.7	ug/L	5.0	100	55	146	0.8	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701595

08-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	MB-29713	SampType:	MBLK	TestCode:	200.8 ICPMS Metals:Total					
Client ID:	PBW	Batch ID:	29713	RunNo:	40070					
Prep Date:	1/16/2017	Analysis Date:	1/17/2017	SeqNo:	1255934	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010								
Uranium	ND	0.00050								

Sample ID	MSLCS-29713	SampType:	LCS	TestCode:	200.8 ICPMS Metals:Total					
Client ID:	LCSW	Batch ID:	29713	RunNo:	40070					
Prep Date:	1/16/2017	Analysis Date:	1/17/2017	SeqNo:	1255936	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.024	0.0010	0.02500	0	95.3	85	115			
Uranium	0.012	0.00050	0.01250	0	97.4	85	115			

Sample ID	MSLLLCS-29713	SampType:	LCSLL	TestCode:	200.8 ICPMS Metals:Total					
Client ID:	BatchQC	Batch ID:	29713	RunNo:	40070					
Prep Date:	1/16/2017	Analysis Date:	1/17/2017	SeqNo:	1255938	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.0011	0.0010	0.001000	0	114	50	150			
Uranium	ND	0.00050	0.0005000	0	99.1	50	150			

Qualifiers:

- | | |
|---|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| H Holding times for preparation or analysis exceeded | J Analyte detected below quantitation limits |
| ND Not Detected at the Reporting Limit | P Sample pH Not In Range |
| R RPD outside accepted recovery limits | RL Reporting Detection Limit |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701595

08-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	rb	SampType:	MBLK		TestCode:	EPA Method 8260B: VOLATILES				
Client ID:	PBW	Batch ID:	W40032		RunNo:	40032				
Prep Date:		Analysis Date:	1/16/2017		SeqNo:	1254687	Units:	µg/L		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701595

08-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID rb	SampType: MBLK	TestCode: EPA Method 8260B: VOLATILES
Client ID: PBW	Batch ID: W40032	RunNo: 40032
Prep Date:	Analysis Date: 1/16/2017	SeqNo: 1254687 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.7		10.00		97.0	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		98.7	70	130			
Surr: Dibromofluoromethane	9.8		10.00		98.0	70	130			
Surr: Toluene-d8	10		10.00		101	70	130			

Sample ID 100ng lcs	SampType: LCS	TestCode: EPA Method 8260B: VOLATILES
Client ID: LCSW	Batch ID: W40032	RunNo: 40032
Prep Date:	Analysis Date: 1/16/2017	SeqNo: 1254688 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	101	70	130			
Toluene	20	1.0	20.00	0	98.1	70	130			
Chlorobenzene	21	1.0	20.00	0	104	70	130			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701595

08-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID 100ng lcs	SampType: LCS		TestCode: EPA Method 8260B: VOLATILES							
Client ID: LCSW	Batch ID: W40032		RunNo: 40032							
Prep Date:	Analysis Date: 1/16/2017		SeqNo: 1254688		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloroethene	18	1.0	20.00	0	91.9	70	130			
Trichloroethene (TCE)	19	1.0	20.00	0	93.3	70	130			
Surr: 1,2-Dichloroethane-d4	9.4		10.00		94.1	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		102	70	130			
Surr: Dibromofluoromethane	9.5		10.00		95.0	70	130			
Surr: Toluene-d8	10		10.00		99.7	70	130			

Sample ID 1701595-001a ms	SampType: MS		TestCode: EPA Method 8260B: VOLATILES							
Client ID: MWSF9-170112	Batch ID: W40032		RunNo: 40032							
Prep Date:	Analysis Date: 1/16/2017		SeqNo: 1255034		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	22	1.0	20.00	0	110	70	130			
Toluene	20	1.0	20.00	0	98.5	70	130			
Chlorobenzene	19	1.0	20.00	0	96.9	70	130			
1,1-Dichloroethene	20	1.0	20.00	0	98.1	70	130			
Trichloroethene (TCE)	20	1.0	20.00	0	101	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		104	70	130			
Surr: 4-Bromofluorobenzene	9.6		10.00		96.3	70	130			
Surr: Dibromofluoromethane	10		10.00		104	70	130			
Surr: Toluene-d8	9.6		10.00		96.0	70	130			

Sample ID 1701595-001a msd	SampType: MSD		TestCode: EPA Method 8260B: VOLATILES							
Client ID: MWSF9-170112	Batch ID: W40032		RunNo: 40032							
Prep Date:	Analysis Date: 1/16/2017		SeqNo: 1255035		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	105	70	130	3.89	20	
Toluene	19	1.0	20.00	0	93.4	70	130	5.31	20	
Chlorobenzene	19	1.0	20.00	0	93.8	70	130	3.26	20	
1,1-Dichloroethene	18	1.0	20.00	0	91.1	70	130	7.32	20	
Trichloroethene (TCE)	19	1.0	20.00	0	96.1	70	130	5.15	20	
Surr: 1,2-Dichloroethane-d4	10		10.00		102	70	130	0	0	
Surr: 4-Bromofluorobenzene	9.3		10.00		92.6	70	130	0	0	
Surr: Dibromofluoromethane	10		10.00		103	70	130	0	0	
Surr: Toluene-d8	9.3		10.00		93.4	70	130	0	0	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified



Hall Environmental Analysis Laboratory
 4901 Hawkins NE
 Albuquerque, NM 87109
 TEL: 505-345-3975 FAX: 505-345-4107
 Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: TER-LC

Work Order Number: 1701595

RcptNo: 1

Received by/date: ~~_____~~ 01/14/17

Logged By: Lindsay Mangin 1/14/2017 9:00:00 AM *Lindsay Mangin*

Completed By: Lindsay Mangin 1/14/2017 10:43:18 AM *Lindsay Mangin*

Reviewed By: *AM* 1/16/17

Chain of Custody

- Custody seals intact on sample bottles? Yes No Not Present
- Is Chain of Custody complete? Yes No Not Present
- How was the sample delivered? FedEx

Log In

- Was an attempt made to cool the samples? Yes No NA
- Were all samples received at a temperature of >0° C to 6.0° C Yes No NA
- Sample(s) in proper container(s)? Yes No
- Sufficient sample volume for indicated test(s)? Yes No
- Are samples (except VOA and ONG) properly preserved? Yes No
- Was preservative added to bottles? Yes No NA
- VOA vials have zero headspace? Yes No No VOA Vials
- Were any sample containers received broken? Yes No
- Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes No
- Are matrices correctly identified on Chain of Custody? Yes No
- Is it clear what analyses were requested? Yes No
- Were all holding times able to be met? (If no, notify customer for authorization.) Yes No

pH	sample # of bottles
2.5	009-010
3.0	011
5.0	008
6.0	001, 005-007, 012

of preserved bottles checked for pH: 9
 Adjusted? (<2 or >12 unless noted) NO
 Checked by: Re

Special Handling (if applicable)

- Was client notified of all discrepancies with this order? Yes No NA

Person Notified: _____ Date: _____
 By Whom: _____ Via: eMail Phone Fax In Person
 Regarding: _____
 Client Instructions: _____

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	9.4	Good	Yes			

Chain-of-Custody Record

Client: Terracon Consultants Inc.

Mailing Address: 4450 Batson Memorial E

Las Cruces, NM 88011

Phone #: 575.527.1700

email or Fax#: Kyle.Williams@terracon.com

QA/QC Package: Standard Level 4 (Full Validation)

Accreditation NELAP Other

EDD (Type)

Project Name: Criggs & Walnut C&W Plant

Project #: 68167094

Project Manager: Kyle Williams

Sampler: Williams

On Ice: Yes No

Sample Temperature: 9.4

Container Type and #

Preservative Type

HEAL No. 1701595

Turn-Around Time:

Standard Rush As AP

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F, Cl, NO ₃ , NO ₂ , PO ₄ , SO ₄)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	6020 As, U	A3114 As Speciation	Air Bubbles (Y or N)
1/26/17	1515	CW	MWSF-9-170112			1701595												X	X	
1/26/17	—		Trip Blank			-001										X				
1/19/17	—		Trip Blank			-002										X				
1/19/17	1300		FB-170113			-003										X				
1/19/17	1410		CWMW10-01-170113	1/14		-004										X				
1/19/17	1420		CWMW10-02-170113	1/14		-005										X				
1/19/17	1440		CWMW10-03-170113			-006										X				
1/19/17	1455		CWMW10-04-170113			-007										X				
1/19/17	1505		CWMW10-05-170113			-008										X				
1/19/17	1510		CWMW10-06-170113			-009										X				
1/19/17	1520		CWMW10-07-170113			-010										X				
1/19/17	1420		CWMW10-02-170113-DUP			-011										X				
1/13/17	1610					-012										X				

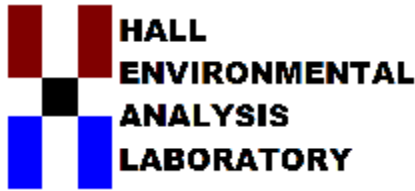
Date: 1/13/17 Time: 1610

Date: 01/14/17 Time: 0900

Received by: [Signature]

Received by: [Signature]

Remarks: Invoice the City of Las Cruces



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

January 20, 2017

Kyle Williams

Terracon

4450 Bataan Memorial E

Las Cruces, NM 88005

TEL: (575) 527-1700

FAX (575) 527-1092

RE: Griggs & Walnut GW Plume

OrderNo.: 1701254

Dear Kyle Williams:

Hall Environmental Analysis Laboratory received 8 sample(s) on 1/9/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a light blue horizontal line.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701254

Date Reported: 1/20/2017

CLIENT: Terracon

Client Sample ID: CLC18-170104

Project: Griggs & Walnut GW Plume

Collection Date: 1/4/2017 11:50:00 AM

Lab ID: 1701254-001

Matrix: AQUEOUS

Received Date: 1/9/2017 9:40:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0017	0.0010		mg/L	1	1/11/2017 3:21:15 PM	29619
Uranium	0.011	0.00050		mg/L	1	1/11/2017 3:21:15 PM	29619
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
Toluene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
Ethylbenzene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
Naphthalene	ND	2.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
1-Methylnaphthalene	ND	4.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
2-Methylnaphthalene	ND	4.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
Acetone	ND	10		µg/L	1	1/9/2017 1:09:00 PM	R39905
Bromobenzene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
Bromodichloromethane	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
Bromoform	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
Bromomethane	ND	3.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
2-Butanone	ND	10		µg/L	1	1/9/2017 1:09:00 PM	R39905
Carbon disulfide	ND	10		µg/L	1	1/9/2017 1:09:00 PM	R39905
Carbon Tetrachloride	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
Chlorobenzene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
Chloroethane	ND	2.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
Chloroform	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
Chloromethane	ND	3.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
2-Chlorotoluene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
4-Chlorotoluene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
cis-1,2-DCE	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
Dibromochloromethane	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
Dibromomethane	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
1,1-Dichloroethane	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
1,1-Dichloroethene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701254

Date Reported: 1/20/2017

CLIENT: Terracon

Client Sample ID: CLC18-170104

Project: Griggs & Walnut GW Plume

Collection Date: 1/4/2017 11:50:00 AM

Lab ID: 1701254-001

Matrix: AQUEOUS

Received Date: 1/9/2017 9:40:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,2-Dichloropropane	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
1,3-Dichloropropane	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
2,2-Dichloropropane	ND	2.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
1,1-Dichloropropene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
Hexachlorobutadiene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
2-Hexanone	ND	10		µg/L	1	1/9/2017 1:09:00 PM	R39905
Isopropylbenzene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
4-Isopropyltoluene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
4-Methyl-2-pentanone	ND	10		µg/L	1	1/9/2017 1:09:00 PM	R39905
Methylene Chloride	ND	3.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
n-Butylbenzene	ND	3.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
n-Propylbenzene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
sec-Butylbenzene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
Styrene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
tert-Butylbenzene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
Tetrachloroethene (PCE)	1.7	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
trans-1,2-DCE	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
Trichlorofluoromethane	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
Vinyl chloride	ND	1.0		µg/L	1	1/9/2017 1:09:00 PM	R39905
Xylenes, Total	ND	1.5		µg/L	1	1/9/2017 1:09:00 PM	R39905
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	1/9/2017 1:09:00 PM	R39905
Surr: 4-Bromofluorobenzene	99.5	70-130		%Rec	1	1/9/2017 1:09:00 PM	R39905
Surr: Dibromofluoromethane	99.2	70-130		%Rec	1	1/9/2017 1:09:00 PM	R39905
Surr: Toluene-d8	98.6	70-130		%Rec	1	1/9/2017 1:09:00 PM	R39905

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701254

Date Reported: 1/20/2017

CLIENT: Terracon

Client Sample ID: CLC27-170104

Project: Griggs & Walnut GW Plume

Collection Date: 1/4/2017 12:10:00 PM

Lab ID: 1701254-002

Matrix: AQUEOUS

Received Date: 1/9/2017 9:40:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0019	0.0010		mg/L	1	1/11/2017 3:30:16 PM	29619
Uranium	0.022	0.00050		mg/L	1	1/11/2017 3:30:16 PM	29619
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
Toluene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
Ethylbenzene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
Naphthalene	ND	2.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
1-Methylnaphthalene	ND	4.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
2-Methylnaphthalene	ND	4.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
Acetone	ND	10		µg/L	1	1/9/2017 2:20:00 PM	R39905
Bromobenzene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
Bromodichloromethane	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
Bromoform	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
Bromomethane	ND	3.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
2-Butanone	ND	10		µg/L	1	1/9/2017 2:20:00 PM	R39905
Carbon disulfide	ND	10		µg/L	1	1/9/2017 2:20:00 PM	R39905
Carbon Tetrachloride	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
Chlorobenzene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
Chloroethane	ND	2.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
Chloroform	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
Chloromethane	ND	3.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
2-Chlorotoluene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
4-Chlorotoluene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
cis-1,2-DCE	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
Dibromochloromethane	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
Dibromomethane	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
1,1-Dichloroethane	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
1,1-Dichloroethene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701254

Date Reported: 1/20/2017

CLIENT: Terracon

Client Sample ID: CLC27-170104

Project: Griggs & Walnut GW Plume

Collection Date: 1/4/2017 12:10:00 PM

Lab ID: 1701254-002

Matrix: AQUEOUS

Received Date: 1/9/2017 9:40:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,2-Dichloropropane	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
1,3-Dichloropropane	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
2,2-Dichloropropane	ND	2.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
1,1-Dichloropropene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
Hexachlorobutadiene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
2-Hexanone	ND	10		µg/L	1	1/9/2017 2:20:00 PM	R39905
Isopropylbenzene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
4-Isopropyltoluene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
4-Methyl-2-pentanone	ND	10		µg/L	1	1/9/2017 2:20:00 PM	R39905
Methylene Chloride	ND	3.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
n-Butylbenzene	ND	3.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
n-Propylbenzene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
sec-Butylbenzene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
Styrene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
tert-Butylbenzene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
Tetrachloroethene (PCE)	13	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
trans-1,2-DCE	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
Trichlorofluoromethane	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
Vinyl chloride	ND	1.0		µg/L	1	1/9/2017 2:20:00 PM	R39905
Xylenes, Total	ND	1.5		µg/L	1	1/9/2017 2:20:00 PM	R39905
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	1/9/2017 2:20:00 PM	R39905
Surr: 4-Bromofluorobenzene	98.4	70-130		%Rec	1	1/9/2017 2:20:00 PM	R39905
Surr: Dibromofluoromethane	103	70-130		%Rec	1	1/9/2017 2:20:00 PM	R39905
Surr: Toluene-d8	97.7	70-130		%Rec	1	1/9/2017 2:20:00 PM	R39905

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701254

Date Reported: 1/20/2017

CLIENT: Terracon

Client Sample ID: CLCPaz-170104

Project: Griggs & Walnut GW Plume

Collection Date: 1/4/2017 12:50:00 PM

Lab ID: 1701254-003

Matrix: AQUEOUS

Received Date: 1/9/2017 9:40:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0028	0.0010		mg/L	1	1/11/2017 3:33:16 PM	29619
Uranium	0.049	0.0025	*	mg/L	5	1/11/2017 4:00:23 PM	29619
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
Toluene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
Ethylbenzene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
Naphthalene	ND	2.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
1-Methylnaphthalene	ND	4.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
2-Methylnaphthalene	ND	4.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
Acetone	ND	10		µg/L	1	1/9/2017 2:44:00 PM	R39905
Bromobenzene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
Bromodichloromethane	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
Bromoform	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
Bromomethane	ND	3.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
2-Butanone	ND	10		µg/L	1	1/9/2017 2:44:00 PM	R39905
Carbon disulfide	ND	10		µg/L	1	1/9/2017 2:44:00 PM	R39905
Carbon Tetrachloride	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
Chlorobenzene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
Chloroethane	ND	2.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
Chloroform	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
Chloromethane	ND	3.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
2-Chlorotoluene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
4-Chlorotoluene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
cis-1,2-DCE	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
Dibromochloromethane	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
Dibromomethane	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
1,1-Dichloroethane	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
1,1-Dichloroethene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701254

Date Reported: 1/20/2017

CLIENT: Terracon

Client Sample ID: CLCPaz-170104

Project: Griggs & Walnut GW Plume

Collection Date: 1/4/2017 12:50:00 PM

Lab ID: 1701254-003

Matrix: AQUEOUS

Received Date: 1/9/2017 9:40:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,2-Dichloropropane	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
1,3-Dichloropropane	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
2,2-Dichloropropane	ND	2.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
1,1-Dichloropropene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
Hexachlorobutadiene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
2-Hexanone	ND	10		µg/L	1	1/9/2017 2:44:00 PM	R39905
Isopropylbenzene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
4-Isopropyltoluene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
4-Methyl-2-pentanone	ND	10		µg/L	1	1/9/2017 2:44:00 PM	R39905
Methylene Chloride	ND	3.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
n-Butylbenzene	ND	3.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
n-Propylbenzene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
sec-Butylbenzene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
Styrene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
tert-Butylbenzene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
trans-1,2-DCE	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
Trichlorofluoromethane	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
Vinyl chloride	ND	1.0		µg/L	1	1/9/2017 2:44:00 PM	R39905
Xylenes, Total	ND	1.5		µg/L	1	1/9/2017 2:44:00 PM	R39905
Surr: 1,2-Dichloroethane-d4	105	70-130		%Rec	1	1/9/2017 2:44:00 PM	R39905
Surr: 4-Bromofluorobenzene	98.6	70-130		%Rec	1	1/9/2017 2:44:00 PM	R39905
Surr: Dibromofluoromethane	102	70-130		%Rec	1	1/9/2017 2:44:00 PM	R39905
Surr: Toluene-d8	98.0	70-130		%Rec	1	1/9/2017 2:44:00 PM	R39905

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701254

Date Reported: 1/20/2017

CLIENT: Terracon

Client Sample ID: CLCPaz-170104D

Project: Griggs & Walnut GW Plume

Collection Date: 1/4/2017 12:50:00 PM

Lab ID: 1701254-004

Matrix: AQUEOUS

Received Date: 1/9/2017 9:40:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0033	0.0010		mg/L	1	1/11/2017 3:36:17 PM	29619
Uranium	0.049	0.0025	*	mg/L	5	1/11/2017 4:03:23 PM	29619
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
Toluene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
Ethylbenzene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
Naphthalene	ND	2.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
1-Methylnaphthalene	ND	4.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
2-Methylnaphthalene	ND	4.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
Acetone	ND	10		µg/L	1	1/9/2017 3:08:00 PM	R39905
Bromobenzene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
Bromodichloromethane	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
Bromoform	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
Bromomethane	ND	3.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
2-Butanone	ND	10		µg/L	1	1/9/2017 3:08:00 PM	R39905
Carbon disulfide	ND	10		µg/L	1	1/9/2017 3:08:00 PM	R39905
Carbon Tetrachloride	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
Chlorobenzene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
Chloroethane	ND	2.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
Chloroform	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
Chloromethane	ND	3.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
2-Chlorotoluene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
4-Chlorotoluene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
cis-1,2-DCE	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
Dibromochloromethane	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
Dibromomethane	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
1,1-Dichloroethane	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
1,1-Dichloroethene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701254

Date Reported: 1/20/2017

CLIENT: Terracon

Client Sample ID: CLCPaz-170104D

Project: Griggs & Walnut GW Plume

Collection Date: 1/4/2017 12:50:00 PM

Lab ID: 1701254-004

Matrix: AQUEOUS

Received Date: 1/9/2017 9:40:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,2-Dichloropropane	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
1,3-Dichloropropane	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
2,2-Dichloropropane	ND	2.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
1,1-Dichloropropene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
Hexachlorobutadiene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
2-Hexanone	ND	10		µg/L	1	1/9/2017 3:08:00 PM	R39905
Isopropylbenzene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
4-Isopropyltoluene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
4-Methyl-2-pentanone	ND	10		µg/L	1	1/9/2017 3:08:00 PM	R39905
Methylene Chloride	ND	3.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
n-Butylbenzene	ND	3.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
n-Propylbenzene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
sec-Butylbenzene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
Styrene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
tert-Butylbenzene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
trans-1,2-DCE	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
Trichlorofluoromethane	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
Vinyl chloride	ND	1.0		µg/L	1	1/9/2017 3:08:00 PM	R39905
Xylenes, Total	ND	1.5		µg/L	1	1/9/2017 3:08:00 PM	R39905
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	1/9/2017 3:08:00 PM	R39905
Surr: 4-Bromofluorobenzene	100	70-130		%Rec	1	1/9/2017 3:08:00 PM	R39905
Surr: Dibromofluoromethane	102	70-130		%Rec	1	1/9/2017 3:08:00 PM	R39905
Surr: Toluene-d8	98.6	70-130		%Rec	1	1/9/2017 3:08:00 PM	R39905

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701254

Date Reported: 1/20/2017

CLIENT: Terracon

Client Sample ID: MW1-170105

Project: Griggs & Walnut GW Plume

Collection Date: 1/5/2017 12:40:00 PM

Lab ID: 1701254-005

Matrix: AQUEOUS

Received Date: 1/9/2017 9:40:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0061	0.0010		mg/L	1	1/11/2017 3:39:17 PM	29619
Uranium	0.022	0.00050		mg/L	1	1/11/2017 3:39:17 PM	29619
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
Toluene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
Ethylbenzene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
Naphthalene	ND	2.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
1-Methylnaphthalene	ND	4.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
2-Methylnaphthalene	ND	4.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
Acetone	ND	10		µg/L	1	1/9/2017 3:31:00 PM	R39905
Bromobenzene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
Bromodichloromethane	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
Bromoform	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
Bromomethane	ND	3.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
2-Butanone	ND	10		µg/L	1	1/9/2017 3:31:00 PM	R39905
Carbon disulfide	ND	10		µg/L	1	1/9/2017 3:31:00 PM	R39905
Carbon Tetrachloride	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
Chlorobenzene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
Chloroethane	ND	2.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
Chloroform	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
Chloromethane	ND	3.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
2-Chlorotoluene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
4-Chlorotoluene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
cis-1,2-DCE	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
Dibromochloromethane	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
Dibromomethane	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
1,1-Dichloroethane	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
1,1-Dichloroethene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701254

Date Reported: 1/20/2017

CLIENT: Terracon

Client Sample ID: MW1-170105

Project: Griggs & Walnut GW Plume

Collection Date: 1/5/2017 12:40:00 PM

Lab ID: 1701254-005

Matrix: AQUEOUS

Received Date: 1/9/2017 9:40:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,2-Dichloropropane	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
1,3-Dichloropropane	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
2,2-Dichloropropane	ND	2.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
1,1-Dichloropropene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
Hexachlorobutadiene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
2-Hexanone	ND	10		µg/L	1	1/9/2017 3:31:00 PM	R39905
Isopropylbenzene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
4-Isopropyltoluene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
4-Methyl-2-pentanone	ND	10		µg/L	1	1/9/2017 3:31:00 PM	R39905
Methylene Chloride	ND	3.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
n-Butylbenzene	ND	3.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
n-Propylbenzene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
sec-Butylbenzene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
Styrene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
tert-Butylbenzene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
Tetrachloroethene (PCE)	5.4	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
trans-1,2-DCE	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
Trichlorofluoromethane	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
Vinyl chloride	ND	1.0		µg/L	1	1/9/2017 3:31:00 PM	R39905
Xylenes, Total	ND	1.5		µg/L	1	1/9/2017 3:31:00 PM	R39905
Surr: 1,2-Dichloroethane-d4	104	70-130		%Rec	1	1/9/2017 3:31:00 PM	R39905
Surr: 4-Bromofluorobenzene	98.9	70-130		%Rec	1	1/9/2017 3:31:00 PM	R39905
Surr: Dibromofluoromethane	101	70-130		%Rec	1	1/9/2017 3:31:00 PM	R39905
Surr: Toluene-d8	97.6	70-130		%Rec	1	1/9/2017 3:31:00 PM	R39905

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701254

Date Reported: 1/20/2017

CLIENT: Terracon

Client Sample ID: MWSF5-170105

Project: Griggs & Walnut GW Plume

Collection Date: 1/5/2017 2:30:00 PM

Lab ID: 1701254-006

Matrix: AQUEOUS

Received Date: 1/9/2017 9:40:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0032	0.0010		mg/L	1	1/11/2017 3:42:17 PM	29619
Uranium	0.021	0.00050		mg/L	1	1/11/2017 3:42:17 PM	29619
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
Toluene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
Ethylbenzene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
Naphthalene	ND	2.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
1-Methylnaphthalene	ND	4.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
2-Methylnaphthalene	ND	4.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
Acetone	ND	10		µg/L	1	1/9/2017 3:55:00 PM	R39905
Bromobenzene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
Bromodichloromethane	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
Bromoform	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
Bromomethane	ND	3.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
2-Butanone	ND	10		µg/L	1	1/9/2017 3:55:00 PM	R39905
Carbon disulfide	ND	10		µg/L	1	1/9/2017 3:55:00 PM	R39905
Carbon Tetrachloride	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
Chlorobenzene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
Chloroethane	ND	2.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
Chloroform	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
Chloromethane	ND	3.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
2-Chlorotoluene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
4-Chlorotoluene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
cis-1,2-DCE	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
Dibromochloromethane	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
Dibromomethane	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
1,1-Dichloroethane	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
1,1-Dichloroethene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701254

Date Reported: 1/20/2017

CLIENT: Terracon

Client Sample ID: MWSF5-170105

Project: Griggs & Walnut GW Plume

Collection Date: 1/5/2017 2:30:00 PM

Lab ID: 1701254-006

Matrix: AQUEOUS

Received Date: 1/9/2017 9:40:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,2-Dichloropropane	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
1,3-Dichloropropane	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
2,2-Dichloropropane	ND	2.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
1,1-Dichloropropene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
Hexachlorobutadiene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
2-Hexanone	ND	10		µg/L	1	1/9/2017 3:55:00 PM	R39905
Isopropylbenzene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
4-Isopropyltoluene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
4-Methyl-2-pentanone	ND	10		µg/L	1	1/9/2017 3:55:00 PM	R39905
Methylene Chloride	ND	3.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
n-Butylbenzene	ND	3.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
n-Propylbenzene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
sec-Butylbenzene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
Styrene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
tert-Butylbenzene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
trans-1,2-DCE	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
Trichlorofluoromethane	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
Vinyl chloride	ND	1.0		µg/L	1	1/9/2017 3:55:00 PM	R39905
Xylenes, Total	ND	1.5		µg/L	1	1/9/2017 3:55:00 PM	R39905
Surr: 1,2-Dichloroethane-d4	105	70-130		%Rec	1	1/9/2017 3:55:00 PM	R39905
Surr: 4-Bromofluorobenzene	98.1	70-130		%Rec	1	1/9/2017 3:55:00 PM	R39905
Surr: Dibromofluoromethane	102	70-130		%Rec	1	1/9/2017 3:55:00 PM	R39905
Surr: Toluene-d8	98.7	70-130		%Rec	1	1/9/2017 3:55:00 PM	R39905

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701254

Date Reported: 1/20/2017

CLIENT: Terracon

Client Sample ID: MWSF6-170105

Project: Griggs & Walnut GW Plume

Collection Date: 1/5/2017 3:30:00 PM

Lab ID: 1701254-007

Matrix: AQUEOUS

Received Date: 1/9/2017 9:40:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.010	0.0010	*	mg/L	1	1/11/2017 3:45:18 PM	29619
Uranium	0.033	0.0025	*	mg/L	5	1/11/2017 4:06:23 PM	29619
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
Toluene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
Ethylbenzene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
Naphthalene	ND	2.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
1-Methylnaphthalene	ND	4.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
2-Methylnaphthalene	ND	4.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
Acetone	ND	10		µg/L	1	1/9/2017 4:19:00 PM	R39905
Bromobenzene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
Bromodichloromethane	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
Bromoform	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
Bromomethane	ND	3.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
2-Butanone	ND	10		µg/L	1	1/9/2017 4:19:00 PM	R39905
Carbon disulfide	ND	10		µg/L	1	1/9/2017 4:19:00 PM	R39905
Carbon Tetrachloride	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
Chlorobenzene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
Chloroethane	ND	2.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
Chloroform	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
Chloromethane	ND	3.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
2-Chlorotoluene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
4-Chlorotoluene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
cis-1,2-DCE	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
Dibromochloromethane	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
Dibromomethane	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
1,1-Dichloroethane	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
1,1-Dichloroethene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701254

Date Reported: 1/20/2017

CLIENT: Terracon

Client Sample ID: MWSF6-170105

Project: Griggs & Walnut GW Plume

Collection Date: 1/5/2017 3:30:00 PM

Lab ID: 1701254-007

Matrix: AQUEOUS

Received Date: 1/9/2017 9:40:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,2-Dichloropropane	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
1,3-Dichloropropane	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
2,2-Dichloropropane	ND	2.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
1,1-Dichloropropene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
Hexachlorobutadiene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
2-Hexanone	ND	10		µg/L	1	1/9/2017 4:19:00 PM	R39905
Isopropylbenzene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
4-Isopropyltoluene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
4-Methyl-2-pentanone	ND	10		µg/L	1	1/9/2017 4:19:00 PM	R39905
Methylene Chloride	ND	3.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
n-Butylbenzene	ND	3.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
n-Propylbenzene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
sec-Butylbenzene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
Styrene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
tert-Butylbenzene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
trans-1,2-DCE	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
Trichlorofluoromethane	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
Vinyl chloride	ND	1.0		µg/L	1	1/9/2017 4:19:00 PM	R39905
Xylenes, Total	ND	1.5		µg/L	1	1/9/2017 4:19:00 PM	R39905
Surr: 1,2-Dichloroethane-d4	106	70-130		%Rec	1	1/9/2017 4:19:00 PM	R39905
Surr: 4-Bromofluorobenzene	99.4	70-130		%Rec	1	1/9/2017 4:19:00 PM	R39905
Surr: Dibromofluoromethane	103	70-130		%Rec	1	1/9/2017 4:19:00 PM	R39905
Surr: Toluene-d8	98.4	70-130		%Rec	1	1/9/2017 4:19:00 PM	R39905

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701254

Date Reported: 1/20/2017

CLIENT: Terracon

Client Sample ID: Trip Blank

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701254-008

Matrix: AQUEOUS

Received Date: 1/9/2017 9:40:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
Toluene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
Ethylbenzene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
Naphthalene	ND	2.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
1-Methylnaphthalene	ND	4.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
2-Methylnaphthalene	ND	4.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
Acetone	ND	10		µg/L	1	1/9/2017 4:42:00 PM	R39905
Bromobenzene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
Bromodichloromethane	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
Bromoform	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
Bromomethane	ND	3.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
2-Butanone	ND	10		µg/L	1	1/9/2017 4:42:00 PM	R39905
Carbon disulfide	ND	10		µg/L	1	1/9/2017 4:42:00 PM	R39905
Carbon Tetrachloride	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
Chlorobenzene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
Chloroethane	ND	2.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
Chloroform	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
Chloromethane	ND	3.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
2-Chlorotoluene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
4-Chlorotoluene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
cis-1,2-DCE	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
Dibromochloromethane	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
Dibromomethane	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
1,1-Dichloroethane	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
1,1-Dichloroethene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
1,2-Dichloropropane	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
1,3-Dichloropropane	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
2,2-Dichloropropane	ND	2.0		µg/L	1	1/9/2017 4:42:00 PM	R39905

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701254

Date Reported: 1/20/2017

CLIENT: Terracon

Client Sample ID: Trip Blank

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701254-008

Matrix: AQUEOUS

Received Date: 1/9/2017 9:40:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,1-Dichloropropene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
Hexachlorobutadiene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
2-Hexanone	ND	10		µg/L	1	1/9/2017 4:42:00 PM	R39905
Isopropylbenzene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
4-Isopropyltoluene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
4-Methyl-2-pentanone	ND	10		µg/L	1	1/9/2017 4:42:00 PM	R39905
Methylene Chloride	ND	3.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
n-Butylbenzene	ND	3.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
n-Propylbenzene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
sec-Butylbenzene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
Styrene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
tert-Butylbenzene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
trans-1,2-DCE	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
Trichlorofluoromethane	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
Vinyl chloride	ND	1.0		µg/L	1	1/9/2017 4:42:00 PM	R39905
Xylenes, Total	ND	1.5		µg/L	1	1/9/2017 4:42:00 PM	R39905
Surr: 1,2-Dichloroethane-d4	105	70-130		%Rec	1	1/9/2017 4:42:00 PM	R39905
Surr: 4-Bromofluorobenzene	100	70-130		%Rec	1	1/9/2017 4:42:00 PM	R39905
Surr: Dibromofluoromethane	102	70-130		%Rec	1	1/9/2017 4:42:00 PM	R39905
Surr: Toluene-d8	98.0	70-130		%Rec	1	1/9/2017 4:42:00 PM	R39905

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
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ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010101-001
Client Sample ID: 1701254-001C CLC18-170104

Report Date: 01/20/17
Collection Date: 01/04/17 11:50
Date Received: 01/10/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/12/17 16:34 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/12/17 16:34 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010101-002
Client Sample ID: 1701254-002C CLC27-170104

Report Date: 01/20/17
Collection Date: 01/04/17 12:10
Date Received: 01/10/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/12/17 17:10 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/12/17 17:10 / rgk

Report Definitions:
 RL - Analyte reporting limit.
 QCL - Quality control limit.

MCL - Maximum contaminant level.
 ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010101-003
Client Sample ID: 1701254-003C CLCPat-170104

Report Date: 01/20/17
Collection Date: 01/04/17 12:50
Date Received: 01/10/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/12/17 17:22 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/12/17 17:22 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010101-004
Client Sample ID: 1701254-004C CLCPat-170104D

Report Date: 01/20/17
Collection Date: 01/04/17 12:50
Date Received: 01/10/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/12/17 17:34 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/12/17 17:34 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hali Environmental
Project: Not Indicated
Lab ID: H17010101-005
Client Sample ID: 1701254-005C MW1-170105

Report Date: 01/20/17
Collection Date: 01/05/17 12:40
Date Received: 01/10/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/12/17 17:46 / rgk
Arsenic-V	6	ug/L		5		E1632AM	01/12/17 17:46 / rgk

Report
Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010101-006
Client Sample ID: 1701254-006C MWSF5-170105

Report Date: 01/20/17
Collection Date: 01/05/17 14:30
Date Received: 01/10/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/12/17 17:58 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/12/17 17:58 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010101-007
Client Sample ID: 1701254-007C MWSF6-170105

Report Date: 01/20/17
Collection Date: 01/05/17 15:30
Date Received: 01/10/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/12/17 18:10 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/12/17 18:10 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hall Environmental

Report Date: 01/20/17

Project: Not Indicated

Work Order: H17010101

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E1632AM		Analytical Run: ARSENIC SPECIATION_170113A								
Lab ID: AS-ICV 25ppb-1/12/20	2	Initial Calibration Verification Standard								01/12/17 15:34
Arsenic-III		25.6	ug/L	5.0	103	87.6	114			
Arsenic-V		24.2	ug/L	5.0	97	87	116			
Lab ID: AS-50.0-1/12/2017	2	Continuing Calibration Verification Standard								01/12/17 15:46
Arsenic-III		50.3	ug/L	5.0	101	85	115			
Arsenic-V		51.2	ug/L	5.0	102	85	115			
Method: E1632AM		Batch: R122035								
Lab ID: AS-LFB 50ppb-1/12/2	2	Laboratory Fortified Blank								Run: ARSENIC SPECIATION_1701 01/12/17 16:10
Arsenic-III		50.2	ug/L	5.0	100	55	146			
Arsenic-V		50.7	ug/L	5.0	101	55	146			
Lab ID: ICB	2	Method Blank								Run: ARSENIC SPECIATION_1701 01/12/17 16:22
Arsenic-III		ND	ug/L	0.2						
Arsenic-V		ND	ug/L	0.5						
Lab ID: H17010101-001A MS	2	Sample Matrix Spike								Run: ARSENIC SPECIATION_1701 01/12/17 16:46
Arsenic-III		49.7	ug/L	5.0	99	55	146			
Arsenic-V		51.7	ug/L	5.0	101	55	146			
Lab ID: H17010101-001A MSD	2	Sample Matrix Spike Duplicate								Run: ARSENIC SPECIATION_1701 01/12/17 16:58
Arsenic-III		49.2	ug/L	5.0	98	55	146	1.0	20	
Arsenic-V		51.2	ug/L	5.0	100	55	146	0.9	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701254

20-Jan-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	1701254-001BMSDL		SampType:	MSDLL		TestCode:	200.8 ICPMS Metals:Total				
Client ID:	CLC18-170104		Batch ID:	29619		RunNo:	39963				
Prep Date:	1/10/2017		Analysis Date:	1/11/2017		SeqNo:	1252325		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Arsenic	0.028	0.0010	0.02500	0.001685	104	70	130	2.05	20		
Uranium	0.024	0.00050	0.01250	0.01149	99.5	70	130	0.932	20		

Sample ID	1701254-001BMSLL		SampType:	MSLL		TestCode:	200.8 ICPMS Metals:Total				
Client ID:	CLC18-170104		Batch ID:	29619		RunNo:	39963				
Prep Date:	1/10/2017		Analysis Date:	1/11/2017		SeqNo:	1252326		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Arsenic	0.028	0.0010	0.02500	0.001685	106	70	130				
Uranium	0.024	0.00050	0.01250	0.01149	101	70	130				

Sample ID	MB-29619		SampType:	MBLK		TestCode:	200.8 ICPMS Metals:Total				
Client ID:	PBW		Batch ID:	29619		RunNo:	39963				
Prep Date:	1/10/2017		Analysis Date:	1/11/2017		SeqNo:	1252336		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Arsenic	ND	0.0010									
Uranium	ND	0.00050									

Sample ID	MSLCS-29619		SampType:	LCS		TestCode:	200.8 ICPMS Metals:Total				
Client ID:	LCSW		Batch ID:	29619		RunNo:	39963				
Prep Date:	1/10/2017		Analysis Date:	1/11/2017		SeqNo:	1252338		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Arsenic	0.026	0.0010	0.02500	0	103	85	115				
Uranium	0.012	0.00050	0.01250	0	97.5	85	115				

Sample ID	MSLLLCS-29619		SampType:	LCSLL		TestCode:	200.8 ICPMS Metals:Total				
Client ID:	BatchQC		Batch ID:	29619		RunNo:	39963				
Prep Date:	1/10/2017		Analysis Date:	1/11/2017		SeqNo:	1252340		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Arsenic	0.0010	0.0010	0.001000	0	104	50	150				
Uranium	ND	0.00050	0.0005000	0	94.6	50	150				

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701254

20-Jan-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID 100ng lcs	SampType: LCS		TestCode: EPA Method 8260B: VOLATILES							
Client ID: LCSW	Batch ID: R39905		RunNo: 39905							
Prep Date:	Analysis Date: 1/9/2017		SeqNo: 1250686		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	93.9	70	130			
Toluene	20	1.0	20.00	0	98.4	70	130			
Chlorobenzene	20	1.0	20.00	0	100	70	130			
1,1-Dichloroethene	20	1.0	20.00	0	100	70	130			
Trichloroethene (TCE)	18	1.0	20.00	0	89.9	70	130			
Surr: 1,2-Dichloroethane-d4	9.9		10.00		98.7	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130			
Surr: Dibromofluoromethane	9.8		10.00		97.9	70	130			
Surr: Toluene-d8	9.9		10.00		99.3	70	130			

Sample ID rb	SampType: MBLK		TestCode: EPA Method 8260B: VOLATILES							
Client ID: PBW	Batch ID: R39905		RunNo: 39905							
Prep Date:	Analysis Date: 1/9/2017		SeqNo: 1250687		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701254

20-Jan-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	rb	SampType:	MBLK		TestCode:	EPA Method 8260B: VOLATILES				
Client ID:	PBW	Batch ID:	R39905		RunNo:	39905				
Prep Date:		Analysis Date:	1/9/2017		SeqNo:	1250687	Units:	µg/L		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701254

20-Jan-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	rb	SampType:	MBLK	TestCode:	EPA Method 8260B: VOLATILES					
Client ID:	PBW	Batch ID:	R39905	RunNo:	39905					
Prep Date:		Analysis Date:	1/9/2017	SeqNo:	1250687	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	10		10.00		101	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		100	70	130			
Surr: Dibromofluoromethane	9.7		10.00		96.8	70	130			
Surr: Toluene-d8	9.8		10.00		98.2	70	130			

Sample ID	1701254-001ams	SampType:	MS	TestCode:	EPA Method 8260B: VOLATILES					
Client ID:	CLC18-170104	Batch ID:	R39905	RunNo:	39905					
Prep Date:		Analysis Date:	1/9/2017	SeqNo:	1250692	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	97.6	70	130			
Toluene	19	1.0	20.00	0	97.1	70	130			
Chlorobenzene	20	1.0	20.00	0	99.3	70	130			
1,1-Dichloroethene	21	1.0	20.00	0	105	70	130			
Trichloroethene (TCE)	19	1.0	20.00	0.2060	96.2	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		103	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		98.7	70	130			
Surr: Dibromofluoromethane	10		10.00		101	70	130			
Surr: Toluene-d8	9.8		10.00		97.9	70	130			

Sample ID	1701254-001amsd	SampType:	MSD	TestCode:	EPA Method 8260B: VOLATILES					
Client ID:	CLC18-170104	Batch ID:	R39905	RunNo:	39905					
Prep Date:		Analysis Date:	1/9/2017	SeqNo:	1250693	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	97.2	70	130	0.503	20	
Toluene	19	1.0	20.00	0	97.0	70	130	0.134	20	
Chlorobenzene	20	1.0	20.00	0	99.4	70	130	0.0302	20	
1,1-Dichloroethene	20	1.0	20.00	0	102	70	130	3.15	20	
Trichloroethene (TCE)	19	1.0	20.00	0.2060	94.1	70	130	2.18	20	
Surr: 1,2-Dichloroethane-d4	10		10.00		104	70	130	0	0	
Surr: 4-Bromofluorobenzene	10		10.00		100	70	130	0	0	
Surr: Dibromofluoromethane	10		10.00		102	70	130	0	0	
Surr: Toluene-d8	9.9		10.00		98.6	70	130	0	0	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

Sample Log-In Check List

Client Name: TER-LC

Work Order Number: 1701254

RcptNo: 1

Received by/date: LM 1/9/17

Logged By: Andy Jansson 1/9/2017 9:40:00 AM *andy jansson*

Completed By: Andy Jansson 1/9/17

Reviewed By: KA 01/09/17

Chain of Custody

- 1. Custody seals intact on sample bottles? Yes No Not Present
- 2. Is Chain of Custody complete? Yes No Not Present
- 3. How was the sample delivered? FedEx

Log In

- 4. Was an attempt made to cool the samples? Yes No NA
- 5. Were all samples received at a temperature of >0° C to 6.0°C Yes No NA
- 6. Sample(s) in proper container(s)? Yes No
- 7. Sufficient sample volume for indicated test(s)? Yes No
- 8. Are samples (except VOA and ONG) properly preserved? Yes No
- 9. Was preservative added to bottles? Yes No NA
- 10. VOA vials have zero headspace? Yes No No VOA Vials
- 11. Were any sample containers received broken? Yes No
- 12. Does paperwork match bottle labels? Yes No
(Note discrepancies on chain of custody)
- 13. Are matrices correctly identified on Chain of Custody? Yes No
- 14. Is it clear what analyses were requested? Yes No
- 15. Were all holding times able to be met? Yes No
(If no, notify customer for authorization.)

of preserved bottles checked for pH: 16
 (or >12 unless noted)
 Adjusted? YES
 Checked by: aj

Special Handling (if applicable)

- 16. Was client notified of all discrepancies with this order? Yes No NA

Person Notified: _____ Date: _____
 By Whom: _____ Via: eMail Phone Fax In Person
 Regarding: _____
 Client Instructions: _____

17. Additional remarks: For Arsenic Spec; added 1mL HCl to -001 -> -008 for acceptable pH.

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	5.7	Good	Yes			

1/9 @ 1120
aj

Chain-of-Custody Record

Client: Teracion Consultants, Inc.
 Mailing Address: 4450 Bateman Mountain E
Las Cruces, NM 88011
 Phone #: 575.527.1700
 email or Fax#: Kyle W. Williams @ Teracion.com
 QA/QC Package:
 Standard Level 4 (Full Validation)
 NELAP Other
 EDD (Type)

Turn-Around Time:
 Standard Rush
 Project Name:
Carrizo & Walnut GLO Phase 2
 Project #:
68167094
 Project Manager:
Kyle Williams
 Sampler: Williams
 On Ice: Yes No
 Sample Temperature: 5.7

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.
1/4/17	1150	GW	CLC18-170104 (AMS/USD)			1701254
	1210		CLC27-170104			-001
	1250		CLC202-170104			-002
	1250		CLC22-170104 D			-003
1/5/17	1240		MW1-170105			-004
	1430		MWSF5-170105			-005
	1530		MWSF6-170105			-006
1/5/17			Trip Blank			-007
						-008

Date: 1/5/17 Time: 1620
 Relinquished by: [Signature]
 Date: 1/5/17 Time: 1700
 Relinquished by: [Signature]



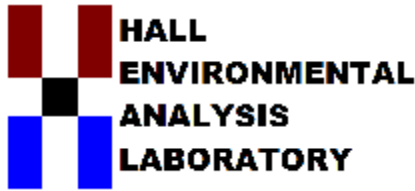
HALL ENVIRONMENTAL ANALYSIS LABORATORY
 www.hallenvironmental.com
 4901 Hawkins NE - Albuquerque, NM 87109
 Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F, Cl, NO ₃ , NO ₂ , PO ₄ , SO ₄)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	6020 As & U	As speciation A 3114	Air Bubbles (Y or N)
									X		X	X	

Received by: [Signature] Date: 01/09/17 Time: 1700
 Received by: [Signature] Date: 01/09/17 Time: 1700

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

February 01, 2017

Kyle Williams

Terracon

4450 Bataan Memorial E

Las Cruces, NM 88005

TEL: (575) 527-1700

FAX (575) 527-1092

RE: Griggs & Walnut GW Plume

OrderNo.: 1701308

Dear Kyle Williams:

Hall Environmental Analysis Laboratory received 10 sample(s) on 1/10/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a white background.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701308

Date Reported: 2/1/2017

CLIENT: Terracon

Client Sample ID: CLC26-170106

Project: Griggs & Walnut GW Plume

Collection Date: 1/6/2017 9:00:00 AM

Lab ID: 1701308-001

Matrix: AQUEOUS

Received Date: 1/10/2017 9:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA 200.8: METALS							Analyst: JLF
Arsenic	0.0015	0.0010		mg/L	1	1/12/2017 4:32:01 PM	29653
Uranium	ND	0.00050		mg/L	1	1/12/2017 4:32:01 PM	29653
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
Toluene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
Ethylbenzene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
Naphthalene	ND	2.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
1-Methylnaphthalene	ND	4.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
2-Methylnaphthalene	ND	4.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
Acetone	ND	10		µg/L	1	1/10/2017 3:28:00 PM	A39923
Bromobenzene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
Bromodichloromethane	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
Bromoform	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
Bromomethane	ND	3.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
2-Butanone	ND	10		µg/L	1	1/10/2017 3:28:00 PM	A39923
Carbon disulfide	ND	10		µg/L	1	1/10/2017 3:28:00 PM	A39923
Carbon Tetrachloride	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
Chlorobenzene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
Chloroethane	ND	2.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
Chloroform	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
Chloromethane	ND	3.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
2-Chlorotoluene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
4-Chlorotoluene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
cis-1,2-DCE	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
Dibromochloromethane	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
Dibromomethane	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
1,1-Dichloroethane	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
1,1-Dichloroethene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701308

Date Reported: 2/1/2017

CLIENT: Terracon

Client Sample ID: CLC26-170106

Project: Griggs & Walnut GW Plume

Collection Date: 1/6/2017 9:00:00 AM

Lab ID: 1701308-001

Matrix: AQUEOUS

Received Date: 1/10/2017 9:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,2-Dichloropropane	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
1,3-Dichloropropane	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
2,2-Dichloropropane	ND	2.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
1,1-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
Hexachlorobutadiene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
2-Hexanone	ND	10		µg/L	1	1/10/2017 3:28:00 PM	A39923
Isopropylbenzene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
4-Isopropyltoluene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
4-Methyl-2-pentanone	ND	10		µg/L	1	1/10/2017 3:28:00 PM	A39923
Methylene Chloride	ND	3.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
n-Butylbenzene	ND	3.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
n-Propylbenzene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
sec-Butylbenzene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
Styrene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
tert-Butylbenzene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
trans-1,2-DCE	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
Trichlorofluoromethane	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
Vinyl chloride	ND	1.0		µg/L	1	1/10/2017 3:28:00 PM	A39923
Xylenes, Total	ND	1.5		µg/L	1	1/10/2017 3:28:00 PM	A39923
Surr: 1,2-Dichloroethane-d4	109	70-130		%Rec	1	1/10/2017 3:28:00 PM	A39923
Surr: 4-Bromofluorobenzene	99.4	70-130		%Rec	1	1/10/2017 3:28:00 PM	A39923
Surr: Dibromofluoromethane	104	70-130		%Rec	1	1/10/2017 3:28:00 PM	A39923
Surr: Toluene-d8	98.3	70-130		%Rec	1	1/10/2017 3:28:00 PM	A39923

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701308

Date Reported: 2/1/2017

CLIENT: Terracon

Client Sample ID: CLC20-170106

Project: Griggs & Walnut GW Plume

Collection Date: 1/6/2017 9:50:00 AM

Lab ID: 1701308-002

Matrix: AQUEOUS

Received Date: 1/10/2017 9:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA 200.8: METALS							Analyst: JLF
Arsenic	ND	0.0050		mg/L	5	1/17/2017 1:33:18 PM	29653
Uranium	ND	0.00050		mg/L	1	1/12/2017 4:44:07 PM	29653
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
Toluene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
Ethylbenzene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
Naphthalene	ND	2.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
1-Methylnaphthalene	ND	4.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
2-Methylnaphthalene	ND	4.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
Acetone	ND	10		µg/L	1	1/10/2017 3:53:00 PM	A39923
Bromobenzene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
Bromodichloromethane	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
Bromoform	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
Bromomethane	ND	3.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
2-Butanone	ND	10		µg/L	1	1/10/2017 3:53:00 PM	A39923
Carbon disulfide	ND	10		µg/L	1	1/10/2017 3:53:00 PM	A39923
Carbon Tetrachloride	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
Chlorobenzene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
Chloroethane	ND	2.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
Chloroform	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
Chloromethane	ND	3.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
2-Chlorotoluene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
4-Chlorotoluene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
cis-1,2-DCE	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
Dibromochloromethane	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
Dibromomethane	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
1,1-Dichloroethane	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
1,1-Dichloroethene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701308

Date Reported: 2/1/2017

CLIENT: Terracon

Client Sample ID: CLC20-170106

Project: Griggs & Walnut GW Plume

Collection Date: 1/6/2017 9:50:00 AM

Lab ID: 1701308-002

Matrix: AQUEOUS

Received Date: 1/10/2017 9:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,2-Dichloropropane	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
1,3-Dichloropropane	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
2,2-Dichloropropane	ND	2.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
1,1-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
Hexachlorobutadiene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
2-Hexanone	ND	10		µg/L	1	1/10/2017 3:53:00 PM	A39923
Isopropylbenzene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
4-Isopropyltoluene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
4-Methyl-2-pentanone	ND	10		µg/L	1	1/10/2017 3:53:00 PM	A39923
Methylene Chloride	ND	3.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
n-Butylbenzene	ND	3.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
n-Propylbenzene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
sec-Butylbenzene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
Styrene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
tert-Butylbenzene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
trans-1,2-DCE	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
Trichlorofluoromethane	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
Vinyl chloride	ND	1.0		µg/L	1	1/10/2017 3:53:00 PM	A39923
Xylenes, Total	ND	1.5		µg/L	1	1/10/2017 3:53:00 PM	A39923
Surr: 1,2-Dichloroethane-d4	106	70-130		%Rec	1	1/10/2017 3:53:00 PM	A39923
Surr: 4-Bromofluorobenzene	98.3	70-130		%Rec	1	1/10/2017 3:53:00 PM	A39923
Surr: Dibromofluoromethane	102	70-130		%Rec	1	1/10/2017 3:53:00 PM	A39923
Surr: Toluene-d8	100	70-130		%Rec	1	1/10/2017 3:53:00 PM	A39923

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701308

Date Reported: 2/1/2017

CLIENT: Terracon

Client Sample ID: CLC57-170106

Project: Griggs & Walnut GW Plume

Collection Date: 1/6/2017 10:15:00 AM

Lab ID: 1701308-003

Matrix: AQUEOUS

Received Date: 1/10/2017 9:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA 200.8: METALS							Analyst: JLF
Arsenic	0.0011	0.0010		mg/L	1	1/12/2017 4:47:08 PM	29653
Uranium	0.00079	0.00050		mg/L	1	1/12/2017 4:47:08 PM	29653
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
Toluene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
Ethylbenzene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
Naphthalene	ND	2.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
1-Methylnaphthalene	ND	4.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
2-Methylnaphthalene	ND	4.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
Acetone	ND	10		µg/L	1	1/10/2017 4:19:00 PM	A39923
Bromobenzene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
Bromodichloromethane	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
Bromoform	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
Bromomethane	ND	3.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
2-Butanone	ND	10		µg/L	1	1/10/2017 4:19:00 PM	A39923
Carbon disulfide	ND	10		µg/L	1	1/10/2017 4:19:00 PM	A39923
Carbon Tetrachloride	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
Chlorobenzene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
Chloroethane	ND	2.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
Chloroform	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
Chloromethane	ND	3.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
2-Chlorotoluene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
4-Chlorotoluene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
cis-1,2-DCE	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
Dibromochloromethane	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
Dibromomethane	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
1,1-Dichloroethane	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
1,1-Dichloroethene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701308

Date Reported: 2/1/2017

CLIENT: Terracon

Client Sample ID: CLC57-170106

Project: Griggs & Walnut GW Plume

Collection Date: 1/6/2017 10:15:00 AM

Lab ID: 1701308-003

Matrix: AQUEOUS

Received Date: 1/10/2017 9:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,2-Dichloropropane	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
1,3-Dichloropropane	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
2,2-Dichloropropane	ND	2.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
1,1-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
Hexachlorobutadiene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
2-Hexanone	ND	10		µg/L	1	1/10/2017 4:19:00 PM	A39923
Isopropylbenzene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
4-Isopropyltoluene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
4-Methyl-2-pentanone	ND	10		µg/L	1	1/10/2017 4:19:00 PM	A39923
Methylene Chloride	ND	3.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
n-Butylbenzene	ND	3.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
n-Propylbenzene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
sec-Butylbenzene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
Styrene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
tert-Butylbenzene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
trans-1,2-DCE	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
Trichlorofluoromethane	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
Vinyl chloride	ND	1.0		µg/L	1	1/10/2017 4:19:00 PM	A39923
Xylenes, Total	ND	1.5		µg/L	1	1/10/2017 4:19:00 PM	A39923
Surr: 1,2-Dichloroethane-d4	108	70-130		%Rec	1	1/10/2017 4:19:00 PM	A39923
Surr: 4-Bromofluorobenzene	99.2	70-130		%Rec	1	1/10/2017 4:19:00 PM	A39923
Surr: Dibromofluoromethane	102	70-130		%Rec	1	1/10/2017 4:19:00 PM	A39923
Surr: Toluene-d8	97.8	70-130		%Rec	1	1/10/2017 4:19:00 PM	A39923

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701308

Date Reported: 2/1/2017

CLIENT: Terracon

Client Sample ID: TRIP BLANK

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701308-004

Matrix: TRIP BLANK

Received Date: 1/10/2017 9:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
Toluene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
Ethylbenzene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
Naphthalene	ND	2.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
1-Methylnaphthalene	ND	4.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
2-Methylnaphthalene	ND	4.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
Acetone	ND	10		µg/L	1	1/10/2017 4:44:00 PM	A39923
Bromobenzene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
Bromodichloromethane	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
Bromoform	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
Bromomethane	ND	3.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
2-Butanone	ND	10		µg/L	1	1/10/2017 4:44:00 PM	A39923
Carbon disulfide	ND	10		µg/L	1	1/10/2017 4:44:00 PM	A39923
Carbon Tetrachloride	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
Chlorobenzene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
Chloroethane	ND	2.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
Chloroform	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
Chloromethane	ND	3.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
2-Chlorotoluene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
4-Chlorotoluene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
cis-1,2-DCE	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
Dibromochloromethane	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
Dibromomethane	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
1,1-Dichloroethane	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
1,1-Dichloroethene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
1,2-Dichloropropane	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
1,3-Dichloropropane	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
2,2-Dichloropropane	ND	2.0		µg/L	1	1/10/2017 4:44:00 PM	A39923

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701308

Date Reported: 2/1/2017

CLIENT: Terracon

Client Sample ID: TRIP BLANK

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701308-004

Matrix: TRIP BLANK

Received Date: 1/10/2017 9:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,1-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
Hexachlorobutadiene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
2-Hexanone	ND	10		µg/L	1	1/10/2017 4:44:00 PM	A39923
Isopropylbenzene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
4-Isopropyltoluene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
4-Methyl-2-pentanone	ND	10		µg/L	1	1/10/2017 4:44:00 PM	A39923
Methylene Chloride	ND	3.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
n-Butylbenzene	ND	3.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
n-Propylbenzene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
sec-Butylbenzene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
Styrene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
tert-Butylbenzene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
trans-1,2-DCE	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
Trichlorofluoromethane	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
Vinyl chloride	ND	1.0		µg/L	1	1/10/2017 4:44:00 PM	A39923
Xylenes, Total	ND	1.5		µg/L	1	1/10/2017 4:44:00 PM	A39923
Surr: 1,2-Dichloroethane-d4	106	70-130		%Rec	1	1/10/2017 4:44:00 PM	A39923
Surr: 4-Bromofluorobenzene	100	70-130		%Rec	1	1/10/2017 4:44:00 PM	A39923
Surr: Dibromofluoromethane	101	70-130		%Rec	1	1/10/2017 4:44:00 PM	A39923
Surr: Toluene-d8	97.2	70-130		%Rec	1	1/10/2017 4:44:00 PM	A39923

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701308

Date Reported: 2/1/2017

CLIENT: Terracon

Client Sample ID: GWMW08-07-170109

Project: Griggs & Walnut GW Plume

Collection Date: 1/9/2017 2:05:00 PM

Lab ID: 1701308-005

Matrix: AQUEOUS

Received Date: 1/10/2017 9:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA 200.8: METALS							Analyst: JLF
Arsenic	0.0061	0.0010		mg/L	1	1/12/2017 4:50:08 PM	29653
Uranium	0.0016	0.00050		mg/L	1	1/12/2017 4:50:08 PM	29653
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
Toluene	4.0	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
Ethylbenzene	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
Methyl tert-butyl ether (MTBE)	7.3	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
Naphthalene	ND	2.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
1-Methylnaphthalene	ND	4.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
2-Methylnaphthalene	ND	4.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
Acetone	46	10		µg/L	1	1/10/2017 5:09:00 PM	A39923
Bromobenzene	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
Bromodichloromethane	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
Bromoform	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
Bromomethane	ND	3.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
2-Butanone	ND	10		µg/L	1	1/10/2017 5:09:00 PM	A39923
Carbon disulfide	ND	10		µg/L	1	1/10/2017 5:09:00 PM	A39923
Carbon Tetrachloride	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
Chlorobenzene	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
Chloroethane	ND	2.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
Chloroform	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
Chloromethane	ND	3.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
2-Chlorotoluene	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
4-Chlorotoluene	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
cis-1,2-DCE	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
Dibromochloromethane	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
Dibromomethane	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
1,1-Dichloroethane	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
1,1-Dichloroethene	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701308

Date Reported: 2/1/2017

CLIENT: Terracon

Client Sample ID: GWMW08-07-170109

Project: Griggs & Walnut GW Plume

Collection Date: 1/9/2017 2:05:00 PM

Lab ID: 1701308-005

Matrix: AQUEOUS

Received Date: 1/10/2017 9:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,2-Dichloropropane	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
1,3-Dichloropropane	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
2,2-Dichloropropane	ND	2.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
1,1-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
Hexachlorobutadiene	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
2-Hexanone	ND	10		µg/L	1	1/10/2017 5:09:00 PM	A39923
Isopropylbenzene	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
4-Isopropyltoluene	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
4-Methyl-2-pentanone	ND	10		µg/L	1	1/10/2017 5:09:00 PM	A39923
Methylene Chloride	ND	3.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
n-Butylbenzene	ND	3.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
n-Propylbenzene	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
sec-Butylbenzene	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
Styrene	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
tert-Butylbenzene	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
trans-1,2-DCE	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
Trichlorofluoromethane	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
Vinyl chloride	ND	1.0		µg/L	1	1/10/2017 5:09:00 PM	A39923
Xylenes, Total	ND	1.5		µg/L	1	1/10/2017 5:09:00 PM	A39923
Surr: 1,2-Dichloroethane-d4	108	70-130		%Rec	1	1/10/2017 5:09:00 PM	A39923
Surr: 4-Bromofluorobenzene	100	70-130		%Rec	1	1/10/2017 5:09:00 PM	A39923
Surr: Dibromofluoromethane	101	70-130		%Rec	1	1/10/2017 5:09:00 PM	A39923
Surr: Toluene-d8	99.1	70-130		%Rec	1	1/10/2017 5:09:00 PM	A39923

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701308

Date Reported: 2/1/2017

CLIENT: Terracon

Client Sample ID: GWMW08-06-170109

Project: Griggs & Walnut GW Plume

Collection Date: 1/9/2017 2:15:00 PM

Lab ID: 1701308-006

Matrix: AQUEOUS

Received Date: 1/10/2017 9:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA 200.8: METALS							Analyst: JLF
Arsenic	0.0018	0.0010		mg/L	1	1/12/2017 4:53:09 PM	29653
Uranium	ND	0.00050		mg/L	1	1/12/2017 4:53:09 PM	29653
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
Toluene	3.5	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
Ethylbenzene	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
Methyl tert-butyl ether (MTBE)	1.1	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
Naphthalene	ND	2.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
1-Methylnaphthalene	ND	4.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
2-Methylnaphthalene	ND	4.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
Acetone	ND	10		µg/L	1	1/10/2017 5:34:00 PM	A39923
Bromobenzene	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
Bromodichloromethane	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
Bromoform	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
Bromomethane	ND	3.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
2-Butanone	ND	10		µg/L	1	1/10/2017 5:34:00 PM	A39923
Carbon disulfide	ND	10		µg/L	1	1/10/2017 5:34:00 PM	A39923
Carbon Tetrachloride	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
Chlorobenzene	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
Chloroethane	ND	2.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
Chloroform	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
Chloromethane	ND	3.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
2-Chlorotoluene	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
4-Chlorotoluene	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
cis-1,2-DCE	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
Dibromochloromethane	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
Dibromomethane	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
1,1-Dichloroethane	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
1,1-Dichloroethene	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701308

Date Reported: 2/1/2017

CLIENT: Terracon

Client Sample ID: GWMW08-06-170109

Project: Griggs & Walnut GW Plume

Collection Date: 1/9/2017 2:15:00 PM

Lab ID: 1701308-006

Matrix: AQUEOUS

Received Date: 1/10/2017 9:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,2-Dichloropropane	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
1,3-Dichloropropane	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
2,2-Dichloropropane	ND	2.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
1,1-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
Hexachlorobutadiene	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
2-Hexanone	ND	10		µg/L	1	1/10/2017 5:34:00 PM	A39923
Isopropylbenzene	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
4-Isopropyltoluene	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
4-Methyl-2-pentanone	ND	10		µg/L	1	1/10/2017 5:34:00 PM	A39923
Methylene Chloride	ND	3.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
n-Butylbenzene	ND	3.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
n-Propylbenzene	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
sec-Butylbenzene	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
Styrene	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
tert-Butylbenzene	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
trans-1,2-DCE	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
Trichlorofluoromethane	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
Vinyl chloride	ND	1.0		µg/L	1	1/10/2017 5:34:00 PM	A39923
Xylenes, Total	ND	1.5		µg/L	1	1/10/2017 5:34:00 PM	A39923
Surr: 1,2-Dichloroethane-d4	105	70-130		%Rec	1	1/10/2017 5:34:00 PM	A39923
Surr: 4-Bromofluorobenzene	99.6	70-130		%Rec	1	1/10/2017 5:34:00 PM	A39923
Surr: Dibromofluoromethane	99.4	70-130		%Rec	1	1/10/2017 5:34:00 PM	A39923
Surr: Toluene-d8	98.3	70-130		%Rec	1	1/10/2017 5:34:00 PM	A39923

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701308

Date Reported: 2/1/2017

CLIENT: Terracon

Client Sample ID: GWMW08-05-170109

Project: Griggs & Walnut GW Plume

Collection Date: 1/9/2017 2:25:00 PM

Lab ID: 1701308-007

Matrix: AQUEOUS

Received Date: 1/10/2017 9:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA 200.8: METALS							Analyst: JLF
Arsenic	0.0030	0.0010		mg/L	1	1/12/2017 4:56:10 PM	29653
Uranium	ND	0.00050		mg/L	1	1/12/2017 4:56:10 PM	29653
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
Toluene	4.1	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
Ethylbenzene	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
Methyl tert-butyl ether (MTBE)	8.2	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
Naphthalene	ND	2.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
1-Methylnaphthalene	ND	4.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
2-Methylnaphthalene	ND	4.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
Acetone	11	10		µg/L	1	1/10/2017 5:59:00 PM	A39923
Bromobenzene	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
Bromodichloromethane	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
Bromoform	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
Bromomethane	ND	3.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
2-Butanone	ND	10		µg/L	1	1/10/2017 5:59:00 PM	A39923
Carbon disulfide	ND	10		µg/L	1	1/10/2017 5:59:00 PM	A39923
Carbon Tetrachloride	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
Chlorobenzene	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
Chloroethane	ND	2.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
Chloroform	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
Chloromethane	ND	3.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
2-Chlorotoluene	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
4-Chlorotoluene	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
cis-1,2-DCE	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
Dibromochloromethane	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
Dibromomethane	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
1,1-Dichloroethane	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
1,1-Dichloroethene	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701308

Date Reported: 2/1/2017

CLIENT: Terracon

Client Sample ID: GWMW08-05-170109

Project: Griggs & Walnut GW Plume

Collection Date: 1/9/2017 2:25:00 PM

Lab ID: 1701308-007

Matrix: AQUEOUS

Received Date: 1/10/2017 9:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,2-Dichloropropane	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
1,3-Dichloropropane	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
2,2-Dichloropropane	ND	2.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
1,1-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
Hexachlorobutadiene	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
2-Hexanone	ND	10		µg/L	1	1/10/2017 5:59:00 PM	A39923
Isopropylbenzene	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
4-Isopropyltoluene	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
4-Methyl-2-pentanone	ND	10		µg/L	1	1/10/2017 5:59:00 PM	A39923
Methylene Chloride	ND	3.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
n-Butylbenzene	ND	3.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
n-Propylbenzene	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
sec-Butylbenzene	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
Styrene	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
tert-Butylbenzene	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
trans-1,2-DCE	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
Trichlorofluoromethane	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
Vinyl chloride	ND	1.0		µg/L	1	1/10/2017 5:59:00 PM	A39923
Xylenes, Total	ND	1.5		µg/L	1	1/10/2017 5:59:00 PM	A39923
Surr: 1,2-Dichloroethane-d4	105	70-130		%Rec	1	1/10/2017 5:59:00 PM	A39923
Surr: 4-Bromofluorobenzene	96.4	70-130		%Rec	1	1/10/2017 5:59:00 PM	A39923
Surr: Dibromofluoromethane	101	70-130		%Rec	1	1/10/2017 5:59:00 PM	A39923
Surr: Toluene-d8	98.2	70-130		%Rec	1	1/10/2017 5:59:00 PM	A39923

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701308

Date Reported: 2/1/2017

CLIENT: Terracon

Client Sample ID: GWMW08-04-170109

Project: Griggs & Walnut GW Plume

Collection Date: 1/9/2017 2:35:00 PM

Lab ID: 1701308-008

Matrix: AQUEOUS

Received Date: 1/10/2017 9:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA 200.8: METALS							Analyst: JLF
Arsenic	0.0028	0.0010		mg/L	1	1/12/2017 4:59:10 PM	29653
Uranium	ND	0.00050		mg/L	1	1/12/2017 4:59:10 PM	29653
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
Toluene	5.5	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
Ethylbenzene	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
Methyl tert-butyl ether (MTBE)	11	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
Naphthalene	ND	2.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
1-Methylnaphthalene	ND	4.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
2-Methylnaphthalene	ND	4.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
Acetone	ND	10		µg/L	1	1/10/2017 6:23:00 PM	R39923
Bromobenzene	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
Bromodichloromethane	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
Bromoform	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
Bromomethane	ND	3.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
2-Butanone	ND	10		µg/L	1	1/10/2017 6:23:00 PM	R39923
Carbon disulfide	ND	10		µg/L	1	1/10/2017 6:23:00 PM	R39923
Carbon Tetrachloride	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
Chlorobenzene	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
Chloroethane	ND	2.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
Chloroform	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
Chloromethane	ND	3.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
2-Chlorotoluene	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
4-Chlorotoluene	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
cis-1,2-DCE	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
Dibromochloromethane	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
Dibromomethane	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
1,1-Dichloroethane	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
1,1-Dichloroethene	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701308

Date Reported: 2/1/2017

CLIENT: Terracon

Client Sample ID: GWMW08-04-170109

Project: Griggs & Walnut GW Plume

Collection Date: 1/9/2017 2:35:00 PM

Lab ID: 1701308-008

Matrix: AQUEOUS

Received Date: 1/10/2017 9:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,2-Dichloropropane	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
1,3-Dichloropropane	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
2,2-Dichloropropane	ND	2.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
1,1-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
Hexachlorobutadiene	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
2-Hexanone	ND	10		µg/L	1	1/10/2017 6:23:00 PM	R39923
Isopropylbenzene	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
4-Isopropyltoluene	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
4-Methyl-2-pentanone	ND	10		µg/L	1	1/10/2017 6:23:00 PM	R39923
Methylene Chloride	ND	3.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
n-Butylbenzene	ND	3.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
n-Propylbenzene	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
sec-Butylbenzene	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
Styrene	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
tert-Butylbenzene	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
trans-1,2-DCE	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
Trichlorofluoromethane	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
Vinyl chloride	ND	1.0		µg/L	1	1/10/2017 6:23:00 PM	R39923
Xylenes, Total	ND	1.5		µg/L	1	1/10/2017 6:23:00 PM	R39923
Surr: 1,2-Dichloroethane-d4	108	70-130		%Rec	1	1/10/2017 6:23:00 PM	R39923
Surr: 4-Bromofluorobenzene	96.6	70-130		%Rec	1	1/10/2017 6:23:00 PM	R39923
Surr: Dibromofluoromethane	99.9	70-130		%Rec	1	1/10/2017 6:23:00 PM	R39923
Surr: Toluene-d8	98.4	70-130		%Rec	1	1/10/2017 6:23:00 PM	R39923

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701308

Date Reported: 2/1/2017

CLIENT: Terracon

Client Sample ID: GWMW08-03-170109

Project: Griggs & Walnut GW Plume

Collection Date: 1/9/2017 2:45:00 PM

Lab ID: 1701308-009

Matrix: AQUEOUS

Received Date: 1/10/2017 9:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA 200.8: METALS							Analyst: JLF
Arsenic	0.0026	0.0010		mg/L	1	1/13/2017 3:57:58 PM	A40026
Uranium	ND	0.00050		mg/L	1	1/13/2017 3:57:58 PM	A40026
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
Toluene	4.0	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
Ethylbenzene	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
Methyl tert-butyl ether (MTBE)	10	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
Naphthalene	ND	2.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
1-Methylnaphthalene	ND	4.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
2-Methylnaphthalene	ND	4.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
Acetone	ND	10		µg/L	1	1/10/2017 6:48:00 PM	R39923
Bromobenzene	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
Bromodichloromethane	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
Bromoform	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
Bromomethane	ND	3.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
2-Butanone	ND	10		µg/L	1	1/10/2017 6:48:00 PM	R39923
Carbon disulfide	ND	10		µg/L	1	1/10/2017 6:48:00 PM	R39923
Carbon Tetrachloride	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
Chlorobenzene	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
Chloroethane	ND	2.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
Chloroform	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
Chloromethane	ND	3.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
2-Chlorotoluene	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
4-Chlorotoluene	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
cis-1,2-DCE	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
Dibromochloromethane	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
Dibromomethane	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
1,1-Dichloroethane	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
1,1-Dichloroethene	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701308

Date Reported: 2/1/2017

CLIENT: Terracon

Client Sample ID: GWMW08-03-170109

Project: Griggs & Walnut GW Plume

Collection Date: 1/9/2017 2:45:00 PM

Lab ID: 1701308-009

Matrix: AQUEOUS

Received Date: 1/10/2017 9:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,2-Dichloropropane	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
1,3-Dichloropropane	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
2,2-Dichloropropane	ND	2.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
1,1-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
Hexachlorobutadiene	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
2-Hexanone	ND	10		µg/L	1	1/10/2017 6:48:00 PM	R39923
Isopropylbenzene	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
4-Isopropyltoluene	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
4-Methyl-2-pentanone	ND	10		µg/L	1	1/10/2017 6:48:00 PM	R39923
Methylene Chloride	ND	3.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
n-Butylbenzene	ND	3.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
n-Propylbenzene	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
sec-Butylbenzene	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
Styrene	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
tert-Butylbenzene	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
trans-1,2-DCE	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
Trichlorofluoromethane	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
Vinyl chloride	ND	1.0		µg/L	1	1/10/2017 6:48:00 PM	R39923
Xylenes, Total	ND	1.5		µg/L	1	1/10/2017 6:48:00 PM	R39923
Surr: 1,2-Dichloroethane-d4	105	70-130		%Rec	1	1/10/2017 6:48:00 PM	R39923
Surr: 4-Bromofluorobenzene	98.4	70-130		%Rec	1	1/10/2017 6:48:00 PM	R39923
Surr: Dibromofluoromethane	102	70-130		%Rec	1	1/10/2017 6:48:00 PM	R39923
Surr: Toluene-d8	97.8	70-130		%Rec	1	1/10/2017 6:48:00 PM	R39923

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701308

Date Reported: 2/1/2017

CLIENT: Terracon

Client Sample ID: TRIP BLANK

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701308-010

Matrix: TRIP BLANK

Received Date: 1/10/2017 9:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
Toluene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
Ethylbenzene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
Naphthalene	ND	2.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
1-Methylnaphthalene	ND	4.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
2-Methylnaphthalene	ND	4.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
Acetone	ND	10		µg/L	1	1/11/2017 5:08:47 PM	W39956
Bromobenzene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
Bromodichloromethane	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
Bromoform	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
Bromomethane	ND	3.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
2-Butanone	ND	10		µg/L	1	1/11/2017 5:08:47 PM	W39956
Carbon disulfide	ND	10		µg/L	1	1/11/2017 5:08:47 PM	W39956
Carbon Tetrachloride	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
Chlorobenzene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
Chloroethane	ND	2.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
Chloroform	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
Chloromethane	ND	3.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
2-Chlorotoluene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
4-Chlorotoluene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
cis-1,2-DCE	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
Dibromochloromethane	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
Dibromomethane	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
1,1-Dichloroethane	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
1,1-Dichloroethene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
1,2-Dichloropropane	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
1,3-Dichloropropane	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
2,2-Dichloropropane	ND	2.0		µg/L	1	1/11/2017 5:08:47 PM	W39956

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701308

Date Reported: 2/1/2017

CLIENT: Terracon

Client Sample ID: TRIP BLANK

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701308-010

Matrix: TRIP BLANK

Received Date: 1/10/2017 9:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,1-Dichloropropene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
Hexachlorobutadiene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
2-Hexanone	ND	10		µg/L	1	1/11/2017 5:08:47 PM	W39956
Isopropylbenzene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
4-Isopropyltoluene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
4-Methyl-2-pentanone	ND	10		µg/L	1	1/11/2017 5:08:47 PM	W39956
Methylene Chloride	ND	3.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
n-Butylbenzene	ND	3.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
n-Propylbenzene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
sec-Butylbenzene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
Styrene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
tert-Butylbenzene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
trans-1,2-DCE	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
Trichlorofluoromethane	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
Vinyl chloride	ND	1.0		µg/L	1	1/11/2017 5:08:47 PM	W39956
Xylenes, Total	ND	1.5		µg/L	1	1/11/2017 5:08:47 PM	W39956
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	1/11/2017 5:08:47 PM	W39956
Surr: 4-Bromofluorobenzene	96.1	70-130		%Rec	1	1/11/2017 5:08:47 PM	W39956
Surr: Dibromofluoromethane	98.5	70-130		%Rec	1	1/11/2017 5:08:47 PM	W39956
Surr: Toluene-d8	98.3	70-130		%Rec	1	1/11/2017 5:08:47 PM	W39956

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified



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College Station, TX 888.690.2218 • Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010113-001
Client Sample ID: 1701308-001C CLC26-170106

Report Date: 01/20/17
Collection Date: 01/06/17 09:00
Date Received: 01/11/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/12/17 19:22 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/12/17 19:22 / rgk

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010113-002
Client Sample ID: 1701308-002C CLC20-170106

Report Date: 01/20/17
Collection Date: 01/06/17 09:50
Date Received: 01/11/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/12/17 19:34 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/12/17 19:34 / rgk

Report
Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010113-003
Client Sample ID: 1701308-003C CLC57-170106

Report Date: 01/20/17
Collection Date: 01/06/17 10:15
Date Received: 01/11/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/12/17 20:10 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/12/17 20:10 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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College Station, TX 888.690.2218 • Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010113-004
Client Sample ID: 1701308-005C GWMW08-07-170109

Report Date: 01/20/17
Collection Date: 01/09/17 14:05
Date Received: 01/11/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/12/17 20:22 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/12/17 20:22 / rgk

Report
Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010113-005
Client Sample ID: 1701308-006C GWMW08-06-170109

Report Date: 01/20/17
Collection Date: 01/09/17 14:15
Date Received: 01/11/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/12/17 20:34 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/12/17 20:34 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010113-006
Client Sample ID: 1701308-007C GWMW08-05-170109

Report Date: 01/20/17
Collection Date: 01/09/17 14:25
Date Received: 01/11/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/12/17 20:46 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/12/17 20:46 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010113-007
Client Sample ID: 1701308-008C GWMW08-04-170109

Report Date: 01/20/17
Collection Date: 01/09/17 14:35
Date Received: 01/11/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/12/17 20:58 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/12/17 20:58 / rgk

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010113-008
Client Sample ID: 1701308-009C GWMW08-03-170109

Report Date: 01/20/17
Collection Date: 01/09/17 14:45
Date Received: 01/11/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/12/17 21:10 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/12/17 21:10 / rgk

Report RL - Analyte reporting limit.
Definitions: QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hall Environmental

Report Date: 01/20/17

Project: Not Indicated

Work Order: H17010113

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E1632AM		Analytical Run: ARSENIC SPECIATION_170113A							
Lab ID: AS-ICV 25ppb-1/12/2017	Initial Calibration Verification Standard								01/12/17 15:34
Arsenic-III	25.6	ug/L	5.0	103	87.6	114			
Arsenic-V	24.2	ug/L	5.0	97	87	116			
Lab ID: AS-50.0-1/12/2017	Continuing Calibration Verification Standard								01/12/17 18:46
Arsenic-III	49.8	ug/L	5.0	100	85	115			
Arsenic-V	48.6	ug/L	5.0	97	85	115			
Method: E1632AM		Batch: R122035							
Lab ID: AS-LFB 50ppb-1/12/2017	Laboratory Fortified Blank				Run: ARSENIC SPECIATION_1701		01/12/17 16:10		
Arsenic-III	50.2	ug/L	5.0	100	55	146			
Arsenic-V	50.7	ug/L	5.0	101	55	146			
Lab ID: ICB	Method Blank				Run: ARSENIC SPECIATION_1701		01/12/17 16:22		
Arsenic-III	ND	ug/L	0.2						
Arsenic-V	ND	ug/L	0.5						
Lab ID: H17010113-002A MS	Sample Matrix Spike				Run: ARSENIC SPECIATION_1701		01/12/17 19:46		
Arsenic-III	51.3	ug/L	5.0	103	55	146			
Arsenic-V	46.0	ug/L	5.0	92	55	146			
Lab ID: H17010113-002A MSD	Sample Matrix Spike Duplicate				Run: ARSENIC SPECIATION_1701		01/12/17 19:58		
Arsenic-III	52.9	ug/L	5.0	106	55	146	3.0	20	
Arsenic-V	46.1	ug/L	5.0	92	55	146	0.2	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701308

01-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	MB-29653	SampType:	MBLK	TestCode:	EPA 200.8: Metals					
Client ID:	PBW	Batch ID:	29653	RunNo:	39985					
Prep Date:	1/11/2017	Analysis Date:	1/12/2017	SeqNo:	1252950	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010								
Uranium	ND	0.00050								

Sample ID	MSLCS-29653	SampType:	LCS	TestCode:	EPA 200.8: Metals					
Client ID:	LCSW	Batch ID:	29653	RunNo:	39985					
Prep Date:	1/11/2017	Analysis Date:	1/12/2017	SeqNo:	1252951	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.024	0.0010	0.02500	0	96.5	85	115			
Uranium	0.012	0.00050	0.01250	0	95.1	85	115			

Sample ID	MSLLCS-29653	SampType:	LCSLL	TestCode:	EPA 200.8: Metals					
Client ID:	BatchQC	Batch ID:	29653	RunNo:	39985					
Prep Date:	1/11/2017	Analysis Date:	1/12/2017	SeqNo:	1252952	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.0010	0.0010	0.001000	0	101	50	150			
Uranium	ND	0.00050	0.0005000	0	95.4	50	150			

Sample ID	1701308-001BMSLL	SampType:	MSLL	TestCode:	EPA 200.8: Metals					
Client ID:	CLC26-170106	Batch ID:	29653	RunNo:	39985					
Prep Date:	1/11/2017	Analysis Date:	1/12/2017	SeqNo:	1253132	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.027	0.0010	0.02500	0.001505	101	70	130			
Uranium	0.013	0.00050	0.01250	0.0003232	105	70	130			

Sample ID	1701308-009BMSLL	SampType:	MSLL	TestCode:	EPA 200.8: Metals					
Client ID:	GMMW08-03-17010	Batch ID:	A40026	RunNo:	40026					
Prep Date:		Analysis Date:	1/13/2017	SeqNo:	1254519	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.029	0.0010	0.02500	0.002574	105	70	130			
Uranium	0.015	0.00050	0.01250	0.0002316	117	70	130			

Sample ID	LCS	SampType:	LCS	TestCode:	EPA 200.8: Metals					
Client ID:	LCSW	Batch ID:	A40026	RunNo:	40026					
Prep Date:		Analysis Date:	1/13/2017	SeqNo:	1254573	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701308

01-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID LCS	SampType: LCS		TestCode: EPA 200.8: Metals							
Client ID: LCSW	Batch ID: A40026		RunNo: 40026							
Prep Date:	Analysis Date: 1/13/2017		SeqNo: 1254573		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.025	0.0010	0.02500	0	99.9	85	115			
Uranium	0.013	0.00050	0.01250	0	101	85	115			

Sample ID LLCS	SampType: LCSLL		TestCode: EPA 200.8: Metals							
Client ID: BatchQC	Batch ID: A40026		RunNo: 40026							
Prep Date:	Analysis Date: 1/13/2017		SeqNo: 1254580		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010	0.001000	0	91.6	50	150			
Uranium	0.00051	0.00050	0.0005000	0	102	50	150			

Sample ID MB	SampType: MBLK		TestCode: EPA 200.8: Metals							
Client ID: PBW	Batch ID: A40026		RunNo: 40026							
Prep Date:	Analysis Date: 1/13/2017		SeqNo: 1254585		Units: mg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010								
Uranium	ND	0.00050								

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701308

01-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID 100ng lcs	SampType: LCS		TestCode: EPA Method 8260B: VOLATILES							
Client ID: LCSW	Batch ID: A39923		RunNo: 39923							
Prep Date:	Analysis Date: 1/10/2017		SeqNo: 1251176		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	97.9	70	130			
Toluene	19	1.0	20.00	0	96.8	70	130			
Chlorobenzene	20	1.0	20.00	0	98.3	70	130			
1,1-Dichloroethene	20	1.0	20.00	0	101	70	130			
Trichloroethene (TCE)	19	1.0	20.00	0	94.9	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		103	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		99.3	70	130			
Surr: Dibromofluoromethane	10		10.00		101	70	130			
Surr: Toluene-d8	9.8		10.00		98.5	70	130			

Sample ID vsb deli	SampType: MBLK		TestCode: EPA Method 8260B: VOLATILES							
Client ID: PBW	Batch ID: A39923		RunNo: 39923							
Prep Date:	Analysis Date: 1/10/2017		SeqNo: 1251414		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701308

01-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID: vsb deli	SampType: MBLK	TestCode: EPA Method 8260B: VOLATILES
Client ID: PBW	Batch ID: A39923	RunNo: 39923
Prep Date:	Analysis Date: 1/10/2017	SeqNo: 1251414 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701308

01-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	vsb deli	SampType:	MBLK	TestCode:	EPA Method 8260B: VOLATILES					
Client ID:	PBW	Batch ID:	A39923	RunNo:	39923					
Prep Date:		Analysis Date:	1/10/2017	SeqNo:	1251414	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	10		10.00		104	70	130			
Surr: 4-Bromofluorobenzene	9.8		10.00		98.3	70	130			
Surr: Dibromofluoromethane	10		10.00		101	70	130			
Surr: Toluene-d8	9.9		10.00		98.6	70	130			

Sample ID	rb	SampType:	MBLK	TestCode:	EPA Method 8260B: VOLATILES					
Client ID:	PBW	Batch ID:	W39956	RunNo:	39956					
Prep Date:		Analysis Date:	1/11/2017	SeqNo:	1252571	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								

Qualifiers:

- | | |
|---|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| H Holding times for preparation or analysis exceeded | J Analyte detected below quantitation limits |
| ND Not Detected at the Reporting Limit | P Sample pH Not In Range |
| R RPD outside accepted recovery limits | RL Reporting Detection Limit |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701308

01-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	rb	SampType:	MBLK	TestCode:	EPA Method 8260B: VOLATILES					
Client ID:	PBW	Batch ID:	W39956	RunNo:	39956					
Prep Date:		Analysis Date:	1/11/2017	SeqNo:	1252571	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.7		10.00		96.5	70	130			

Qualifiers:

- | | |
|---|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| H Holding times for preparation or analysis exceeded | J Analyte detected below quantitation limits |
| ND Not Detected at the Reporting Limit | P Sample pH Not In Range |
| R RPD outside accepted recovery limits | RL Reporting Detection Limit |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701308

01-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID rb	SampType: MBLK		TestCode: EPA Method 8260B: VOLATILES							
Client ID: PBW	Batch ID: W39956		RunNo: 39956							
Prep Date:	Analysis Date: 1/11/2017		SeqNo: 1252571				Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130			
Surr: Dibromofluoromethane	9.8		10.00		97.9	70	130			
Surr: Toluene-d8	10		10.00		100	70	130			

Sample ID 100ng lcs	SampType: LCS		TestCode: EPA Method 8260B: VOLATILES							
Client ID: LCSW	Batch ID: W39956		RunNo: 39956							
Prep Date:	Analysis Date: 1/11/2017		SeqNo: 1252572				Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	102	70	130			
Toluene	21	1.0	20.00	0	107	70	130			
Chlorobenzene	20	1.0	20.00	0	99.6	70	130			
1,1-Dichloroethene	19	1.0	20.00	0	94.1	70	130			
Trichloroethene (TCE)	19	1.0	20.00	0	96.8	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		99.7	70	130			
Surr: 4-Bromofluorobenzene	9.8		10.00		98.2	70	130			
Surr: Dibromofluoromethane	10		10.00		100	70	130			
Surr: Toluene-d8	10		10.00		100	70	130			

Qualifiers:

- | | |
|---|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| H Holding times for preparation or analysis exceeded | J Analyte detected below quantitation limits |
| ND Not Detected at the Reporting Limit | P Sample pH Not In Range |
| R RPD outside accepted recovery limits | RL Reporting Detection Limit |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |



Hall Environmental Analysis Laboratory
 4901 Hawkins NE
 Albuquerque, NM 87109
 TEL: 505-345-3975 FAX: 505-345-4107
 Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: TER-LC

Work Order Number: 1701308

RcptNo: 1

Received by/date: **RE** 01/10/17

Logged By: **Ashley Gallegos** 1/10/2017 9:20:00 AM *AG*

Completed By: **Ashley Gallegos** 1/10/2017 9:43:15 AM *AG*

Reviewed By: *La* 01/10/17

Chain of Custody

- 1. Custody seals intact on sample bottles? Yes No Not Present
- 2. Is Chain of Custody complete? Yes No Not Present
- 3. How was the sample delivered? FedEx

Log In

- 4. Was an attempt made to cool the samples? Yes No NA
- 5. Were all samples received at a temperature of >0° C to 6.0°C Yes No NA
- 6. Sample(s) in proper container(s)? Yes No
- 7. Sufficient sample volume for indicated test(s)? Yes No
- 8. Are samples (except VOA and ONG) properly preserved? ~~Yes~~ No *re*
- 9. Was preservative added to bottles? Yes No NA
- 10. VOA vials have zero headspace? Yes No No VOA Vials
- 11. Were any sample containers received broken? Yes No
- 12. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes No
- 13. Are matrices correctly identified on Chain of Custody? Yes No
- 14. Is it clear what analyses were requested? Yes No
- 15. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes No

of preserved bottles checked for pH: **811, 5 pH @ 3.5**

Adjusted? or >12 unless noted **NO**

Checked by: *re*

Special Handling (if applicable)

- 16. Was client notified of all discrepancies with this order? Yes No NA

Person Notified: _____ Date: _____

By Whom: _____ Via: eMail Phone Fax In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks: *Samples 005X-009C had pH level of 3.5; 00K-003C pH level @ 1.5.*

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	4.5	Good	Yes			

*1420 re
1/10/16*

Chain-of-Custody Record

Client: Terracon Consultants, Inc.

Mailing Address: 4450 Betan Memorial E

Las Cruces, NM

Phone #: 575-527-1700

email or Fax#: Kyle.Williams@terracon.com

QA/QC Package: Standard Level 4 (Full Validation)

Accreditation: NELAP Other

EDD (Type)

Turn-Around Time:

Standard Rush

Project Name: Crr. 993 + Walnut + GW Plus 2nd

Project #: 68167094

Project Manager: Kyle W. Williams

Sampler: Williams

On Ice: Yes No

Sample Temperature: 45

Container Type and #

Preservative Type

HEAL No. 1701308

Date

Time

Matrix

Sample Request ID

1/6/17 0900 GW CLC26-170106

0950 CLC20-170106

1015 CLC57-170106

1405 Trip Blank

1/9/16 1405 GW GWMW08-07-170109

1405 GWMW08-06-170109

1425 GWMW08-05-170109

1435 GWMW08-04-170109

1445 GWMW08-03-170109

Trip Blank

Date: 1/9/17

Time: 1605

Relinquished by: [Signature]

Relinquished by:

Received by: [Signature]

Date: 11/17

Date: 11/17

Time: 0920

Remarks: Invoice City of Las Cruces

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

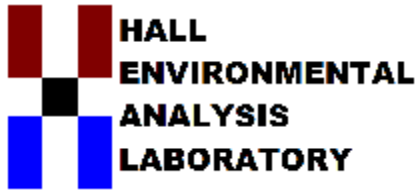
4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

BTEX + MTBE + TMB's (8021)	
BTEX + MTBE + TPH (Gas only)	
TPH 8015B (GRO / DRO / MRO)	
TPH (Method 418.1)	
EDB (Method 504.1)	
PAH's (8310 or 8270 SIMS)	
RCRA 8 Metals	
Anions (F, Cl, NO ₃ , NO ₂ , PO ₄ , SO ₄)	
8081 Pesticides / 8082 PCB's	
8260B (VOA)	X
8270 (Semi-VOA)	X
6020 As, U	X
43114 As specification	X
Air Bubbles (Y or N)	

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

January 25, 2017

Kyle Williams

Terracon

4450 Bataan Memorial E

Las Cruces, NM 88005

TEL: (575) 527-1700

FAX (575) 527-1092

RE: Griggs & Walnut GW Plume

OrderNo.: 1701404

Dear Kyle Williams:

Hall Environmental Analysis Laboratory received 8 sample(s) on 1/11/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a white background.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701404

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: GWMW03-01-170110

Project: Griggs & Walnut GW Plume

Collection Date: 1/10/2017 1:50:00 PM

Lab ID: 1701404-001

Matrix: GROUNDWA

Received Date: 1/11/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.013	0.0010	*	mg/L	1	1/17/2017 1:45:36 PM	29685
Uranium	0.029	0.0025		mg/L	5	1/17/2017 1:48:37 PM	29685
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
Toluene	4.3	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
Ethylbenzene	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
Naphthalene	ND	2.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
1-Methylnaphthalene	ND	4.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
2-Methylnaphthalene	ND	4.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
Acetone	ND	10		µg/L	1	1/12/2017 6:10:27 PM	W39990
Bromobenzene	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
Bromodichloromethane	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
Bromoform	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
Bromomethane	ND	3.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
2-Butanone	ND	10		µg/L	1	1/12/2017 6:10:27 PM	W39990
Carbon disulfide	ND	10		µg/L	1	1/12/2017 6:10:27 PM	W39990
Carbon Tetrachloride	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
Chlorobenzene	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
Chloroethane	ND	2.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
Chloroform	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
Chloromethane	ND	3.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
2-Chlorotoluene	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
4-Chlorotoluene	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
cis-1,2-DCE	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
Dibromochloromethane	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
Dibromomethane	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
1,1-Dichloroethane	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
1,1-Dichloroethene	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701404

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: GWMW03-01-170110

Project: Griggs & Walnut GW Plume

Collection Date: 1/10/2017 1:50:00 PM

Lab ID: 1701404-001

Matrix: GROUNDWA

Received Date: 1/11/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
1,3-Dichloropropane	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
2,2-Dichloropropane	ND	2.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
1,1-Dichloropropene	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
Hexachlorobutadiene	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
2-Hexanone	ND	10		µg/L	1	1/12/2017 6:10:27 PM	W39990
Isopropylbenzene	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
4-Isopropyltoluene	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
4-Methyl-2-pentanone	ND	10		µg/L	1	1/12/2017 6:10:27 PM	W39990
Methylene Chloride	ND	3.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
n-Butylbenzene	ND	3.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
n-Propylbenzene	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
sec-Butylbenzene	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
Styrene	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
tert-Butylbenzene	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
trans-1,2-DCE	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
Trichlorofluoromethane	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
Vinyl chloride	ND	1.0		µg/L	1	1/12/2017 6:10:27 PM	W39990
Xylenes, Total	ND	1.5		µg/L	1	1/12/2017 6:10:27 PM	W39990
Surr: 1,2-Dichloroethane-d4	104	70-130		%Rec	1	1/12/2017 6:10:27 PM	W39990
Surr: 4-Bromofluorobenzene	89.0	70-130		%Rec	1	1/12/2017 6:10:27 PM	W39990
Surr: Dibromofluoromethane	106	70-130		%Rec	1	1/12/2017 6:10:27 PM	W39990
Surr: Toluene-d8	97.1	70-130		%Rec	1	1/12/2017 6:10:27 PM	W39990

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701404

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: GWMW03-01-170110 D

Project: Griggs & Walnut GW Plume

Collection Date: 1/10/2017 1:50:00 PM

Lab ID: 1701404-002

Matrix: GROUNDWA

Received Date: 1/11/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.015	0.0010	*	mg/L	1	1/17/2017 1:59:44 PM	29685
Uranium	0.030	0.0025		mg/L	5	1/17/2017 2:02:44 PM	29685
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
Toluene	4.5	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
Ethylbenzene	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
Naphthalene	ND	2.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
1-Methylnaphthalene	ND	4.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
2-Methylnaphthalene	ND	4.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
Acetone	ND	10		µg/L	1	1/12/2017 6:39:50 PM	W39990
Bromobenzene	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
Bromodichloromethane	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
Bromoform	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
Bromomethane	ND	3.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
2-Butanone	ND	10		µg/L	1	1/12/2017 6:39:50 PM	W39990
Carbon disulfide	ND	10		µg/L	1	1/12/2017 6:39:50 PM	W39990
Carbon Tetrachloride	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
Chlorobenzene	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
Chloroethane	ND	2.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
Chloroform	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
Chloromethane	ND	3.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
2-Chlorotoluene	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
4-Chlorotoluene	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
cis-1,2-DCE	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
Dibromochloromethane	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
Dibromomethane	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
1,1-Dichloroethane	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
1,1-Dichloroethene	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701404

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: GWMW03-01-170110 D

Project: Griggs & Walnut GW Plume

Collection Date: 1/10/2017 1:50:00 PM

Lab ID: 1701404-002

Matrix: GROUNDWA

Received Date: 1/11/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
1,3-Dichloropropane	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
2,2-Dichloropropane	ND	2.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
1,1-Dichloropropene	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
Hexachlorobutadiene	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
2-Hexanone	ND	10		µg/L	1	1/12/2017 6:39:50 PM	W39990
Isopropylbenzene	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
4-Isopropyltoluene	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
4-Methyl-2-pentanone	ND	10		µg/L	1	1/12/2017 6:39:50 PM	W39990
Methylene Chloride	ND	3.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
n-Butylbenzene	ND	3.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
n-Propylbenzene	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
sec-Butylbenzene	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
Styrene	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
tert-Butylbenzene	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
trans-1,2-DCE	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
Trichlorofluoromethane	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
Vinyl chloride	ND	1.0		µg/L	1	1/12/2017 6:39:50 PM	W39990
Xylenes, Total	ND	1.5		µg/L	1	1/12/2017 6:39:50 PM	W39990
Surr: 1,2-Dichloroethane-d4	98.4	70-130		%Rec	1	1/12/2017 6:39:50 PM	W39990
Surr: 4-Bromofluorobenzene	95.7	70-130		%Rec	1	1/12/2017 6:39:50 PM	W39990
Surr: Dibromofluoromethane	103	70-130		%Rec	1	1/12/2017 6:39:50 PM	W39990
Surr: Toluene-d8	98.3	70-130		%Rec	1	1/12/2017 6:39:50 PM	W39990

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701404

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: GWMW03-02-170110

Project: Griggs & Walnut GW Plume

Collection Date: 1/10/2017 1:55:00 PM

Lab ID: 1701404-003

Matrix: GROUNDWA

Received Date: 1/11/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0054	0.0010		mg/L	1	1/17/2017 2:05:45 PM	29685
Uranium	0.021	0.00050		mg/L	1	1/16/2017 5:59:48 PM	29685
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	1.1	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
Toluene	15	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
Ethylbenzene	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
Naphthalene	ND	2.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
1-Methylnaphthalene	ND	4.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
2-Methylnaphthalene	ND	4.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
Acetone	ND	10		µg/L	1	1/12/2017 7:09:06 PM	W39990
Bromobenzene	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
Bromodichloromethane	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
Bromoform	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
Bromomethane	ND	3.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
2-Butanone	ND	10		µg/L	1	1/12/2017 7:09:06 PM	W39990
Carbon disulfide	ND	10		µg/L	1	1/12/2017 7:09:06 PM	W39990
Carbon Tetrachloride	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
Chlorobenzene	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
Chloroethane	ND	2.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
Chloroform	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
Chloromethane	ND	3.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
2-Chlorotoluene	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
4-Chlorotoluene	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
cis-1,2-DCE	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
Dibromochloromethane	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
Dibromomethane	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
1,1-Dichloroethane	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
1,1-Dichloroethene	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701404

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: GWMW03-02-170110

Project: Griggs & Walnut GW Plume

Collection Date: 1/10/2017 1:55:00 PM

Lab ID: 1701404-003

Matrix: GROUNDWA

Received Date: 1/11/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
1,3-Dichloropropane	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
2,2-Dichloropropane	ND	2.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
1,1-Dichloropropene	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
Hexachlorobutadiene	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
2-Hexanone	ND	10		µg/L	1	1/12/2017 7:09:06 PM	W39990
Isopropylbenzene	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
4-Isopropyltoluene	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
4-Methyl-2-pentanone	ND	10		µg/L	1	1/12/2017 7:09:06 PM	W39990
Methylene Chloride	ND	3.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
n-Butylbenzene	ND	3.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
n-Propylbenzene	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
sec-Butylbenzene	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
Styrene	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
tert-Butylbenzene	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
trans-1,2-DCE	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
Trichlorofluoromethane	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
Vinyl chloride	ND	1.0		µg/L	1	1/12/2017 7:09:06 PM	W39990
Xylenes, Total	ND	1.5		µg/L	1	1/12/2017 7:09:06 PM	W39990
Surr: 1,2-Dichloroethane-d4	97.5	70-130		%Rec	1	1/12/2017 7:09:06 PM	W39990
Surr: 4-Bromofluorobenzene	92.1	70-130		%Rec	1	1/12/2017 7:09:06 PM	W39990
Surr: Dibromofluoromethane	98.9	70-130		%Rec	1	1/12/2017 7:09:06 PM	W39990
Surr: Toluene-d8	100	70-130		%Rec	1	1/12/2017 7:09:06 PM	W39990

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701404

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: GWMW03-03-170110

Project: Griggs & Walnut GW Plume

Collection Date: 1/10/2017 2:00:00 PM

Lab ID: 1701404-004

Matrix: GROUNDWA

Received Date: 1/11/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0065	0.0010		mg/L	1	1/17/2017 2:08:45 PM	29685
Uranium	ND	0.00050		mg/L	1	1/16/2017 6:04:56 PM	29685
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
Toluene	8.9	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
Ethylbenzene	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
Naphthalene	ND	2.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
1-Methylnaphthalene	ND	4.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
2-Methylnaphthalene	ND	4.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
Acetone	ND	10		µg/L	1	1/12/2017 7:38:20 PM	W39990
Bromobenzene	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
Bromodichloromethane	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
Bromoform	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
Bromomethane	ND	3.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
2-Butanone	11	10		µg/L	1	1/12/2017 7:38:20 PM	W39990
Carbon disulfide	ND	10		µg/L	1	1/12/2017 7:38:20 PM	W39990
Carbon Tetrachloride	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
Chlorobenzene	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
Chloroethane	ND	2.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
Chloroform	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
Chloromethane	ND	3.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
2-Chlorotoluene	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
4-Chlorotoluene	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
cis-1,2-DCE	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
Dibromochloromethane	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
Dibromomethane	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
1,1-Dichloroethane	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
1,1-Dichloroethene	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701404

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: GWMW03-03-170110

Project: Griggs & Walnut GW Plume

Collection Date: 1/10/2017 2:00:00 PM

Lab ID: 1701404-004

Matrix: GROUNDWA

Received Date: 1/11/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
1,3-Dichloropropane	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
2,2-Dichloropropane	ND	2.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
1,1-Dichloropropene	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
Hexachlorobutadiene	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
2-Hexanone	ND	10		µg/L	1	1/12/2017 7:38:20 PM	W39990
Isopropylbenzene	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
4-Isopropyltoluene	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
4-Methyl-2-pentanone	ND	10		µg/L	1	1/12/2017 7:38:20 PM	W39990
Methylene Chloride	ND	3.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
n-Butylbenzene	ND	3.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
n-Propylbenzene	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
sec-Butylbenzene	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
Styrene	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
tert-Butylbenzene	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
trans-1,2-DCE	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
Trichlorofluoromethane	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
Vinyl chloride	ND	1.0		µg/L	1	1/12/2017 7:38:20 PM	W39990
Xylenes, Total	ND	1.5		µg/L	1	1/12/2017 7:38:20 PM	W39990
Surr: 1,2-Dichloroethane-d4	98.0	70-130		%Rec	1	1/12/2017 7:38:20 PM	W39990
Surr: 4-Bromofluorobenzene	92.7	70-130		%Rec	1	1/12/2017 7:38:20 PM	W39990
Surr: Dibromofluoromethane	101	70-130		%Rec	1	1/12/2017 7:38:20 PM	W39990
Surr: Toluene-d8	101	70-130		%Rec	1	1/12/2017 7:38:20 PM	W39990

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701404

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: GWMW03-06-170110

Project: Griggs & Walnut GW Plume

Collection Date: 1/10/2017 2:10:00 PM

Lab ID: 1701404-005

Matrix: GROUNDWA

Received Date: 1/11/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0076	0.0010		mg/L	1	1/17/2017 2:21:29 PM	29685
Uranium	ND	0.00050		mg/L	1	1/16/2017 6:10:05 PM	29685
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
Toluene	9.1	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
Ethylbenzene	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
Naphthalene	ND	2.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
1-Methylnaphthalene	ND	4.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
2-Methylnaphthalene	ND	4.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
Acetone	ND	10		µg/L	1	1/12/2017 8:07:41 PM	W39990
Bromobenzene	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
Bromodichloromethane	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
Bromoform	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
Bromomethane	ND	3.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
2-Butanone	ND	10		µg/L	1	1/12/2017 8:07:41 PM	W39990
Carbon disulfide	ND	10		µg/L	1	1/12/2017 8:07:41 PM	W39990
Carbon Tetrachloride	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
Chlorobenzene	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
Chloroethane	ND	2.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
Chloroform	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
Chloromethane	ND	3.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
2-Chlorotoluene	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
4-Chlorotoluene	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
cis-1,2-DCE	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
Dibromochloromethane	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
Dibromomethane	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
1,1-Dichloroethane	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
1,1-Dichloroethene	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701404

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: GWMW03-06-170110

Project: Griggs & Walnut GW Plume

Collection Date: 1/10/2017 2:10:00 PM

Lab ID: 1701404-005

Matrix: GROUNDWA

Received Date: 1/11/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
1,3-Dichloropropane	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
2,2-Dichloropropane	ND	2.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
1,1-Dichloropropene	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
Hexachlorobutadiene	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
2-Hexanone	ND	10		µg/L	1	1/12/2017 8:07:41 PM	W39990
Isopropylbenzene	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
4-Isopropyltoluene	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
4-Methyl-2-pentanone	ND	10		µg/L	1	1/12/2017 8:07:41 PM	W39990
Methylene Chloride	ND	3.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
n-Butylbenzene	ND	3.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
n-Propylbenzene	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
sec-Butylbenzene	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
Styrene	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
tert-Butylbenzene	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
trans-1,2-DCE	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
Trichlorofluoromethane	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
Vinyl chloride	ND	1.0		µg/L	1	1/12/2017 8:07:41 PM	W39990
Xylenes, Total	ND	1.5		µg/L	1	1/12/2017 8:07:41 PM	W39990
Surr: 1,2-Dichloroethane-d4	97.6	70-130		%Rec	1	1/12/2017 8:07:41 PM	W39990
Surr: 4-Bromofluorobenzene	89.7	70-130		%Rec	1	1/12/2017 8:07:41 PM	W39990
Surr: Dibromofluoromethane	101	70-130		%Rec	1	1/12/2017 8:07:41 PM	W39990
Surr: Toluene-d8	98.9	70-130		%Rec	1	1/12/2017 8:07:41 PM	W39990

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701404

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: FB-170110

Project: Griggs & Walnut GW Plume

Collection Date: 1/10/2017 12:15:00 PM

Lab ID: 1701404-006

Matrix: GROUNDWA

Received Date: 1/11/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
Toluene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
Ethylbenzene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
Naphthalene	ND	2.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
1-Methylnaphthalene	ND	4.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
2-Methylnaphthalene	ND	4.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
Acetone	ND	10		µg/L	1	1/12/2017 9:35:20 PM	W39990
Bromobenzene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
Bromodichloromethane	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
Bromoform	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
Bromomethane	ND	3.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
2-Butanone	ND	10		µg/L	1	1/12/2017 9:35:20 PM	W39990
Carbon disulfide	ND	10		µg/L	1	1/12/2017 9:35:20 PM	W39990
Carbon Tetrachloride	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
Chlorobenzene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
Chloroethane	ND	2.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
Chloroform	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
Chloromethane	ND	3.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
2-Chlorotoluene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
4-Chlorotoluene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
cis-1,2-DCE	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
Dibromochloromethane	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
Dibromomethane	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
1,1-Dichloroethane	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
1,1-Dichloroethene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
1,2-Dichloropropane	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
1,3-Dichloropropane	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
2,2-Dichloropropane	ND	2.0		µg/L	1	1/12/2017 9:35:20 PM	W39990

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701404

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: FB-170110

Project: Griggs & Walnut GW Plume

Collection Date: 1/10/2017 12:15:00 PM

Lab ID: 1701404-006

Matrix: GROUNDWA

Received Date: 1/11/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,1-Dichloropropene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
Hexachlorobutadiene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
2-Hexanone	ND	10		µg/L	1	1/12/2017 9:35:20 PM	W39990
Isopropylbenzene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
4-Isopropyltoluene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
4-Methyl-2-pentanone	ND	10		µg/L	1	1/12/2017 9:35:20 PM	W39990
Methylene Chloride	ND	3.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
n-Butylbenzene	ND	3.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
n-Propylbenzene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
sec-Butylbenzene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
Styrene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
tert-Butylbenzene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
trans-1,2-DCE	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
Trichlorofluoromethane	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
Vinyl chloride	ND	1.0		µg/L	1	1/12/2017 9:35:20 PM	W39990
Xylenes, Total	ND	1.5		µg/L	1	1/12/2017 9:35:20 PM	W39990
Surr: 1,2-Dichloroethane-d4	98.4	70-130		%Rec	1	1/12/2017 9:35:20 PM	W39990
Surr: 4-Bromofluorobenzene	92.3	70-130		%Rec	1	1/12/2017 9:35:20 PM	W39990
Surr: Dibromofluoromethane	103	70-130		%Rec	1	1/12/2017 9:35:20 PM	W39990
Surr: Toluene-d8	98.7	70-130		%Rec	1	1/12/2017 9:35:20 PM	W39990

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701404

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: GWSF10-170110

Project: Griggs & Walnut GW Plume

Collection Date: 1/10/2017 3:30:00 PM

Lab ID: 1701404-007

Matrix: GROUNDWA

Received Date: 1/11/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0043	0.0010		mg/L	1	1/17/2017 2:11:47 PM	29685
Uranium	0.017	0.00050		mg/L	1	1/16/2017 6:35:51 PM	29685
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
Toluene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
Ethylbenzene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
Naphthalene	ND	2.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
1-Methylnaphthalene	ND	4.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
2-Methylnaphthalene	ND	4.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
Acetone	ND	10		µg/L	1	1/12/2017 10:04:22 PM	W39990
Bromobenzene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
Bromodichloromethane	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
Bromoform	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
Bromomethane	ND	3.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
2-Butanone	ND	10		µg/L	1	1/12/2017 10:04:22 PM	W39990
Carbon disulfide	ND	10		µg/L	1	1/12/2017 10:04:22 PM	W39990
Carbon Tetrachloride	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
Chlorobenzene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
Chloroethane	ND	2.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
Chloroform	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
Chloromethane	ND	3.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
2-Chlorotoluene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
4-Chlorotoluene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
cis-1,2-DCE	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
Dibromochloromethane	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
Dibromomethane	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
1,1-Dichloroethane	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
1,1-Dichloroethene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701404

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: GWSF10-170110

Project: Griggs & Walnut GW Plume

Collection Date: 1/10/2017 3:30:00 PM

Lab ID: 1701404-007

Matrix: GROUNDWA

Received Date: 1/11/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
1,3-Dichloropropane	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
2,2-Dichloropropane	ND	2.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
1,1-Dichloropropene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
Hexachlorobutadiene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
2-Hexanone	ND	10		µg/L	1	1/12/2017 10:04:22 PM	W39990
Isopropylbenzene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
4-Isopropyltoluene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
4-Methyl-2-pentanone	ND	10		µg/L	1	1/12/2017 10:04:22 PM	W39990
Methylene Chloride	ND	3.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
n-Butylbenzene	ND	3.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
n-Propylbenzene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
sec-Butylbenzene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
Styrene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
tert-Butylbenzene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
Tetrachloroethene (PCE)	18	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
trans-1,2-DCE	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
Trichloroethene (TCE)	1.2	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
Trichlorofluoromethane	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
Vinyl chloride	ND	1.0		µg/L	1	1/12/2017 10:04:22 PM	W39990
Xylenes, Total	ND	1.5		µg/L	1	1/12/2017 10:04:22 PM	W39990
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	1/12/2017 10:04:22 PM	W39990
Surr: 4-Bromofluorobenzene	91.5	70-130		%Rec	1	1/12/2017 10:04:22 PM	W39990
Surr: Dibromofluoromethane	103	70-130		%Rec	1	1/12/2017 10:04:22 PM	W39990
Surr: Toluene-d8	96.2	70-130		%Rec	1	1/12/2017 10:04:22 PM	W39990

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701404

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: Trip Blank

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701404-008

Matrix: AQUEOUS

Received Date: 1/11/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
Toluene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
Ethylbenzene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
Naphthalene	ND	2.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
1-Methylnaphthalene	ND	4.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
2-Methylnaphthalene	ND	4.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
Acetone	ND	10		µg/L	1	1/12/2017 10:33:32 PM	W39990
Bromobenzene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
Bromodichloromethane	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
Bromoform	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
Bromomethane	ND	3.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
2-Butanone	ND	10		µg/L	1	1/12/2017 10:33:32 PM	W39990
Carbon disulfide	ND	10		µg/L	1	1/12/2017 10:33:32 PM	W39990
Carbon Tetrachloride	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
Chlorobenzene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
Chloroethane	ND	2.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
Chloroform	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
Chloromethane	ND	3.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
2-Chlorotoluene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
4-Chlorotoluene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
cis-1,2-DCE	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
Dibromochloromethane	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
Dibromomethane	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
1,1-Dichloroethane	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
1,1-Dichloroethene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
1,2-Dichloropropane	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
1,3-Dichloropropane	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
2,2-Dichloropropane	ND	2.0		µg/L	1	1/12/2017 10:33:32 PM	W39990

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701404

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: Trip Blank

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701404-008

Matrix: AQUEOUS

Received Date: 1/11/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,1-Dichloropropene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
Hexachlorobutadiene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
2-Hexanone	ND	10		µg/L	1	1/12/2017 10:33:32 PM	W39990
Isopropylbenzene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
4-Isopropyltoluene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
4-Methyl-2-pentanone	ND	10		µg/L	1	1/12/2017 10:33:32 PM	W39990
Methylene Chloride	ND	3.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
n-Butylbenzene	ND	3.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
n-Propylbenzene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
sec-Butylbenzene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
Styrene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
tert-Butylbenzene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
trans-1,2-DCE	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
Trichlorofluoromethane	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
Vinyl chloride	ND	1.0		µg/L	1	1/12/2017 10:33:32 PM	W39990
Xylenes, Total	ND	1.5		µg/L	1	1/12/2017 10:33:32 PM	W39990
Surr: 1,2-Dichloroethane-d4	97.7	70-130		%Rec	1	1/12/2017 10:33:32 PM	W39990
Surr: 4-Bromofluorobenzene	96.3	70-130		%Rec	1	1/12/2017 10:33:32 PM	W39990
Surr: Dibromofluoromethane	101	70-130		%Rec	1	1/12/2017 10:33:32 PM	W39990
Surr: Toluene-d8	101	70-130		%Rec	1	1/12/2017 10:33:32 PM	W39990

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified



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College Station, TX 888.690.2218 • Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010189-001
Client Sample ID: 1701404-001C GWMW03-01-170110

Report Date: 01/24/17
Collection Date: 01/10/17 13:50
DateReceived: 01/17/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/23/17 13:21 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/23/17 13:21 / rgk

Report
Definitions:

RL - Analyte reporting limit.
 QCL - Quality control limit.

MCL - Maximum contaminant level.
 ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010189-002
Client Sample ID: 1701404-002C GWMW03-01-070110 D

Report Date: 01/24/17
Collection Date: 01/10/17 13:50
Date Received: 01/17/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/23/17 13:33 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/23/17 13:33 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010189-003
Client Sample ID: 1701404-003C GMMW03-02-070110

Report Date: 01/24/17
Collection Date: 01/10/17 13:55
Date Received: 01/17/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/23/17 13:45 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/23/17 13:45 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010189-004
Client Sample ID: 1701404-004C GWMW03-03-070110

Report Date: 01/24/17
Collection Date: 01/10/17 14:00
Date Received: 01/17/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/23/17 13:57 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/23/17 13:57 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010189-005
Client Sample ID: 1701404-005C GWMW03-06-070110

Report Date: 01/24/17
Collection Date: 01/10/17 14:10
Date Received: 01/17/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/23/17 14:09 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/23/17 14:09 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010189-006
Client Sample ID: 1701404-007C GWSF10-070110

Report Date: 01/24/17
Collection Date: 01/10/17 15:30
Date Received: 01/17/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/23/17 14:45 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/23/17 14:45 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hall Environmental

Report Date: 01/24/17

Project: Not Indicated

Work Order: H17010189

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E1632AM		Analytical Run: ARSENIC SPECIATION_170123A							
Lab ID: AS-ICV 25ppb-1/23/2017	Initial Calibration Verification Standard								01/23/17 12:21
Arsenic-III	24.4	ug/L	5.0	98	87.6	114			
Arsenic-V	24.8	ug/L	5.0	99	87	116			
Lab ID: AS-50.0-1/23/2017	Continuing Calibration Verification Standard								01/23/17 12:33
Arsenic-III	49.2	ug/L	5.0	98	85	115			
Arsenic-V	51.0	ug/L	5.0	102	85	115			
Method: E1632AM		Batch: R122233							
Lab ID: AS-LFB 50ppb-1/23/2017	Laboratory Fortified Blank				Run: ARSENIC SPECIATION_1701			01/23/17 12:57	
Arsenic-III	45.8	ug/L	5.0	92	55	146			
Arsenic-V	46.9	ug/L	5.0	94	55	146			
Lab ID: ICB	Method Blank				Run: ARSENIC SPECIATION_1701			01/23/17 13:09	
Arsenic-III	ND	ug/L	0.2						
Arsenic-V	ND	ug/L	0.5						
Lab ID: H17010189-005A MS	Sample Matrix Spike				Run: ARSENIC SPECIATION_1701			01/23/17 14:21	
Arsenic-III	47.7	ug/L	5.0	94	55	146			
Arsenic-V	43.4	ug/L	5.0	87	55	146			
Lab ID: H17010189-005A MSD	Sample Matrix Spike Duplicate				Run: ARSENIC SPECIATION_1701			01/23/17 14:33	
Arsenic-III	47.6	ug/L	5.0	94	55	146	0.2	20	
Arsenic-V	43.2	ug/L	5.0	86	55	146	0.4	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701404

25-Jan-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	1701404-005BMSDL		SampType:	MSDLL		TestCode:	200.8 ICPMS Metals:Total				
Client ID:	GMMW03-06-17011		Batch ID:	29685		RunNo:	40054				
Prep Date:	1/13/2017		Analysis Date:	1/16/2017		SeqNo:	1255285		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Uranium	0.013	0.00050	0.01250	0	108	70	130	2.17	20		

Sample ID	1701404-005BMSLL		SampType:	MSLL		TestCode:	200.8 ICPMS Metals:Total				
Client ID:	GMMW03-06-17011		Batch ID:	29685		RunNo:	40054				
Prep Date:	1/13/2017		Analysis Date:	1/16/2017		SeqNo:	1255286		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Uranium	0.014	0.00050	0.01250	0	110	70	130				

Sample ID	MB-29685		SampType:	MBLK		TestCode:	200.8 ICPMS Metals:Total				
Client ID:	PBW		Batch ID:	29685		RunNo:	40054				
Prep Date:	1/13/2017		Analysis Date:	1/16/2017		SeqNo:	1255288		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Arsenic	ND	0.0010									
Uranium	ND	0.00050									

Sample ID	MSLCS-29685		SampType:	LCS		TestCode:	200.8 ICPMS Metals:Total				
Client ID:	LCSW		Batch ID:	29685		RunNo:	40054				
Prep Date:	1/13/2017		Analysis Date:	1/16/2017		SeqNo:	1255289		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Arsenic	0.025	0.0010	0.02500	0	99.2	85	115				
Uranium	0.013	0.00050	0.01250	0	102	85	115				

Sample ID	MSLCSLL-29685		SampType:	LCSLL		TestCode:	200.8 ICPMS Metals:Total				
Client ID:	BatchQC		Batch ID:	29685		RunNo:	40054				
Prep Date:	1/13/2017		Analysis Date:	1/16/2017		SeqNo:	1255290		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Arsenic	0.0011	0.0010	0.001000	0	107	50	150				
Uranium	0.00050	0.00050	0.0005000	0	100	50	150				

Sample ID	1701404-005BMSDL		SampType:	MSDLL		TestCode:	200.8 ICPMS Metals:Total				
Client ID:	GMMW03-06-17011		Batch ID:	29685		RunNo:	40070				
Prep Date:	1/13/2017		Analysis Date:	1/17/2017		SeqNo:	1256099		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Arsenic	0.031	0.0010	0.02500	0.007629	95.1	70	130	1.05	20		

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701404

25-Jan-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	1701404-005BMSLL	SampType:	MSLL		TestCode:	200.8 ICPMS Metals:Total				
Client ID:	GWMW03-06-17011	Batch ID:	29685		RunNo:	40070				
Prep Date:	1/13/2017	Analysis Date:	1/17/2017		SeqNo:	1256100	Units:	mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.032	0.0010	0.02500	0.007629	96.4	70	130			

Qualifiers:

- | | |
|---|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| H Holding times for preparation or analysis exceeded | J Analyte detected below quantitation limits |
| ND Not Detected at the Reporting Limit | P Sample pH Not In Range |
| R RPD outside accepted recovery limits | RL Reporting Detection Limit |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701404

25-Jan-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	rb	SampType:	MBLK		TestCode:	EPA Method 8260B: VOLATILES				
Client ID:	PBW	Batch ID:	W39990		RunNo:	39990				
Prep Date:		Analysis Date:	1/12/2017		SeqNo:	1253078	Units:	µg/L		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								

Qualifiers:

- | | |
|---|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| H Holding times for preparation or analysis exceeded | J Analyte detected below quantitation limits |
| ND Not Detected at the Reporting Limit | P Sample pH Not In Range |
| R RPD outside accepted recovery limits | RL Reporting Detection Limit |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701404

25-Jan-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID rb	SampType: MBLK	TestCode: EPA Method 8260B: VOLATILES
Client ID: PBW	Batch ID: W39990	RunNo: 39990
Prep Date:	Analysis Date: 1/12/2017	SeqNo: 1253078 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.9		10.00		99.2	70	130			
Surr: 4-Bromofluorobenzene	9.6		10.00		96.1	70	130			
Surr: Dibromofluoromethane	9.9		10.00		98.8	70	130			
Surr: Toluene-d8	9.7		10.00		96.5	70	130			

Sample ID 100ng lcs b	SampType: LCS	TestCode: EPA Method 8260B: VOLATILES
Client ID: LCSW	Batch ID: W39990	RunNo: 39990
Prep Date:	Analysis Date: 1/12/2017	SeqNo: 1253079 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	99.2	70	130			
Toluene	20	1.0	20.00	0	98.7	70	130			
Chlorobenzene	19	1.0	20.00	0	96.3	70	130			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701404

25-Jan-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	100ng lcs b	SampType:	LCS	TestCode:	EPA Method 8260B: VOLATILES						
Client ID:	LCSW	Batch ID:	W39990	RunNo:	39990						
Prep Date:		Analysis Date:	1/12/2017	SeqNo:	1253079	Units:	µg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
1,1-Dichloroethene	17	1.0	20.00	0	87.1	70	130				
Trichloroethene (TCE)	19	1.0	20.00	0	93.3	70	130				
Surr: 1,2-Dichloroethane-d4	9.7		10.00		97.3	70	130				
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130				
Surr: Dibromofluoromethane	9.5		10.00		94.8	70	130				
Surr: Toluene-d8	9.6		10.00		95.6	70	130				

Sample ID	1701404-005a ms	SampType:	MS	TestCode:	EPA Method 8260B: VOLATILES						
Client ID:	GMMW03-06-17011	Batch ID:	W39990	RunNo:	39990						
Prep Date:		Analysis Date:	1/12/2017	SeqNo:	1253089	Units:	µg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Benzene	24	1.0	20.00	0.8156	114	70	130				
Toluene	36	1.0	20.00	9.095	135	70	130			S	
Chlorobenzene	20	1.0	20.00	0	100	70	130				
1,1-Dichloroethene	19	1.0	20.00	0	92.8	70	130				
Trichloroethene (TCE)	20	1.0	20.00	0	100	70	130				
Surr: 1,2-Dichloroethane-d4	10		10.00		105	70	130				
Surr: 4-Bromofluorobenzene	9.6		10.00		95.7	70	130				
Surr: Dibromofluoromethane	10		10.00		101	70	130				
Surr: Toluene-d8	9.6		10.00		95.7	70	130				

Sample ID	1701404-005a msd	SampType:	MSD	TestCode:	EPA Method 8260B: VOLATILES						
Client ID:	GMMW03-06-17011	Batch ID:	W39990	RunNo:	39990						
Prep Date:		Analysis Date:	1/12/2017	SeqNo:	1253090	Units:	µg/L				
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Benzene	22	1.0	20.00	0.8156	107	70	130	5.88	20		
Toluene	35	1.0	20.00	9.095	128	70	130	4.28	20		
Chlorobenzene	19	1.0	20.00	0	94.1	70	130	6.33	20		
1,1-Dichloroethene	18	1.0	20.00	0	90.9	70	130	2.09	20		
Trichloroethene (TCE)	19	1.0	20.00	0	94.8	70	130	5.60	20		
Surr: 1,2-Dichloroethane-d4	10		10.00		102	70	130	0	0		
Surr: 4-Bromofluorobenzene	9.0		10.00		90.3	70	130	0	0		
Surr: Dibromofluoromethane	10		10.00		101	70	130	0	0		
Surr: Toluene-d8	9.8		10.00		97.9	70	130	0	0		

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified



Hall Environmental Analysis Laboratory
 4901 Hawkins NE
 Albuquerque, NM 87109
 TEL: 505-345-3975 FAX: 505-345-4107
 Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: TER-LC

Work Order Number: 1701404

RcptNo: 1

Received by/date:

RE 01/11/17

Logged By: Anne Thorne

1/11/2017 9:00:00 AM

Anne Thorne

Completed By: Anne Thorne

1/11/2017 12:14:23 PM

Anne Thorne

Reviewed By:

[Signature]

01/11/17

Chain of Custody

- 1. Custody seals intact on sample bottles? Yes No Not Present
- 2. Is Chain of Custody complete? Yes No Not Present
- 3. How was the sample delivered? FedEx

Log In

- 4. Was an attempt made to cool the samples? Yes No NA
- 5. Were all samples received at a temperature of >0° C to 6.0° C? Yes No NA
- 6. Sample(s) in proper container(s)? Yes No
- 7. Sufficient sample volume for indicated test(s)? Yes No
- 8. Are samples (except VOA and ONG) properly preserved? Yes No
- 9. Was preservative added to bottles? Yes No NA
- 10. VOA vials have zero headspace? Yes No No VOA Vials
- 11. Were any sample containers received broken? Yes No
- 12. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes No
- 13. Are matrices correctly identified on Chain of Custody? Yes No
- 14. Is it clear what analyses were requested? Yes No
- 15. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes No

La
01/12/17
 # of preserved bottles checked for pH: 14
 (2) or >12 unless noted
 Adjusted? ND
 Checked by: *La*

Special Handling (if applicable)

- 16. Was client notified of all discrepancies with this order? Yes No NA

Person Notified: _____ Date: _____
 By Whom: _____ Via: eMail Phone Fax In Person
 Regarding: _____
 Client Instructions: _____

17. Additional remarks:

For Arsenic speciation analysis: pH of -001C, -002C, and -004C is 4.0. pH of -003C is 2.0, pH of -005C is 2.5 and pH of -007C is 6.0.

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.2	Good	Yes			01/12/17 <i>La</i>

Chain-of-Custody Record

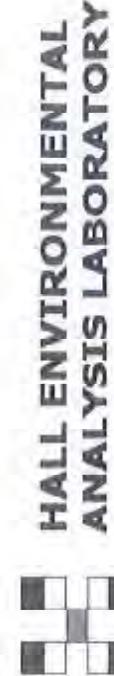
Client: Terracon Consultants Inc.
 Mailing Address: 4450 Bataan Memorial F
Las Cruces, NM 88011
 Phone #: 575.527.1700
 email or Fax#: Kyle Williams@terracon.com
 QA/QC Package: Standard Level 4 (Full Validation)
 Accreditation: NELAP Other
 EDD (Type)

Turn-Around Time:
 Standard Rush
 Project Name: Guiggs + Walnut GW P/line
 Project #: 68167094
 Project Manager: Kyle Williams
 Sampler: Williams
 On Ice: Yes No AS 2/11/17
 Sample Temperature: 77-78-64
 HEAL No. 1701404

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.
1/10/17	1350	GW	GW03-01-170110			-C01
	1350		GW03-01-170110 D			-C02
	1355		GW03-02-170110			-C03
	1400		GW03-03-170110			-C04
	1410		GW03-06-170110			-C05
1/10/17	1215	DI	FB-170110	AS 011117		-C06
1/10/17	1530	GW	GW03-10-170110			-C07
1/10/17			- Trip Blank			-C08

Received by: [Signature] Date: 1/11/17 Time: 0900
 Relinquished by: [Signature] Date: 1/11/17 Time: 0900
 Relinquished by: [Signature] Date: 1/11/17 Time: 0900

Remarks: Invoice to the City of Las Cruces



HALL ENVIRONMENTAL ANALYSIS LABORATORY
 www.hallenvironmental.com
 4901 Hawkins NE - Albuquerque, NM 87109
 Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Analysis Request	Response
BTEX + MTBE + TMBs (8021)	
BTEX + MTBE + TPH (Gas only)	
TPH 8015B (GRO / DRO / MRO)	
TPH (Method 418.1)	
EDB (Method 504.1)	
PAHs (8310 or 8270 SIMS)	
RCRA 8 Metals	
Anions (F, Cl, NO ₂ , NO ₃ , PO ₄ , SO ₄)	
8081 Pesticides / 8082 PCBs	
8260B (VOA)	X
8270 (Semi-VOA)	X
6020 As, H	X
A3114 As specification	X
Air Bubbles (Y or N)	

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

January 25, 2017

Kyle Williams

Terracon

4450 Bataan Memorial E

Las Cruces, NM 88005

TEL: (575) 527-1700

FAX (575) 527-1092

RE: Griggs & Walnut GW Plume

OrderNo.: 1701525

Dear Kyle Williams:

Hall Environmental Analysis Laboratory received 7 sample(s) on 1/12/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a white background.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701525

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: GWMW01-01-170111

Project: Griggs & Walnut GW Plume

Collection Date: 1/11/2017 1:25:00 PM

Lab ID: 1701525-001

Matrix: GROUNDWA

Received Date: 1/12/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0071	0.0010		mg/L	1	1/17/2017 3:12:48 PM	29713
Uranium	0.013	0.00050		mg/L	1	1/17/2017 3:12:48 PM	29713
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
Toluene	1.3	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
Ethylbenzene	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
Naphthalene	ND	2.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
1-Methylnaphthalene	ND	4.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
2-Methylnaphthalene	ND	4.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
Acetone	ND	10		µg/L	1	1/13/2017 4:42:54 PM	A40004
Bromobenzene	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
Bromodichloromethane	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
Bromoform	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
Bromomethane	ND	3.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
2-Butanone	ND	10		µg/L	1	1/13/2017 4:42:54 PM	A40004
Carbon disulfide	ND	10		µg/L	1	1/13/2017 4:42:54 PM	A40004
Carbon Tetrachloride	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
Chlorobenzene	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
Chloroethane	ND	2.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
Chloroform	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
Chloromethane	ND	3.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
2-Chlorotoluene	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
4-Chlorotoluene	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
cis-1,2-DCE	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
Dibromochloromethane	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
Dibromomethane	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
1,1-Dichloroethane	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
1,1-Dichloroethene	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701525

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: GWMW01-01-170111

Project: Griggs & Walnut GW Plume

Collection Date: 1/11/2017 1:25:00 PM

Lab ID: 1701525-001

Matrix: GROUNDWA

Received Date: 1/12/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
1,3-Dichloropropane	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
2,2-Dichloropropane	ND	2.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
1,1-Dichloropropene	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
Hexachlorobutadiene	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
2-Hexanone	ND	10		µg/L	1	1/13/2017 4:42:54 PM	A40004
Isopropylbenzene	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
4-Isopropyltoluene	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
4-Methyl-2-pentanone	ND	10		µg/L	1	1/13/2017 4:42:54 PM	A40004
Methylene Chloride	ND	3.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
n-Butylbenzene	ND	3.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
n-Propylbenzene	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
sec-Butylbenzene	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
Styrene	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
tert-Butylbenzene	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
Tetrachloroethene (PCE)	9.8	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
trans-1,2-DCE	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
Trichlorofluoromethane	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
Vinyl chloride	ND	1.0		µg/L	1	1/13/2017 4:42:54 PM	A40004
Xylenes, Total	ND	1.5		µg/L	1	1/13/2017 4:42:54 PM	A40004
Surr: 1,2-Dichloroethane-d4	98.4	70-130		%Rec	1	1/13/2017 4:42:54 PM	A40004
Surr: 4-Bromofluorobenzene	96.5	70-130		%Rec	1	1/13/2017 4:42:54 PM	A40004
Surr: Dibromofluoromethane	100	70-130		%Rec	1	1/13/2017 4:42:54 PM	A40004
Surr: Toluene-d8	97.8	70-130		%Rec	1	1/13/2017 4:42:54 PM	A40004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701525

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: GWMW01-03-170111

Project: Griggs & Walnut GW Plume

Collection Date: 1/11/2017 1:35:00 PM

Lab ID: 1701525-002

Matrix: GROUNDWA

Received Date: 1/12/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0073	0.0010		mg/L	1	1/17/2017 3:15:49 PM	29713
Uranium	ND	0.00050		mg/L	1	1/17/2017 3:15:49 PM	29713
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
Toluene	2.7	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
Ethylbenzene	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
Naphthalene	ND	2.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
1-Methylnaphthalene	ND	4.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
2-Methylnaphthalene	ND	4.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
Acetone	ND	10		µg/L	1	1/13/2017 5:12:27 PM	A40004
Bromobenzene	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
Bromodichloromethane	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
Bromoform	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
Bromomethane	ND	3.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
2-Butanone	ND	10		µg/L	1	1/13/2017 5:12:27 PM	A40004
Carbon disulfide	ND	10		µg/L	1	1/13/2017 5:12:27 PM	A40004
Carbon Tetrachloride	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
Chlorobenzene	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
Chloroethane	ND	2.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
Chloroform	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
Chloromethane	ND	3.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
2-Chlorotoluene	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
4-Chlorotoluene	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
cis-1,2-DCE	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
Dibromochloromethane	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
Dibromomethane	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
1,1-Dichloroethane	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
1,1-Dichloroethene	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701525

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: GWMW01-03-170111

Project: Griggs & Walnut GW Plume

Collection Date: 1/11/2017 1:35:00 PM

Lab ID: 1701525-002

Matrix: GROUNDWA

Received Date: 1/12/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
1,3-Dichloropropane	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
2,2-Dichloropropane	ND	2.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
1,1-Dichloropropene	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
Hexachlorobutadiene	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
2-Hexanone	ND	10		µg/L	1	1/13/2017 5:12:27 PM	A40004
Isopropylbenzene	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
4-Isopropyltoluene	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
4-Methyl-2-pentanone	ND	10		µg/L	1	1/13/2017 5:12:27 PM	A40004
Methylene Chloride	ND	3.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
n-Butylbenzene	ND	3.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
n-Propylbenzene	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
sec-Butylbenzene	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
Styrene	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
tert-Butylbenzene	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
Tetrachloroethene (PCE)	7.0	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
trans-1,2-DCE	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
Trichloroethene (TCE)	1.3	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
Trichlorofluoromethane	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
Vinyl chloride	ND	1.0		µg/L	1	1/13/2017 5:12:27 PM	A40004
Xylenes, Total	ND	1.5		µg/L	1	1/13/2017 5:12:27 PM	A40004
Surr: 1,2-Dichloroethane-d4	97.8	70-130		%Rec	1	1/13/2017 5:12:27 PM	A40004
Surr: 4-Bromofluorobenzene	96.6	70-130		%Rec	1	1/13/2017 5:12:27 PM	A40004
Surr: Dibromofluoromethane	98.6	70-130		%Rec	1	1/13/2017 5:12:27 PM	A40004
Surr: Toluene-d8	96.3	70-130		%Rec	1	1/13/2017 5:12:27 PM	A40004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701525

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: GWMW01-04-170111

Project: Griggs & Walnut GW Plume

Collection Date: 1/11/2017 1:50:00 PM

Lab ID: 1701525-003

Matrix: GROUNDWA

Received Date: 1/12/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0023	0.0010		mg/L	1	1/17/2017 3:18:49 PM	29713
Uranium	0.0024	0.00050		mg/L	1	1/17/2017 3:18:49 PM	29713
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
Toluene	1.8	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
Ethylbenzene	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
Naphthalene	ND	2.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
1-Methylnaphthalene	ND	4.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
2-Methylnaphthalene	ND	4.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
Acetone	ND	10		µg/L	1	1/13/2017 5:42:04 PM	A40004
Bromobenzene	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
Bromodichloromethane	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
Bromoform	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
Bromomethane	ND	3.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
2-Butanone	ND	10		µg/L	1	1/13/2017 5:42:04 PM	A40004
Carbon disulfide	ND	10		µg/L	1	1/13/2017 5:42:04 PM	A40004
Carbon Tetrachloride	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
Chlorobenzene	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
Chloroethane	ND	2.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
Chloroform	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
Chloromethane	ND	3.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
2-Chlorotoluene	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
4-Chlorotoluene	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
cis-1,2-DCE	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
Dibromochloromethane	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
Dibromomethane	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
1,1-Dichloroethane	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
1,1-Dichloroethene	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701525

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: GWMW01-04-170111

Project: Griggs & Walnut GW Plume

Collection Date: 1/11/2017 1:50:00 PM

Lab ID: 1701525-003

Matrix: GROUNDWA

Received Date: 1/12/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
1,3-Dichloropropane	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
2,2-Dichloropropane	ND	2.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
1,1-Dichloropropene	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
Hexachlorobutadiene	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
2-Hexanone	ND	10		µg/L	1	1/13/2017 5:42:04 PM	A40004
Isopropylbenzene	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
4-Isopropyltoluene	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
4-Methyl-2-pentanone	ND	10		µg/L	1	1/13/2017 5:42:04 PM	A40004
Methylene Chloride	ND	3.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
n-Butylbenzene	ND	3.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
n-Propylbenzene	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
sec-Butylbenzene	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
Styrene	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
tert-Butylbenzene	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
trans-1,2-DCE	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
Trichlorofluoromethane	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
Vinyl chloride	ND	1.0		µg/L	1	1/13/2017 5:42:04 PM	A40004
Xylenes, Total	ND	1.5		µg/L	1	1/13/2017 5:42:04 PM	A40004
Surr: 1,2-Dichloroethane-d4	97.8	70-130		%Rec	1	1/13/2017 5:42:04 PM	A40004
Surr: 4-Bromofluorobenzene	94.9	70-130		%Rec	1	1/13/2017 5:42:04 PM	A40004
Surr: Dibromofluoromethane	100	70-130		%Rec	1	1/13/2017 5:42:04 PM	A40004
Surr: Toluene-d8	96.5	70-130		%Rec	1	1/13/2017 5:42:04 PM	A40004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701525

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: GWMW01-05-170111

Project: Griggs & Walnut GW Plume

Collection Date: 1/11/2017 2:00:00 PM

Lab ID: 1701525-004

Matrix: GROUNDWA

Received Date: 1/12/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0027	0.0010		mg/L	1	1/17/2017 3:27:54 PM	29713
Uranium	0.0012	0.00050		mg/L	1	1/17/2017 3:27:54 PM	29713
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
Toluene	2.5	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
Ethylbenzene	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
Naphthalene	ND	2.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
1-Methylnaphthalene	ND	4.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
2-Methylnaphthalene	ND	4.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
Acetone	ND	10		µg/L	1	1/13/2017 6:11:36 PM	A40004
Bromobenzene	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
Bromodichloromethane	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
Bromoform	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
Bromomethane	ND	3.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
2-Butanone	ND	10		µg/L	1	1/13/2017 6:11:36 PM	A40004
Carbon disulfide	ND	10		µg/L	1	1/13/2017 6:11:36 PM	A40004
Carbon Tetrachloride	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
Chlorobenzene	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
Chloroethane	ND	2.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
Chloroform	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
Chloromethane	ND	3.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
2-Chlorotoluene	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
4-Chlorotoluene	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
cis-1,2-DCE	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
Dibromochloromethane	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
Dibromomethane	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
1,1-Dichloroethane	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
1,1-Dichloroethene	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701525

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: GWMW01-05-170111

Project: Griggs & Walnut GW Plume

Collection Date: 1/11/2017 2:00:00 PM

Lab ID: 1701525-004

Matrix: GROUNDWA

Received Date: 1/12/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
1,3-Dichloropropane	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
2,2-Dichloropropane	ND	2.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
1,1-Dichloropropene	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
Hexachlorobutadiene	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
2-Hexanone	ND	10		µg/L	1	1/13/2017 6:11:36 PM	A40004
Isopropylbenzene	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
4-Isopropyltoluene	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
4-Methyl-2-pentanone	ND	10		µg/L	1	1/13/2017 6:11:36 PM	A40004
Methylene Chloride	ND	3.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
n-Butylbenzene	ND	3.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
n-Propylbenzene	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
sec-Butylbenzene	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
Styrene	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
tert-Butylbenzene	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
trans-1,2-DCE	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
Trichlorofluoromethane	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
Vinyl chloride	ND	1.0		µg/L	1	1/13/2017 6:11:36 PM	A40004
Xylenes, Total	ND	1.5		µg/L	1	1/13/2017 6:11:36 PM	A40004
Surr: 1,2-Dichloroethane-d4	97.5	70-130		%Rec	1	1/13/2017 6:11:36 PM	A40004
Surr: 4-Bromofluorobenzene	95.7	70-130		%Rec	1	1/13/2017 6:11:36 PM	A40004
Surr: Dibromofluoromethane	99.6	70-130		%Rec	1	1/13/2017 6:11:36 PM	A40004
Surr: Toluene-d8	98.5	70-130		%Rec	1	1/13/2017 6:11:36 PM	A40004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701525

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: GWMW01-06-170111

Project: Griggs & Walnut GW Plume

Collection Date: 1/11/2017 2:10:00 PM

Lab ID: 1701525-005

Matrix: GROUNDWA

Received Date: 1/12/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.016	0.0010	*	mg/L	1	1/17/2017 3:30:55 PM	29714
Uranium	ND	0.00050		mg/L	1	1/17/2017 3:30:55 PM	29714
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
Toluene	3.2	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
Ethylbenzene	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
Naphthalene	ND	2.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
1-Methylnaphthalene	ND	4.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
2-Methylnaphthalene	ND	4.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
Acetone	ND	10		µg/L	1	1/13/2017 6:41:18 PM	A40004
Bromobenzene	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
Bromodichloromethane	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
Bromoform	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
Bromomethane	ND	3.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
2-Butanone	ND	10		µg/L	1	1/13/2017 6:41:18 PM	A40004
Carbon disulfide	ND	10		µg/L	1	1/13/2017 6:41:18 PM	A40004
Carbon Tetrachloride	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
Chlorobenzene	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
Chloroethane	ND	2.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
Chloroform	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
Chloromethane	ND	3.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
2-Chlorotoluene	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
4-Chlorotoluene	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
cis-1,2-DCE	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
Dibromochloromethane	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
Dibromomethane	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
1,1-Dichloroethane	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
1,1-Dichloroethene	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701525

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: GWMW01-06-170111

Project: Griggs & Walnut GW Plume

Collection Date: 1/11/2017 2:10:00 PM

Lab ID: 1701525-005

Matrix: GROUNDWA

Received Date: 1/12/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
1,3-Dichloropropane	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
2,2-Dichloropropane	ND	2.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
1,1-Dichloropropene	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
Hexachlorobutadiene	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
2-Hexanone	ND	10		µg/L	1	1/13/2017 6:41:18 PM	A40004
Isopropylbenzene	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
4-Isopropyltoluene	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
4-Methyl-2-pentanone	ND	10		µg/L	1	1/13/2017 6:41:18 PM	A40004
Methylene Chloride	ND	3.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
n-Butylbenzene	ND	3.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
n-Propylbenzene	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
sec-Butylbenzene	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
Styrene	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
tert-Butylbenzene	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
Tetrachloroethene (PCE)	4.7	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
trans-1,2-DCE	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
Trichlorofluoromethane	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
Vinyl chloride	ND	1.0		µg/L	1	1/13/2017 6:41:18 PM	A40004
Xylenes, Total	ND	1.5		µg/L	1	1/13/2017 6:41:18 PM	A40004
Surr: 1,2-Dichloroethane-d4	96.1	70-130		%Rec	1	1/13/2017 6:41:18 PM	A40004
Surr: 4-Bromofluorobenzene	99.3	70-130		%Rec	1	1/13/2017 6:41:18 PM	A40004
Surr: Dibromofluoromethane	101	70-130		%Rec	1	1/13/2017 6:41:18 PM	A40004
Surr: Toluene-d8	97.3	70-130		%Rec	1	1/13/2017 6:41:18 PM	A40004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701525

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: GWMW01-07-170111

Project: Griggs & Walnut GW Plume

Collection Date: 1/11/2017 2:25:00 PM

Lab ID: 1701525-006

Matrix: GROUNDWA

Received Date: 1/12/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.030	0.0010	*	mg/L	1	1/17/2017 3:39:57 PM	29714
Uranium	ND	0.00050		mg/L	1	1/17/2017 3:39:57 PM	29714
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	1.3	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
Toluene	4.5	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
Ethylbenzene	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
Naphthalene	ND	2.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
1-Methylnaphthalene	ND	4.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
2-Methylnaphthalene	ND	4.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
Acetone	ND	10		µg/L	1	1/13/2017 8:09:53 PM	A40004
Bromobenzene	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
Bromodichloromethane	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
Bromoform	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
Bromomethane	ND	3.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
2-Butanone	ND	10		µg/L	1	1/13/2017 8:09:53 PM	A40004
Carbon disulfide	ND	10		µg/L	1	1/13/2017 8:09:53 PM	A40004
Carbon Tetrachloride	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
Chlorobenzene	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
Chloroethane	ND	2.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
Chloroform	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
Chloromethane	ND	3.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
2-Chlorotoluene	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
4-Chlorotoluene	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
cis-1,2-DCE	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
Dibromochloromethane	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
Dibromomethane	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
1,1-Dichloroethane	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
1,1-Dichloroethene	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701525

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: GWMW01-07-170111

Project: Griggs & Walnut GW Plume

Collection Date: 1/11/2017 2:25:00 PM

Lab ID: 1701525-006

Matrix: GROUNDWA

Received Date: 1/12/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
1,3-Dichloropropane	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
2,2-Dichloropropane	ND	2.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
1,1-Dichloropropene	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
Hexachlorobutadiene	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
2-Hexanone	ND	10		µg/L	1	1/13/2017 8:09:53 PM	A40004
Isopropylbenzene	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
4-Isopropyltoluene	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
4-Methyl-2-pentanone	ND	10		µg/L	1	1/13/2017 8:09:53 PM	A40004
Methylene Chloride	ND	3.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
n-Butylbenzene	ND	3.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
n-Propylbenzene	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
sec-Butylbenzene	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
Styrene	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
tert-Butylbenzene	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
trans-1,2-DCE	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
Trichlorofluoromethane	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
Vinyl chloride	ND	1.0		µg/L	1	1/13/2017 8:09:53 PM	A40004
Xylenes, Total	ND	1.5		µg/L	1	1/13/2017 8:09:53 PM	A40004
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	1/13/2017 8:09:53 PM	A40004
Surr: 4-Bromofluorobenzene	97.4	70-130		%Rec	1	1/13/2017 8:09:53 PM	A40004
Surr: Dibromofluoromethane	102	70-130		%Rec	1	1/13/2017 8:09:53 PM	A40004
Surr: Toluene-d8	95.2	70-130		%Rec	1	1/13/2017 8:09:53 PM	A40004

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701525

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: Trip Blank

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701525-007

Matrix: AQUEOUS

Received Date: 1/12/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
Toluene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
Ethylbenzene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
Naphthalene	ND	2.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
1-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
2-Methylnaphthalene	ND	4.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
Acetone	ND	10		µg/L	1	1/16/2017 10:43:08 AM	W40032
Bromobenzene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
Bromodichloromethane	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
Bromoform	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
Bromomethane	ND	3.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
2-Butanone	ND	10		µg/L	1	1/16/2017 10:43:08 AM	W40032
Carbon disulfide	ND	10		µg/L	1	1/16/2017 10:43:08 AM	W40032
Carbon Tetrachloride	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
Chlorobenzene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
Chloroethane	ND	2.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
Chloroform	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
Chloromethane	ND	3.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
2-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
4-Chlorotoluene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
cis-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
Dibromochloromethane	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
Dibromomethane	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
1,1-Dichloroethane	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
1,1-Dichloroethene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
1,2-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
1,3-Dichloropropane	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
2,2-Dichloropropane	ND	2.0		µg/L	1	1/16/2017 10:43:08 AM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701525

Date Reported: 1/25/2017

CLIENT: Terracon

Client Sample ID: Trip Blank

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701525-007

Matrix: AQUEOUS

Received Date: 1/12/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,1-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
Hexachlorobutadiene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
2-Hexanone	ND	10		µg/L	1	1/16/2017 10:43:08 AM	W40032
Isopropylbenzene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
4-Isopropyltoluene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
4-Methyl-2-pentanone	ND	10		µg/L	1	1/16/2017 10:43:08 AM	W40032
Methylene Chloride	ND	3.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
n-Butylbenzene	ND	3.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
n-Propylbenzene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
sec-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
Styrene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
tert-Butylbenzene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
trans-1,2-DCE	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
Trichlorofluoromethane	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
Vinyl chloride	ND	1.0		µg/L	1	1/16/2017 10:43:08 AM	W40032
Xylenes, Total	ND	1.5		µg/L	1	1/16/2017 10:43:08 AM	W40032
Surr: 1,2-Dichloroethane-d4	94.5	70-130		%Rec	1	1/16/2017 10:43:08 AM	W40032
Surr: 4-Bromofluorobenzene	97.7	70-130		%Rec	1	1/16/2017 10:43:08 AM	W40032
Surr: Dibromofluoromethane	94.9	70-130		%Rec	1	1/16/2017 10:43:08 AM	W40032
Surr: Toluene-d8	104	70-130		%Rec	1	1/16/2017 10:43:08 AM	W40032

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010190-001
Client Sample ID: 1701525-001C GWMW01-01-170111

Report Date: 01/24/17
Collection Date: 01/11/17 13:25
Date Received: 01/17/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/23/17 14:57 / rjk
Arsenic-V	ND	ug/L		5		E1632AM	01/23/17 14:57 / rjk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010190-002
Client Sample ID: 1701525-002C GMMW01-03-170111

Report Date: 01/24/17
Collection Date: 01/11/17 13:35
Date Received: 01/17/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/23/17 15:09 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/23/17 15:09 / rgk

Report Definitions:
 RL - Analyte reporting limit.
 QCL - Quality control limit.

MCL - Maximum contaminant level.
 ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010190-003
Client Sample ID: 1701525-003C GMMW01-04-170111

Report Date: 01/24/17
Collection Date: 01/11/17 13:50
Date Received: 01/17/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/23/17 15:21 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/23/17 15:21 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010190-004
Client Sample ID: 1701525-004C GWMW01-05-170111

Report Date: 01/24/17
Collection Date: 01/11/17 14:00
Date Received: 01/17/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/23/17 15:33 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/23/17 15:33 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010190-005
Client Sample ID: 1701525-005C GWMW01-06-170111

Report Date: 01/24/17
Collection Date: 01/11/17 14:10
Date Received: 01/17/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/18/17 22:00 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/18/17 22:00 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010190-006
Client Sample ID: 1701525-006C GMMW01-07-170111

Report Date: 01/24/17
Collection Date: 01/11/17 14:25
Date Received: 01/17/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/18/17 22:36 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/18/17 22:36 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hall Environmental

Report Date: 01/24/17

Project: Not Indicated

Work Order: H17010190

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E1632AM		Analytical Run: ARSENIC SPECIATION_170118A							
Lab ID: AS-ICV 25ppb-1/18/2017	Initial Calibration Verification Standard								01/18/17 15:07
Arsenic-III	25.2	ug/L	5.0	101	87.6	114			
Arsenic-V	24.7	ug/L	5.0	99	87	116			
Lab ID: AS-50.0-1/18/2017	Continuing Calibration Verification Standard								01/18/17 18:31
Arsenic-III	50.1	ug/L	5.0	100	85	115			
Arsenic-V	48.4	ug/L	5.0	97	85	115			
Lab ID: AS-50.0-1/18/2017	Continuing Calibration Verification Standard								01/18/17 21:36
Arsenic-III	51.0	ug/L	5.0	102	85	115			
Arsenic-V	50.6	ug/L	5.0	101	85	115			
Method: E1632AM		Batch: R122181							
Lab ID: AS-LFB 50ppb-1/18/2017	Laboratory Fortified Blank								Run: ARSENIC SPECIATION_1701 01/18/17 15:43
Arsenic-III	50.0	ug/L	5.0	100	55	146			
Arsenic-V	47.1	ug/L	5.0	94	55	146			
Lab ID: ICB	Method Blank								Run: ARSENIC SPECIATION_1701 01/18/17 15:55
Arsenic-III	ND	ug/L	0.2						
Arsenic-V	ND	ug/L	0.5						
Lab ID: H17010190-005A MS	Sample Matrix Spike								Run: ARSENIC SPECIATION_1701 01/18/17 22:12
Arsenic-III	51.3	ug/L	5.0	100	55	146			
Arsenic-V	44.2	ug/L	5.0	85	55	146			
Lab ID: H17010190-005A MSD	Sample Matrix Spike Duplicate								Run: ARSENIC SPECIATION_1701 01/18/17 22:24
Arsenic-III	51.5	ug/L	5.0	101	55	146	0.4	20	
Arsenic-V	45.3	ug/L	5.0	87	55	146	2.3	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.



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QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hall Environmental

Report Date: 01/24/17

Project: Not Indicated

Work Order: H17010190

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E1632AM		Analytical Run: ARSENIC SPECIATION_170123A							
Lab ID: AS-ICV 25ppb-1/23/2017	Initial Calibration Verification Standard								01/23/17 12:21
Arsenic-III	24.4	ug/L	5.0	98	87.6	114			
Arsenic-V	24.8	ug/L	5.0	99	87	116			
Lab ID: AS-50.0-1/23/2017	Continuing Calibration Verification Standard								01/23/17 12:33
Arsenic-III	49.2	ug/L	5.0	98	85	115			
Arsenic-V	51.0	ug/L	5.0	102	85	115			
Method: E1632AM		Batch: R122233							
Lab ID: AS-LFB 50ppb-1/23/2017	Laboratory Fortified Blank				Run: ARSENIC SPECIATION_1701		01/23/17 12:57		
Arsenic-III	45.8	ug/L	5.0	92	55	146			
Arsenic-V	46.9	ug/L	5.0	94	55	146			
Lab ID: ICB	Method Blank				Run: ARSENIC SPECIATION_1701		01/23/17 13:09		
Arsenic-III	ND	ug/L	0.2						
Arsenic-V	ND	ug/L	0.5						
Lab ID: H17010189-005A MS	Sample Matrix Spike				Run: ARSENIC SPECIATION_1701		01/23/17 14:21		
Arsenic-III	47.7	ug/L	5.0	94	55	146			
Arsenic-V	43.4	ug/L	5.0	87	55	146			
Lab ID: H17010189-005A MSD	Sample Matrix Spike Duplicate				Run: ARSENIC SPECIATION_1701		01/23/17 14:33		
Arsenic-III	47.6	ug/L	5.0	94	55	146	0.2	20	
Arsenic-V	43.2	ug/L	5.0	86	55	146	0.4	20	
Lab ID: H17010246-002A MS	Sample Matrix Spike				Run: ARSENIC SPECIATION_1701		01/23/17 16:45		
Arsenic-III	47.8	ug/L	5.0	96	55	146			
Arsenic-V	42.8	ug/L	5.0	86	55	146			
Lab ID: H17010246-002A MSD	Sample Matrix Spike Duplicate				Run: ARSENIC SPECIATION_1701		01/23/17 16:57		
Arsenic-III	49.0	ug/L	5.0	98	55	146	2.5	20	
Arsenic-V	41.8	ug/L	5.0	84	55	146	2.4	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701525

25-Jan-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	MB-29713	SampType:	MBLK	TestCode:	200.8 ICPMS Metals:Total					
Client ID:	PBW	Batch ID:	29713	RunNo:	40070					
Prep Date:	1/16/2017	Analysis Date:	1/17/2017	SeqNo:	1255934	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010								
Uranium	ND	0.00050								

Sample ID	MB-29714	SampType:	MBLK	TestCode:	200.8 ICPMS Metals:Total					
Client ID:	PBW	Batch ID:	29714	RunNo:	40070					
Prep Date:	1/16/2017	Analysis Date:	1/17/2017	SeqNo:	1255935	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010								
Uranium	ND	0.00050								

Sample ID	MSLCS-29713	SampType:	LCS	TestCode:	200.8 ICPMS Metals:Total					
Client ID:	LCSW	Batch ID:	29713	RunNo:	40070					
Prep Date:	1/16/2017	Analysis Date:	1/17/2017	SeqNo:	1255936	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.024	0.0010	0.02500	0	95.3	85	115			
Uranium	0.012	0.00050	0.01250	0	97.4	85	115			

Sample ID	MSLCS-29714	SampType:	LCS	TestCode:	200.8 ICPMS Metals:Total					
Client ID:	LCSW	Batch ID:	29714	RunNo:	40070					
Prep Date:	1/16/2017	Analysis Date:	1/17/2017	SeqNo:	1255937	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.024	0.0010	0.02500	0	96.0	85	115			
Uranium	0.012	0.00050	0.01250	0	97.1	85	115			

Sample ID	MSLLCS-29713	SampType:	LCSLL	TestCode:	200.8 ICPMS Metals:Total					
Client ID:	BatchQC	Batch ID:	29713	RunNo:	40070					
Prep Date:	1/16/2017	Analysis Date:	1/17/2017	SeqNo:	1255938	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.0011	0.0010	0.001000	0	114	50	150			
Uranium	ND	0.00050	0.0005000	0	99.1	50	150			

Sample ID	MSLLCS-29714	SampType:	LCSLL	TestCode:	200.8 ICPMS Metals:Total					
Client ID:	BatchQC	Batch ID:	29714	RunNo:	40070					
Prep Date:	1/16/2017	Analysis Date:	1/17/2017	SeqNo:	1255939	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701525

25-Jan-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	MSLLCS-29714	SampType:	LCSLL	TestCode:	200.8 ICPMS Metals:Total					
Client ID:	BatchQC	Batch ID:	29714	RunNo:	40070					
Prep Date:	1/16/2017	Analysis Date:	1/17/2017	SeqNo:	1255939	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.0012	0.0010	0.001000	0	120	50	150			
Uranium	ND	0.00050	0.0005000	0	99.0	50	150			

Sample ID	1701525-005BMSDL	SampType:	MSDLL	TestCode:	200.8 ICPMS Metals:Total					
Client ID:	GMMW01-06-17011	Batch ID:	29714	RunNo:	40070					
Prep Date:	1/16/2017	Analysis Date:	1/17/2017	SeqNo:	1256109	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.041	0.0010	0.02500	0.01608	97.7	70	130	0.0733	20	
Uranium	0.013	0.00050	0.01250	0	108	70	130	1.27	20	

Sample ID	1701525-005BMSLL	SampType:	MSLL	TestCode:	200.8 ICPMS Metals:Total					
Client ID:	GMMW01-06-17011	Batch ID:	29714	RunNo:	40070					
Prep Date:	1/16/2017	Analysis Date:	1/17/2017	SeqNo:	1256110	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.041	0.0010	0.02500	0.01608	97.8	70	130			
Uranium	0.013	0.00050	0.01250	0	107	70	130			

Qualifiers:

- | | |
|---|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| H Holding times for preparation or analysis exceeded | J Analyte detected below quantitation limits |
| ND Not Detected at the Reporting Limit | P Sample pH Not In Range |
| R RPD outside accepted recovery limits | RL Reporting Detection Limit |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701525

25-Jan-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	rb	SampType:	MBLK		TestCode:	EPA Method 8260B: VOLATILES				
Client ID:	PBW	Batch ID:	A40004		RunNo:	40004				
Prep Date:		Analysis Date:	1/13/2017		SeqNo:	1254003	Units:	µg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								

Qualifiers:

- | | |
|---|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| H Holding times for preparation or analysis exceeded | J Analyte detected below quantitation limits |
| ND Not Detected at the Reporting Limit | P Sample pH Not In Range |
| R RPD outside accepted recovery limits | RL Reporting Detection Limit |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701525

25-Jan-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID rb	SampType: MBLK	TestCode: EPA Method 8260B: VOLATILES
Client ID: PBW	Batch ID: A40004	RunNo: 40004
Prep Date:	Analysis Date: 1/13/2017	SeqNo: 1254003 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.7		10.00		97.2	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		102	70	130			
Surr: Dibromofluoromethane	10		10.00		101	70	130			
Surr: Toluene-d8	10		10.00		99.7	70	130			

Sample ID 100ng lcs	SampType: LCS	TestCode: EPA Method 8260B: VOLATILES
Client ID: LCSW	Batch ID: A40004	RunNo: 40004
Prep Date:	Analysis Date: 1/13/2017	SeqNo: 1254004 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	96.4	70	130			
Toluene	19	1.0	20.00	0	94.6	70	130			
Chlorobenzene	19	1.0	20.00	0	96.6	70	130			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701525

25-Jan-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	100ng lcs	SampType:	LCS	TestCode:	EPA Method 8260B: VOLATILES					
Client ID:	LCSW	Batch ID:	A40004	RunNo:	40004					
Prep Date:		Analysis Date:	1/13/2017	SeqNo:	1254004	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloroethene	17	1.0	20.00	0	85.7	70	130			
Trichloroethene (TCE)	17	1.0	20.00	0	87.4	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		100	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130			
Surr: Dibromofluoromethane	9.6		10.00		96.4	70	130			
Surr: Toluene-d8	9.8		10.00		97.7	70	130			

Sample ID	1701525-005a ms	SampType:	MS	TestCode:	EPA Method 8260B: VOLATILES					
Client ID:	GMMW01-06-17011	Batch ID:	A40004	RunNo:	40004					
Prep Date:		Analysis Date:	1/13/2017	SeqNo:	1254015	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	22	1.0	20.00	0.8974	105	70	130			
Toluene	23	1.0	20.00	3.165	101	70	130			
Chlorobenzene	20	1.0	20.00	0	98.4	70	130			
1,1-Dichloroethene	18	1.0	20.00	0	90.6	70	130			
Trichloroethene (TCE)	20	1.0	20.00	0.2270	100	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		107	70	130			
Surr: 4-Bromofluorobenzene	9.3		10.00		93.1	70	130			
Surr: Dibromofluoromethane	10		10.00		100	70	130			
Surr: Toluene-d8	9.6		10.00		96.1	70	130			

Sample ID	1701525-005a msd	SampType:	MSD	TestCode:	EPA Method 8260B: VOLATILES					
Client ID:	GMMW01-06-17011	Batch ID:	A40004	RunNo:	40004					
Prep Date:		Analysis Date:	1/13/2017	SeqNo:	1254016	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0.8974	95.7	70	130	9.03	20	
Toluene	22	1.0	20.00	3.165	96.6	70	130	3.72	20	
Chlorobenzene	19	1.0	20.00	0	93.8	70	130	4.82	20	
1,1-Dichloroethene	16	1.0	20.00	0	79.6	70	130	13.0	20	
Trichloroethene (TCE)	18	1.0	20.00	0.2270	88.7	70	130	12.2	20	
Surr: 1,2-Dichloroethane-d4	9.6		10.00		96.4	70	130	0	0	
Surr: 4-Bromofluorobenzene	9.4		10.00		94.4	70	130	0	0	
Surr: Dibromofluoromethane	9.3		10.00		92.8	70	130	0	0	
Surr: Toluene-d8	9.5		10.00		95.3	70	130	0	0	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701525

25-Jan-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	rb	SampType:	MBLK		TestCode:	EPA Method 8260B: VOLATILES				
Client ID:	PBW	Batch ID:	W40032		RunNo:	40032				
Prep Date:		Analysis Date:	1/16/2017		SeqNo:	1254687	Units:	µg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								

Qualifiers:

- | | |
|---|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| H Holding times for preparation or analysis exceeded | J Analyte detected below quantitation limits |
| ND Not Detected at the Reporting Limit | P Sample pH Not In Range |
| R RPD outside accepted recovery limits | RL Reporting Detection Limit |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701525

25-Jan-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID rb	SampType: MBLK	TestCode: EPA Method 8260B: VOLATILES
Client ID: PBW	Batch ID: W40032	RunNo: 40032
Prep Date:	Analysis Date: 1/16/2017	SeqNo: 1254687 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.7		10.00		97.0	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		98.7	70	130			
Surr: Dibromofluoromethane	9.8		10.00		98.0	70	130			
Surr: Toluene-d8	10		10.00		101	70	130			

Sample ID 100ng lcs	SampType: LCS	TestCode: EPA Method 8260B: VOLATILES
Client ID: LCSW	Batch ID: W40032	RunNo: 40032
Prep Date:	Analysis Date: 1/16/2017	SeqNo: 1254688 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	101	70	130			
Toluene	20	1.0	20.00	0	98.1	70	130			
Chlorobenzene	21	1.0	20.00	0	104	70	130			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701525

25-Jan-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID: 100ng lcs	SampType: LCS		TestCode: EPA Method 8260B: VOLATILES							
Client ID: LCSW	Batch ID: W40032		RunNo: 40032							
Prep Date:	Analysis Date: 1/16/2017		SeqNo: 1254688		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloroethene	18	1.0	20.00	0	91.9	70	130			
Trichloroethene (TCE)	19	1.0	20.00	0	93.3	70	130			
Surr: 1,2-Dichloroethane-d4	9.4		10.00		94.1	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		102	70	130			
Surr: Dibromofluoromethane	9.5		10.00		95.0	70	130			
Surr: Toluene-d8	10		10.00		99.7	70	130			

Qualifiers:

- | | |
|---|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| H Holding times for preparation or analysis exceeded | J Analyte detected below quantitation limits |
| ND Not Detected at the Reporting Limit | P Sample pH Not In Range |
| R RPD outside accepted recovery limits | RL Reporting Detection Limit |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |



Hall Environmental Analysis Laboratory
 4901 Hawkins NE
 Albuquerque, NM 87109
 TEL: 505-345-3975 FAX: 505-345-4107
 Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: TER-LC

Work Order Number: 1701525

RcptNo: 1

Received by/date: RE 01/12/17

Logged By: **Anne Thorne** 1/12/2017 9:00:00 AM *Anne Thorne*

Completed By: **Anne Thorne** 1/13/2017 8:27:33 AM *Anne Thorne*

Reviewed By: *AG* 01/13/17

Chain of Custody

- 1. Custody seals intact on sample bottles? Yes No Not Present
- 2. Is Chain of Custody complete? Yes No Not Present
- 3. How was the sample delivered? FedEx

Log In

- 4. Was an attempt made to cool the samples? Yes No NA
- 5. Were all samples received at a temperature of >0° C to 6.0°C Yes No NA
- 6. Sample(s) in proper container(s)? Yes No
- 7. Sufficient sample volume for indicated test(s)? Yes No
- 8. Are samples (except VOA and ONG) properly preserved? Yes No
- 9. Was preservative added to bottles? Yes No NA
- 10. VOA vials have zero headspace? Yes No No VOA Vials
- 11. Were any sample containers received broken? Yes No
- 12. Does paperwork match bottle labels? Yes No
(Note discrepancies on chain of custody)
- 13. Are matrices correctly identified on Chain of Custody? Yes No
- 14. Is it clear what analyses were requested? Yes No
- 15. Were all holding times able to be met? Yes No
(If no, notify customer for authorization.)

of preserved bottles checked for pH: 7
 (<2 or >12 unless noted)

Adjusted? NO

Checked by: *La*

Special Handling (if applicable)

- 16. Was client notified of all discrepancies with this order? Yes No NA

Person Notified: _____ Date: _____

By Whom: _____ Via: eMail Phone Fax In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:
 For arsenic speciation analysis: pH of -001C is 5.5, pH of -002 and -006C is 3.0, pH of -003C and -004C is 2.5 and pH of -005C is 2.0.

Cooler No	Temp °C	Condition	Seal Intact?	Seal No	Seal Date	Signed By
1	2.1	Good	Yes			

01/13/17 @ 1200
La

Chain-of-Custody Record

Client: Terraviva Consultants Inc

Mailing Address: 4450 Barton Memorial
Las Cruces, NM 88011

Phone #: 575.527.1700

email or Fax#: Kyle.Williams@terramva.com

QA/QC Package: Standard Level 4 (Full Validation)

Accreditation: NELAP Other

EDD (Type)

Turn-Around Time: Standard Rush

Project Name: Carrizos & Wolcott C&W Phase

Project #: 68167094

Project Manager: Kyle Williams

Sampler: Williams

On Ice: Yes No

Sample Temperature: 2

Container Type and #

Preservative Type

HEAL No

1701525

701

702

703

704

705

706

707

Date

Time

Matrix

Sample Request ID

1/11/17

1325

GW

GW01-01-170111

1335

GW01-02-170111

1350

GW01-04-170111

1400

GW01-05-170111

1410

GW01-06-170111

1425

Trip Blank

Date: 1/11/17

Time: 1630

Relinquished by: [Signature]

Date: 1/11/17

Time: 1630

Relinquished by: [Signature]

Received by: [Signature]

Date: 1/12/17

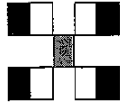
Time: 0900

Received by: [Signature]

Date: 1/12/17

Time: 0900

Remarks: Invoice to the City of Las Cruces



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

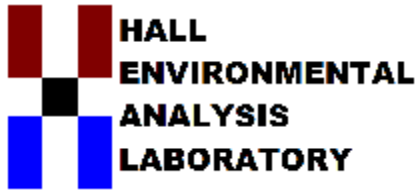
4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

BTEX + MTBE + TMBs (8021)	
BTEX + MTBE + TPH (Gas only)	
TPH 8015B (GRO / DRO / MRO)	
TPH (Method 418.1)	
EDB (Method 504.1)	
PAH's (8310 or 8270 SIMS)	
RCRA 8 Metals	
Anions (F, Cl, NO ₃ , NO ₂ , PO ₄ , SO ₄)	
8081 Pesticides / 8082 PCBs	
8260B (VOA)	X
8270 (Semi-VOA)	X
6020 As, U	X
A3114 As Speciation	X
Air Bubbles (Y or N)	

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

February 07, 2017

Kyle Williams

Terracon

4450 Bataan Memorial E

Las Cruces, NM 88005

TEL: (575) 527-1700

FAX (575) 527-1092

RE: Griggs & Walnut GW Plume

OrderNo.: 1701646

Dear Kyle Williams:

Hall Environmental Analysis Laboratory received 8 sample(s) on 1/17/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a white background.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701646

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: GWMW09-01-170116

Project: Griggs & Walnut GW Plume

Collection Date: 1/16/2017 1:15:00 PM

Lab ID: 1701646-001

Matrix: AQUEOUS

Received Date: 1/17/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0030	0.0010		mg/L	1	1/23/2017 4:08:14 PM	29771
Uranium	ND	0.00050		mg/L	1	1/23/2017 4:08:14 PM	29771
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
Toluene	13	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
Ethylbenzene	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
Naphthalene	ND	2.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
1-Methylnaphthalene	ND	4.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
2-Methylnaphthalene	ND	4.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
Acetone	ND	10		µg/L	1	1/17/2017 4:42:48 PM	A40068
Bromobenzene	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
Bromodichloromethane	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
Bromoform	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
Bromomethane	ND	3.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
2-Butanone	ND	10		µg/L	1	1/17/2017 4:42:48 PM	A40068
Carbon disulfide	ND	10		µg/L	1	1/17/2017 4:42:48 PM	A40068
Carbon Tetrachloride	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
Chlorobenzene	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
Chloroethane	ND	2.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
Chloroform	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
Chloromethane	ND	3.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
2-Chlorotoluene	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
4-Chlorotoluene	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
cis-1,2-DCE	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
Dibromochloromethane	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
Dibromomethane	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
1,1-Dichloroethane	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
1,1-Dichloroethene	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701646

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: GWMW09-01-170116

Project: Griggs & Walnut GW Plume

Collection Date: 1/16/2017 1:15:00 PM

Lab ID: 1701646-001

Matrix: AQUEOUS

Received Date: 1/17/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
1,3-Dichloropropane	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
2,2-Dichloropropane	ND	2.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
1,1-Dichloropropene	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
Hexachlorobutadiene	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
2-Hexanone	ND	10		µg/L	1	1/17/2017 4:42:48 PM	A40068
Isopropylbenzene	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
4-Isopropyltoluene	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
4-Methyl-2-pentanone	ND	10		µg/L	1	1/17/2017 4:42:48 PM	A40068
Methylene Chloride	ND	3.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
n-Butylbenzene	ND	3.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
n-Propylbenzene	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
sec-Butylbenzene	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
Styrene	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
tert-Butylbenzene	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
trans-1,2-DCE	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
Trichlorofluoromethane	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
Vinyl chloride	ND	1.0		µg/L	1	1/17/2017 4:42:48 PM	A40068
Xylenes, Total	ND	1.5		µg/L	1	1/17/2017 4:42:48 PM	A40068
Surr: 1,2-Dichloroethane-d4	96.2	70-130		%Rec	1	1/17/2017 4:42:48 PM	A40068
Surr: 4-Bromofluorobenzene	94.0	70-130		%Rec	1	1/17/2017 4:42:48 PM	A40068
Surr: Dibromofluoromethane	99.7	70-130		%Rec	1	1/17/2017 4:42:48 PM	A40068
Surr: Toluene-d8	97.0	70-130		%Rec	1	1/17/2017 4:42:48 PM	A40068

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701646

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: GWMW09-02-170116

Project: Griggs & Walnut GW Plume

Collection Date: 1/16/2017 1:25:00 PM

Lab ID: 1701646-002

Matrix: AQUEOUS

Received Date: 1/17/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0035	0.0010		mg/L	1	1/23/2017 4:11:15 PM	29771
Uranium	ND	0.00050		mg/L	1	1/23/2017 4:11:15 PM	29771
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	1.9	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
Toluene	48	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
Ethylbenzene	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
Naphthalene	ND	2.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
1-Methylnaphthalene	ND	4.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
2-Methylnaphthalene	ND	4.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
Acetone	ND	10		µg/L	1	1/17/2017 5:12:04 PM	A40068
Bromobenzene	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
Bromodichloromethane	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
Bromoform	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
Bromomethane	ND	3.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
2-Butanone	ND	10		µg/L	1	1/17/2017 5:12:04 PM	A40068
Carbon disulfide	ND	10		µg/L	1	1/17/2017 5:12:04 PM	A40068
Carbon Tetrachloride	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
Chlorobenzene	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
Chloroethane	ND	2.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
Chloroform	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
Chloromethane	ND	3.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
2-Chlorotoluene	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
4-Chlorotoluene	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
cis-1,2-DCE	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
Dibromochloromethane	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
Dibromomethane	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
1,1-Dichloroethane	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
1,1-Dichloroethene	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701646

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: GWMW09-02-170116

Project: Griggs & Walnut GW Plume

Collection Date: 1/16/2017 1:25:00 PM

Lab ID: 1701646-002

Matrix: AQUEOUS

Received Date: 1/17/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
1,3-Dichloropropane	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
2,2-Dichloropropane	ND	2.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
1,1-Dichloropropene	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
Hexachlorobutadiene	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
2-Hexanone	ND	10		µg/L	1	1/17/2017 5:12:04 PM	A40068
Isopropylbenzene	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
4-Isopropyltoluene	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
4-Methyl-2-pentanone	ND	10		µg/L	1	1/17/2017 5:12:04 PM	A40068
Methylene Chloride	ND	3.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
n-Butylbenzene	ND	3.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
n-Propylbenzene	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
sec-Butylbenzene	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
Styrene	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
tert-Butylbenzene	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
trans-1,2-DCE	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
Trichlorofluoromethane	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
Vinyl chloride	ND	1.0		µg/L	1	1/17/2017 5:12:04 PM	A40068
Xylenes, Total	ND	1.5		µg/L	1	1/17/2017 5:12:04 PM	A40068
Surr: 1,2-Dichloroethane-d4	100	70-130		%Rec	1	1/17/2017 5:12:04 PM	A40068
Surr: 4-Bromofluorobenzene	93.6	70-130		%Rec	1	1/17/2017 5:12:04 PM	A40068
Surr: Dibromofluoromethane	102	70-130		%Rec	1	1/17/2017 5:12:04 PM	A40068
Surr: Toluene-d8	96.7	70-130		%Rec	1	1/17/2017 5:12:04 PM	A40068

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701646

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: GWMW09-03-170116

Project: Griggs & Walnut GW Plume

Collection Date: 1/16/2017 1:35:00 PM

Lab ID: 1701646-003

Matrix: AQUEOUS

Received Date: 1/17/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0058	0.0010		mg/L	1	1/23/2017 4:20:17 PM	29771
Uranium	0.068	0.0025	*	mg/L	5	1/23/2017 4:29:20 PM	29771
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	1.4	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
Toluene	40	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
Ethylbenzene	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
Naphthalene	ND	2.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
1-Methylnaphthalene	ND	4.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
2-Methylnaphthalene	ND	4.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
Acetone	ND	10		µg/L	1	1/17/2017 6:39:41 PM	A40068
Bromobenzene	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
Bromodichloromethane	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
Bromoform	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
Bromomethane	ND	3.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
2-Butanone	ND	10		µg/L	1	1/17/2017 6:39:41 PM	A40068
Carbon disulfide	ND	10		µg/L	1	1/17/2017 6:39:41 PM	A40068
Carbon Tetrachloride	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
Chlorobenzene	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
Chloroethane	ND	2.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
Chloroform	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
Chloromethane	ND	3.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
2-Chlorotoluene	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
4-Chlorotoluene	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
cis-1,2-DCE	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
Dibromochloromethane	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
Dibromomethane	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
1,1-Dichloroethane	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
1,1-Dichloroethene	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701646

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: GWMW09-03-170116

Project: Griggs & Walnut GW Plume

Collection Date: 1/16/2017 1:35:00 PM

Lab ID: 1701646-003

Matrix: AQUEOUS

Received Date: 1/17/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
1,3-Dichloropropane	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
2,2-Dichloropropane	ND	2.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
1,1-Dichloropropene	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
Hexachlorobutadiene	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
2-Hexanone	ND	10		µg/L	1	1/17/2017 6:39:41 PM	A40068
Isopropylbenzene	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
4-Isopropyltoluene	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
4-Methyl-2-pentanone	ND	10		µg/L	1	1/17/2017 6:39:41 PM	A40068
Methylene Chloride	ND	3.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
n-Butylbenzene	ND	3.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
n-Propylbenzene	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
sec-Butylbenzene	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
Styrene	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
tert-Butylbenzene	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
Tetrachloroethene (PCE)	13	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
trans-1,2-DCE	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
Trichlorofluoromethane	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
Vinyl chloride	ND	1.0		µg/L	1	1/17/2017 6:39:41 PM	A40068
Xylenes, Total	ND	1.5		µg/L	1	1/17/2017 6:39:41 PM	A40068
Surr: 1,2-Dichloroethane-d4	94.3	70-130		%Rec	1	1/17/2017 6:39:41 PM	A40068
Surr: 4-Bromofluorobenzene	93.7	70-130		%Rec	1	1/17/2017 6:39:41 PM	A40068
Surr: Dibromofluoromethane	98.3	70-130		%Rec	1	1/17/2017 6:39:41 PM	A40068
Surr: Toluene-d8	99.5	70-130		%Rec	1	1/17/2017 6:39:41 PM	A40068

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701646

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: GWMW09-04-170116

Project: Griggs & Walnut GW Plume

Collection Date: 1/16/2017 1:45:00 PM

Lab ID: 1701646-004

Matrix: AQUEOUS

Received Date: 1/17/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0045	0.0010		mg/L	1	1/23/2017 4:23:17 PM	29771
Uranium	0.016	0.00050		mg/L	1	1/23/2017 4:23:17 PM	29771
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	2.1	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
Toluene	51	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
Ethylbenzene	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
Naphthalene	ND	2.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
1-Methylnaphthalene	ND	4.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
2-Methylnaphthalene	ND	4.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
Acetone	ND	10		µg/L	1	1/17/2017 7:08:51 PM	A40068
Bromobenzene	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
Bromodichloromethane	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
Bromoform	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
Bromomethane	ND	3.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
2-Butanone	ND	10		µg/L	1	1/17/2017 7:08:51 PM	A40068
Carbon disulfide	ND	10		µg/L	1	1/17/2017 7:08:51 PM	A40068
Carbon Tetrachloride	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
Chlorobenzene	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
Chloroethane	ND	2.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
Chloroform	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
Chloromethane	ND	3.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
2-Chlorotoluene	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
4-Chlorotoluene	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
cis-1,2-DCE	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
Dibromochloromethane	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
Dibromomethane	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
1,1-Dichloroethane	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
1,1-Dichloroethene	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701646

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: GWMW09-04-170116

Project: Griggs & Walnut GW Plume

Collection Date: 1/16/2017 1:45:00 PM

Lab ID: 1701646-004

Matrix: AQUEOUS

Received Date: 1/17/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
1,3-Dichloropropane	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
2,2-Dichloropropane	ND	2.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
1,1-Dichloropropene	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
Hexachlorobutadiene	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
2-Hexanone	ND	10		µg/L	1	1/17/2017 7:08:51 PM	A40068
Isopropylbenzene	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
4-Isopropyltoluene	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
4-Methyl-2-pentanone	ND	10		µg/L	1	1/17/2017 7:08:51 PM	A40068
Methylene Chloride	ND	3.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
n-Butylbenzene	ND	3.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
n-Propylbenzene	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
sec-Butylbenzene	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
Styrene	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
tert-Butylbenzene	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
Tetrachloroethene (PCE)	9.2	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
trans-1,2-DCE	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
Trichlorofluoromethane	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
Vinyl chloride	ND	1.0		µg/L	1	1/17/2017 7:08:51 PM	A40068
Xylenes, Total	ND	1.5		µg/L	1	1/17/2017 7:08:51 PM	A40068
Surr: 1,2-Dichloroethane-d4	99.5	70-130		%Rec	1	1/17/2017 7:08:51 PM	A40068
Surr: 4-Bromofluorobenzene	98.0	70-130		%Rec	1	1/17/2017 7:08:51 PM	A40068
Surr: Dibromofluoromethane	101	70-130		%Rec	1	1/17/2017 7:08:51 PM	A40068
Surr: Toluene-d8	98.8	70-130		%Rec	1	1/17/2017 7:08:51 PM	A40068

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701646

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: GWMW09-05-170116

Project: Griggs & Walnut GW Plume

Collection Date: 1/16/2017 1:55:00 PM

Lab ID: 1701646-005

Matrix: AQUEOUS

Received Date: 1/17/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0041	0.0010		mg/L	1	1/23/2017 4:38:25 PM	29771
Uranium	0.0031	0.00050		mg/L	1	1/23/2017 4:38:25 PM	29771
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	2.2	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
Toluene	57	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
Ethylbenzene	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
Naphthalene	ND	2.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
1-Methylnaphthalene	ND	4.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
2-Methylnaphthalene	ND	4.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
Acetone	ND	10		µg/L	1	1/17/2017 7:38:01 PM	A40068
Bromobenzene	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
Bromodichloromethane	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
Bromoform	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
Bromomethane	ND	3.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
2-Butanone	ND	10		µg/L	1	1/17/2017 7:38:01 PM	A40068
Carbon disulfide	ND	10		µg/L	1	1/17/2017 7:38:01 PM	A40068
Carbon Tetrachloride	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
Chlorobenzene	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
Chloroethane	ND	2.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
Chloroform	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
Chloromethane	ND	3.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
2-Chlorotoluene	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
4-Chlorotoluene	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
cis-1,2-DCE	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
Dibromochloromethane	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
Dibromomethane	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
1,1-Dichloroethane	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
1,1-Dichloroethene	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701646

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: GWMW09-05-170116

Project: Griggs & Walnut GW Plume

Collection Date: 1/16/2017 1:55:00 PM

Lab ID: 1701646-005

Matrix: AQUEOUS

Received Date: 1/17/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
1,3-Dichloropropane	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
2,2-Dichloropropane	ND	2.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
1,1-Dichloropropene	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
Hexachlorobutadiene	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
2-Hexanone	ND	10		µg/L	1	1/17/2017 7:38:01 PM	A40068
Isopropylbenzene	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
4-Isopropyltoluene	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
4-Methyl-2-pentanone	ND	10		µg/L	1	1/17/2017 7:38:01 PM	A40068
Methylene Chloride	ND	3.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
n-Butylbenzene	ND	3.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
n-Propylbenzene	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
sec-Butylbenzene	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
Styrene	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
tert-Butylbenzene	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
Tetrachloroethene (PCE)	19	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
trans-1,2-DCE	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
Trichloroethene (TCE)	1.9	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
Trichlorofluoromethane	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
Vinyl chloride	ND	1.0		µg/L	1	1/17/2017 7:38:01 PM	A40068
Xylenes, Total	ND	1.5		µg/L	1	1/17/2017 7:38:01 PM	A40068
Surr: 1,2-Dichloroethane-d4	98.4	70-130		%Rec	1	1/17/2017 7:38:01 PM	A40068
Surr: 4-Bromofluorobenzene	91.3	70-130		%Rec	1	1/17/2017 7:38:01 PM	A40068
Surr: Dibromofluoromethane	101	70-130		%Rec	1	1/17/2017 7:38:01 PM	A40068
Surr: Toluene-d8	101	70-130		%Rec	1	1/17/2017 7:38:01 PM	A40068

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701646

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: GWMW09-06-170116

Project: Griggs & Walnut GW Plume

Collection Date: 1/16/2017 2:05:00 PM

Lab ID: 1701646-006

Matrix: AQUEOUS

Received Date: 1/17/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.11	0.0050	*	mg/L	5	1/23/2017 4:47:28 PM	29771
Uranium	0.00063	0.00050		mg/L	1	1/23/2017 4:41:26 PM	29771
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	6.8	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
Toluene	110	10		µg/L	10	1/18/2017 8:19:45 PM	R40109
Ethylbenzene	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
Naphthalene	ND	2.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
1-Methylnaphthalene	ND	4.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
2-Methylnaphthalene	ND	4.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
Acetone	61	10		µg/L	1	1/17/2017 8:07:03 PM	A40068
Bromobenzene	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
Bromodichloromethane	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
Bromoform	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
Bromomethane	ND	3.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
2-Butanone	49	10		µg/L	1	1/17/2017 8:07:03 PM	A40068
Carbon disulfide	ND	10		µg/L	1	1/17/2017 8:07:03 PM	A40068
Carbon Tetrachloride	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
Chlorobenzene	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
Chloroethane	ND	2.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
Chloroform	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
Chloromethane	ND	3.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
2-Chlorotoluene	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
4-Chlorotoluene	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
cis-1,2-DCE	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
Dibromochloromethane	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
Dibromomethane	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
1,1-Dichloroethane	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
1,1-Dichloroethene	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701646

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: GWMW09-06-170116

Project: Griggs & Walnut GW Plume

Collection Date: 1/16/2017 2:05:00 PM

Lab ID: 1701646-006

Matrix: AQUEOUS

Received Date: 1/17/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
1,3-Dichloropropane	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
2,2-Dichloropropane	ND	2.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
1,1-Dichloropropene	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
Hexachlorobutadiene	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
2-Hexanone	ND	10		µg/L	1	1/17/2017 8:07:03 PM	A40068
Isopropylbenzene	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
4-Isopropyltoluene	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
4-Methyl-2-pentanone	ND	10		µg/L	1	1/17/2017 8:07:03 PM	A40068
Methylene Chloride	ND	3.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
n-Butylbenzene	ND	3.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
n-Propylbenzene	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
sec-Butylbenzene	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
Styrene	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
tert-Butylbenzene	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
trans-1,2-DCE	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
Trichlorofluoromethane	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
Vinyl chloride	ND	1.0		µg/L	1	1/17/2017 8:07:03 PM	A40068
Xylenes, Total	ND	1.5		µg/L	1	1/17/2017 8:07:03 PM	A40068
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	1/17/2017 8:07:03 PM	A40068
Surr: 4-Bromofluorobenzene	94.8	70-130		%Rec	1	1/17/2017 8:07:03 PM	A40068
Surr: Dibromofluoromethane	102	70-130		%Rec	1	1/17/2017 8:07:03 PM	A40068
Surr: Toluene-d8	99.5	70-130		%Rec	1	1/17/2017 8:07:03 PM	A40068

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701646

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: GWMW09-07-170116

Project: Griggs & Walnut GW Plume

Collection Date: 1/16/2017 2:15:00 PM

Lab ID: 1701646-007

Matrix: AQUEOUS

Received Date: 1/17/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.12	0.0050	*	mg/L	5	1/23/2017 4:50:29 PM	29771
Uranium	ND	0.00050		mg/L	1	1/23/2017 4:44:26 PM	29771
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	6.7	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
Toluene	110	10		µg/L	10	1/18/2017 8:48:35 PM	R40109
Ethylbenzene	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
Naphthalene	ND	2.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
1-Methylnaphthalene	ND	4.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
2-Methylnaphthalene	ND	4.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
Acetone	88	10		µg/L	1	1/17/2017 8:36:09 PM	A40068
Bromobenzene	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
Bromodichloromethane	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
Bromoform	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
Bromomethane	ND	3.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
2-Butanone	68	10		µg/L	1	1/17/2017 8:36:09 PM	A40068
Carbon disulfide	ND	10		µg/L	1	1/17/2017 8:36:09 PM	A40068
Carbon Tetrachloride	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
Chlorobenzene	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
Chloroethane	ND	2.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
Chloroform	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
Chloromethane	ND	3.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
2-Chlorotoluene	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
4-Chlorotoluene	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
cis-1,2-DCE	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
Dibromochloromethane	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
Dibromomethane	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
1,1-Dichloroethane	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
1,1-Dichloroethene	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701646

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: GWMW09-07-170116

Project: Griggs & Walnut GW Plume

Collection Date: 1/16/2017 2:15:00 PM

Lab ID: 1701646-007

Matrix: AQUEOUS

Received Date: 1/17/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
1,3-Dichloropropane	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
2,2-Dichloropropane	ND	2.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
1,1-Dichloropropene	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
Hexachlorobutadiene	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
2-Hexanone	ND	10		µg/L	1	1/17/2017 8:36:09 PM	A40068
Isopropylbenzene	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
4-Isopropyltoluene	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
4-Methyl-2-pentanone	ND	10		µg/L	1	1/17/2017 8:36:09 PM	A40068
Methylene Chloride	ND	3.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
n-Butylbenzene	ND	3.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
n-Propylbenzene	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
sec-Butylbenzene	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
Styrene	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
tert-Butylbenzene	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
trans-1,2-DCE	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
Trichlorofluoromethane	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
Vinyl chloride	ND	1.0		µg/L	1	1/17/2017 8:36:09 PM	A40068
Xylenes, Total	ND	1.5		µg/L	1	1/17/2017 8:36:09 PM	A40068
Surr: 1,2-Dichloroethane-d4	98.0	70-130		%Rec	1	1/17/2017 8:36:09 PM	A40068
Surr: 4-Bromofluorobenzene	91.6	70-130		%Rec	1	1/17/2017 8:36:09 PM	A40068
Surr: Dibromofluoromethane	99.3	70-130		%Rec	1	1/17/2017 8:36:09 PM	A40068
Surr: Toluene-d8	100	70-130		%Rec	1	1/17/2017 8:36:09 PM	A40068

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701646

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: Trip Blank

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701646-008

Matrix: AQUEOUS

Received Date: 1/17/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
Toluene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
Ethylbenzene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
Naphthalene	ND	2.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
1-Methylnaphthalene	ND	4.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
2-Methylnaphthalene	ND	4.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
Acetone	ND	10		µg/L	1	1/17/2017 9:05:01 PM	A40068
Bromobenzene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
Bromodichloromethane	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
Bromoform	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
Bromomethane	ND	3.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
2-Butanone	ND	10		µg/L	1	1/17/2017 9:05:01 PM	A40068
Carbon disulfide	ND	10		µg/L	1	1/17/2017 9:05:01 PM	A40068
Carbon Tetrachloride	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
Chlorobenzene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
Chloroethane	ND	2.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
Chloroform	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
Chloromethane	ND	3.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
2-Chlorotoluene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
4-Chlorotoluene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
cis-1,2-DCE	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
Dibromochloromethane	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
Dibromomethane	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
1,1-Dichloroethane	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
1,1-Dichloroethene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
1,2-Dichloropropane	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
1,3-Dichloropropane	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
2,2-Dichloropropane	ND	2.0		µg/L	1	1/17/2017 9:05:01 PM	A40068

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701646

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: Trip Blank

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701646-008

Matrix: AQUEOUS

Received Date: 1/17/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,1-Dichloropropene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
Hexachlorobutadiene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
2-Hexanone	ND	10		µg/L	1	1/17/2017 9:05:01 PM	A40068
Isopropylbenzene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
4-Isopropyltoluene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
4-Methyl-2-pentanone	ND	10		µg/L	1	1/17/2017 9:05:01 PM	A40068
Methylene Chloride	ND	3.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
n-Butylbenzene	ND	3.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
n-Propylbenzene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
sec-Butylbenzene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
Styrene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
tert-Butylbenzene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
trans-1,2-DCE	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
Trichlorofluoromethane	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
Vinyl chloride	ND	1.0		µg/L	1	1/17/2017 9:05:01 PM	A40068
Xylenes, Total	ND	1.5		µg/L	1	1/17/2017 9:05:01 PM	A40068
Surr: 1,2-Dichloroethane-d4	97.4	70-130		%Rec	1	1/17/2017 9:05:01 PM	A40068
Surr: 4-Bromofluorobenzene	96.7	70-130		%Rec	1	1/17/2017 9:05:01 PM	A40068
Surr: Dibromofluoromethane	105	70-130		%Rec	1	1/17/2017 9:05:01 PM	A40068
Surr: Toluene-d8	99.3	70-130		%Rec	1	1/17/2017 9:05:01 PM	A40068

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010246-001
Client Sample ID: 1701646-001C GWMW09-01-170116

Report Date: 01/25/17
Collection Date: 01/16/17 13:15
Date Received: 01/19/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/23/17 16:21 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/23/17 16:21 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental

Project: Not Indicated

Lab ID: H17010246-002

Client Sample ID: 1701646-002C GWMW09-02-170116

Report Date: 01/25/17

Collection Date: 01/16/17 13:25

Date Received: 01/19/17

Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/23/17 16:33 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/23/17 16:33 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental

Project: Not Indicated

Lab ID: H17010246-003

Client Sample ID: 1701646-003C GWMW09-03-170116

Report Date: 01/25/17

Collection Date: 01/16/17 13:35

Date Received: 01/19/17

Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/23/17 17:09 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/23/17 17:09 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010246-004
Client Sample ID: 1701646-004C GWMW09-04-170116

Report Date: 01/25/17
Collection Date: 01/16/17 13:45
Date Received: 01/19/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/23/17 17:21 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/23/17 17:21 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental

Project: Not Indicated

Lab ID: H17010246-005

Client Sample ID: 1701646-005C GWMW09-05-170116

Report Date: 01/25/17

Collection Date: 01/16/17 13:55

Date Received: 01/19/17

Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/23/17 17:33 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/23/17 17:33 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental

Project: Not Indicated

Lab ID: H17010246-006

Client Sample ID: 1701646-006C GWMW09-06-170116

Report Date: 01/25/17

Collection Date: 01/16/17 14:05

Date Received: 01/19/17

Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/23/17 17:45 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/23/17 17:45 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010246-007
Client Sample ID: 1701646-007C GWMW09-07-170116

Report Date: 01/25/17
Collection Date: 01/16/17 14:15
Date Received: 01/19/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/23/17 17:57 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/23/17 17:57 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hall Environmental

Report Date: 01/25/17

Project: Not Indicated

Work Order: H17010246

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual	
Method: E1632AM								Analytical Run: ARSENIC SPECIATION_170123A		
Lab ID: AS-ICV 25ppb-1/23/2017	Initial Calibration Verification Standard							01/23/17 12:21		
Arsenic-III	24.4	ug/L	5.0	98	87.6	114				
Arsenic-V	24.8	ug/L	5.0	99	87	116				
Lab ID: AS-50.0-1/23/2017	Continuing Calibration Verification Standard							01/23/17 15:45		
Arsenic-III	47.3	ug/L	5.0	95	85	115				
Arsenic-V	51.6	ug/L	5.0	103	85	115				
Method: E1632AM								Batch: R122233		
Lab ID: AS-LFB 50ppb-1/23/2017	Laboratory Fortified Blank							Run: ARSENIC SPECIATION_1701 01/23/17 12:57		
Arsenic-III	45.8	ug/L	5.0	92	55	146				
Arsenic-V	46.9	ug/L	5.0	94	55	146				
Lab ID: ICB	Method Blank							Run: ARSENIC SPECIATION_1701 01/23/17 13:09		
Arsenic-III	ND	ug/L	0.2							
Arsenic-V	ND	ug/L	0.5							
Lab ID: H17010246-002A MS	Sample Matrix Spike							Run: ARSENIC SPECIATION_1701 01/23/17 16:45		
Arsenic-III	47.8	ug/L	5.0	96	55	146				
Arsenic-V	42.8	ug/L	5.0	86	55	146				
Lab ID: H17010246-002A MSD	Sample Matrix Spike Duplicate							Run: ARSENIC SPECIATION_1701 01/23/17 16:57		
Arsenic-III	49.0	ug/L	5.0	98	55	146	2.5	20		
Arsenic-V	41.8	ug/L	5.0	84	55	146	2.4	20		

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701646

07-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	1701646-002BMSDL		SampType:	MSDLL		TestCode:	200.8 ICPMS Metals:Total				
Client ID:	GMMW09-02-17011		Batch ID:	29771		RunNo:	40219				
Prep Date:	1/18/2017		Analysis Date:	1/23/2017		SeqNo:	1260917		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Arsenic	0.029	0.0010	0.02500	0.003524	101	70	130	1.61	20		
Uranium	0.013	0.00050	0.01250	0	105	70	130	1.35	20		

Sample ID	1701646-002BMSLL		SampType:	MSLL		TestCode:	200.8 ICPMS Metals:Total				
Client ID:	GMMW09-02-17011		Batch ID:	29771		RunNo:	40219				
Prep Date:	1/18/2017		Analysis Date:	1/23/2017		SeqNo:	1260918		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Arsenic	0.028	0.0010	0.02500	0.003524	98.7	70	130				
Uranium	0.013	0.00050	0.01250	0	104	70	130				

Sample ID	MB-29771		SampType:	MBLK		TestCode:	200.8 ICPMS Metals:Total				
Client ID:	PBW		Batch ID:	29771		RunNo:	40219				
Prep Date:	1/18/2017		Analysis Date:	1/23/2017		SeqNo:	1260935		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Arsenic	ND	0.0010									
Uranium	ND	0.00050									

Sample ID	MSLCS-29771		SampType:	LCS		TestCode:	200.8 ICPMS Metals:Total				
Client ID:	LCSW		Batch ID:	29771		RunNo:	40219				
Prep Date:	1/18/2017		Analysis Date:	1/23/2017		SeqNo:	1260939		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Arsenic	0.026	0.0010	0.02500	0	102	85	115				
Uranium	0.013	0.00050	0.01250	0	101	85	115				

Sample ID	MSLCSLL-29771		SampType:	LCSLL		TestCode:	200.8 ICPMS Metals:Total				
Client ID:	BatchQC		Batch ID:	29771		RunNo:	40219				
Prep Date:	1/18/2017		Analysis Date:	1/23/2017		SeqNo:	1260943		Units: mg/L		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Arsenic	0.0011	0.0010	0.001000	0	114	50	150				
Uranium	ND	0.00050	0.0005000	0	98.3	50	150				

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701646

07-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	rb	SampType:	MBLK		TestCode:	EPA Method 8260B: VOLATILES				
Client ID:	PBW	Batch ID:	A40068		RunNo:	40068				
Prep Date:		Analysis Date:	1/17/2017		SeqNo:	1256454	Units:	µg/L		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701646

07-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID rb	SampType: MBLK	TestCode: EPA Method 8260B: VOLATILES
Client ID: PBW	Batch ID: A40068	RunNo: 40068
Prep Date:	Analysis Date: 1/17/2017	SeqNo: 1256454 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.0		10.00		90.3	70	130			
Surr: 4-Bromofluorobenzene	9.3		10.00		92.7	70	130			
Surr: Dibromofluoromethane	9.6		10.00		96.2	70	130			
Surr: Toluene-d8	9.6		10.00		96.3	70	130			

Sample ID 100ng lcs	SampType: LCS	TestCode: EPA Method 8260B: VOLATILES
Client ID: LCSW	Batch ID: A40068	RunNo: 40068
Prep Date:	Analysis Date: 1/17/2017	SeqNo: 1256455 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	102	70	130			
Toluene	20	1.0	20.00	0	97.9	70	130			
Chlorobenzene	20	1.0	20.00	0	101	70	130			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701646

07-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID 100ng lcs	SampType: LCS		TestCode: EPA Method 8260B: VOLATILES							
Client ID: LCSW	Batch ID: A40068		RunNo: 40068							
Prep Date:	Analysis Date: 1/17/2017		SeqNo: 1256455		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloroethene	18	1.0	20.00	0	90.1	70	130			
Trichloroethene (TCE)	19	1.0	20.00	0	92.6	70	130			
Surr: 1,2-Dichloroethane-d4	8.6		10.00		86.4	70	130			
Surr: 4-Bromofluorobenzene	9.7		10.00		96.9	70	130			
Surr: Dibromofluoromethane	9.4		10.00		94.2	70	130			
Surr: Toluene-d8	9.7		10.00		96.7	70	130			

Sample ID 1701646-002a ms	SampType: MS		TestCode: EPA Method 8260B: VOLATILES							
Client ID: GMMW09-02-17011	Batch ID: A40068		RunNo: 40068							
Prep Date:	Analysis Date: 1/17/2017		SeqNo: 1256460		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	23	1.0	20.00	1.914	104	70	130			
Toluene	58	1.0	20.00	47.99	50.5	70	130			S
Chlorobenzene	20	1.0	20.00	0	98.5	70	130			
1,1-Dichloroethene	18	1.0	20.00	0	89.5	70	130			
Trichloroethene (TCE)	19	1.0	20.00	0	94.6	70	130			
Surr: 1,2-Dichloroethane-d4	9.9		10.00		98.7	70	130			
Surr: 4-Bromofluorobenzene	9.6		10.00		95.8	70	130			
Surr: Dibromofluoromethane	9.5		10.00		94.9	70	130			
Surr: Toluene-d8	9.4		10.00		93.7	70	130			

Sample ID 1701646-002a msd	SampType: MSD		TestCode: EPA Method 8260B: VOLATILES							
Client ID: GMMW09-02-17011	Batch ID: A40068		RunNo: 40068							
Prep Date:	Analysis Date: 1/17/2017		SeqNo: 1256461		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	22	1.0	20.00	1.914	101	70	130	2.73	20	
Toluene	56	1.0	20.00	47.99	41.4	70	130	3.19	20	S
Chlorobenzene	19	1.0	20.00	0	93.8	70	130	4.93	20	
1,1-Dichloroethene	17	1.0	20.00	0	86.8	70	130	3.13	20	
Trichloroethene (TCE)	18	1.0	20.00	0	91.2	70	130	3.65	20	
Surr: 1,2-Dichloroethane-d4	9.5		10.00		95.0	70	130	0	0	
Surr: 4-Bromofluorobenzene	9.3		10.00		92.7	70	130	0	0	
Surr: Dibromofluoromethane	9.5		10.00		94.7	70	130	0	0	
Surr: Toluene-d8	9.5		10.00		94.6	70	130	0	0	

Qualifiers:

- | | |
|---|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| H Holding times for preparation or analysis exceeded | J Analyte detected below quantitation limits |
| ND Not Detected at the Reporting Limit | P Sample pH Not In Range |
| R RPD outside accepted recovery limits | RL Reporting Detection Limit |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701646

07-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID 100ng lcs	SampType: LCS		TestCode: EPA Method 8260B: VOLATILES							
Client ID: LCSW	Batch ID: R40109		RunNo: 40109							
Prep Date:	Analysis Date: 1/18/2017		SeqNo: 1257826		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	20	1.0	20.00	0	99.3	70	130			
Surr: 1,2-Dichloroethane-d4	9.5		10.00		94.6	70	130			
Surr: 4-Bromofluorobenzene	9.8		10.00		98.1	70	130			
Surr: Dibromofluoromethane	9.2		10.00		92.4	70	130			
Surr: Toluene-d8	9.9		10.00		98.9	70	130			

Sample ID rb	SampType: MBLK		TestCode: EPA Method 8260B: VOLATILES							
Client ID: PBW	Batch ID: R40109		RunNo: 40109							
Prep Date:	Analysis Date: 1/18/2017		SeqNo: 1257846		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	ND	1.0								
Surr: 1,2-Dichloroethane-d4	9.3		10.00		92.6	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130			
Surr: Dibromofluoromethane	9.6		10.00		95.6	70	130			
Surr: Toluene-d8	9.8		10.00		97.9	70	130			

Qualifiers:

- | | |
|---|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| H Holding times for preparation or analysis exceeded | J Analyte detected below quantitation limits |
| ND Not Detected at the Reporting Limit | P Sample pH Not In Range |
| R RPD outside accepted recovery limits | RL Reporting Detection Limit |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |



Hall Environmental Analysis Laboratory
 4901 Hawkins NE
 Albuquerque, NM 87109
 TEL: 505-345-3975 FAX: 505-345-4107
 Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: TER-LC

Work Order Number: 1701646

RcptNo: 1

Received by/date: ajs 1/17/17

Logged By: Andy Jansson 1/17/2017 9:00:00 AM *only for*

Completed By: Andy Jansson 1/17/17

Reviewed By: [Signature] 01/17/17

Chain of Custody

- Custody seals intact on sample bottles? Yes No Not Present
- Is Chain of Custody complete? Yes No Not Present
- How was the sample delivered? FedEx

Log In

- Was an attempt made to cool the samples? Yes No NA
- Were all samples received at a temperature of >0° C to 6.0°C? Yes No NA
- Sample(s) in proper container(s)? Yes No
- Sufficient sample volume for indicated test(s)? Yes No
- Are samples (except VOA and ONG) properly preserved? Yes No
- Was preservative added to bottles? Yes No NA
- VOA vials have zero headspace? Yes No No VOA Vials
- Were any sample containers received broken? Yes No
- Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes No
- Are matrices correctly identified on Chain of Custody? Yes No
- Is it clear what analyses were requested? Yes No
- Were all holding times able to be met? (If no, notify customer for authorization.) Yes No

of preserved bottles checked for pH: 8
 (<2 or >12 unless noted)

Adjusted? NO

Checked by La

Special Handling (if applicable)

- Was client notified of all discrepancies with this order? Yes No NA

Person Notified: _____ Date: _____

By Whom: _____ Via: eMail Phone Fax In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks: For arsenic speciation: pH of -001C, -003C, -004C, -006C, and -007C is 3. pH level of -002C and -005C is 2.5.

18. Cooler Information - 002C and -005C is 2.5. 01/17/17 @ 1020

Cooler No	Temp °C	Condition	Seal Intact?	Seal No	Seal Date	Signed By
1	4.1	Good	Yes			

La

Chain-of-Custody Record

Client: Terminon Consultants Inc.

Mailing Address: 4450 Bataan Memorial E

Los Cruces, NM 88011

Phone #: 575.527.1700

email or Fax#: Kyle.Williams@terminon.com

QA/QC Package:

Standard Level 4 (Full Validation)

Accreditation

NELAP Other _____

EDD (Type) _____

Project Manager:

Kyle Williams

Sampler:

Williams

On Ice: Yes No

Sample Temperature:

4.1°C

Date Time Matrix Sample Request ID

1/16/17 1315 CW GUMW09-01-170116

1325 GUMW09-02-170116 (TMS/MSD)

1335 GUMW09-03-170116

1345 GUMW09-04-170116

1355 GUMW09-05-170116

1405 GUMW09-06-170116

1415 GUMW09-07-170116

↓ Trip Blank

Container Type and #

-001

-002

-003

-004

-005

-006

-007

-0078

Preservative Type

HEAL No.
1701646

Date: 1/16/17 1350

Relinquished by: The Villain

Date: _____

Relinquished by: _____

Received by: andrew

Date: 1/17/17 0900

Time: _____

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

BTEX + MTBE + TMB's (8021)	
BTEX + MTBE + TPH (Gas only)	
TPH 8015B (GRO / DRO / MRO)	
TPH (Method 418.1)	
EDB (Method 504.1)	
PAH's (8310 or 8270 SIMS)	
RCRA 8 Metals	
Anions (F ₂ , Cl, NO ₃ , NO ₂ , PO ₄ , SO ₄)	
8081 Pesticides / 8082 PCB's	
8260B (VOA)	X
8270 (Semi-VOA)	X
6020 As, U	X
A3114 As speciation	X
Air Bubbles (Y or N)	

Remarks:

Invoice to the City of Los Cruces



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

February 02, 2017

Kyle Williams

Terracon

4450 Bataan Memorial E

Las Cruces, NM 88005

TEL: (575) 527-1700

FAX (575) 527-1092

RE: Griggs & Walnut GW Plume

OrderNo.: 1701A17

Dear Kyle Williams:

Hall Environmental Analysis Laboratory received 9 sample(s) on 1/25/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a white background.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A17

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: GWMW11-S-170123

Project: Griggs & Walnut GW Plume

Collection Date: 1/23/2017 11:30:00 AM

Lab ID: 1701A17-001

Matrix: AQUEOUS

Received Date: 1/25/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0014	0.0010		mg/L	1	1/30/2017 1:02:38 PM	29914
Uranium	0.027	0.0025		mg/L	5	1/30/2017 1:17:45 PM	29914
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
Toluene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
Ethylbenzene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
Naphthalene	ND	2.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
1-Methylnaphthalene	ND	4.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
2-Methylnaphthalene	ND	4.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
Acetone	ND	10		µg/L	1	1/25/2017 1:11:00 PM	R40274
Bromobenzene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
Bromodichloromethane	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
Bromoform	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
Bromomethane	ND	3.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
2-Butanone	ND	10		µg/L	1	1/25/2017 1:11:00 PM	R40274
Carbon disulfide	ND	10		µg/L	1	1/25/2017 1:11:00 PM	R40274
Carbon Tetrachloride	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
Chlorobenzene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
Chloroethane	ND	2.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
Chloroform	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
Chloromethane	ND	3.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
2-Chlorotoluene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
4-Chlorotoluene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
cis-1,2-DCE	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
Dibromochloromethane	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
Dibromomethane	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
1,1-Dichloroethane	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
1,1-Dichloroethene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A17

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: GWMW11-S-170123

Project: Griggs & Walnut GW Plume

Collection Date: 1/23/2017 11:30:00 AM

Lab ID: 1701A17-001

Matrix: AQUEOUS

Received Date: 1/25/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,2-Dichloropropane	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
1,3-Dichloropropane	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
2,2-Dichloropropane	ND	2.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
1,1-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
Hexachlorobutadiene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
2-Hexanone	ND	10		µg/L	1	1/25/2017 1:11:00 PM	R40274
Isopropylbenzene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
4-Isopropyltoluene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
4-Methyl-2-pentanone	ND	10		µg/L	1	1/25/2017 1:11:00 PM	R40274
Methylene Chloride	ND	3.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
n-Butylbenzene	ND	3.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
n-Propylbenzene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
sec-Butylbenzene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
Styrene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
tert-Butylbenzene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
trans-1,2-DCE	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
Trichlorofluoromethane	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
Vinyl chloride	ND	1.0		µg/L	1	1/25/2017 1:11:00 PM	R40274
Xylenes, Total	ND	1.5		µg/L	1	1/25/2017 1:11:00 PM	R40274
Surr: 1,2-Dichloroethane-d4	84.6	70-130		%Rec	1	1/25/2017 1:11:00 PM	R40274
Surr: 4-Bromofluorobenzene	100	70-130		%Rec	1	1/25/2017 1:11:00 PM	R40274
Surr: Dibromofluoromethane	90.4	70-130		%Rec	1	1/25/2017 1:11:00 PM	R40274
Surr: Toluene-d8	94.2	70-130		%Rec	1	1/25/2017 1:11:00 PM	R40274

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A17

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: EB-170123

Project: Griggs & Walnut GW Plume

Collection Date: 1/23/2017 12:10:00 PM

Lab ID: 1701A17-002

Matrix: AQUEOUS

Received Date: 1/25/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	ND	0.0010		mg/L	1	1/30/2017 1:05:39 PM	29914
Uranium	ND	0.00050		mg/L	1	1/30/2017 1:05:39 PM	29914
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
Toluene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
Ethylbenzene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
Naphthalene	ND	2.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
1-Methylnaphthalene	ND	4.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
2-Methylnaphthalene	ND	4.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
Acetone	ND	10		µg/L	1	1/25/2017 2:22:00 PM	R40274
Bromobenzene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
Bromodichloromethane	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
Bromoform	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
Bromomethane	ND	3.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
2-Butanone	ND	10		µg/L	1	1/25/2017 2:22:00 PM	R40274
Carbon disulfide	ND	10		µg/L	1	1/25/2017 2:22:00 PM	R40274
Carbon Tetrachloride	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
Chlorobenzene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
Chloroethane	ND	2.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
Chloroform	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
Chloromethane	ND	3.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
2-Chlorotoluene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
4-Chlorotoluene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
cis-1,2-DCE	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
Dibromochloromethane	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
Dibromomethane	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
1,1-Dichloroethane	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
1,1-Dichloroethene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A17

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: EB-170123

Project: Griggs & Walnut GW Plume

Collection Date: 1/23/2017 12:10:00 PM

Lab ID: 1701A17-002

Matrix: AQUEOUS

Received Date: 1/25/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,2-Dichloropropane	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
1,3-Dichloropropane	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
2,2-Dichloropropane	ND	2.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
1,1-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
Hexachlorobutadiene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
2-Hexanone	ND	10		µg/L	1	1/25/2017 2:22:00 PM	R40274
Isopropylbenzene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
4-Isopropyltoluene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
4-Methyl-2-pentanone	ND	10		µg/L	1	1/25/2017 2:22:00 PM	R40274
Methylene Chloride	ND	3.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
n-Butylbenzene	ND	3.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
n-Propylbenzene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
sec-Butylbenzene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
Styrene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
tert-Butylbenzene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
trans-1,2-DCE	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
Trichlorofluoromethane	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
Vinyl chloride	ND	1.0		µg/L	1	1/25/2017 2:22:00 PM	R40274
Xylenes, Total	ND	1.5		µg/L	1	1/25/2017 2:22:00 PM	R40274
Surr: 1,2-Dichloroethane-d4	80.9	70-130		%Rec	1	1/25/2017 2:22:00 PM	R40274
Surr: 4-Bromofluorobenzene	97.5	70-130		%Rec	1	1/25/2017 2:22:00 PM	R40274
Surr: Dibromofluoromethane	88.5	70-130		%Rec	1	1/25/2017 2:22:00 PM	R40274
Surr: Toluene-d8	96.3	70-130		%Rec	1	1/25/2017 2:22:00 PM	R40274

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A17

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: FB-170123

Project: Griggs & Walnut GW Plume

Collection Date: 1/23/2017 2:40:00 PM

Lab ID: 1701A17-003

Matrix: AQUEOUS

Received Date: 1/25/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
Toluene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
Ethylbenzene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
Naphthalene	ND	2.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
1-Methylnaphthalene	ND	4.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
2-Methylnaphthalene	ND	4.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
Acetone	ND	10		µg/L	1	1/25/2017 2:46:00 PM	R40274
Bromobenzene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
Bromodichloromethane	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
Bromoform	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
Bromomethane	ND	3.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
2-Butanone	ND	10		µg/L	1	1/25/2017 2:46:00 PM	R40274
Carbon disulfide	ND	10		µg/L	1	1/25/2017 2:46:00 PM	R40274
Carbon Tetrachloride	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
Chlorobenzene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
Chloroethane	ND	2.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
Chloroform	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
Chloromethane	ND	3.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
2-Chlorotoluene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
4-Chlorotoluene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
cis-1,2-DCE	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
Dibromochloromethane	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
Dibromomethane	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
1,1-Dichloroethane	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
1,1-Dichloroethene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
1,2-Dichloropropane	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
1,3-Dichloropropane	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
2,2-Dichloropropane	ND	2.0		µg/L	1	1/25/2017 2:46:00 PM	R40274

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A17

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: FB-170123

Project: Griggs & Walnut GW Plume

Collection Date: 1/23/2017 2:40:00 PM

Lab ID: 1701A17-003

Matrix: AQUEOUS

Received Date: 1/25/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,1-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
Hexachlorobutadiene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
2-Hexanone	ND	10		µg/L	1	1/25/2017 2:46:00 PM	R40274
Isopropylbenzene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
4-Isopropyltoluene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
4-Methyl-2-pentanone	ND	10		µg/L	1	1/25/2017 2:46:00 PM	R40274
Methylene Chloride	ND	3.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
n-Butylbenzene	ND	3.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
n-Propylbenzene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
sec-Butylbenzene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
Styrene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
tert-Butylbenzene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
trans-1,2-DCE	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
Trichlorofluoromethane	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
Vinyl chloride	ND	1.0		µg/L	1	1/25/2017 2:46:00 PM	R40274
Xylenes, Total	ND	1.5		µg/L	1	1/25/2017 2:46:00 PM	R40274
Surr: 1,2-Dichloroethane-d4	86.0	70-130		%Rec	1	1/25/2017 2:46:00 PM	R40274
Surr: 4-Bromofluorobenzene	98.5	70-130		%Rec	1	1/25/2017 2:46:00 PM	R40274
Surr: Dibromofluoromethane	90.1	70-130		%Rec	1	1/25/2017 2:46:00 PM	R40274
Surr: Toluene-d8	96.6	70-130		%Rec	1	1/25/2017 2:46:00 PM	R40274

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A17

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: GWMW11-I-170123

Project: Griggs & Walnut GW Plume

Collection Date: 1/23/2017 3:20:00 PM

Lab ID: 1701A17-004

Matrix: AQUEOUS

Received Date: 1/25/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0018	0.0010		mg/L	1	1/30/2017 1:20:46 PM	29914
Uranium	0.041	0.0025	*	mg/L	5	1/30/2017 1:29:49 PM	29914
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
Toluene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
Ethylbenzene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
Naphthalene	ND	2.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
1-Methylnaphthalene	ND	4.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
2-Methylnaphthalene	ND	4.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
Acetone	ND	10		µg/L	1	1/25/2017 3:10:00 PM	R40274
Bromobenzene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
Bromodichloromethane	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
Bromoform	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
Bromomethane	ND	3.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
2-Butanone	ND	10		µg/L	1	1/25/2017 3:10:00 PM	R40274
Carbon disulfide	ND	10		µg/L	1	1/25/2017 3:10:00 PM	R40274
Carbon Tetrachloride	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
Chlorobenzene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
Chloroethane	ND	2.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
Chloroform	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
Chloromethane	ND	3.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
2-Chlorotoluene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
4-Chlorotoluene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
cis-1,2-DCE	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
Dibromochloromethane	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
Dibromomethane	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
1,1-Dichloroethane	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
1,1-Dichloroethene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A17

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: GWMW11-I-170123

Project: Griggs & Walnut GW Plume

Collection Date: 1/23/2017 3:20:00 PM

Lab ID: 1701A17-004

Matrix: AQUEOUS

Received Date: 1/25/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,2-Dichloropropane	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
1,3-Dichloropropane	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
2,2-Dichloropropane	ND	2.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
1,1-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
Hexachlorobutadiene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
2-Hexanone	ND	10		µg/L	1	1/25/2017 3:10:00 PM	R40274
Isopropylbenzene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
4-Isopropyltoluene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
4-Methyl-2-pentanone	ND	10		µg/L	1	1/25/2017 3:10:00 PM	R40274
Methylene Chloride	ND	3.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
n-Butylbenzene	ND	3.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
n-Propylbenzene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
sec-Butylbenzene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
Styrene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
tert-Butylbenzene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
Tetrachloroethene (PCE)	1.8	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
trans-1,2-DCE	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
Trichlorofluoromethane	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
Vinyl chloride	ND	1.0		µg/L	1	1/25/2017 3:10:00 PM	R40274
Xylenes, Total	ND	1.5		µg/L	1	1/25/2017 3:10:00 PM	R40274
Surr: 1,2-Dichloroethane-d4	84.5	70-130		%Rec	1	1/25/2017 3:10:00 PM	R40274
Surr: 4-Bromofluorobenzene	93.6	70-130		%Rec	1	1/25/2017 3:10:00 PM	R40274
Surr: Dibromofluoromethane	91.2	70-130		%Rec	1	1/25/2017 3:10:00 PM	R40274
Surr: Toluene-d8	98.1	70-130		%Rec	1	1/25/2017 3:10:00 PM	R40274

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A17

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: Trip Blank

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701A17-005

Matrix: AQUEOUS

Received Date: 1/25/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
Toluene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
Ethylbenzene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
Naphthalene	ND	2.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
1-Methylnaphthalene	ND	4.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
2-Methylnaphthalene	ND	4.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
Acetone	ND	10		µg/L	1	1/25/2017 3:33:00 PM	R40274
Bromobenzene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
Bromodichloromethane	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
Bromoform	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
Bromomethane	ND	3.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
2-Butanone	ND	10		µg/L	1	1/25/2017 3:33:00 PM	R40274
Carbon disulfide	ND	10		µg/L	1	1/25/2017 3:33:00 PM	R40274
Carbon Tetrachloride	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
Chlorobenzene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
Chloroethane	ND	2.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
Chloroform	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
Chloromethane	ND	3.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
2-Chlorotoluene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
4-Chlorotoluene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
cis-1,2-DCE	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
Dibromochloromethane	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
Dibromomethane	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
1,1-Dichloroethane	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
1,1-Dichloroethene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
1,2-Dichloropropane	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
1,3-Dichloropropane	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
2,2-Dichloropropane	ND	2.0		µg/L	1	1/25/2017 3:33:00 PM	R40274

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A17

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: Trip Blank

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701A17-005

Matrix: AQUEOUS

Received Date: 1/25/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,1-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
Hexachlorobutadiene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
2-Hexanone	ND	10		µg/L	1	1/25/2017 3:33:00 PM	R40274
Isopropylbenzene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
4-Isopropyltoluene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
4-Methyl-2-pentanone	ND	10		µg/L	1	1/25/2017 3:33:00 PM	R40274
Methylene Chloride	ND	3.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
n-Butylbenzene	ND	3.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
n-Propylbenzene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
sec-Butylbenzene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
Styrene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
tert-Butylbenzene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
trans-1,2-DCE	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
Trichlorofluoromethane	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
Vinyl chloride	ND	1.0		µg/L	1	1/25/2017 3:33:00 PM	R40274
Xylenes, Total	ND	1.5		µg/L	1	1/25/2017 3:33:00 PM	R40274
Surr: 1,2-Dichloroethane-d4	83.1	70-130		%Rec	1	1/25/2017 3:33:00 PM	R40274
Surr: 4-Bromofluorobenzene	94.6	70-130		%Rec	1	1/25/2017 3:33:00 PM	R40274
Surr: Dibromofluoromethane	90.0	70-130		%Rec	1	1/25/2017 3:33:00 PM	R40274
Surr: Toluene-d8	98.9	70-130		%Rec	1	1/25/2017 3:33:00 PM	R40274

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A17

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: GWMW11-O-170124

Project: Griggs & Walnut GW Plume

Collection Date: 1/24/2017 1:10:00 PM

Lab ID: 1701A17-006

Matrix: AQUEOUS

Received Date: 1/25/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0011	0.0010		mg/L	1	1/30/2017 1:23:47 PM	29914
Uranium	0.0031	0.00050		mg/L	1	1/30/2017 1:23:47 PM	29914
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
Toluene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
Ethylbenzene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
Naphthalene	ND	2.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
1-Methylnaphthalene	ND	4.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
2-Methylnaphthalene	ND	4.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
Acetone	ND	10		µg/L	1	1/25/2017 3:57:00 PM	R40274
Bromobenzene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
Bromodichloromethane	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
Bromoform	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
Bromomethane	ND	3.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
2-Butanone	ND	10		µg/L	1	1/25/2017 3:57:00 PM	R40274
Carbon disulfide	ND	10		µg/L	1	1/25/2017 3:57:00 PM	R40274
Carbon Tetrachloride	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
Chlorobenzene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
Chloroethane	ND	2.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
Chloroform	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
Chloromethane	ND	3.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
2-Chlorotoluene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
4-Chlorotoluene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
cis-1,2-DCE	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
Dibromochloromethane	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
Dibromomethane	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
1,1-Dichloroethane	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
1,1-Dichloroethene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A17

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: GWMW11-O-170124

Project: Griggs & Walnut GW Plume

Collection Date: 1/24/2017 1:10:00 PM

Lab ID: 1701A17-006

Matrix: AQUEOUS

Received Date: 1/25/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,2-Dichloropropane	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
1,3-Dichloropropane	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
2,2-Dichloropropane	ND	2.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
1,1-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
Hexachlorobutadiene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
2-Hexanone	ND	10		µg/L	1	1/25/2017 3:57:00 PM	R40274
Isopropylbenzene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
4-Isopropyltoluene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
4-Methyl-2-pentanone	ND	10		µg/L	1	1/25/2017 3:57:00 PM	R40274
Methylene Chloride	ND	3.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
n-Butylbenzene	ND	3.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
n-Propylbenzene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
sec-Butylbenzene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
Styrene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
tert-Butylbenzene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
trans-1,2-DCE	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
Trichlorofluoromethane	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
Vinyl chloride	ND	1.0		µg/L	1	1/25/2017 3:57:00 PM	R40274
Xylenes, Total	ND	1.5		µg/L	1	1/25/2017 3:57:00 PM	R40274
Surr: 1,2-Dichloroethane-d4	83.1	70-130		%Rec	1	1/25/2017 3:57:00 PM	R40274
Surr: 4-Bromofluorobenzene	97.3	70-130		%Rec	1	1/25/2017 3:57:00 PM	R40274
Surr: Dibromofluoromethane	86.9	70-130		%Rec	1	1/25/2017 3:57:00 PM	R40274
Surr: Toluene-d8	95.6	70-130		%Rec	1	1/25/2017 3:57:00 PM	R40274

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A17

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: EB-170124

Project: Griggs & Walnut GW Plume

Collection Date: 1/24/2017 2:00:00 PM

Lab ID: 1701A17-007

Matrix: AQUEOUS

Received Date: 1/25/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	ND	0.0010		mg/L	1	1/30/2017 1:26:47 PM	29914
Uranium	ND	0.00050		mg/L	1	1/30/2017 1:26:47 PM	29914
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
Toluene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
Ethylbenzene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
Naphthalene	ND	2.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
1-Methylnaphthalene	ND	4.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
2-Methylnaphthalene	ND	4.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
Acetone	ND	10		µg/L	1	1/25/2017 4:20:00 PM	R40274
Bromobenzene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
Bromodichloromethane	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
Bromoform	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
Bromomethane	ND	3.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
2-Butanone	ND	10		µg/L	1	1/25/2017 4:20:00 PM	R40274
Carbon disulfide	ND	10		µg/L	1	1/25/2017 4:20:00 PM	R40274
Carbon Tetrachloride	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
Chlorobenzene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
Chloroethane	ND	2.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
Chloroform	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
Chloromethane	ND	3.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
2-Chlorotoluene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
4-Chlorotoluene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
cis-1,2-DCE	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
Dibromochloromethane	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
Dibromomethane	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
1,1-Dichloroethane	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
1,1-Dichloroethene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A17

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: EB-170124

Project: Griggs & Walnut GW Plume

Collection Date: 1/24/2017 2:00:00 PM

Lab ID: 1701A17-007

Matrix: AQUEOUS

Received Date: 1/25/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,2-Dichloropropane	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
1,3-Dichloropropane	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
2,2-Dichloropropane	ND	2.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
1,1-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
Hexachlorobutadiene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
2-Hexanone	ND	10		µg/L	1	1/25/2017 4:20:00 PM	R40274
Isopropylbenzene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
4-Isopropyltoluene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
4-Methyl-2-pentanone	ND	10		µg/L	1	1/25/2017 4:20:00 PM	R40274
Methylene Chloride	ND	3.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
n-Butylbenzene	ND	3.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
n-Propylbenzene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
sec-Butylbenzene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
Styrene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
tert-Butylbenzene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
trans-1,2-DCE	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
Trichlorofluoromethane	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
Vinyl chloride	ND	1.0		µg/L	1	1/25/2017 4:20:00 PM	R40274
Xylenes, Total	ND	1.5		µg/L	1	1/25/2017 4:20:00 PM	R40274
Surr: 1,2-Dichloroethane-d4	82.8	70-130		%Rec	1	1/25/2017 4:20:00 PM	R40274
Surr: 4-Bromofluorobenzene	96.8	70-130		%Rec	1	1/25/2017 4:20:00 PM	R40274
Surr: Dibromofluoromethane	88.5	70-130		%Rec	1	1/25/2017 4:20:00 PM	R40274
Surr: Toluene-d8	101	70-130		%Rec	1	1/25/2017 4:20:00 PM	R40274

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A17

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: GWMW16-S-170124

Project: Griggs & Walnut GW Plume

Collection Date: 1/24/2017 4:20:00 PM

Lab ID: 1701A17-008

Matrix: AQUEOUS

Received Date: 1/25/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0026	0.0010		mg/L	1	1/30/2017 1:32:51 PM	29914
Uranium	0.024	0.00050		mg/L	1	1/30/2017 1:32:51 PM	29914
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
Toluene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
Ethylbenzene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
Naphthalene	ND	2.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
1-Methylnaphthalene	ND	4.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
2-Methylnaphthalene	ND	4.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
Acetone	ND	10		µg/L	1	1/25/2017 4:44:00 PM	R40274
Bromobenzene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
Bromodichloromethane	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
Bromoform	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
Bromomethane	ND	3.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
2-Butanone	ND	10		µg/L	1	1/25/2017 4:44:00 PM	R40274
Carbon disulfide	ND	10		µg/L	1	1/25/2017 4:44:00 PM	R40274
Carbon Tetrachloride	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
Chlorobenzene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
Chloroethane	ND	2.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
Chloroform	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
Chloromethane	ND	3.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
2-Chlorotoluene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
4-Chlorotoluene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
cis-1,2-DCE	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
Dibromochloromethane	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
Dibromomethane	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
1,1-Dichloroethane	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
1,1-Dichloroethene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A17

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: GWMW16-S-170124

Project: Griggs & Walnut GW Plume

Collection Date: 1/24/2017 4:20:00 PM

Lab ID: 1701A17-008

Matrix: AQUEOUS

Received Date: 1/25/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,2-Dichloropropane	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
1,3-Dichloropropane	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
2,2-Dichloropropane	ND	2.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
1,1-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
Hexachlorobutadiene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
2-Hexanone	ND	10		µg/L	1	1/25/2017 4:44:00 PM	R40274
Isopropylbenzene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
4-Isopropyltoluene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
4-Methyl-2-pentanone	ND	10		µg/L	1	1/25/2017 4:44:00 PM	R40274
Methylene Chloride	ND	3.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
n-Butylbenzene	ND	3.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
n-Propylbenzene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
sec-Butylbenzene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
Styrene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
tert-Butylbenzene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
Tetrachloroethene (PCE)	4.9	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
trans-1,2-DCE	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
Trichlorofluoromethane	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
Vinyl chloride	ND	1.0		µg/L	1	1/25/2017 4:44:00 PM	R40274
Xylenes, Total	ND	1.5		µg/L	1	1/25/2017 4:44:00 PM	R40274
Surr: 1,2-Dichloroethane-d4	84.6	70-130		%Rec	1	1/25/2017 4:44:00 PM	R40274
Surr: 4-Bromofluorobenzene	96.9	70-130		%Rec	1	1/25/2017 4:44:00 PM	R40274
Surr: Dibromofluoromethane	89.7	70-130		%Rec	1	1/25/2017 4:44:00 PM	R40274
Surr: Toluene-d8	97.6	70-130		%Rec	1	1/25/2017 4:44:00 PM	R40274

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A17

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: Trip Blank

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701A17-009

Matrix: AQUEOUS

Received Date: 1/25/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
Toluene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
Ethylbenzene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
Naphthalene	ND	2.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
1-Methylnaphthalene	ND	4.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
2-Methylnaphthalene	ND	4.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
Acetone	ND	10		µg/L	1	1/25/2017 5:07:00 PM	R40274
Bromobenzene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
Bromodichloromethane	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
Bromoform	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
Bromomethane	ND	3.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
2-Butanone	ND	10		µg/L	1	1/25/2017 5:07:00 PM	R40274
Carbon disulfide	ND	10		µg/L	1	1/25/2017 5:07:00 PM	R40274
Carbon Tetrachloride	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
Chlorobenzene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
Chloroethane	ND	2.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
Chloroform	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
Chloromethane	ND	3.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
2-Chlorotoluene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
4-Chlorotoluene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
cis-1,2-DCE	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
Dibromochloromethane	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
Dibromomethane	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
1,1-Dichloroethane	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
1,1-Dichloroethene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
1,2-Dichloropropane	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
1,3-Dichloropropane	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
2,2-Dichloropropane	ND	2.0		µg/L	1	1/25/2017 5:07:00 PM	R40274

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A17

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: Trip Blank

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701A17-009

Matrix: AQUEOUS

Received Date: 1/25/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,1-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
Hexachlorobutadiene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
2-Hexanone	ND	10		µg/L	1	1/25/2017 5:07:00 PM	R40274
Isopropylbenzene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
4-Isopropyltoluene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
4-Methyl-2-pentanone	ND	10		µg/L	1	1/25/2017 5:07:00 PM	R40274
Methylene Chloride	ND	3.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
n-Butylbenzene	ND	3.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
n-Propylbenzene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
sec-Butylbenzene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
Styrene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
tert-Butylbenzene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
trans-1,2-DCE	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
Trichlorofluoromethane	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
Vinyl chloride	ND	1.0		µg/L	1	1/25/2017 5:07:00 PM	R40274
Xylenes, Total	ND	1.5		µg/L	1	1/25/2017 5:07:00 PM	R40274
Surr: 1,2-Dichloroethane-d4	85.6	70-130		%Rec	1	1/25/2017 5:07:00 PM	R40274
Surr: 4-Bromofluorobenzene	96.2	70-130		%Rec	1	1/25/2017 5:07:00 PM	R40274
Surr: Dibromofluoromethane	90.3	70-130		%Rec	1	1/25/2017 5:07:00 PM	R40274
Surr: Toluene-d8	94.5	70-130		%Rec	1	1/25/2017 5:07:00 PM	R40274

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010333-001
Client Sample ID: 1701A17-001C GMMW11-S-170123

Report Date: 02/02/17
Collection Date: 01/23/17 11:30
Date Received: 01/26/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/31/17 18:30 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/31/17 18:30 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010333-002
Client Sample ID: 1701A17-002C EB-170123

Report Date: 02/02/17
Collection Date: 01/23/17 12:10
Date Received: 01/26/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/31/17 19:06 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/31/17 19:06 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010333-003
Client Sample ID: 1701A17-004C GMMW11-I-170123

Report Date: 02/02/17
Collection Date: 01/23/17 15:20
Date Received: 01/26/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/31/17 19:18 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/31/17 19:18 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010333-004
Client Sample ID: 1701A17-006C GWMW11-O-170124

Report Date: 02/02/17
Collection Date: 01/24/17 13:10
Date Received: 01/26/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/31/17 19:30 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/31/17 19:30 / rgk

Report Definitions:
 RL - Analyte reporting limit.
 QCL - Quality control limit.

MCL - Maximum contaminant level.
 ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010333-005
Client Sample ID: 1701A17-007C EB-170124

Report Date: 02/02/17
Collection Date: 01/24/17 14:00
Date Received: 01/26/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/31/17 19:42 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/31/17 19:42 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010333-006
Client Sample ID: 1701A17-008C GWMW16-S-170124

Report Date: 02/02/17
Collection Date: 01/24/17 16:20
Date Received: 01/26/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/31/17 19:54 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/31/17 19:54 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hall Environmental

Report Date: 02/02/17

Project: Not Indicated

Work Order: H17010333

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E1632AM		Analytical Run: ARSENIC SPECIATION_170131A							
Lab ID: AS-ICV 25ppb-1/31/2017	Initial Calibration Verification Standard								01/31/17 16:42
Arsenic-III	25.6	ug/L	5.0	103	87.6	114			
Arsenic-V	24.4	ug/L	5.0	98	87	116			
Lab ID: AS-50.0-1/31/2017	Continuing Calibration Verification Standard								01/31/17 16:54
Arsenic-III	48.2	ug/L	5.0	96	85	115			
Arsenic-V	46.7	ug/L	5.0	93	85	115			
Method: E1632AM		Batch: R122441							
Lab ID: AS-LFB 50ppb-1/31/2017	Laboratory Fortified Blank				Run: ARSENIC SPECIATION_1701		01/31/17 17:18		
Arsenic-III	45.5	ug/L	5.0	91	55	146			
Arsenic-V	46.6	ug/L	5.0	93	55	146			
Lab ID: ICB	Method Blank				Run: ARSENIC SPECIATION_1701		01/31/17 17:30		
Arsenic-III	ND	ug/L	0.2						
Arsenic-V	ND	ug/L	0.5						
Lab ID: H17010333-001A MS	Sample Matrix Spike				Run: ARSENIC SPECIATION_1701		01/31/17 18:42		
Arsenic-III	46.7	ug/L	5.0	93	55	146			
Arsenic-V	50.5	ug/L	5.0	101	55	146			
Lab ID: H17010333-001A MSD	Sample Matrix Spike Duplicate				Run: ARSENIC SPECIATION_1701		01/31/17 18:54		
Arsenic-III	48.4	ug/L	5.0	97	55	146	3.7	20	
Arsenic-V	49.0	ug/L	5.0	98	55	146	3.0	20	
Lab ID: H17010360-002A MS	Sample Matrix Spike				Run: ARSENIC SPECIATION_1701		01/31/17 21:06		
Arsenic-III	49.7	ug/L	5.0	99	55	146			
Arsenic-V	48.0	ug/L	5.0	96	55	146			
Lab ID: H17010360-002A MSD	Sample Matrix Spike Dupllicate				Run: ARSENIC SPECIATION_1701		01/31/17 21:18		
Arsenic-III	50.6	ug/L	5.0	101	55	146	1.8	20	
Arsenic-V	48.2	ug/L	5.0	96	55	146	0.3	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701A17

02-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	MB-29914	SampType:	MBLK	TestCode:	200.8 ICPMS Metals:Total					
Client ID:	PBW	Batch ID:	29914	RunNo:	40367					
Prep Date:	1/26/2017	Analysis Date:	1/30/2017	SeqNo:	1265456	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010								
Uranium	ND	0.00050								

Sample ID	MSLCS-29914	SampType:	LCS	TestCode:	200.8 ICPMS Metals:Total					
Client ID:	LCSW	Batch ID:	29914	RunNo:	40367					
Prep Date:	1/26/2017	Analysis Date:	1/30/2017	SeqNo:	1265457	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.025	0.0010	0.02500	0	99.7	85	115			
Uranium	0.012	0.00050	0.01250	0	99.9	85	115			

Sample ID	MSLCSLL-29914	SampType:	LCSLL	TestCode:	200.8 ICPMS Metals:Total					
Client ID:	BatchQC	Batch ID:	29914	RunNo:	40367					
Prep Date:	1/26/2017	Analysis Date:	1/30/2017	SeqNo:	1265458	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010	0.001000	0	96.9	50	150			
Uranium	0.00051	0.00050	0.0005000	0	102	50	150			

Qualifiers:

- | | |
|---|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| H Holding times for preparation or analysis exceeded | J Analyte detected below quantitation limits |
| ND Not Detected at the Reporting Limit | P Sample pH Not In Range |
| R RPD outside accepted recovery limits | RL Reporting Detection Limit |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701A17

02-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID 100ng lcs2	SampType: LCS		TestCode: EPA Method 8260B: VOLATILES							
Client ID: LCSW	Batch ID: R40274		RunNo: 40274							
Prep Date:	Analysis Date: 1/25/2017		SeqNo: 1262633		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	94.7	70	130			
Toluene	20	1.0	20.00	0	102	70	130			
Chlorobenzene	21	1.0	20.00	0	107	70	130			
1,1-Dichloroethene	20	1.0	20.00	0	98.8	70	130			
Trichloroethene (TCE)	18	1.0	20.00	0	92.1	70	130			
Surr: 1,2-Dichloroethane-d4	8.2		10.00		81.7	70	130			
Surr: 4-Bromofluorobenzene	9.7		10.00		96.7	70	130			
Surr: Dibromofluoromethane	9.1		10.00		90.7	70	130			
Surr: Toluene-d8	9.9		10.00		99.4	70	130			

Sample ID rb	SampType: MBLK		TestCode: EPA Method 8260B: VOLATILES							
Client ID: PBW	Batch ID: R40274		RunNo: 40274							
Prep Date:	Analysis Date: 1/25/2017		SeqNo: 1262634		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701A17

02-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	rb	SampType:	MBLK		TestCode:	EPA Method 8260B: VOLATILES				
Client ID:	PBW	Batch ID:	R40274		RunNo:	40274				
Prep Date:		Analysis Date:	1/25/2017		SeqNo:	1262634	Units:	µg/L		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701A17

02-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID rb	SampType: MBLK		TestCode: EPA Method 8260B: VOLATILES							
Client ID: PBW	Batch ID: R40274		RunNo: 40274							
Prep Date:	Analysis Date: 1/25/2017		SeqNo: 1262634		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	8.0		10.00		80.4	70	130			
Surr: 4-Bromofluorobenzene	9.7		10.00		96.7	70	130			
Surr: Dibromofluoromethane	8.8		10.00		87.9	70	130			
Surr: Toluene-d8	10		10.00		99.5	70	130			

Sample ID 1701a17-001ams	SampType: MS		TestCode: EPA Method 8260B: VOLATILES							
Client ID: GMMW11-S-170123	Batch ID: R40274		RunNo: 40274							
Prep Date:	Analysis Date: 1/25/2017		SeqNo: 1262650		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	15	1.0	20.00	0	77.2	70	130			
Toluene	16	1.0	20.00	0	81.9	70	130			
Chlorobenzene	17	1.0	20.00	0	83.3	70	130			
1,1-Dichloroethene	15	1.0	20.00	0	77.4	70	130			
Trichloroethene (TCE)	15	1.0	20.00	0	74.1	70	130			
Surr: 1,2-Dichloroethane-d4	8.4		10.00		83.5	70	130			
Surr: 4-Bromofluorobenzene	9.7		10.00		97.1	70	130			
Surr: Dibromofluoromethane	8.9		10.00		88.6	70	130			
Surr: Toluene-d8	9.8		10.00		98.2	70	130			

Sample ID 1701a17-001amsd	SampType: MSD		TestCode: EPA Method 8260B: VOLATILES							
Client ID: GMMW11-S-170123	Batch ID: R40274		RunNo: 40274							
Prep Date:	Analysis Date: 1/25/2017		SeqNo: 1262651		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	96.7	70	130	22.5	20	R
Toluene	20	1.0	20.00	0	102	70	130	21.6	20	R
Chlorobenzene	21	1.0	20.00	0	107	70	130	24.7	20	R
1,1-Dichloroethene	20	1.0	20.00	0	99.8	70	130	25.3	20	R
Trichloroethene (TCE)	18	1.0	20.00	0	89.3	70	130	18.6	20	
Surr: 1,2-Dichloroethane-d4	8.1		10.00		80.9	70	130	0	0	
Surr: 4-Bromofluorobenzene	10		10.00		99.9	70	130	0	0	
Surr: Dibromofluoromethane	8.9		10.00		88.6	70	130	0	0	
Surr: Toluene-d8	9.6		10.00		95.8	70	130	0	0	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified



Hall Environmental Analysis Laboratory
 4901 Hawks NE
 Albuquerque NM 87109
 TEL: 505-345-3975 FAX: 505-345-4107
 Website: www.halleenvironmental.com

Sample Log-In Check List

Client Name: TER-LC Work Order Number: 1701A17 RcptNo: 1

Received by/date: LA 1/25/17
 Logged By: Andy Jansson 1/25/2017 8:55:00 AM
 Completed By: Andy Jansson 1/25/17
 Reviewed By: LA 01/25/17

Chain of Custody

- 1. Custody seals intact on sample bottles? Yes No Not Present
- 2. Is Chain of Custody complete? Yes No Not Present
- 3. How was the sample delivered? FedEx

Log In

- 4. Was an attempt made to cool the samples? Yes No NA
- 5. Were all samples received at a temperature of >0° C to 6 0° C? Yes No NA
- 6. Sample(s) in proper container(s)? Yes No
- 7. Sufficient sample volume for indicated test(s)? Yes No
- 8. Are samples (except VOA and CNG) properly preserved? Yes No
- 9. Was preservative added to bottles? Yes No NA
- 10. VOA vials have zero headspace? Yes No No VOA Vials
- 11. Were any sample containers received broken? Yes No
- 12. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes No
- 13. Are matrices correctly identified on Chain of Custody? Yes No
- 14. Is it clear what analyses were requested? Yes No
- 15. Were all holding times able to be met? (If no, notify customer for authorization.) Yes No

Bottles = 001c, 004c, 002, 003c, pH=2.5
 # of preserved bottles checked for pH: 9
 Adjusted? (<2 or >12 unless noted) NO
 Checked by: [Signature]

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes No NA

Person Notified: _____ Date: _____
 By Whom: _____ Via: eMail Phone Fax In Person
 Regarding: _____
 Client Instructions: _____

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.6	Good	Yes			

Chain-of-Custody Record

Client: Tennessee Consultants Inc

Mailing Address: 4450 Baton Rouge, Mississippi

Project Name: Los Cruces, NM BB01

Phone #: 575.527.1700

email or Fax#: Kyle Williams@hallenv.com

QA/QC Package: Standard Level 4 (Full Validation)

Accreditation: NELAP Other _____

EDD (Type) _____

Turn-Around Time: _____

Standard Rush

Project Name: _____

Project #: 68167094

Project Manager: Kyle Williams

Sampler: Williams

On Ice: Yes No

Sample Temperature: 2.6

Container Type and # _____

Preservative Type _____

HEAL No. 1701A17

Date	Time	Matrix	Sample Request ID	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA & Metals	Anions (F ⁻ , Cl ⁻ , NO ₃ ⁻ , NO ₂ ⁻ , PO ₄ ⁻ , SO ₄ ⁻)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	6020 As, V	A3114 As specification	Air Bubbles (Y or N)
4/23/17	1130	GW	GUMW11-5-170123							X			X	X	
	1210	DJ	EB-170123							X			X	X	
	1440	DJ	FB-170123							X			X	X	
	1520	GW	GUMW11-I-170123							X			X	X	
	-	-	Trip Blank							X			X	X	
4/24/17	1310	GW	GUMW11-D-170124							X			X	X	
	1400	DJ	EB-170124							X			X	X	
	1620	GW	GUMW16-S-170124							X			X	X	
	-	-	Trip Blank							X			X	X	

Date: 4/24/17 Time: 1700

Date: _____ Time: _____

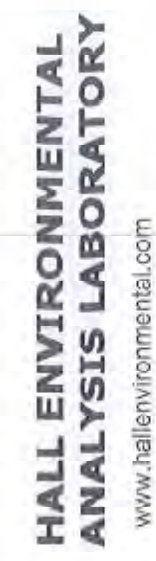
Relinquished by: [Signature]

Relinquished by: _____

Received by: [Signature] Date: 01/25/17 0855

Received by: _____ Date: _____

Remarks: In voice to the City of Los Cruces



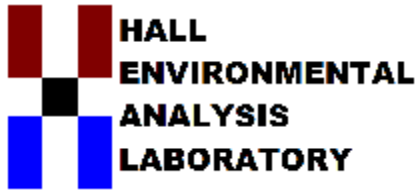
HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenv.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly noted on the analytical report.



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

February 02, 2017

Kyle Williams

Terracon

4450 Bataan Memorial E

Las Cruces, NM 88005

TEL: (575) 527-1700

FAX (575) 527-1092

RE: Griggs & Walnut GW Plume

OrderNo.: 1701A80

Dear Kyle Williams:

Hall Environmental Analysis Laboratory received 5 sample(s) on 1/26/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a light blue horizontal line.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A80

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: FB-170125

Project: Griggs & Walnut GW Plume

Collection Date: 1/25/2017 11:30:00 AM

Lab ID: 1701A80-001

Matrix: AQUEOUS

Received Date: 1/26/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: AG
Benzene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
Toluene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
Ethylbenzene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
Naphthalene	ND	2.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
1-Methylnaphthalene	ND	4.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
2-Methylnaphthalene	ND	4.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
Acetone	ND	10		µg/L	1	1/26/2017 3:49:45 PM	B40324
Bromobenzene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
Bromodichloromethane	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
Bromoform	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
Bromomethane	ND	3.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
2-Butanone	ND	10		µg/L	1	1/26/2017 3:49:45 PM	B40324
Carbon disulfide	ND	10		µg/L	1	1/26/2017 3:49:45 PM	B40324
Carbon Tetrachloride	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
Chlorobenzene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
Chloroethane	ND	2.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
Chloroform	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
Chloromethane	ND	3.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
2-Chlorotoluene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
4-Chlorotoluene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
cis-1,2-DCE	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
Dibromochloromethane	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
Dibromomethane	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
1,1-Dichloroethane	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
1,1-Dichloroethene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
1,2-Dichloropropane	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
1,3-Dichloropropane	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
2,2-Dichloropropane	ND	2.0		µg/L	1	1/26/2017 3:49:45 PM	B40324

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A80

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: FB-170125

Project: Griggs & Walnut GW Plume

Collection Date: 1/25/2017 11:30:00 AM

Lab ID: 1701A80-001

Matrix: AQUEOUS

Received Date: 1/26/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: AG
1,1-Dichloropropene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
Hexachlorobutadiene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
2-Hexanone	ND	10		µg/L	1	1/26/2017 3:49:45 PM	B40324
Isopropylbenzene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
4-Isopropyltoluene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
4-Methyl-2-pentanone	ND	10		µg/L	1	1/26/2017 3:49:45 PM	B40324
Methylene Chloride	ND	3.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
n-Butylbenzene	ND	3.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
n-Propylbenzene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
sec-Butylbenzene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
Styrene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
tert-Butylbenzene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
trans-1,2-DCE	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
Trichlorofluoromethane	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
Vinyl chloride	ND	1.0		µg/L	1	1/26/2017 3:49:45 PM	B40324
Xylenes, Total	ND	1.5		µg/L	1	1/26/2017 3:49:45 PM	B40324
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	1/26/2017 3:49:45 PM	B40324
Surr: 4-Bromofluorobenzene	100	70-130		%Rec	1	1/26/2017 3:49:45 PM	B40324
Surr: Dibromofluoromethane	115	70-130		%Rec	1	1/26/2017 3:49:45 PM	B40324
Surr: Toluene-d8	103	70-130		%Rec	1	1/26/2017 3:49:45 PM	B40324

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A80

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: GWMW16-D-170125

Project: Griggs & Walnut GW Plume

Collection Date: 1/25/2017 12:35:00 PM

Lab ID: 1701A80-002

Matrix: AQUEOUS

Received Date: 1/26/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	ND	0.0010		mg/L	1	1/30/2017 1:35:51 PM	29914
Uranium	0.069	0.0025	*	mg/L	5	1/30/2017 1:54:10 PM	29914
EPA METHOD 8260B: VOLATILES							Analyst: AG
Benzene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
Toluene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
Ethylbenzene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
Naphthalene	ND	2.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
1-Methylnaphthalene	ND	4.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
2-Methylnaphthalene	ND	4.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
Acetone	ND	10		µg/L	1	1/26/2017 5:16:38 PM	B40324
Bromobenzene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
Bromodichloromethane	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
Bromoform	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
Bromomethane	ND	3.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
2-Butanone	ND	10		µg/L	1	1/26/2017 5:16:38 PM	B40324
Carbon disulfide	ND	10		µg/L	1	1/26/2017 5:16:38 PM	B40324
Carbon Tetrachloride	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
Chlorobenzene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
Chloroethane	ND	2.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
Chloroform	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
Chloromethane	ND	3.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
2-Chlorotoluene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
4-Chlorotoluene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
cis-1,2-DCE	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
Dibromochloromethane	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
Dibromomethane	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
1,1-Dichloroethane	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
1,1-Dichloroethene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A80

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: GWMW16-D-170125

Project: Griggs & Walnut GW Plume

Collection Date: 1/25/2017 12:35:00 PM

Lab ID: 1701A80-002

Matrix: AQUEOUS

Received Date: 1/26/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: AG
1,2-Dichloropropane	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
1,3-Dichloropropane	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
2,2-Dichloropropane	ND	2.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
1,1-Dichloropropene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
Hexachlorobutadiene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
2-Hexanone	ND	10		µg/L	1	1/26/2017 5:16:38 PM	B40324
Isopropylbenzene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
4-Isopropyltoluene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
4-Methyl-2-pentanone	ND	10		µg/L	1	1/26/2017 5:16:38 PM	B40324
Methylene Chloride	ND	3.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
n-Butylbenzene	ND	3.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
n-Propylbenzene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
sec-Butylbenzene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
Styrene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
tert-Butylbenzene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
Tetrachloroethene (PCE)	5.0	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
trans-1,2-DCE	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
Trichloroethene (TCE)	1.0	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
Trichlorofluoromethane	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
Vinyl chloride	ND	1.0		µg/L	1	1/26/2017 5:16:38 PM	B40324
Xylenes, Total	ND	1.5		µg/L	1	1/26/2017 5:16:38 PM	B40324
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	1/26/2017 5:16:38 PM	B40324
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	1/26/2017 5:16:38 PM	B40324
Surr: Dibromofluoromethane	113	70-130		%Rec	1	1/26/2017 5:16:38 PM	B40324
Surr: Toluene-d8	96.8	70-130		%Rec	1	1/26/2017 5:16:38 PM	B40324

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A80

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: GWMW16-D-170125D

Project: Griggs & Walnut GW Plume

Collection Date: 1/25/2017 12:35:00 PM

Lab ID: 1701A80-003

Matrix: AQUEOUS

Received Date: 1/26/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	ND	0.0010		mg/L	1	1/30/2017 1:41:52 PM	29914
Uranium	0.067	0.0025	*	mg/L	5	1/30/2017 2:00:11 PM	29914
EPA METHOD 8260B: VOLATILES							Analyst: AG
Benzene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
Toluene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
Ethylbenzene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
Naphthalene	ND	2.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
1-Methylnaphthalene	ND	4.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
2-Methylnaphthalene	ND	4.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
Acetone	ND	10		µg/L	1	1/26/2017 5:45:34 PM	B40324
Bromobenzene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
Bromodichloromethane	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
Bromoform	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
Bromomethane	ND	3.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
2-Butanone	ND	10		µg/L	1	1/26/2017 5:45:34 PM	B40324
Carbon disulfide	ND	10		µg/L	1	1/26/2017 5:45:34 PM	B40324
Carbon Tetrachloride	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
Chlorobenzene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
Chloroethane	ND	2.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
Chloroform	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
Chloromethane	ND	3.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
2-Chlorotoluene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
4-Chlorotoluene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
cis-1,2-DCE	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
Dibromochloromethane	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
Dibromomethane	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
1,1-Dichloroethane	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
1,1-Dichloroethene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A80

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: GWMW16-D-170125D

Project: Griggs & Walnut GW Plume

Collection Date: 1/25/2017 12:35:00 PM

Lab ID: 1701A80-003

Matrix: AQUEOUS

Received Date: 1/26/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: AG
1,2-Dichloropropane	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
1,3-Dichloropropane	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
2,2-Dichloropropane	ND	2.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
1,1-Dichloropropene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
Hexachlorobutadiene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
2-Hexanone	ND	10		µg/L	1	1/26/2017 5:45:34 PM	B40324
Isopropylbenzene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
4-Isopropyltoluene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
4-Methyl-2-pentanone	ND	10		µg/L	1	1/26/2017 5:45:34 PM	B40324
Methylene Chloride	ND	3.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
n-Butylbenzene	ND	3.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
n-Propylbenzene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
sec-Butylbenzene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
Styrene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
tert-Butylbenzene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
Tetrachloroethene (PCE)	5.0	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
trans-1,2-DCE	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
Trichlorofluoromethane	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
Vinyl chloride	ND	1.0		µg/L	1	1/26/2017 5:45:34 PM	B40324
Xylenes, Total	ND	1.5		µg/L	1	1/26/2017 5:45:34 PM	B40324
Surr: 1,2-Dichloroethane-d4	95.4	70-130		%Rec	1	1/26/2017 5:45:34 PM	B40324
Surr: 4-Bromofluorobenzene	99.4	70-130		%Rec	1	1/26/2017 5:45:34 PM	B40324
Surr: Dibromofluoromethane	114	70-130		%Rec	1	1/26/2017 5:45:34 PM	B40324
Surr: Toluene-d8	98.4	70-130		%Rec	1	1/26/2017 5:45:34 PM	B40324

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A80

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: EB-170125

Project: Griggs & Walnut GW Plume

Collection Date: 1/25/2017 1:45:00 PM

Lab ID: 1701A80-004

Matrix: AQUEOUS

Received Date: 1/26/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	ND	0.0010		mg/L	1	1/30/2017 1:51:08 PM	29914
Uranium	ND	0.00050		mg/L	1	1/30/2017 1:51:08 PM	29914
EPA METHOD 8260B: VOLATILES							Analyst: AG
Benzene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
Toluene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
Ethylbenzene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
Naphthalene	ND	2.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
1-Methylnaphthalene	ND	4.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
2-Methylnaphthalene	ND	4.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
Acetone	ND	10		µg/L	1	1/26/2017 6:14:32 PM	B40324
Bromobenzene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
Bromodichloromethane	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
Bromoform	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
Bromomethane	ND	3.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
2-Butanone	ND	10		µg/L	1	1/26/2017 6:14:32 PM	B40324
Carbon disulfide	ND	10		µg/L	1	1/26/2017 6:14:32 PM	B40324
Carbon Tetrachloride	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
Chlorobenzene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
Chloroethane	ND	2.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
Chloroform	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
Chloromethane	ND	3.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
2-Chlorotoluene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
4-Chlorotoluene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
cis-1,2-DCE	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
Dibromochloromethane	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
Dibromomethane	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
1,1-Dichloroethane	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
1,1-Dichloroethene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A80

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: EB-170125

Project: Griggs & Walnut GW Plume

Collection Date: 1/25/2017 1:45:00 PM

Lab ID: 1701A80-004

Matrix: AQUEOUS

Received Date: 1/26/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: AG
1,2-Dichloropropane	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
1,3-Dichloropropane	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
2,2-Dichloropropane	ND	2.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
1,1-Dichloropropene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
Hexachlorobutadiene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
2-Hexanone	ND	10		µg/L	1	1/26/2017 6:14:32 PM	B40324
Isopropylbenzene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
4-Isopropyltoluene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
4-Methyl-2-pentanone	ND	10		µg/L	1	1/26/2017 6:14:32 PM	B40324
Methylene Chloride	ND	3.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
n-Butylbenzene	ND	3.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
n-Propylbenzene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
sec-Butylbenzene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
Styrene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
tert-Butylbenzene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
trans-1,2-DCE	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
Trichlorofluoromethane	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
Vinyl chloride	ND	1.0		µg/L	1	1/26/2017 6:14:32 PM	B40324
Xylenes, Total	ND	1.5		µg/L	1	1/26/2017 6:14:32 PM	B40324
Surr: 1,2-Dichloroethane-d4	96.3	70-130		%Rec	1	1/26/2017 6:14:32 PM	B40324
Surr: 4-Bromofluorobenzene	95.9	70-130		%Rec	1	1/26/2017 6:14:32 PM	B40324
Surr: Dibromofluoromethane	108	70-130		%Rec	1	1/26/2017 6:14:32 PM	B40324
Surr: Toluene-d8	101	70-130		%Rec	1	1/26/2017 6:14:32 PM	B40324

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A80

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: Trip Blank

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701A80-005

Matrix: AQUEOUS

Received Date: 1/26/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: AG
Benzene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
Toluene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
Ethylbenzene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
Naphthalene	ND	2.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
1-Methylnaphthalene	ND	4.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
2-Methylnaphthalene	ND	4.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
Acetone	ND	10		µg/L	1	1/26/2017 6:43:30 PM	B40324
Bromobenzene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
Bromodichloromethane	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
Bromoform	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
Bromomethane	ND	3.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
2-Butanone	ND	10		µg/L	1	1/26/2017 6:43:30 PM	B40324
Carbon disulfide	ND	10		µg/L	1	1/26/2017 6:43:30 PM	B40324
Carbon Tetrachloride	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
Chlorobenzene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
Chloroethane	ND	2.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
Chloroform	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
Chloromethane	ND	3.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
2-Chlorotoluene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
4-Chlorotoluene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
cis-1,2-DCE	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
Dibromochloromethane	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
Dibromomethane	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
1,1-Dichloroethane	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
1,1-Dichloroethene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
1,2-Dichloropropane	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
1,3-Dichloropropane	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
2,2-Dichloropropane	ND	2.0		µg/L	1	1/26/2017 6:43:30 PM	B40324

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701A80

Date Reported: 2/2/2017

CLIENT: Terracon

Client Sample ID: Trip Blank

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701A80-005

Matrix: AQUEOUS

Received Date: 1/26/2017 8:55:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: AG
1,1-Dichloropropene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
Hexachlorobutadiene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
2-Hexanone	ND	10		µg/L	1	1/26/2017 6:43:30 PM	B40324
Isopropylbenzene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
4-Isopropyltoluene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
4-Methyl-2-pentanone	ND	10		µg/L	1	1/26/2017 6:43:30 PM	B40324
Methylene Chloride	ND	3.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
n-Butylbenzene	ND	3.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
n-Propylbenzene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
sec-Butylbenzene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
Styrene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
tert-Butylbenzene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
trans-1,2-DCE	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
Trichlorofluoromethane	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
Vinyl chloride	ND	1.0		µg/L	1	1/26/2017 6:43:30 PM	B40324
Xylenes, Total	ND	1.5		µg/L	1	1/26/2017 6:43:30 PM	B40324
Surr: 1,2-Dichloroethane-d4	93.0	70-130		%Rec	1	1/26/2017 6:43:30 PM	B40324
Surr: 4-Bromofluorobenzene	96.9	70-130		%Rec	1	1/26/2017 6:43:30 PM	B40324
Surr: Dibromofluoromethane	110	70-130		%Rec	1	1/26/2017 6:43:30 PM	B40324
Surr: Toluene-d8	96.5	70-130		%Rec	1	1/26/2017 6:43:30 PM	B40324

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010360-001
Client Sample ID: 1701A80-002C GWMW16-D-170125

Report Date: 02/02/17
Collection Date: 01/25/17 12:35
Date Received: 01/27/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/31/17 20:42 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/31/17 20:42 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010360-002
Client Sample ID: 1701A80-003C GMMW16-D-170125D

Report Date: 02/02/17
Collection Date: 01/25/17 12:35
Date Received: 01/27/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/31/17 20:54 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/31/17 20:54 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010360-003
Client Sample ID: 1701A80-004C EB-170125

Report Date: 02/02/17
Collection Date: 01/25/17 13:45
Date Received: 01/27/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	01/31/17 21:30 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	01/31/17 21:30 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hall Environmental

Report Date: 02/02/17

Project: Not Indicated

Work Order: H17010360

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E1632AM		Analytical Run: ARSENIC SPECIATION_170131A							
Lab ID: AS-ICV 25ppb-1/31/2017	Initial Calibration Verification Standard								01/31/17 16:42
Arsenic-III	25.6	ug/L	5.0	103	87.6	114			
Arsenic-V	24.4	ug/L	5.0	98	87	116			
Lab ID: AS-50.0-1/31/2017	Continuing Calibration Verification Standard								01/31/17 20:06
Arsenic-III	46.7	ug/L	5.0	93	85	115			
Arsenic-V	48.8	ug/L	5.0	98	85	115			
Method: E1632AM		Batch: R122441							
Lab ID: AS-LFB 50ppb-1/31/2017	Laboratory Fortified Blank				Run: ARSENIC SPECIATION_1701		01/31/17 17:18		
Arsenic-III	45.5	ug/L	5.0	91	55	146			
Arsenic-V	46.6	ug/L	5.0	93	55	146			
Lab ID: ICB	Method Blank				Run: ARSENIC SPECIATION_1701		01/31/17 17:30		
Arsenic-III	ND	ug/L	0.2						
Arsenic-V	ND	ug/L	0.5						
Lab ID: H17010360-002A MS	Sample Matrix Spike				Run: ARSENIC SPECIATION_1701		01/31/17 21:06		
Arsenic-III	49.7	ug/L	5.0	99	55	146			
Arsenic-V	48.0	ug/L	5.0	96	55	146			
Lab ID: H17010360-002A MSD	Sample Matrix Spike Duplicate				Run: ARSENIC SPECIATION_1701		01/31/17 21:18		
Arsenic-III	50.6	ug/L	5.0	101	55	146	1.8	20	
Arsenic-V	48.2	ug/L	5.0	96	55	146	0.3	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701A80

02-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	1701A80-002BMSLL		SampType:	MSLL		TestCode:	200.8 ICPMS Metals:Total				
Client ID:	GMMW16-D-170125		Batch ID:	29914		RunNo:	40367				
Prep Date:	1/26/2017	Analysis Date:	1/30/2017		SeqNo:	1265450	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Uranium	0.080	0.0025	0.01250	0.06872	92.7	70	130				

Sample ID	1701A80-002BMSLL		SampType:	MSLL		TestCode:	200.8 ICPMS Metals:Total				
Client ID:	GMMW16-D-170125		Batch ID:	29914		RunNo:	40367				
Prep Date:	1/26/2017	Analysis Date:	1/30/2017		SeqNo:	1265451	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Arsenic	0.025	0.0010	0.02500	0.0007604	97.1	70	130				

Sample ID	MB-29914		SampType:	MBLK		TestCode:	200.8 ICPMS Metals:Total				
Client ID:	PBW		Batch ID:	29914		RunNo:	40367				
Prep Date:	1/26/2017	Analysis Date:	1/30/2017		SeqNo:	1265456	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Arsenic	ND	0.0010									
Uranium	ND	0.00050									

Sample ID	MSLCS-29914		SampType:	LCS		TestCode:	200.8 ICPMS Metals:Total				
Client ID:	LCSW		Batch ID:	29914		RunNo:	40367				
Prep Date:	1/26/2017	Analysis Date:	1/30/2017		SeqNo:	1265457	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Arsenic	0.025	0.0010	0.02500	0	99.7	85	115				
Uranium	0.012	0.00050	0.01250	0	99.9	85	115				

Sample ID	MSLCSLL-29914		SampType:	LCSLL		TestCode:	200.8 ICPMS Metals:Total				
Client ID:	BatchQC		Batch ID:	29914		RunNo:	40367				
Prep Date:	1/26/2017	Analysis Date:	1/30/2017		SeqNo:	1265458	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual	
Arsenic	ND	0.0010	0.001000	0	96.9	50	150				
Uranium	0.00051	0.00050	0.0005000	0	102	50	150				

Qualifiers:

- | | |
|---|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| H Holding times for preparation or analysis exceeded | J Analyte detected below quantitation limits |
| ND Not Detected at the Reporting Limit | P Sample pH Not In Range |
| R RPD outside accepted recovery limits | RL Reporting Detection Limit |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701A80

02-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	rb	SampType:	MBLK		TestCode:	EPA Method 8260B: VOLATILES				
Client ID:	PBW	Batch ID:	B40324		RunNo:	40324				
Prep Date:		Analysis Date:	1/26/2017		SeqNo:	1263936	Units:	µg/L		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								

Qualifiers:

- | | |
|---|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| H Holding times for preparation or analysis exceeded | J Analyte detected below quantitation limits |
| ND Not Detected at the Reporting Limit | P Sample pH Not In Range |
| R RPD outside accepted recovery limits | RL Reporting Detection Limit |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701A80

02-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID rb	SampType: MBLK	TestCode: EPA Method 8260B: VOLATILES
Client ID: PBW	Batch ID: B40324	RunNo: 40324
Prep Date:	Analysis Date: 1/26/2017	SeqNo: 1263936 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.7		10.00		96.8	70	130			
Surr: 4-Bromofluorobenzene	9.8		10.00		98.4	70	130			
Surr: Dibromofluoromethane	11		10.00		113	70	130			
Surr: Toluene-d8	9.8		10.00		98.5	70	130			

Sample ID 100ng lcs	SampType: LCS	TestCode: EPA Method 8260B: VOLATILES
Client ID: LCSW	Batch ID: B40324	RunNo: 40324
Prep Date:	Analysis Date: 1/26/2017	SeqNo: 1263938 Units: µg/L

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	22	1.0	20.00	0	108	70	130			
Toluene	19	1.0	20.00	0	94.7	70	130			
Chlorobenzene	19	1.0	20.00	0	96.6	70	130			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701A80

02-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	100ng lcs	SampType:	LCS	TestCode:	EPA Method 8260B: VOLATILES					
Client ID:	LCSW	Batch ID:	B40324	RunNo:	40324					
Prep Date:		Analysis Date:	1/26/2017	SeqNo:	1263938	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloroethene	25	1.0	20.00	0	124	70	130			
Trichloroethene (TCE)	18	1.0	20.00	0	92.0	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		99.6	70	130			
Surr: 4-Bromofluorobenzene	9.6		10.00		95.7	70	130			
Surr: Dibromofluoromethane	10		10.00		99.9	70	130			
Surr: Toluene-d8	9.7		10.00		96.5	70	130			

Sample ID	1701a80-001ams	SampType:	MS	TestCode:	EPA Method 8260B: VOLATILES					
Client ID:	FB-170125	Batch ID:	B40324	RunNo:	40324					
Prep Date:		Analysis Date:	1/26/2017	SeqNo:	1264021	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	22	1.0	20.00	0	111	70	130			
Toluene	20	1.0	20.00	0	100	70	130			
Chlorobenzene	20	1.0	20.00	0	102	70	130			
1,1-Dichloroethene	23	1.0	20.00	0	116	70	130			
Trichloroethene (TCE)	20	1.0	20.00	0	98.9	70	130			
Surr: 1,2-Dichloroethane-d4	9.7		10.00		96.9	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		98.7	70	130			
Surr: Dibromofluoromethane	9.9		10.00		98.7	70	130			
Surr: Toluene-d8	9.9		10.00		99.4	70	130			

Sample ID	1701a80-001amsd	SampType:	MSD	TestCode:	EPA Method 8260B: VOLATILES					
Client ID:	FB-170125	Batch ID:	B40324	RunNo:	40324					
Prep Date:		Analysis Date:	1/26/2017	SeqNo:	1264022	Units:	µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	107	70	130	3.59	20	
Toluene	20	1.0	20.00	0	97.9	70	130	2.30	20	
Chlorobenzene	20	1.0	20.00	0	99.9	70	130	2.29	20	
1,1-Dichloroethene	22	1.0	20.00	0	110	70	130	5.41	20	
Trichloroethene (TCE)	18	1.0	20.00	0	90.9	70	130	8.35	20	
Surr: 1,2-Dichloroethane-d4	9.3		10.00		92.6	70	130	0	0	
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130	0	0	
Surr: Dibromofluoromethane	10		10.00		101	70	130	0	0	
Surr: Toluene-d8	10		10.00		99.7	70	130	0	0	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified



Hall Environmental Analysis Laboratory
 4901 Hawkins NE
 Albuquerque, NM 87109
 TEL: 505-345-3975 FAX: 505-345-4107
 Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: TER-LC

Work Order Number: 1701A80

RcptNo: 1

Received by/date: RE 1/26/17

Logged By: Andy Jansson 1/26/2017 8:55:00 AM *andy jansson*

Completed By: Andy Jansson 1/26/17

Reviewed By: *[Signature]* 01/26/17

Chain of Custody

- 1. Custody seals intact on sample bottles? Yes No Not Present
- 2. Is Chain of Custody complete? Yes No Not Present
- 3. How was the sample delivered? FedEx

Log In

- 4. Was an attempt made to cool the samples? Yes No NA
- 5. Were all samples received at a temperature of >0° C to 6.0°C Yes No NA
- 6. Sample(s) in proper container(s)? Yes No
- 7. Sufficient sample volume for indicated test(s)? Yes No
- 8. Are samples (except VOA and ONG) properly preserved? Yes No
- 9. Was preservative added to bottles? Yes No NA
- 10. VOA vials have zero headspace? Yes No No VOA Vials
- 11. Were any sample containers received broken? Yes No
- 12. Does paperwork match bottle labels? Yes No
(Note discrepancies on chain of custody)
- 13. Are matrices correctly identified on Chain of Custody? Yes No
- 14. Is it clear what analyses were requested? Yes No
- 15. Were all holding times able to be met? Yes No
(If no, notify customer for authorization.)

of preserved bottles checked for pH: 6
 (<2 or >12 unless noted)

Adjusted? No

Checked by: Re

Special Handling (if applicable)

- 16. Was client notified of all discrepancies with this order? Yes No NA

Person Notified: _____ Date: _____

By Whom: _____ Via: eMail Phone Fax In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.6	Good	Yes			

Chain-of-Custody Record

Client: Francisco Consulting Inc.

Mailing Address: 4450 Bataan Memorial E
Las Cruces, NM 88011

Phone #: 575-527-1700
 email or Fax#: Kyle.Williams@terras.com

QA/QC Package: Standard Level 4 (Full Validation)

Accreditation: NELAP Other _____

EDD (Type) _____

Turn-Around Time:

Standard Rush

Project Name:

Coyote-Walnut Cw Phase 2
 Project #: 68167094

Project Manager:

Kyle Williams

Sampler: Williams

On Ice: Yes No

Sample Temperature: 3.6 CF-10=2.6

Date Time Matrix Sample Request ID

12/5/17 1130 DI FB-170125
1235 GW GW16-D-170125
1235 GW GW16-D-170125 D
1345 DI FB-170125
- - Trip Blank

Container Type and #

1701A80
-001
-002
-003
-004
-005

Preservative Type

HEAL No.
1701A80

Date: 12/5/17 Time: 1530 Relinquished by: Kyle Williams

Date: 12/6/17 Time: 0855 Received by: [Signature]

Date: _____ Time: _____ Relinquished by: _____

Date: _____ Time: _____ Received by: _____

Analysis Request

BTEX + MTBE + TMB's (8021)	
BTEX + MTBE + TPH (Gas only)	
TPH 8015B (GRO / DRO / MRO)	
TPH (Method 418.1)	
EDB (Method 504.1)	
PAH's (8310 or 8270 SIMS)	
RCRA 8 Metals	
Anions (F, Cl, NO ₃ , NO ₂ , PO ₄ , SO ₄)	
8081 Pesticides / 8082 PCB's	
8260B (VOA)	<input checked="" type="checkbox"/>
8270 (Semi-VOA)	<input checked="" type="checkbox"/>
6020 As, U	<input checked="" type="checkbox"/>
A3114 As Speciation	<input checked="" type="checkbox"/>
Air Bubbles (Y or N)	<u>Yes</u>

Remarks:

Invoice to City of Las Cruces.

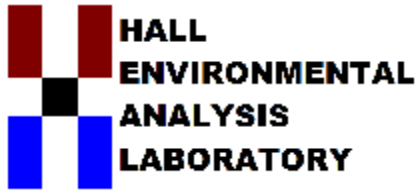


HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

February 07, 2017

Kyle Williams

Terracon

4450 Bataan Memorial E

Las Cruces, NM 88005

TEL: (575) 527-1700

FAX (575) 527-1092

RE: Griggs & Walnut GW Plume

OrderNo.: 1701B84

Dear Kyle Williams:

Hall Environmental Analysis Laboratory received 10 sample(s) on 1/28/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a light blue horizontal line.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701B84

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: GWMW15-I-170126

Project: Griggs & Walnut GW Plume

Collection Date: 1/26/2017 11:30:00 AM

Lab ID: 1701B84-001

Matrix: GROUNDWA

Received Date: 1/28/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	ND	0.0050		mg/L	5	1/31/2017 2:33:43 PM	29957
Uranium	0.056	0.0025	*	mg/L	5	1/31/2017 2:33:43 PM	29957
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
Toluene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
Ethylbenzene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
Naphthalene	ND	2.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
1-Methylnaphthalene	ND	4.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
2-Methylnaphthalene	ND	4.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
Acetone	ND	10		µg/L	1	1/30/2017 5:26:48 PM	W40383
Bromobenzene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
Bromodichloromethane	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
Bromoform	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
Bromomethane	ND	3.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
2-Butanone	ND	10		µg/L	1	1/30/2017 5:26:48 PM	W40383
Carbon disulfide	ND	10		µg/L	1	1/30/2017 5:26:48 PM	W40383
Carbon Tetrachloride	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
Chlorobenzene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
Chloroethane	ND	2.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
Chloroform	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
Chloromethane	ND	3.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
2-Chlorotoluene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
4-Chlorotoluene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
cis-1,2-DCE	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
Dibromochloromethane	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
Dibromomethane	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
1,1-Dichloroethane	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
1,1-Dichloroethene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701B84

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: GWMW15-I-170126

Project: Griggs & Walnut GW Plume

Collection Date: 1/26/2017 11:30:00 AM

Lab ID: 1701B84-001

Matrix: GROUNDWA

Received Date: 1/28/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
1,3-Dichloropropane	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
2,2-Dichloropropane	ND	2.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
1,1-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
Hexachlorobutadiene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
2-Hexanone	ND	10		µg/L	1	1/30/2017 5:26:48 PM	W40383
Isopropylbenzene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
4-Isopropyltoluene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
4-Methyl-2-pentanone	ND	10		µg/L	1	1/30/2017 5:26:48 PM	W40383
Methylene Chloride	ND	3.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
n-Butylbenzene	ND	3.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
n-Propylbenzene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
sec-Butylbenzene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
Styrene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
tert-Butylbenzene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
Tetrachloroethene (PCE)	4.5	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
trans-1,2-DCE	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
Trichlorofluoromethane	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
Vinyl chloride	ND	1.0		µg/L	1	1/30/2017 5:26:48 PM	W40383
Xylenes, Total	ND	1.5		µg/L	1	1/30/2017 5:26:48 PM	W40383
Surr: 1,2-Dichloroethane-d4	97.3	70-130		%Rec	1	1/30/2017 5:26:48 PM	W40383
Surr: 4-Bromofluorobenzene	81.3	70-130		%Rec	1	1/30/2017 5:26:48 PM	W40383
Surr: Dibromofluoromethane	102	70-130		%Rec	1	1/30/2017 5:26:48 PM	W40383
Surr: Toluene-d8	95.4	70-130		%Rec	1	1/30/2017 5:26:48 PM	W40383

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701B84

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: GWMW15-I-170126 D

Project: Griggs & Walnut GW Plume

Collection Date: 1/26/2017 11:30:00 AM

Lab ID: 1701B84-002

Matrix: GROUNDWA

Received Date: 1/28/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	ND	0.0050		mg/L	5	1/31/2017 2:44:01 PM	29957
Uranium	0.056	0.0025	*	mg/L	5	1/31/2017 2:44:01 PM	29957
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
Toluene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
Ethylbenzene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
Naphthalene	ND	2.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
1-Methylnaphthalene	ND	4.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
2-Methylnaphthalene	ND	4.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
Acetone	ND	10		µg/L	1	1/30/2017 5:55:58 PM	W40383
Bromobenzene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
Bromodichloromethane	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
Bromoform	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
Bromomethane	ND	3.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
2-Butanone	ND	10		µg/L	1	1/30/2017 5:55:58 PM	W40383
Carbon disulfide	ND	10		µg/L	1	1/30/2017 5:55:58 PM	W40383
Carbon Tetrachloride	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
Chlorobenzene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
Chloroethane	ND	2.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
Chloroform	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
Chloromethane	ND	3.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
2-Chlorotoluene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
4-Chlorotoluene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
cis-1,2-DCE	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
Dibromochloromethane	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
Dibromomethane	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
1,1-Dichloroethane	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
1,1-Dichloroethene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701B84

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: GWMW15-I-170126 D

Project: Griggs & Walnut GW Plume

Collection Date: 1/26/2017 11:30:00 AM

Lab ID: 1701B84-002

Matrix: GROUNDWA

Received Date: 1/28/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
1,3-Dichloropropane	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
2,2-Dichloropropane	ND	2.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
1,1-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
Hexachlorobutadiene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
2-Hexanone	ND	10		µg/L	1	1/30/2017 5:55:58 PM	W40383
Isopropylbenzene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
4-Isopropyltoluene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
4-Methyl-2-pentanone	ND	10		µg/L	1	1/30/2017 5:55:58 PM	W40383
Methylene Chloride	ND	3.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
n-Butylbenzene	ND	3.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
n-Propylbenzene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
sec-Butylbenzene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
Styrene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
tert-Butylbenzene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
Tetrachloroethene (PCE)	5.6	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
trans-1,2-DCE	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
Trichlorofluoromethane	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
Vinyl chloride	ND	1.0		µg/L	1	1/30/2017 5:55:58 PM	W40383
Xylenes, Total	ND	1.5		µg/L	1	1/30/2017 5:55:58 PM	W40383
Surr: 1,2-Dichloroethane-d4	99.0	70-130		%Rec	1	1/30/2017 5:55:58 PM	W40383
Surr: 4-Bromofluorobenzene	81.5	70-130		%Rec	1	1/30/2017 5:55:58 PM	W40383
Surr: Dibromofluoromethane	104	70-130		%Rec	1	1/30/2017 5:55:58 PM	W40383
Surr: Toluene-d8	98.1	70-130		%Rec	1	1/30/2017 5:55:58 PM	W40383

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701B84

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: EB-170126

Project: Griggs & Walnut GW Plume

Collection Date: 1/26/2017 12:10:00 PM

Lab ID: 1701B84-003

Matrix: AQUEOUS

Received Date: 1/28/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	ND	0.0010		mg/L	1	1/31/2017 2:00:59 PM	29957
Uranium	ND	0.00050		mg/L	1	1/31/2017 2:00:59 PM	29957
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
Toluene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
Ethylbenzene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
Naphthalene	ND	2.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
1-Methylnaphthalene	ND	4.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
2-Methylnaphthalene	ND	4.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
Acetone	ND	10		µg/L	1	1/30/2017 6:25:15 PM	W40383
Bromobenzene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
Bromodichloromethane	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
Bromoform	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
Bromomethane	ND	3.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
2-Butanone	ND	10		µg/L	1	1/30/2017 6:25:15 PM	W40383
Carbon disulfide	ND	10		µg/L	1	1/30/2017 6:25:15 PM	W40383
Carbon Tetrachloride	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
Chlorobenzene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
Chloroethane	ND	2.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
Chloroform	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
Chloromethane	ND	3.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
2-Chlorotoluene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
4-Chlorotoluene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
cis-1,2-DCE	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
Dibromochloromethane	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
Dibromomethane	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
1,1-Dichloroethane	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
1,1-Dichloroethene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701B84

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: EB-170126

Project: Griggs & Walnut GW Plume

Collection Date: 1/26/2017 12:10:00 PM

Lab ID: 1701B84-003

Matrix: AQUEOUS

Received Date: 1/28/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
1,3-Dichloropropane	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
2,2-Dichloropropane	ND	2.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
1,1-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
Hexachlorobutadiene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
2-Hexanone	ND	10		µg/L	1	1/30/2017 6:25:15 PM	W40383
Isopropylbenzene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
4-Isopropyltoluene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
4-Methyl-2-pentanone	ND	10		µg/L	1	1/30/2017 6:25:15 PM	W40383
Methylene Chloride	ND	3.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
n-Butylbenzene	ND	3.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
n-Propylbenzene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
sec-Butylbenzene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
Styrene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
tert-Butylbenzene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
trans-1,2-DCE	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
Trichlorofluoromethane	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
Vinyl chloride	ND	1.0		µg/L	1	1/30/2017 6:25:15 PM	W40383
Xylenes, Total	ND	1.5		µg/L	1	1/30/2017 6:25:15 PM	W40383
Surr: 1,2-Dichloroethane-d4	104	70-130		%Rec	1	1/30/2017 6:25:15 PM	W40383
Surr: 4-Bromofluorobenzene	84.5	70-130		%Rec	1	1/30/2017 6:25:15 PM	W40383
Surr: Dibromofluoromethane	106	70-130		%Rec	1	1/30/2017 6:25:15 PM	W40383
Surr: Toluene-d8	94.7	70-130		%Rec	1	1/30/2017 6:25:15 PM	W40383

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701B84

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: FB-170126

Project: Griggs & Walnut GW Plume

Collection Date: 1/26/2017 1:30:00 PM

Lab ID: 1701B84-004

Matrix: AQUEOUS

Received Date: 1/28/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
Toluene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
Ethylbenzene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
Naphthalene	ND	2.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
1-Methylnaphthalene	ND	4.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
2-Methylnaphthalene	ND	4.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
Acetone	ND	10		µg/L	1	1/30/2017 6:54:19 PM	W40383
Bromobenzene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
Bromodichloromethane	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
Bromoform	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
Bromomethane	ND	3.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
2-Butanone	ND	10		µg/L	1	1/30/2017 6:54:19 PM	W40383
Carbon disulfide	ND	10		µg/L	1	1/30/2017 6:54:19 PM	W40383
Carbon Tetrachloride	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
Chlorobenzene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
Chloroethane	ND	2.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
Chloroform	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
Chloromethane	ND	3.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
2-Chlorotoluene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
4-Chlorotoluene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
cis-1,2-DCE	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
Dibromochloromethane	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
Dibromomethane	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
1,1-Dichloroethane	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
1,1-Dichloroethene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
1,2-Dichloropropane	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
1,3-Dichloropropane	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
2,2-Dichloropropane	ND	2.0		µg/L	1	1/30/2017 6:54:19 PM	W40383

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701B84

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: FB-170126

Project: Griggs & Walnut GW Plume

Collection Date: 1/26/2017 1:30:00 PM

Lab ID: 1701B84-004

Matrix: AQUEOUS

Received Date: 1/28/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,1-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
Hexachlorobutadiene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
2-Hexanone	ND	10		µg/L	1	1/30/2017 6:54:19 PM	W40383
Isopropylbenzene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
4-Isopropyltoluene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
4-Methyl-2-pentanone	ND	10		µg/L	1	1/30/2017 6:54:19 PM	W40383
Methylene Chloride	ND	3.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
n-Butylbenzene	ND	3.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
n-Propylbenzene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
sec-Butylbenzene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
Styrene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
tert-Butylbenzene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
trans-1,2-DCE	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
Trichlorofluoromethane	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
Vinyl chloride	ND	1.0		µg/L	1	1/30/2017 6:54:19 PM	W40383
Xylenes, Total	ND	1.5		µg/L	1	1/30/2017 6:54:19 PM	W40383
Surr: 1,2-Dichloroethane-d4	99.0	70-130		%Rec	1	1/30/2017 6:54:19 PM	W40383
Surr: 4-Bromofluorobenzene	80.1	70-130		%Rec	1	1/30/2017 6:54:19 PM	W40383
Surr: Dibromofluoromethane	105	70-130		%Rec	1	1/30/2017 6:54:19 PM	W40383
Surr: Toluene-d8	97.2	70-130		%Rec	1	1/30/2017 6:54:19 PM	W40383

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701B84

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: GWMW15-S-170126

Project: Griggs & Walnut GW Plume

Collection Date: 1/26/2017 2:35:00 PM

Lab ID: 1701B84-005

Matrix: GROUNDWA

Received Date: 1/28/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	ND	0.0050		mg/L	5	1/31/2017 2:49:09 PM	29957
Uranium	0.012	0.00050		mg/L	1	1/31/2017 2:06:08 PM	29957
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
Toluene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
Ethylbenzene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
Naphthalene	ND	2.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
1-Methylnaphthalene	ND	4.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
2-Methylnaphthalene	ND	4.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
Acetone	ND	10		µg/L	1	1/30/2017 7:23:17 PM	W40383
Bromobenzene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
Bromodichloromethane	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
Bromoform	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
Bromomethane	ND	3.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
2-Butanone	ND	10		µg/L	1	1/30/2017 7:23:17 PM	W40383
Carbon disulfide	ND	10		µg/L	1	1/30/2017 7:23:17 PM	W40383
Carbon Tetrachloride	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
Chlorobenzene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
Chloroethane	ND	2.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
Chloroform	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
Chloromethane	ND	3.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
2-Chlorotoluene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
4-Chlorotoluene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
cis-1,2-DCE	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
Dibromochloromethane	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
Dibromomethane	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
1,1-Dichloroethane	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
1,1-Dichloroethene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701B84

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: GWMW15-S-170126

Project: Griggs & Walnut GW Plume

Collection Date: 1/26/2017 2:35:00 PM

Lab ID: 1701B84-005

Matrix: GROUNDWA

Received Date: 1/28/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
1,3-Dichloropropane	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
2,2-Dichloropropane	ND	2.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
1,1-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
Hexachlorobutadiene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
2-Hexanone	ND	10		µg/L	1	1/30/2017 7:23:17 PM	W40383
Isopropylbenzene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
4-Isopropyltoluene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
4-Methyl-2-pentanone	ND	10		µg/L	1	1/30/2017 7:23:17 PM	W40383
Methylene Chloride	ND	3.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
n-Butylbenzene	ND	3.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
n-Propylbenzene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
sec-Butylbenzene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
Styrene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
tert-Butylbenzene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
trans-1,2-DCE	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
Trichlorofluoromethane	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
Vinyl chloride	ND	1.0		µg/L	1	1/30/2017 7:23:17 PM	W40383
Xylenes, Total	ND	1.5		µg/L	1	1/30/2017 7:23:17 PM	W40383
Surr: 1,2-Dichloroethane-d4	99.8	70-130		%Rec	1	1/30/2017 7:23:17 PM	W40383
Surr: 4-Bromofluorobenzene	87.0	70-130		%Rec	1	1/30/2017 7:23:17 PM	W40383
Surr: Dibromofluoromethane	105	70-130		%Rec	1	1/30/2017 7:23:17 PM	W40383
Surr: Toluene-d8	98.1	70-130		%Rec	1	1/30/2017 7:23:17 PM	W40383

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701B84

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: Trip Blank

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701B84-006

Matrix: AQUEOUS

Received Date: 1/28/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
Toluene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
Ethylbenzene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
Naphthalene	ND	2.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
1-Methylnaphthalene	ND	4.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
2-Methylnaphthalene	ND	4.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
Acetone	ND	10		µg/L	1	1/30/2017 7:52:31 PM	W40383
Bromobenzene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
Bromodichloromethane	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
Bromoform	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
Bromomethane	ND	3.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
2-Butanone	ND	10		µg/L	1	1/30/2017 7:52:31 PM	W40383
Carbon disulfide	ND	10		µg/L	1	1/30/2017 7:52:31 PM	W40383
Carbon Tetrachloride	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
Chlorobenzene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
Chloroethane	ND	2.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
Chloroform	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
Chloromethane	ND	3.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
2-Chlorotoluene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
4-Chlorotoluene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
cis-1,2-DCE	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
Dibromochloromethane	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
Dibromomethane	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
1,1-Dichloroethane	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
1,1-Dichloroethene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
1,2-Dichloropropane	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
1,3-Dichloropropane	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
2,2-Dichloropropane	ND	2.0		µg/L	1	1/30/2017 7:52:31 PM	W40383

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701B84

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: Trip Blank

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701B84-006

Matrix: AQUEOUS

Received Date: 1/28/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,1-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
Hexachlorobutadiene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
2-Hexanone	ND	10		µg/L	1	1/30/2017 7:52:31 PM	W40383
Isopropylbenzene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
4-Isopropyltoluene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
4-Methyl-2-pentanone	ND	10		µg/L	1	1/30/2017 7:52:31 PM	W40383
Methylene Chloride	ND	3.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
n-Butylbenzene	ND	3.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
n-Propylbenzene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
sec-Butylbenzene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
Styrene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
tert-Butylbenzene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
trans-1,2-DCE	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
Trichlorofluoromethane	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
Vinyl chloride	ND	1.0		µg/L	1	1/30/2017 7:52:31 PM	W40383
Xylenes, Total	ND	1.5		µg/L	1	1/30/2017 7:52:31 PM	W40383
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	1/30/2017 7:52:31 PM	W40383
Surr: 4-Bromofluorobenzene	85.6	70-130		%Rec	1	1/30/2017 7:52:31 PM	W40383
Surr: Dibromofluoromethane	108	70-130		%Rec	1	1/30/2017 7:52:31 PM	W40383
Surr: Toluene-d8	97.9	70-130		%Rec	1	1/30/2017 7:52:31 PM	W40383

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701B84

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: EB-170127

Project: Griggs & Walnut GW Plume

Collection Date: 1/27/2017 8:45:00 AM

Lab ID: 1701B84-007

Matrix: AQUEOUS

Received Date: 1/28/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	ND	0.0010		mg/L	1	1/31/2017 2:11:16 PM	29957
Uranium	ND	0.00050		mg/L	1	1/31/2017 2:11:16 PM	29957
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
Toluene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
Ethylbenzene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
Naphthalene	ND	2.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
1-Methylnaphthalene	ND	4.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
2-Methylnaphthalene	ND	4.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
Acetone	ND	10		µg/L	1	1/30/2017 8:21:24 PM	W40383
Bromobenzene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
Bromodichloromethane	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
Bromoform	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
Bromomethane	ND	3.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
2-Butanone	ND	10		µg/L	1	1/30/2017 8:21:24 PM	W40383
Carbon disulfide	ND	10		µg/L	1	1/30/2017 8:21:24 PM	W40383
Carbon Tetrachloride	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
Chlorobenzene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
Chloroethane	ND	2.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
Chloroform	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
Chloromethane	ND	3.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
2-Chlorotoluene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
4-Chlorotoluene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
cis-1,2-DCE	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
Dibromochloromethane	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
Dibromomethane	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
1,1-Dichloroethane	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
1,1-Dichloroethene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701B84

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: EB-170127

Project: Griggs & Walnut GW Plume

Collection Date: 1/27/2017 8:45:00 AM

Lab ID: 1701B84-007

Matrix: AQUEOUS

Received Date: 1/28/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
1,3-Dichloropropane	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
2,2-Dichloropropane	ND	2.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
1,1-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
Hexachlorobutadiene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
2-Hexanone	ND	10		µg/L	1	1/30/2017 8:21:24 PM	W40383
Isopropylbenzene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
4-Isopropyltoluene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
4-Methyl-2-pentanone	ND	10		µg/L	1	1/30/2017 8:21:24 PM	W40383
Methylene Chloride	ND	3.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
n-Butylbenzene	ND	3.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
n-Propylbenzene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
sec-Butylbenzene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
Styrene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
tert-Butylbenzene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
trans-1,2-DCE	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
Trichlorofluoromethane	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
Vinyl chloride	ND	1.0		µg/L	1	1/30/2017 8:21:24 PM	W40383
Xylenes, Total	ND	1.5		µg/L	1	1/30/2017 8:21:24 PM	W40383
Surr: 1,2-Dichloroethane-d4	100	70-130		%Rec	1	1/30/2017 8:21:24 PM	W40383
Surr: 4-Bromofluorobenzene	88.2	70-130		%Rec	1	1/30/2017 8:21:24 PM	W40383
Surr: Dibromofluoromethane	109	70-130		%Rec	1	1/30/2017 8:21:24 PM	W40383
Surr: Toluene-d8	97.4	70-130		%Rec	1	1/30/2017 8:21:24 PM	W40383

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701B84

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: FB-170127

Project: Griggs & Walnut GW Plume

Collection Date: 1/27/2017 10:30:00 AM

Lab ID: 1701B84-008

Matrix: AQUEOUS

Received Date: 1/28/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
Toluene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
Ethylbenzene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
Naphthalene	ND	2.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
1-Methylnaphthalene	ND	4.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
2-Methylnaphthalene	ND	4.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
Acetone	ND	10		µg/L	1	1/30/2017 8:50:21 PM	W40383
Bromobenzene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
Bromodichloromethane	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
Bromoform	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
Bromomethane	ND	3.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
2-Butanone	ND	10		µg/L	1	1/30/2017 8:50:21 PM	W40383
Carbon disulfide	ND	10		µg/L	1	1/30/2017 8:50:21 PM	W40383
Carbon Tetrachloride	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
Chlorobenzene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
Chloroethane	ND	2.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
Chloroform	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
Chloromethane	ND	3.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
2-Chlorotoluene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
4-Chlorotoluene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
cis-1,2-DCE	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
Dibromochloromethane	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
Dibromomethane	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
1,1-Dichloroethane	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
1,1-Dichloroethene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
1,2-Dichloropropane	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
1,3-Dichloropropane	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
2,2-Dichloropropane	ND	2.0		µg/L	1	1/30/2017 8:50:21 PM	W40383

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701B84

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: FB-170127

Project: Griggs & Walnut GW Plume

Collection Date: 1/27/2017 10:30:00 AM

Lab ID: 1701B84-008

Matrix: AQUEOUS

Received Date: 1/28/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,1-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
Hexachlorobutadiene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
2-Hexanone	ND	10		µg/L	1	1/30/2017 8:50:21 PM	W40383
Isopropylbenzene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
4-Isopropyltoluene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
4-Methyl-2-pentanone	ND	10		µg/L	1	1/30/2017 8:50:21 PM	W40383
Methylene Chloride	ND	3.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
n-Butylbenzene	ND	3.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
n-Propylbenzene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
sec-Butylbenzene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
Styrene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
tert-Butylbenzene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
trans-1,2-DCE	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
Trichlorofluoromethane	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
Vinyl chloride	ND	1.0		µg/L	1	1/30/2017 8:50:21 PM	W40383
Xylenes, Total	ND	1.5		µg/L	1	1/30/2017 8:50:21 PM	W40383
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	1/30/2017 8:50:21 PM	W40383
Surr: 4-Bromofluorobenzene	85.6	70-130		%Rec	1	1/30/2017 8:50:21 PM	W40383
Surr: Dibromofluoromethane	110	70-130		%Rec	1	1/30/2017 8:50:21 PM	W40383
Surr: Toluene-d8	95.8	70-130		%Rec	1	1/30/2017 8:50:21 PM	W40383

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701B84

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: GWMW15-D-170127

Project: Griggs & Walnut GW Plume

Collection Date: 1/27/2017 11:50:00 AM

Lab ID: 1701B84-009

Matrix: GROUNDWA

Received Date: 1/28/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	0.0018	0.0010		mg/L	1	1/31/2017 2:16:25 PM	29957
Uranium	0.012	0.00050		mg/L	1	1/31/2017 2:16:25 PM	29957
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
Toluene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
Ethylbenzene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
Naphthalene	ND	2.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
1-Methylnaphthalene	ND	4.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
2-Methylnaphthalene	ND	4.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
Acetone	ND	10		µg/L	1	1/30/2017 9:19:26 PM	W40383
Bromobenzene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
Bromodichloromethane	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
Bromoform	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
Bromomethane	ND	3.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
2-Butanone	ND	10		µg/L	1	1/30/2017 9:19:26 PM	W40383
Carbon disulfide	ND	10		µg/L	1	1/30/2017 9:19:26 PM	W40383
Carbon Tetrachloride	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
Chlorobenzene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
Chloroethane	ND	2.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
Chloroform	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
Chloromethane	ND	3.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
2-Chlorotoluene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
4-Chlorotoluene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
cis-1,2-DCE	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
Dibromochloromethane	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
Dibromomethane	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
1,1-Dichloroethane	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
1,1-Dichloroethene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701B84

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: GWMW15-D-170127

Project: Griggs & Walnut GW Plume

Collection Date: 1/27/2017 11:50:00 AM

Lab ID: 1701B84-009

Matrix: GROUNDWA

Received Date: 1/28/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,2-Dichloropropane	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
1,3-Dichloropropane	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
2,2-Dichloropropane	ND	2.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
1,1-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
Hexachlorobutadiene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
2-Hexanone	ND	10		µg/L	1	1/30/2017 9:19:26 PM	W40383
Isopropylbenzene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
4-Isopropyltoluene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
4-Methyl-2-pentanone	ND	10		µg/L	1	1/30/2017 9:19:26 PM	W40383
Methylene Chloride	ND	3.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
n-Butylbenzene	ND	3.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
n-Propylbenzene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
sec-Butylbenzene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
Styrene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
tert-Butylbenzene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
trans-1,2-DCE	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
Trichlorofluoromethane	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
Vinyl chloride	ND	1.0		µg/L	1	1/30/2017 9:19:26 PM	W40383
Xylenes, Total	ND	1.5		µg/L	1	1/30/2017 9:19:26 PM	W40383
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	1/30/2017 9:19:26 PM	W40383
Surr: 4-Bromofluorobenzene	82.3	70-130		%Rec	1	1/30/2017 9:19:26 PM	W40383
Surr: Dibromofluoromethane	110	70-130		%Rec	1	1/30/2017 9:19:26 PM	W40383
Surr: Toluene-d8	99.3	70-130		%Rec	1	1/30/2017 9:19:26 PM	W40383

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701B84

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: Trip Blank

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701B84-010

Matrix: AQUEOUS

Received Date: 1/28/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
Benzene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
Toluene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
Ethylbenzene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
Naphthalene	ND	2.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
1-Methylnaphthalene	ND	4.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
2-Methylnaphthalene	ND	4.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
Acetone	ND	10		µg/L	1	1/30/2017 11:15:23 PM	W40383
Bromobenzene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
Bromodichloromethane	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
Bromoform	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
Bromomethane	ND	3.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
2-Butanone	ND	10		µg/L	1	1/30/2017 11:15:23 PM	W40383
Carbon disulfide	ND	10		µg/L	1	1/30/2017 11:15:23 PM	W40383
Carbon Tetrachloride	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
Chlorobenzene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
Chloroethane	ND	2.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
Chloroform	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
Chloromethane	ND	3.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
2-Chlorotoluene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
4-Chlorotoluene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
cis-1,2-DCE	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
Dibromochloromethane	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
Dibromomethane	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
1,2-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
1,3-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
1,4-Dichlorobenzene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
Dichlorodifluoromethane	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
1,1-Dichloroethane	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
1,1-Dichloroethene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
1,2-Dichloropropane	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
1,3-Dichloropropane	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
2,2-Dichloropropane	ND	2.0		µg/L	1	1/30/2017 11:15:23 PM	W40383

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1701B84

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: Trip Blank

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1701B84-010

Matrix: AQUEOUS

Received Date: 1/28/2017 9:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: DJF
1,1-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
Hexachlorobutadiene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
2-Hexanone	ND	10		µg/L	1	1/30/2017 11:15:23 PM	W40383
Isopropylbenzene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
4-Isopropyltoluene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
4-Methyl-2-pentanone	ND	10		µg/L	1	1/30/2017 11:15:23 PM	W40383
Methylene Chloride	ND	3.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
n-Butylbenzene	ND	3.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
n-Propylbenzene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
sec-Butylbenzene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
Styrene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
tert-Butylbenzene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
trans-1,2-DCE	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
1,1,1-Trichloroethane	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
1,1,2-Trichloroethane	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
Trichloroethene (TCE)	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
Trichlorofluoromethane	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
1,2,3-Trichloropropane	ND	2.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
Vinyl chloride	ND	1.0		µg/L	1	1/30/2017 11:15:23 PM	W40383
Xylenes, Total	ND	1.5		µg/L	1	1/30/2017 11:15:23 PM	W40383
Surr: 1,2-Dichloroethane-d4	98.6	70-130		%Rec	1	1/30/2017 11:15:23 PM	W40383
Surr: 4-Bromofluorobenzene	84.8	70-130		%Rec	1	1/30/2017 11:15:23 PM	W40383
Surr: Dibromofluoromethane	106	70-130		%Rec	1	1/30/2017 11:15:23 PM	W40383
Surr: Toluene-d8	96.3	70-130		%Rec	1	1/30/2017 11:15:23 PM	W40383

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified



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College Station, TX 888.690.2218 • Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010394-001
Client Sample ID: 1701B84-001C GWMW15-I-170126

Report Date: 02/07/17
Collection Date: 01/26/17 11:30
Date Received: 01/31/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	02/06/17 15:46 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	02/06/17 15:46 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010394-002
Client Sample ID: 1701B84-002C GWMW15-I-17026 D

Report Date: 02/07/17
Collection Date: 01/26/17 11:30
Date Received: 01/31/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	02/06/17 16:27 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	02/06/17 16:27 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010394-003
Client Sample ID: 1701B84-003C EB-17026

Report Date: 02/07/17
Collection Date: 01/26/17 12:10
Date Received: 01/31/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	02/06/17 16:39 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	02/06/17 16:39 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010394-004
Client Sample ID: 1701B84-005C GWMW15-S-17026

Report Date: 02/07/17
Collection Date: 01/26/17 14:35
Date Received: 01/31/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	02/06/17 16:51 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	02/06/17 16:51 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



Trust our People. Trust our Data.

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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010394-005
Client Sample ID: 1701B84-007C EB-17026

Report Date: 02/07/17
Collection Date: 01/27/17 08:45
Date Received: 01/31/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	02/06/17 17:03 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	02/06/17 17:03 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



Trust our People. Trust our Data.

Billings, MT 800.735.4489 • Casper, WY 888.235.0515

College Station, TX 888.690.2218 • Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17010394-006
Client Sample ID: 1701B84-009C GWMW15-D-17027

Report Date: 02/07/17
Collection Date: 01/27/17 11:50
Date Received: 01/31/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	02/06/17 17:15 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	02/06/17 17:15 / rgk

Report Definitions: RL - Analyte reporting limit.
 QCL - Quality control limit.

MCL - Maximum contaminant level.
 ND - Not detected at the reporting limit.



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College Station, TX 888.690.2218 • Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hall Environmental

Report Date: 02/07/17

Project: Not Indicated

Work Order: H17010394

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E1632AM		Analytical Run: ARSENIC SPECIATION_170206A							
Lab ID: AS-ICV 25ppb-2/6/2017	Initial Calibration Verification Standard								02/06/17 14:34
Arsenic-III	25.5	ug/L	5.0	102	87.6	114			
Arsenic-V	24.1	ug/L	5.0	96	87	116			
Lab ID: AS-50.0-2/6/2017	Continuing Calibration Verification Standard								02/06/17 14:46
Arsenic-III	50.9	ug/L	5.0	102	85	115			
Arsenic-V	48.3	ug/L	5.0	97	85	115			
Method: E1632AM		Batch: R122552							
Lab ID: AS-LFB 50ppb-2/6/2017	Laboratory Fortified Blank								Run: ARSENIC SPECIATION_1702 02/06/17 15:10
Arsenic-III	51.0	ug/L	5.0	102	55	146			
Arsenic-V	50.0	ug/L	5.0	100	55	146			
Lab ID: ICB	Method Blank								Run: ARSENIC SPECIATION_1702 02/06/17 15:22
Arsenic-III	ND	ug/L	0.2						
Arsenic-V	ND	ug/L	0.5						
Lab ID: H17010394-001A MS	Sample Matrix Spike								Run: ARSENIC SPECIATION_1702 02/06/17 15:58
Arsenic-III	50.1	ug/L	5.0	100	55	146			
Arsenic-V	54.1	ug/L	5.0	104	55	146			
Lab ID: H17010394-001A MSD	Sample Matrix Spike Duplicate								Run: ARSENIC SPECIATION_1702 02/06/17 16:15
Arsenic-III	48.2	ug/L	5.0	96	55	146	3.9	20	
Arsenic-V	55.3	ug/L	5.0	106	55	146	2.1	20	

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701B84

07-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	MB-29957	SampType:	MBLK	TestCode:	200.8 ICPMS Metals:Total					
Client ID:	PBW	Batch ID:	29957	RunNo:	40393					
Prep Date:	1/30/2017	Analysis Date:	1/31/2017	SeqNo:	1266300	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010								
Uranium	ND	0.00050								

Sample ID	MSLCS-29957	SampType:	LCS	TestCode:	200.8 ICPMS Metals:Total					
Client ID:	LCSW	Batch ID:	29957	RunNo:	40393					
Prep Date:	1/30/2017	Analysis Date:	1/31/2017	SeqNo:	1266301	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.026	0.0010	0.02500	0	103	85	115			
Uranium	0.013	0.00050	0.01250	0	101	85	115			

Sample ID	MSLCSLL-29957	SampType:	LCSLL	TestCode:	200.8 ICPMS Metals:Total					
Client ID:	BatchQC	Batch ID:	29957	RunNo:	40393					
Prep Date:	1/30/2017	Analysis Date:	1/31/2017	SeqNo:	1266302	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.0010	0.0010	0.001000	0	103	50	150			
Uranium	ND	0.00050	0.0005000	0	99.6	50	150			

Sample ID	1701B84-001BMSLL	SampType:	MSLL	TestCode:	200.8 ICPMS Metals:Total					
Client ID:	GMMW15-I-170126	Batch ID:	29957	RunNo:	40393					
Prep Date:	1/30/2017	Analysis Date:	1/31/2017	SeqNo:	1266433	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.027	0.0050	0.02500	0.001607	101	70	130			
Uranium	0.069	0.0025	0.01250	0.05572	108	70	130			

Qualifiers:

- | | |
|---|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| H Holding times for preparation or analysis exceeded | J Analyte detected below quantitation limits |
| ND Not Detected at the Reporting Limit | P Sample pH Not In Range |
| R RPD outside accepted recovery limits | RL Reporting Detection Limit |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701B84

07-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	rb	SampType:	MBLK		TestCode:	EPA Method 8260B: VOLATILES				
Client ID:	PBW	Batch ID:	W40383		RunNo:	40383				
Prep Date:		Analysis Date:	1/30/2017		SeqNo:	1265895	Units:	µg/L		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701B84

07-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	rb	SampType: MBLK			TestCode: EPA Method 8260B: VOLATILES					
Client ID:	PBW	Batch ID: W40383			RunNo: 40383					
Prep Date:		Analysis Date: 1/30/2017			SeqNo: 1265895		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.5		10.00		95.1	70	130			
Surr: 4-Bromofluorobenzene	8.9		10.00		88.9	70	130			
Surr: Dibromofluoromethane	9.7		10.00		97.2	70	130			
Surr: Toluene-d8	9.6		10.00		96.5	70	130			

Sample ID	100ng Ics	SampType: LCS			TestCode: EPA Method 8260B: VOLATILES					
Client ID:	LCSW	Batch ID: W40383			RunNo: 40383					
Prep Date:		Analysis Date: 1/30/2017			SeqNo: 1265896		Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	101	70	130			
Toluene	20	1.0	20.00	0	101	70	130			
Chlorobenzene	20	1.0	20.00	0	99.1	70	130			

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1701B84

07-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID: 100ng lcs	SampType: LCS		TestCode: EPA Method 8260B: VOLATILES							
Client ID: LCSW	Batch ID: W40383		RunNo: 40383							
Prep Date:	Analysis Date: 1/30/2017		SeqNo: 1265896		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
1,1-Dichloroethene	24	1.0	20.00	0	119	70	130			
Trichloroethene (TCE)	21	1.0	20.00	0	105	70	130			
Surr: 1,2-Dichloroethane-d4	9.7		10.00		97.4	70	130			
Surr: 4-Bromofluorobenzene	8.6		10.00		85.6	70	130			
Surr: Dibromofluoromethane	9.6		10.00		96.5	70	130			
Surr: Toluene-d8	9.9		10.00		99.2	70	130			

Qualifiers:

- | | |
|---|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| H Holding times for preparation or analysis exceeded | J Analyte detected below quantitation limits |
| ND Not Detected at the Reporting Limit | P Sample pH Not In Range |
| R RPD outside accepted recovery limits | RL Reporting Detection Limit |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |



Hall Environmental Analysis Laboratory
 4901 Hawkins NE
 Albuquerque, NM 87109
 TEL: 505-345-3975 FAX: 505-345-4107
 Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: TER-LC

Work Order Number: 1701B84

RcptNo: 1

Received by/date: LM 01/28/17

Logged By: Anne Thorne 1/28/2017 9:00:00 AM *Anne Thorne*

Completed By: Anne Thorne 1/30/2017 9:15:05 AM *Anne Thorne*

Reviewed By: *[Signature]* 01/30/17

Chain of Custody

- 1. Custody seals intact on sample bottles? Yes No Not Present
- 2. Is Chain of Custody complete? Yes No Not Present
- 3. How was the sample delivered? FedEx

Log In

- 4. Was an attempt made to cool the samples? Yes No NA
- 5. Were all samples received at a temperature of >0° C to 6.0°C Yes No NA
- 6. Sample(s) in proper container(s)? Yes No
- 7. Sufficient sample volume for indicated test(s)? Yes No
- 8. Are samples (except VOA and ONG) properly preserved? Yes No
- 9. Was preservative added to bottles? Yes No NA
- 10. VOA vials have zero headspace? Yes No No VOA Vials
- 11. Were any sample containers received broken? Yes No
- 12. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes No
- 13. Are matrices correctly identified on Chain of Custody? Yes No
- 14. Is it clear what analyses were requested? Yes No
- 15. Were all holding times able to be met? (If no, notify customer for authorization.) Yes No

of preserved bottles checked for pH: 12
 (<2 or >12 unless noted)
 Adjusted? NO
 Checked by: pe

Special Handling (if applicable)

- 16. Was client notified of all discrepancies with this order? Yes No NA

Person Notified: _____ Date: _____
 By Whom: _____ Via: eMail Phone Fax In Person
 Regarding: _____
 Client Instructions: _____

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.3	Good	Yes			

Chain-of-Custody Record

Client: Terracon Consultants Inc

Mailing Address: 4415 D Bateman Memorial E

Las Cruces, NM 88011

Phone #: 505.527.1700

email or Fax#: Kyle.Williams@terracon.com

QA/QC Package: Standard Level 4 (Full Validation)

Accreditation: NELAP Other

EDD (Type)

Turn-Around Time:

Standard Rush

Project Name:

Cariggs - Whitcomb GW Please

Project #:

68167094

Project Manager:

Kyle Williams

Sampler:

Williams

On Ice: Yes No

Sample Temperature: 13

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No.
4/26/17	1130	GW	GW15-I-170126			1701B84
1	1130	↓	GW15-I-170126 D			202
1	1210	DI	EB-170126			202
1	1330	↓	FB-170126			204
1	1435	GW	GW15-S-170126			205
4/26/17	—	—	Trip Blank			206
4/27/17	0845	DI	EB-170126			207
1	1030	DI	FB-170126			208
4/27/17	1150	GW	GW15-D-170127			209
1	—	—	Trip Blank			210

Date:

Time:

Time:

Time:

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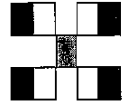
Time:

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Time:

Time:



HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

BTEX + MTBE + TMB's (8021)	
BTEX + MTBE + TPH (Gas only)	
TPH 8015B (GRO / DRO / MRO)	
TPH (Method 418.1)	
EDB (Method 504.1)	
PAH's (8310 or 8270 SIMS)	
RCRA 8 Metals	
Anions (F, Cl, NO ₃ , NO ₂ , PO ₄ , SO ₄)	
8081 Pesticides / 8082 PCB's	
8260B (VOA)	X
8270 (Semi-VOA)	X
6020 As, U	X
A3114 As specification	X
Air Bubbles (Y or N)	

Remarks:

Invoice the City of Las Cruces

Received by: [Signature] Date: 01/28/17 Time: 0900

Received by: [Signature] Date: 01/28/17 Time: 0900



Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

February 07, 2017

Kyle Williams

Terracon

4450 Bataan Memorial E

Las Cruces, NM 88005

TEL: (575) 527-1700

FAX (575) 527-1092

RE: Griggs & Walnut GW Plume

OrderNo.: 1702016

Dear Kyle Williams:

Hall Environmental Analysis Laboratory received 3 sample(s) on 2/1/2017 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifiers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

A handwritten signature in black ink, appearing to read 'Andy Freeman', is written over a white background.

Andy Freeman

Laboratory Manager

4901 Hawkins NE

Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1702016

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: EB-170131

Project: Griggs & Walnut GW Plume

Collection Date: 1/31/2017 11:10:00 AM

Lab ID: 1702016-001

Matrix: AQUEOUS

Received Date: 2/1/2017 9:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	ND	0.0010		mg/L	1	2/2/2017 12:52:00 PM	30009
Uranium	ND	0.00050		mg/L	1	2/2/2017 12:52:00 PM	30009
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
Toluene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
Ethylbenzene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
Naphthalene	ND	2.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
1-Methylnaphthalene	ND	4.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
2-Methylnaphthalene	ND	4.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
Acetone	ND	10		µg/L	1	2/1/2017 5:09:00 PM	R40430
Bromobenzene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
Bromodichloromethane	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
Bromoform	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
Bromomethane	ND	3.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
2-Butanone	ND	10		µg/L	1	2/1/2017 5:09:00 PM	R40430
Carbon disulfide	ND	10		µg/L	1	2/1/2017 5:09:00 PM	R40430
Carbon Tetrachloride	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
Chlorobenzene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
Chloroethane	ND	2.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
Chloroform	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
Chloromethane	ND	3.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
2-Chlorotoluene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
4-Chlorotoluene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
cis-1,2-DCE	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
Dibromochloromethane	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
Dibromomethane	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
1,2-Dichlorobenzene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
1,3-Dichlorobenzene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
1,4-Dichlorobenzene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
Dichlorodifluoromethane	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
1,1-Dichloroethane	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
1,1-Dichloroethene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1702016

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: EB-170131

Project: Griggs & Walnut GW Plume

Collection Date: 1/31/2017 11:10:00 AM

Lab ID: 1702016-001

Matrix: AQUEOUS

Received Date: 2/1/2017 9:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,2-Dichloropropane	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
1,3-Dichloropropane	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
2,2-Dichloropropane	ND	2.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
1,1-Dichloropropene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
Hexachlorobutadiene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
2-Hexanone	ND	10		µg/L	1	2/1/2017 5:09:00 PM	R40430
Isopropylbenzene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
4-Isopropyltoluene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
4-Methyl-2-pentanone	ND	10		µg/L	1	2/1/2017 5:09:00 PM	R40430
Methylene Chloride	ND	3.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
n-Butylbenzene	ND	3.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
n-Propylbenzene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
sec-Butylbenzene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
Styrene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
tert-Butylbenzene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
trans-1,2-DCE	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
1,1,1-Trichloroethane	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
1,1,2-Trichloroethane	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
Trichloroethene (TCE)	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
Trichlorofluoromethane	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
1,2,3-Trichloropropane	ND	2.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
Vinyl chloride	ND	1.0		µg/L	1	2/1/2017 5:09:00 PM	R40430
Xylenes, Total	ND	1.5		µg/L	1	2/1/2017 5:09:00 PM	R40430
Surr: 1,2-Dichloroethane-d4	115	70-130		%Rec	1	2/1/2017 5:09:00 PM	R40430
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	2/1/2017 5:09:00 PM	R40430
Surr: Dibromofluoromethane	112	70-130		%Rec	1	2/1/2017 5:09:00 PM	R40430
Surr: Toluene-d8	105	70-130		%Rec	1	2/1/2017 5:09:00 PM	R40430

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1702016

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: CLC57-170131

Project: Griggs & Walnut GW Plume

Collection Date: 1/31/2017 1:35:00 PM

Lab ID: 1702016-002

Matrix: AQUEOUS

Received Date: 2/1/2017 9:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
200.8 ICPMS METALS:TOTAL							Analyst: JLF
Arsenic	ND	0.0010		mg/L	1	2/2/2017 12:57:09 PM	30009
Uranium	ND	0.00050		mg/L	1	2/2/2017 12:57:09 PM	30009
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
Toluene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
Ethylbenzene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
Naphthalene	ND	2.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
1-Methylnaphthalene	ND	4.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
2-Methylnaphthalene	ND	4.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
Acetone	ND	10		µg/L	1	2/1/2017 5:33:00 PM	R40430
Bromobenzene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
Bromodichloromethane	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
Bromoform	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
Bromomethane	ND	3.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
2-Butanone	ND	10		µg/L	1	2/1/2017 5:33:00 PM	R40430
Carbon disulfide	ND	10		µg/L	1	2/1/2017 5:33:00 PM	R40430
Carbon Tetrachloride	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
Chlorobenzene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
Chloroethane	ND	2.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
Chloroform	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
Chloromethane	ND	3.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
2-Chlorotoluene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
4-Chlorotoluene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
cis-1,2-DCE	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
Dibromochloromethane	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
Dibromomethane	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
1,2-Dichlorobenzene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
1,3-Dichlorobenzene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
1,4-Dichlorobenzene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
Dichlorodifluoromethane	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
1,1-Dichloroethane	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
1,1-Dichloroethene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1702016

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: CLC57-170131

Project: Griggs & Walnut GW Plume

Collection Date: 1/31/2017 1:35:00 PM

Lab ID: 1702016-002

Matrix: AQUEOUS

Received Date: 2/1/2017 9:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,2-Dichloropropane	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
1,3-Dichloropropane	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
2,2-Dichloropropane	ND	2.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
1,1-Dichloropropene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
Hexachlorobutadiene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
2-Hexanone	ND	10		µg/L	1	2/1/2017 5:33:00 PM	R40430
Isopropylbenzene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
4-Isopropyltoluene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
4-Methyl-2-pentanone	ND	10		µg/L	1	2/1/2017 5:33:00 PM	R40430
Methylene Chloride	ND	3.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
n-Butylbenzene	ND	3.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
n-Propylbenzene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
sec-Butylbenzene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
Styrene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
tert-Butylbenzene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
trans-1,2-DCE	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
1,1,1-Trichloroethane	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
1,1,2-Trichloroethane	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
Trichloroethene (TCE)	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
Trichlorofluoromethane	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
1,2,3-Trichloropropane	ND	2.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
Vinyl chloride	ND	1.0		µg/L	1	2/1/2017 5:33:00 PM	R40430
Xylenes, Total	ND	1.5		µg/L	1	2/1/2017 5:33:00 PM	R40430
Surr: 1,2-Dichloroethane-d4	112	70-130		%Rec	1	2/1/2017 5:33:00 PM	R40430
Surr: 4-Bromofluorobenzene	107	70-130		%Rec	1	2/1/2017 5:33:00 PM	R40430
Surr: Dibromofluoromethane	112	70-130		%Rec	1	2/1/2017 5:33:00 PM	R40430
Surr: Toluene-d8	102	70-130		%Rec	1	2/1/2017 5:33:00 PM	R40430

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:			
*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1702016

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: Trip Blank

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1702016-003

Matrix: AQUEOUS

Received Date: 2/1/2017 9:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
Benzene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
Toluene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
Ethylbenzene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
1,2,4-Trimethylbenzene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
1,3,5-Trimethylbenzene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
1,2-Dichloroethane (EDC)	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
1,2-Dibromoethane (EDB)	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
Naphthalene	ND	2.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
1-Methylnaphthalene	ND	4.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
2-Methylnaphthalene	ND	4.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
Acetone	ND	10		µg/L	1	2/1/2017 5:57:00 PM	R40430
Bromobenzene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
Bromodichloromethane	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
Bromoform	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
Bromomethane	ND	3.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
2-Butanone	ND	10		µg/L	1	2/1/2017 5:57:00 PM	R40430
Carbon disulfide	ND	10		µg/L	1	2/1/2017 5:57:00 PM	R40430
Carbon Tetrachloride	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
Chlorobenzene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
Chloroethane	ND	2.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
Chloroform	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
Chloromethane	ND	3.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
2-Chlorotoluene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
4-Chlorotoluene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
cis-1,2-DCE	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
cis-1,3-Dichloropropene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
1,2-Dibromo-3-chloropropane	ND	2.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
Dibromochloromethane	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
Dibromomethane	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
1,2-Dichlorobenzene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
1,3-Dichlorobenzene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
1,4-Dichlorobenzene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
Dichlorodifluoromethane	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
1,1-Dichloroethane	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
1,1-Dichloroethene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
1,2-Dichloropropane	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
1,3-Dichloropropane	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
2,2-Dichloropropane	ND	2.0		µg/L	1	2/1/2017 5:57:00 PM	R40430

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
	D	Sample Diluted Due to Matrix	E	Value above quantitation range
	H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
	ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
	R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
	S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

Analytical Report

Lab Order 1702016

Date Reported: 2/7/2017

CLIENT: Terracon

Client Sample ID: Trip Blank

Project: Griggs & Walnut GW Plume

Collection Date:

Lab ID: 1702016-003

Matrix: AQUEOUS

Received Date: 2/1/2017 9:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8260B: VOLATILES							Analyst: BCN
1,1-Dichloropropene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
Hexachlorobutadiene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
2-Hexanone	ND	10		µg/L	1	2/1/2017 5:57:00 PM	R40430
Isopropylbenzene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
4-Isopropyltoluene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
4-Methyl-2-pentanone	ND	10		µg/L	1	2/1/2017 5:57:00 PM	R40430
Methylene Chloride	ND	3.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
n-Butylbenzene	ND	3.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
n-Propylbenzene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
sec-Butylbenzene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
Styrene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
tert-Butylbenzene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
1,1,1,2-Tetrachloroethane	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
1,1,2,2-Tetrachloroethane	ND	2.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
Tetrachloroethene (PCE)	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
trans-1,2-DCE	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
trans-1,3-Dichloropropene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
1,2,3-Trichlorobenzene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
1,2,4-Trichlorobenzene	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
1,1,1-Trichloroethane	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
1,1,2-Trichloroethane	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
Trichloroethene (TCE)	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
Trichlorofluoromethane	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
1,2,3-Trichloropropane	ND	2.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
Vinyl chloride	ND	1.0		µg/L	1	2/1/2017 5:57:00 PM	R40430
Xylenes, Total	ND	1.5		µg/L	1	2/1/2017 5:57:00 PM	R40430
Surr: 1,2-Dichloroethane-d4	110	70-130		%Rec	1	2/1/2017 5:57:00 PM	R40430
Surr: 4-Bromofluorobenzene	107	70-130		%Rec	1	2/1/2017 5:57:00 PM	R40430
Surr: Dibromofluoromethane	111	70-130		%Rec	1	2/1/2017 5:57:00 PM	R40430
Surr: Toluene-d8	100	70-130		%Rec	1	2/1/2017 5:57:00 PM	R40430

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:	* Value exceeds Maximum Contaminant Level.	B Analyte detected in the associated Method Blank
	D Sample Diluted Due to Matrix	E Value above quantitation range
	H Holding times for preparation or analysis exceeded	J Analyte detected below quantitation limits
	ND Not Detected at the Reporting Limit	P Sample pH Not In Range
	R RPD outside accepted recovery limits	RL Reporting Detection Limit
	S % Recovery outside of range due to dilution or matrix	W Sample container temperature is out of limit as specified



Trust our People. Trust our Data.

Billings, MT 800.735.4489 • Casper, WY 888.235.0515

College Station, TX 888.690.2218 • Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17020031-001
Client Sample ID: 1702016-001C EB-170131

Report Date: 02/07/17
Collection Date: 01/31/17 11:10
Date Received: 02/02/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	02/06/17 17:39 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	02/06/17 17:39 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



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LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: Hall Environmental
Project: Not Indicated
Lab ID: H17020031-002
Client Sample ID: 1702016-002C CLC57-170131

Report Date: 02/07/17
Collection Date: 01/31/17 13:35
Date Received: 02/02/17
Matrix: Aqueous

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
SPECIATED, TOTAL							
Arsenic-III	ND	ug/L		5		E1632AM	02/06/17 17:51 / rgk
Arsenic-V	ND	ug/L		5		E1632AM	02/06/17 17:51 / rgk

Report Definitions: RL - Analyte reporting limit.
QCL - Quality control limit.

MCL - Maximum contaminant level.
ND - Not detected at the reporting limit.



Trust our People. Trust our Data.

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College Station, TX 888.690.2218 • Gillette, WY 866.686.7175 • Helena, MT 877.472.0711

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: Hall Environmental

Report Date: 02/07/17

Project: Not Indicated

Work Order: H17020031

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E1632AM		Analytical Run: ARSENIC SPECIATION_170206A							
Lab ID: AS-ICV 25ppb-2/6/2017	Initial Calibration Verification Standard								02/06/17 14:34
Arsenic-III	25.5	ug/L	5.0	102	87.6	114			
Arsenic-V	24.1	ug/L	5.0	96	87	116			
Lab ID: AS-50.0-2/6/2017	Continuing Calibration Verification Standard								02/06/17 14:46
Arsenic-III	50.9	ug/L	5.0	102	85	115			
Arsenic-V	48.3	ug/L	5.0	97	85	115			
Method: E1632AM		Batch: R122552							
Lab ID: AS-LFB 50ppb-2/6/2017	Laboratory Fortified Blank				Run: ARSENIC SPECIATION_1702		02/06/17 15:10		
Arsenic-III	51.0	ug/L	5.0	102	55	146			
Arsenic-V	50.0	ug/L	5.0	100	55	146			
Lab ID: ICB	Method Blank				Run: ARSENIC SPECIATION_1702		02/06/17 15:22		
Arsenic-III	ND	ug/L	0.2						
Arsenic-V	ND	ug/L	0.5						
Lab ID: H17010394-001A MS	Sample Matrix Spike				Run: ARSENIC SPECIATION_1702		02/06/17 15:58		
Arsenic-III	50.1	ug/L	5.0	100	55	146			
Arsenic-V	54.1	ug/L	5.0	104	55	146			
Lab ID: H17010394-001A MSD	Sample Matrix Spike Duplicate				Run: ARSENIC SPECIATION_1702		02/06/17 16:15		
Arsenic-III	48.2	ug/L	5.0	96	55	146	3.9	20	
Arsenic-V	55.3	ug/L	5.0	106	55	146	2.1	20	
Lab ID: H17010304-005E MS	Sample Matrix Spike				Run: ARSENIC SPECIATION_1702		02/06/17 20:05		
Arsenic-III	55.1	ug/L	5.0	102	55	146			
Arsenic-V	386	ug/L	5.0		55	146			A
Lab ID: H17010304-005E MSD	Sample Matrix Spike Duplicate				Run: ARSENIC SPECIATION_1702		02/06/17 20:17		
Arsenic-III	54.0	ug/L	5.0	100	55	146	1.9	20	
Arsenic-V	399	ug/L	5.0		55	146	3.3	20	A

Qualifiers:

RL - Analyte reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

ND - Not detected at the reporting limit.

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1702016

07-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	MB-30009	SampType:	MBLK	TestCode:	200.8 ICPMS Metals:Total					
Client ID:	PBW	Batch ID:	30009	RunNo:	40475					
Prep Date:	2/1/2017	Analysis Date:	2/2/2017	SeqNo:	1268406	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010								
Uranium	ND	0.00050								

Sample ID	MSLCS-30009	SampType:	LCS	TestCode:	200.8 ICPMS Metals:Total					
Client ID:	LCSW	Batch ID:	30009	RunNo:	40475					
Prep Date:	2/1/2017	Analysis Date:	2/2/2017	SeqNo:	1268407	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	0.025	0.0010	0.02500	0	102	85	115			
Uranium	0.013	0.00050	0.01250	0	104	85	115			

Sample ID	MSLCSLL-30009	SampType:	LCSLL	TestCode:	200.8 ICPMS Metals:Total					
Client ID:	BatchQC	Batch ID:	30009	RunNo:	40475					
Prep Date:	2/1/2017	Analysis Date:	2/2/2017	SeqNo:	1268408	Units:	mg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	0.0010	0.001000	0	91.5	50	150			
Uranium	ND	0.00050	0.0005000	0	97.9	50	150			

Qualifiers:

- | | |
|---|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| H Holding times for preparation or analysis exceeded | J Analyte detected below quantitation limits |
| ND Not Detected at the Reporting Limit | P Sample pH Not In Range |
| R RPD outside accepted recovery limits | RL Reporting Detection Limit |
| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1702016

07-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID 100ng lcs	SampType: LCS		TestCode: EPA Method 8260B: VOLATILES							
Client ID: LCSW	Batch ID: R40430		RunNo: 40430							
Prep Date:	Analysis Date: 2/1/2017		SeqNo: 1267163		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	24	1.0	20.00	0	118	70	130			
Toluene	22	1.0	20.00	0	110	70	130			
Chlorobenzene	22	1.0	20.00	0	111	70	130			
1,1-Dichloroethene	23	1.0	20.00	0	117	70	130			
Trichloroethene (TCE)	23	1.0	20.00	0	115	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		113	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		107	70	130			
Surr: Dibromofluoromethane	11		10.00		108	70	130			
Surr: Toluene-d8	10		10.00		102	70	130			

Sample ID rb	SampType: MBLK		TestCode: EPA Method 8260B: VOLATILES							
Client ID: PBW	Batch ID: R40430		RunNo: 40430							
Prep Date:	Analysis Date: 2/1/2017		SeqNo: 1267164		Units: µg/L					
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
1,2,4-Trimethylbenzene	ND	1.0								
1,3,5-Trimethylbenzene	ND	1.0								
1,2-Dichloroethane (EDC)	ND	1.0								
1,2-Dibromoethane (EDB)	ND	1.0								
Naphthalene	ND	2.0								
1-Methylnaphthalene	ND	4.0								
2-Methylnaphthalene	ND	4.0								
Acetone	ND	10								
Bromobenzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	3.0								
2-Butanone	ND	10								
Carbon disulfide	ND	10								
Carbon Tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	2.0								
Chloroform	ND	1.0								
Chloromethane	ND	3.0								
2-Chlorotoluene	ND	1.0								

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1702016

07-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	rb	SampType:	MBLK		TestCode:	EPA Method 8260B: VOLATILES				
Client ID:	PBW	Batch ID:	R40430		RunNo:	40430				
Prep Date:		Analysis Date:	2/1/2017		SeqNo:	1267164	Units:	µg/L		

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
4-Chlorotoluene	ND	1.0								
cis-1,2-DCE	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	2.0								
Dibromochloromethane	ND	1.0								
Dibromomethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,3-Dichlorobenzene	ND	1.0								
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2-Dichloropropane	ND	1.0								
1,3-Dichloropropane	ND	1.0								
2,2-Dichloropropane	ND	2.0								
1,1-Dichloropropene	ND	1.0								
Hexachlorobutadiene	ND	1.0								
2-Hexanone	ND	10								
Isopropylbenzene	ND	1.0								
4-Isopropyltoluene	ND	1.0								
4-Methyl-2-pentanone	ND	10								
Methylene Chloride	ND	3.0								
n-Butylbenzene	ND	3.0								
n-Propylbenzene	ND	1.0								
sec-Butylbenzene	ND	1.0								
Styrene	ND	1.0								
tert-Butylbenzene	ND	1.0								
1,1,1,2-Tetrachloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	2.0								
Tetrachloroethene (PCE)	ND	1.0								
trans-1,2-DCE	ND	1.0								
trans-1,3-Dichloropropene	ND	1.0								
1,2,3-Trichlorobenzene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,1,1-Trichloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
Trichloroethene (TCE)	ND	1.0								
Trichlorofluoromethane	ND	1.0								
1,2,3-Trichloropropane	ND	2.0								

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- D Sample Diluted Due to Matrix
- H Holding times for preparation or analysis exceeded
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- S % Recovery outside of range due to dilution or matrix
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- J Analyte detected below quantitation limits
- P Sample pH Not In Range
- RL Reporting Detection Limit
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: 1702016

07-Feb-17

Client: Terracon
Project: Griggs & Walnut GW Plume

Sample ID	rb	SampType: MBLK		TestCode: EPA Method 8260B: VOLATILES						
Client ID:	PBW	Batch ID: R40430		RunNo: 40430						
Prep Date:		Analysis Date: 2/1/2017		SeqNo: 1267164			Units: µg/L			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Vinyl chloride	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	11		10.00		113	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		105	70	130			
Surr: Dibromofluoromethane	11		10.00		109	70	130			
Surr: Toluene-d8	10		10.00		101	70	130			

Qualifiers:

- | | |
|---|---|
| * Value exceeds Maximum Contaminant Level. | B Analyte detected in the associated Method Blank |
| D Sample Diluted Due to Matrix | E Value above quantitation range |
| H Holding times for preparation or analysis exceeded | J Analyte detected below quantitation limits |
| ND Not Detected at the Reporting Limit | P Sample pH Not In Range |
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| S % Recovery outside of range due to dilution or matrix | W Sample container temperature is out of limit as specified |



Hall Environmental Analysis Laboratory
 4901 Hawkins NE
 Albuquerque, NM 87109
 TEL: 505-345-3975 FAX: 505-345-4107
 Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: TER-LC

Work Order Number: 1702016

RcptNo: 1

Received by/date: aj 2/1/17

Logged By: Andy Jansson 2/1/2017 9:15:00 AM *aj*

Completed By: Andy Jansson 2/1/17

Reviewed By: aj 02/01/17

Chain of Custody

- 1. Custody seals intact on sample bottles? Yes No Not Present
- 2. Is Chain of Custody complete? Yes No Not Present
- 3. How was the sample delivered? FedEx

Log In

- 4. Was an attempt made to cool the samples? Yes No NA
- 5. Were all samples received at a temperature of >0° C to 6.0°C Yes No NA
- 6. Sample(s) in proper container(s)? Yes No
- 7. Sufficient sample volume for indicated test(s)? Yes No
- 8. Are samples (except VOA and ONG) properly preserved? Yes No
- 9. Was preservative added to bottles? Yes No NA
- 10. VOA vials have zero headspace? Yes No No VOA Vials
- 11. Were any sample containers received broken? Yes No
- 12. Does paperwork match bottle labels?
(Note discrepancies on chain of custody) Yes No
- 13. Are matrices correctly identified on Chain of Custody? Yes No
- 14. Is it clear what analyses were requested? Yes No
- 15. Were all holding times able to be met?
(If no, notify customer for authorization.) Yes No

of preserved bottles checked for pH: 4
 (<2 or >12 unless noted)
 Adjusted? NO
 Checked by: ke

Special Handling (if applicable)

- 16. Was client notified of all discrepancies with this order? Yes No NA

Person Notified: _____ Date: _____
 By Whom: _____ Via: eMail Phone Fax In Person
 Regarding: _____
 Client Instructions: _____

17. Additional remarks:

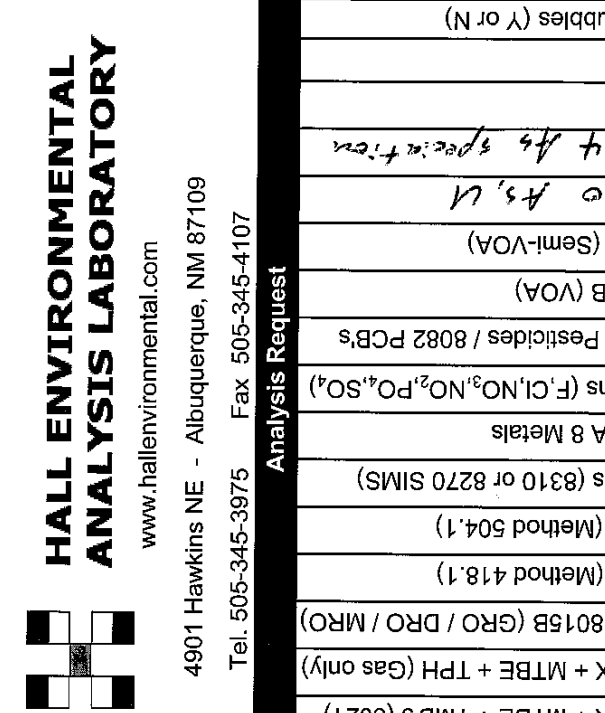
18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.6	Good	Yes			

Chain-of-Custody Record

Client: Terracon Consultants, Inc.
 Mailing Address: 4430 Beatean Memorial E
Los Cruces, NM 88011
 Phone #: 575.527.1700
 email or Fax#: kyle.williams@terracon.com
 QA/QC Package:
 Standard Level 4 (Full Validation)
 Accreditation
 NELAP Other _____
 EDD (Type) _____

Turn-Around Time:
 Standard Rush
 Project Name:
Coyogs-Walnut G.W. Plume
 Project #:
68167094
 Project Manager:
Kyle Williams
 Sampler: Williams
 On Ice: Yes No
 Sample Temperature: 1.6°C to 0.50°C
 Preservative Type
 HEAL No. 1702016
 Container Type and #
-001
-002
-003



Date	Time	Matrix	Sample Request ID	Analysis Request
3/31/17	1110	DI	EB-170131	BTEX + MTBE + TMBs (8021)
↓	1335	GW	CLC57-170131	BTEX + MTBE + TPH (Gas only)
↓	-	-	Trip Blank	TPH 8015B (GRO / DRO / MRO)
				TPH (Method 418.1)
				EDB (Method 504.1)
				PAH's (8310 or 8270 SIMS)
				RCRA 8 Metals
				Anions (F, Cl, NO3, NO2, PO4, SO4)
				8081 Pesticides / 8082 PCB's
				8260B (VOA)
				8270 (Semi-VOA)
				Air Bubbles (Y or N)

Date: 3/31/17 Time: 1430 Relinquished by: William
 Date: 02/17/2015 Time: _____ Received by: _____
 Remarks:
Invoice the City of Los Cruces

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

APPENDIX D

Field Logs

12-28-16

11:30 Arrive MW 6, opened well
 observations: well casing blocked
 at ~ 1.5' below ground. unable to
 remove hydro-sleeve sampling rope
 from well. Water level indicator
 encountered obstruction at 190.5'
 bgs. Probe c.p. muddy. No Sample.
 Lat: 32.31504 } MW 6
 Long: -106.75664 }

12:00 Arrive MW 1, opened well
 observations: sample line removed
 well casing appears OK. well
 vault intact.
 DTW 192.40' } WC: 3.59'
 TP 195.99' }
 installed Hydro sleeve.
 Lat: 32.31517 } MW 1
 Long: -106.75801 }

WC: water column

12-28-16

13:30 Arrive ^{MW SF 1} ~~MW 5~~ opened well
 observations: well vault OK
 well casing blocked at 59.90' bgs
 - no DTW, no sample
 Lat: 32.31575 } MW SF 1
 Long: -106.75814 }

14:00 Arrive MW 2, opened well
 observations: well vault OK,
 well casing blocked @ 18" bgs
 Lat: 32.31938 } MW 2
 Long: -106.75803 }

14:30 MW 4 opened.
 observations: well vault OK.
 removed sample line
 DTW - no water,
 TP - 185.71' bgs.
 No sample

Lat: 32.31494 } MW 4
 Long: -106.75928 }

14:45 MW SF 3 unable to
 locate *Remedia.*

12-28-16

14:50 MW-SF2 unable to locate

15:00 MW-3 opened.

observations: well vault cap cracked at hole entry.

removed sample liner.

DTW 189.55' } WC = 0.16'

TD 189.71' }

new sample

Lat: 32.31557 } MW-3

Long: -106.75891 }

15:10 MW-SF5, opened well

observations: well vault cap OK
well casing appears OK.

DTW 147.83' } WC = 5.52

TD 153.35' }

set hydro sleeve

Lat 32.31753 } MW-SF5

Long: -106.76299 }

12-28-16

15:35 MW-SF10 opened

observations: well vault cap OK
well casing appears OK

DTW 194.68' } MW-SF10

TD 204.44' } WC = 9.76

set hydro sleeve

Lat: 32.31904' } MW-SF10

Long: -106.75524' }

MW-SF4 - wood shawl

MW-SF6 - wood shawl

MW-SF3 - unable to locate

12-29-16

0915 MW-5, opened
observations: well vault OK
DTW - day
TD - 191.8'
No Sample
Lat: 32.31466 } MW-5
Long: -106.75774 }

0930 MW-SF9, opened
observations: well vault OK
well casing OK
DTW 190.13 } wt: 12.97
TD 203.10 }
got hydrostave
Lat: 32.31443 } MW-SF9
Long: -106.75432 }

1015 CW MW01, opened
well vault OK, well
lining + joint OK
Lat: 32.31589
Long: -106.75860

12-29-16

1030 MW-SF4 opened
well vault OK
DTW 39.1
TD - 81.3
well appears plugged.
perched water??
Lat: 32.31563
Long: -106.76047 (76047)
got hydrostave

1105 MW-SF6 opened
well vault + casing OK
DTW - 128.77 } wt - 3.88
TD - 132.25 }
pulled sample line, de-biasing
sampler in place. collected
diffusion sampler and set
hydrostave.
Lat: 32.31762
Long: -106.76655

diffusion sampler collected
@ 1115 12-29-16
Sample ID - MW-SF6
12-29

Roosterham

1-3-17

Sampling MW-1 ✓

MW-SF5 ✓

MW-SF10 ✓

MW-SF9 ✓

MW-SF4 ✓ (suspect perched
water)

MW-SF6 ✓

0900 Arrive MW-1 - set up to sample
sample no. MW1-170103
water level insufficient to
sample with hydro-sleeve -
will bail sample

T 20.3 °C

DO 47.5 %

SFC 1540 $\mu\text{S}/\text{cm}$

Res 712.1 $\Omega\text{-cm}$

TDS 1001 mg/L

pH 7.03

ORP 1050 mV

NTU 95.5

1-3-17

1000 -

MW-SF4 Set up to sample

sample no. MW-SF4-170103

T 20.0 °C

DO 20.3 %

SFC 1172 $\mu\text{S}/\text{cm}$

Res 926.1 $\Omega\text{-cm}$

TDS 765.5

pH 7.24

ORP -96.2

NTU 121.5

1045 MW-SF5

sample no. MW-SF5-170103

and MW-SF5-170103 D

T 21.4 °C

DO 66 %

SFC 2011 $\mu\text{S}/\text{cm}$

Res 533 $\Omega\text{-cm}$

TDS 1309 mg/L

pH 6.95

ORP 141.6 mV

NTU 18.3

1-3-17

1130 MW-SF6 set up for sampling.

sample no MW-SF6-170103

T 20.2 °C
DO 58.9 %
SPC 2433 $\mu\text{S/cm}$
R_s 412.7 $\Omega\text{-cm}$
TDS 1585 mg/L
pH 6.95
ORP 153.2 mV
NTU 74.50

1300 MW-SF9 sampling

sample no MW-SF9-170103

T 18.9 °C
DO 75.3 %
SPC 124 $\mu\text{S/cm}$
R_s 942 $\Omega\text{-cm}$
TDS 181 mg/L
pH 6.91
ORP 166 mV
NTU 82.6

1-3-17

1430 MW-SF10 sampling

sample no MW-SF10-170103

T 19.1 °C
DO 58.1 %
SPC 1451 $\mu\text{S/cm}$
R_s 776.7 $\Omega\text{-cm}$
TDS 943 mg/L
pH 6.62
ORP 174.7 mV
NTU 74.6

1-4-17

1150 CLL 18 gauge DTW

Sample no. 746 DTW 201.7

CLL 18-170104

+ MS -106.759083

Lat. 32.315039, Long. ~~106.759083~~

1210 CLL 27 gauge DTW 234.7

Sample no. 1144 static 236.5

CLL 27-170104

Lat. 32.315410, Long. -106.755449

1220 CLL 26 DTW 175.28

Sample no.

CLL 26-170104

+ Dup No sample

Lat. 32.309327, Long. -106.755341

1250 CLL Par Park DTW 174

Sample No

CLL Par-170104

+ Dup -106.760092

Lat. 32.321075, Long. ~~106.760092~~

1330 CLL 20 DTW 235.3

Lat 32.311457, Long. -106.747612

1400 CLL 57 DTW 290.85

Lat. 32.315681, Long. -106.741827

1-5-17

Purge and sample wells
previously sampled using
hydro-sleeve. Includes

MW-1

MW-SF 4

MW-SF 5

MW-SF 6

MW-SF 7

MW-SF 10

1020 Set hydro-sleeve in

CLL 57, CLL 26, CLL 20

CLL 57, set at 320' DTW 295.4

CLL 20, set at 285' DTW 235.7

CLL 26, set at 200' DTW 175.5

1700 MW-1 purge + sample

DTW 192.51 } LLC = 3.49

TP 155.49 }

2' well c1657/ft

well vol: 0.164 x 3.48 = 0.569

purge vol: 1.68 gal

begin bailing.

(continued)

1-5-17

1200 MW-1 cont. record

	1000	2000	3000
T (°C)	20.1	20.2	20.2
DO (%)	43.0	49.5	47.4
SPC (µS/cm)	1694	1695	1900
R _{ms} (20-cm)	67.7	64.5	61.1
TDS (mg/l)	1059	1110	1172
pH	6.61	6.60	6.63
ORP (mV)	171	164	159
NTU	45.0	60.0	65.3

1240 sampled MW-1

sample no. MW-1-170105

1350 MW-SF5 purge & sample

DTU 147.872 L_{vol} = 5.48'

TD 193.35'

well vol = 2.7 gal

purge vol = 2.7 gal

begin boiling

1-5-17

MW-SF5	1000	2000	3000
T (°C)	20.3	20.2	20.3
DO (%)	60.7	69.3	70.6
SPC (µS/cm)	1999	1991	2001
R _{ms} (20-cm)	548	552	546
TDS (mg/l)	1300	1295	1304
pH	6.79	6.86	6.88
ORP (mV)	161	156	153
NTU	11.9	8.6	12.7

1430 collected sample MW-SF5

sample no. MW-SF5-170105

1-5-17

1500 MW-SFG purge + sample

DTC = 128.80 } wc = 3.45

TD 132.25 }

well vol (2" well) = 3.45 x 0.163 = 0.56 g

purge vol = 1.68 gal

begin bailing

MW-SFG	1w.o.	2w.o.	3w.o.
T (°C)	20.7	20.6	20.7
DO (%)	67.4	74.5	74.8
SPL (mg/cm)	2375	2428	2445
Res (Ω/cm)	449	449	445
TDS (mg/L)	1543	1580	1589
pH	6.54	6.86	6.82
ORP (mV)	165	154	152
NTU	275	304	957

1530 sampled MW-SFG

sample no MW-SFG-170103

1-6-17

0900 CLC 26 sample hydro sleeve

sample no CLC26-170106

T (°C)	16.5
DO (%)	64.5
SPL (mg/cm)	708
Res (Ω/cm)	1690
TDS (mg/L)	460
pH	6.85
ORP (mV)	62.7
NTU	7.4

0950 CLC 20 sample hydro sleeve

sample no CLC20-170106

T (°C)	17.6
DO (%)	57.5
SPL (mg/cm)	895
Res (Ω/cm)	1308
TDS (mg/L)	587
pH	7.20
ORP (mV)	97.5
NTU	16.0

1-6-17

1015 CLL57 sample-hydrostat...
sample no. CLL57-170106

T (°C)	19.3
DO (%)	70.2
SPL (mg/cm)	416
PO ₄ (µm)	270.7
TDS (mg/L)	269
pH	7.38
ORP (mV)	119
NTU	13.8

1-9-17

0900 GWMWDB - set up the
pump

tag DTW	176.5'
Part 1	176.5'
Part 2	176.1'
added 5-gal water	
Tag DTW	173.8'
Part 1	173.8'

N₂ on at 1117L (part 5, 6, 7)
H₂O return 1118
tagged 1 @ 1128 P 5, 6, 7

H₂ on @ 1133 P 2, 3, 4; H₂O @ 1134
1142 tagged.

2nd part 2 N₂ leak
N₂ on @ 1202 P 5, 6, 7 H₂O August 1203 1205
3rd tag 1230 P 5, 6, 7 H₂O 1231 1235
N₂ on @ 1215 P 3, 4, H₂O 1215
tag 1233 H₂O @ 1234

Lat. 32.91870, Long. 106.75895

Blue water

1-9-17

GWRWOB

Part 7	1 st	2 nd	3 rd
T	20.3		20.1
DO	21.6		13.4
S/C	545		1310
R.S	2011		830
TDS	354		850
pH	7.61		7.96
ORP	-136		-164
NTU	1.8		2.9

Part 6	1 st	2 nd	3 rd
T	20.4		20.7
DO	20.1		31.5
S/C	498		537
R.S	2530		2026
TDS	264		389
pH	7.79		8.15
ORP	-137		-76.6
NTU	11.6		0.6

1-9-17

Part 5	1 st	2 nd	3 rd
T	20.4		21.1
DO	21.2		25.8
S/C	403		1030
R.S	2722		999
TDS	201		702
pH	7.87		6.77
ORP	-154		-76.2
NTU	3.6		12.6

Part 3	1 st	2 nd	3 rd
T	19.7		20.7
DO	40.9		19.3
S/C	810		2213
R.S	1354		434
TDS	521		1439
pH	10.64		6.26
ORP	-93.2		-123.1
NTU	0.8		5.5

1-9-17

Port 4	1 st	2 nd	3 rd
T	19.8		20.6
DO	32.9		22.3
SPC	501		2076
Res	2190		523
TDS	325		1350
pH	8.90		6.94
ORP	1101		-108
NTU	1.3		1.1

1300 Purged 5 ports 3 purges each.

Port 3, purged ~ 6 gal
 4 6 gal
 5 5.5 gal
 6 5.5 gal
 7 5.5 gal

Lunch

1-9-17

Time	Sample No.	Flow
1345	Sampling CUMW08	
1405	CUMW08-07-170109	7
1415	CUMW08-06-170109	6
1425	CUMW08-05-170109	5
1435	CUMW08-04-170109	4
1445	CUMW08-03-170109	3

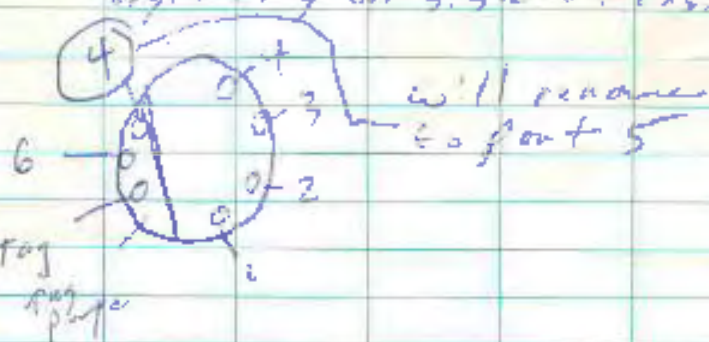
CUMW08: fittings should be replaced.
 Ports 1 & 2 not functioning
 P1: break down hole
 P2: break down hole

1-10-17

GWS MW 03

0945 tag 117.7' } OK to start
 part 1 127.9' } purge.

6 ports, labelled 1, 2, 3, 4, 5, 6
 beginning on S. side of casing



1005 start purge 1, 1, 2, 3 (min H₂O) 1000

1015 Purge 1, 1, 2, 3 14"

1020 start purge 1 4, 5, 6

1028 Purge 1, 4, 5, 6 15"

1050 Purge 1, 1, 2, 3 22" 1051 H₂O

1100 Purge 1, 1, 2, 3

1105 Purge 1, 4, 5, 6 - P4, 5 - no recharge

1115 Purge P6

1130 Purge 1, 1, 2, 3 1132 H₂O 1135 P6

1139 13 purged: 1141 P1 purged

1145 Purge 1, 4, 5, 6 P6 into 1147
 1, 4, 5 are recharge: 1156 P6 purged

Sample after lunch.

Purge Parameters GWS MW 03 1-10-17

Purge #	Port	T	DO	SPC	Fe	Mn	pH	ORP	ATU	vol
		°C	%	ppm	ppm	ppm	av	av	gal	
1	1	20.4	8.0	1997	549	1079	7.66	-144	1005	1.5
	2	20.3	9.6	2258	490	1459	7.75	-150	2381	1.5
	3	20.6	9.7	2259	478	1492	7.14	-166	383	1.5
2	1	20.5	5.3	1474	800	874	9.05	-145	1718	1.5
	2	20.3	7.3	1507	727	919	9.20	-155	1889	1.0
	3	20.5	6.5	1600	677	1043	10.99	-179	848	0.3
3	1	20.4	5.1	1582	676	1002	11.99	-209	1365	1.5
	2	20.5	3.9	1926	551	1410	8.25	-245	2623	1.5
	3	20.8	2.1	1559	679	1002	11.58	-225	843	1.5
4	1	21.9	5.7	2350	1576	1545	11.82	-262	151	1.3
	2	NO RECHARGE								0
	3	NO RECHARGE								0
5	1	20.3	5.1	1580	571	571	11.14	-214	1495	1.3
	2	NO RECHARGE								0
	3	NO RECHARGE								0
6	1	20.3	1.8	7099	1372	576	10.42	-350	1770	1.3
	2	20.4	4.9	832	1425	546	11.28	-213	3435	1.3
	3	20.6	5.5	836	1315	530	11.01	-175	867	1.3

Robert Wilson

1-10-17 GWMW03

1215 Collected Field Blank
sample no. FB-170110
- lunch -

1345 - set up for sampling GWMW03

Time	Sample No.	Point
1350	<u>GWMW03-01-170110</u>	1
1350	<u>GWMW03-01-170110 D</u>	
1355	<u>GWMW03-02-170110</u>	2
1400	<u>GWMW03-03-170110</u>	3
1410	<u>GWMW03-06-170110</u>	6
1410	<u>GWMW03-06-170110 MS</u>	

Lat. 32.31722, Long. -706.26120

1-10-17

1440 MWSF10 ^{hr: 1 + Sample}
UTW: 17468 2 wt. = 9.76
TD = 20444

2 well vol. $9.76 \times 0.163 = 1.59 \text{ gal}$
pump vol. = $1.6 \times 3 = 4.8 \text{ gal}$

MWSF10	1 wt.	2 wt.	3 wt.
T (°C)	21.0	20.6	20.5
DO (%)	25.5	27.7	20.0
SK (mg/L)	1352	1335	1302
R ₁₂ (mg/L)	800	818	839
TD (mg/L)	879	867	846
pH	6.64	7.03	7.06
ORP (mV)	167	156	159
NTU	3130	3150	3170

1530 sampled MW-SF10
sample no. MWSF10-170110

1-11-17

1000 GWMW-01 against one 11,
man hole cover - 12" below
grade, lines separate @
surface, ports appear
intact.

tag DTW - 182.33

port 1 DTW - 190.06

1040 Purge¹ P1, 2, 3 water @ 1042
blow times P2 - 1049, P3 - 1050, P1 - 1051

1057 Purge¹ P4, 5, 6 water @ 1058
blow times P4 1106 P5 1106 P6 1106

1120 Purge¹ P7, water @ 1111 blow @ 1120

1148 Purge² P1, 2, 3, water @ 1149 P1, P3,
P2 - no water, P1 blow @ 1157, P3 @ 1157

1200 Purge² P4, 5, 6, water @ 1201 P4, 5, 6
P4, 5, 6 blow @ 1210

1215 Purge² P7, water @ 1216, blow @ 1225

1228 Purge³ P1, 2, 3, water @ 1229 P1, 3, P2 - no
P1 blow @ 1238, P3 blow @ 1237 all blow

1243 Purge¹ P4, 5, 6, water @ 1243 P4, 5, 6 1254

1256 Purge¹ P7, water @ 1257, blow @ 1304

- Lunch -

Part	Purge	1-11-17 GWMW-01 Purge Parameters									
		T °C	DO %	SPC % _{min}	R _{in} %	TDS mg/L	ORP mV	ORP (2nd) mV	ORP (3rd) mV	ORP (4th) mV	ORP (5th) mV
1	1	20.5	12.4	1053	661	1078	6.99	855	1248	1.5	
	2	21.7	27.6	1453	735	944	2.15	-323	1178	1.5	
	3	21.0	27.5	1508	718	980	2.61	-107	1105	1.5	
2	1	20.7	16.2	1408	772	912	8.95	50.1	1089	1.5	
	2	no rec. change								0	
	3	no rec. change								0	
3	1	20.9	7.1	1187	920	763	11.16	-149	1177	1.4	
	2	21.6	21.2	1242	862	810	13.17	-111	1101	1.4	
4	3	21.0	20.2	1447	751	995	11.30	-197	1121	1.4	
	1	20.8	22.6	833	1305	541	8.60	-100	112	1.5	
2	2	21.5	19.2	800	1340	520	8.14	-75.6	883	1.4	
	3	21.2	23.0	863	1248	561	8.66	-50	780	1.2	
5	1	20.2	12.7	550	1972	357	8.47	-120	907	1.4	
	2	20.3	11.6	514	2087	354	9.66	-152	265	1.4	
3	3	21.0	19.2	565	2147	307	9.87	-112	164	1.2	
	6	1	20.8	13.3	564	1921	367	8.34	-175	606	1.4
2	2	21.0	10.4	580	1875	387	9.22	-160	512	1.4	
	3	20.2	13.7	601	1808	391	9.50	-114	1051	1.2	
7	1	20.7	10.5	436	2501	253	8.41	-156	2520	1.5	
	2	21.0	12.0	610	2765	401	8.48	-135	1525	1.5	
3	3	20.9	23.5	800	1956	521	8.52	-94	353	1.4	

B... ..

1-11-17

Time	GWMW-01 Sampling Sample No.	Point
1325	GWMW01-01-170111	1
No. Sample	GWMW01-02-170111	2
1335	GWMW01-03-170111	3
1350	GWMW01-04-170111	4
1400	GWMW01-05-170111	5
1410	GWMW01-06-170111 (+ <u>consolid</u>)	6
1425	GWMW01-07-170111	7

GWMW01-02 part did not recharge after 2:45 min - No sample

Lat. 32.31583, Long. -106.75859

1-12-17

1415 MW-SF9
 DTW 190.25 } wc = 12.85
 TD 203.10 /
 $12.85 \times 0.183 = 2.1 \text{ gal/w.v.}$
 pore vol = $2.1 \times 3 = 6.29 \text{ gal.}$
 parameters

MW-SF9	1 w.v.	2 w.v.	3 w.v.
T (°C)	26.5	20.2	20.1
DO (%)	76.6	78.2	79.1
SpL (mg/L)	1186	1191	1181
Res (µm)	915	923	933
TDS (mg/L)	771	774	767
pH	6.93	7.31	7.34
ORP (mV)	146	137	139
NTU	1336	1378	1381

1515 Sampled MW-SF9
 Sample no. MW-SF9-170112

1-13-17

1000 GUMMI 10

tag 222.2

part 1 222.2

addg 5 gal to line tag PTCV = 222.8

begin purge @ 1.88 pps

1119 Purge¹ P1, 2, 3

1120 water P1, 2, 3

1128 P2, 3 blow

1150 P1 blow

1155 Purge² P4, 5, 6, 7

1156 water P4, P6, P7, P5

1205 P4, 5, 6, 7 blow

1215 Purge² P1, 2, 3, 4

1217 water P1, 2, 3, 4

1227 P1, 2, 3, 4 blow

1235 Purge² P5, 6, 7

1276 water P5, 6, 7 - all blow 12.43

1300 Purge² P1, 2, 3, 4

1301 water P1, 2, 3, 4

1309 P2, 3, 4 blow

1311 P1 blow

1320 Purge³ P5, 6, 7

1321 water P5, 6, 7

1330 P5, 6, 7 blow

1-13-17

notes: part 1 purges were slow;
no leaks or obstructions observed
but suspect some form of
obstruction elsewhere.

Ground well vent OK.

Part 3 discharge line (1/2") fitted,
- cut & spliced.

Part 4 discharge line (1/2") has
hole - cut & spliced.

Part 1 - 2nd and 3rd purge
produced blow rates similar
to other parts. appears
obstruction has cleared.

Collected Field Blank

1300 Sample no. FB 17013

Lat. 32.31648, Long. -106.75337

1-13-17

Columbus Pump Parameters

Port	Pump	TCO1	DO(%)	SPC(%)	R- (mm)	PO2(%)	pH	ORP(mV)	NTU	gal
1	1	20.1	26.8	1804	604	1185	7.24	-50.2	667	0.9
	2	20.1	29.9	1773	623	1152	6.92	-72.2	2318	1.2
	3	20.5	14.6	1713	637	1111	7.31	-106	2701	1.4
2	1	20.1	45.1	1756	628	1146	6.87	-110	72.7	2
	2	20.3	15.0	1714	640	1111	7.21	-166	3448	2
	3	20.6	8.5	1698	641	1102	7.36	-194	1137	1.8
3	1	20.7	17.5	1749	622	1126	7.14	-142	1769	1.8
	2	20.5	14.4	1684	650	1045	7.33	-172	1754	1.8
	3	20.7	10.4	1692	649	1090	7.35	-178	214	1.6
4	1	20.2	26.2	1712	640	1113	6.97	-130	854	1.8
	2	20.3	7.3	1639	667	1063	7.35	-181	1518	1.6
	3	20.4	23.2	1665	658	1084	7.13	-190	271	1.4
5	1	20.4	18.2	1704	635	1118	7.10	-158	1824	1.9
	2	20.5	14.2	1605	681	1043	7.20	-123	365	2.0
	3	20.4	28.8	1535	715	996	6.87	-146	979	2.0
6	1	20.8	18.6	963	1170	825	7.32	-128	1481	2.1
	2	20.5	12.8	1217	898	791	7.45	182	1018	2.0
	3	20.6	18	1185	920	790	7.51	-253	218	2.0
7	1	20.6	18.0	493	2211	320	7.42	-172	1134	2.0
	2	20.6	6.9	976	1092	649	7.87	-208	1195	2.0
	3	20.6	18.5	938	1901	545	7.81	-195	2233	2.0

B. Smith

1-13-17

time	CW MW ID Sampling	Port
1410	<u>CW MW 10-01-170113</u>	1
1420	<u>CW MW 10-02-170113</u>	2
	↳ <u>GL MW 10-02-170113 D</u>	2
1440	<u>CW MW 10-03-170113</u>	3
1455	<u>CW MW 10-04-170113</u>	4
1505	<u>CW MW 10-05-170113</u>	5
1510	<u>CW MW 10-06-170113</u>	6
1520	<u>CW MW 10-07-170113</u>	7

1-16-17

CW MW 09
0950 PTWS pump pressure
196 psi
tag - 218.3'
port 1 - 208.0'
add water to liner, 9 gal
404 - 206.5' - OK to sample
10:12 - Purge P 1, 2, 3, 4, liner H₂O 11.4
1025 blow P 1, 2, 3, 4
1032 - Purge P 5, 6, 7, water P 5, 6, 7 1032
1044 blow P 5, 6, 7
1045 Purge P 1, 2, 3, 4, water liner P 1-4
1103 P 3, 4 blow; 1106 P 1, 2 blow
1111 Purge P 5, 6, 7, water P 5, 6, 7 1113
1125 blow P 5, 6, 7
1132 Purge P 1, 2, 3, 4, water 1134 P 1-4
1142 blow P 3, 4; 1145 P 1, 2 blow
1150 Purge P 5, 6, 7, water @ 1152 P 5, 6, 7
1202 P 5 blow; 1203 P 6, 7 blow.

Lat. 32.31914, Long. -106.25291

1-16-17

G.W. M2009 Pump Parameters

Point	Run #	T (°C)	DO (ppm)	SPC (ppm)	R ₁₂ (Ω)	TDS (mg/L)	pH	ORP (mV)	NTU	g/L
1	1	19.2	12.0	257	4340	168	6.38	-600	31.6	2.5
	2	20.2	11.1	233	4701	151	6.69	-130	119	2.0
	3	20.2	50.1	225	4909	145	6.69	-116	917	2.0
2	1	19.9	11.0	1791	833	861	8.33	-102	1939	2.5
	2	20.6	14.1	415	2629	269	7.19	-198	2055	2.0
	3	20.3	16.0	334	3255	213	7.01	-201	1609	2.0
3	1	19.8	13.1	1755	634	1137	8.71	-830	414	2.5
	2	20.2	12.3	1845	597	1191	11.62	-296	1631	1.2
	3	20.7	9.3	1725	633	1116	10.54	-305	1110	1.5
4	1	19.7	16.0	1756	633	1138	8.07	-91	1706	2.5
	2	20.3	7.5	1529	717	993	9.90	-217	983	1.0
	3	20.7	10.0	1665	653	1082	9.14	-204	844	1.0
5	1	19.1	30.2	1552	724	1011	6.77	620	1929	2.4
	2	20.2	21.1	1525	720	997	10.70	-175	46.6	2.0
	3	20.3	40.1	1521	722	989	9.64	-108	444	2.0
6	1	19.8	15.0	1075	1035	697	7.88	240	1350	2.4
	2	20.4	13.3	925	1184	600	9.00	-174	147	2.0
	3	20.6	17.0	913	1197	591	9.10	-128	579	2.0
7	1	20.0	7.8	635	1739	410	8.87	-272	1557	2.4
	2	20.4	12.2	862	1265	560	9.00	-179	757	2.0
	3	20.6	11.1	863	1264	559	8.92	-131	912	2.0

1-16-17

GW MW 09 Sampling
(see rd instructions)

Time	Sample no	Point
1315	<u>GW MW 09-01-170116</u>	1
1325	<u>GW MW 09-02-170116</u> + MS	2
1335	<u>GW MW 09-03-170116</u>	3
1345	<u>GW MW 09-04-170116</u>	4
1355	<u>GW MW 09-05-170116</u>	5
1405	<u>GW MW 09-06-170116</u>	6
1415	<u>GW MW 09-07-170116</u>	7

~~1-20-17~~

~~1000 Set up on GW MW 15
with pump gauge to 15 I~~

~~GW MW 15 I~~

~~DTW - 183.53 } wv = 158.97~~

~~TD - 322.50 } wv = 5 gal~~

~~3 wv = 153 gal~~

~~GW MW 15 S~~

~~DTW - 177.83 } wv = 36.95 w.v.~~

~~TD - 244.78 } wv = 135 gal~~

~~3 wv = 40 gal~~

Error on Measurements

Kyle Williams 1-20-17

Nested Wells

GWAW-11

- S 11/15 DTW-172.0 TD-205
- I 11/15 DTW-185.6 TD-314.1
- D 11/15 DTW-185.15 TD-540

GWAW-15

- S 11/15 DTW-241.15 TD-304.2
- I 11/15 DTW-241.6 TD-475
- D 11/15 DTW-241.36 TD-545

GWAW-16

- S 11/15 DTW-188.55 TD-205
- D 11/15 DTW-194.4 TD-370

1.27-16

0730 GWAW-11

GWAW-11 S DTW-172.83 } DTW=173.17
 TD-205 } DTW=185.15
 } DTW=185.15
 } DTW=185.15

progs out = 29.7 gal
 4. - pump @ 192' by 4
 set pressure to 95 psi

0807 start pump

op. end cycle @ 55/45

DTW stabilized @ 177.45'

collecting pressure (next page)

pump set @ 200'



1-23-16 CUMMINS-115

Parameters

Time	gal	T(°C)	DO(%)	PH(45°C)	Res (sec)
1020	9	18.0	20.5	1600	707
1031	9.5	18.4	20.5	1601	702
1052	10.5	19.1	20.5	1614	698
1106	11.0	19.2	20.8	1629	697
1130	12.0	19.1	20.2	1620	692

sampled CUMMINS-115 - 1130

sample no. CUMMINS-1-170123

1210 collected equipment blank

FB-170123 - 1210

1220 set up on 11-I

CUMMINS-115 DTW 183.73

TD 314.10

1235 begin pumping - optimized at 70/25 cycle

Time	gal	T(°C)	DO(%)	PH(45°C)	Res (sec)
1430	10	20.4	20.1	1235	894
1440	11	20.4	21.2	1242	882
1455	12	20.3	21.5	1246	884
1500	13	20.2	21.7	1240	887
1510	14	20.3	21.6	1241	883

1520 Sampled CUMMINS-115

sample no. CUMMINS-1-170123

TDS(%)	pH	ORP(mV)	NTU
1044	6.78	173	2047
1046	6.94	155	729
1048	7.14	149	929
1055	7.07	145	847
1052	7.04	148	865

DTW stabilized @ 183.80'

pump set @ 300'

cycle Parameters:

TDS(%)	pH	ORP(mV)	NTU
880	6.98	148	1036
887	6.87	141	531
806	6.86	144	963
806	6.91	147	961
805	6.89	147	959

1440 - FB-170123

Field Blank

1-24-17 GWMW-11D

0830 Set up.

DTW 183.4

TD 540 cycle

set pump at 530' bgs. 95/25

0955 Start purge. reg. @ 200psi,

1002 water. DTW 183.50

1015 regulator @ 250psi
optimized cycle @ 45/45

1020 DTW 183.70'

1100 183.85'

1130 183.90' purged 6 gal

Parameters

Time	gal	T(°C)	DO(%)	g/k(mg/L)	Res (Ω-cm)
------	-----	-------	-------	-----------	------------

1142	6	19.2	24.0	538	2040
------	---	------	------	-----	------

1149	7	19.1	21.5	535	2101
------	---	------	------	-----	------

1213	9	19.3	18.1	539	2082
------	---	------	------	-----	------

1220	10	19.4	22.1	543	2050
------	----	------	------	-----	------

1246	12	19.6	26.0	534	2088
------	----	------	------	-----	------

1257	13	19.4	26.9	541	2069
------	----	------	------	-----	------

1310 stable - will sample
collected sample no.

GWMW-11-D-170124

1-24-17

1145 DTW 183.90'

1220 DTW 183.90'

1250 DTW 183.90'

TDS (mg/L)	pH	ORP (mV)	NTU
------------	----	----------	-----

349	7.02	110	161
-----	------	-----	-----

355	7.38	7.5	137
-----	------	-----	-----

350	7.03	71.0	217
-----	------	------	-----

353	7.28	40.2	121
-----	------	------	-----

347	7.10	98.7	279
-----	------	------	-----

751	7.00	83.2	551
-----	------	------	-----

1-24-17 GWMW-16S ER-170124

1350 Set up Collected Eq. Blank: 1400

1355 DTW ~~188.65~~ 188.65'

1425 pump 40 t @ ~~200~~ 198'
regulator @ 150 psi
40/20 cycle

1500 DTW 188.64' cycle 50/40
@ 110 psi

purge water highly turbid
red-orange - clays ???

1515 DTW 188.64'

purge water clearing
3 gal Purge

1540 DTW 188.64' purged 5 gal
- Parameters

Time	gal	T(°C)	DO(%)	SR(%)	Res(men)
------	-----	-------	-------	-------	----------

1542	5	17.7	47.5	1874	619
------	---	------	------	------	-----

1550	5.5	17.5	45.3	1874	629
------	-----	------	------	------	-----

1558	6	17.4	49.3	1864	630
------	---	------	------	------	-----

1606	6.5	17.2	48.7	1860	632
------	-----	------	------	------	-----

1614	7	17.3	49.1	1862	628
------	---	------	------	------	-----

1615 DTW - 188.64' - stable

1620 Sampled no

GWMW16-S-170124

1-24-17

TDS(mg/L)	pH	ORP(mV)	NTU
-----------	----	---------	-----

1218	6.57	156	2324
------	------	-----	------

1219	6.54	138	1470
------	------	-----	------

1212	6.65	120	1920
------	------	-----	------

1217	6.62	126	1850
------	------	-----	------

1213	6.54	130	1805
------	------	-----	------

1-25-17

0940 Set up C.W.M.W. 16D
DTW 193.74
Screen 350-370, set pyc at 360

0940 Pump back DTW 193.64

0951 water discharge

1010 DTW 193.85

Optimization cycle @ 40/30, 180 ps.

1030 DTW 194.00 | 1130 DTW 194.05

1100 DTW 194.05 | 1200 DTW 194.05

1110 DTW 194.05

1130 Collected Field Blank FB 170125

1150 Begin collecting permeates

Time	gal	Time	DO (ppm)	SPC (#/gal)	Res (mg/L)	TDS (mg/L)	pH	ERP (u.v)	NTU
—	—	17.5	—	—	—	—	—	—	191
1150	9	17.5	14.0	1313	854	886	7.00	43.5	191
1159	10	17.0	14.4	1350	861	882	7.02	29	1285
1208	11	17.7	5.3	1365	851	888	7.20	-18.7	1036
1212	12	18.2	4.7	1368	839	888	7.15	-18.2	1042
1227	13	18.2	4.6	1368	839	889	7.16	-18.0	1039

Stable - will sample

1235 collected sample no.

G.W.M.W. 16-D-170125

+ C.W.M.W. 16-D-170125 Dup.

1345 collected Eg Blank

EB-170125

1-26-17

0915 Set up @ GWW-15 I
 DTW 241.22
 0943 Pump set @ ~~460~~ 460, ^{pump} on.
 DTW 241.38
 1017 optimized @ 40/30-210 psi
 DTW 241.30
 1046 DTW 241.35 - purged 5 gal.
 1058 DTW 241.35
 1113 DTW 241.36
 1122 DTW 241.35

Parameters GWW-15

Time	gal	T(°C)	PO(%)	SPC(%)	Ris(mwd)	TDS(mg/L)	pH	ORP(mV)	DTW
1050	5.5	20.2	77.5	1536	716	998	7.15	78.2	1329
1102	6.0	20.3	77.4	1544	712	1002	7.19	78.4	1369
1114	7.0	20.2	78.4	1544	711	1004	7.20	78.9	1400
1122	8.0	20.3	77.6	1547	711	1003	7.19	78.6	1391

Stable. Well sample

1130 collected GWW-15-I-170126
 and GWW-15-I-170126 D

1210 collected Eq. Blank

EB-170126

1-26-17

1220 Set up on GWMW-155
set pump @ 290'
DTW 240.60'

1320 opt: metered @ 35/25, 150 psi
DTW 240.60'

1330 collected Field Blank
sample no. FB-170126

1330 opt: metered 35/25 @ 150 psi

1355 DTW 240.65' - pumped 5 gal.

1405 DTW 240.63' - pumped 6 gal

1422 DTW 240.63'

1430 DTW 240.63'

GWMW-155 Parameters

Time	gal	T(°C)	DO(%)	SR(µm)	Roc(µm)
1410	6	20.6	86.5	1142	955
1417	7	20.3	85.7	1148	957
1430	8	20.6	86.7	1147	952

Stable

1435 sampled GWMW-155
sample no. GWMW-155-170126

TDS(mg/L)	pH	ORP(mV)	NTU
742	7.22	114	1223
746	7.20	896	1306
745	7.28	97.2	1262

1-27-17

0830 Set up on GLOW-15 D
DTW 241.20

0845 Decou pump, collected Field Black
Sample no. EB-170127

0920 pump on. dry line.

0925 water. cycle 40/25 @ 220 psi

0930 DTW 241.25

1025 DTW 241.19, 4.5 gal purged.

1030 collected Field Black no

EB-170126

1050 DTW 241.19

1115 DTW 241.20, 7 gal purged.

Parameters

Time	gal	Toc	DOC	SPC (1000)	Res (aren)
1115	7	19.0	30.8	976	1158
1122	8	18.9	27.4	974	1162
1129	9	18.9	26.7	971	1166
1140	10	19.0	26.5	970	1165

Stable

1150 sampled GLOW-15 D

sample no GLOW-15-D-170127

1-27-17

1130 DTW 241.21

1140 DTW 241.20

TDS (mg/L)	pH	ORP (mV)	NTU
624	7.39	109	1159
633	7.45	70.7	1210
630	7.45	51.5	1223
630	7.45	50.6	1225

1-31-17 CLC 57

1100 set up on CLC 57 →

1130 pump set.
DTW 240.45

1132 pump set at 460, turned on

1135 pumping, set at 70/25, 250 psi

1215 5 gal purged.

1245 7 gal purged

1255 8 gal purged

CLC 57 parameters

Time	gal	T(°C)	DO(%)	SP(µmhos)	Res (ohm)
1255	8	22.0	10.2	438	2420
1305	9	22.0	8.0	438	2421
1315	10	21.9	9.4	438	2422
1325	11	21.9	9.2	438	2422

stable.

1335 Sampled CLC-57

Sample no. CLC57-170131

1110 collected Eq. Black

sample no. EB-170131

TDS(µg/L)	pH	ORP(mV)	NTU
284	8.67	-48.3	1049
284	8.71	-81.1	1044
285	8.71	-82.2	1150
285	8.71	-83.0	1155

DAILY FIELD LOG

PAGE: ___ OF ___

3, MAA6 PARK
 MWSF-5
 prev. level 144.4 ft.

DATE: 11-2-15

CLIENT: _____

PROJECT: _____

LOCATION: MWSF-5

ACTIVITY: _____

GEOLOGIST: _____

arrive @ 9:40 am

Water level 146.9'

Screen Interval?

Dropped HS @ 9:45 to 148 ft (12iptick)

113-15 arrive @ 8:43 HS is full to top

Sampled @ 8:45

pH = 7.24

Temp = 21.2

Cond = 2073

DAILY FIELD LOG

PAGE: ___ OF ___

AQUATIC CENTER

MW-SF-6 Prev.

Prev. H₂O depth 125.8 ft

DATE: 11-2-15

CLIENT: _____

PROJECT: _____

LOCATION: MW-SF-6

ACTIVITY: _____

GEOLOGIST: LEM, VP

Arrive @ 9:56

Screen Interval 116 - 131 ft

H₂O Depth = 128.6 ft.

New Rope measures 132 ft.

W. H. Drop HS to 132 ft. Hope Rope length.

(Somebody Sampled this well prior to today & all new Rope & Plug.)

11/3/15 arrive @ 8:55

Sample full of muddy H₂O

N 8-9 inches in HS

PH = 7.22 Cond = 2235.0 Temp = 21.5°C

STREETS Yard
MWSF-9

DAILY FIELD LOG

PAGE: ___ OF ___

Prev Depth 188 ft

DATE: 11-2-15
CLIENT: _____
PROJECT: _____
LOCATION: MWSF-9
ACTIVITY: _____
GEOLOGIST: Lem, VP

arrive @ 10:20 Water Depth = 190.34 ft

Screen Interval 188 - 203 ft

Dropped HS to 195.5 ft (whole rope length)
@ 10:33

arrive @ 9:25

Sample mostly clean
Full to top
HS is full

9:29 analysis

Sample @ 9:28

pH = 7.19 Cond = 1284 T = 20.8

DATE: 11-2-15

CLIENT: _____

PROJECT: _____

LOCATION: MW-SF-10

ACTIVITY: _____

GEOLOGIST: Lem, VD
VictorMW-SF-10
Bantam Wt. GardPrev. Depth. ~~1881 ft.~~ 1928

arrive @ 10:38

Screen Interval = 193.2 - 203.7 ft.

Depth = 194.5 ft.

Dropped HS to 197 ft. (1 ft less than whole)
@ 10:45

arrive @ 9:08

11-3-15

sampled @ 9:14

Sample pretty clear
HS full

9:15 PH = 7.21 T = 20.4 Cond = 1458

MWST-4 Behind JSP

DATE: 11-2-15

CLIENT: _____

PROJECT: _____

LOCATION: MWST-4

ACTIVITY: _____

GEOLOGIST: Lem & VP

MWST-4

arrive @ 11:18

H₂O level @ 18.2 ftmeasured New Rope @ 172 ft = 3 zip ties
will drop the HS to 172 ft.

Screen Interval = 168-183 ft

HS would not go down all the way
marked the level w/ 2 zip ties

Dropped HS @ 11:45

 $14 \text{ ft} + 3 \text{ ft BAG} = 17 \text{ feet we dropped HS}$
and it came to a stop

11-3-15 arrive @ 9:45

Sample time 9:50

analysis @ 9:48

pH = 7.18 Cond = 1179 Temp = 22.5°C

Well is plugged.

Depth = 22.4 ft

 $29.85 \text{ ft. is the Plug.}$ Stagnant
Well
20

DAC ADMIN OFC
MW-4

DATE: 11-2-15

CLIENT: _____

PROJECT: _____

LOCATION: MW-4

ACTIVITY: _____

GEOLOGIST: Lem, VP

Prev Depth: 183 ft

arrive @ 9:25

186.2 ft. H₂O Static Meter levels out.

Screen Depth is 175-185 ft.

No Water to Sample.

Vicky will use his "Sounder"

Bring Bailer to Sample

Back @ 11:53 w/ Bailer

Rope is @ 187 ft. + length of Bailer
TRIED to Drop it all the way but
it stopped around 7 ft short.

~~NEED HO. Depth.~~

arrive @ 10:12 Bailer is Dry
H₂O Vicky will use his Sounder (has Beards)
11-3-15 my meter Bottomed out @ 186.2 ft.

Vicky's Bottomed out @ 193 ft.

No Water Well is Dry.

DAE Parking Lot
 MW-5
 puv

DATE: 11-2-15

CLIENT: _____

PROJECT: _____

LOCATION: _____

ACTIVITY: _____

GEOLOGIST: LEM & VP

Arrive @ 12:05

Prev Depth = 189.8 ft

Current Depth (to top of pipe) 192.2 ft

2 Zipties = 195 ft

Dropped HS to 195 ft

Screen Interval = 182-192 ft

Dropped HS to 195 ft @ 12:19 pm

→ No Sample Dropped ~~to~~ HS to length of
 Rope = 197.5 ft

11-3-15 Re-measured Depth = 192.3 ft

Cuz HS had no H₂O it was dry on outside

Measured Rope = 197.5 ft

Put a ^{4 ft} bailer on and dropped it 201.5 ft

No Sample in Bailer.

D&E FLEET DRIVEWAY

MW-1

Prev Depth: 189.1 ft

DATE: 11-2-15

CLIENT: _____

PROJECT: _____

LOCATION: MW-1

ACTIVITY: _____

GEOLOGIST: Lem ~~VP~~
(NICTAR)

11-2-15

arrive @ 9:00 am

Well depth 191.9'

(No bolts on cover)

Screen Interval 187-197'

→ Rope was premarked (2 zip ties) @ 192 ft.
 We added 3 more feet.
 HS dropped to 195 ft.

~~Droped HS @ 9:18~~
 Droped HS @ 9:18

11-3-15 arrive @ 8:20 am

Only N: 5 in of H₂O in HS

Sampled @ 8:25. Next time dip it

LOWER

8:27 PH = 7.09 T = 21.9

Concl = NOT ENOUGH VOL

DAILY FIELD LOG

PAGE: _____ OF _____

58-3689

DATE: 11-9-15

CLIENT: _____

PROJECT: _____

LOCATION: Well 20

ACTIVITY: _____

GEOLOGIST: Lam, VP

Well 20 Young Pedan
 3/89 3533

Need Static level = ~~240.5~~ 240.5' (240.5 ft)

Mapped HS to 430 ft. using existing rope
 (full of oil & black metal particles)

HS dropped @ 10:40 am

~~11-10-15~~
 11-10-15
 Arrive @ 10:32

HS is full

VOC Sample @ 10:40

analysis 10:42

pH = 7.06 Cond = 1532 Temp = 21.1°C

DATE: 11-9-15

CLIENT: _____

PROJECT: _____

LOCATION: Well 26

ACTIVITY: _____

GEOLOGIST: Ken & V.P.

Well 26 Young Park
Out of Commission

Static level from 11-3-15 is 177.7 ft.

Well has Oil in it, will drop HS level to ~192 ft. This will leave about 14 feet for ~~residual~~ I don't sample the Oil.

Old line was contaminated, cut New line @ 212 ft. made a KNOT in the line to designate 192 ft. Dropped HS to 192 ft. @ 9:26 am.

11-10-15 arrive @ 10:13

Pulled up HS it was full

VOC Sample @ 10:22

analysis @ 10:23

PH = 7.75

Temp = 26.5 °C

Cond = 765.1

765.1

DAILY FIELD LOG

PAGE: ___ OF ___

Well Paz Park

DATE: 11-9-15

CLIENT: _____

PROJECT: _____

LOCATION: Paz Park Well

ACTIVITY: _____

GEOLOGIST: Lem & Vic Perez

Arrived @ well @ 9:40. Pumps will turn on
Well @ 10:00 am to sample.

Sampled (GRAB) @ 10:02

Analysis 10:03 pH = 6.98 Cond = 2366 Temp = 20.5°C

⊗ Need Static level 171.1 ft

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 11-10-15

CLIENT: _____

PROJECT: _____

LOCATION: CEC 27

ACTIVITY: _____

GEOLOGIST: Gem, VP

Well 27

arrive @ Well 27 @ 9:04

pulled Grab sample @ 9:12

also pulled extra samples required (metals, etc)

analysis

9:14 pH=7.14 Cond=1133 Temp=21.4°C

Well 18

arrive @ Well 18 @ 9:22

pulled Grab sample @ 9:35

also pulled extra samples required (metals, etc)

analysis

9:37 pH=7.28 Cond=1384 Temp=20.6°C

DATE: 11-12-15

CLIENT: _____

PROJECT: _____

LOCATION: GUMW11-I

ACTIVITY: _____

GEOLOGIST: G.M. J. VA

Arrive @ WPD @ 9:30 Get HD @ 9:45 ish

Static level = 185.6 ft

6N₂ Tank # 048869423

Initial pressure = 1900

(Black Box) → Set cycles 40/20 w/ 250psi

Total Depth - Static level

(300 - 185)

115 ft

5.6 ft³ πr^2 $\pi (1.5in)^2$ $\pi (0.125)^2$ $\pi (0.0156)$

0.049 ft

0.49

↓

3" well

 $5.6 \text{ ft}^3 / 7.48 \text{ gal} = 42 \text{ gal}$
(cu ft.)

@ 10:45 Pumped 5 gal (dumped into Reservoir)

@ 11:45 Pumped 5 gal more

@ 12:00 Pumped 5 gal more

12:35 Ran out of 6N₂ on Tank # 048869423

Switched to Tank # 066246060 2000 psi

@ 12:50 Pumped 3 more gal / 18 Total

Began Parameters →

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 11-13-15

CLIENT: _____

PROJECT: _____

LOCATION: Garmw-115

ACTIVITY: _____

GEOLOGIST: _____

Garmw-115

Start @ 11:40

H₂O level = 177.0 ft

Screen depth = 190-205

12:00 Stop = Brought the wrong spool

Brought old spool - its all chewed up by the Dead Squirrel inside spool

12:49 Started GN₂ Same Bell. (100psi) as Deep Well #048801678

Cycle: 50/55

12:52 Got the

→ Note: The spool line had holes. So we re-measured New line @ 198 ft.

13:28 get 4 cal's

13:29 Start parameters

GN₂ @ 100psi

	pH	Cond	Temp
1330	7.75	1652	21.3
1333	7.70	1654	20.5
1335	7.65	1656	20.3
1338	7.64	1654	20.4
1340	7.64	1655	20.4
1342	7.64	1654	20.4

Soft site @

14:07

⊗ 1345 pulled VOC samples 2 sets due to extreme amt of dissolved gases.

DAILY FIELD LOG

PAGE: ___ OF ___

GUMWILD

DATE: 11-13-15

CLIENT: _____

PROJECT: _____

LOCATION: GUMWILD

ACTIVITY: _____

GEOLOGIST: JEM, JES, VP
Josh Mott

Arrive @ 8:00 am

H₂O level: 185.75'Drapping Bladder @ ~~8:15~~ @ 8:15 (took 18 min) ^{4 people}GN₂ ON @ 8:35

1300 psi on tank

10:01 - 5 gal purged

Cycle: 40/20 @

PSI on Controller = 250 psi

10:30 - swapped GN₂ tank

#048801678

This one has 200 psi

11:05 - 5 gal Purged

(10 gal total)

11:08 - Begin looking at parameters

	Cond	pH	Temp
1108	549.9	7.55	21.9
1111	554.9	7.73	21.2
1113	556.2	7.82	20.6
1115	554.5	7.81	20.9
1117	556.0	7.83	20.7
1119	555.5	7.83	21.1
1121	555.6	7.83	21.2
1123	555.5	7.83	21.2

11:25 13 gal total purged

⊗ 11:25 Sampled VOC's

11:26 Tear Down Sampler

DATE: 11/16/15

CLIENT: _____

PROJECT: _____

LOCATION: GWMW 15-D

ACTIVITY: _____

GEOLOGIST: Lem Jey

Vic P. & Josh Mort

arrive @ 8:45

NOTE: Approx purge vol = 6.3 gal
Prev. static level = 239.89NOTE - line is 500 ft. 2015 H₂O level 241.36 ft

The line that is rolled up gets knotted really bad. Need to put zip ties every 5-8 ft. when pulling it out.

Screen interval is 580-595 ft.

Need to check the length of this line.

Dropped in 6 H₂ lines @ 9:20
Turned N₂ on @ 9:40NOTE: There is H₂O in the line. $\frac{1}{4}$ " ID = 0.25 in
 $R = 0.125$ in = 0.0104 ft.

$$Vol = \pi r^2 h = 3.14 (0.0104)^2 \times 575 \text{ ft}$$

$$Vol = 0.20 \text{ cu ft} \times 7.48 =$$

$$Vol \text{ H}_2\text{O in line} = 1.5 \text{ gal}$$

Need to purge out 2 gal from line and then to move to sample.

OVER →

DAILY FIELD LOG

PAGE: _____ OF _____

60MW15-I

DATE: 11-17-15

CLIENT: _____

PROJECT: _____

LOCATION: 60MW15-I

ACTIVITY: _____

GEOLOGIST: Lein JZJ

arrive @ 8:07 PURGE VOL = 4.5 gal

H₂O Depth = 241.6 ft.

Tubing 470 ft. long. Screen 4/20-475

Blocker in @ 8:35 6N₂ ON H₂O @ 8:40

Cycle 40/25

- 9:17 purged 5 gals. ^{Total} (~ 1.5 gal in line)
- 9:45 purged 9 gals

	pH	Cond	Temp.
9:48	7.03↑	1591	19.6
9:51	7.15	1582	19.9
9:53	7.21	1591	19.8
9:55	7.26	1584	19.7
9:57	7.23	1568	20.0
9:58	7.28	1600	18.9
10:00	7.30	1599	19.1
10:02	7.29	1596	19.2
10:04	7.28	1594	19.8

Pulled VOC's @ 10:05 Total purge Vol = 11 1/2 gal

Pulled out Blocker (Used ~ 1100 psi 6N₂)

È Begin 60MW15-S

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 11-19-15

CLIENT: _____

PROJECT: _____

LOCATION: GUMW15-S

ACTIVITY: _____

GEOLOGIST: LEM JRY

GUMW15-S

Wrong
Hole

Begin @ 10:30 } Wrong opening GUMW15-T

Bladder in @ 10:38 } Start over

Dropped Bladder H₂O Depth = 241.15 ft

@ 11:32

Line is 295 ft

Screen Depth = 289-304 ft

Pressure on Box Reg = 250

Cycle 40/20 to H₂OBlowing a lot of N₂

Set pressure to 150 psi (on box) still too high

Set pressure to 50 psi Cycle 5/15

OK seems to be stable @ 150 psi & 15/10 cycles

@ 12:03 pumped ~ 3 gallons

@ 12:36 pumped 5 gallons

@ 12:58 pumped 7 gallons total

	pH	COND	TEMP
12:58	7.42	1023	20.2
13:00	7.44	1050	21.0
13:02	7.41	1086	20.0
13:04	7.45	1063	20.6
13:06	7.43	1064	20.6
13:08	7.44	1064	20.6

13:09 pulled VOC sample

CNA tank 1400 psi Shut off GAS B10

DATE: 11-18-15

CLIENT: _____

PROJECT: _____

LOCATION: C1C-5D

ACTIVITY: _____

GEOLOGIST: JES, CM, VP

Well 5D Pre-1
Behind Pre-1

and @ 8:10 Pre-1 HO level = 293.2 ft
~~HO level = 288.0 ft~~ Current
 Screen Interval = 408 - 516 ft
 11-18-15 HO Depth 288.0 ft

NOTE: Put a Zip Tie N every 5-6 ft.
 around 2 lines and the Rope. No air in pulling
 Bladders Back out. The sounding tubes are
 1 1/4" PVC pipe extending down 350 ft.
 They are located ON 2 NORTH PORTS

H₂O @ 9:15 Cycle 40/25 @ 250 psi

We estimate ~ 1 1/2 gal of H₂O in line.
 Need to purge 7 gals. So start reading
 parameters @ 8-9 gals.

10:00 Purged 5 gallons total

10:34 Purged 9 gals total

	pH	Cond	Temp
10:35	7.92	513.6	20.9

10:36	8.44	510.2	20.7
-------	------	-------	------

10:38	8.59	506.7	21.3
-------	------	-------	------

10:40	8.66	509.2	21.1
-------	------	-------	------

10:42	8.65	509.4	21.2
-------	------	-------	------

10:44	8.68	508.7	21.2
-------	------	-------	------

10:46	8.70	510.3	21.0
-------	------	-------	------

10:50	8.68	511.0	20.8
-------	------	-------	------

(0.5) → Oull VOC's 11 gals purged

DAILY FIELD LOG

PAGE 3 OF 3

2) Gummwog
Hadley

DATE: 11-24-15

CLIENT: _____

PROJECT: _____

LOCATION: Gummwog

ACTIVITY: _____

GEOLOGIST: J. L. 1.8m

2nd phase

	Port	pH	Cond	Temp	Refringed
12:10	Port 1	6.70	3046	21.7	1 1/2 gal
	Port 2	11.46	1944	20.6	1 1/2 gal
	Port 3	11.45	2153	20.5	1 1/2 gal

Vocs pulled @ 12:15 for port 1-3

12:21 bN₂ on Port 4 ES

	Port	pH	Cond	Temp	Refringed
12:28	Port 4	8.70	1731	22.0	1 1/2 gal
12:28	Port 5	9.87	1596	21.2	1 1/2 gal

VOC 12:27

Ports 6 & 7. bN₂ on 12:33, H₂O @ 12:33

Pulled vocs @ 12:38

	Port	pH	Cond	Temp
12:39	Port 6	9.04	1025	22.8
12:39	Port 7	9.29	69.8	21.8

bN₂ off @ 12:41

NOTE: Port 1 & 2 Do NOT work!

DAILY FIELD LOG

PAGE: _____ OF _____

See Below

60mmW-08
PAZ Parking Lot

DATE: 11-23-15

CLIENT: _____

PROJECT: _____

LOCATION: 60mmW-08

ACTIVITY: _____

GEOLOGIST: LEM, JZJ, JPA

UK

Sounder is 2" shorter than what it reads

arrive @ site @ 9:40 am.

Sounder dropped in Tag @ 10:00

Tag = 162' 1" Port 1 = 162' 1"

Port 2 = 178' 1"

Note: Note Port 1 is Busted! DON'T USE IT.
Sounder got stuck inside port 2 - took
30+ minutes to get it out. USE Port 3
Next time.

11:06 = 6N₂ Pinger P = 17.0 psf

11:07 = get H₂O on 3, 4

1st reading on Pinger

	PH	Cond	Temp
11:16 Port 3	10.92	898.0	20.4
11:17 Port 4	9.05	898.	20.4

Port 3 & 4 Blew @ 11:18

11:33 6N₂ on Port 2, 5, 6, 7

Port 2 NOT CONNECTED

DATE: 11-24-15

CLIENT: _____

PROJECT: _____

LOCATION: 6AMW-09

ACTIVITY: _____

GEOLOGIST: _____

ARRIVE @ 9:00

Remember Tag Needs to be 6" Higher than Port
But Not more than 20ft.

Tag = 209' 2"

Port 7 = 208' 8"

added 19 Liters 207' 2"

finished adding all 19L Tag = 207' ft.

finished H₂O LEVELS @ 9:45GN₂ ON 9:54 am@ 9:55 port 4 and 6 have H₂O

9:56 Port 5 and 7 " "

10:00 Read Parameters

	PH	Cond	Temp	Color
Port 4	7.66	1777	18.2 °C	Greenish Brown
5	7.94	1570	18.1	Pink-Brown
6	7.97	1287	17.8	Clear
7	9.96	487.2	17.9	Greenish

10:05 - change GN₂ cylinders on @ 10:00(10:30) H₂O stopped flowing but lines did not
Blow. Let these ports regenerate.

Switched to port 1, 2, 3 left port 4 attached

GN₂ on @ 10:33

NOTE: Ports 4 & 5 DO NOT REGENERATE

DAILY FIELD LOG

PAGE: 1 OF 4

DATE: 11-30-15

CLIENT: _____

PROJECT: _____

LOCATION: GWMW-03

ACTIVITY: _____

GEOLOGIST: G.M. JBS

GWMW-03
AQUATIC
CENTER

NOTE: THE TAG STATIC LEVEL NEEDS TO BE AT LEAST 6" HIGHER THAN PORT 1. But Not more than 20 ft.

arrive @ well @ 9:30 am

Tag Depth = 92' 0" $\Delta = 36$ ft
Port 1 Depth = 128' 6"

→ Tank had 600 psi

10:05 6N₂ on TAG Need to Purge out 6-12 gal (last time (1-17-14) we purged out 6.25 gal and the tag went down from 1095.3 in to 1126 which is 30.7 inches = 2.6 ft.

10:12 Ran out of 6N₂ = NO H₂O

10:25 Put New tank (2000 psi) Set tag to 180 psi NOTHING

10:42 up it to 210 psi already Used 800 psi
10:55 turned off N₂ tank went from 2000 to 900 psi
stopped

@ 11:23 Chris showed up @ 11:00. Checked lines the clip is leaking. Changed the Brian attachment and used another full connection - Now not leaking. Set psi to 200 and waiting - put the ring under H₂O & waited for N₂ Bubbles = NAHA

Shut down Purge of Tag line = too much head pressure went through 2000 psi (1 1/2 bottles 6N₂)

DATE: 11-30-15

CLIENT: _____

PROJECT: _____

LOCATION: _____

ACTIVITY: _____

GEOLOGIST: Lem Jett

6WMMW-03

AQUATIC CTR

1319 - ON_2 BACK ON

1326 - LINE BLEW (3.5 gal) purge = 38 gal

~~1333~~ - LINE BLEW (4 gal) 4 gal

1336 - measured TAB = 124 ft

1338 ON_2 BACK ON

1345 - LINE BLEW (4 gal more)

1350 ON_2 BACK ON

1358 - LINE BLEW (4 gal more) 50 gal total

DIDN'T NEED TO PUMP OUT THIS MUCH H_2O . TAB = 128' 0" OOPS

Part 1 = 128' 6" WREN 6 WAY

Start Part 1-3 Purge. → ADDED H_2O 1407 - ON_2 ON TAB = 132 ft1409 - all ports have H_2O 1, 2, 3

		pH	Cond	TEMP	
1411	Port 1	7.16	2383	19.5	Clear
	Port 2	10.08	1359	19.1	clear
	Port 3	11.48	1415	19.3	Dark green

1416 Port 2 & 3 Blew / 1417 Port 1 Blew

OK Purgineg Ports 5-6

DATE: 12-1-15

CLIENT: _____

PROJECT: _____

LOCATION: GUMW-01

ACTIVITY: _____

GEOLOGIST: _____

GUMW-01
DAC FLEET NEXT TO JSP

Tag = 173' 10" Part 1 = 187' 4"

9:05 ARRIVE

ARRIVE @ 9:05. The well is covered w/ dirt.
 used the Metal Detector to locate well cover.
 Found the general vicinity - had to Dig Down
 2 ft to FIND The Cap

10:10 $6N_2$ on Ports 1-4 - N_2 Leak10:19 $6N_2$ on Ports 1-310:20 all Ports have H_2O ON

10:28 Ports 1-3 Blew

10:35 Ports 4 & 5 $6N_2$ ON.10:37 4 & 5 have H_2O

10:45 Ports 4 & 5 Blew

10:48 Part 5 & 6 ~~ON~~ Right $6N_2$ ON10:50 Part 5 & 6 have H_2O

10:58 Part 6 Blew

10:59 Part 7 Blew

OK ready to Start again after Regenerating Ports

11:50 $6N_2$ ON Ports 1, 3, 4

DATE: 12-2-15

CLIENT: _____

PROJECT: _____

LOCATION: Gamm-10

ACTIVITY: _____

GEOLOGIST: Lem J21

Use Sampling/Purge P=180psi
 Gamm-10
 Access from DEA

8:55 arrive at site

Tag = 219'10" / Port 1 = 219'6"

Purged 5 gals in Tag Tag = 218'6"

8:38 6N₂ on on Ports 1-38:39 H₂O on8:58 2 & 3 Blew Shut off 6N₂ from 2 & 3
 Port 1 filling much slower

9:02 Port 1 Blew

9:07 6N₂ on Port 4-69:08 H₂O on all 3 ports

Port 4 H₂O line has hole in it ~ 6-8 in
 up from port. Used a red cap & cut end off
 to patch hole temporarily.

9:18 Port 4-6 Blew

9:21 6N₂ on Port 7 Purging Port 7 By itself because9:22 Port 7 has H₂O there is a patch repair

9:32 Port 7 Blew on the line

Allow 15 min for completion of regeneration
 before purging to collect samples

DATE: 12-3-15

CLIENT: _____

PROJECT: _____

LOCATION: 6Wmw-16A

ACTIVITY: _____

GEOLOGIST: _____

Arrive @ 8:40 (Em JZ)

H₂O Depth = 194.4 ft.

Cens showed up we had to use yellow nylon rope, so we stretched it out to measure.

The screen is 350-370 ft. (The well is 380 ft deep)

We measured the rope and put marks (2.0m) every 100 ft. w/ sm. zip ties we put a large zip tie at 375 ft.

We tied the rope off on the tripod @ 370 ft. So ~ 9 ft of rope is out of well → giving 360 ft inside well.

9:45 ON → Got Bubbles in Beater on 2nd cycle. Got H₂O @ 9:49

Set Control Box to 250psi, @ 40/25 Cycle

This is too much pressure - It would blow H₂O & spurt out a lot of N₂.Played w/ N₂ pressure and found 150psi Best.

⊗ Set Bladder pump to 150psi @ 40/25 cycle

10:15 - No more H₂O coming out pinged ~ 2' gal - Couldn't feel N₂ pressure on H₂O line tip.

10:30 → Pull out Bladder and check for kinks in line

DATE: 12-4-15

CLIENT: _____

PROJECT: _____

LOCATION: Gwmw165

ACTIVITY: _____

GEOLOGIST: J.M. J&J

Gwmw165

Well from
HELL

arrive @ 9:00

H₂O level = 188.55 ft9:31 ON₂ ON 40/25 @ 150 PSI, ON Controller9:33 Pumping alot of N₂ out of the line - Drop
pressure till H₂O flows then up it
Pressure @ 75 psi9:43 Changed Cycles to 15/10 @ 75 PSI
→ still pushing N₂ & spatter H₂O through
Hose - Bladder torn?

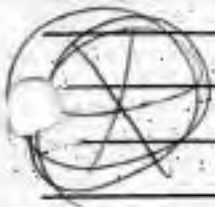
9:45 Full Bladder back out & check!

9:55 Bladder is torn

10:00 Left back to lab - J&J stayed

10:35 back w/ Bladder - charged out and
ready to go10:53 ON₂ BACK ON

Cycle = 25/15 @ 125 PSI

11:01 - not getting anything. Dipped pressure
to 200 PSI11:15 Used Squirt Bottle to put H₂O in the
line ~ 150 ml -w/ pressure @ 200 and 40/25 cycle
we got H₂O

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 1-3-14

CLIENT: _____

PROJECT: _____

LOCATION: MW-5

ACTIVITY: _____

GEOLOGIST: Lem, Feb, JZJ

1-3-14 Arrive @ Site @ 7:50 (Wb & JZJ)

Site needs to be dug out (under gravel)

Screen depth = 182-192 ft.

H₂O Depth 2012 = 182.14 ft

May 2013 = 187.8 ft

~~Had~~ Had to talk to Dickie Apodaca

Pulled out weight @ 8:23

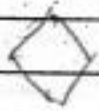
Jan 2014 H₂O Depth = 189.8 ft

8:35 dropped HS to 192' @ 2 ziptie mark

1-6-14 arrive @ site 14:00

Lifted out HS @ 14:02 - No Sample

14:08 dropped HS back in the whole length of rope = approx 196.5 ft. Retrieve tomorrow.

Made sure HS opening was opened  "square"

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 1-3-14

CLIENT: _____

PROJECT: _____

LOCATION: MW SF-4

ACTIVITY: _____

GEOLOGIST: J. Kim

1-3-14 arrive @ site @ 8:45

Site has Never Been Accessed.

Screen Interval = 168' - 183 ft.

H₂O level = 5.2 ft.H₂O can be seen w/ flashlight.

1 sm Znp = 80.5 ft.

3 sm Znp = 75 ft.

Dropped HS @ 9:16 am to 75 ft' (3 sm Znp) (100 ft - 80.5 ft)

1-6-14 arrive @ 13:30 lifted out HS @ 13:31

Doc Sample taken @ 1334

1335 Cond = 1.22 mS Temp = 20.2°C pH = 6.05

DAILY FIELD LOG

PAGE: _____ OF _____

DATE: 1-7-14
CLIENT: _____
PROJECT: _____
LOCATION: UC 18
ACTIVITY: _____
GEOLOGIST: Jem

Arrive @ Well 18 @ 11:21

Took uc's @ 11:26

Sampled Speciation 11:28
11 Dye 11:30

} Sampled

DAILY FIELD LOG

PAGE: _____ OF _____

DATE: 1-7-14
CLIENT: _____
PROJECT: _____
LOCATION: Well 20
ACTIVITY: _____
GEOLOGIST: JEM

Grind @ Well @ 11:40

1st VOC @ 11:41

VOC Dip @ 11:42

Analysis 1449 11:43

Speciation Samples @ 11:46

} Sampled

DAILY FIELD LOG

PAGE: 1 OF 3

DATE: 1-15-14

CLIENT: _____

PROJECT: _____

LOCATION: GWMW-10

ACTIVITY: _____

GEOLOGIST: Jemyru

Arrive @ 10:15

Purge Pressure - 188 psi, Sampling - 165 psi

Tank Pressure → Tank A - 200 psi

Remove white caps on each port
 #7 port is rigged w/a connector piece (looks like it had broken)

Log depth → 213.55 in. Port → 217.6 in.

Start Log @ 10:15

H₂O @ 10:16

Port	pH	Cond	Temp
1	5.39	1.795	18.5
2	7.74	1.418	18.5
3	6.60	1.551	18.4
4	6.70	1.960	18.0

Line 2 All line blow by 10:29
 Chngy Line A psi < 200

Collected about 2 gallons each port 1-4

Wait to regenerate → @ 10:34

DAILY FIELD LOG

PAGE: 3 OF 3

DATE: 1-15-14

CLIENT: _____

PROJECT: 6W MW-10

LOCATION: _____

ACTIVITY: _____

GEOLOGIST: _____

Pressure back on @ 12:34

Port 6 on @ 12:35

Blew @

Port 5 " @ " "

Blew @ 12:43

Port 7 " @ 12:35

Blew @ 12:41

Link B → @ 1300 psi

Back @ lab @ 13:20

DAILY FIELD LOG

PAGE: ___ OF ___

DAE Fleet by SP

DATE: 1-16-14

CLIENT: _____

PROJECT: _____

LOCATION: GUMW-01

ACTIVITY: _____

GEOLOGIST: GEM & AES

Arrive @ 8:30

Tag Depth 174' 3/4"

Port 1 185' 9" (= 185.8 ft)

⊗ Port 2 collect set 3) purge (at end) and hold just in case No. Sample on 2nd purge.

Tank B = 1300 psi.

GN₂ on @ 9:31

Port 1 & 2, 3 & 4 H₂O on @ 9:33

	PH	Cond	Temp	
Port 1	6.36	2.02	19.2	loc 2 9.35
Port 2	7.05	1.434	19.1	
Port 3	10.37	1.356	19.3	
Port 4	7.76	0.703	17.6	

all Blew @ 9:40

Regenerated lines

GN₂ ON AGAIN @ 10:25

2nd catch

Flute well
by Aquatic
Center

DAILY FIELD LOG

PAGE: 1 OF 2

DATE: 1-17-14

CLIENT: _____

PROJECT: _____

LOCATION: 6W MW-03

ACTIVITY: _____

GEOLOGIST: WB & LEM

8:40 Arrive @ Well

9:08 Tag Depth 91 ft 3 1/4 in.

9:13 Part 1 120 ft 3 1/4 in = (120.3 ft)

9:16 Tank C 160 ps.

* Purge Tag to get Part 1 & TAG
within < 20 ft difference

9:22 Purge TAG at 160 ps.

- Start flow immediately

9:24 - Pressure increased to 180 ps.

9:33 - Flow stopped

- Pressure Released to Regulator
~ 3.25 gallons purged.

10:04 Tank C 140 ps.

- Start Purge 160 ps.

Flow started at 10:04

10:11 Pressure increased to 180 ps.

10:16 Flow stopped

- Pressure Released to Regulator
~ 5 gallons

10:28 Part 1 = 121 ft.

Tag = 93 ft 10"

DAILY FIELD LOG

DATE: 1-17-14
 CLIENT: _____
 PROJECT: _____
 LOCATION: SWMW - 03
 ACTIVITY: _____
 GEOLOGIST: W6 & W8M

Time	PH	Cond	Temp
12:10			
Port 1	7.44	2430	21.3
Port 2	10.38	1.384	21.8
Green Port 3	11.13	1.285	21.3
Port 4	11.40	2.730	20.3

Ports 2, 3, 4 Blow @ 12:15

12:17 GN2 OFF

12:38 GN2 ON @ 130 psi

12:39 Port 4 Blow

12:39 1 & 3 H2O ON

12:41 2 H2O ON

Bumped up pressure to 160 psi @ 12:45

12:45 Port 2 Blow

12:47 Port 3 Blow Dark green H2O

12:50 Port 1 Blow

12:55 GN2 on line 5 and 6

12:55 H2O on 6

12:56 H2O on 5

⊗ Because 4 Blow Sample 4 when you take voc's of 5 & 6 - to give enough regeneration time.

DAILY FIELD LOG

PAGE: 1 OF 4

DATE: 1-10-2014
 CLIENT: _____
 PROJECT: _____
 LOCATION: GWMW-08
 ACTIVITY: _____
 GEOLOGIST: Lem Y/W

arrive @ 8:50

1162.25 Tag

1160' 1 1/4" Part 1

Log will not have a connection

TANK A GN₂ psi = 2575

Valve @ Top of octopus when Black Valve
 (arrow) is pointed to green face, Valve is open

NOTE: The Tag needs to be at least
 6" HIGHER THAN Part 1.

3 gal \approx 1 ft. Remember10:30 Added 10 gal H₂O

Part 1 = 154' 0"

Tag = 154' 1"

Part 2 = 175' 2"

Notes after adding 10 gal. Both Part 1 & the Tag
 were at the same level which indicates that
 Part 1 was is cracked or at least open to tag.

DATE: 1-10-14
 CLIENT: _____
 PROJECT: _____
 LOCATION: 60Wmw-08
 ACTIVITY: _____
 GEOLOGIST: EmyLV

*2nd
 time*

12:10 GN₂ ON Ho @ 12:11

Sampled VOC @ 12:12 See Param page.

#3 Blow 12:19 }
 #5 Blow 12:19 } all N₂ sees apart
 #4 Blow 12:20 }

Pressure on Tank ~ 1400 psi

12:24 Beyond 2
 Line 1 on Port 2 - No Sample
 " 2 on Port 6
 " 3 on Port 7

GN₂ ON @ 12:26 Tank Pressure = 1400 psi

#6 } Both had Ho @ 12:27
 #7 }

Date	pH	Cond	Temp	
#6	7.78	0.434	22.2	12:28
#7	8.18	0.446	21.5	12:29

yellowish } Blow @ 12:34 N₂ gas purged
 (i Blow @ 12:34 ~ 2 gal purged

GN₂ off @ 12:36

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 1-21-14

CLIENT: _____

PROJECT: _____

LOCATION: Gownw-09

ACTIVITY: _____

GEOLOGIST: Fern, RJK

Remember: Tag Needs to be at least 6" Higher than Port 1, But Not more than 20 feet.

Got here @ 9:30

Tag Depth = 189 ft + 10" @ 10:15
 Port 1 = 207 ft - 7" (= 207.6 ft)

Note: Tag Tube was tight. Had to force feed H₂O depth to about 150ft then it went by itself. (H₂O meter)

Tank E = 2300 psi

Pressure on 10:38

Ports Blew

10:39 2 & 3 on

Port 2 10:49 1057

10:40 1 & 4 on

Port 1 10:52 Port 3 on

Port 4 10:54

pH

Cond

Temp

	pH	Cond	Temp	
Clear Port 1	7.17	0.785	19.3	2gal
Brown pink 2	6.36	1.688	19.7	2gal
Pink 3	6.56	1.835	19.0	3gal
4	6.93	1.695	18.2	3gal

10:56 LN₂ off. Let regenerate

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 1-23-14
 CLIENT: _____
 PROJECT: _____
 LOCATION: GWMWHS
 ACTIVITY: _____
 GEOLOGIST: YRW & Cem

Arrive @ Site @ 10:30

Go Depth \rightarrow 174.6 Tank 6 P = 2500 psi.
 Screen Interval = 190-205'

Dropped line - Tripod Doesn't really hold the weight.

Remember

11:24 Ready to purge.

11:54 - Starting to pump GIL. Bumped up controller from 10/5 cycle to 20/10 cycle @ 11:55 got HO @ 11:57.

@ 12:32 purged approx 3 gallons.

Note: Cycling @ 130psi w/ 20/10 cycle

Regulator (on tank) Set @ 1100 psi

12:47 Start measuring parameters @ 4 gal H₂O purged.

	pH	Cond	Temp
12:49	6.42	1.179	20.3
12:50	6.54	1.680	20.4
12:51	6.58	1.684	20.5
12:53	6.62	1.681	20.5
12:54	6.68	1.687	20.1
12:56	6.69	1.688	20.2

Out Site @ 13:33

Out VOC'S 12:57

DAILY FIELD LOG

PAGE: _____ OF _____

DATE: 2-4-14

CLIENT: _____

PROJECT: _____

LOCATION: bwmw11-I

ACTIVITY: _____

GEOLOGIST: Cem, JZJ

Arrive @ 10:15 Well Depth = 314 ft

~~Well~~ Depth = 184.1 ft

Used (brought) the wrong tubing (bwmw15-I) instead of bwmw11-I C

So we used the depth indication on the Nylon Rope (of 300ft) and added ~ 8 ft. Started pumping O_2 and got H_2O right. We cut the sample line @ ~ 308 ft. We started pumping O_2 and got H_2O right away. It must have been the H_2O from the sample line. Then after about 10 min of pumping the sample started coming out like grey silt. It pumped grey silt (approx. 300 ml) then we pulled the bladder up about 8-10 ft then kept on pumping. But then the H_2O stopped flowing. We kept pumping for another 30 mins and still didn't get any flow. So we shut down and went back to lab.

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 2-11-14
 CLIENT: _____
 PROJECT: _____
 LOCATION: Gwmw 11-I
 ACTIVITY: _____
 GEOLOGIST: [Em, JZ]

arrive @ 9:40

Well Depth = 184.0 ft.

Previous Cycle = 35/20 & 6 gal pumped

So set 40/20 to start

10:15 ON₂ on @ 10:15 tank @ 250 psi (Reg) Pressure Total = 1800 psi
 Cycles @ 40/20

Got H₂O. GREAT AT START (BUT FROM TUBING)

11:30 - 5 gals pinged.

12:30 - 8 gal pinged.

	pH	Cond	Temp
1230	7.33	1.227	19.4
1234	7.53	1.229	19.8
1236	7.53	1.225	19.4
1242	7.52	1.227	19.3
1248	7.57	1.227	19.4
1248	Sampled DOC		

DAILY FIELD LOG

PAGE: 1 OF 1

DATE: 2-13-14

CLIENT: _____

PROJECT: _____

LOCATION: 6WMMW1-D

ACTIVITY: _____

GEOLOGIST: Lem, JZJ

arrive @ well @ 9:00

Previous: Screen Interval = 525-540 ft.

H ₂ O level	2012	=	182.83'
	2013	=	186.65'
	2014	=	182.95'

Check on (tension coupler) for tubing connect.

9:55 bladder installed in well
used black elect-tape to fortify couplers.10:00 Set 6N₂ on Tank @ 290
~~Set~~ Set Throttle @ 200 psi
Cycles @ 35/2510:03 Get H₂O - it's the water from the tubing.

12:11 Changed on Gas Tank. New tank G has 300 psi.

12:15 Purged w 12-13 gals (2 1/2 lg buckets)

Begin sampling for parameters.

DAILY FIELD LOG

PAGE 1 OF 1

DATE: 2-18-14
 CLIENT: _____
 PROJECT: _____
 LOCATION: GWMW15-5
 ACTIVITY: _____
 GEOLOGIST: Lem J21

arrive @ 9:00 - Forget to exchange GN_2 cylinders

Went back to AIRBAS

arrive @ 9:45

2012 H₂O Depth = 237.5'

2013 H₂O Depth = 238.3'

2014 H₂O Depth = 239.4'

Tank Pressure = 2000 psi

Started GN_2 Set tank Reg @ 175 psi

Box Reg was 150 psi

and cycles are 40/20

GN_2 ON @ 10:42

H₂O @ 10:45

GN_2 Tank = 2000 psi
To Start

By 11:30 had 2 gals purged.

11:55 purged about 3 gals

Changed the box throttle to 200 psi

tanked regulator is @ 250 psi

Cycles 40/20

Note Changing from 150 psi to 200 psi on throttle makes a huge difference in time to pump 1 gal.

Will 200 psi all the time.

12:35 purged 8 gals Begin sampling parameters

GN_2 Tank Pressure = 1900

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 2-20-14

CLIENT: _____

PROJECT: _____

LOCATION: 6umw15I

ACTIVITY: _____

GEOLOGIST: LEM JZJ

Purge Vol = 17 liters
 4.5 gals

Arrive @ 9:15 am

H₂O Depth

2012

239.08'

2013

239.7'

Feb 2014

242.0'

Tubing ~ 468' long (Need to measure new tubing.
 Reined prev. tubing @ well 6umw11-I - so there it is (way).

Got tubing measured to 420ft. Finally

GN₂ Tank 1800 psi

10:12 GN₂ ON tank reg @ 200 / Throttle @ 200 psi

10:37 got H₂O

Cycles 40/20

↳ Purged 1/2 gal.

11:00 Bumped up throttle pressure to 230 psi.

Remember Throttle Pressure should be 1/2 psi for every foot of pump depth.

12:10 Tank pressure = 200 psi / purge vol = 1 1/2 gal

13:20 Tank empty. Switched to Tank "I"
 psi = 2800, approx. 3 gals purged

14:00 purge Vol = 4.5 liters

Began sampling for parameters

DAILY FIELD LOG

PAGE: 1 OF 1

DATE: 2-25-14

CLIENT: _____

PROJECT: _____

LOCATION: GUMM 15-D

ACTIVITY: _____

GEOLOGIST: LRM JZJ

purge Vol
 = 6.3 gal
 + vol in line

Arrive @ 8:45

Previously	May 2013	H ₂ O Depth
	2012	239.7'
Screen Interval	580.6 - 595.6'	237.99'

February H₂O Dept. 239.89'

9:20 Bladder in

9:24 6N₂ ON

Tank @ 2000 psi

Tank Reg @ 3000 psi

Throttle @ 2600 psi

Cycles @ 40/20

Everything running smooth!

12:30 Changed to New 6N₂ Tank psi = 2800 psi
 Purge Vol so far is 11 gals.
 Remember 6 gal purge is full line

12:55 Start sampling for params (w/ 12.5 gal
 total purge)

13:15 finished Sampled VOCs @ 13:12

6N₂ Tank @ 2200 psi

DATE: 2-27-14

CLIENT: _____

PROJECT: _____

LOCATION: Well 57

ACTIVITY: _____

GEOLOGIST: Leah E. JET

arrive @ 9:00

C/C Well 57 behind Pier 1

Since the pipe is Big (Diam \approx 3-4") Pump approx
26 Liters when get three consecutive param.

May 2013	Previous	H ₂ O Depth	239.09
Feb 2014	"	"	293.20

Going to use New tubing (500ft lengths)

We cut off 20ft of the line (left 10ft
out of well so bladder is @ 40ft.

Bladder Depth = 40ft. (with 10ft line out of well)

9:43 ready to go.

6N₂ Tank @ 2200ps.6N₂ " Reg @ 3000ps.

Throttle @ 200ps.

Cycles are 40/20

Purge Vol in 2013 was 26 Liters.

26 Liters / (Gal) = 6.87 gal
(3.78541)Need to purge ~ 7gals then the params can be read
till 3 consec readings are achieved.

11:45 5 gals purged (still need 2gals)

DAILY FIELD LOG

PAGE: 1 OF 1

DATE: 3-3-14

CLIENT: _____

PROJECT: _____

LOCATION: _____

ACTIVITY: LLC well 20

GEOLOGIST: Lem

Well 20
By Young Pecan

MAY 2013 Static level = 243.25 ft.

Dropped Hydro sleeve to 430 ft.

March 3, 2014

Static level (per Scada) = 238.9 ft.

4 screen levels 380-395

415-440

450-525

615-673

arrived @ well 20 @ 10:30

Nylon rope was still attached to valve handle
and the length was extended down inside
well. (w/ it attached)attached Hydro sleeve to end of rope (430 ft)
and dropped in well. @ 10:42Note: rope is full of oil and black metal
particulate @ about 250 ft to ~ 350 ft.

3-4-13

Went and pulled up Hydro Sleeve
at 12:45, felt a lot of wt - had ~ 50-100
ft more of the wt "let go" - nothing on end of rope
1349 called Luis - he said drop another
Hydro sleeve - dropped @ 13:55

City of Las Cruces
Joint Superfund Project

Date: 1-6-14

Sampler: LEM

Weather Conditions: _____

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
MW-5	No Sample					
MWSF-4	13:35	6.05	1.226	20.2	1334	

City of La Cruces
Joint Superfund Project

Date: 1-7-14

Sampler: LEM

Weather Conditions: _____

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
Well 18	1127	6.42	0.689	20.7	1126	
Well 27	1143	6.65	1.135	21.9	1141	
					1142 - DUPE	

City of Las Cruces
Joint Superfund Project

Date: 1-9-14

Sampler: LEM

Weather Conditions: _____

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
MW-5	13:50	6.48	1.893	19.9	13:48	DAE Rd parking lot

City of Las Cruces
Joint Superfund Project

Date: 1-10-14

Sampler: Sam, YRU

Weather Conditions: _____

Comments: GWMW-08 Pat Parking Lot

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
Point 3	12:14	9.15	0.634	22.7	12:12	
Point 4	12:15	7.81	0.474	21.8	12:13	
Point 5	12:16	8.83	0.428	20.8	12:14	
Point 6	13:09	7.93	0.449	20.8	13:10	
Point 7	13:11	8.48	0.453	21.3	13:12	

City of Las Cruces
Joint Superfund Project

Date: 1-15-14

Sampler: LEM, YRU

Weather Conditions: 6

Comments: 6mw10 - Ports 1-7 (By DEA Bldg)

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
Port 1	11:16	6.85	1.863	17.4	11:13	
Port 2	11:16	8.85	1.507	17.9	11:14	(Pink) Dupe @ 11:15
Port 3	11:16	7.11	1.603	18.8	11:15	Dupe @ 11:16
Port 4	11:33	7.58	1.386	19.4	11:32	
Port 5	12:35 11:35 am	8.67	1.308	21.2	12:42	
Port 6	12:36	7.69	1.182	22.0	12:40	
Port 7	12:37	10.12	0.677	21.6	12:39	

City of Las Cruces
Joint Superfund Project

Date: 1-16-14

Sampler: LEM

Weather Conditions: _____

Comments: 6Wmw-01 Need Dupes on Port 1 & 6

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
Port 1	1033	8.08	0.699	18.3	10:30	
Port 3	1032	9.77	1.325	19.2	10:27	Dupe @ 10:28
Port 4	1034	8.08	0.699	18.3	10:29	
Port 1	1033	6.93	1.005	17.9	10:30	Dupe @ 10:30
Port 2					9:35	Sampled 1 st Purge
Port 2					12:18	
Port 5	1224	8.18	0.475	20.4	12:20	
Port 6	1224	8.41	0.648	20.4	12:22	Dupe @ 12:23
Port 7	1225	8.40	0.580	19.8	12:19	

City of La Cruces
Joint Superfund Project

Date: 1-17-14

Sampler: LEM, ~~443~~ 426

Weather Conditions: _____

Comments: 602MW-03

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
Port 1	1244	7.64	2.17ms	22.6	1240	
Port 2	1243	6.97	21.1ms	37.2	1241	
Port 3	1245	10.09	0.636	20.6	1240	
Port 2	1243	9.54	1.342	21.1	1241	
Port 4						
Port 5					1336	Nodata - only trial
Port 6	1340	9.07	0.568	21.0	1337	Nodata - only trial
					1335	

City of La. Cruces

Joint Superfund Project

Date: 1-21-14

Sampler: LEM

Weather Conditions: _____

Comments: 6 Wmut-09

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
Point 1	11:31	7.35	1.069	20.2	11:31	
Point 2	11:38	10.19	1.782	20.0	11:32	
Point 3	11:40	10.59	1.902	19.9	11:34	
Point 4	11:42	8.37	1.635	19.6	11:36	
Point 5	11:55	9.31	1.608	21.1	11:52	H ₂ O is Pink/Brown
Point 6	11:56	7.54	1.221	20.4	11:53	
Point 7	11:57	9.11	0.505	20.4	11:54	H ₂ O is Pink

City of La Cruces
Joint Superfund Project

Date: 1-23-17

Sampler: LEM & YRU

Weather Conditions: _____

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
GUMS1FS	12:56	6.69	1.688	20.2	12:57	

City of La. Cruces
Joint Superfund Project

Date: 2-11-14

Sampler: LEM

Weather Conditions: Breezy & Sunny

Comments: GWMW11-I

plunged 8 gals then took readings

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
GWMW11-I	12:30	7.33	1.227	19.4		
	12:34	7.53	1.229	19.8		
	12:36	7.53	1.225	19.4		
	12:42	7.52	1.227	19.3		
GWMW11-I	12:48	7.57	1.227	19.4	12:48	

City of La. Cruces
Joint Superfund Project

Date: 2-13-14

Sampler: JEM JZJ

Weather Conditions: _____

Comments: GWMW 11-D

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
GWMW 11-D	12:18	7.69	0.553	21.5		
	12:20	7.93	0.558	21.1		
	12:22	7.94	0.557	20.9		
	12:24	7.94	0.556	21.1		
	12:27	7.94	0.553	20.8		
	12:33	7.95	0.556	21.1		
GWMW 11-D	12:37	7.94	0.556	21.0	12:36	

City of La Cruces
Joint Superfund Project

Date: 2-13-14

Sampler: JEM

Weather Conditions: Hot Sunny

Comments: 60mmw 15-5

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
60mmw 15-5	12:38	7.34	0.918	22.2		
	12:39	7.36	0.918	22.0		
	12:42	7.40	0.919	22.2		
	12:44	7.39	0.918	22.0		
60mmw 15-5	12:46	7.41	0.919	21.0	12:47	

City of La. Cruces
Joint Superfund Project

Date: 2-20-19

Sampler: LEM

Weather Conditions: Hot Sunny - Very Breezy

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
GWMWIS-I	1403	7.22	1.560	22.2		
	1405	7.32	1.574	21.8		
	1408	7.34	1.570	21.6		
	1410	7.36	1.571	21.2		
	1411	7.37	1.565	21.7		
GWMWIS-I	1413	7.35	1.565	22.1	1415	

City of La Cruces

Joint Superfund Project

Date: 2-25-14

Sampler: LEM

Weather Conditions: Overcast Cloudy & Hot ~ 70°F

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
6WMW15-D	1255	7.47	0.901	22.4		
	1258	7.54	0.908	22.3		
	1302	7.55	0.920	22.0		
	1304	7.54	0.920	21.8		
	1307	7.53	0.917	21.9		
6WMW15-D	1310	7.56	0.914	21.8	1312	

City of La. Cruces
Joint Superfund Project

Date: 2-27-14

Sampler: LEM

Weather Conditions: Sunny, V. Windy

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
CLC 57	1205	8.66	0.451	22.7		
	1208	8.77	0.453	22.9		
	1212	8.81	0.452	22.6		
	1214	8.84	0.451	22.7		
	1216	8.85	0.454	22.3		
	1218	8.84	0.453	22.6	1219	

City of La Cruces
Joint Superfund Project

Date: 3-4-14

Sampler: _____

Weather Conditions: _____

Comments: LOST Hydro Sleeve

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
		NO Sample				

City of La Cruces

Joint Superfund Project

Date: 3-6-14

Sampler: LEM

Weather Conditions: _____

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
CU 20	1324	8.03	0.987	22.1	1322	

DAILY FIELD LOG

PAGE: 2 OF 2

DATE: 4-16-13

CLIENT: _____

PROJECT: _____

LOCATION: GWMW 11-S

ACTIVITY: _____

GEOLOGIST: Lem & RJR

After collecting 4 gals we need to get 3 consecutive readings (within 40% of each other) of pH & cond.

12:09 purged 5 gal will check pH & cond.

	<u>pH</u>	<u>Cond (ms)</u>	<u>Temp °C</u>	<u>NOTES</u>
12:10	6.99	1.773 ms	22.8	
12:14	7.20	1.771	22.3	
12:18	7.32	1.763	22.6	
12:22	7.18	1.776	22.5	6 gals purged

12:25 pulled 1bc Sample

Sampled

On Willow St & Wendal corner.

DAILY FIELD LOG

PAGE: 1 OF 2

DATE: 4-17-13

CLIENT: _____

PROJECT: _____

LOCATION: EWMW-11-D

ACTIVITY: _____

GEOLOGIST: RLR LEM

Got 2nd 6N₂ Bottle

Arrive @ Site 9:00

Screen Interval = 525 - 540 ft.

2012 H₂O level = 182 ft 182.83 ft.

2013 H₂O level = 186' 6.5"

Sample line = 533 ft.

10:28 Started 6N₂ Cycle @ 35/20 psi = 175
6N₂ regulator Set @ 300 psi.

Calc: [0.036 gal/ft for 11-D)
530 ft - H₂O Depth (186.5') = 343.5 ft of H₂O
in column
343.5 ft x 0.036 gal/ft = 12.47 gal / 1 purge Vol.

12.47 x 3 = 37.4 gal for 3 well vols.

So Std field ^{practice} ~~is~~ is min of 1 well vol
and 3 consec param reading w/in < 10%

< 10% = HIGH - LOW
AVG.

2012 purge Vol = 9 gals.

10:50 get H₂O Note we had upped Psi to 250
Cycle @ 35/25

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 4-16-13

CLIENT: _____

PROJECT: _____

LOCATION: GWMW 11-S

ACTIVITY: _____

GEOLOGIST: Lem & RJK, LGB

arrive 8:43

2012 H₂O Depth = 171.47'4-16-13 H₂O Depth = 172.71'

Screen Interval 190-205'

Man Cover used 3/4" Socket

Line Cut @ 198' → 5'2" sticking out = 192'10" in casing.

$$\frac{192'10''}{172'71''} \rightarrow 20.25' \text{ of water to purge out.}$$

10:04 Ready to Purge

2890 psi on 6N₂ CylinderSet Controller @ ¹³⁰100psi & cycle @ 10/5

Typical Setting is 1/2 psi for each ft of depth

10:17 Reset Controller to 130 psi & cycle 20/10

had a leak at gas/tubing connection; fixed & restarted

@ 10:32

start over dropped it @ 11:04 get H₂O @ 1107
6N₂ on tank @ 2600 psi
$$\text{Flow } \frac{80 \text{ ml}}{2 \text{ sec}} = \frac{2.4 \text{ L}}{\text{min}} \quad // \quad \text{pur cycle flow time is } \frac{300 \text{ ml}}{\text{min}}$$

Behind Target

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 4-19-13
CLIENT: _____
PROJECT: _____
LOCATION: GWMW 155
ACTIVITY: _____
GEOLOGIST: Lem-4RV

Arrive 8:45

2012 H₂O Depth = 237.5
2013 " " = 238.3

Screen Interval 289-301
GWL Depth = 297

In 2012 pressure set @ 130 psi ^{on box} 1st then 150 psi
cycle 20/12 25/15

Begin using
S cyl #20
@ 9:40 started pumping GN₂ Reg @ 180 (full tank = 2500 psi)
@ 9:45 Set Box pressure to 150 psi.

10:00 get H₂O

10:45 pumped 2 gal

11:15 cycled cycle to 30/20

11:30 pumped 4 gal

12:15 pumped 6 gal

12:20 Begin sampling for pH & Cond

	pH	Cond	Temp
12:22	7.03	0.964	20.8
12:30	7.14	0.954	21.1
12:34	7.23	0.968	21.1
12:38	7.27	0.965	21.0
12:40	7.30	0.964	20.8
12:42	7.31	0.963	21.0
12:43	7.27	0.961	21.4

12:44 collect WOCs

DAILY FIELD LOG

PAGE: ___ OF ___

Willow St

DATE: 4-18-13

CLIENT: _____

PROJECT: _____

LOCATION: GWMW-11I

ACTIVITY: _____

GEOLOGIST: Lem. yon

Arrive 9:00 Screen Interval 299-314'

2012 H₂O Depth = 181.32 ft.

2013 = 185.98 ft.

Sample line = 308 ft

Opened New GN₂ Cyl. = 2500 psi

Cycle 20/10

Turned on GN₂ @ 0954

10:06

Boxed 1000 psi / cyl @ 200 psi.
No H₂O yet~~10:06~~ Set GN₂ cyl @ 3000 psi

10:10 Change Cycle to 40/20 @ 150 psi

10:28 Changed cycle to 35/20 @ 150 psi

11:03 4 gals purged.

11:30 6 gals purged.

Begin taking parameters

	PH	Cond	Temp
11:33	7.25	1346	21.5
11:36	7.21	1311	21.0
11:38	7.17	1351	21.1
11:40	7.12	1358	20.3
11:42	7.14	1355	20.6
11:45	7.17	1352	20.7

11:46 took VOC Samples 18 gals purged

Note Settings GN₂ Cyl = 1800 psi

DATE: 4-22-13

CLIENT: _____

PROJECT: _____

LOCATION: GWMN-15D

ACTIVITY: _____

GEOLOGIST: Lem & YPN

Arrived @ 0850

2012 H₂O Depth = 237.99

2013 " " = 239.73

Screen Interval - 580.6 - 595.6
true Depth 5889:15 Set up controller & dropped Bladder.
around 9:30 discovered we were missing the Brass
connection for the Black gas line (to Bladder).10:38 Set up & ready to go.
GN₂ Tank = 1100 psi Reg @ 200

10:42 Controller @ 150 psi Cycle = 20/10

10:48 No Air yet (when checking by putting H₂O line under H₂O)

10:58 Set Controller pressure to 1080 psi

11:30 Upped cycles from 20/10 to 25/15.

11:57 Changed Controller pressure to 200 psi and
Cycles to 40/20.12:30 Switched out GN₂ cylinders (using 3rd one now)
P = 3000 psi, Regulator @ 30013:00 (per Luis) up pressure to 300 psi (controller)
got to 275 & line Blew hole.

No Sample Tear Down - Try Next Time

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 4-26-13

CLIENT: _____

PROJECT: _____

LOCATION: WNW-15-L

ACTIVITY: _____

GEOLOGIST: YRW - CRM

8:00 -

Arrive @ 8:35

	H ₂ O Depth	Screen
2012	= 238.08'	460-475
2013	= 239.7	

Tubing = 468'

O₂ is @ 2400

Start 0911 O₂ regulator @ 200
Control Box @ 140
Cycles 20/10

Need to Purge 17 Liters

No H₂O @ 10:30 Called Luis - he said pull it out check for kinks & gas pressure, ⇒ there were (in the bladder) kinks @ start.

gas is good, lines are tight.

11:15 Start up again

Set O₂ Reg @ 240psi / Controller @ 150

Cycle 20/10

@ 1147 - O₂ PSI = 150 on the controller

Cycles = 25/15

12:30 - NO H₂O, pulled Bladder OutNo kinks, some H₂O in line ⇒

Remember 1/2 psi / ft Depth

DATE: 4-29-13

CLIENT: _____

PROJECT: _____

LOCATION: Gwmw15-D

ACTIVITY: _____

GEOLOGIST: Lem

Arrive @ 8:35 \Rightarrow FORGOT BLANDET
(Alex is Bringing it)

203 H₂O Depth = 239.7'

Screen Interval = 5806 - 5956 ft.

Line Depth = 588 ft.

6 N₂ Cylinder (3) @ 900psi Set Reg = 300psi
Controller @ 270
Cycle @ 25/15
Start Controller @ 19:45

Calc Purge Vol = 588 - 240 = 348 ft.

$$348 \times 0.036 \text{ gal/ft} = 12.5 \text{ gal}$$

Sol Ratio Compared to 15-I

$$\frac{17 \text{ Liters}}{24.6 \text{ gal}} = \frac{X}{37.6 \text{ gal}} \quad X = 25.97 \text{ Liters}$$

$$\frac{12.5 \text{ gal}}{3} = 37.6 \text{ gal}$$

9:50 got H₂O - Purged initial 2L out (from line) before counting
10:40 purged 8L (plus initial 2L) = 10 total Vol.
10:55 12 liters purged.
11:10 cyl 3 out of 6 N₂ (Replace w/ cyl 4 psi = 3400

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 05-01-13

CLIENT: _____

PROJECT: _____

LOCATION: GWMW15-I

ACTIVITY: _____

GEOLOGIST: LEM / JRV

Arrived @ 0843

H₂O Depth → 2012 = 238.08
2013 = 239.7Screen: (460-475)
Tubing - 468O₂ → 2000 Regulator → 300 psi
Control → 175 psi (circled) Cycles - 20/10

Starting @ 0917

9:24 We got Bubbles!

9:28 We got H₂O Baby!!10:29 Got 8 liters = H₂O is Brownish Orange
(has dirt/sediment in it)

11:00 got 12 liters

11:28 purged 16 liters

11:53 purged 20 liters

We begin sampling parameters

12:09 finished sampling VOCs

Flute Well in Don Ana
Construction yard.

DATE: 5-8-13

CLIENT: _____

PROJECT: _____

LOCATION: GWMW-01

ACTIVITY: _____

GEOLOGIST: GWR/ylh

Arrived @ 0835. Had to dig out well
@ 0933 Measuring H₂O level (1st)
Log = 176.39 ft. 176.3 3/4 inches

@ 0938 Measuring Part 1 (need to take off Perthead)
Part 1 = 187.51 ft (187.6 3/4 inches)

Use Jones A - psi - 21750

* PSC - Use table to determine psi to use

Make sure to read psi - not kpa

- Psi set at 175 @ 0959
H₂O in H₂O Part 1, 2, 3 & 4 @ 1000

@ 1012 Part 1, 2 & 3 blow

@ 1013 Part 4 blow

Part 1 = 1 gallon 1/2

Part 4, 3, 2 = 1 3/4 gallon

Left w/ 2500 psi.

@ 1046 Test psi to 152

H₂O @ 1048 for parts 1, 3 & 4

* Part 2 needs to be regenerated at least 1 hr.

DAILY FIELD LOG

PAGE: 9 OF 3

DATE: 5-9-13

CLIENT: _____

PROJECT: GWMW-03

LOCATION: _____

ACTIVITY: _____

GEOLOGIST: WJH/jrl

11:54 ~~1st~~ Port 2 Blows: 2nd Purge11:57 Port 3 Blows: 2nd Purge12:03 1st Purge ports 5 & 6: Water @ 12:04

Tank C 1750 ps:

	pH	Temp	Cond.	Time	1 st Purge
port 5	11.12	22.2	1.347	1205	1.5 gal
6	9.00	22.2	.499	1207	1.5 gal

12:13 ports 5 & 6 blew

Restart @ ~~11:50~~ 1242 - Attempted Port 4 again
 (Port 4 blew)

Left Tank (C) → 1150 psu

Done @ 1253

Port 4 blew when 2nd purge attempted.
 Took sample @ 1st purge. Injected w/ HCl

* When ^{Tag} H₂O depth is lower than port 1 depth always purge H₂O !!!

Do not Add !!!

DATE: 5-9-13

CLIENT: _____

PROJECT: _____

LOCATION: GWMW-03

ACTIVITY: _____

GEOLOGIST: LJB/jrv

Arrived @ 0915

Use Tank A -> psi -> 1600

Measuring H₂O Depth - Tag 95.08 (95 inch)

" Port 1 -> 123.29

-> Added H₂O, remeasured and distance was longer
* Need to take out H₂O

Start purge (H₂O removal @ 1012, psi 150)

(EPA)

Stopped @ 1029 due to EPA Audit.

5-10-13

Arrived at 0831

Tag Depth (H₂O) - 86.17

Port 1 Depth - 122.25

@ 0840 Begin purging Tag Line - Tank A = 1000 psi

0850 - H₂O Stopped, Remeasured @ 87.83

0901 - 89.08

0913 - 90.52 -> Went to pick up new tank.

9:21 - Switched to Tank B psi 2750

9:22 - Start purge

9:31 - water stopped - Recharge Tag = 92.67 ft

9:32 - start Purge B Tank 2425 psi

9:42 - water stopped - Recharge Tag = 94.25 ft

9:44 - ~~water~~ start Purge B Tank 2150 psi

DATE: 5.13.13

CLIENT: _____

PROJECT: _____

LOCATION: Gwmw-09

ACTIVITY: _____

GEOLOGIST: _____

Arrived @ 0831@ 0840 Log Depth → 196.0Port II → 203 201.58@ 0858 Start purge psi @ 196 H₂O @ 0859 (1-4)

	pH	Temp	Cond.	Time
port 1	7.31	22.1	1.003	0900
2	6.82	21.6	1.848	0901
3	10.82	21.5	1.796	0902
4	7.89	21.4	1.758	0903

Port 1- & 3 blow @ 09112 & 4 blow @ 0912Restart @ 0944 , H₂O @ 0945@ 0950 Change tank, no pressureTank D @ 2500Restart @ 0958 H₂O in Port 1 & 2* Port 1 has leaking (fritting) used up lot of gas.@ 1016 Restart Tank D-2300Regulator 294

* Careful walking w/
Part 5. Connections need to
be secured!!

DATE: 5-16-13
CLIENT: _____
PROJECT: _____
LOCATION: GNMU-10
ACTIVITY: _____
GEOLOGIST: Kth Jyer

Arrived @ 0925

Log Depth = 217.54 Part 1 = 221.00

Set and ready to go @ 0903 H₂O @ = 0906
Link psi = 1800 Regulator set @ 188 psi

	PH	Temp	Cond	Time	
part 1	6.97	22.1	1.214	0906	} all 2 1.25 gallons
2	7.28	22.0	1.429	0909	
3	7.89	21.8	1.613	0910	
4	7.69	21.6	1.438	0912	

all parts blow @ 0915

Restart @ 0945, H₂O @ 0946 psi @ 165

Lines blow @ 0957

Start parts 5, 6, 7 @ 1007 psi @ 188

change out link psi @ 2800, H₂O @ 1010

	PH	Temp	Cond	Time	
part 5	7.87	21.9	1.386	@ 1011	} 2 1.25 gallons
6	8.28	21.8	1.221	1015	
7	8.07	22.0	.568	1016	

Part blow @ 1021

Link @ 2400

Restart @ 1050

Regulator @ 165

(Tap on 5) H₂O @ 1052

Lines blow @ 1102 Finished!!

Link E @ 1800 psi

DAILY FIELD LOG

PAGE: _____ OF _____

DATE: _____

CLIENT: 5-20-13

PROJECT: _____

LOCATION: _____

ACTIVITY: Well 57GEOLOGIST: WB YRU

	pH	Cond	Temp
12:35	7.75	0.554	28.8
12:39	7.73	0.555	25.2
12:41	7.74	0.561	24.2
12:43	7.74	0.565	23.7
12:44	7.83	0.565	23.5
12:48	7.87	0.564	23.8
12:47	7.85	0.568	23.2
12:52	8.02	0.568	23.8
12:53	6.06	0.570	23.5
12:58	8.09	0.570	23.8

Sample Time: 12:56 DUP 4WUW

Total

Well 57 (Pre 1)

Bladder

DATE: 5.20.13

CLIENT: _____

PROJECT: _____

LOCATION: Well 57

ACTIVITY: (Behind Pump 2)

GEOLOGIST: Wb YRW

Arrived on site @ 0935

H₂O level - 839.09

- Sample filter set @ 490 ft

- Start purge @ 11:15

set pressure. Tank: 1800 ps

Regulator 300 psi

Controller 175 psi

Cycle 25/15

- pressure on controller set @ 250 ps

- Water @ 11:24

- 11:33 purge Rate 3 min 2 sec / L

= 329.71 ml/min

- 11:42 = 5 L purged

- 11:54 9 L purged total

Tank 1300 ps

- 12:08 13 L purged total

Tank 1100 ps

12:23 17 L purged total

850 ps

12:33 20 L purged

12:45 23 L

Total Volume = 26 L

DAILY FIELD LOG

PAGE: 1 OF 1

DATE: 12-3-13
 CLIENT:
 PROJECT: JSP Grand Ho
 LOCATION: MW-3
 ACTIVITY:
 GEOLOGIST: Gem

12-3-13

Arrive @ Well @ ~~11:30~~ 11:30

Pulled out Rope and there was Black oil on end of Nylon Rope next to SS Weight. (at end.)

Current Ho Depth = 186.5 ft

Screen Interval = 180-190 ft.

Existing Line = 188' (186' yellow line + 2' Nylon)

Dropped HydroSleeve @ 11:55 am

12-4-13 11:50 am

Pulled up H Sleeve and it's empty. Outside of Sleeve is wet though. Added one more foot of Nylon Rope (length = 189 ft now)

Weight was full of mud? Dropped H Sleeve in @ 12:03 pm.

12-5-13

13:30 pulled up H Sleeve - full of mud on bottom outside of weight. Need to drop a bailer.

Dropped bailer @ 13:30

12-12-13 10:30 Bailer full of H₂O w/ ~ 3" mud on bottom
 NOC @ 10:30 11:33 PH = 6.63 Con d = 1.043 mS T = 18.1°C

DAILY FIELD LOG

DATE: 12-3-13
 CLIENT:
 PROJECT: JSP Ground H₂O
 LOCATION: \$S MWSF-2
 ACTIVITY: MW SF-2
 GEOLOGIST: LEM

12-3-13

Arrive @ well @ 12:30

Current H₂O Depth = 187.6'

Screen Interval = 184' - 199'

Existing line is 192 ft @ 3 small zip ties

Set HydraSteeve @ 192 ft

Dropped Hydra Steeve @ 1:00 PM

12-4-13 arrive @ 12:50

pulled HydraSteeve up, contained H₂O. Sampled at 12:55 pm.

OK

	pH	cond	Temp	DOC Sampled
12:58	5.90	2,170	20.2	12:55

DAILY FIELD LOG

PAGE: 1 OF 1

DATE: 12-4-13
 CLIENT: _____
 PROJECT: JSP bounded 60
 LOCATION: MW-4
 ACTIVITY: _____
 GEOLOGIST: Lem

12-4-13
 arrive @ 13:08 pm MW-4

Screen Interval = 175-185 ft.
 H₂O Depth = 183.0 ft. D

Hydrate zone (+ yellow) is currently @ 187 ft.

See if we can get sample @ 182 ft.

Dropped Hydra. Leave the whole length of line
 at 13:30

12-5-13 arrive @ 13:50 H₂O level was empty
 remeasured line holding H₂O 1 ft
 measured 196 ft. (63 x 3 ft) = 190 ft
 4 ft. →

Set a Barter @ 190 ft @ 14:35
 Seemed as though the Barter was heavy w/
 4 ft. left to drop.

12-12-13 10:15 pulled up Barter - contained 200 ml's sample

1017 Cond = 2.18 ms T = 11.4 pH = 6.24

1016 VOC Sampled

DAILY FIELD LOG

PAGE: 1 OF 1

DATE: 12-17-13

CLIENT:

PROJECT: JSP Ground H₂O

LOCATION: MW-St-9

ACTIVITY:

GEOLOGIST: Ken

arrive @ 9:20, dug out well lid (covered w/ dirt)

Screen Interval = 188-203 ft

H₂O Depth: 2012 = 185'

Apr. 2013 = 186.3'

Dec. 2013 = 188.1'

Apr 2013 Nylon Rope is measured @ 195.5 ft
will drop HS to this Depth

Dropped HS @ 9:50 left site @ 9:56

12-18-13 arrive @ site @ 9:45
UCC Sampled @ 10:10

10:15 pH = 6.588 Cond = 1.680 Temp = 20.5

DAILY FIELD LOG

PAGE: 1 OF 1

DATE: 12-17-13

CLIENT: JSP

PROJECT: Ground H₂O

LOCATION: MWSF10

ACTIVITY:

GEOLOGIST: JEM

Arrive @ Site 10:04

Screen Interval = 193.5' - 203.5'

H₂O Depth 2012 = 190.3'

Apr 2013 = 191.8'

H₂O Depth Dec 2013 = 192.8'

Yellow nylon Rope is 198' long (incl white 3' Rope)

Dropped HS @ 10:30

Left @ 10:36

12-18-13 arrive @ Site @ 10:30

Need a duplicate sample (Prev PCE = 100)

1st VOC taken 10:38

Dupl VOC taken 10:40

1042 pH = 5.582 Cond = 1.819 Temp = 19.5

DAILY FIELD LOG

PAGE: 1 OF 1

DATE: 12-17-13

CLIENT: _____

PROJECT: JSP Ground H₂O

LOCATION: MWSE-5

ACTIVITY: _____

GEOLOGIST: 12-17-13 [EM]

arrive @ 10:40

Remeasured yellow nylon Rope (it had incorrect markings).

New markings: 2-zipties = 100 ft
 3-zipties = 140 ft. (middle ziptie)
 1-ziptie @ end = 148 ft.

Screen Interval =

AO Depth 2012 = 142.1'

Apr 2013 = 143.4'

Dec 2013 = 144.4'

Dropped HS @ 11:00 am

12-18-13 arrive @ site @ 13:43

Doc Sample taken @ 13:50

Analysis 13:52 pH = 6.270 Cond = 2050 Temp = 2.1

DAILY FIELD LOG

PAGE: 1 OF 1

DATE: 12-17-13

CLIENT: _____

PROJECT: JSP Groundwater

LOCATION: MW-6

ACTIVITY: _____

GEOLOGIST: Jem

arrive @ well @ 11:20

Pulled up Rope w/ weight! The Rope is caked w/ dirt. The weight and knot holding the weight was caked w/ Black thick mud.

Screen Interval = 188-198 ft.

H₂O Depth = 2012 = 194.9 ft.

Apr. 2013 = 197.3 ft.

Dec. 2013 = 198.3 ft.

No way to sample! - left @ 12:00

Went to talk to DAC Rd. Need safety cones in driveway to sample - Also for back fenced in yard.

DAC Gravel parking lot by street light

12-17-13

DAILY FIELD LOG

PAGE: 1 OF 1

DATE: 12-17-13

CLIENT:

PROJECT: JSP Groundwater

LOCATION: MW-5F Co

ACTIVITY:

GEOLOGIST: JRM

Arrive @ 1:30

Screen Interval = 116-131 ft.

H₂O Depth 2012 = 123.2 ft.

Apr 2013 = 121.9 ft.

Dec 2013 = 125.2 ft.

Need to drop H₃ @ 128 ft. ~~At~~ Existing measure is a large zip tie (two of them) they are located at 126 ft. So 2 ft is added to mark 128 ft. at the single small zip tie.

Dropped H₃ @ 1:40 pm

Arrive @ Site @ 2:08 (1408)

VOC Sampled @ 1412

1415 analysis pH = 5.931 Cond = 2750 Temp = 21.7

DAILY FIELD LOG

PAGE: 1 OF 1

DATE: 12-20-13

CLIENT: _____

PROJECT: JSP Wells

LOCATION: MW SF-3

ACTIVITY: _____

GEOLOGIST: JEM

12/20/13
 Arrived @ Site @ 10:16 (Previous = No Sample)

Screen Interval = 174.8' - 189.8'
 v. H₂O Depth = 175'

Dec 20, 13 H₂O Depth = (172.45')

End of Depth finder was covered w/ muddy sand/gravel
 which pulled up.

No Sample Taken

DAILY FIELD LOG

PAGE: 1 OF 1

DATE: 12-20-13

CLIENT:

PROJECT: SP Grand Ho

LOCATION: MWSF-1

ACTIVITY:

GEOLOGIST: JEM

DAC "Sheet"
Driveway - North

12-20-13

Arrive @ Site 10:35

Previously no sample

Screen Interval = 183.6' - 198.6'

Approx Ho Depth = 187.2'

Dec 2013 Ho Depth = 59.88'

No way to sample

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 12-20-13

CLIENT: _____

PROJECT: JSP Grand Ho

LOCATION: MW-2

ACTIVITY: _____

GEOLOGIST: JEM

Arrive @ Site @ 10:58

Previously No SAMPLE

Screen Interval = 190-195'

Approx H₂O Depth = 18.1'

Dropped Depth-finder = Only would go in
to 18" (18 inches)
Came to a full stop
No way through

PVC pipe is bowed (visibly)

No Sample Taken

DAILY FIELD LOG

PAGE: 1 OF 1

DATE: 12-20-13

CLIENT:

PROJECT: JSP Ground Ho

LOCATION: MW-1

ACTIVITY:

GEOLOGIST: JEM

12-20-13
 arrive @ Site @ 11:25

Screen Interval = 18.2-19.7'

Approx. Ho Depth = 186.3'

Dec 2013 Depth = 189.12'

Remeasured Nylon Rope, 192 ft @ the triple mark
 (3 small 0.2 ft ties)

So I need to drop HS to 192-193 ft

Dropped HS @ 11:52 to 192 1/2 ft.

12-27-13 arrive @ site @ 9:45

pulled up HS @ 9:58

VOC @ 10:00

pH & Temp @ 10:01

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 12-27-13

CLIENT: _____

PROJECT: _____

LOCATION: Well 26 Young

ACTIVITY: _____

GEOLOGIST: Jam

Young
Adit
Well 26

12-27-13

arrive @ 13:00 No Static level taken

pulled Vbc Sample @ 1305

Lead pH & Cond @ 1307 see Results sheet.

~~Tank A psi = 2575~~

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 12-27-13

CLIENT: _____

PROJECT: _____

LOCATION: Well Paz Park

ACTIVITY: _____

GEOLOGIST: Jem

12-27-13

arrive @ 13:18

H₂O level 168.8 ft.

Doc Sample @ 13:22

Analysis @ 13:26

City of Las Cruces
Joint Superfund Project

Date: Various from 12-4 thru

Sampler: JEM

Weather Conditions: _____

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
MWSF-2	12:58	5.90	2.170	20.2	12:55	Sampled on 12-4-13
MW-3	10:33	6.63	1.143	18.1	10:32	Sampled on 12-12-12
MW-4	10:17	6.24	2.180	16.4	10:16	

City of La Cruces
Joint Superfund Project

Date: 12-18-13

Sampler: _____

Weather Conditions: _____

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
MWSF-9	10:15	6.588	1.680	20.5	10:10	
MWSF-10	10:42	5.582	1.819	19.5	10:38	
MWSF-10 DUPE					10:40	
MWSF-5	13:52	6.270	2.050	21.1	13:50	
MWSF-6	14:15	5.931	2.750	21.7	14:12	

City of La Cruces
Joint Superfund Project

Date: 12-27-13

Sampler: _____

Weather Conditions: Cold

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
MW-1	10:01	5.62	1.805	18.1	10:00	
CC 26	1307	6.19	1.161	22.2	1305	Young Park
PAZ PK	1326	5.67	2.010	19.6	1322	

DAILY FIELD LOG

PAGE _____ OF _____

DATE: 4/26/13

CLIENT: _____

PROJECT: _____

LOCATION: _____

ACTIVITY: _____

GEOLOGIST: _____

Area on HD line ~ 3-4" in looked like it
had been kinked.

Need to cut off ~ 1 ft. before starting
AGAIN.

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 4/29/13

CLIENT: _____

PROJECT: _____

LOCATION: _____

ACTIVITY: _____

GEOLOGIST: _____

11:24 16 liters purged

11:42 20 liters purged

12:05 24 liters

12:18 purged 28 liters took sample

Start Sampling for param's

6N₂ Cyl @ 2600 psi

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 4-25-13

CLIENT: _____

PROJECT: _____

LOCATION: _____

ACTIVITY: _____

GEOLOGIST: LRM

MWSFG Aquatic Center by Transit Fence

arrive @ well @ 11:44

	H ₂ O Depth	Screen Interval
2012	123.22'	116-131
2013	124.85'	

Last year H/S was dropped to 126 ft. (marked on yellow line w/a single large zip tie.

Need to drop H/S to about 128 ft.

$\frac{131' - 125'}{2} = 3 \text{ ft}$ and $125' \text{ H}_2\text{O Depth} + 3 = 128'$

1210 dropped H/S to 128 ft.

1220 (Paz Park well) Well Head is Sealed / Well Running
Spiget attached for Sampling. But don't have anal. meters So sample next time.

1235 (well 57 behind Area 1) well off line.

There's a 4" pipe for sampling that has a screw cap on it - need a 2 1/4" wrench to open it.

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 4-23-13

CLIENT: _____

PROJECT: _____

LOCATION: _____

ACTIVITY: _____

GEOLOGIST: _____

ARRIVE @ MW-4 @ 9:25 (old crew were here)

Measured to Depth = 181.75'

9:30 Will drop bailer in @ 189 ft.

ARRIVE 9:40 MW-5-3

Can't get Nylon Rope out of well

Mud ~~to~~ Depth 174.2'

Screen Interval = 174.8 - 189.8'

measured line to 185 ft. less 3 ft Bailer = 182'
 actually dropped in about 188 ft.

DAILY FIELD LOG

PAGE: _____ OF _____

DATE: 4/22/13

CLIENT: _____

PROJECT: _____

LOCATION: _____

ACTIVITY: _____

GEOLOGIST: _____

15L says 17L however

H₂O depth 240 E H₂O Depth 4168'

$$\Delta = 2284'$$

$$228 \times 0.036 = 8.2 \text{ gal}$$

x3

$$112.7 \text{ L} = 24.6 \text{ gal}$$

17L is OK

4/8/13

410 Remeasured H₂O Depth = 181' 7"

Called Curtis : (12:55)

he said maybe the larger wt is getting stuck on something. \Rightarrow Change the weight to a smaller wt and Redrop the Hydra sleeve to 185 ft.

City of Las Cruces
Joint Superfund Project

Date: 5-23-13

Sampler: YRU / 89M

Weather Conditions: Hot Sunny

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
MUSE-05	10:10	6.70	1.807	24.4	10:08	- Duplicate also
Well 20	11:02	6.75	1.594	22.6	11:01	

City of Las Cruces

Joint Superfund Project

Date: _____

Sampler: _____

Weather Conditions: _____

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments

City of Las Cruces

Joint Superfund Project

Date: 5-17-13

Sampler: WJG/yc

Weather Conditions: Sunny

Comments: Pag Park @ 0909, Well 26 @ 1000

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
<u>Pag Park</u>	<u>0942</u>	<u>6.87</u>	<u>1.956</u>	<u>23.2</u>	<u>0942</u>	
<u>Well 26</u>	<u>1020</u>	<u>7.27</u>	<u>1.218</u>	<u>23.4</u>	<u>1015</u>	

City of Las Cruces

Joint Superfund Project

Date: 5.16.13

Sampler: JRV / LTH

Weather Conditions: Sunny, Calm

Comments: GW MW-10

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
Part 1	0953	7.28	1,933	22.1	0946	clear
2	0954	10.85	1450	22.1	0948	yellowish
3	0956	7.89	1672	22.1	0946	clear
4	0957	7.96	1363	22.4	0956	clear
						} Total volume each 2.5 gallons
5	1056	9.28	1389	23.1	1052	yellow
6	1057	10.39	1285	22.7	1056	yellow
7	1058	10.23	580	22.8	1052	clear
						} Total volume on each 2-3 gallons

City of Las Cruces

Joint Superfund Project

Date: 5/3/13

Sampler: 156/Jan

Weather Conditions: Sunny, Clear

Comments: GWMW-09

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
Port 3	0950	10.95	2.36	21.9	0945	white
Port 4	0951	9.36	1.788	21.5	0945	white black ~25 gallons
Port 2	10:04	9.25	1.701	21.6	10:00	reddish ~2.5 gallons
Port 1	10:06	8.21	0.551	21.7	10:02	orange ~2.5 gallons
Port 5	1103	9.87	1.710	21.4	1101	
6	1105	8.62	1.241	21.1	1103	
7	1107	9.57	.507	21.3	1101	
					1103	

City of Las Cruces

Joint Superfund Project

Date: 5-10-13

Sampler: LJL / jhr

Weather Conditions: Cloudy, breezy

Comments: Giv/MW-03

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
Part 1	1144	8.19	2.34	24.2	1147	+ Ruffled Color
Part 2	1154	9.90	1.477	23.9	1149	Clear
Part 3	1157	11.40	1.886	21.9	1147	Green Color
Part 4	1136	11.36	2.77	23.4	1133	- no Sample 2nd Page
Part 5	1250	10.84	1.820	20.1	1247	
Part 6	1248	10.83	1.834	21.4	1246	ruddish
						Part 4 - 1st page Sample w/ HCl

City of Las Cruces

Joint Superfund Project

Date: 5-8-13

Sampler: LJh Jyri

Weather Conditions: Sunny, Calm GWNW-01

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
Port 1	1002	7.08	2.00	22.4	10:45	} 1st Purge
Port 2	1004	6.80	1.611	22.0	1004	
Port 3	1005	7.95	1.683	21.6		
Port 4	1006	7.80	0.748	22.0		
Port 3	1050	10.64	1.135	23.7	1051	
Port 4	1053	9.65	0.790	22.8	10:53	
Port 1	10:54	6.81	2.24	22.4	10:49	
Port 5	1201	7.49	.569	23.4	1208	
Port 6	1214	9.00	.927	23.0	1208	
Port 7	1215	8.93	.668	22.5	1209	

City of Las Cruces
Joint Superfund Project

Date: 5.3.13

Sampler: JHU/LJB

Weather Conditions: Cold & Windy

Comments: GWMW-08 (Paz Park parking lot)

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
GWMW-08						
part 6	1152	7.28	0.491	20.9	1152	
part 7	1154	8.13	0.573	20.8	1154	
part 3	1057	9.86	1.036	20.5	1053 - Dupe for Part 3	
part 4	1058	8.33	.511	20.6	1053	
part 5	1056	8.70	0.471	21.9	1054	
					1053	

City of Las Cruces

Joint Superfund Project

Date: 5-1-13

Sampler: _____

Weather Conditions: _____

Comments: cupped pressure on controller (from 125) to 200 psi
to get more volume.

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
60mw15-I	11.55	6.76	1.572	24.9		
	11.57	6.86	1.576	24.3		
	11.58	6.96	1.581	23.9		
	12.00	7.02	1.586	23.9		
	12.01	7.05	1.590	23.8		
	12.02	7.07	1.590	23.7		
	12.03	7.08	1.590	23.7		
60mw15-I					12.05	VOC Sample
					12.07	Duplicate Sample

City of Las Cruces
 Joint Superfund Project

Date: 4-30-13

Sampler: _____

Weather Conditions: _____

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments

No Sample
Per 62mmw-151

City of Las Cruces
Joint Superfund Project

Date: 4-29-13

Sampler: Jem / yrw

Weather Conditions: _____

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
6wmw15D	1208	7.24	0.992	25.4		
	1210	7.30	0.990	24.8		
	1211	7.34	0.993	24.8		
	1213	7.41	0.987	23.5		
	1214	7.43	0.987	23.7		
	1215	7.45	0.987	23.6		
	1216	7.47	0.985	23.2		
	1217	7.48	0.986	23.3	1218	

City of Las Cruces

Joint Superfund Project

Date: 4-26-13 FRI

Sampler: Dem Lynd

Weather Conditions: _____

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
MW SF10	1318	6.75	1.872	24.5	1315	
MW SF6	1335	7.00	2.98	22.9	1333	

City of Las Cruces

Joint Superfund Project

Date: 4-23⁴-12 Wed.

Sampler: LEM

Weather Conditions: _____

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
MW5	0856	6.01	1.857	18.9	0855	
MW4	0923	7.25	2.09	18.5	0920	

City of Las Cruces
Joint Superfund Project

Date: 04-22-13

Sampler: LEM

Weather Conditions: Attempted to Sample

Comments: 6mW15-D But No H₂O

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
No Sample						

City of Las Cruces

Joint Superfund Project

Date: 4-19-13

Sampler: LEM

Weather Conditions: Calm Sunny & Hot

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
6W15-S	1222	7.03	0.964	20.8		
	1230	7.14	0.954	21.1		
	1234	7.23	0.968	21.1		
	1238	7.27	0.965	21.0		
	1240	7.30	0.964	20.8		
	1242	7.31	0.963	21.0		
6W15-S	1243	7.27	0.961	21.4	1244	

City of Las Cruces

Joint Superfund Project

Date: 4-18-13

Sampler: LEM

Weather Conditions: Calm & Sunny

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
BWMW-11I	1133	7.25	1.346	21.5		
	1136	7.21	1.341	21.0		
	1138	7.17	1.351	21.1		
	1140	7.12	1.358	20.3		
	1142	7.14	1.355	20.6		
BWMW-11I	1145	7.17	1.352	20.7	1146	

City of Las Cruces
Joint Superfund Project

Date: 4-17-13

Sampler: FEM

Weather Conditions: Extremely Windy

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
BWMW-11D	1215	7.88m				
	1203					
BWMW-11D	1208	7.14	0.572	21.3		
	1208	7.34	0.573	21.1		
	1211	7.41	0.572	20.9		N 11 gal purged
	1213	7.42	0.571	20.9		
	1215	7.45	0.573	20.8	1217	N 12 gal purged

City of Las Cruces
Joint Superfund Project

Date: 4-16-13

Sampler: LEM & BJR

Weather Conditions: Windy, Dusty

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
6mw115	1222	7.18	1.776	22.5	1225	
mw-1	1320	6.58	1.803	23.7	1315	

City of Las Cruces
Joint Superfund Project

Date: 4-15-13

Sampler: YRU & LEM

Weather Conditions: Calm & Breezy around 11:00

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
CLC 18	10:01	6.93	0.709	22.0	10:02	
CLC 27	13:09	6.86	1.186	23.6	13:10	

City of Las Cruces
Joint Superfund Project

Date: 4-10-13

Sampler: Laura Montoya

Weather Conditions: Breezy, Sunny, slightly cloudy

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
MW SF9	10:52	6.88	1.770	22.1	10:48	(sample clear) Streets yard

City of Las Cruces
 Joint Superfund Project

Date: 4-9-13

Sampler: Laura Montoya

Weather Conditions: Very VERY windy and overcast

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
MW-SF2	1206	6.45	2.230	19.5	12:03	full of muddy water
MW-3	1356	6.72	1.842	19.9	1355	full of muddy water

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 6-12-12

CLIENT: _____

PROJECT: _____

LOCATION: PAZ Park well

ACTIVITY: _____

GEOLOGIST: TRM

CUC: PAZ Park Well

Screen depth (per memo) 251'

Cut Nylon Rope to 220'

Set ~~bladder~~ hydrasleeve @ 260' (at double zipper)Water Depth = 171' 7" 6-12-12

Dropped Sleeve in @ 1330

DATE: 5/23/12

CLIENT: _____

PROJECT: _____

LOCATION: _____

ACTIVITY: _____

GEOLOGIST: JEM

City Well Static Measurements

- ① OLC-PAZ Point 9:13 Depth = 171' 4"
171.33 ft
- ② Well # 20 9:35 Depth = 226' 8" (guessing)
full of oil from 296' to tip.
Took me until 10:58 to wipe down 296'
of meter "line". ~ 226.67 ft
- ③ Well 57? > 300ft
- ④ 5/30/12 LSG
Well 57 289.38 ft

DATE: 5-21-12

CLIENT: _____

PROJECT: _____

LOCATION: MW-6

ACTIVITY: _____

GEOLOGIST: _____

Arrive on site @ 13:10

H₂O Depth = 194' 9" 194.75 ft

Nylon rope is 195' 6" (added 28 ft to line)

Bailer had 3' 4" H₂O in it. ↙

13:50 pulled out Bailer
13:51 took 10 cc Sample

13:52 Cond = 1,812 mS 26.1 °C
pH = 6.98

MW-4

located just west of Admin Bldg @ the corner of fence N of parking area, Approx 4 ft north of fence.

DAILY FIELD LOG

PAGE: 1 OF 1

DATE: 5-21-12

CLIENT: _____

PROJECT: _____

LOCATION: MW-4 (Cymw-4)

ACTIVITY: _____

GEOLOGIST: LEM

bps = N 32° 18.89'
W 106° 45.559'

Arrive @ well @ 10:20, pulled yellow nylon line out and stretched it out

10:26 measuring H₂O depth = 178'9" = 178.75'
Screen interval = 175-185'

Set hydrascave @ 182' Note: that is the actual length of the Nylon Rope.

VOC dropped hydrascave in

5-22-12 arrived on site @ 11:08

pulled up hydrascave and only ~ 50ml of sample inside

drop a bailer, but add ~ 5 ft of Nylon Rope. Chris says drop hydrascave back in w/ 5 ft extra rope and pick up tomorrow.

11:30 hydrascave dropped back into well (MW-4) (187')

5-23-12 arrive @ site 11:04 & pulled out line
VOC grab @ 11:06

11:07 pH = 7.18
Conc = 1.874 mg Temp = 24.5°C

MWSFA approx 50ft south of ~~mw-3~~ mw-3 (tin bed) MWSFA located
~7ft North of Blue pole of targeted area.

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 5-21-12

CLIENT: _____

PROJECT: _____

LOCATION: MW-SF 2

ACTIVITY: _____

GEOLOGIST: GEM

GPS N 32° 18.926'
W 106° 45.526'

arrived @ site @ 9:15

dug out debris - NOTE well has no cover. Full of rocks dirt, wood & branches. Pulled out existing yellow nylon rope and N 1st 20ft is black from oil & tar.

9:28 measured HO Depth = 184'6" = 184.5'

Screen Interval = 184.3 - 199.3

Set Hydrasleeve @ 192' (to 2 aptres)

10:06 dropped Hydrasleeve in.

522-12

arrive on site @ 9:35

9:55 began pulling Hydrasleeve out of well.

MW-3 located in County yard next to circular fire bldg on fence line south of Power Center.

DAILY FIELD LOG

PAGE: ___ OF ___

GPS = N 32° 18.94'
W 106° 45.52'

DATE: 5-14-12 / 5-21-12
CLIENT: _____
PROJECT: _____
LOCATION: MW-3
ACTIVITY: _____
GEOLOGIST: LEM

CY MW 3 13:14 measured H₂O Depth = 179' 4 1/2"
Screen interval = 180-190' 179.38 ft.
put markers on existing yellow nylon line @ 186 ft.

5-21-12 Back to drop Hydrasleeve.

8:30 arrive on site, filled up yellow line and attached Hydrasleeve.

9:03 dropped Hydrasleeve

5-22-12 arrive on site @ 8:48

got instruments ready

9:00 began pulling hydrasleeve out of well

9:03 Hydrasleeve out of well

begin analysis & sample taking

DATE: 5-18-12

CLIENT: _____

PROJECT: _____

LOCATION: 6W MW-09

ACTIVITY: _____

GEOLOGIST: _____

6W MW-09:

9:00 arrive on site

9:17 Tag Depth = 190' 1" 190.08 ft

9:30 Part 1 = 205' 0"

9:50 6N₂ ON - 9:52 (Part 2) / 9:53 (Part 3) / 9:54 (Part 1)~~10:00~~ No more H₂O flow^{1/4} - didn't blow however = 1st purge
Turned off 6N₂ source to recharge

10:19 System started again to finish

10:21 all ports pressurized - for 2nd purge.

10:27 all ports Blew

11:02 6N₂ ON for Sampling Ports 1-4 P=180psi12:13 6N₂ on Ports 5-712:14 5, 6, & 7 all have H₂O

12:29 System off to recharge w 2 1/2 gal per port purged.

12:52 System back on for Sampling Ports 5-7

VMW-08 Puz Parking Lot.

GPS = N 32° 19.124'
W 106° 45.508'

DATE: 5-17-12

CLIENT: _____

PROJECT: _____

LOCATION: 6VMW-08

ACTIVITY: _____

GEOLOGIST: Pam Brian, Fred

AMPH on site @ 8:30

8:45 Measured TAG = 161.0 ft Port 1 = 160' 8 1/2"
= 160.71 ft9:15 Pumped N 3 gallons H₂O into line.

Tag = 160' 9" = 160.75 ft

This well doesn't have fitting for Octopus thingy

9:46 GN₂ ON P = 160 psi9:47 Port 4, 3 on — Ports 1 & 2 are leaking N₂ down
in the pipe below — can NOT use.10:00 Ran out of GN₂ — Brian went to replace cylinders.10:48 — GN₂ Back on to complete 1st purge on ports 3 & 4

10:57 — Port 3 Blew

10:58 — Port 4 Blew

11:17 — GN₂ Back on for 2nd purg 11:18 Both 4 & 3 have H₂O

11:25 — Port 3 & 4 Blew at same time.

11:50 — Started sampling purge. Port 3 & 4

12:04 — Began GN₂ purge on 5, 6 & 7, Port 6 Blew open
— need to replace the quick connect — will take the
Quick connect off of port 1.12:06: GN₂ Back on for ports 5-712:07: H₂O on in 5-7

12:15: 5-7 Blew.

12:34: GN₂ on for 2nd purg @ 12:35 H₂O on

12:40 Port 7 Blew, 1241 Port 6 Blew, 1242 Port 5 Blew.

GPS N = $32^{\circ} 18.989'$
W = $106^{\circ} 45.200'$

DATE: 5-16-12
CLIENT: _____
PROJECT: _____
LOCATION: GWMW-01
ACTIVITY: _____
GEOLOGIST: _____

- 8:15 arrive on site
- 8:30 Tag H₂O Depth 208' 10 1/2" 208.88 ft
- 8:55 Pressure taken on new GNG tank = 2700 psi
System on
- 8:57 got H₂O Pressure set @ 190 psi
- 9:09 #2 Blew, #1, #4 and 3 N₂ gallons purged
from each of the 4 ports
- 9:12 pressure off.
- 9:30 pressure back on for 2nd purge Set @ 185 psi.
- 9:32 H₂O on all 4 ports.
- 9:37 all 4 ports Blew
- 9:40 pressure off.
- 10:03 6N₂ on (Sampling Session) P = 165 psi.
- 10:05 Began Params & Sampling -
- 10:25 Setup Ports 5, 6, 7 & 6N₂ on P = 185
- 10:27 all have H₂O on
- 10:35 5, 6, 7 all Blew
- 10:37 6N₂ off.
- 10:55 6N₂ on for 2nd purge
- 10:56 got H₂O. → 11:03 all Blew
- 11:23 6N₂ on for Sampling sequence
Began Sampling @ 11:26
Left site @ 12:10

} approx
4 gals
each.

6WMLW-03

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 5-16-12

CLIENT: _____

PROJECT: _____

LOCATION: 6WMLW-03

ACTIVITY: _____

GEOLOGIST: _____

10.5 = N 30° 19.032'

W 100° 46.033'

T

VI

OI

Back on Wed 5/16/12 @ 12:20 to work Ports 4, 5 & 6.

12:32 ON₂ on P=1

12:33 H₂O jets 4, 5 & 6.

12:35 Port 1 w/ 4" Port 5,

13:20 ON when on But Blew
w/ min dust for ~ 40.
NO H₂O. never recharged w/

1402 - 60 psi on P=15C

1407 - P low

1411 - P low

1436 - 60 psi. Dust on P=12
pling.

a few minutes
recharge.
Just blows ON₂

GWMW-03

Next to Aquatic Center

DAILY FIELD LOG

PAGE: ___ OF ___

GPS =

DATE: 5-15-12

CLIENT: _____

PROJECT: _____

LOCATION: GWMW-03

ACTIVITY: _____

GEOLOGIST: Laura, Brian Frost

GWMW-03

8:00 arrive on site

8:34 H₂O Depth = 82' 5 1/2" = 82.96 ft.8:40 ~~Found~~ H₂O Depth = 133' 11" = 133.92~~Next diam 3/4"~~

~~$V = \pi r^2 h$~~
 ~~$r = 3/8"$ $h =$~~
 ~~$N_{am} = 3/4"$~~
 ~~$\Delta = 51.416$~~
 Brian measured wrong Port
 (this is actually Port 6)

10:17 measuring Port 1 = 119' 0"

Need to remove soft from Tag

Use the WRT = Water Removal Tube

10:58 started purging liner - we need to remove ~ 17 gal from WRT @ pressure @ 160 psi

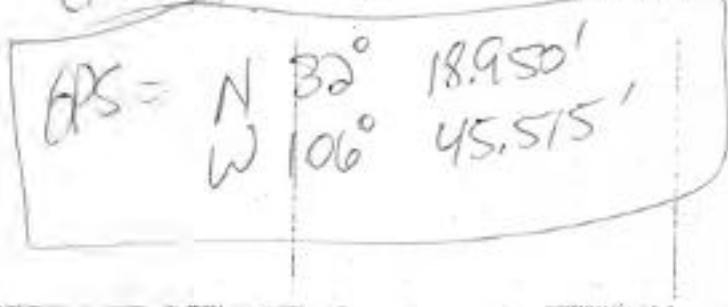
11:45 - ~~stopped purge~~ coming out collected ~ 2.5 gallons

11:55 - Began purging again.

→ till 14:05 purged ~ 27 gals (yellowish w/ H₂S smell)14:08 = H₂O Depth = 102' 7" = 102.58 ft.14:30 = G_N₂ ON water flow w/in one minute.14:40 = G_N₂ Blew [port 3 Busted - this replaced seal]14:55 = G_N₂ ON for 2nd purge15:05 = G_N₂ Blew AGAIN - end of 2nd purge

↓ Fred delivered another tank - reorganized Pick up to accommodate 2nd tank

16:30 = Began Sampling.



DATE: 5-14-12
 CLIENT: _____
 PROJECT: _____
 LOCATION: GWMW-01
 ACTIVITY: _____
 GEOLOGIST: Laura & Brian Woodcock

GWMW-01 FLUTE well

845 arrive on site - waited for Luis & Fred

11:09 H₂O Depth = 180 11" = 180.92 ft.

Part 1 H₂O Depth = 184' 6.5" = 184.54 ft.

11:55 - Problem w/ 1st regulator - switched out with spare.

12:05 - putting pressure on G_N lines / G_N purge Pressure = 175 PSI

12:09 - H₂O in each line 1-4

12:19 - Took forward Field Blank

12:20 wells 1 & 2 H₂O off, purging N₂

12:21 well 3 H₂O off, purging N₂

12:22 well 4 H₂O off, purging N₂

12:49 G_N on AGAIN, set sample pressure to 150 psi

12:51 Part 2 Blew G_N
 need to let them regenerate longer.

13:42 G_N on AGAIN
 → Began Sampling

14:13 G_N on H₂O @ 14:16 @ Pans 5-7

14:24 H₂O off → Recycle

15:07 G_N on
 15:10 H₂O on Begin Sampling

15:26 H₂O finished, G_N purging thru

MW-2 in County Rd Dept yard by Service Garage
Next to fence at north end of Dog Cemetery

DAILY FIELD LOG

PAGE 2 OF

DATE: 5-9-12

CLIENT: _____

PROJECT: _____

LOCATION: MW-2

ACTIVITY: _____

GEOLOGIST: Laura M. Boye

GPS	N	32° 18.925'
	W	106° 45.479'

13:22 Back @ MW-2 (in County Yard.) (middle well)

Screen Interval = 190 - 200 ft.

Depth-finder stopped @ 56' 2". Dirt & spider webs were on end when I pulled it up.

5-10-12 10:38 Called Fred Small - left msg regarding this well

5-10-12 11:20 Fred Small returned phone call
he said just report "well is inaccessible due to blockage".

6070 ft from SE corner of BRIGGS & WALNUT.

DAILY FIELD LOG

PAGE: ___ OF ___

GPS
N 32° 18.903'
W 106° 45.398'

DATE: 5-9-12

CLIENT: _____

PROJECT: _____

LOCATION: MW-6

ACTIVITY: _____

GEOLOGIST: Laura Mentoya

11:14 arrive on site.

No Nylon Rope - will measure out new ^{1/2} w/new weight.

H₂O Depth = 194' 8 1/2" (11:29) = 194.71 ft.

Screen Depth (Interval) = 188 - 198 ft.

11:34 Measure Nylon Rope to 194 ft.

11:55 Hydro Sleeve Dropped in 5-9-12

5-10-12 Arrived on Site @ 11:50

11:55 Pulled up Hydro Sleeve and it was empty so I added one more weight and dropped it back in to 196 ft. (2 feet more), will check tomorrow.

5-11-12 11:55 AGAIN - NO SAMPLE

located in parking lot south of County yard, directly in line with
mw2 and mw5.

DAILY FIELD LOG

PAGE: ___ OF ___

GPS = N 32° 18.881'
W 106° 45.466'

DATE: 5-9-12

CLIENT: _____

PROJECT: _____

LOCATION: MW-5 (Cymw-5)

ACTIVITY: _____

GEOLOGIST: Liana Mosby

arrived on site to work @ 9:42

9:56 H₂O Depth = 182.14' Screen Interval = 182' - 192'

10:10 Measure Nylon Rope 188' (for top of Hydra Sleeve)

10:27 Dropped in Hydra Sleeve. 5-9-12

5-10-12 arrived on site @ 10:20

Pulled out Hydra sleeve @ 10:27

VOC Samples taken @ 10:29 5-10-12

GPS N 32° 18.911'
W 106° 45.458'

DATE: 5-7-12
CLIENT: _____
PROJECT: _____
LOCATION: Cymw-1
ACTIVITY: _____
GEOLOGIST: Laura Montoya

Back @ County Rd Dept Yard @ 14:25

Well is labeled as "Cymw-1" I will assume it to be MW-1 which has screen interval = 187-197'

Water Depth = 186.88' (14:37)

Submerge Hydra Sleeve to 192-ft @

14:50 Hydra Sleeve in! 5-7-12

Returned 5-8-12 14:45
Sampled for VOC's 14:50

Hydrasleeve had only ~ 6-7" of water

So next time drop hydrasleeve ~ 1 ft deeper.

in county yard

DAILY FIELD LOG

PAGE: ___ OF ___

GPS N 32° 18.920'
W 106° 45.485'

DATE: 5-7-12

CLIENT: _____

PROJECT: _____

LOCATION: MW-2

ACTIVITY: _____

GEOLOGIST: Liana Monbye

I believe this well is MW-2

13:00 No ID on this well

well depth measured will not drop any further than 50 ft.

IN ACCESSIBLE (40 level)

INSIDE COUNTY ROAD YARD Furthest NE Corner • HAS A SMALL "8" plate COVER

DAILY FIELD LOG

PAGE: ___ OF ___

GPS = N 32° 18.944'
W. 106° 45.48'

DATE: 5-7-12
CLIENT: _____
PROJECT: _____
LOCATION: MWSE1
ACTIVITY: _____
GEOLOGIST: Laura Monbya

WELL ID is MWSE-1

Screen interval is 183.5 - 198.5 (~15 ft)

arrived on site ~ 12:05 pm 5-7-12, informed EPIC @ front ofc that i would be working in the yard.

12:23 H₂O Depth = 187.81' 198.5 - 187.8 = 10.7' to work w/
lowest screen depth = 198.5'

measure nylon rope (top of hydrastave) @ 192'

12:45 dropped in Hydrastave 5-7-12

Returned 5-8-12 @ 12:30
Sampled for VOC's 12:45 5-8-12
NOTE ~ 200 nls only was actually collected in Hydrastave.

NOTE: NEXT TIME Drop Hydrastave in about 1 foot deeper.

MWSF-6 Due East of Aquatic Center (N 10ft west of Transit Yard Fence)
(~ 1ft under gravel)

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 5-7-12

CLIENT: _____

PROJECT: _____

LOCATION: MW SF6

ACTIVITY: _____

GEOLOGIST: Laura Montoya

GPS = N 32' 19.059"
W 106' 45.993"

arrive on site ~ 10:20
dug out well plate, Positive ID on MWSF-6
1/2 way btwn screens = 124'
H₂O Depth measured @ = 123.22 ft

Because the H₂O Depth is just 1ft above the 1/2 way pt of the screen interval, I need to go lower by about 2 1/2 - 3 ft, so I will set the top of the hydrasleeve @ 126', I will measure the slope to 126',
~~Screen~~ Interval = 116.5 - 131.5'

Dropped in Hydrasleeve @ 11:40 am 5-7-12

Returned 5-8-12 @ 11:30
Sampled Vals @ 11:50 5-8-12

Hydrasleeve only had about 6" sample
Next time drop hydrasleeve in about 1 ft deeper

Located in sm fenced in area NE of Bantam Weight football fields.

DAILY FIELD LOG

PAGE: ___ OF ___

MWSF-10

685 N 32° 19.142'
W. 106° 45.314'
Elev 4050

DATE: 5-3-12

CLIENT: _____

PROJECT: _____

LOCATION: MWSF-10

ACTIVITY: _____

GEOLOGIST: Laura Mombaya,
Brian Woodcock

11:40 arrived on site

Hyd Depth = 190.28'

Pump Depth = 198'

measured out tubing, hooked up and set up for sample

12:15 dropped bladder pump into casing

12:20 pump STUCK

12:25 called Luis

1:30 Luis showed up

14:30 got pump unstuck

14:40 closing up shop.

Recommend: Do not use bladder pump for 2" casings

Hydro sleeve dropped @ 2:58 on 5-3-12

5-4-12 ~~From~~ 14:30 Returned to MWSF-10

Sampled VOC's @ 15:00 5-4-12

MWSF-9 cont (day 2)

DATE: 5-3-12

CLIENT: _____

PROJECT: _____

LOCATION: MWSF-9

ACTIVITY: _____

GEOLOGIST: Laura Montoya
Brian Woodcock

Bladder Pump @ 196'

8:23 arrived @ MWSF9, set up bladder, dropped in

9:11 controller on, GN₂ on P = 30 psi 10/15

9:13 GN₂ P = 50 psi 10/15

9:17 P = 50 psi 30/15

9:20 P = 60 psi 30/15

9:24 P = 70 psi 30/15

9:26 P = 80 psi 30/15

9:33 P = 90 psi 30/15

9:35 P = 100 psi 30/15

9:38 H₂O on

lowest screen = 203

H₂O depth = 185

diff = 18 ft

2 in pipe. [conv factor = 0.016]

Average Volume

18 ft (0.016) x 3 ^{feet} vols = 0.86 gal x 3.785 L/gal = 3.3 L

9:46 Flow rate = 90 mls/min

MWSF9

DAILY FIELD LOG

PAGE: ___ OF ___

GPS N 32° 18.866'
W 106° 45.251'

DATE: 5-2-12

CLIENT: _____

PROJECT: _____

LOCATION: MWSF-9

ACTIVITY: _____

GEOLOGIST: Jem

INSIDE STREETS YARD OFF WALNUT

13:00 arrived @ SF9

13:10 found SF9 Buried under ~6" dirt.

13:23 HO Depth = 184.90'
tubing length = 196'

measured out both tubing lines & weed cord.

14:20 - Back @ WDC

continued on 5-3-12

MW SF-5

DAILY FIELD LOG

PAGE: ___ OF ___

GPS N 32° 19.051'
W 106° 45.775'

IN CORNER OF MAG PARK PARKING LOT.
(far NE corner)

MW SF-5

DATE: 5-2-12

CLIENT: _____

PROJECT: _____

LOCATION: MW SF-5

ACTIVITY: _____

GEOLOGIST: Laura Montoya
Brian Woodcock

8:30 arrive on site

measure tubing @ 146'

Pump @ 146'

9:20 H₂O Depth 142.09'

NOTE: Screen Interval is

lowest screen - H₂O Depth 132.73' - 152.73'

$$\text{purge Vol} = 152.73 - 142.09 = 10.64 \times 3 \text{ purge Vol}$$

$$\times 0.2 \text{ gals (for 2" casing)}$$

$$= 0.5 \text{ gal} = 2 \text{ liters}$$

See NOTE

9:32 Took Equipment Blank

9:54 GNG ON P = 30 psi Cycle = 10/5

9:57 GNG P (controller) = 40 psi Cycle = 10/5

9:59 P = 50 psi Cycle = 20/10

10:05 P = 60 psi Cycle = 30/15

10:20 P = 70 psi Cycle = 30/15

10:36 P = 70 30/15 and still no H₂O

10:40 pulled pump out to make sure it was in the H₂O & it IS!

10:46 → Set P = 45 w/ cycle 10/5

NOTE: we're concerned that it's in the water cur.

H₂O Depth = 142' and pump tubing = 146'

10:50 P = 50 psi and cycle 20/10

11:00 P = 75 psi cycle 30/15

11:09 get H₂O Q = 160 ml/min (water is dirty)

NOTE: 3 different times the bladder stopped feeding into well is if it hit a dead end. After continued pulling up & down in air it would continue its descent

GWMW 15

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 5-1-12

CLIENT: _____

PROJECT: _____

LOCATION: GWMW 15-I

ACTIVITY: _____

GEOLOGIST: Jem

GPS = N 32° 19.267'
W 106° 44.861'

BEHIND SPORTSMEN WAREHOUSE

measure tubing to 468'

H₂O Depth = 238.08'

8:35 arrived onsite

10:04 Turned on controller. Set P = 130 psi Cycle 25/15
Pressure on 1/2" tubing = 900 psi

10:30 Cranked up P to 150 psi (N₂ H₂O yet)

10:31 H₂O out

10:52 ~ 3 1/2 liters of H₂O so far. No way to
measure flow rate yet - wait for Luis to bring
sampling box.

11:12 ~ 7 liters total purged.

11:38 ~ 10.5 liters total purged.

12:02 began sampling for H₂O &

12:04 flow rate = 130 ml/min

GPS locat =

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 5-1-12

CLIENT: _____

PROJECT: _____

LOCATION: _____

ACTIVITY: _____

GEOLOGIST: _____

GW 15-I

921 H₂O Depth = 238.08'
1004 Pump Set @ 468'
Controller P = 130psi, 25/15 cyl P = 900psi
to

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 4-30-12

CLIENT: _____

PROJECT: _____

LOCATION: GUMW 15-5

ACTIVITY: _____

GEOLOGIST: _____

H₂O depth 37.49 (0930)

Recon site 71.02, wean measure, tubing from well depth. fire turned ~ 9:45.

9:55 Decon - ladder sums from last

10:00 Took nipmat Blank

10:30 Stop pumping G₂

Se. Pressure to 130psi

10:57 Chk Bl Pressure to 150psi

10:58 Go G₂ finally

11:20 2nd run pumping surge

12:30 ~flowed H₂O purged

13:01 put + sample

G₂ depth 297'

ridau

J

100 = 20/12

100 = 25/15

1/2 gallon
rate = 80mls/min

zh

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 4-27-12

CLIENT: _____

PROJECT: CAC-3SP

LOCATION: GUMWIS-B

ACTIVITY: _____

GEOLOGIST: Laura Mondaya

Brian Woodcock

8:25 arrived on site,
cut new GN₂ line 588'. Decontaminated Bladder
Set up from yesterday.

9:25 Took Equipment Blank.

— Began lowering bladder pump - after about 20-30'
the line (H₂O) that was trapped around the base seal
was so severely tangled we pulled the pump back out
of casing in order to untangle it.

9:35 Started untangling the 588 ft of H₂O line

10:55 finally finished.

11:00 dropped bladder into well

11:13 Pressure on P=250psi 36/26 cycle

11:23 H₂O on

11:25 Blew the GN₂ line - A only got ~500-700 ml H₂O

11:35 Reset line, fixed leak on controller and ~~it~~
started Pressure. P set @ 150

11:49 H₂O on

11:51 Begin analyses

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 4-27-12

CLIENT: _____

PROJECT: _____

LOCATION: 6WMW-15-D

ACTIVITY: _____

GEOLOGIST: _____

6WMW15-D - Redo

8:30 measured out new Gnz line 588'

9:14 decon new bladder

9:25 took equipment blank (Pump @ 588')

~~##~~ 9:30 Started feeding pump down into casing
but the H₂O line was tangled on the "Hose reel" &
Stopped everything to untangle H₂O line
(took ~ 1 hr 20 min)

GNa tank regulator pressure @ 290/2500 psi

11:16 System on P = 250 psi Cycle = 36/26

11:24 (GNa ON @ 11:16) got H₂O (11:24)

11:28 GNa line ruptured, need to lower pressure

11:35 System on Set P = 150 psi Cycle = 20/10

11:47 Controller P loc to 120 psi Cycle = 25/15

11:49 H₂O on11:51 Began sampling for pH & cond
See analysis sheet

12:01 collected VOC Sample

No Sample Taken ←
EQPMT malfunction

DATE: 4-26-12

CLIENT: _____

PROJECT: _____

LOCATION: GWMW15-D

ACTIVITY: _____

GEOLOGIST: Brian Whalcock
Lama MontoyaH₂O Depth 237.99' (9:30)10:00 N₂ on started purging N₂ tank @ 250 psi10:14 N₂ tank switched over to 1g (1000 psi) tank10:25 [H₂O on] → while setting up new tank heard pop sound
inside controller (Relief Valve?)

10:40 P set @ 270

10:45 measured Q = 150 ml/min.

Lapped P to 285 psi

10:50 Q = 250 ml/min

11:06 controller psi set to 300 psi (per Luis)
flow = 300 ml/min.

11:40 Q = 320 ml/min

11:46 Blew hole in sm line @ connection } P = 300 psi

11:49 Blew hole in sm line again }

11:50 Called Luis P set @ 250 Q 25 ml/min @ 250 psi Q = 40 ml/min

11:53 Set pressure 270 psi Q = 50 ml/min

12:15 Took a field Blank of DI H₂O ⇒ See Analyses12:30 Blew hole H₂O/N₂ per Luis cut off top 2 feet & sample
we are gonna start sampling- Line Blew @ 250 psi - trickle of H₂O.NOTE: (Future Sampling) Set Pressure @ 160 but
= No more than 250.

Replace gas line each time is recommended,

DAILY FIELD LOG

PAGE: ___ OF ___

DATE: 4-26-12

CLIENT: _____

PROJECT: _____

LOCATION: 6WMD15-D

ACTIVITY: _____

GEOLOGIST: _____

448

 5

443

 5

438

We need 593

GWMW 11

DAILY FIELD LOG

PAGE 1 OF 1

GPS N 32° 18.783'
W 106° 45.540'
OFF HADLEY ON WILLOW

DATE: 4-25-12

CLIENT:

PROJECT:

LOCATION: GWMW11-D

ACTIVITY:

GEOLOGIST: Laura & Brian
Montoya Woodcock

Last Day @ GWMW 11

Depth to H₂O = 182.83' Sample/N₂ Lines @ 533'
Began purge @ 10:30

Controller pressure = 250 psi

Change / Discharge = 35/25

10:42 H₂O on flow @ ~ 200 ml/min

10:50 inc P to 260 psi flow = ~ 250 ml/min

11:13 inc P to 270 psi flow = 300 ml/min

11:21 inc P to 280 psi Q = 400 ml/min

11:40 inc P to 285 psi Q = 450 ml/min

1st Sample taken 12:25 purge vol ~ 9 gal
→ See analyses.

DAILY FIELD LOG

PAGE _____ OF _____

DATE: 4-24-12

CLIENT: _____

PROJECT: _____

LOCATION: GWMW11-T

ACTIVITY: _____

GEOLOGIST: Brian & Laura

Luis & Woodrock: Laura

Well Depth = 319'

H₂O Depth = 181.32'Began N₂ purge @ 1042 Sample line = 308'

Controller P = 100psi → 140psi → 150psi

Charge Discharge = 10/5 → 20/10 → 40/20

H₂O in @ 11:09

1201 changed charge/discharge to 35/25

1216 changed controller psi to 160

Q = 400 ml/min

1250 changed out N₂ tank

1304 Began sampling ⇒ see analyses

DAILY FIELD LOG

PAGE: _____ OF _____

DATE: 4-23-12

CLIENT: _____

PROJECT: _____

LOCATION: 6WMD11-5

ACTIVITY: _____

GEOLOGIST: _____

I
C
TI
T
X

H₂O Depth 11.47' (11:00)

Lines cut @ 1" 8'

12:32 N₂ purge on
Pressure controller set 100 → 12 psi
Discharge 10.1

12:35 H₂O 1

13:17 control P = 130 psi Q = 200 ml/min

NOTE:
I left @ 10:20 to sample process water.

City of Las Cruces

Joint Superfund Project

Date: 6-13-12

Sampler: FSM

Weather Conditions: _____

Comments: CLC - Paz Park well

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
<u>CLC-Paz Park</u>	<u>1344</u>	<u>7.35</u>	<u>1.594</u>	<u>24.2</u>	<u>1340</u>	

City of Las Cruces

Joint Superfund Project

Date: 5-23-12

Sampler: DEM

Weather Conditions: Windy, Hot, Sunny

Comments: mw-4

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
<u>mw-4</u>	<u>1107</u>	<u>7.18</u>	<u>1.874</u>	<u>24.5</u>	<u>1106</u>	<u>Milky colored</u>

City of Las Cruces
Joint Superfund Project

Date: 5-22-12

Sampler: PEM

Weather Conditions: Not Sunny

Comments: Sampled the remaining three wells in DA County Yard
(mw-3 by process center gate)

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
MW-3	9:06	7.02	1.610	22.8	9:04	Muddy H ₂ O
MW-SF-2	10:06	7.01	1.959	25.3	10:05	sleeve was full - clear H ₂ O
MW-4	(no sample)					
CIC well #26	10:26	7.00	0.828	25.1	10:23	

City of Las Cruces
Joint Superfund Project

Date: 5-21-12

Sampler: JEM

Weather Conditions: HOT HOT HOT

Comments: MW-6

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
MW-6	1352	6.98	1.812	26.1	1351	Muddy water

City of Las Cruces
Joint Superfund Project

Date: 5-18-12

Sampler: lem

Weather Conditions: Sunny, Warm Breezy.

Comments: GMW-09 on Hadley Next to Sheryl Way

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
Post 1	1107	8.25	0.881	23.1	1108 (1106)	Brown color
Post 2	1110	11.44	2.420	22.2	1109	lt tan color
Post 3	1114	8.69	1.645	22.8	1113	lt tan color
Post 4	1117	8.09	1.690	22.8	1116	lt tan color
Post 5	1254	7.32	1.429	28.7	1255	clear
Post 6	1258	7.40	1.082	27.4	1259	clear
Post 7	1302	8.22	0.436	28.2	1303	clear

City of Las Cruces
Joint Superfund Project

Date: 5-17-12

Sampler: SEM Brian

Weather Conditions: Hot Sunny Breezy

Comments: Ground

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
Port 1	> No	11.50	0.836	23.4	1150	No leak on each purgeline below surface
Port 2						
Port 3	1152	10.86	0.836	23.4	1150	Tan colored
Port 4	1153	9.37	0.507	23.3	1151	grey H ₂ O (dk grey)
Port 5	1304	10.34	0.0471	24.5	1301	pinkish tan in color
Port 6	1306	10.10	0.516	23.8	1303	grey in color
Port 7	1308	10.08	0.644	24.5	1304	tan in color Red

City of Las Cruces
 Joint Superfund Project

Date: 5-16-12

Sampler: LEM, Fred, Brian

Weather Conditions: Windy, Sunny Warm

Comments: GWMLW10

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
Port 1	1006	6.62	1.961	21.2	1005	
Port 2	1008	10.07	1.482	21.1	1006	
Port 3	1009	7.94	1.705	21.0	1008	
Port 4	1011	8.61	1.443	21.0	1009	
Port 5	1127	8.90	1.429	22.0	1126	
Port 6	1125	9.53	1.227	22.2	1126	
Port 7	1130	10.04	.601	23.8	1131	

City of Las Cruces
Joint Superfund Project

Date: 5-15-12

Sampler: Lem

Weather Conditions: Hot, breezy

Comments: 6WMW-03

6wmw03

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
Port 1	1635	10.400	1.391	22.8	1638	tan in color
Port 2	1640	7.88	2.370	22.2	1635	clear
Port 3	1638	11.44	1.388	23.2	1636	v. green in color.
Sampled on 5-16-12 (Day 2 at this well)						
Port 4	empty					
Port 6	1440	11.27	0.977	22.8	1438	
Port 5	1445	11.40	1.362	22.6	1442	

City of Las Cruces
Joint Superfund Project

Date: 5-14-12

Sampler: LEM Luis Bujan

Weather Conditions: Sunny, Breezy

Comments: GW MW-01 - located in DAC construction yard directly east of JSP Process Center

Sample ID	Part	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
GW MW-01	1	1353	7.44	1.809	24.3	1357	tan in color
	2	1358	8.49	1.501	22.6	1400	greenish tint
	3	1354	11.34	1.555	22.9	1355	brownish tint
	4	1352	8.41	0.869	26.3	1352	pink tint
	5	1511	9.13	0.596	21.9	1513	
	6	1510	8.57	0.844	22.9	1514	⊗ DUPE
	7	1513	9.39	0.748	22.8	1512	
⊗ Part 6	Duplicate		VOC @ 1516				
	Back @ lab		15:56				

Field Blank taken @ 12:19 pm

City of Las Cruces

Joint Superfund Project

Date: 5-14-12

Sampler: JEM

Weather Conditions: Sunny, Breezy

Comments: GLWML-01 GPS = N 32° 18.950'
W 106° 45.515'

RED ONE

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
Port 1	1353	7.44	1.809	24.3	1351	Clear brown
Port 2	1358	8.49	1.501	22.6	1352 1400	greenish tint
Port 3	1354	11.34	1.585	22.9	1355	black ppt.
Port 4	1352	8.41	0.869	26.3	1352	brown Pink tint
5 6	1510	8.57	0.844	22.9	1514	
5	1511	9.13	0.596	21.9	1513	
7	1513	9.39	0.748	22.8	1512	
Port 6	Dupe VOC @ 1516					2'13' 6" on ports for 5-7

City of Las Cruces
Joint Superfund Project

Date: 5-10-12

Sampler: LEM

Weather Conditions: Rainy, overcast

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
MW-5	10:31	6.51	1.836	19.3	10:29	

May 2012

City of Las Cruces

Joint Superfund Project

Date: 5-8-12

Sampler: LEM

Weather Conditions: Windy, overcast

Comments: _____

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
MWSF6	11:53	6.48	2.760	21.6	11:50	(Aquatic Center)
MWSF1	12:48	6.94	2.020	22.1	12:45	
(Cymw-1)	14:53	6.67	1.693	23.6	14:50	

City of Las Cruces

Joint Superfund Project

Date: 5-4-12

Sampler: LEM

Weather Conditions: Hot Breezy

Comments: MWSE-10 Hydro Sleeve

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
MWSE-10	1503	7.01	1438	25.3	1500	

City of Las Cruces
Joint Superfund Project

Date: 5-3-12

Sampler: LEM

Weather Conditions: Hot, Sunny

Comments: MWSF-9 Bladder Pump

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
MWSF-9	10:17	6.92	1617	23.3		Sample Jan/brown (~3.5 liters pumped) ~5 liters purged ~5.5 liters purged
	10:22	7.05	1619	23.4		
	10:26	7.04	1620	23.3		
	10:30	7.05	1618	22.7		
	10:32	VOC Sample	Taken - 1032			
	10:35	VOC Duplicate	Sample - 1035			
	10:40	Field Sample (DIH ₂ O)	Taken			

liters pumped!

City of Las Cruces

Joint Superfund Project

Date: 5-2-12

Sampler: SM

Weather Conditions: Hot, Breezy

Comments: MWSE5 H₂O is dirty, murky brown but homogeneous for the most part.
Bladder Pump

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
MWSE5	11:22	6.86 ↑	1.935	23.7		~ 3.5 liters purged H ₂ O tan in color
	11:27	6.90 ↑	1.918	23.6		
	11:32	7.05	1.890	23.3		~ 4.5 liters purged
	11:37	7.18	1.846	23.6		
	11:43	7.06	1.844	23.8		~ 6.0 liters purged
	11:50	7.08	1.834	23.8		~ 8.0 liters purged
	11:52	7.20	1.831	23.8		
	11:54	1st VOC Sample			11:54	
	11:57	duplicate VOC Sample			11:57	

H₂O clipping up in color

WELL SAMPLING/DEVELOPMENT DATA

Site: GWMW-15
 Date: 4-27-12
 Geologist: Laura Mondy & Brian Woodcock

Well Id: GWMW15 Water depth, ft: _____ Water column, ft _____
 Well Purging Method: _____ Well Volume (gallons) _____

Time	Vol. purged (gal)	Temp.	pH	Conductivity (umhos/cm)	Nature of discharge	Other	Comments
4/20/12	GWMW15-D (DEEP)				H ₂ O Depth = 237.99'		Pump Depth = 588'
1151	~1 liter	24.8	8.00	811			
1153	?	24.1	7.96	795		Q = 150 ml/min	
1155	?	23.7	7.94	803		P = 160 psi	
1157	?	23.6	7.96	803			
1159	~2 liters	23.7	7.96	804			
1201	VOC Samples taken						
4/20/12	GWMW15-S (Shallow)				H ₂ O Depth = 232.49'		Pump Depth = 297'
1201	~1.5 liter	24.7	7.63	880			
1209		25.9	7.53	920			
1313		25.4	7.54	916			
1316		26.3	7.53	913			
1320	~2.5 liter	25.9	7.54	911			
1325	VOC Sample taken						
5/1/12	GWMW15-I (Intermediate)				H ₂ O Depth = 238.08'		Pump Depth = 468'
1200	~1.0 liter	24.2	7.62	1452			
1205		23.0	7.65	1455			
1210	~1.2 liter	23.0	7.63	1455			
1213	VOC Sample taken						
1215	VOC Duplicate Sample taken						
							total purg. 17 liters

Sample containers collected and preservatives: _____

Samples Filtered: yes _____ no _____ ; filter size: _____
 Stored on ice _____ blue ice _____ other _____ specify: _____

City of Las Cruces
Joint Superfund Project

Date: 5-1-12

Sampler: LEM
Brian Woodcock

Weather Conditions: Hot, Breezy

Comments: Gwmw 15 - Intermediate

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
Gwmw15-I	1200	7.62	1452	24.2		
	1205	7.65	1455	23.0		~ 12 liters purged w/ faint yellow coloring.
	1210	7.63	1455	23.0		
Gwmw15-I	VOC Sample taken				12:13	
11	VOC DUPLICATE Sample				12:15	~ 17 liters purged.

City of Las Cruces

Joint Superfund Project

Date: 4-30-12

Sampler: LEM

Weather Conditions: Hot Breezy

Comments: Worked alone GWML15 - Shallow

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
GWML15-5	1301	7.63	.880	29.7		
	1309	7.53	.920	25.9		
	1313	7.54	.916	25.4	pH = 7.54	
	1318	7.53	.913	26.3		
	1322	7.54	.911	25.9		
Grab VOC	1325	grabbed	VOC Sample		1325	pumped ~ 2.5 gal. pump 1150

City of Las Cruces
Joint Superfund Project

Date: 4-30-12

Sampler: Lem

Weather Conditions: Hot, Breezy

Comments: Worked alone

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
Gwmw15-S	1301	7.63	880	29.7		
	1309	7.53	920	25.9		
	1313	7.54	916	25.4	pH=7.54	
	1318	7.53	913	26.3		
	1322	7.54	911	25.9		
Grab VOC	1325 grabbed VOC Sample				1325	pumped ~ 2.5 gal purge 1320

City of Las Cruces

Joint Superfund Project

Date: 4-27-12

Sampler: LEM

Weather Conditions: Hot, a little overcast

Comments: GWMW15-D

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
GWMW15-D	1151	8.00	0.811	24.8	/	
	1153	7.96	0.795	24.1	/	
	1155	7.94	0.803	23.7	/	
	1157	7.96	0.803	23.6	/	
	1159	7.96	0.804	23.7	/	
GWMW15-D	VOC Sample taken				1201 pm	

City of Las Cruces
Joint Superfund Project

Date: 4-27-12

Sampler: REM

Weather Conditions: Hot, a little overcast

Comments: GWMW15-D

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
GWMW15-D	1151	8.00	0.811	24.8	/	
	1153	7.96	0.795	24.1		
	1155	7.94	0.803	23.7		
	1157	7.96	0.803	23.6		
	1159	7.96	0.804	23.7		
GWMW15-D	VOC sample taken					1201 pm.

City of Las Cruces
Joint Superfund Project

Date: 4-26-12

Sampler: fem

Weather Conditions: Hot, windy, overcast

Comments: Did not actually sample GWMW15-D, had problems w/ the GWS line - it came kept blowing out (hole) around metal connector.

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
Field Blank	1215	7.94	2.0 μ S	27.4	1215	DI H ₂ O

City of Las Cruces
 Joint Superfund Project

Date: 4-26-12

Sampler: JEM

Weather Conditions: Hot, windy, overcast

Comments: Did not actually sample GWMW15-D, had problems w/ the GWS line - it came kept blowing out (hole) around metal connector
GWMW15-

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
Field Blank	1215	7.94	2.0 μ S	27.4	1215	DI H ₂ O

WELL SAMPLING/DEVELOPMENT DATA

JOINT Superfund Project
Ground H₂O Monitoring Well #11

Date: 4-23-83 to 4-25-83
Geologist: Laura Moulton, Jeff Buerke
Brimley/Boyd/EdF.

Well Id: GUMWU-11 Water depth, ft: _____
Well Purgung Method: _____ Well Volume (gallons) _____
Water column, ft _____

Time	Vol. purged (gal)	Temp.	pH	Conductivity (umhos/cm)	Nature of discharge	Other	Comments
4/23/83	6 GUMWU-11-S			(SHALLOW)		H ₂ O Depth = 171.47'	
13:28	N 2 gal	23.4	7.47	1793			calculated average
13:50	N 3 gal	23.7	7.59	1774			Vol. is 4 gallons
13:57	N 4 gal	24.8	7.63	1714			
GUMWU-11-S	VOC				SAMPLE TAKEN @ 13:58		Line length = 198 ft
	-120453						
4/24/83	6 GUMWU-11-T						H ₂ O Depth = 181.32'
13:04		23.3	7.63	1243			
13:09		22.0	7.20	1241			400 ml/min
13:15		24.6	7.68	1239			
13:21	6.5 gal	24.8	7.68	1238			Line length = 307'
GUMWU-11-T	-120454				TAKEN @ 13:24		
	"	"	"	"	Duplicate TAKEN @ 13:26		
4/25/83	6 GUMWU-11-D						H ₂ O Depth = 182.83 ft.
12:25	N 9 gal	23.0	8.17	540			
12:30		21.6	8.16	531			450 ml/min
12:35		21.5	8.22	534			
12:41		21.6	8.25	530			Line length = 533'
12:46	N 10 gal	21.6	8.27	529			
GUMWU-11-D	-120455				VOC TAKEN @ 12:48		

Sample containers collected and preservatives: _____

Samples filtered: yes _____ no _____; filter size: _____
Stored on ice _____ blue ice _____ other _____ specify: _____

City of Las Cruces

Joint Superfund Project

Date: 4-25-12

Sampler: LEM

Weather Conditions: HOT HOT HOT, Overcast

Comments: Brian Woodcock (Terracon), Laura Montoya

GWMW11-D (Deep)

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
N 9 gal	12:25	8.17	0.540	23.0		
	12:30	8.16	0.531	21.6		
	12:35	8.22	0.534	21.5		
	12:41	8.25	0.530	21.4		Total of 10 gal
	12:48	8.27	0.529	21.6	12:48	plugged
	12:48	- VOC Samples taken (3-40ml vial)				Back @ well 14:40

City of Las Cruces
Joint Superfund Project

Date: 4-24-12

Sampler: LEM / LSC

Weather Conditions: Sunny, Calm

Comments: Groundwater GWMW11-T (intermediate):
Well Depth = 181.32'

$$1.5 \left((0.125)^2 \times 11 \times \frac{181.32}{130} \right) = \frac{8.896}{8.896} \times 7.481$$

130) x 3 = 14 * 6.141

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
GWMW11-I-120424						
GWMW11-I	13:04	7.62	1.243	22.3		400ml/min
" " " "	13:09	7.70	1.241	22.0		
" " " "	13:15	7.68	1.239	21.6		400ml/min
GWMW11-I-120424	13:21	7.68	1.238	21.8	13:24 / 13:26	purge 6.5 gal
						Back @ well 14:30

City of Las Cruces

Joint Superfund Project

Date: 4-23-12

Sampler: 5711

Weather Conditions: Breezy, Hot Monitoring Well # 11

Comments: Brian Woodcock (Terracon Tech), Laura Montoya, Luis Guerra

Well Depth = 171.47 ft.

GWMW11-S Ground Water "Shallow 11"

Sample ID	Analysis Time	pH	Conductivity mS	Temp °C	VOC Sample Time	Comments
1/2 way pt.	1329	7.97	1.793	23.4	—	Sample taken @ ~ 2 gal
	1350	7.59	1.774	23.7	—	
4 gal.	1355	7.625	1.714	24.8	1358	
NOTE: EQUIPMENT BLANK SAMPLES (3x10ml AMBER VIALS) Taken @ 11:55 am						
Back @ WQC @ 14:00						

APPENDIX E

Evaluation of Hydrasleeve™ Method

Hydrasleeve™ Independent Studies

Detailed information regarding the validity of sampling using Hydrasleeve™ grab samplers is available at the vendor's website, www.hydrasleeve.com. This website also provides results of independent studies that address the use of these samplers. These studies were performed at a variety of facilities for various government and private entities. Terracon reviewed several of these studies including the U.S. Army Corps of Engineers (USACE, 2005), California Department of Toxic Substances Control (CDTSC, 2009), U.S. Geological Survey (USGS, 2012), (USGS 2013) and the National Defense Center for Energy and Environment (NDCEE, 2010).

Two of these studies are of particular interest in relation to the Griggs and Walnut Ground Water Plume. Excerpts from the summary sections of these reports are included below.

The *Results Report for the Demonstration of No-Purge Groundwater Sampling Devices at Former McClellan Air Force Base, California* (USACE, 2005, page 6-3) reported that comparison of low flow and Hydrasleeve™ sampling was performed at 40 monitoring wells, and comparison of three well volume purge and Hydrasleeve™ sampling was performed at 44 monitoring wells. The summary the results of Hydrasleeve™ sampling methods as follows:

“For VOC concentrations, the Hydrasleeve™ was most comparable to the three-volume purge and the PDBS [passive diffusion bag sampler]. Samples obtained using this device usually had higher concentrations of VOCs relative to the low-flow purge, PsMS [polysulfone membrane sampler], and RPPS [rigid porous polyethylene sampler] methods. For metals, it was comparable to the three-volume purge, PsMS, and RPPS. Hydrasleeve™ samples typically contained higher concentrations of metals than the RCS [regerated cellulose sampler] and lower concentrations of metals than the low-flow purge samples. For anions, the Hydrasleeve™ was comparable to all other sampling methods against which it was compared. For hexavalent chromium, the Hydrasleeve™ was most comparable to the PsMS and RPPS, and was greater than both of the conventional methods and the RCS. For 1,4 dioxane, the Hydrasleeve™ was most comparable to both conventional methods, and was greater than both the PsMS and the RPPS. The conclusions involving hexavalent chromium and 1,4 dioxane are tentative due to the limited number of comparisons and resulting low statistical power of the tests performed. The Hydrasleeve™ and Snap Sampler™ were not tested in the same wells; therefore, analytical results for these two samplers were not compared with each other.

The Hydrasleeve™ was the least expensive method demonstrated according to the cost analysis”.

The *Passive Sampling Pilot Study Report Stringfellow Hazardous Waste Site* (CDTSC, 2009, page 3-4) summarized a comparison of grab sample analyses with previous analyses of samples obtained by purging three well volumes as follows:

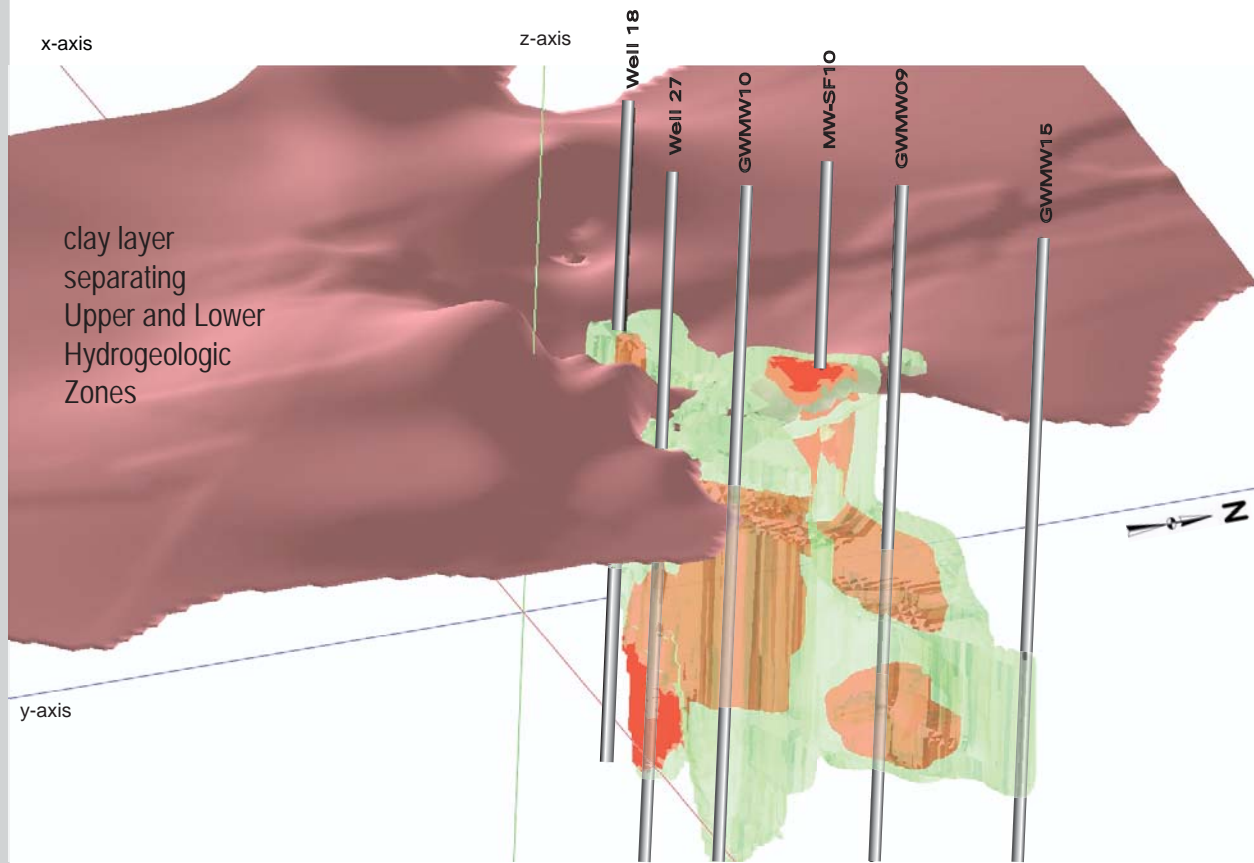
“The reported concentrations for the pumped and passive samples for select contaminants of concern [perchlorate by EPA Method 314.0, perchlorate by IC-MS/lvS, tetrachloroethene (PCE), trichloroethene (TCE), and chloroform] are compared graphically on Figures 3-8 through 3-14. On these figures, only the Spring 2008 data are plotted against the passive sampling results to minimize temporal variations. As described above, if the passive and pumped sampling methods produced samples with equal concentrations, all of the points on the graphs would fall on the respective 1:1 diagonal line.

The finding that most of the points fell close to the 1:1 diagonal lines indicates that the analytical results from the Hydrasleeve™ samples were comparable to the samples that were collected following the purge-and-sample collection techniques. The results from well CTS-OW3 showed the greatest variance from the 1:1 diagonal line; the results from this well also showed the most variance for the depth-discrete passive samples, with the highest concentrations reported for the deepest sample.

While 35 to 42 days elapsed between collection of the Hydrasleeve™ samples and the Spring 2008 samples, time-series charts (Appendix E) suggest that the concentrations for both sample sets correlate with historical analytical results. The concentration differences between the two sampling methods are not significant for samples with high concentrations, but are significant for samples with concentrations near the regulatory limits. For example, at well CTS-OW3, the TCE concentrations for the H Hydrasleeve™ samples exceeded the regulatory limit but were below the regulatory limit for each of the pumped samples. Additional sampling of wells with VOC concentrations near regulatory limits should be performed to further evaluate the variation in VOC concentrations for the two sampling methods.”

Appendix B
JSAI Report

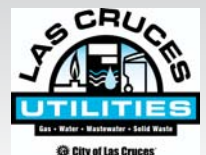
ASSESSMENT OF THE GRIGGS AND WALNUT PCE PLUME AND CAPTURE WELLS 2012 THROUGH 2016



prepared by



prepared for



June 2017

ASSESSMENT OF THE GRIGGS AND WALNUT PCE PLUME AND CAPTURE WELLS 2012 THROUGH 2016

prepared by

Steven T. Finch, Jr., CPG

Caleb J. Jennings

JOHN SHOMAKER & ASSOCIATES, INC.
Water-Resource and Environmental Consultants
2611 Broadbent Parkway NE
Albuquerque, New Mexico 87107
505-345-3407
www.shomaker.com

prepared for

Daniel B. Stephens & Associates, Inc.
Albuquerque, New Mexico



and

Las Cruces Utilities
City of Las Cruces, New Mexico



June 6, 2017



ASSESSMENT OF THE GRIGGS AND WALNUT PCE PLUME AND CAPTURE WELLS 2012 THROUGH 2016

EXECUTIVE SUMMARY

The last several years of Griggs and Walnut capture pumping and data collection have provided evidence that the plume is decreasing in mass and remedial progress is being made. The capture efficiency issue with Well 18 has been investigated and resolved, and capture Wells 18 and 27 pumping rates and schedules are optimized.

A three-dimensional geologic model was developed for the Griggs and Walnut site. The clay layer separating the Upper from the Lower Hydrogeologic Zone is bowl shaped as illustrated on Figure 3. The clay layer is a hydraulic barrier to southeastward migration because the rim of the bowl shaped clay unit is higher in elevation than the water table (Fig. 7). Well 18 is located in the low point of the clay layer, which allows for efficient capture from the PCE plume in the Upper Hydrogeologic Zone underlain by the clay layer. The Upper Hydrogeologic Zone PCE plume is mostly contained by the bowl shape configuration of the clay layer, except to the east of GWMW-16 and MWSF-10 where the clay pinches and the plume spills over the top of clay into the Lower Hydrogeologic Zone (Figs. 4 and 5). The Upper Hydrogeologic Zone PCE plume and the Lower Hydrogeologic Zone PCE plume are connected in the area between Well 27, GWMW09, GWMW10, and GWMW15, and are captured by Well 27.

Revisions to the estimation of PCE mass in groundwater are based on the plume extent in the Upper and Lower Hydrogeologic Zones (see Figs. 8 and 9; Table 5). The revised estimated total PCE mass in groundwater is 30.8 kg. The removal rate from Wells 18 and 27 combined has been about 5 kg/year over the last 4 years.

Calibration and particle tracking results from the Griggs and Walnut telescope mesh refinement (TMR) groundwater-flow model indicate the first 4 years of pumping have contained and captured the PCE plume (Figs. 10 and 11). The model also predicts the PCE plume capture for the Upper and Lower Hydrogeologic Zones will be maintained by continued pumping at the current rates. Model-simulated travel time from GWMW15(I) to Well 27 may be overstated due to the model-simulated low hydraulic gradient at GWMW15(I). The observed hydraulic gradient inferred from the water-level elevation contours appears greater in this area than the model simulated.

Due to the variable PCE results from GWMW09 and GWMW10 (Figs. B4 and B5), it is difficult to accurately predict PCE concentrations for the pump and treat system, and actual clean up duration. However, mass removal rates are expected to decrease as the PCE plume reduces in size and non-impacted groundwater is captured.

Based on the assessment of 2016 data, JSAI recommends continued pumping from Well 18 at the current rate and schedule, and increasing pumping from Well 27 from 156 to 200 gpm. JSAI also recommends to equip Well 18, Well 27, and GWMW16(S,D) with transducers, and re-surveying all measuring point elevations for the monitoring network (see Section 6.0).

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(follow text)

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- Figure 2. Graph showing PCE concentrations versus time for Well 18 and Well 27, Griggs and Walnut site, City of Las Cruces, New Mexico.
- Figure 3. 3D model illustration of clay layer that divides the Upper and Lower Hydrogeologic Zones, Griggs and Walnut site, City of Las Cruces, New Mexico.
- Figure 4. 3D model illustration of 2016 PCE plume perched on clay layer in Upper Hydrogeologic Zone, Griggs and Walnut site, City of Las Cruces, New Mexico.
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- Figure 6. Aerial photograph showing December 2016 regional water-level elevation contours for the City of Las Cruces area.
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- Figure 9. Map showing telescoped groundwater-flow model boundary, Griggs and Walnut site, City of Las Cruces, New Mexico.
- Figure 10. Aerial photograph showing 2016 model-simulated heads in Layer 1, and capture zone for Well 18 simulated by particle tracking, Griggs and Walnut site, City of Las Cruces, New Mexico.
- Figure 11. Aerial photograph showing 2016 model-simulated heads in Layer 3, and capture zone for Well 27 simulated by particle tracking, Griggs and Walnut site, City of Las Cruces, New Mexico.

APPENDICES
(follow illustrations)

Appendix A. Selected hydrographs from wells in the Griggs and Walnut plume area

Appendix B. Time-series PCE concentration graphs

Appendix C. Groundwater-flow model results

**ASSESSMENT OF THE GRIGGS AND WALNUT
PCE PLUME AND CAPTURE WELLS 2012 THROUGH 2016**

1.0 INTRODUCTION

John Shomaker & Associates, Inc. (JSAI) was subcontracted by Daniel B. Stephens & Associates, Inc. (DBS&A) to assist with the assessment of the Griggs and Walnut tetrachloroethene (PCE) plume and efficiency of the pump and treat system for the Griggs and Walnut Joint Superfund Project (Doña Ana County and City of Las Cruces). The primary project goals were to evaluate remedial progress, and optimizing the plume capture wells. Site location map is presented as Figure 1.

1.1 Background

The Griggs and Walnut pump and treat system began during May 2012, and it has been operated near continuously. During the 4th quarter of 2012, Well 18 yielded lower-than-expected PCE concentrations, and Well 27 averaged better-than-expected PCE concentrations. PCE concentrations in water produced from Well 18 decreased from 70 micrograms per liter ($\mu\text{g/L}$) to 2.3 $\mu\text{g/L}$ between April and December 2012. PCE concentrations in water from Well 27 have remained fairly constant at around 14 $\mu\text{g/L}$.

JSAI reviewed the daily meter readings and the PCE concentration trends from capture Wells 18 and 27, and performed diagnostic pumping tests on Well 18 (March 7, 2013). Results from the diagnostic pumping tests performed on Well 18 indicate well performance has not significantly changed. It was determined that PCE concentrations from Well 18 are influenced by well hydraulics, pumping rate, and pumping schedule. Through testing it was identified that the higher PCE groundwater at Well 18 originated from the Upper Hydrogeologic Zone, which recharges the Lower Hydrogeologic Zone by downward flow through the gravel pack when Well 18 is not pumping. In the vicinity of Well 18, the PCE plume in the Upper Hydrogeologic Zone has a much higher specific conductance than the Lower Hydrogeologic Zone. The use of specific conductance measurements allowed the optimization of pumping schedule for Well 18 to maximize the capture of the PCE plume from the Upper Hydrogeologic Zone. It was also determined through testing, that the Lower Hydrogeologic Zone at Well 18 did not contain PCE concentrations greater than 5 $\mu\text{g/L}$: consistent with trends observed at nearby monitoring well GWMW01.

JSAI recommended refinement of the pumping from Well 18 by implementing daily pumping cycles followed by recovery. This cyclic pumping was determined to be more effective with capture of the PCE plume in the Upper Hydrogeologic Zone. At the same time, it was recommended to increase pumping from Well 27 to optimize PCE plume capture in the Lower Hydrogeologic Zone.

Little has been known about the characteristics of the PCE plume center between GWMW01, MW-SF10, and GWMW10. The drilling and installation of GWMW16(S,D) in the projected plume center was accomplished during the 3rd quarter of 2015 (JSAI, 2016). Results from GWMW16(S,D) have helped refine the understanding of the PCE plume extent, and the configuration of the clay layer separating the Upper and Lower Hydrogeologic Zones, as discussed herein.

1.2 Scope of Work

The scope of work included the following tasks:

1. Evaluation of data collected from Wells 18 and 27, and the surrounding monitoring network.
2. Evaluation of PCE plume extent and determine how the PCE plume has responded to capture pumping. This task also includes calculation of PCE mass remaining in groundwater and PCE mass removed.
3. Develop a three dimensional representation of the clay layer separating the Upper Hydrogeologic Zone from the Lower Hydrogeologic zone.
4. Incorporate the data collected into the Griggs and Walnut groundwater-flow and solute-transport model, and re-access plume capture.
5. Prepare a technical report describing and illustrating results.
6. Provide recommendations to improve monitoring, data collection, and operation of capture Wells 18 and 27.

2.0 DATA SOURCES

Data sources used for this evaluation include operational data from the Griggs and Walnut plume treatment system, data collected from the monitoring well network, data collected during Well 18 optimization testing, and data from the City of Las Cruces water-level monitoring program.

2.1 Water-Level Monitoring Network

Las Cruces Utilities developed a water-level monitoring program in 2011. Under the monitoring program, groundwater-level data have been collected at the City's supply wells based on a defined methodology and QA/QC process. Since mid-2011, the monitoring program has used a consistent methodology for collecting hand-measurements of water levels from the majority of the City's active and inactive supply wells on a monthly basis, and transducers have also recorded water levels on an hourly basis in twelve inactive wells. These water-level data help define the regional water-level elevation contours surrounding the Griggs and Walnut site. A summary of the 2016 water-level data is provided in Table 1, and selected hydrographs are presented in Appendix A.

2.2 Wells 18 and 27 Operational Data

In 2010, Wells 18 and 27 were modified by performing partial plug back so pumping would occur from the upper screen section where the PCE plume resided without clean groundwater contributions from the lower screen section. Following modification, step-drawdown pumping tests and water-quality analyses were performed on Wells 18 and 27. Details can be referenced from JSAI (2009). Wells 18 and 27 PCE concentrations prior to and after partial plug back are shown on Figure 2.

Pumping duration and average-daily pumping rate varied as the treatment system was undergoing start up evaluation between May 2012 and August 2012. Since start up, water levels, metered diversions, and PCE concentration data have been collected from Wells 18 and 27. Specific conductance sensor was installed on the discharge line and the data were used to further evaluate the optimum pumping cycle for Well 18. Pumping rates from Wells 18 and 27 remained fairly constant during 2016 (see Table 2 and graphs in Appendix A).

Table 1. Summary of water-level data from selected City of Las Cruces water-supply wells and Griggs and Walnut monitoring network

well	status	elevation (ft amsl)	depth to water December 2016 (ft bgl)	water-level elevation December 2016 (ft amsl)
Lower Hydrogeologic Unit				
CLC 27*	capture	4,050.00	241.4	3,808.60
GWMW11-I	MW	4,021.42	183.73	3,837.69
GWMW15-I	MW	4,079.89	241.22	3,838.67
GWMW16-D	MW	4,031.00	193.74	3,837.26
Paz Park	irrigation	4,013.00	172	3,841.00
CLC 10	inactive	3,936.00	90.9	3,845.10
CLC 19	inactive	4,065.51	224.4	3,841.11
CLC 20	inactive	4,072.00	235.3	3,836.70
CLC 21	inactive	4,076.15	234.3	3,841.85
CLC 24	inactive	4,040.00	203.91	3,836.09
CLC 26	standby	4,011.00	175.28	3,835.72
CLC 54	inactive	4,110.00	271.05	3,838.95
CLC 57	inactive	4,130.00	290.85	3,839.15
CLC 60	inactive	3,948.00	102.1	3,845.90
Upper Hydrogeologic Unit				
CLC 18*	capture	4,044.00	214	3,830.00
MW-1	MW	4,034.75	192.51	3,842.24
MW-SF5	MW	3,992.93	147.87	3,845.06
MW-SF6	MW	3,976.12	128.82	3,847.30
MW-SF9	MW	4,030.08	190.25	3,839.83
MW-SF10	MW	4,036.53	194.68	3,841.85
GWMW11-S	MW	4,021.46	177.83	3,843.63
GWMW15-S	MW	4,079.84	240.6	3,839.24
GWMW16-S	MW	4,031.00	188.65	3,842.35
GWMW-01	MW	4,035.70	182.33	3,853.37
GWMW-03	MW	3,975.20	117.7	3,857.50
GWMW-08	MW	4,018.80	171.5	3,847.30
GWMW-09	MW	4,049.90	206.5	3,843.40
GWMW-10	MW	4,063.40	220.8	3,842.60

* pumping water level

ft amsl - feet above mean sea level

ft bgl - feet below ground level

MW - monitoring well

Table 2. Summary of 2016 average monthly pumping rates for capture Wells 18 and 27

month	Well 18 (gal)	Well 27 (gal)	Well 18 (gpm)	Well 27 (gpm)
1/31/2016	1,284,000	7,254,000	28.8	162.5
2/28/2016	1,193,000	6,588,000	29.6	163.4
3/31/2016	1,325,000	7,116,000	29.7	159.4
4/30/2016	1,218,000	6,863,000	28.2	158.9
5/31/2016	1,287,000	6,883,000	28.8	154.2
6/30/2016	1,255,000	6,782,000	29.1	157.0
7/31/2016	1,291,000	6,969,000	28.9	156.1
8/31/2016	1,300,000	6,993,000	29.1	156.7
9/30/2016	1,252,000	6,443,000	29.0	149.1
10/31/2016	1,273,000	6,767,000	28.5	151.6
11/30/2016	1,253,000	6,459,000	29.0	149.5
12/31/2016	1,287,000	7,031,000	28.8	157.5
average			29.0	156.3

gpm - gallons per minute

2.3 Griggs and Walnut Monitoring Network and Water Quality

The Griggs and Walnut Joint Superfund Project and Terracon (2017) collected water-level and water-quality data from the monitoring well network during December 2016 and January 2017. Several of the monitoring wells in the vicinity of the County Yard were not accessible or had collapsed. Table 3 is a summary of monitoring well completion data and PCE concentrations for selected years. Well locations can be referenced from Figure 1.

There are several sets or series of monitoring wells at the Griggs and Walnut site:

1. Multi-port flute wells GWMW-01 through GWMW-10
2. Conventional well pairs GWMW-11, GWMW-15, and GWMW-16
3. MW-series wells completed above the clay layer near Well 18
4. MW-SF-series wells are conventional monitoring wells located around the Griggs and Walnut site

In the vicinity of Well 18, many of the MW and MW-SF series monitoring wells have gone dry; most had a 10-ft screen interval at the water table when installed about 15 years ago. Time-series PCE graphs are presented in Appendix B.

Griggs and Walnut monitoring network was sampled by Terracon (2017) during December 2016 and January 2017. When reviewing the historical dataset, variability in PCE concentrations from the flute wells is apparent (see graphs for GWMW-01, -03, -09, -10 in Appendix B), whereas PCE concentration data from conventional monitoring wells are more consistent in trend.

Table 3. Summary of well data and 2005 through 2016 PCE results for the Griggs and Walnut site monitoring network

sample location	northing (NMSP NAD 83, ft)	easting (NMSP NAD 83, ft)	elevation (ft amsl)	port ID	depth of screen interval (ft bgl)	well type	Hydrogeologic Zone (HZ) monitored	RI/FS 2005 PCE (µg/L)	remedial design 2009 PCE (µg/L)	system startup 2012 PCE (µg/L)	2015 PCE (µg/L)	2016 PCE (µg/L)
CLC 18	479,040	1,483,111	4,044.00		315 - 516	capture	Upper HZ	35	48	42	13	15
CLC 20	477,573	1,486,695	4,072.00		380 - 673	supply	Lower HZ	---	---	2.3	<1.0	<1.0
CLC 26	476,633	1,484,298	4,021.00		410 - 700	supply	Lower HZ	---	---	<1.0	<1.0	<1.0
CLC 27	478,885	1,484,263	4,050.00		430 - 524	capture	Lower HZ	---	11	5.8	14	13
CLC 57	478,928	1,488,480	4,130.00		408 - 516	supply	Lower HZ	---	---	<1.0	<1.0	<1.0
Paz Park	480,912	1,482,790	4,013.00		na	irrigation	Lower HZ	---	---	<1.0	<1.0	<1.0
GWMW01	479,017.6	1,483,309.2	4,035.70	1	210 - 220	multi-port flute MW	Upper HZ	5.3	---	5.8	3.8	9.8
				2	270 - 280		Lower HZ	21	---	<1.0	<1.0	---
				3	330 - 340		Lower HZ	1	---	2.7	1.6	7
				4	420 - 430		Lower HZ	2	---	<1.0	<1.0	<1.0
				5	460 - 470		Lower HZ	3.4	---	3.2	<1.0	<1.0
				6	515 - 525		Lower HZ	6.2	---	11	2.4	4.7
				7	560 - 570		Lower HZ	2.1	---	3.2	<1.0	<1.0
GWMW03	479,519.7	1,480,641.7	3,975.20	1	140 - 150	multi-port flute MW	Upper HZ	0.3	1.6	<1.0	<1.0	<1.0
				2	225 - 235		Lower HZ	0.5	<1.0	<1.0	<1.0	<1.0
				3	270 - 280		Lower HZ	<0.5	<1.0	<1.0	<1.0	<1.0
				4	320 - 330		Lower HZ	<0.5	<1.0	<1.0	<1.0	---
				5	410 - 420		Lower HZ	---	<1.0	<1.0	<1.0	---
				6	460 - 470		Lower HZ	---	---	<1.0	<1.0	<1.0
GWMW08	480,044.8	1,483,349.7	4,018.80	1	190 - 200	multi-port flute MW	Upper HZ	---	---	---	---	---
				2	255 - 265		Lower HZ	---	---	---	---	---
				3	305 - 315		Lower HZ	<0.5	---	<1.0	<1.0	<1.0
				4	380 - 390		Lower HZ	<0.5	---	<1.0	<1.0	<1.0
				5	430 - 440		Lower HZ	<0.5	---	<1.0	<1.0	<1.0
				6	490 - 500		Lower HZ	<0.5	---	<1.0	<1.0	<1.0
				7	535 - 545		Lower HZ	<0.5	---	<1.0	<1.0	<1.0
GWMW09	480,413.5	1,485,066.6	4,049.90	1	240 - 250	multi-port flute MW	Upper HZ	0.6	<1.0	<1.0	<1.0	<1.0
				2	295 - 305		Lower HZ	19	13	1.3	<1.0	<1.0
				3	355 - 365		Lower HZ	14	9	<1.0	5.1	13
				4	410 - 420		Lower HZ	16	29	1.2	11.0	9.2
				5	480 - 490		Lower HZ	18	20	1.7	16.0	19
				6	550 - 560		Lower HZ	0.2	<1.0	<1.0	<1.0	<1.0
				7	630 - 640		Lower HZ	<1.8	<1.0	<1.0	<1.0	<1.0
GWMW10	479,228.8	1,484,919.3	4,063.40	1	250 - 260	multi-port flute MW	Upper HZ	3.2	31	47	1.2	5.1
				2	320 - 330		Lower HZ	14	36	14	4.4	18
				3	370 - 380		Lower HZ	16	46	45	1.8	16
				4	440 - 450		Lower HZ	14	15	4.5	1.2	13
				5	505 - 515		Lower HZ	0.2	<1.0	<1.0	<1.0	9
				6	560 - 570		Lower HZ	0.4	<1.0	<1.0	<1.0	7.3
				7	620 - 630		Lower HZ	0.2	<1.0	<1.0	4.2	7.5
GWMW11-S	477,982.1	1,483,180.7	4,021.46		190 - 205	conventional MW	Upper HZ	<0.5	<1.0	<1.0	<1.0	<1.0
GWMW11-I	477,982.4	1,483,180.5	4,021.42		299 - 314	conventional MW	Lower HZ upper portion	<0.5	<1.0	<1.0	2.0	1.8
GWMW11-D	477,982.5	1,483,180.8	4,021.46		525 - 540	conventional MW	Lower HZ lower portion	<0.5	<1.0	<1.0	<1.0	<1.0
GWMW15-S	480,920.0	1,486,661.6	4,079.84		289 - 304	conventional MW	Upper HZ	18	2.6	<1.0	<1.0	<1.0
GWMW15-I	480,920.1	1,486,661.2	4,079.89		460 - 475	conventional MW	Lower HZ upper portion	<0.5	<1.0	2.6	6.1	5.6
GWMW15-D	480,919.9	1,486,661.2	4,079.85		581 - 596	conventional MW	Lower HZ lower portion	<0.5	<1.0	<1.0	<1.0	<1.0
GWMW16-S	479,478	1,484,022	4,033.49		185 - 205	conventional MW	Upper HZ	*	*	*	1.6	4.9
GWMW16-D	479,473	1,484,003	4,033.10		350 - 370	conventional MW	Lower HZ upper portion	*	*	*	3.1	5
MW-1	478,754.9	1,483,492.6	4,034.75		187 - 197	conventional MW	Upper HZ	0.2	---	<5.0	2.1	2.9
MW-3	478,919.2	1,483,203.6	4,032.13		180 - 190	conventional MW	Upper HZ	6.4	---	2.4	---	---
MW-4	478,681.5	1,483,079.6	4,029.08		175 - 185	conventional MW	Upper HZ	1.0	---	4.2	---	---
MW-5	478,579.7	1,483,553.9	4,033.79		182 - 192	conventional MW	Upper HZ	0.5	---	<1.0	---	---
MW-SF2	478,837.8	1,483,252.9	4,033.35		184 - 199	conventional MW	Upper HZ	8.3	---	7.4	---	---
MW-SF4	478,733.2	1,482,272.8	4,023.20		165 - 183	conventional MW	Upper HZ	---	---	---	---	<1.0
MW-SF5	479,614.9	1,481,960.0	3,992.93		138 - 153	conventional MW	Upper HZ	1.7	---	<1.0	1.1	<1.0
MW-SF6	479,654.5	1,480,848.4	3,976.12		117 - 132	conventional MW	Upper HZ	0.4	---	<1.0	<1.0	<2.0
MW-SF9	478,481.9	1,484,636.7	4,030.08		188 - 203	conventional MW	Upper HZ	<0.5	---	<1.0	<1.0	<1.0
MW-SF10	480,157.0	1,484,357.3	4,036.53		194 - 204	conventional MW	Upper HZ	17	---	10	23	21

* drilled and completed in 2015
 RI/FS - Remedial Investigation/Feasibility Study (EPA, 2006)
bold indicates above 5 µg/L
 MW - monitoring well

ft amsl - feet above mean seal level
 ft bgl - feet below ground level
 µg/L - micrograms per liter
 PCE - tetrachloroethene

3.0 DATA EVALUATION

3.1 Conceptual Site Model

Water-level and PCE-concentration data were evaluated by hydrogeologic zone and model layer. The hydrogeologic zones presented in the Remedial Investigation/Feasibility Study (RI/FS) by EPA (2006) are slightly different than layers in the Griggs and Walnut groundwater-flow and solute-transport model. A summary of the hydrogeologic zones for model Layers 1 through 3 is as follows:

1. Model Layer 1 represents the Upper Hydrogeologic Zone that is an unconfined aquifer consisting of sand and gravel.
2. Model Layer 2 represents the upper portion of the Lower Hydrogeologic Zone that primarily consists of silt and clay beds. EPA (2006) had identified model Layer 2 as part of the Lower Hydraulic Zone. The low-permeability beds (where present) limit hydraulic communication between the Upper Hydrogeologic Zone and the Lower Hydrogeologic Zone. The silt and clay beds in Layer 2 transition east of Well 18 to silt and sand.
3. Model Layer 3 represents the lower portion of the Lower Hydrogeologic Zone consisting of sand and gravel.

Three-dimensional geologic model diagrams showing the Upper and Lower Hydrogeologic Zones are presented as Figures 3 through 5. The thickness and extent of the low-permeability silt and clay beds that divide Layer 1 from Layer 2 have influenced the lateral and vertical distribution of PCE in groundwater. At Well 18, the clay layer separating the Upper and Lower Hydrogeologic Zones creates a hydraulic barrier to vertical flow. East of GWMW16(S,D), the clay layer transitions to silt and sand allowing for vertical groundwater flow from the Upper to Lower Hydrogeologic Zones under downward head gradient conditions. Historically, the PCE plume moved from west to east in the Upper Hydrogeologic Zone until it was able to migrate vertically into the Lower Hydrogeologic Zone. The eastward migration of the groundwater trough between 1960 and 2000 caused by municipal well pumping (in model Layer 3) also played a role in the eastward migration of the PCE plume (JSAI, 2006).

The clay layer dividing the Upper Hydrogeologic Zone from Lower Hydrogeologic Zone is shaped like a bowl with Well 18 near the low point. The lithology at GWMW16-D, and the re-assessment of GWMW09, GWMW10, and GWMW11 lithologic and geophysical logs, helped define the configuration of the clay layer (see Figs. 3 and 4). Southwest, south, and southeast of Well 18, the top elevation of the clay layer is above the water table preventing migration of the PCE plume.

The head difference between the Upper and Lower Hydrogeologic Zones is about 6 ft where the clay layer is present, and less where the clay layer is absent (Table 4). Past water-level data (2002 to 2006) from the multi-port flute wells also revealed a similar distribution of head differences due to the clay layer, where wells GWMW01, GWMW03, and GWMW08 show a 5 to 10 ft head difference between port 1 and the lower ports, and GWMW09 and GWMW10 do not show a significant head difference between the upper and lower ports (see hydrographs in Appendix A).

Table 4. Summary of head difference between Upper and Lower Hydrogeologic Zones measured in well pairs

well	hydrogeologic zone	December 2016 depth to water (ft amsl)	head difference ¹ (ft)
GWMW11-S GWMW11-D	Upper ² Lower	3,843.63 3,838.02	5.61
GWMW15-S GWMW15-D	Upper ³ Lower	3,839.24 3,838.65	0.59
GWMW16-S GWMW16-D	Upper ² Lower	3,842.35 3,837.26	5.09
MW-1 CLC Well 18	Upper ² both	3,842.24 3,833.90	8.34

¹ Positive number indicates a higher head in the Upper than the Lower Hydrogeologic Zone.

² Clay layer between Upper and Lower Hydrogeologic Zone is present.

³ Clay layer between Upper and Lower Hydrogeologic Zone is not present.

ft amsl - feet above mean sea level

3.2 Water-Level Response to Pumping

Available water-level data from the Griggs and Walnut plume area were evaluated to determine hydraulic gradient, direction of groundwater flow, and drawdown caused by pumping Wells 18 and 27.

December 2016 regional groundwater-flow contours and direction of groundwater flow are shown on Figure 6. The distance between water-level elevation contours across the City indicates a relatively flat hydraulic gradient outside of the Griggs and Walnut site. A drawdown cone in the regional aquifer is evident in the vicinity of Well 27 (Fig. 6).

Local direction of groundwater flow in the Upper Hydrogeologic Zone can be readily contoured where the underlying clay layer is present near Well 18. Water-level elevation contours for the Upper Hydrogeologic Zone are presented on Figure 7. The direction of lateral groundwater flow in Upper Hydrogeologic Zone is northwest to southeast with a drawdown cone around Well 18 (Fig. 7). In the eastern part of the site, there is a slight downward head gradient due to Well 27 pumping where the Upper and Lower Hydrogeologic Zones are hydraulically connected due to the absence of the clay layer which separates the zones to the west near Well 18. Upper Hydrogeologic Zone hydrographs can be referenced from Appendix A. Water-level declines are observed near Well 18 at MW-1 and MW-5 (Figs. A1 and A15). Water-level declines are also observed in the Upper Hydrogeologic Zone at MW-SF9 (Fig. A16) and GWMW15 (Fig. A14), where the clay layer is absent and water levels are influenced by pumping from Well 27.

Water-level elevation contours for the Lower Hydrogeologic Zone are presented on Figure 8. The cone of depression (drawdown) caused by Well 27 is illustrated by the water-level elevation contours within the 3,840-ft water-level elevation contour (Figs. 6 and 8). The horizontal hydraulic gradient outside of the 3,840-ft water-level elevation contour is generally flat as indicated by the water-level elevation range of 3,836 to 3,842 ft in City wells surrounding the Griggs and Walnut site (Table 1; Fig. 6). Lower Hydrogeologic Zone hydrographs can be referenced from Appendix A.

3.3 PCE Plume Configuration and Mass

Since capture pumping began in 2012, the relatively flat hydraulic gradient across the Griggs and Walnut site, and focused pumping from capture wells (18 and 27), has kept the PCE plume in the general vicinity between Well 18 and Interstate 25. The highest PCE concentrations have been observed at Well 18, and the greatest vertical extent has been observed at GWMW09 and GWMW10 (Table 3).

It has become evident from GWMW01, GWMW16(S,D), and Well 18 PCE data that the Lower Hydrogeologic Zone does not contain a PCE plume where the clay layer is present. Prior to operation of the remedial system, when Well 18 was not pumping, the high PCE concentrations in Upper Hydrogeologic Zone recharged the Lower Hydrogeologic Zone by migration through the gravel packed annulus of Well 18. The higher groundwater head in the Upper Hydrogeologic Zone than the Lower Hydrogeologic Zone (Table 3) allows for water to drain by gravity through Well 18 under non-pumping conditions. The elevated PCE concentrations in the Lower Hydrogeologic Zone around Well 18 were then removed by pumping Well 18 at a high rate during the first year of operation (Fig. 2).

Configuration of the 2016 PCE plume is shown by Upper and Lower Hydrogeologic Zones on Figures 7 and 8, respectively. The PCE plume ($>5 \mu\text{g/L}$) in the Upper Hydrogeologic Zone appears to be narrow, extending between Well 18 and MW-SF10 (Fig. 7). The northeastern portion of PCE plume in the Upper Hydrogeologic Zone, between GWMW16-S and MW-SF10, is likely migrating into the Lower Hydrogeologic Zone and captured by Well 27, as shown by the water-level elevation contours and change in direction of the PCE plume on Figure 8. The 2016 average PCE concentration in Upper Hydrogeologic Zone within this narrow plume is estimated at $10 \mu\text{g/L}$, with the highest PCE concentration of $21 \mu\text{g/L}$ observed from MW-SF10 (Fig. 8).

The PCE plume ($>5 \mu\text{g/L}$) in the Lower Hydrogeologic Zone occurs where the clay layer becomes coarser grained east of Well 18 (Fig. 3), and there is vertical downward groundwater flow induced by pumping Well 27 (Fig. 8). The extent of PCE plume in the Lower Hydrogeologic Zone is defined by monitoring points GWMW01, GWMW09, GWMW10, GWMW11-I, GWMW15-I, GWMW16-D, and Well 27. The PCE plume on Figure 8 is within the 3,840-ft water-level elevation contour and drawdown cone caused by pumping Well 27. The average PCE concentration in the Lower Hydrogeologic Zone plume is estimated at $10 \mu\text{g/L}$, with the highest 2016 PCE concentration of $19 \mu\text{g/L}$ observed at GWMW09 (Port 5).

Trends in PCE concentrations at GWMW15-S and -I indicate vertical migration from the shallow well to the intermediate well over the last 10 years (Table 3; Fig. B7). GWMW09 and GWMW10 multi-port wells have also shown a downward shift, reduction in thickness, and reduced concentrations of the PCE plume (see Table 3 and graphs in Appendix B).

The estimated 2005 PCE plume mass was 152 kilograms (kg) when using an effective porosity of 20 percent and 2005 monitoring results (JSAI, 2006). The calculated PCE plume mass was re-evaluated in 2013, and estimated to be 21.4 kg (JSAI, 2013) and 29.5 kg for 2015 (JSAI, 2016b).

The calculated 2016 PCE plume mass is 30.8 kg (Table 5). Over the last 4 years, the PCE mass removal rate has averaged about 5 kg/yr and totaled about 20 kg.

The primary discrepancy between the calculated PCE mass for 2013, 2015, and 2016 is reflected in extending the plume eastward to GWMW15-I and varying PCE concentration results from GWMW09 and GWMW10 (Figs. B4 and B5). For example, monitoring results from 2013 indicated the PCE plume had retreated west of GWMW09, because results from GWMW09 and GWMW15 were below detection limits. Nevertheless, it appears nearly 40 percent of the PCE plume mass has been removed from the last 4 years of pumping capture Wells 18 and 27.

Table 5. Updated estimates of the volume of groundwater containing PCE and the current mass of PCE in groundwater at the Griggs and Walnut site

Hydrogeologic Zone	average thickness (ft)	2016 plume area (ft ²)	volume of groundwater (liters)*	estimated average PCE concentration (µg/L)	revised PCE mass (kg)
Upper	30	1,620,000	275,209,090	10	2.8
Lower	150	3,300,000	2,803,055,560	10	28.0
total					30.8

* Using an effective porosity of 20 percent
 µg/L - micrograms per liter
 kg - kilograms

3.4 Well 18 Performance

Well 18 experienced significant variations in PCE concentrations during the first year of pumping (April 2012 to February 2013; Fig. 2). An assessment of the well hydraulics revealed that the PCE plume in the Upper Hydrogeologic Zone gravity drains into Well 18 production zone under non-pumping conditions via vertical flow through the saturated gravel pack in the annulus between the formation and well casing above the screen interval (JSAI, 2016b). Under pumping conditions Well 18 captures high PCE groundwater that drained from the Upper Hydrogeologic Zone to the Lower Hydrogeologic Zone adjacent to the well.

Well 18 has been operated by pumping the well at a rate of 170 gallons per minute (gpm) for 4 hours/day, which averages about 29 gpm (Table 2). Even with the optimized pumping schedule to maximize mass removal, the PCE concentrations from Well 18 have decreased since the system has been in operation (Fig. 2). Maximum PCE concentrations have dropped from 70 $\mu\text{g/L}$ to less than 20 $\mu\text{g/L}$. The neighboring monitoring wells (MW-series) have also seen significant drops in PCE concentrations (Fig. B9). Water pumped from Well 18 in 2016 had an average PCE concentration of 16 $\mu\text{g/L}$. Continued pumping at an average rate of 29 gpm with a PCE concentration of 15 $\mu\text{g/L}$ would result in a PCE mass removal rate of 0.84 kg/year.

Additional hydraulic analysis indicates Well 18 is more efficient at capturing the Upper Hydrogeologic Zone PCE plume than a hypothetical capture well completed to the top of the clay layer. Due to the limited saturated thickness and declining water level, a hypothetical capture well completed to the top of the clay layer ($Q/s = 1.8$ gpm/ft) would not have enough water column to operate a pump after 1 year of pumping 30 gpm.

3.5 Well 27 Performance

The pumping rate from Well 27 is currently averaging 156 gpm (Table 2), and the PCE concentration continues to slowly increase with time (Fig. 2). Well 27 appears to be adequately capturing the PCE plume in the Lower Hydrogeologic Zone, as indicated by the cone of depression (Fig. 8) and slowly increases PCE concentrations (Fig. 2). JSAI (2016) recommended increasing the pumping rate from Well 27 to 200 gpm; however, it is likely a new pump will be required to increase the pumping to a rate greater than 160 gpm. Pumping at an average annual rate of 156 gpm with a PCE concentration of 14 $\mu\text{g/L}$ would result in a PCE mass removal rate of 4.3 kg/year.

4.0 GRIGGS AND WALNUT PLUME MODEL RESULTS

The Griggs and Walnut groundwater-flow and solute-transport model (JSAI, 2006) was used for the EPA feasibility study and remedial design (EPA, 2006). The model was updated in 2009, and some minor modifications were made and reported by JSAI (2009).

The discontinued pumping from municipal wells surrounding the Griggs and Walnut site has resulted in a reduction in the need for using the full extent of the original model, and model-simulated pumping outside of the plume area. Using the original model, the Griggs and Walnut site telescope mesh refinement (TMR) model was constructed. Area of the telescope mesh refinement is shown on Figure 9. The main objective of the TRM model was to better simulate local hydraulic influences of the clay layer on plume capture that could not be made with the original model.

4.1 Telescope Mesh Refinement (TMR) Model

The TMR model consists of the original five model layers with 66 rows and 66 column, and model cell dimensions of 300 by 300 ft. Model grid and results can be referenced from illustrations in Appendix C. Visual MODFLOW Pro (Waterloo Hydrogeologic, 2011) software was used to run the MODFLOW model.

It was assumed that year 2012 site conditions, prior to pumping Wells 18 and 27, represented a steady-state condition. The steady-state condition was simulated by adding general head boundaries (GHB) for groundwater inflow at the northwest corner of Layer 1 and groundwater outflow along the north, west, and south sides of Layer 5. Additional calibration measures included the following:

1. Reduced hydraulic conductivity of the clay layer in Layer 2 from 1 ft/day to 0.01 ft/day
2. Reduced specific yield from 0.15 to 0.10

Transient groundwater-flow simulations included the time period from May 2012 to May 2026. The only pumping simulated in the model included Well 18 from Layer 1 and Well 27 from Layer 3. Groundwater-head calibration results are shown on the hydrographs in Appendix C. The model-simulated heads reasonably matched observed heads in the Upper and Lower Hydrogeologic Zones.

MODPATH (Pollock, 1989) was used to simulate forward particle tracking results during the first 20 years of the transient model run. Results of the model-simulated particle tracking are shown on Figures 10 and 11.

4.2 Model Results

The observed Griggs and Walnut site data suggest the primary PCE plume migrated from northwest to southeast on top of the clay layer illustrated on Figure 3. Pumping from nearby municipal wells pulled the plume eastward to the edge of the clay layer and then downward into the zone screened by the municipal wells (Layer 1). The TMR model simulates this concept. A significant portion of the PCE plume in the Upper Hydrogeologic Zone is captured by pumping from Well 18, and the remainder spills over the clay layer near MWSF-10 into the Lower Hydrogeologic Zone and is captured by Well 27.

Model-simulated particle tracking starts in year 2012 when capture pumping began and continues for 20 years to year 2032. Model-simulated particle tracking results for the Upper Hydrogeologic Zone west of Well 18 indicate a travel time of 2 years from MW-SF3 to Well 18. East of Well 18, model-simulated travel times are greater as indicated by the shape of the pathlines defining the capture zone for Well 18 (Fig. 10). The capture zone for the Lower Hydrogeologic zone from pumping Well 27 is shown on Figure 11. Model-simulated travel times are 2 years from GWMW-10 to Well 27, and 8 years from MW-SF10 to Well 27. Model-simulated travel time from GWMW15(I) to Well 27 is over 20 years. Travel time for GWMW15 is likely overstated due to the relatively flat model-simulated hydraulic gradient east of GWMW09 in the Lower Hydrogeologic Zone compared to observed hydraulic gradient (Fig. 8). The model also shows that particles added to Layer 1 end up in Layer 3, where the clay is absent, and are contained by pumping Well 27.

After 4 years of capture pumping (2012 to 2016), a significant percent of the estimated plume mass has been removed. The model-simulated travel times and capture zones coincide with the observed removal of plume mass. JSAI (2016) estimated 10 more years of pumping to remove the PCE plume, given the current rate of mass removal is maintained. This estimate was based on efficient plume capture and removal of a uniform PCE plume, which may be an unrealistic assumption as the plume continues to reduce in size, and potentially become partitioned. With the exception of the portion of plume near GWMW15(I), model-simulated particle tracking results also indicate a total clean up duration of 10 to 15 years.

5.0 FINDINGS

The clay layer separating the Upper from the Lower Hydrogeologic Zone is bowl shaped as illustrated on Figure 3. The clay layer is a hydraulic barrier to southeastward migration because the rim of the bowl shaped clay unit is higher in elevation than the water table (Fig. 7). Well 18 is located in the low point of the clay layer, which allows for efficient capture from the PCE plume in the Upper Hydrogeologic Zone underlain by the clay layer. The Upper Hydrogeologic Zone PCE plume is mostly contained by the bowl shape configuration of the clay layer, except to the east of GWMW-16 and MWSF-10 where the clay pinches and the plume spills over the top of clay into the Lower Hydrogeologic Zone (Figs. 4 and 5). The Upper Hydrogeologic Zone PCE plume and the Lower Hydrogeologic Zone PCE plume appear to be connected in the area between Well 27, GWMW09, GWMW10, and GWMW15.

The Griggs and Walnut capture pumping and data collection have provided evidence that the plume is decreasing in mass and remedial progress is being made. Well 18 captures the PCE in the Upper Hydrogeologic Zone where the underlying clay layer is present. Well 27 captures the PCE plume from the Upper Hydrogeologic Zone where the underlying clay layer is absent and from the Lower Hydrogeologic Zone. Well 18 capture efficiency has been maximized. Well 27 capture efficiency can be slightly improved by increasing the average pumping rate from 157 to 200 gpm, with an average annual rate of 180 gpm.

Calibration and particle tracking results from the Griggs and Walnut TMR groundwater-flow model indicate the first 4 years of pumping have contained and captured the PCE plume (Figs. 10 and 11). The model also predicts the PCE plume capture for the Upper and Lower Hydrogeologic Zones will be maintained by continued pumping at the current rates. Model-simulated travel time from GWMW15(I) to Well 27 may be overstated due to the model-simulated low hydraulic gradient at GWMW15(I). The observed hydraulic gradient inferred from the water-level elevation contours appears greater in this area than the model simulated.

The capture system also appears optimized when comparing the estimated 2016 PCE plume mass of 30.8 kg to the average removal rates of 5 to 6 kg/yr. Due to the variable PCE results from GWMW09 and GWMW10 (Figs. B4 and B5), it is difficult to predict PCE concentrations for the pump and treat system, and actual clean up duration. However, mass removal rates are expected to decrease as the PCE plume reduces in size and non-impacted groundwater is captured.

6.0 RECOMMENDATIONS

The following actions are recommended:

1. Continue to collect data on pumping rate, water level, and specific conductance from Well 18, and use the data to track and optimize the PCE mass removal rate. The recommended pumping schedule for Well 18 is 170 gpm 4 hours/day.
2. Continue to collect data on pumping rate, water level, and PCE concentrations from Well 27, and use the data to track and optimize the PCE mass removal rate. The recommended pumping schedule for Well 27 is 200 gpm with an average annual rate of 180 gpm.
3. Equipping Well 18, Well 27, and GWMW16(S,D) with pressure transducers would provide time-series data that could help in better understanding of pumping effects on the PCE plume.
4. The water-level monitoring network consists of inactive municipal wells and various set of monitoring wells across the site. Due to the relative small head difference observed across the site, accurate measuring point elevation for each monitoring point is critical for plotting water-level elevation contours and groundwater-flow direction. It is recommended to have all of the measuring point elevations re-surveyed by a licensed surveyor.

7.0 REFERENCES

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ILLUSTRATIONS



C:\ACAD\Las Cruces\Griggs and Walnut\GW_WellLocations.mxd

Aerial photography source: USDA NAIP, 2016

Figure 1. Aerial photograph of the Griggs and Walnut site showing monitoring network, City of Las Cruces, New Mexico.

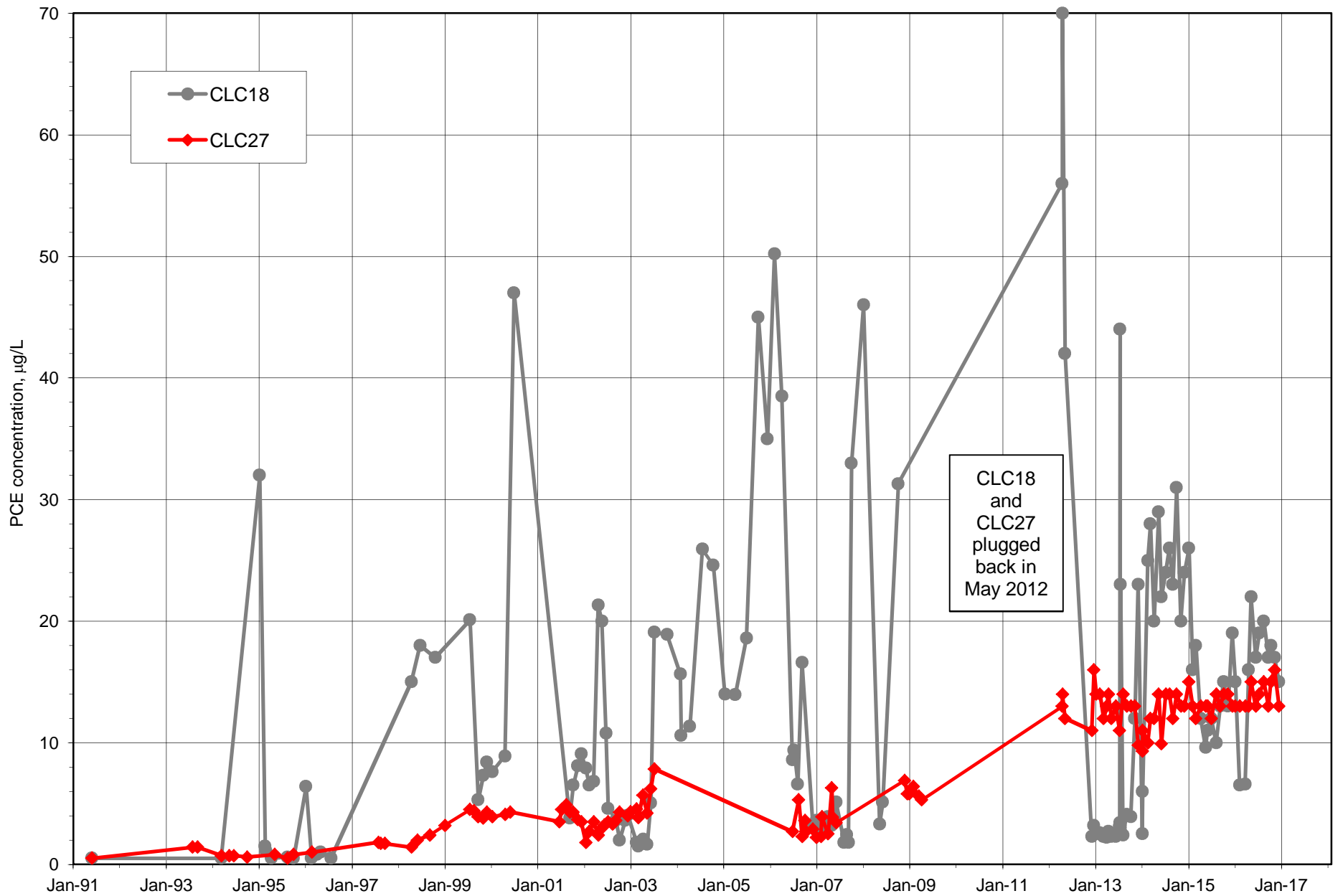


Figure 2. Graph showing PCE concentrations versus time for Well 18 and Well 27, Griggs and Walnut site, City of Las Cruces, New Mexico.

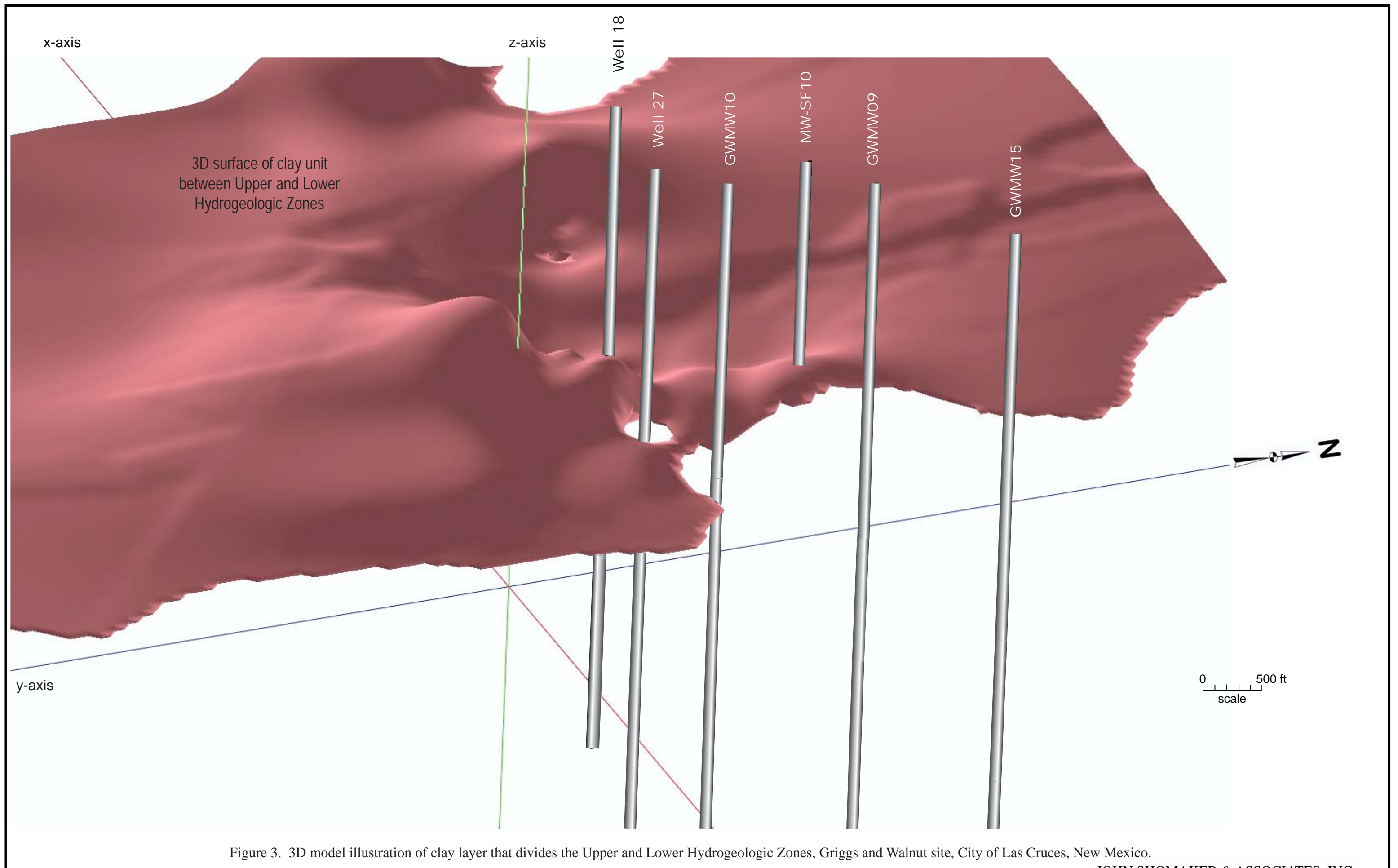


Figure 3. 3D model illustration of clay layer that divides the Upper and Lower Hydrogeologic Zones, Griggs and Walnut site, City of Las Cruces, New Mexico.

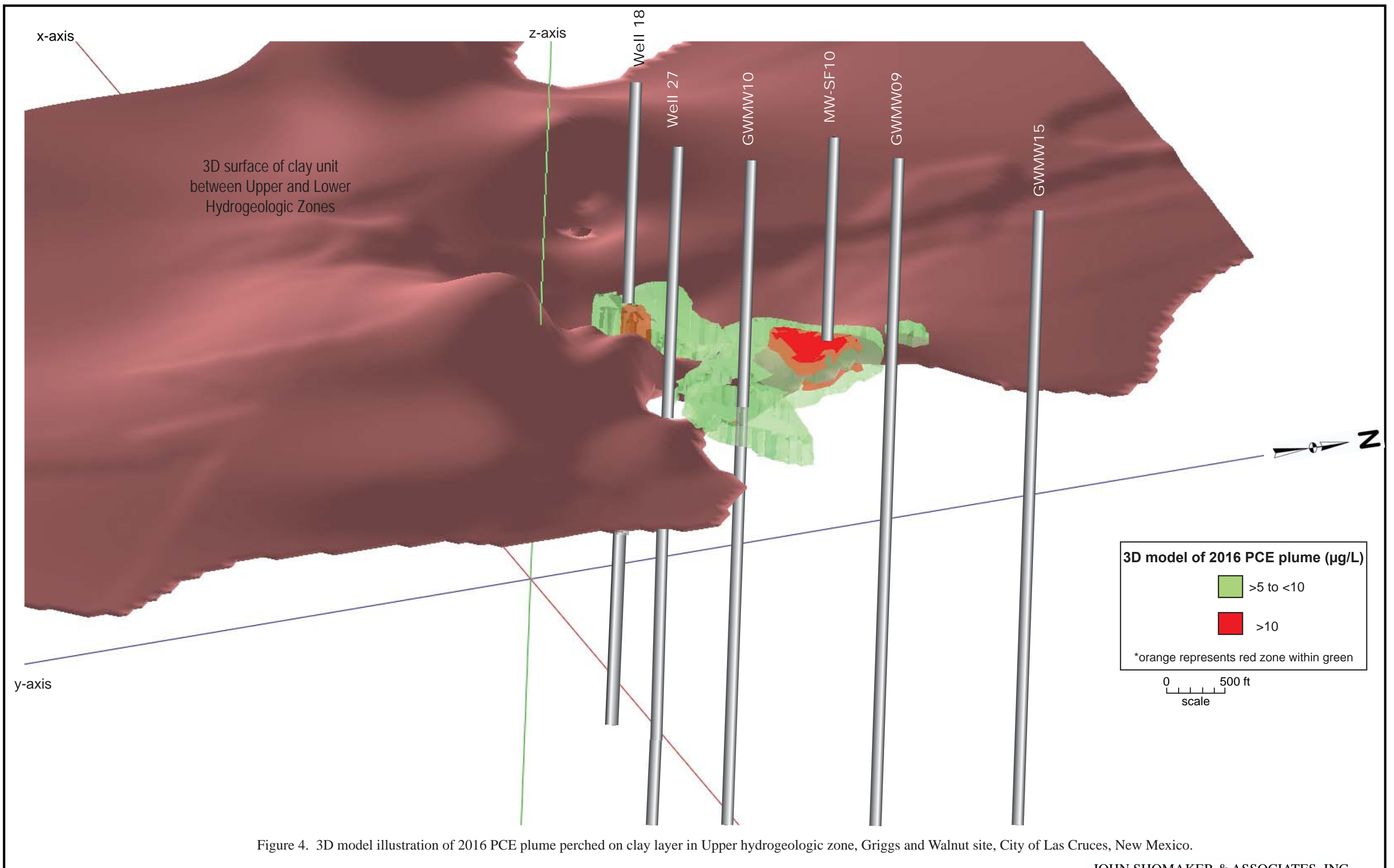


Figure 4. 3D model illustration of 2016 PCE plume perched on clay layer in Upper hydrogeologic zone, Griggs and Walnut site, City of Las Cruces, New Mexico.

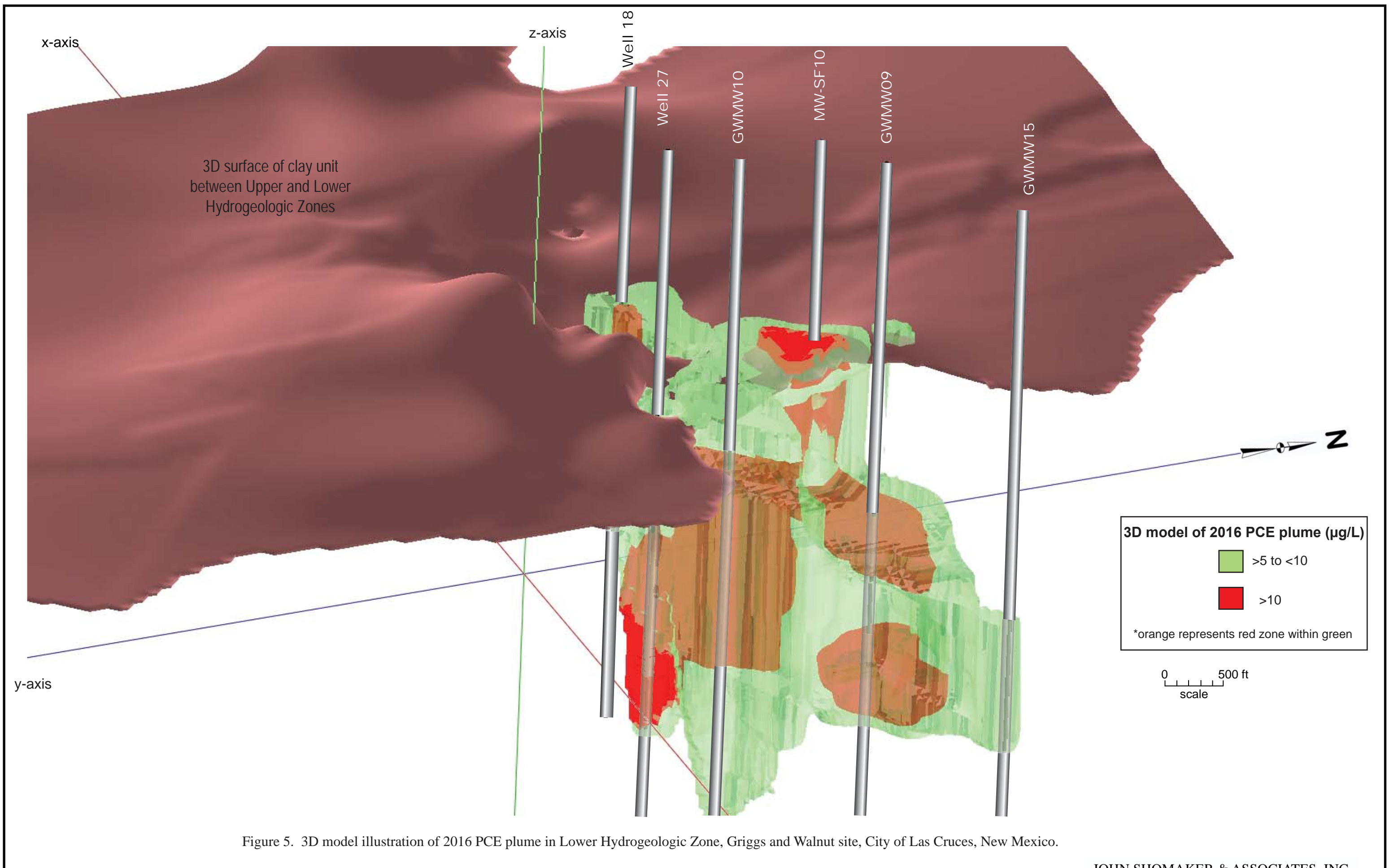
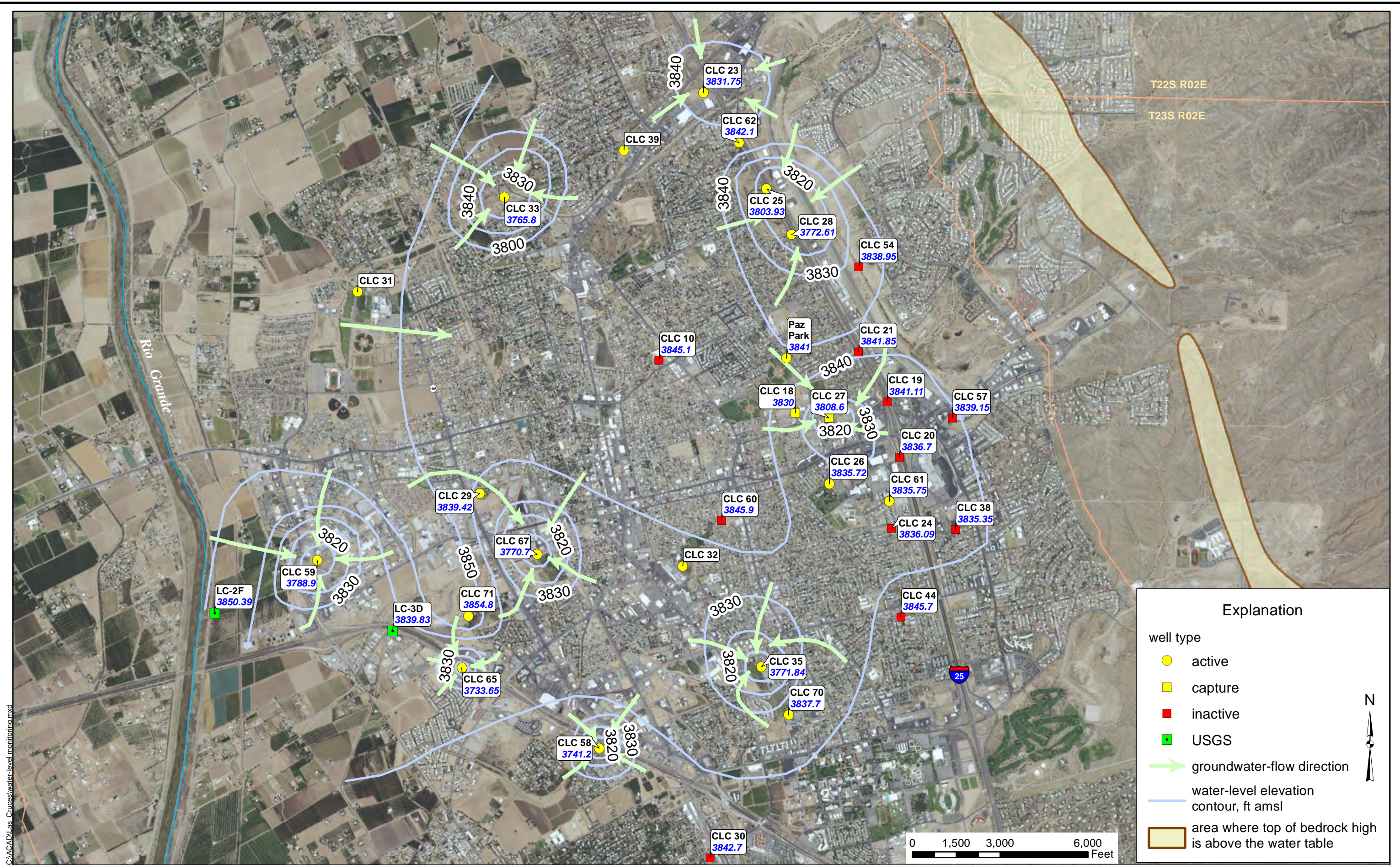


Figure 5. 3D model illustration of 2016 PCE plume in Lower Hydrogeologic Zone, Griggs and Walnut site, City of Las Cruces, New Mexico.



Explanation

- well type
 - active
 - capture
 - inactive
 - USGS
- groundwater-flow direction
- water-level elevation contour, ft amsl
- area where top of bedrock high is above the water table

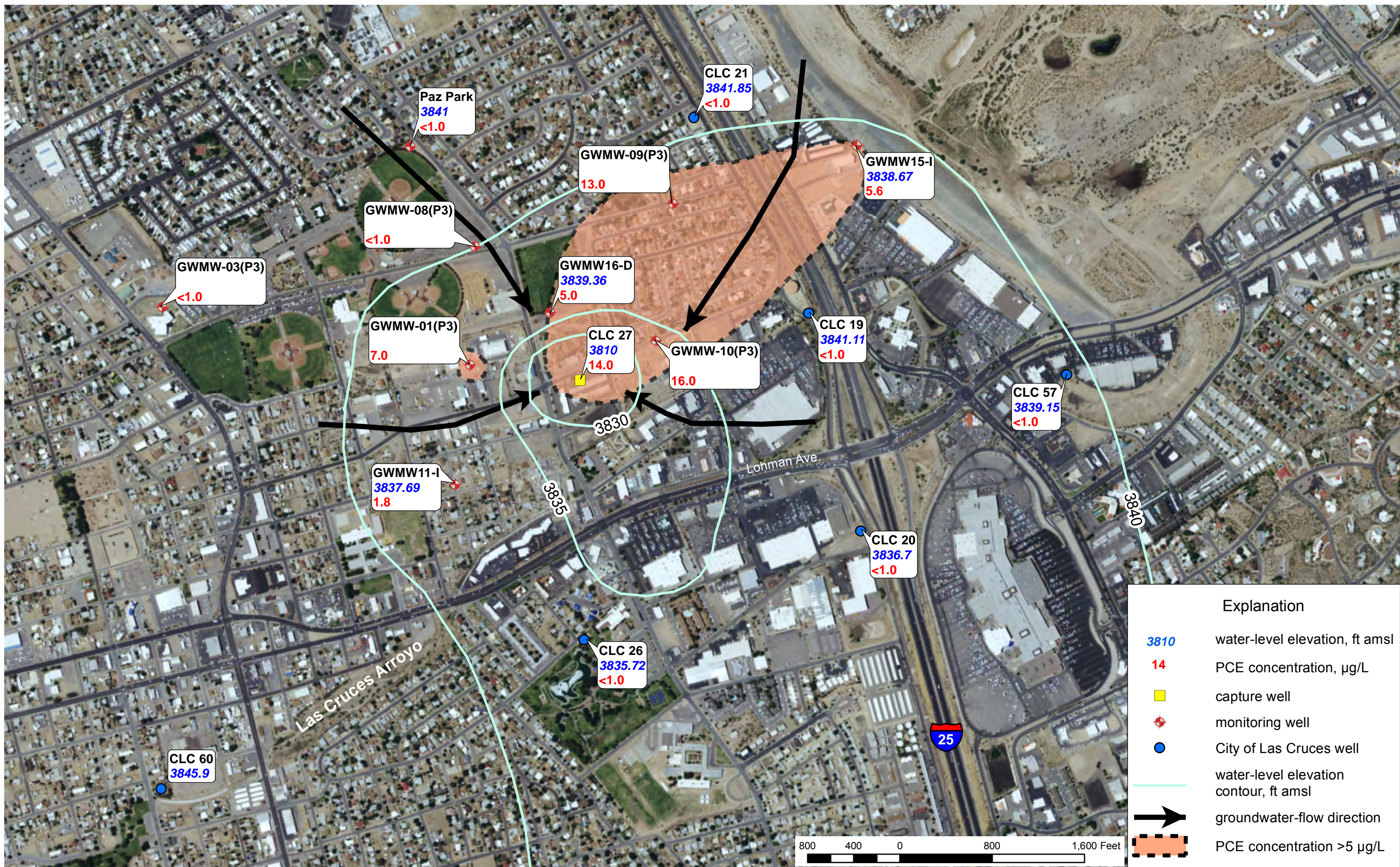
aerial photography: NAIP June 2016 05/22/2017

Figure 6. Aerial photograph showing December 2016 water-level elevation contours for the City of Las Cruces area.



Aerial photography source: USDA, 2016

Figure 7. Aerial photograph showing December 2016 water-level elevation contours and PCE concentrations Upper Hydrogeologic Zone, Griggs and Walnut site, City of Las Cruces, New Mexico.



Explanation	
3810	water-level elevation, ft amsl
14	PCE concentration, µg/L
Yellow square	capture well
Red diamond	monitoring well
Blue circle	City of Las Cruces well
Green line	water-level elevation contour, ft amsl
Black arrow	groundwater-flow direction
Orange dashed box	PCE concentration >5 µg/L

Aerial photography source: USDA, 2016

Figure 8. Aerial photograph showing December 2016 water-level elevation contours and PCE concentrations for the Lower Hydrogeologic Zone, Griggs and Walnut site, City of Las Cruces, New Mexico.

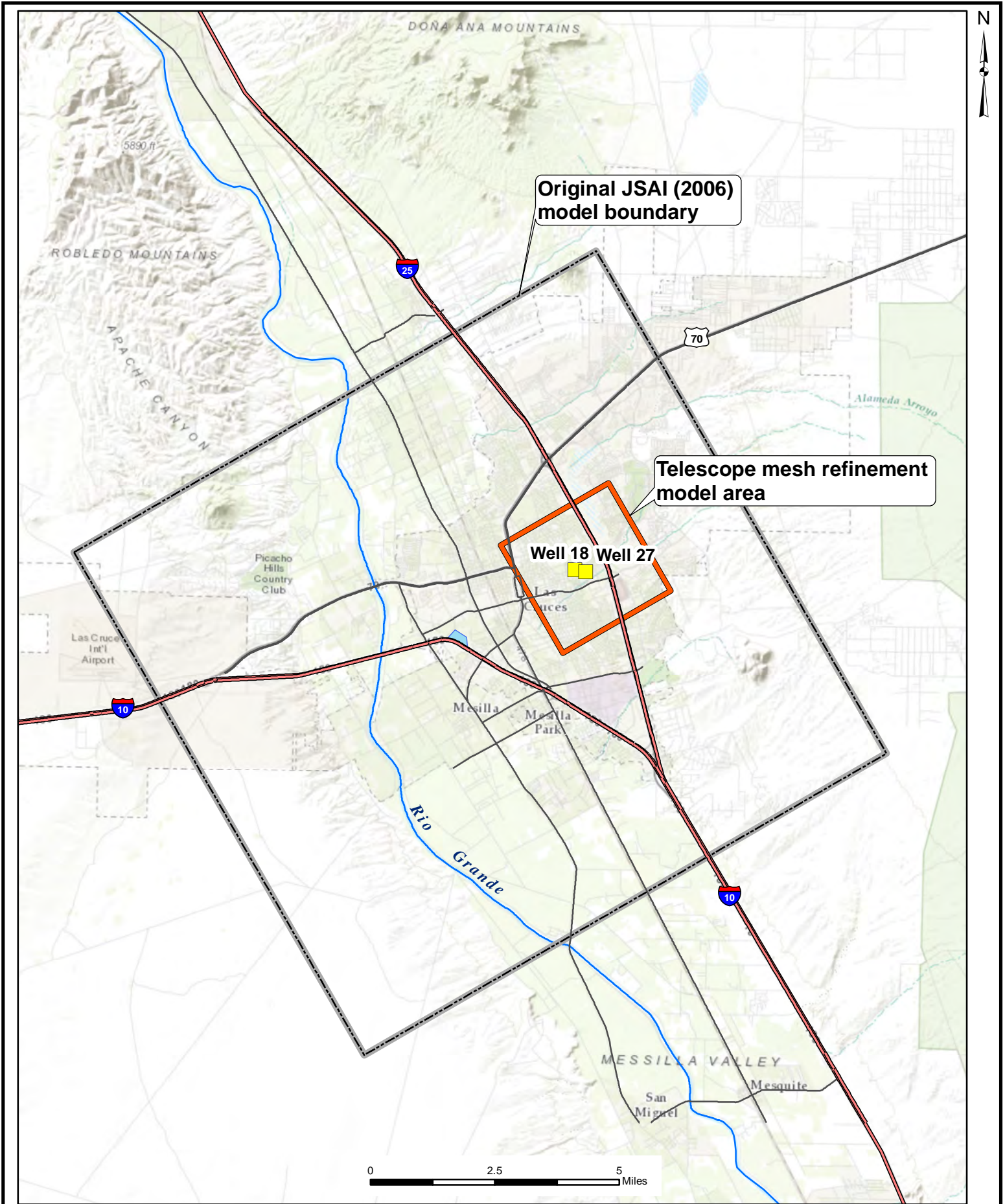
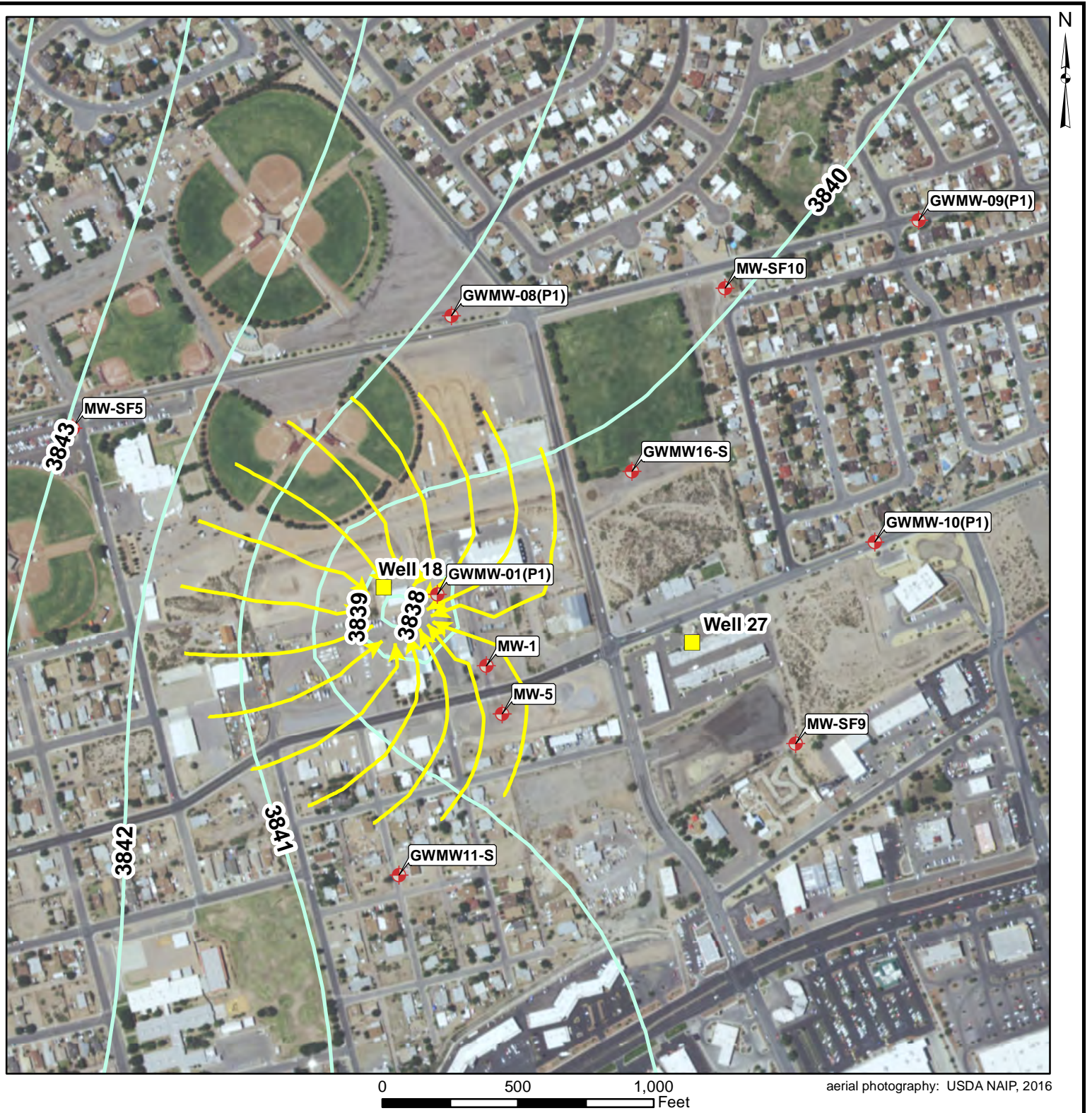


Figure 9. Topographic map showing telescope groundwater-flow model grid, Griggs and Walnut site, City of Las Cruces, New Mexico.







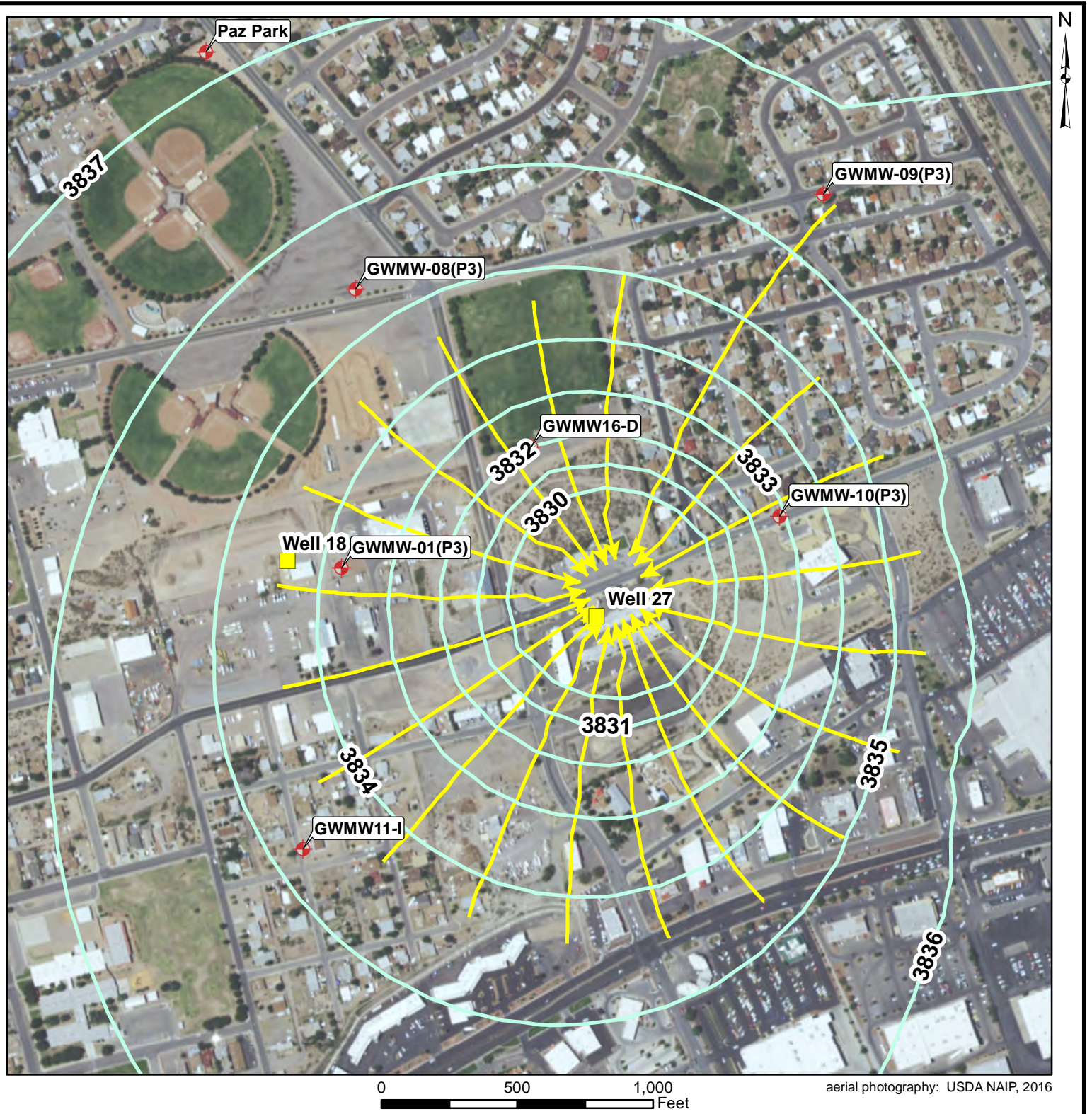
Explanation	
	monitoring well, Layer 1
	simulated particle tracking
	capture well
	model simulated 2016 heads in Layer 1, ft amsl

Figure 10. Aerial photograph showing 2016 model-simulated heads in Layer 1 and capture zone for Well 18 simulated by particle tracking, Griggs and Walnut site, City of Las Cruces, New Mexico.







Explanation	
	monitoring well, Layer 3
	capture well
	model simulated 2016 heads in Layer 3, ft amsl
	simulated particle tracking

Figure 11. Aerial photograph showing 2016 model-simulated heads in Layer 3 and capture zone for Well 27 simulated by particle tracking, Griggs and Walnut site, City of Las Cruces, New Mexico.

APPENDICES

Appendix A.

Selected hydrographs from wells in the Griggs and Walnut plume area

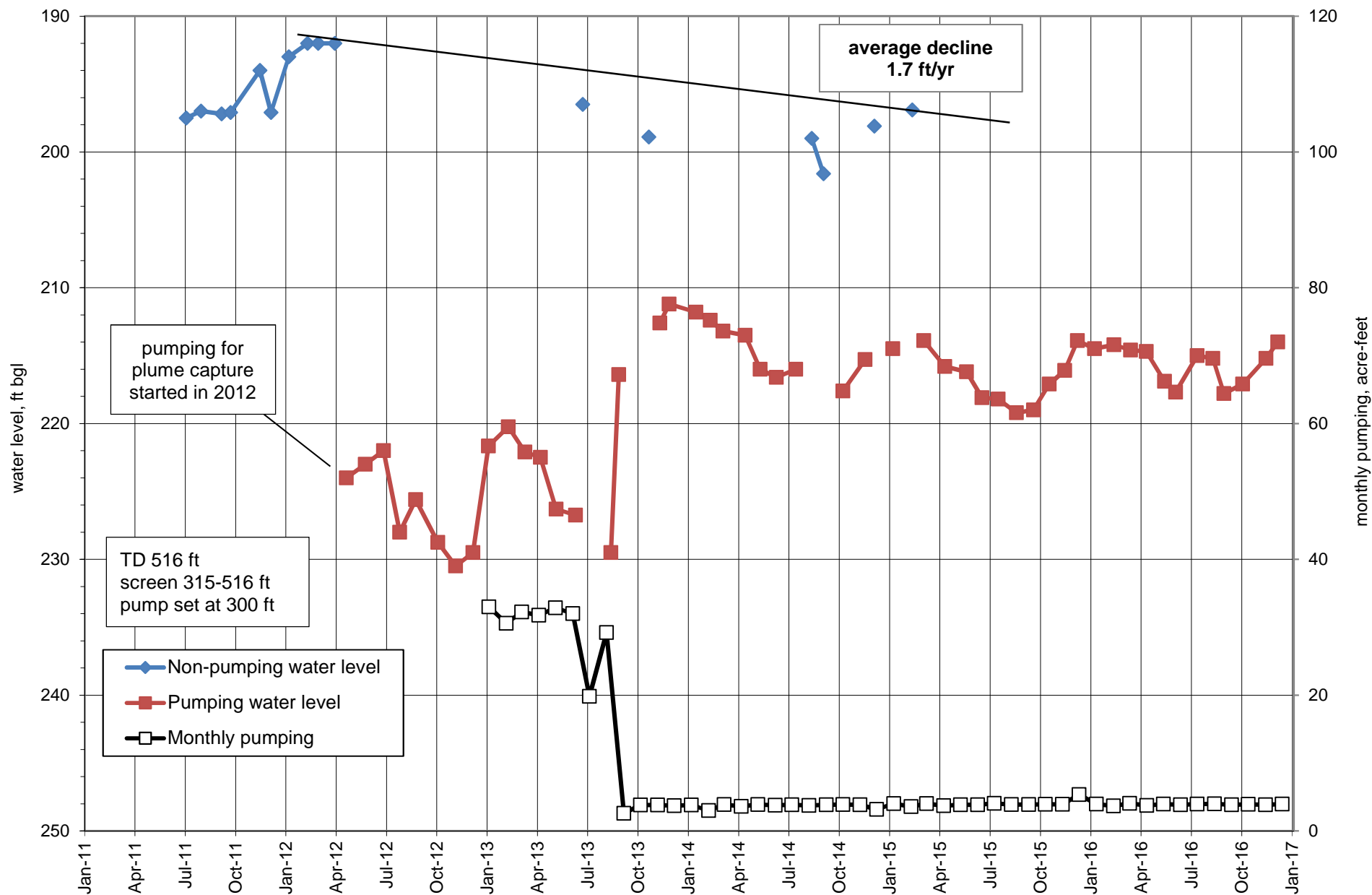


Figure A1. Graph of water-level data and monthly pumping data collected by the City of Las Cruces for Well 18.

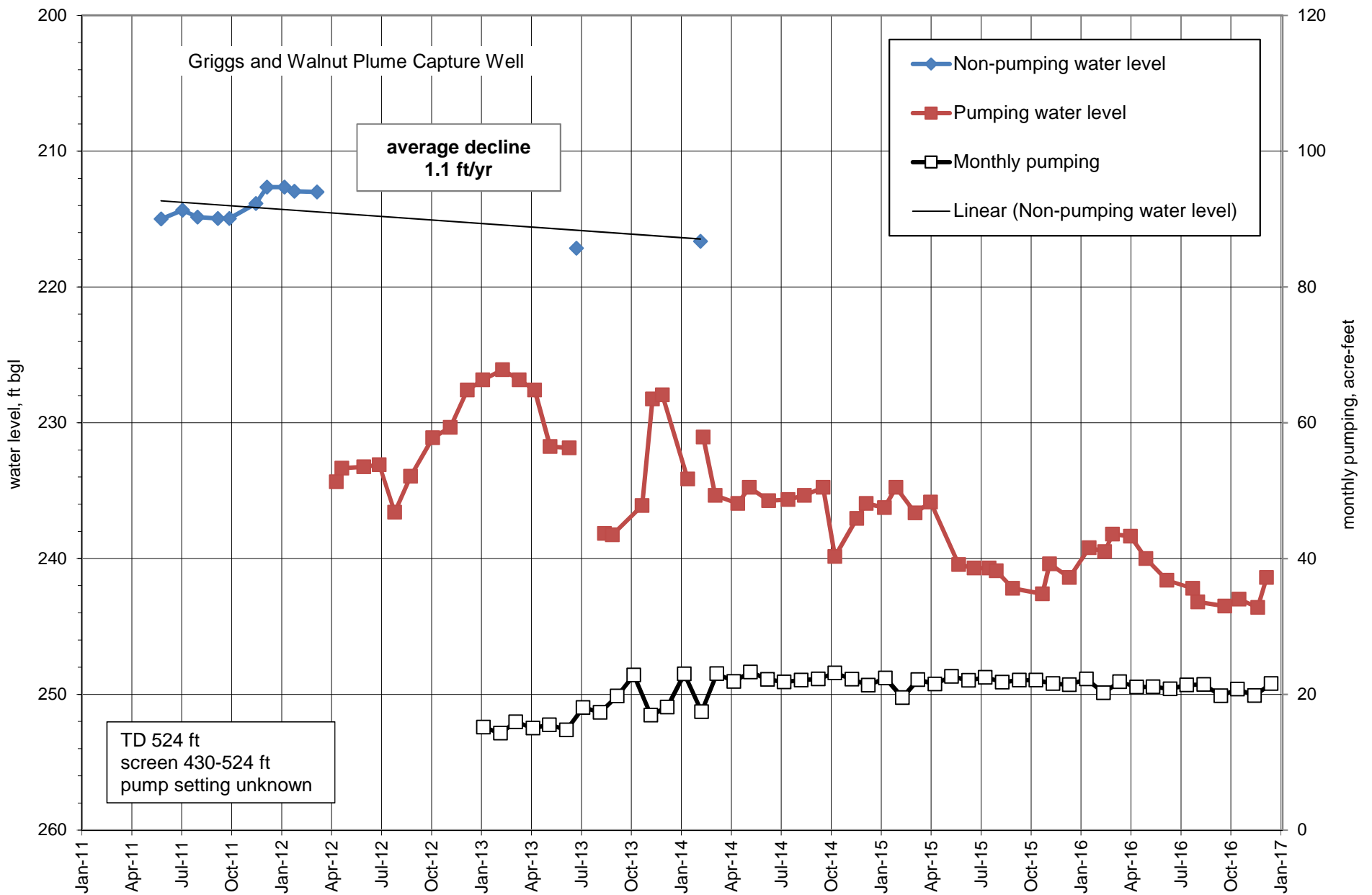


Figure A2. Graph of water-level data and monthly pumping data collected by the City of Las Cruces for Well 27.

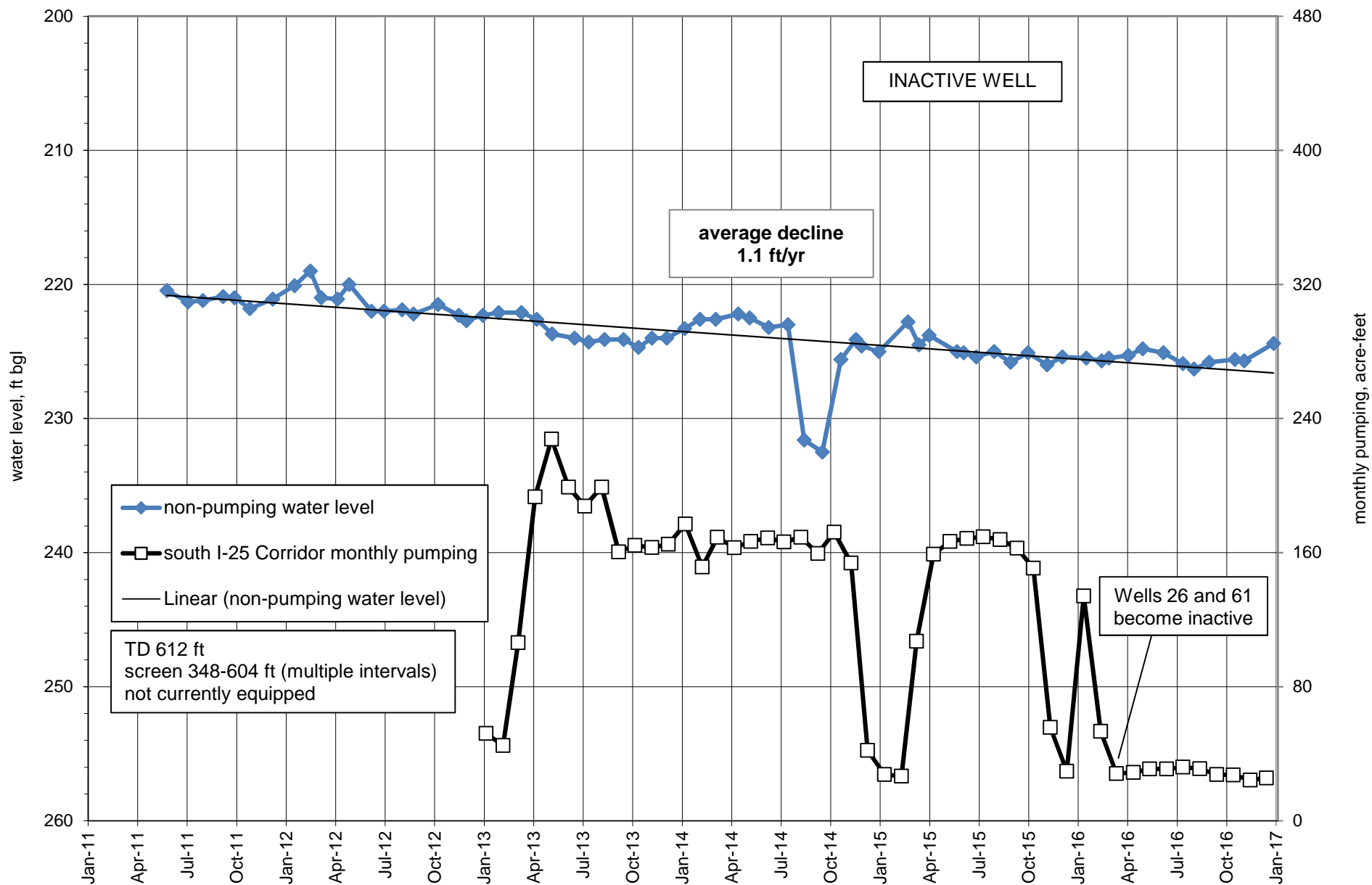


Figure A3. Graph of water-level data collected by the City of Las Cruces for Well 19, and monthly pumping in the southern part of the I-25 Corridor (Wells 18, 27, 26, 61, and Paz Park).

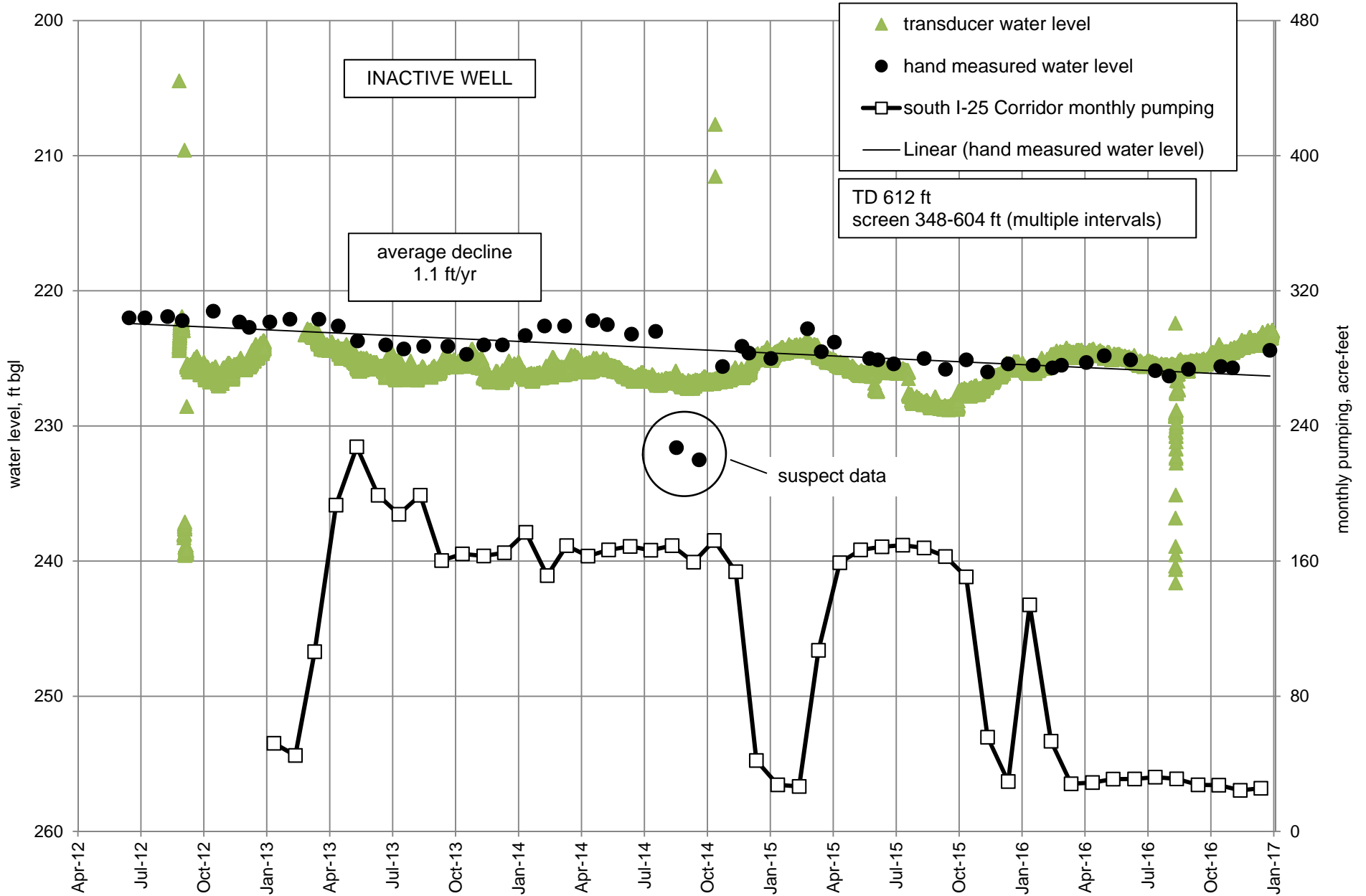


Figure A4. Graph of hand-measured and transducer water-level data collected by the City of Las Cruces for Well 19, and monthly pumping in the southern part of the I-25 Corridor (Wells 18, 27, 26, 61, and Paz Park).

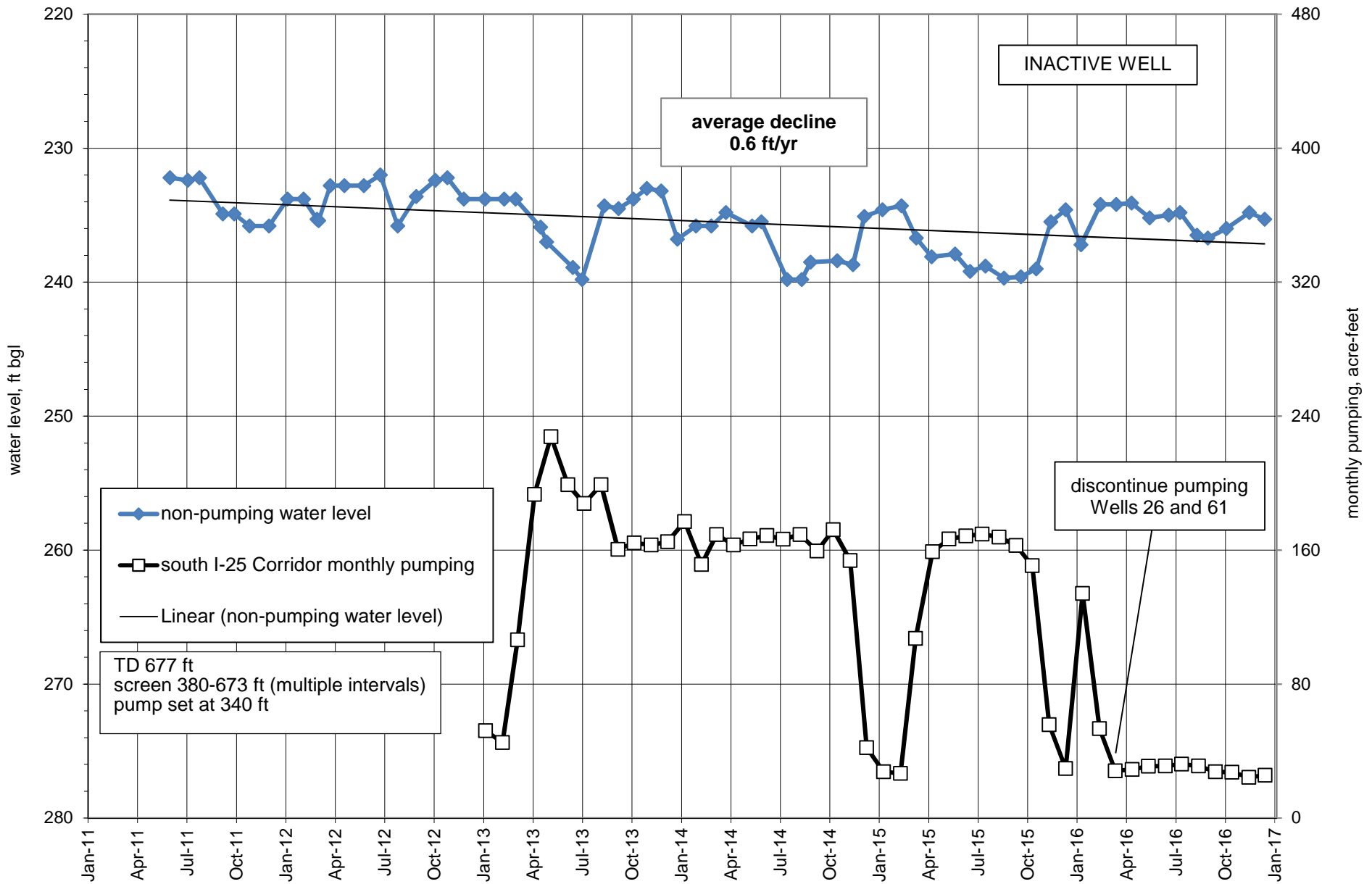


Figure A5. Graph of water-level data collected by the City of Las Cruces for Well 20, and monthly pumping in the southern part of the I-25 Corridor (Wells 18, 27, 26, 61, and Paz Park).

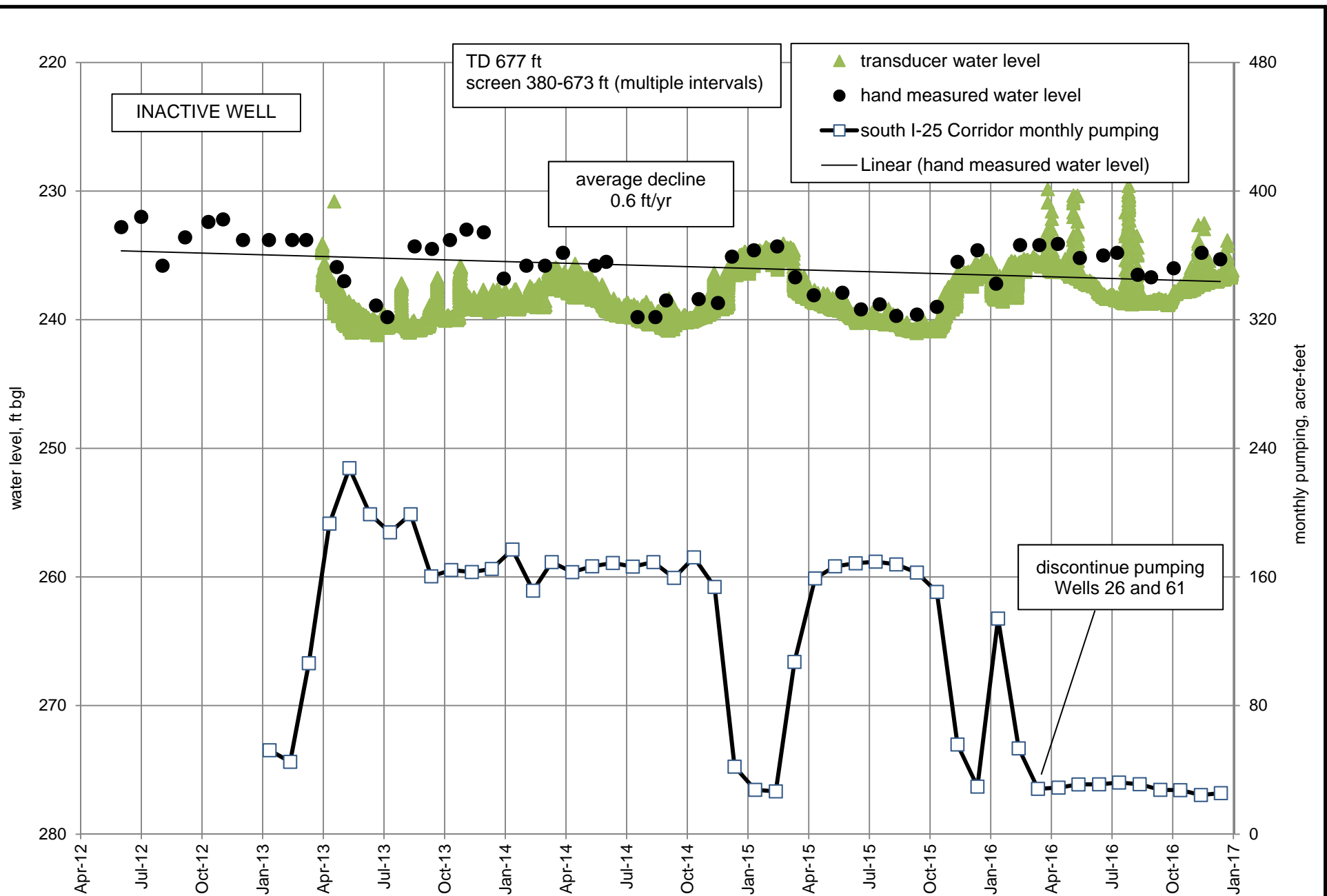


Figure A6. Graph of hand-measured and transducer water-level data collected by the City of Las Cruces for Well 20, and monthly pumping in the southern part of the I-25 Corridor (Wells 18, 27, 26, 61, and Paz Park).

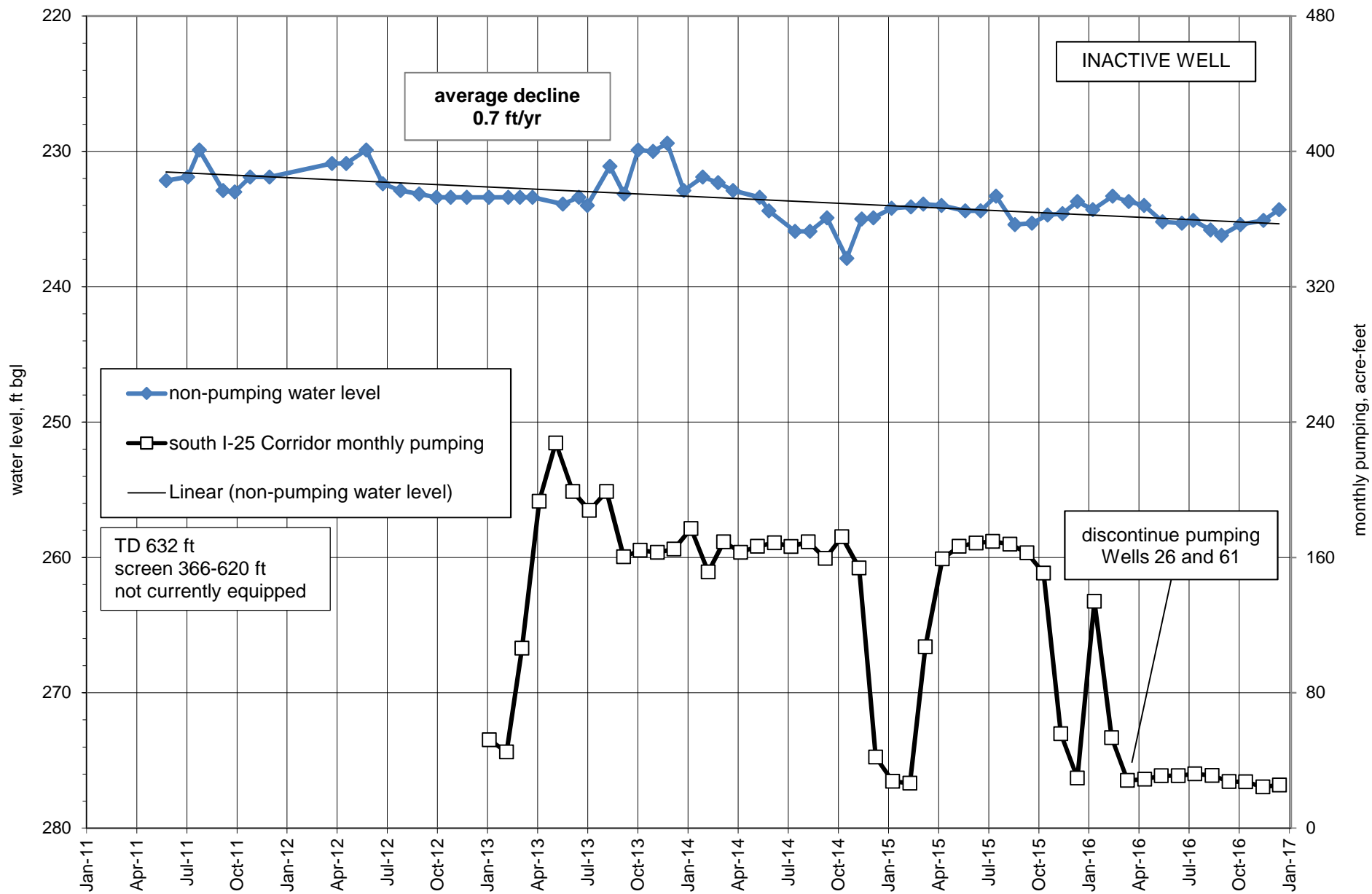


Figure A7. Graph of water-level data collected by the City of Las Cruces for Well 21, and monthly pumping in the southern part of the I-25 Corridor (Wells 18, 27, 26, 61, and Paz Park).

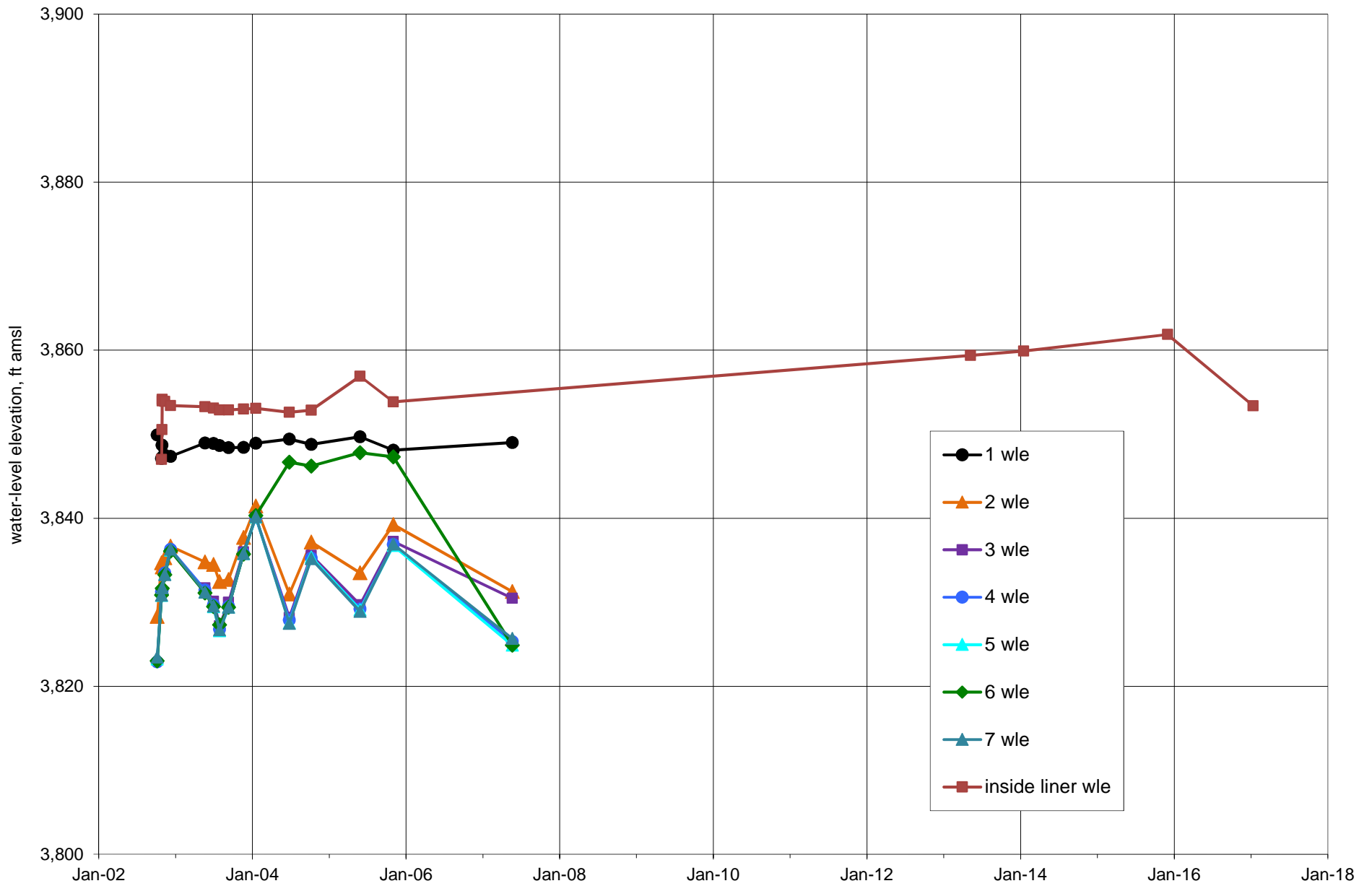


Figure A8. Graph of GWMW01 (Ports 1-7 and inside liner) observed water levels, Griggs and Walnut site.

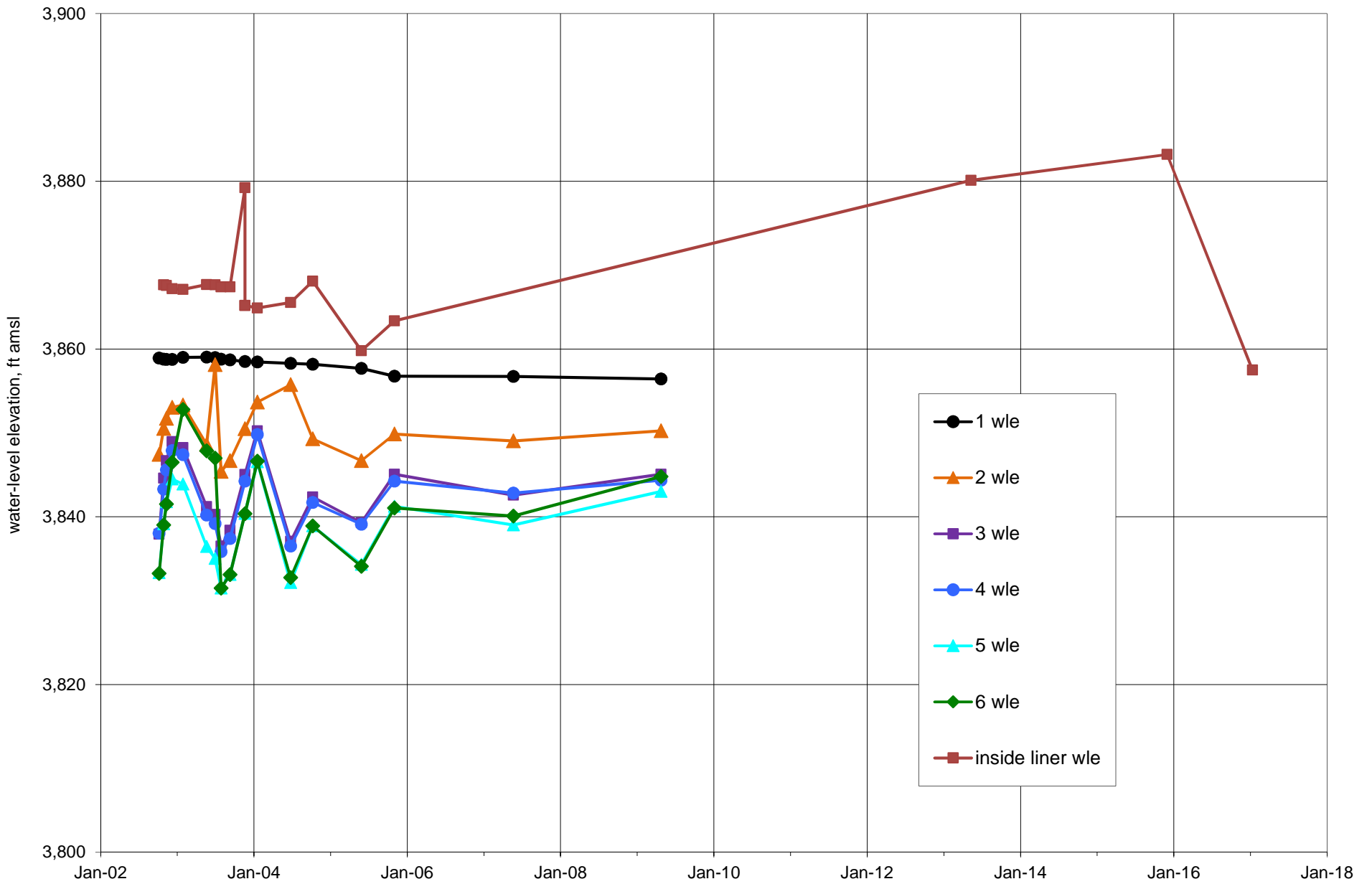


Figure A9. Graph of GMMW03 (Ports 1-6 and inside liner) observed water levels, Griggs and Walnut site.

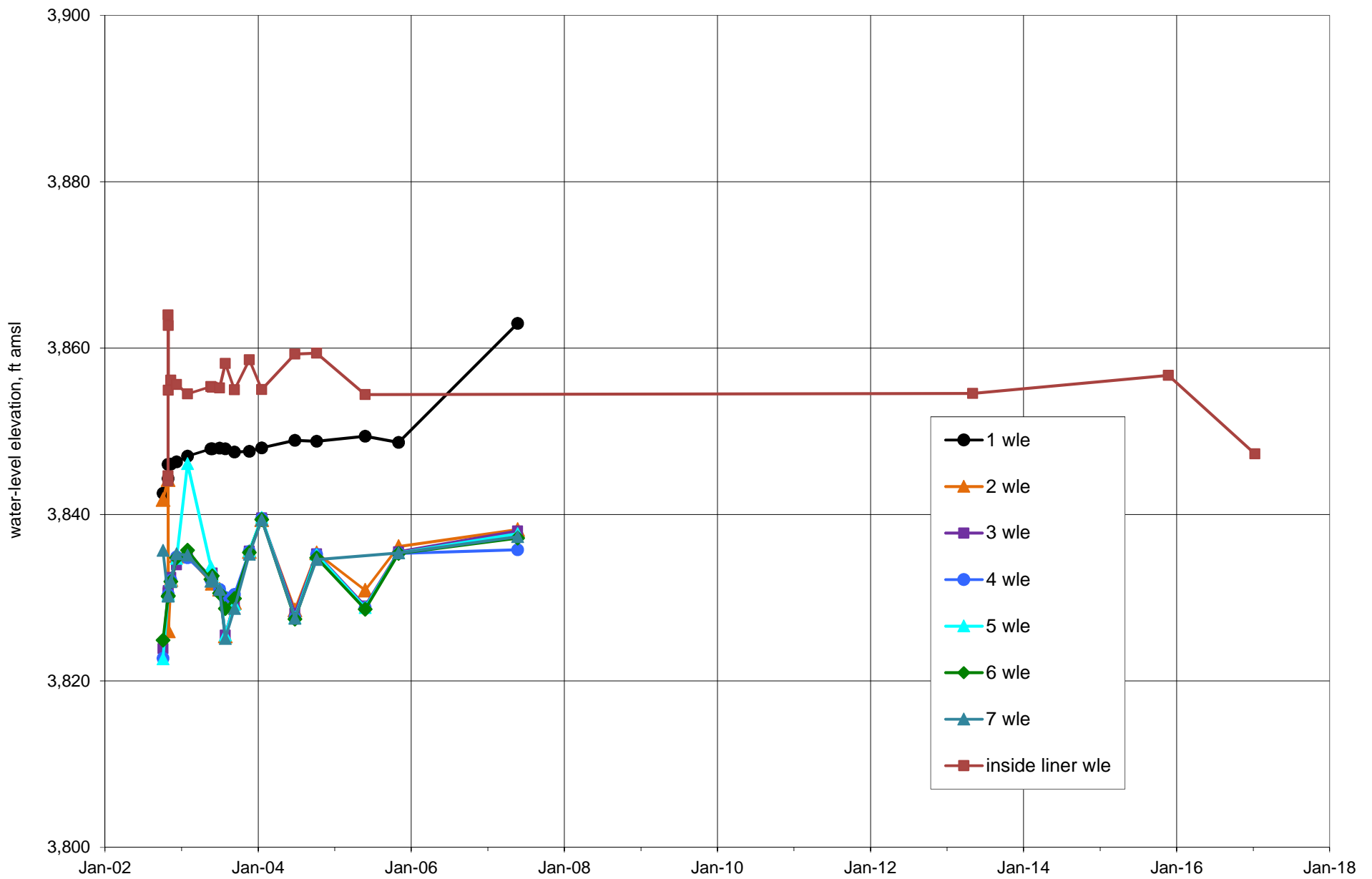


Figure A10. Graph of GWMW08 (Ports 1-7 and inside liner) observed water levels, Griggs and Walnut site.

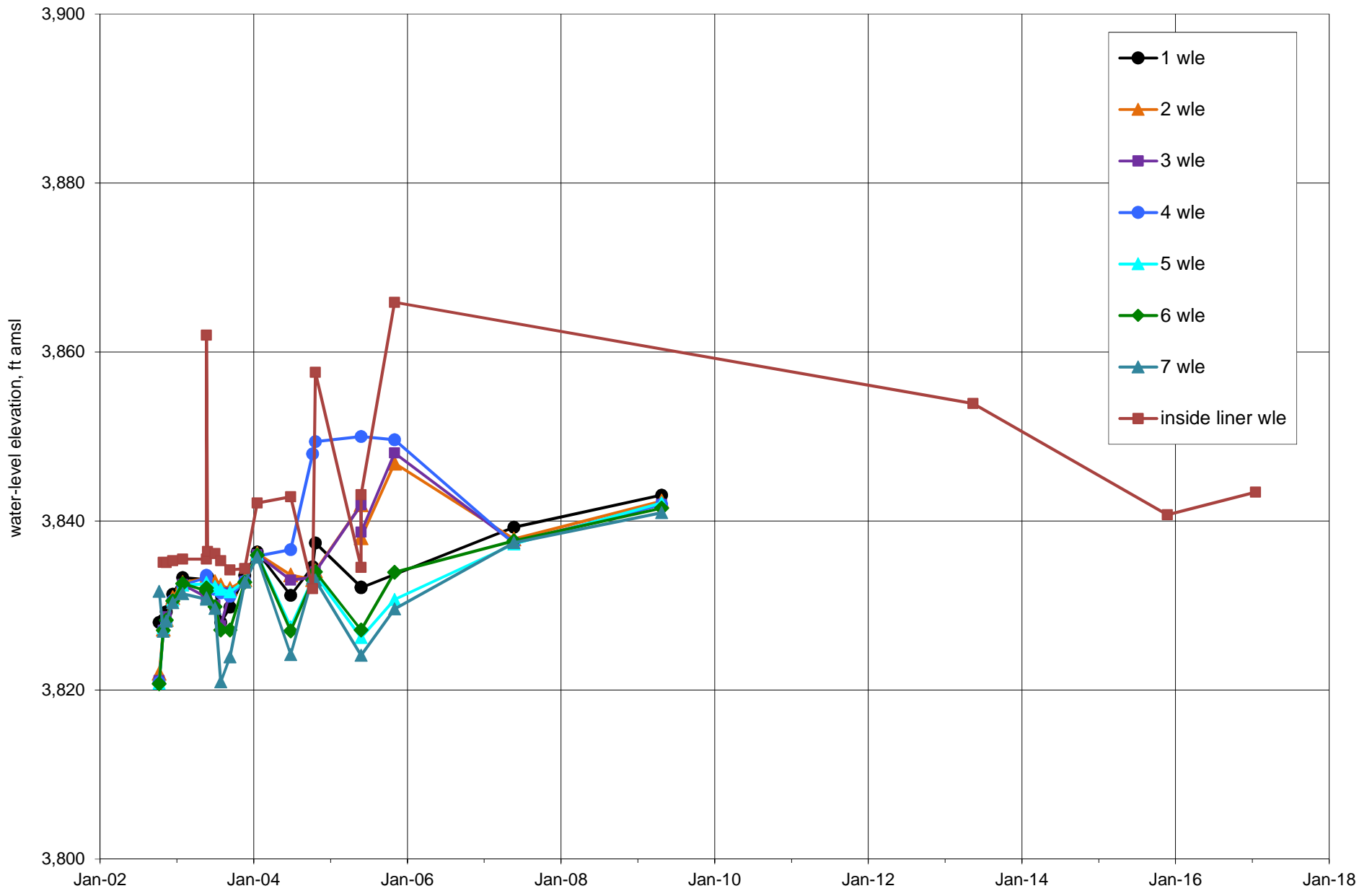


Figure A11. Graph of GWMW09 (Ports 1-7 and inside liner) observed water levels, Griggs and Walnut site.

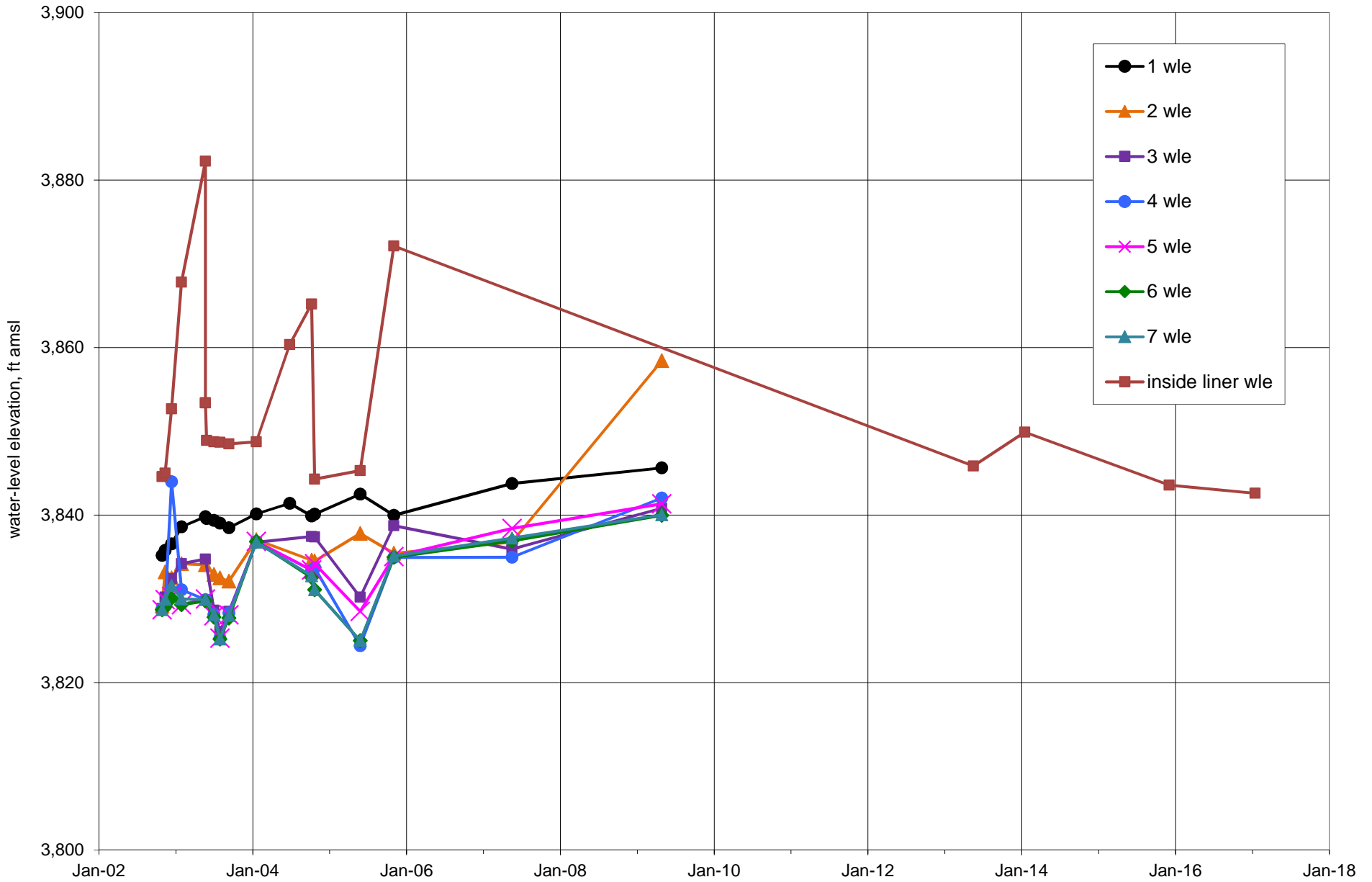


Figure A12. Graph of GWMW10 (Ports 1-7 and inside liner) observed water levels, Griggs and Walnut site.

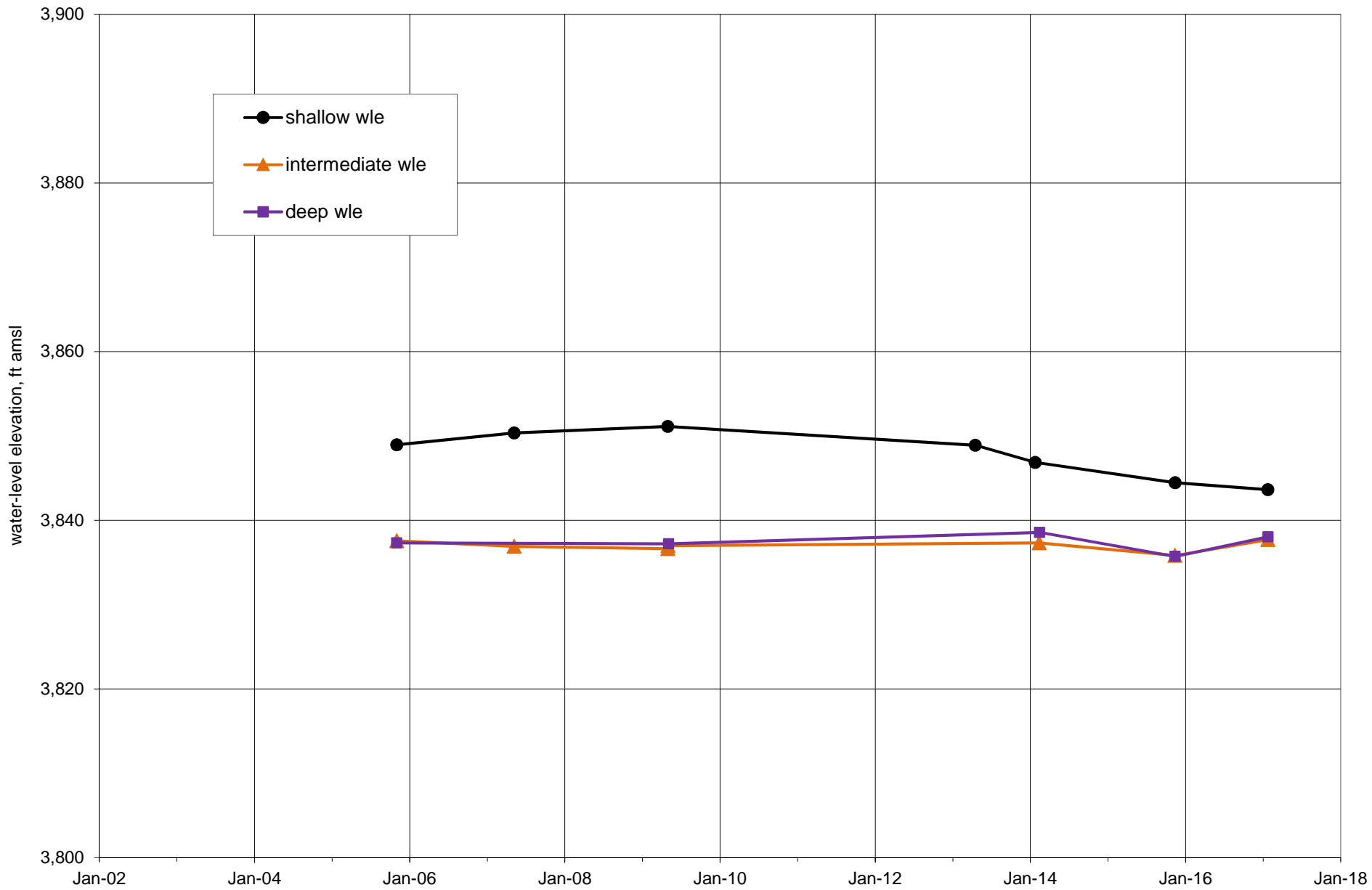


Figure A13. Graph of GMMW11 (shallow, intermediate, and deep) observed water levels, Griggs and Walnut site.

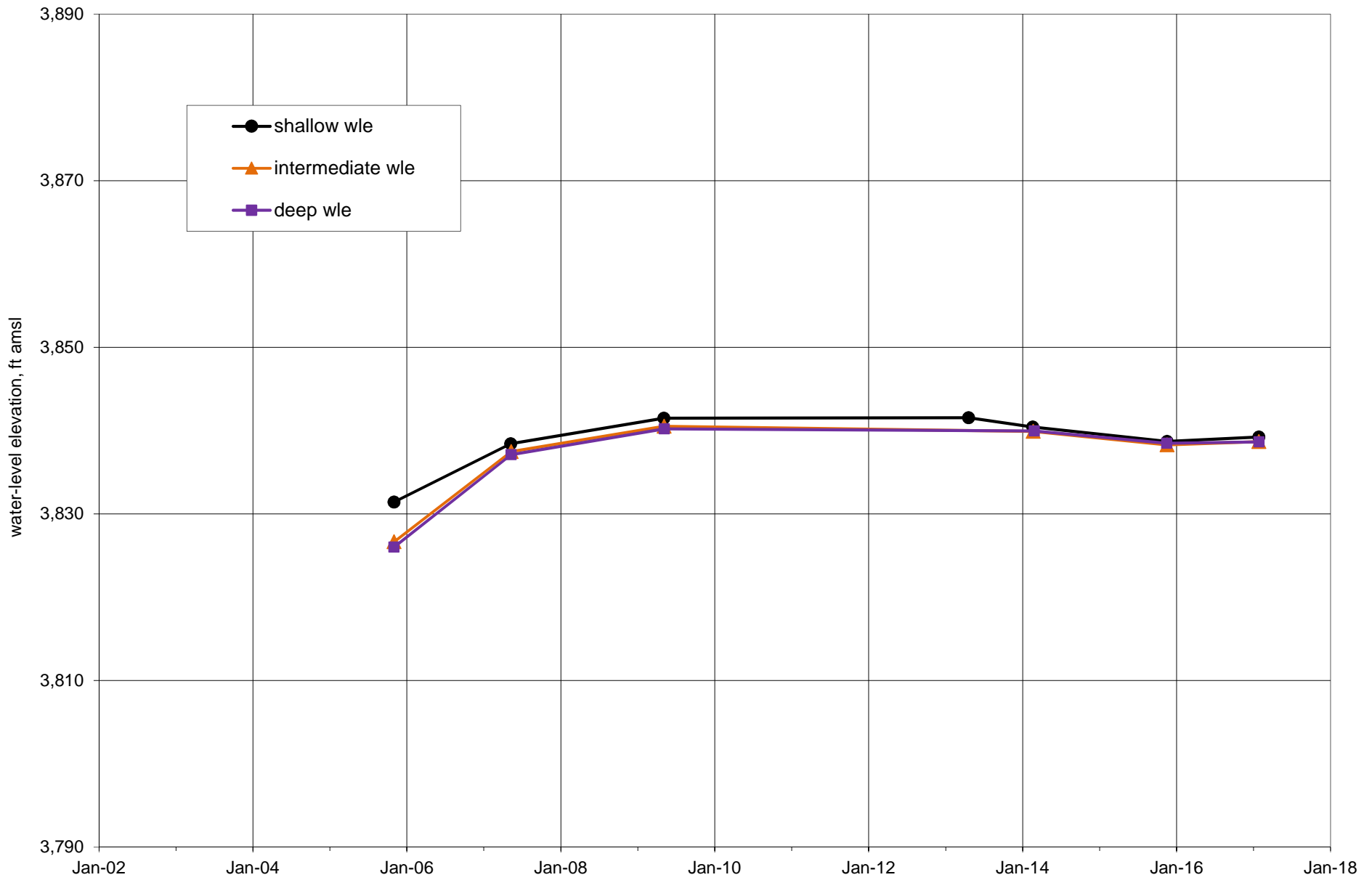


Figure A14. Graph of GWMW15 (shallow, intermediate, and deep) observed water levels, Griggs and Walnut site.

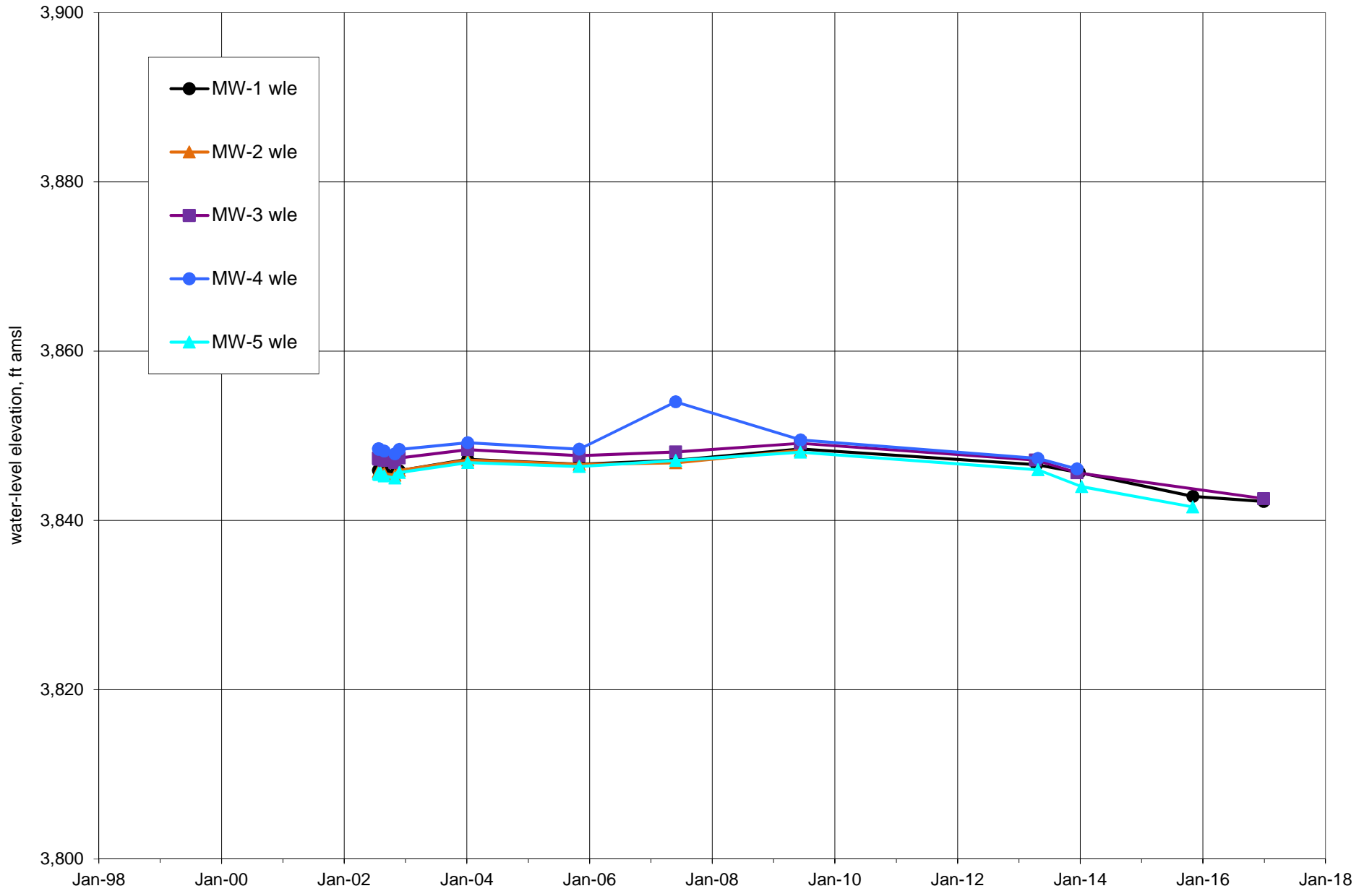


Figure A15. Graph of MW-1 through MW-5 observed water levels, Griggs and Walnut site.

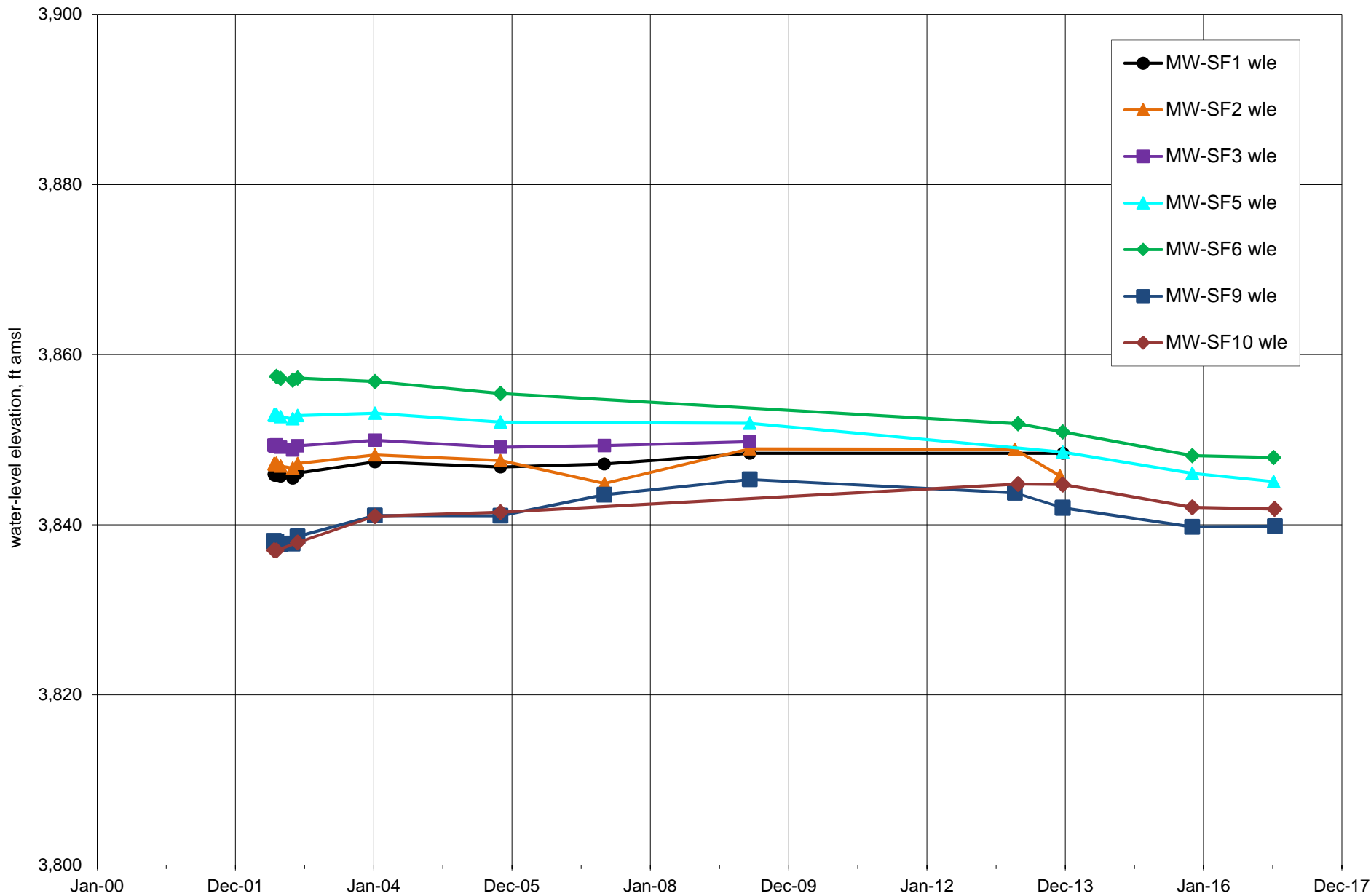


Figure A16. Graph of observed water levels for selected MW-SF-series monitor wells, Griggs and Walnut site.

Appendix B.

Time-series PCE concentration graphs

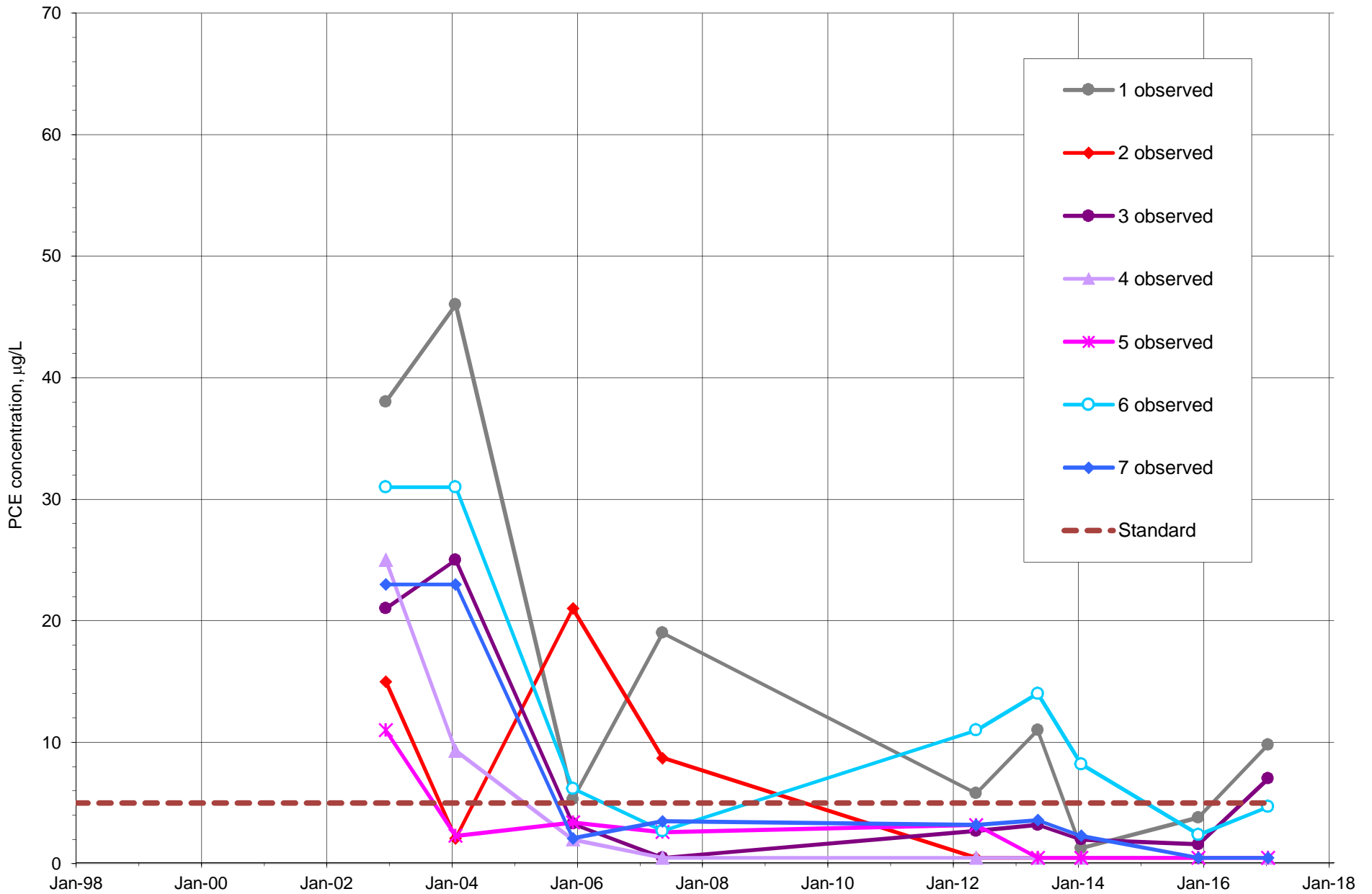


Figure B1. Graph of GWMW01 (ports 1-7) observed PCE concentrations, Griggs and Walnut site.

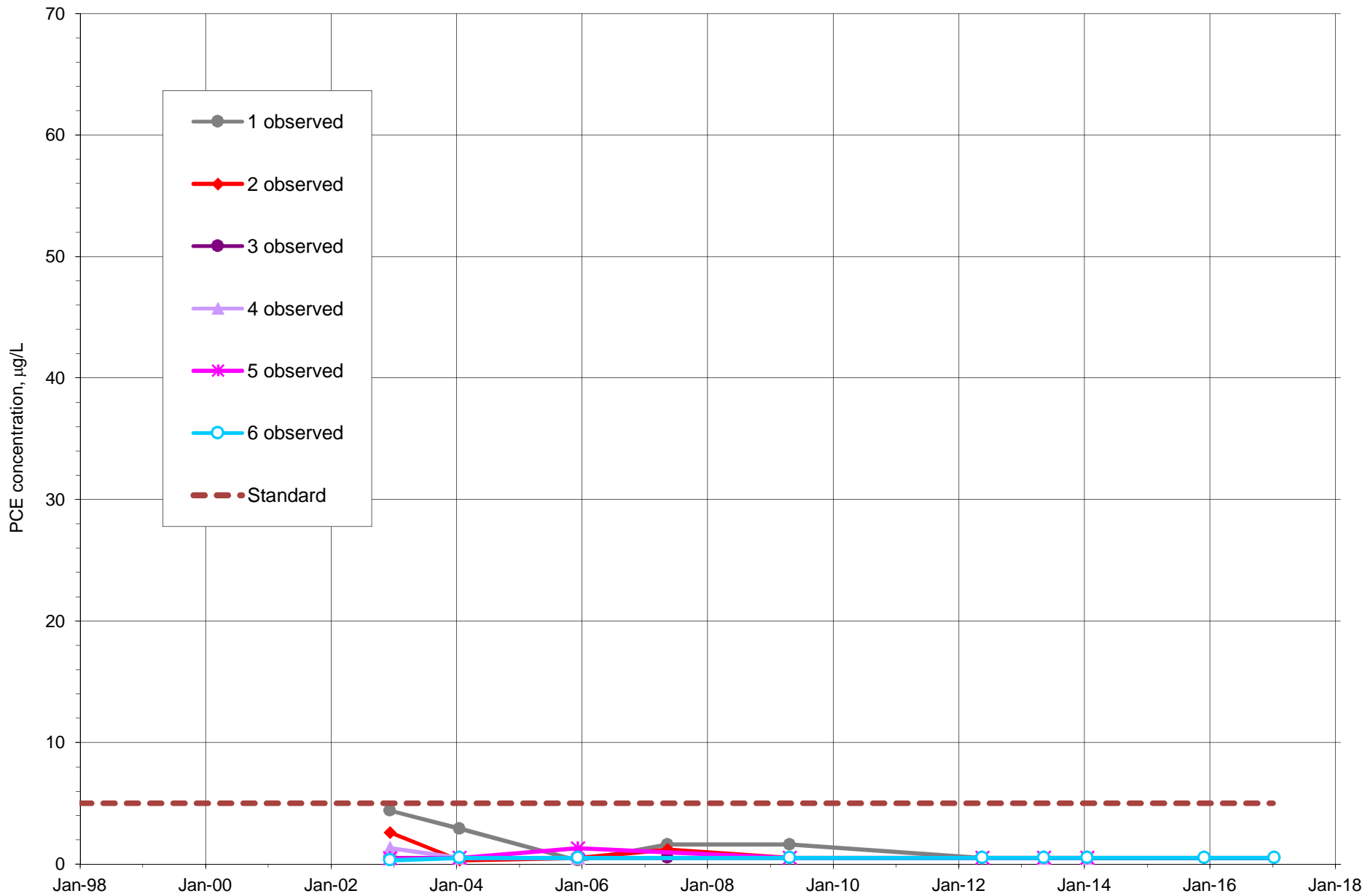


Figure B2. Graph of GWMW03 (ports 1-6) observed PCE concentrations, Griggs and Walnut site.

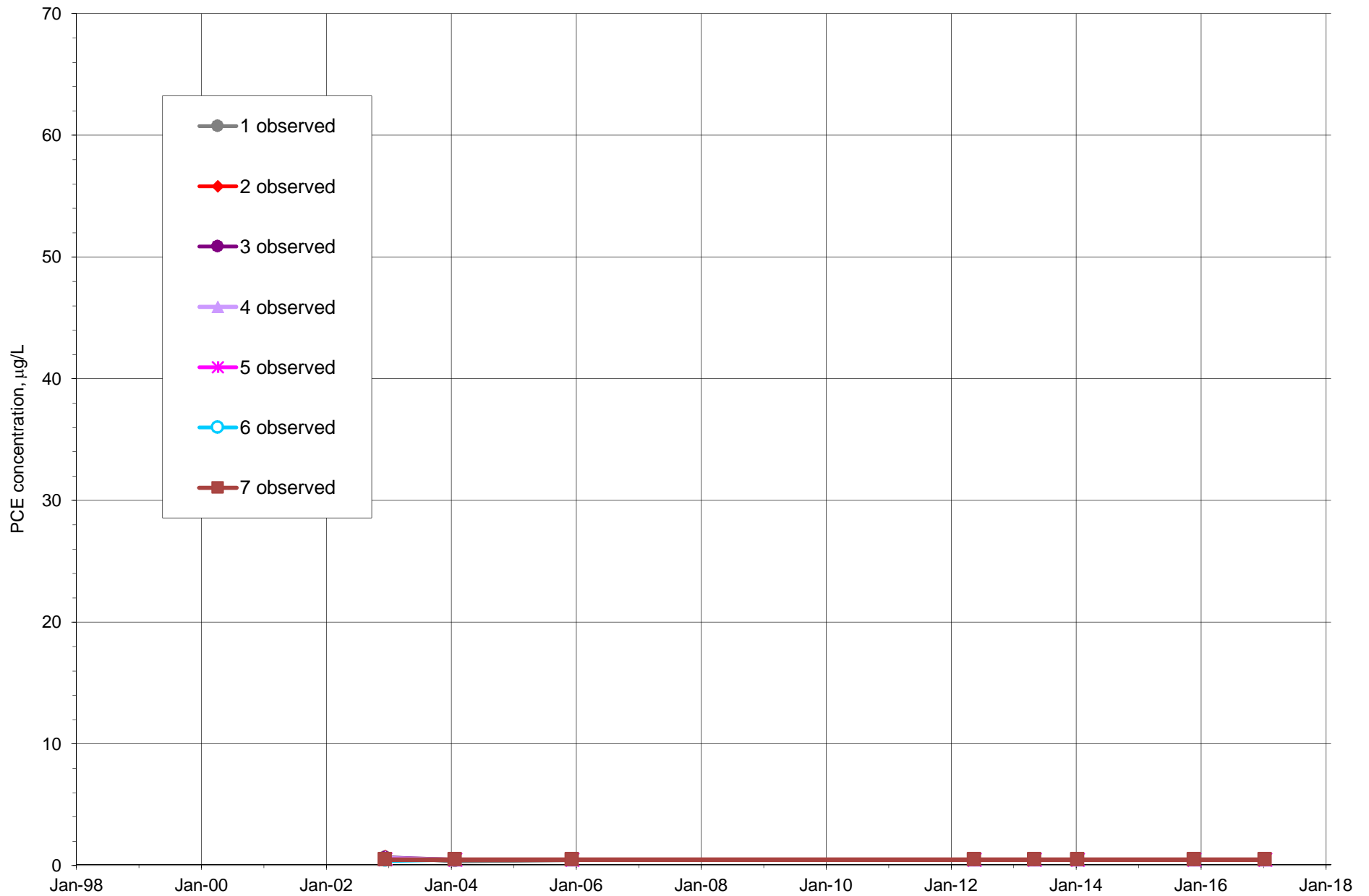


Figure B3. Graph of GWMW08 (ports 1-6) observed PCE concentrations, Griggs and Walnut site.

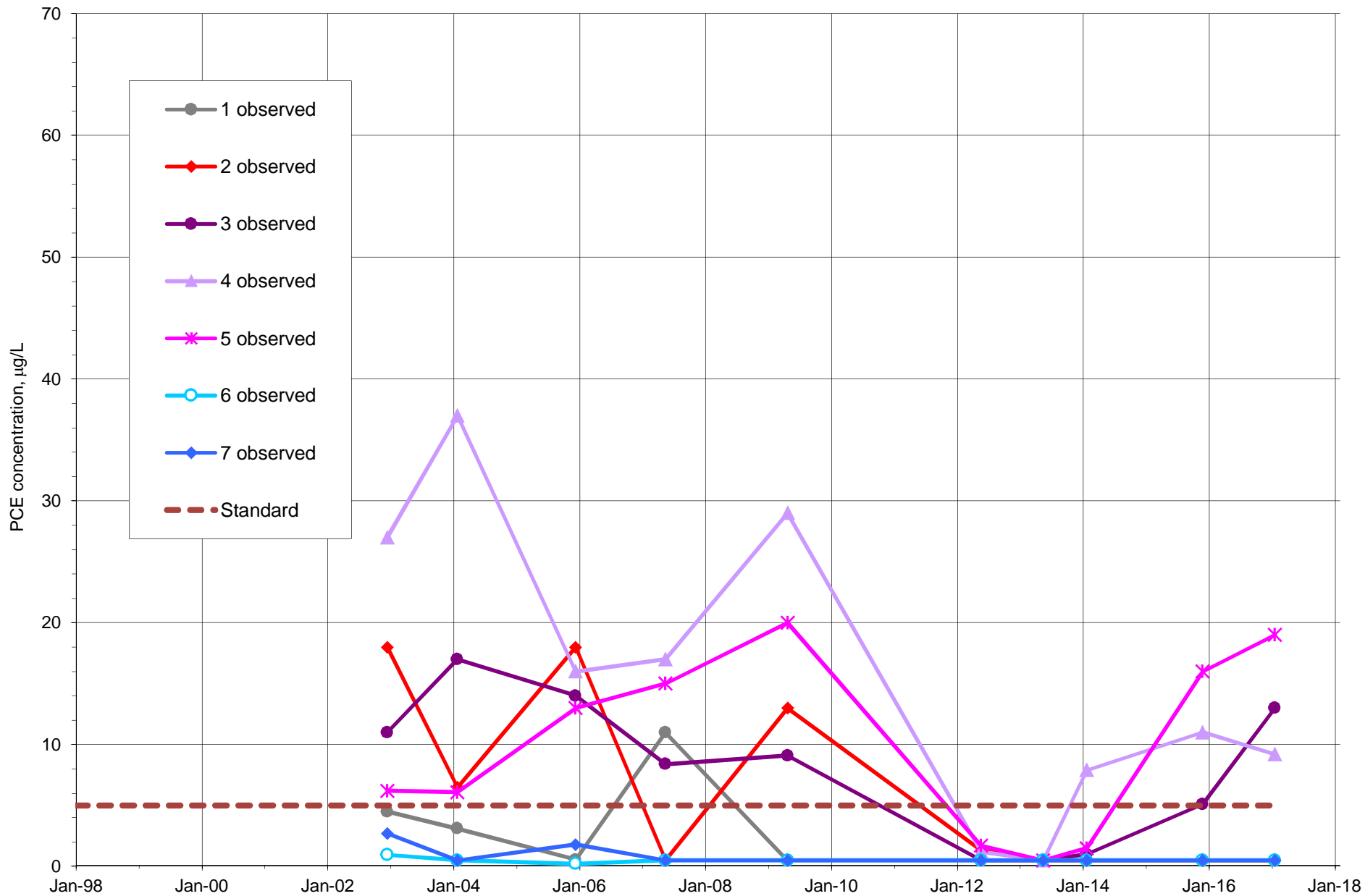


Figure B4. Graph of GWMW09 (ports 1-7) observed PCE concentrations, Griggs and Walnut site.

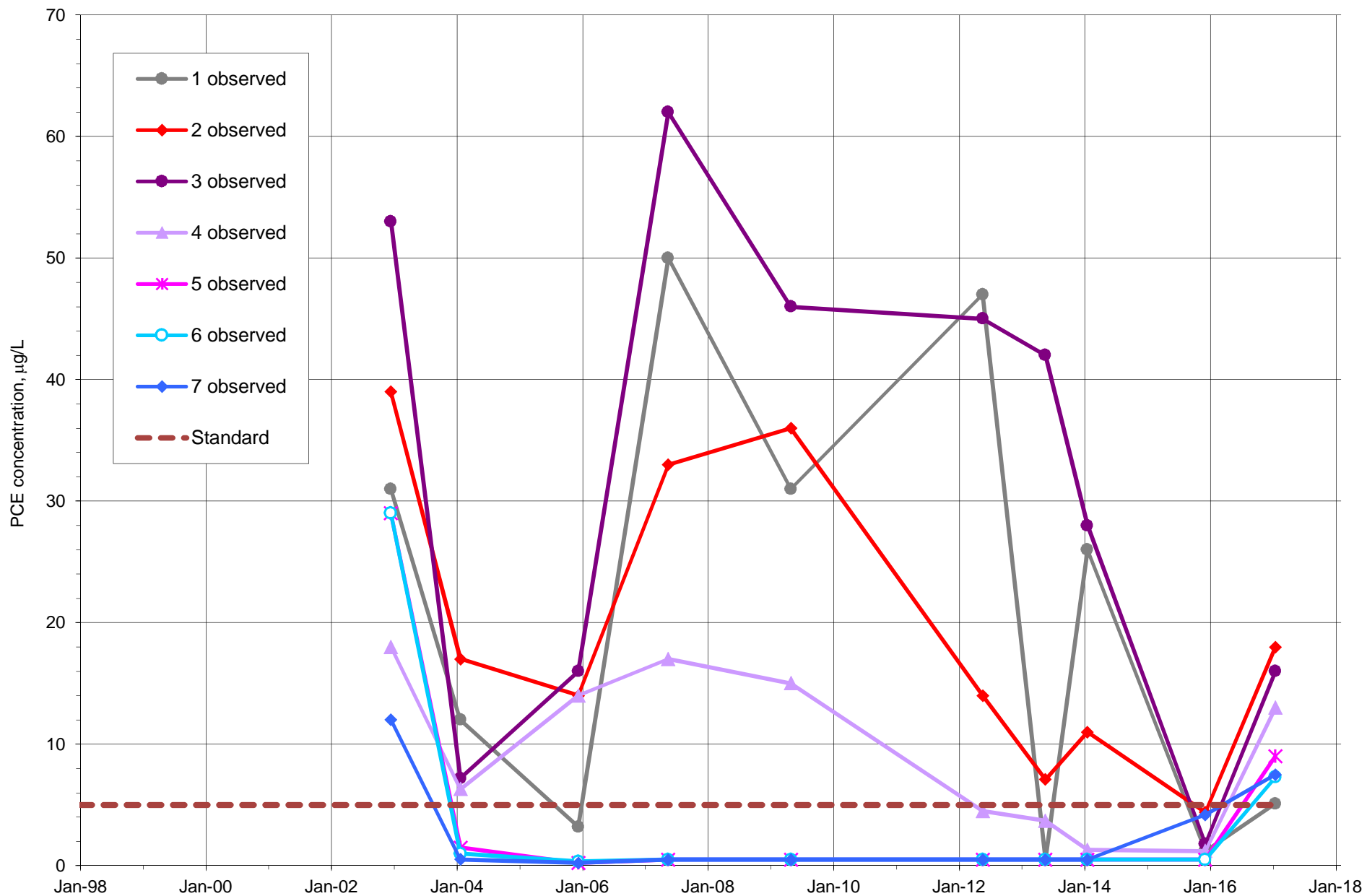


Figure B5. Graph of GWMW10 (ports 1-7) observed PCE concentrations, Griggs and Walnut site.

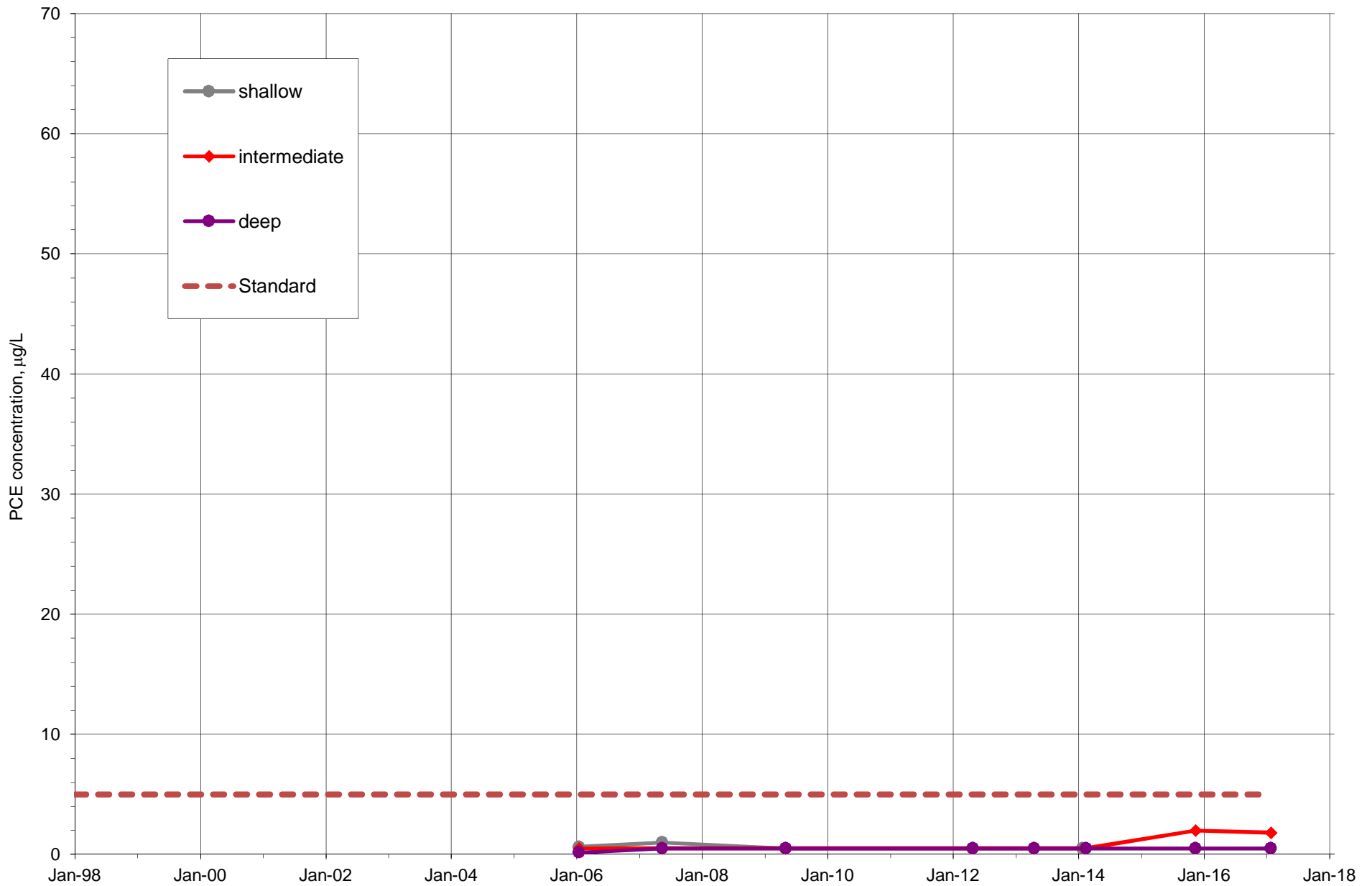


Figure B6. Graph of GWMW11 (shallow, intermediate, and deep) observed PCE concentrations, Griggs and Walnut site.

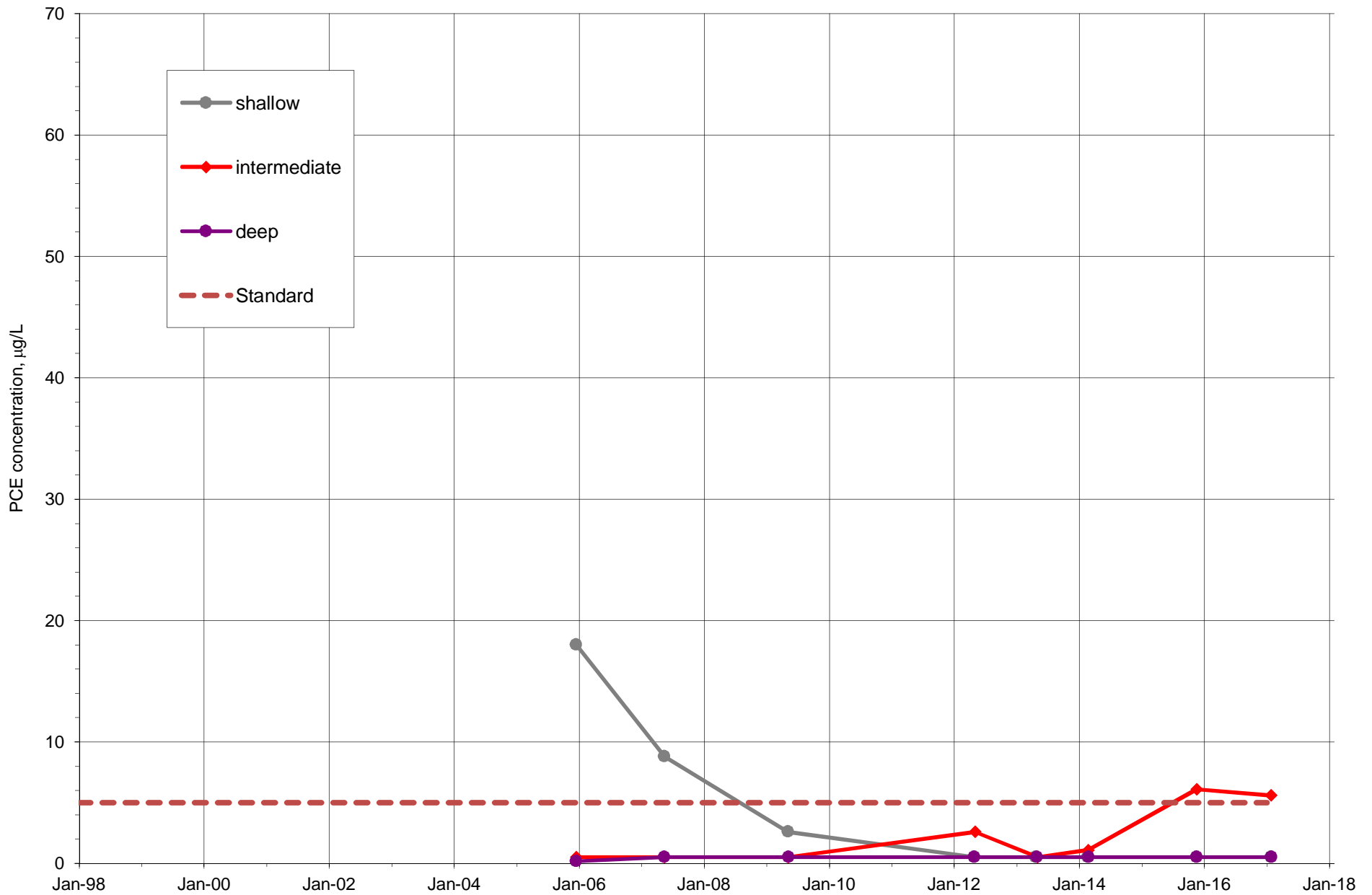


Figure B7. Graph of GWMW15 (shallow, intermediate, and deep) observed PCE concentrations, Griggs and Walnut site.

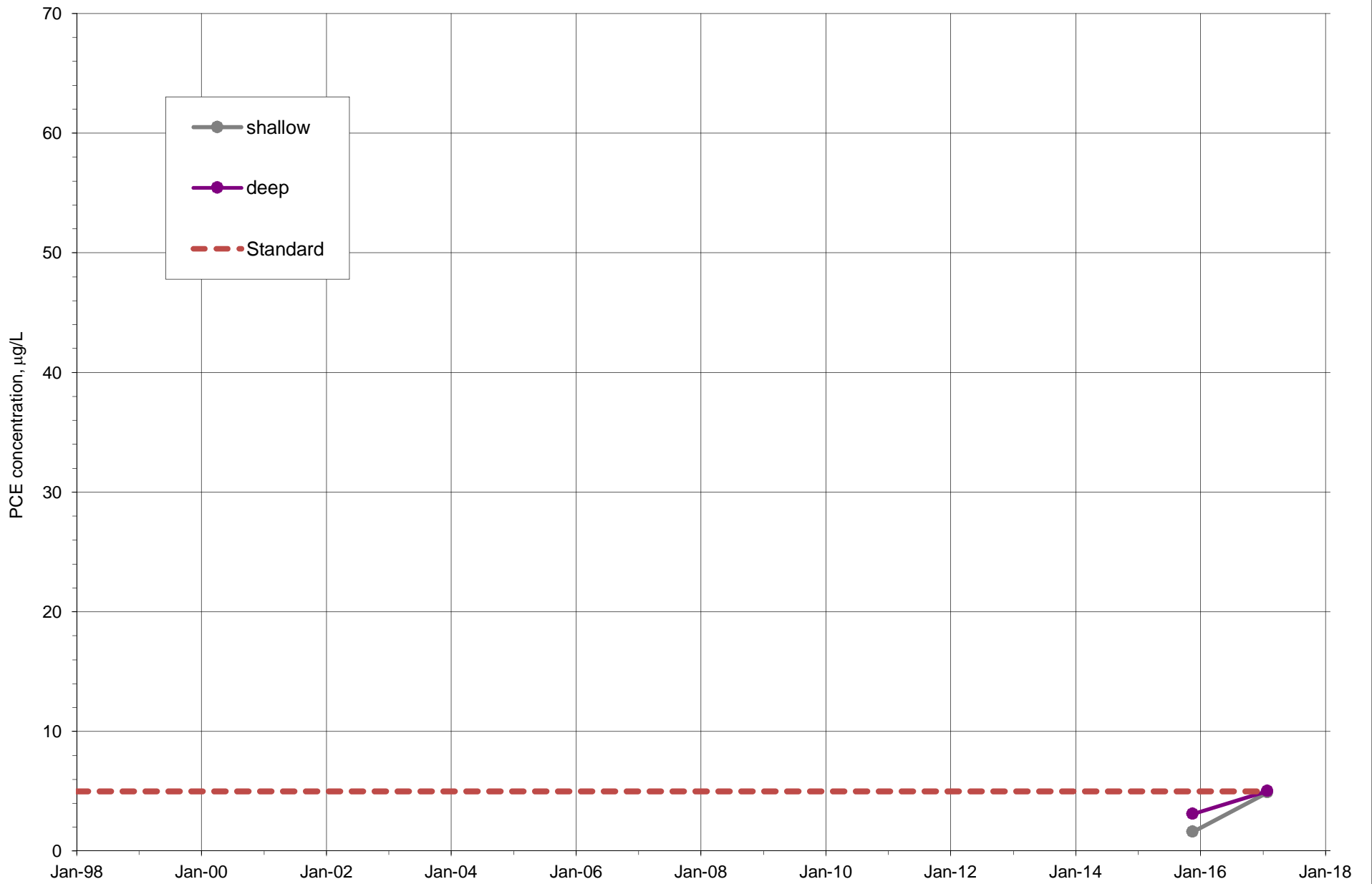


Figure B8. Graph of GWMW16 (shallow and deep) observed PCE concentrations, Griggs and Walnut site.

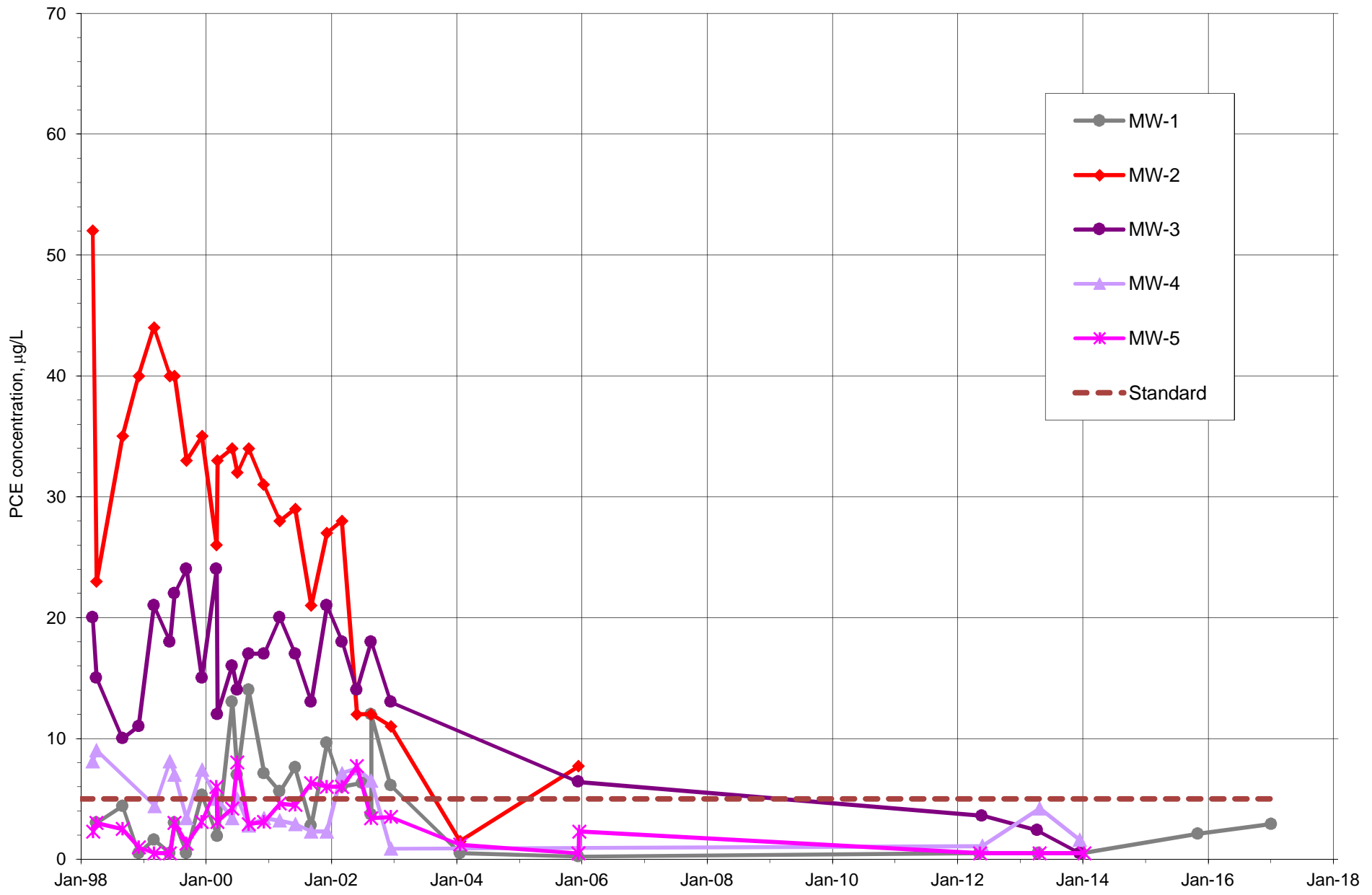


Figure B9. Graph of MW-1 through MW-5 observed PCE concentrations, Griggs and Walnut site.

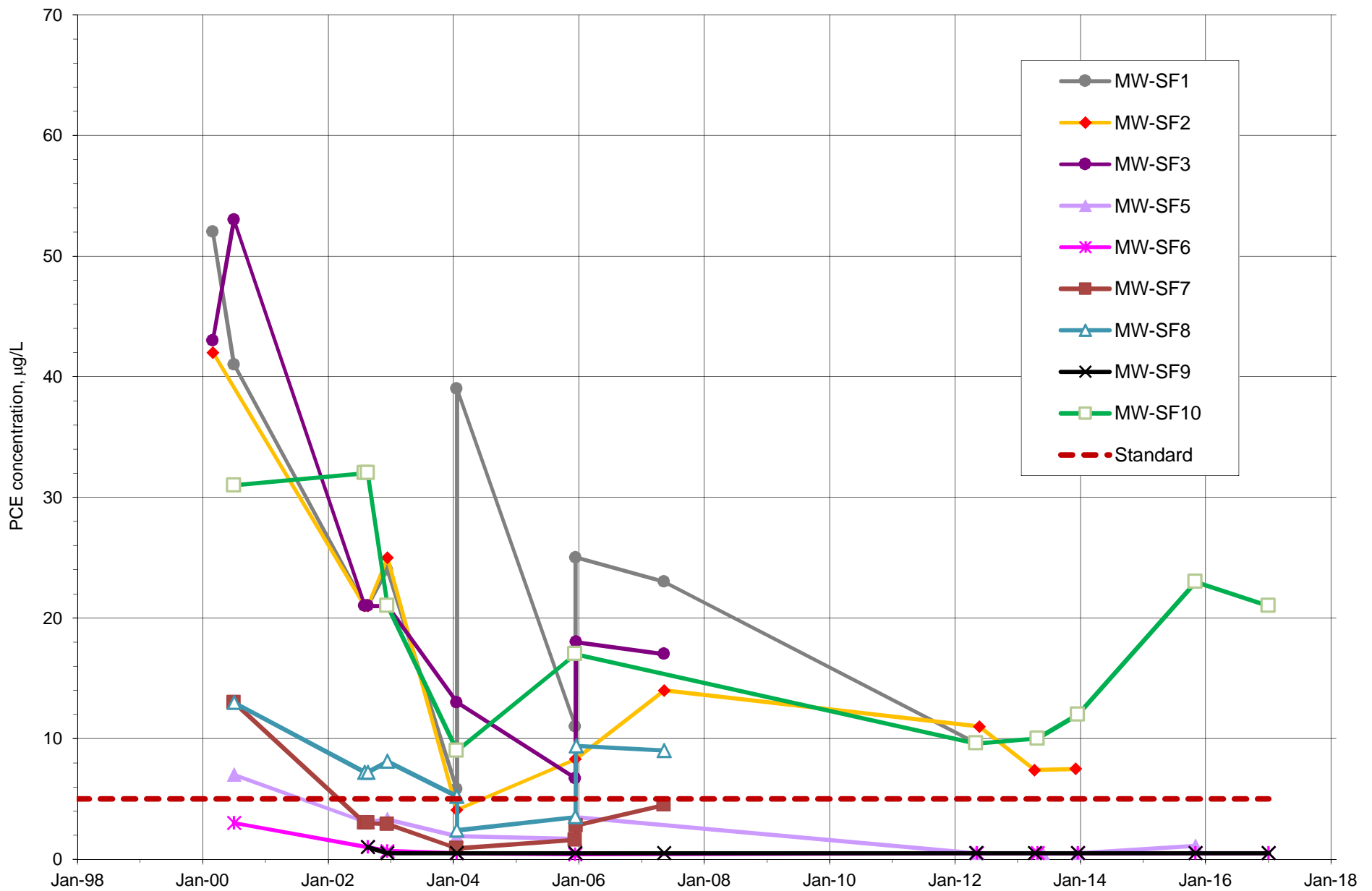


Figure B10. Graph of observed PCE concentrations for selected MW-SF-series monitor wells, Griggs and Walnut site.

Appendix C.
Groundwater-flow model results

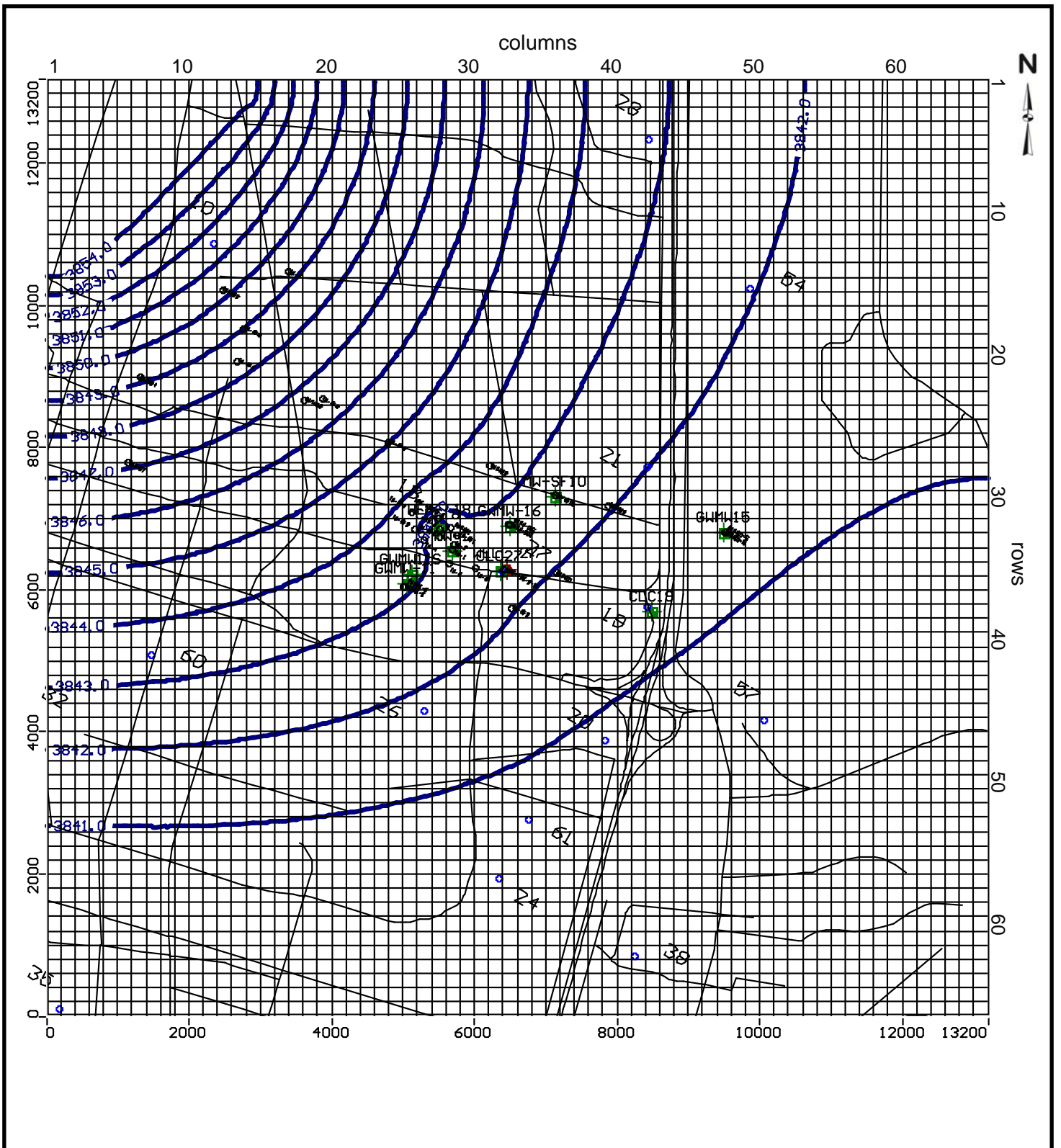
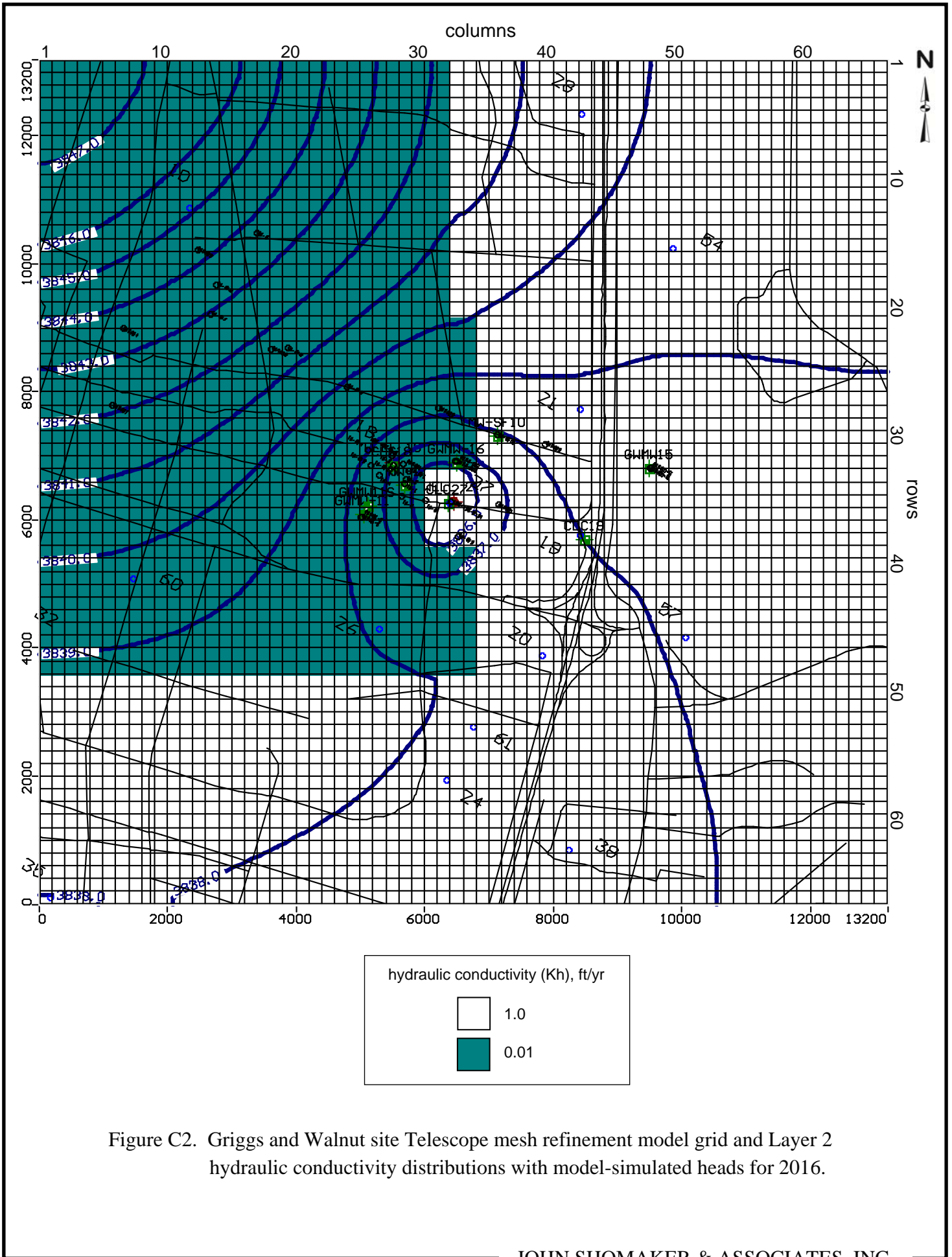


Figure C1. Griggs and Walnut site Telescope mesh refinement model grid and Layer 1 model-simulated heads for 2016.



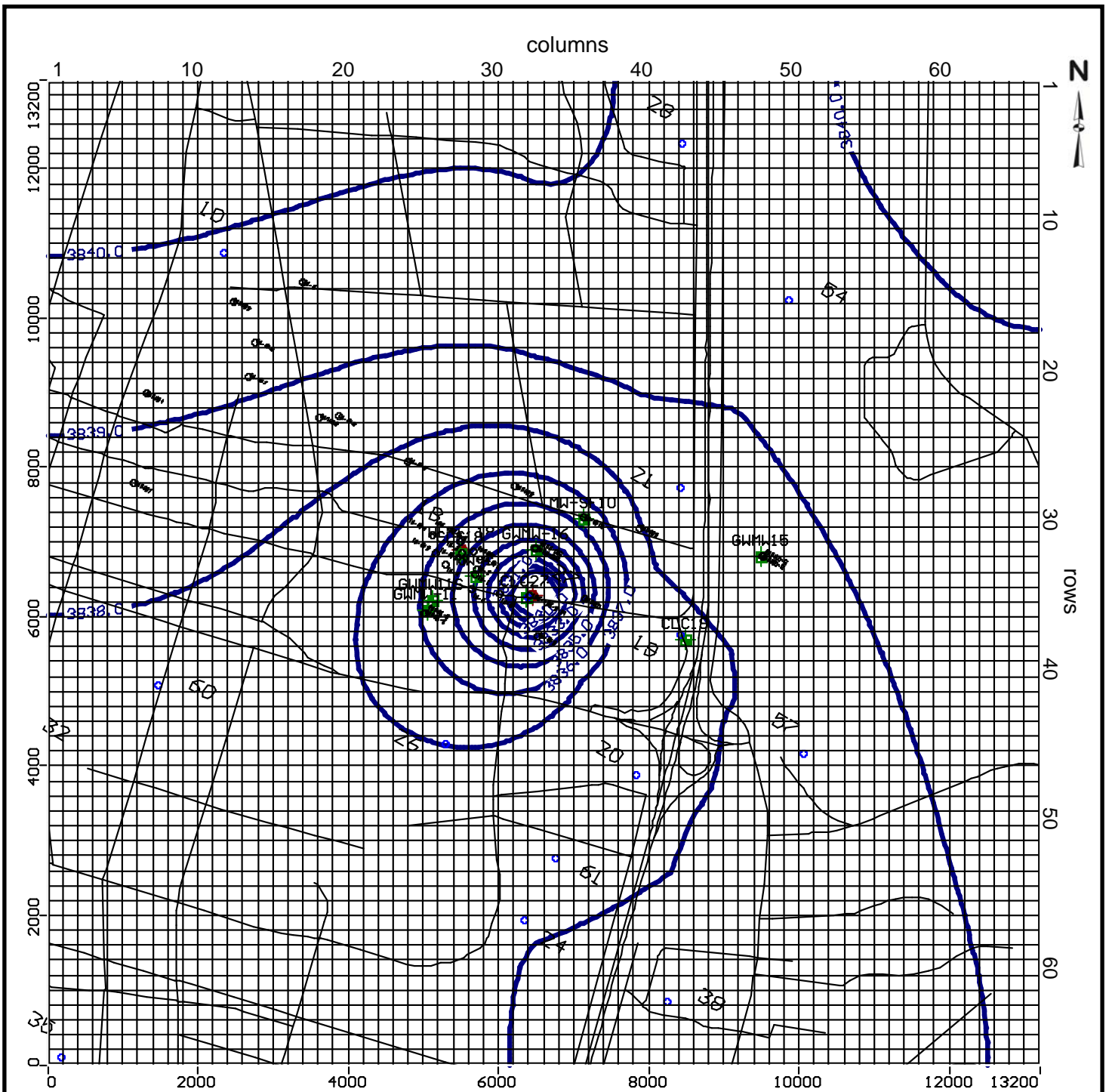


Figure C3. Griggs and Walnut site Telescope mesh refinement model grid and Layer 3 model-simulated heads for 2016.

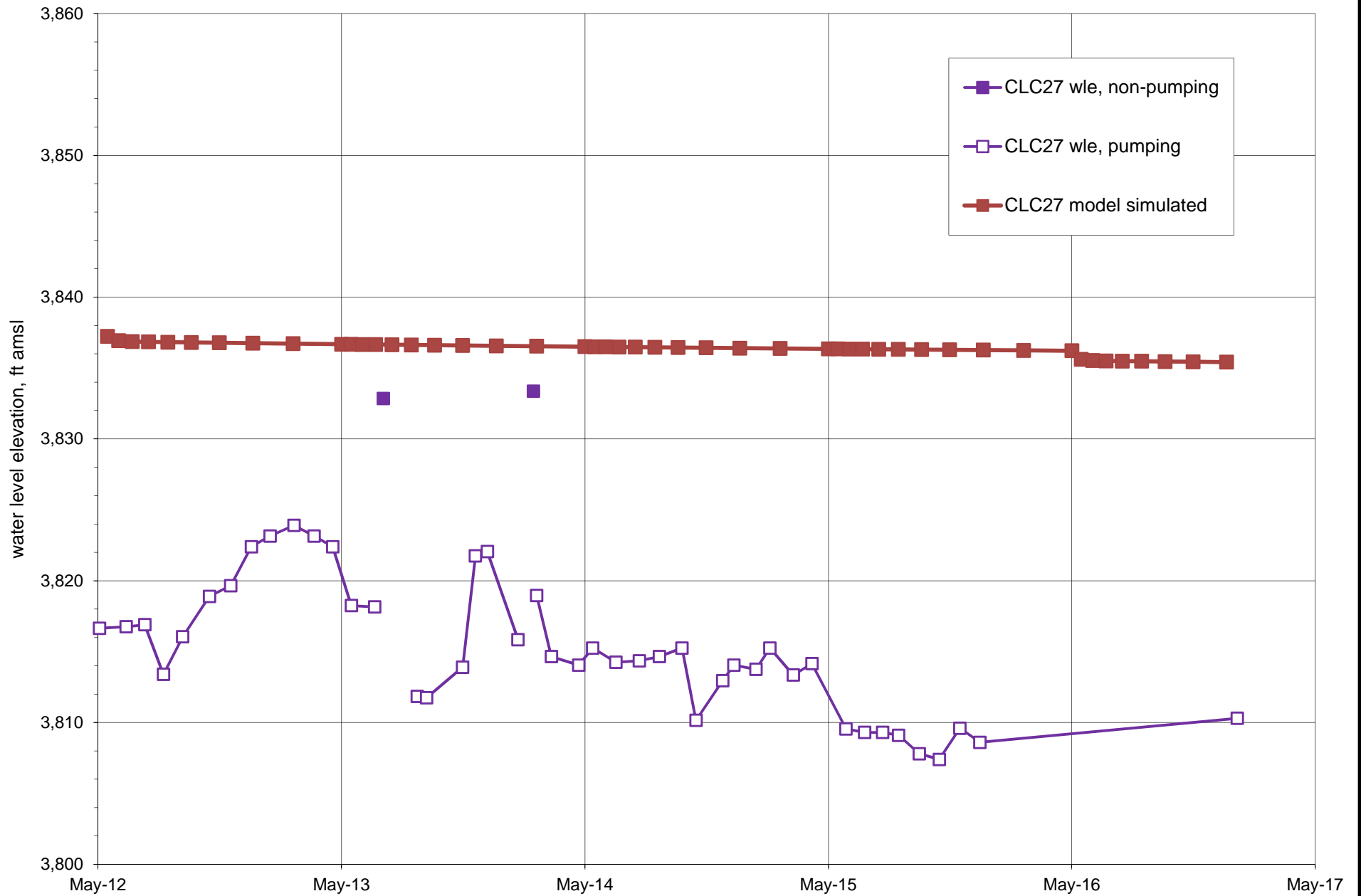


Figure C6. Graph of City of Las Cruces Well 27 observed and model-simulated water levels, Griggs and Walnut site.

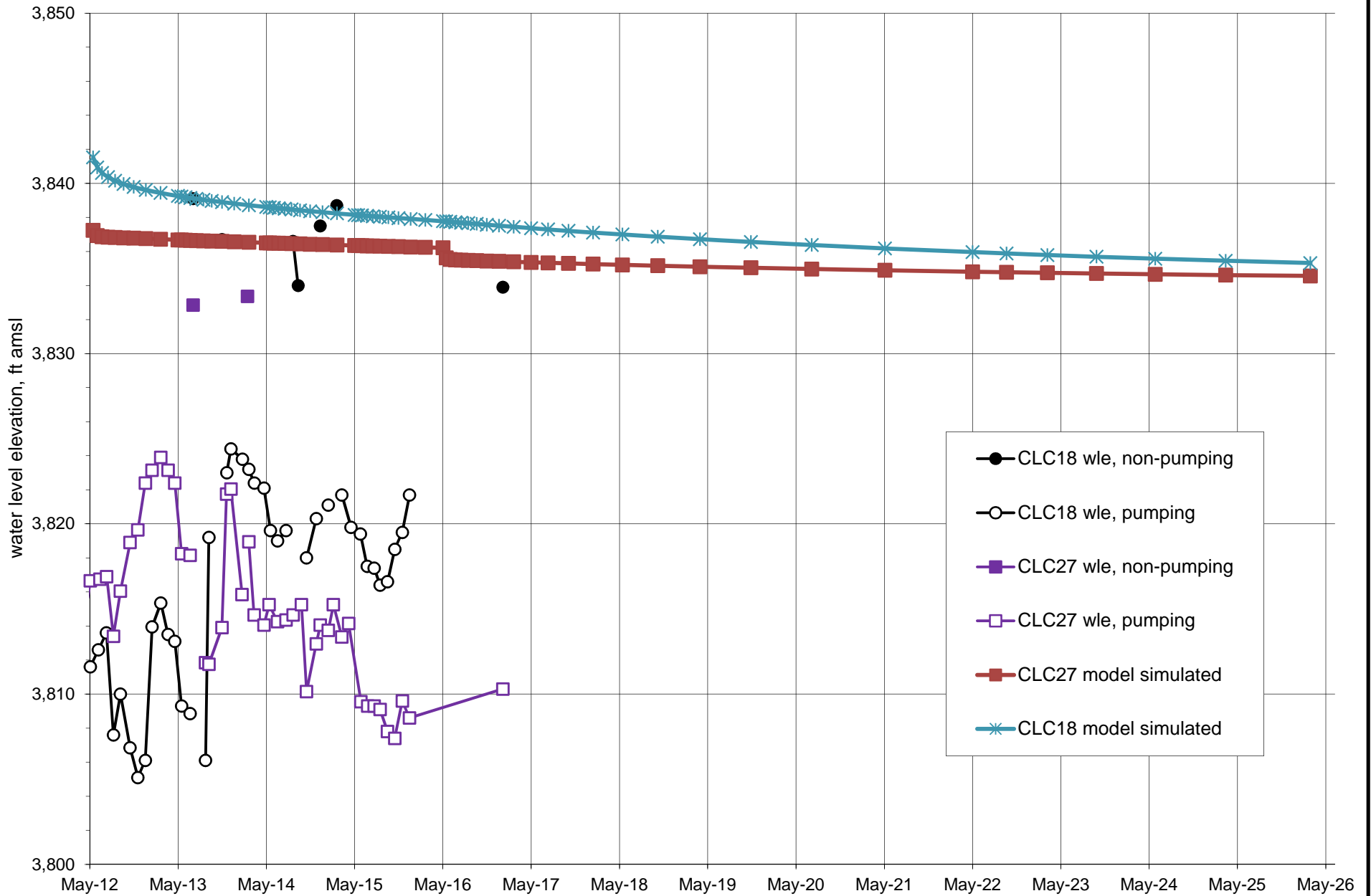


Figure C7. Graph of City of Las Cruces Well 18 and Well 27 observed and model-simulated water levels, Griggs and Walnut site.

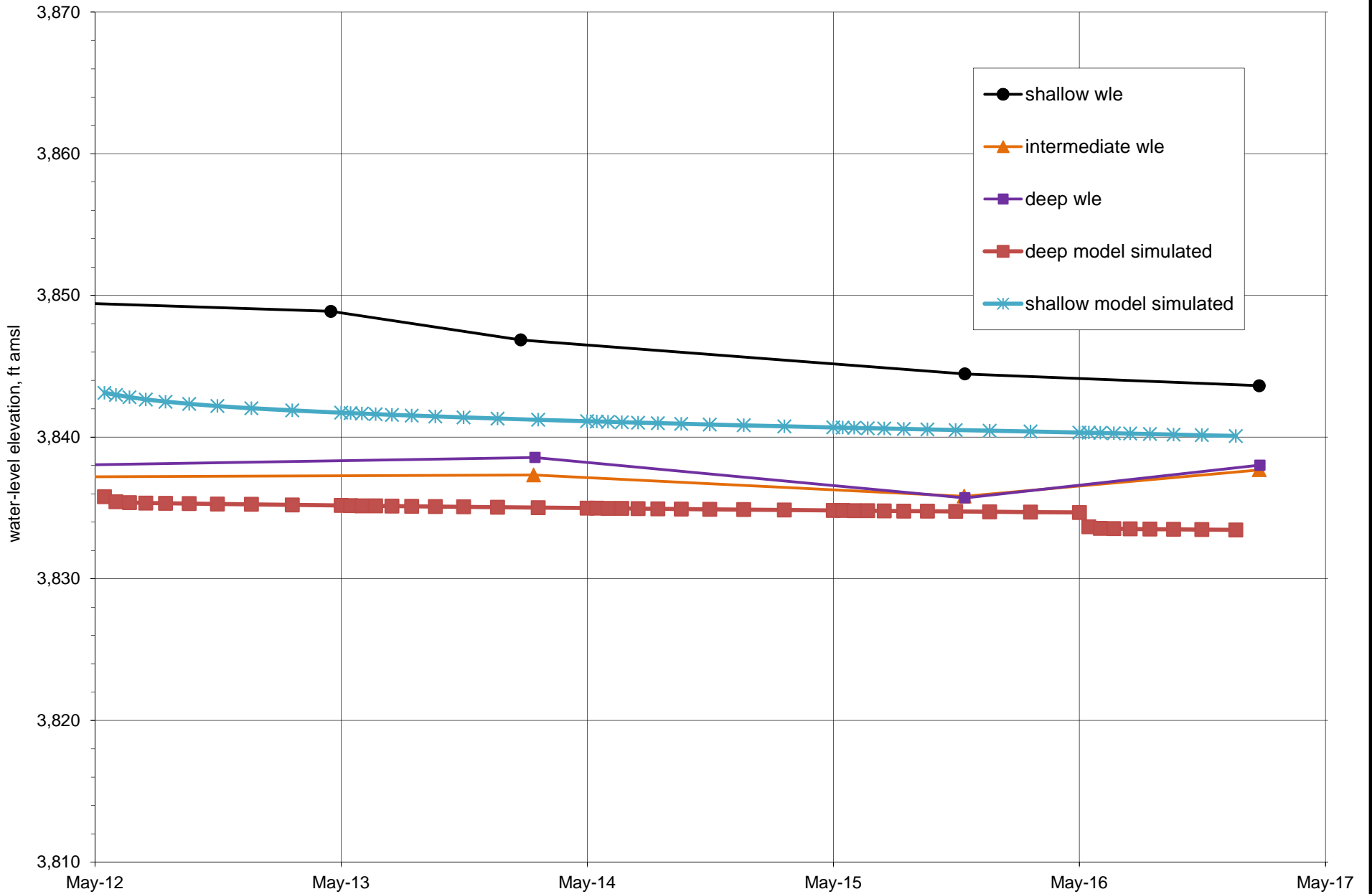


Figure C8. Graph of GWMW11 (shallow, intermediate, and deep) observed and model-simulated water levels, Griggs and Walnut site.

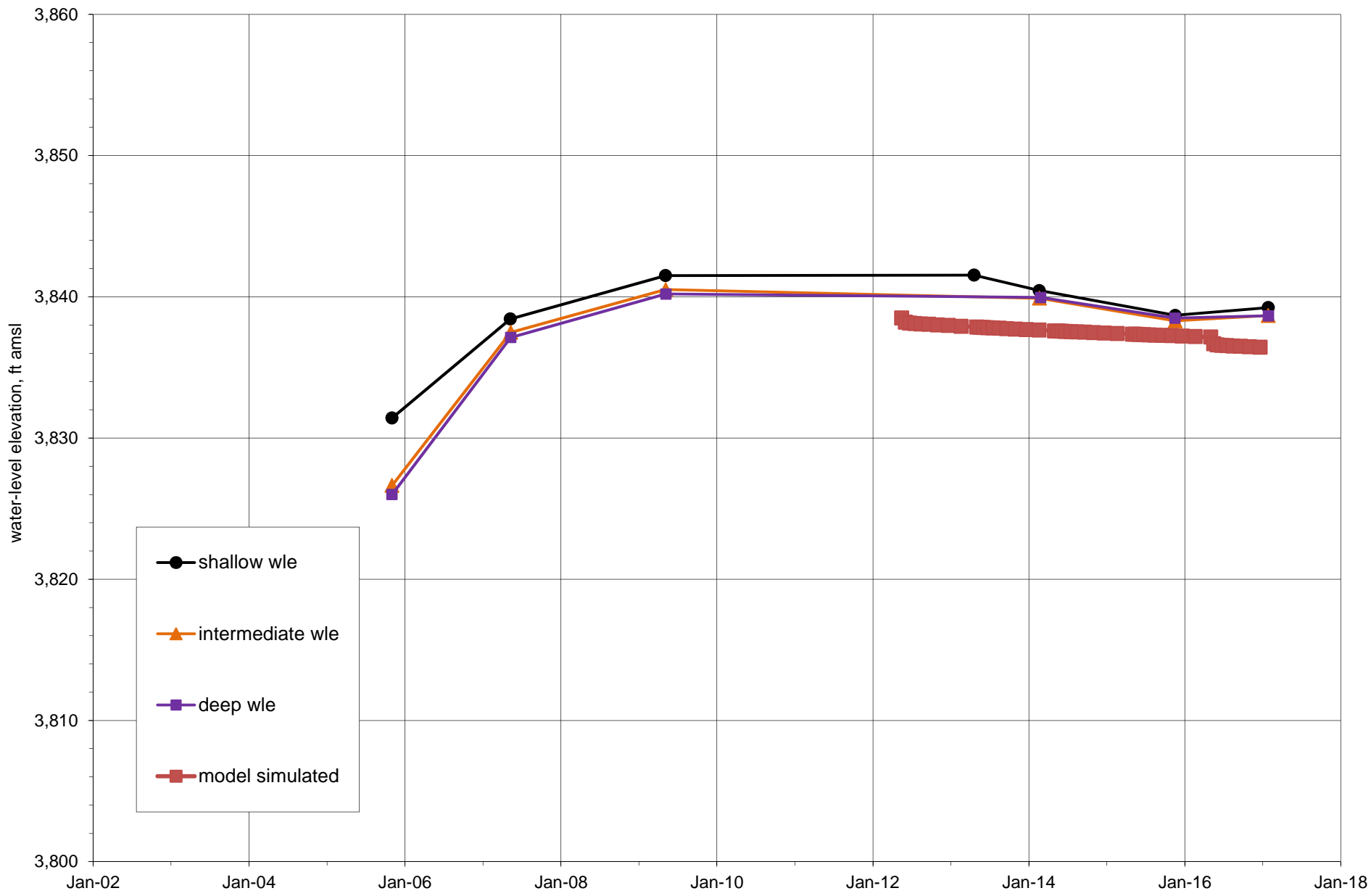


Figure C9. Graph of GWMW15 (shallow, intermediate, and deep) observed and model-simulated water levels, Griggs and Walnut site.

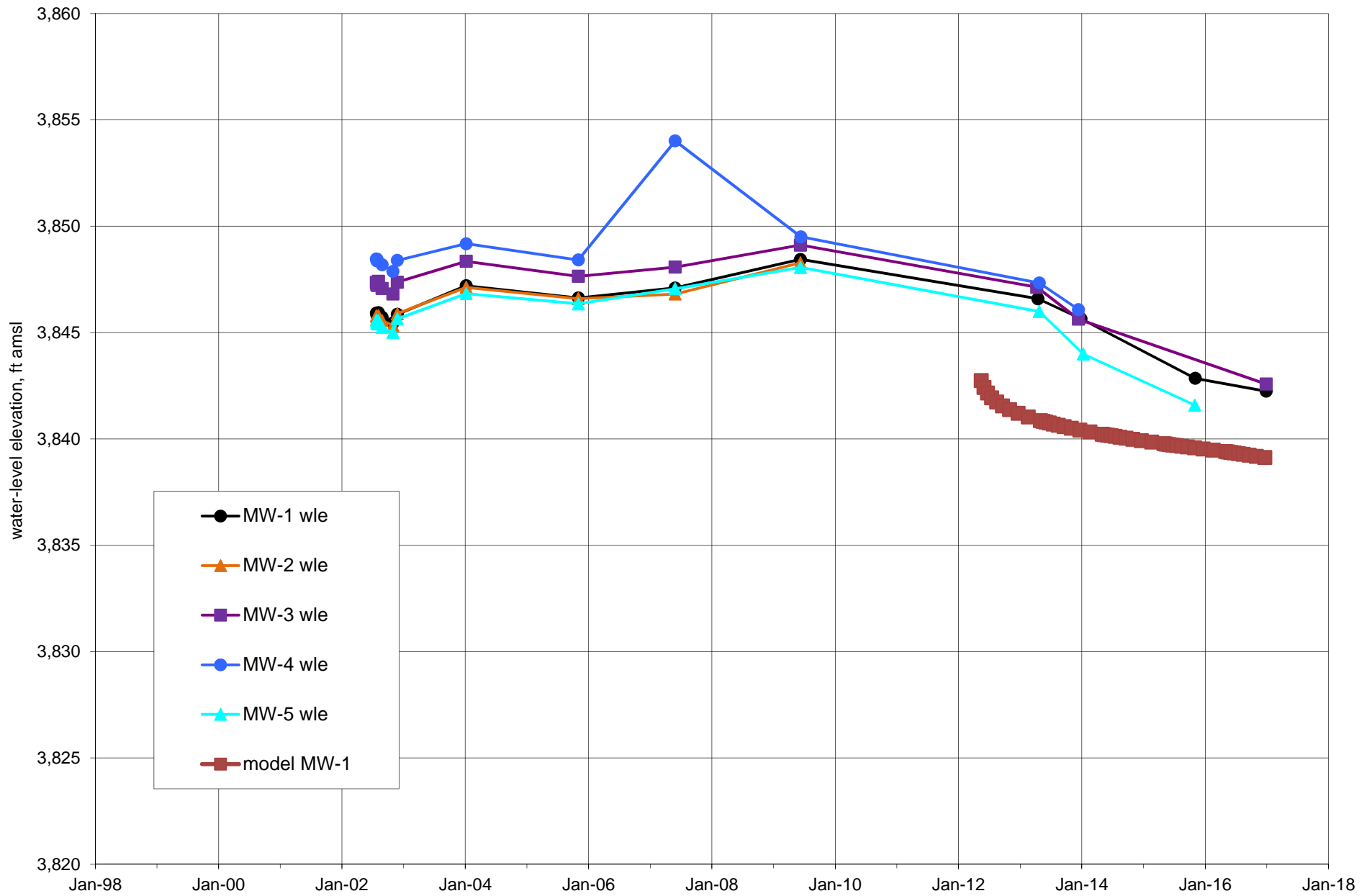


Figure C10. Graph of MW-1 through MW-5 observed and model simulated water levels, Griggs and Walnut site.

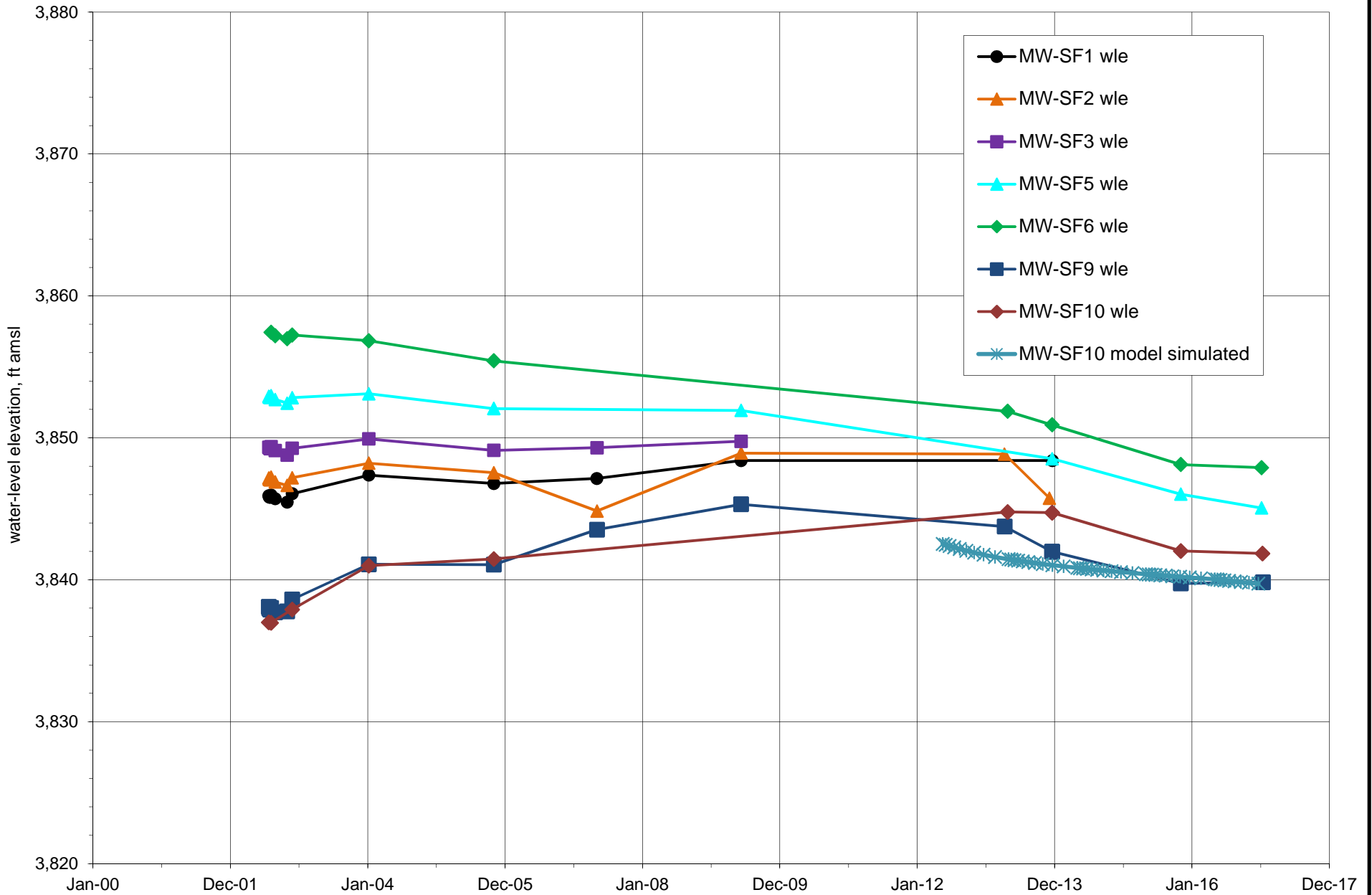


Figure C11. Graph of MW-SF1 through MW-SF10 observed and model-simulated water levels, Griggs and Walnut site.

Appendix C

Proposed Changes to SAP Regarding the Groundwater Monitoring Network



Proposed Changes to Sampling and Analysis Plan Regarding the Groundwater Monitoring Network

Table 1. Griggs Walnut Plume Sampling Monitoring Network

Well Name	No. Of Samples ^a	Baseline Chemistry Sample	Annual Chemistry Sample	Five-Year Review Chemistry Sample	Water Level Monitoring Frequency
CLC 18	1	X	X		Monthly
CLC 26	1	X		X	Quarterly
CLC 27	1	X	X		Monthly
GWMW-01	7	X	X		Annual
GWMW-03	3	X	X		Annual
GWMW-06 Port 1	1	X		X	Annual
GWMW-06 Port 2	1	X		X	Annual
GWMW-08	5	X	X		Annual
GWMW-09	7	X	X		Annual
GWMW-10	7	X	X		Annual
GWMW-11-S	1	X	X		Annual
GWMW-11-I	1	X	X		Annual
GWMW-11-D	1	X	X		Annual
GWMW-15-S	1	X	X		Annual
GWMW-15-I	1	X		X	Annual
GWMW-15-D	1	X		X	Annual
GWMW-16-S	1	X	X		Annual
GWMW-16-D	1	X	X		Annual
MW-1 ^b					Annual
MW-3 ^b					Annual
MW-4 ^b					Annual
MW-5	1	X	X		Annual
MW-SF2	1	X	X		Annual
MW-SF5	1	X	X		Annual
MW-SF9	1	X	X		Annual
MW-SF10	1	X	X		Annual
NGMW-01 ^c	10	X			Annual
NGMW-02 ^c	9	X			Annual
NGMW-03	8 Baseline 1 Annual	X	X		Annual

^a Those wells listed as having multiple samples are multi-port wells, with the exception of NGMW-01, -02, and -03, which currently have passive diffusion bags placed at discrete depths within the well bore.

^b Water level data only for capture analysis.

^c Baseline samples to be collected and analyzed by EPA in 2015.



Table 2. Griggs Walnut Plume Regional Water Level Monitoring Network

Well Name	Type	Water Level Monitoring Frequency
Paz Park	Irrigation	Quarterly
CLC 10	Inactive	Quarterly
CLC 18	Capture	Monthly
CLC 19	Inactive	Quarterly
CLC 20	Inactive	Quarterly
CLC 21	Inactive	Quarterly
CLC 24	Inactive	Quarterly
CLC 26	Standby	Quarterly
CLC 27	Capture	Monthly
CLC 28	Active	Quarterly
CLC 38	Inactive	Quarterly
CLC 54	Inactive	Quarterly
CLC 57	Inactive	Quarterly
CLC 60	Inactive	Quarterly
CLC 61	Active	Quarterly