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# SITE CHARACTERIZATION REPORT / REMEDIAL ACTION PLAN ADDENDUM

**VALLEY VILLAGE**
10243 State Route 85
Kittanning, PA 16201
**Facility I.D. No. 03-06500**
**USTIF No. 2014-0036(S)**

Prepared for

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## LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| bgs | below ground surface |
| COCs | contaminants of concern |
| CSM | Conceptual Site Model |
| DPVE | dual phase vacuum extraction |
| EC | environmental covenant |
| gpm | gallons per minute |
| MSC | Medium Specific Concentration |
| $MSC_{IAQ}$ | Medium Specific Concentration for Indoor Air Quality |
| $MSC_{SG}$ | Medium Specific Concentration for Soil Gas |
| MTBE | methyl tert-butyl ether |
| NQD | New Quick Domenico |
| ORC | oxygen releasing compound |
| OSHA | Occupational Safety and Health Administration |
| PADEP | Pennsylvania Department of Environmental Protection |
| PennDOT | Pennsylvania Department of Transportation |
| PID | photoionization detector |
| PNDI | Pennsylvania Natural Diversity Index |
| POC | Point of Compliance |
| QA/QC | Quality Assurance / Quality Control |
| RACR | Remedial Action Completion Report |
| RAPR | Remedial Action Progress Report |
| RAP | Remedial Action Plan |
| SCR | Site Characterization Report |
| SHS-RUA | Statewide Health Standard, Residential, Used Aquifer |
| SPL | separate phase liquid |
| SSS | Site Specific Standard |
| SVE | soil vapor extraction |
| USEPA | United States Environmental Protection Agency |
| UST | Underground Storage Tank |

## 1.0 INTRODUCTION

Insite Group, Inc. (IGI), on behalf of Mr. Joseph Buffone, provides this SCR / RAP Addendum for the Valley Village Keystone facility located at 10243 State Route 85, Kittanning, Pennsylvania in Cowanshannock Township, Armstrong County.

An SCR / RAP was submitted to the PADEP on March 13, 2015. The PADEP approved the report with modifications in a letter dated June 11, 2015. Since then, additional site characterization and pilot testing have been completed as requested by USTIF and USTIF's third party reviewer to further refine the area of impact to soil and further evaluate impacts to the unconsolidated aquifer at selected depth intervals. This report provides a summary of these activities and modifications to the planned remediation.

A topographic map is provided as **Figure 1**, and a site map is provided as **Figure 2**.

### 1.1 Change in Property Ownership

The subject property was purchased by Shiv Ram Properties, LLC in June 2015. IGI representatives met with the new owners on September 22, 2015, and June 1, 2016, to discuss the remedial approach for the site and potential impacts to their business operations during remediation.

## 2.0 ADDITIONAL SITE CHARACTERIZATION

Between October 1 and 12, 2015, IGI drilled six additional soil borings (B-13 through B-18) and installed three additional monitoring wells (MW-13 through MW-15), one additional extraction well (EW-2), two piezometers (P-1 and P-2), and one additional soil vapor monitoring point (VM-4). A seventh soil boring (B-19) was completed on November 3, 2015. Soil boring logs / well construction diagrams for the new soil borings and wells are provided as **Attachment A**. Well and boring locations are shown on **Figure 2**. Top-of-casing elevations were surveyed by Allstate Mapping, Inc.

### 2.1 Soil

Soil borings B-13 though B-19 and MW-15 were completed in areas around the UST system to refine the extent of impact to soil. Soil samples were also collected from drilling locations P-1, P-2 and EW-2 for FC-1 soil profiling purposes. A total of 19 soil samples were submitted for laboratory analysis of unleaded gasoline parameters by method 5035/8260B. The analytical results are summarized in **Table 1.0**. The benzene concentration exceeds the SHS-RUA for 7 of the samples, and the 1,2,4-trimethylbenzene and 1,3,5-trimethylbenzene concentrations exceed the SHS-RUA in 2 of the samples. The extent of impact to soil map was updated with the new data and is provided as **Figure 3**. The map also shows the original extent of impact to soil included in the 2015 SCR/RAP. The revised extent of impact to soil is slightly smaller (approximately 8%) than previously estimated.

Ten of the samples were also analyzed for FC-1 disposal parameters (extracted TOX by method 9023, lead by method 6010B, and TPH-GRO by method 8015B). The analytical results are summarized in **Table 2.0**. Laboratory analytical reports are provided as **Attachment B**.

## 2.2 Groundwater

### 2.2.1 Well Installation and Development

Monitoring wells MW-13 and MW-14 were installed on the adjacent Cowanshannock Creek Watershed Association property as requested by PADEP and proposed in the SCR/RAP to provide additional monitoring locations downgradient of the proposed excavation. Monitoring well MW-15 was installed along the west side of the UST cavity. Each well is screened from approximately 3 to 13 feet bgs.

Extraction well EW-2 was installed at the southeast corner of the UST cavity. The goal was to install an extraction well that is hydraulically connected to the UST cavity and could be used to dewater the UST cavity. Immediately following installation, separate phase liquid (SPL) globules were observed on the groundwater in the well. To date no measureable SPL has accumulated in EW-2.

Two 2-inch diameter piezometers, P-1 and P-2, were installed to evaluate groundwater in the deeper zone. P-1 is screened from 12 to 15 feet bgs, and P-2 is screened from 13 to 15 feet bgs. Both wells produce a limited amount of groundwater and recover over a period of days. The groundwater elevation in P-1 eventually equilibrated to the groundwater table elevation observed in other monitoring wells screened through both zones. The groundwater elevation in P-2 remains approximately 3 feet below the groundwater table elevation observed in other nearby monitoring wells.

The new wells were developed on October 15 and November 11, 2015. Development continued until either well development parameters [temperature, conductivity, pH, and oxidation-reduction potential (ORP)] in each well stabilized, or the well went dry.

### 2.2.2 Groundwater Monitoring

A groundwater sample was collected from EW-2 following development on October 15, 2015. Groundwater samples were also collected from MW-13, MW-14, MW-15, P-1, and P-2 on November 17, 2015. In addition, five quarterly groundwater monitoring events have been completed since the submission of the SCR/RAP in March 2015. Historical groundwater analytical results, including those collected since the submission of the SCR/RAP, are summarized in **Table 3.0**. Laboratory analytical reports were included with each quarterly RAPR.

### 2.2.3 Groundwater Data Evaluation

The piezometer data confirm the presence of impacted groundwater in the deeper zone but indicates that the volume of groundwater in the deeper zone is limited and slow moving as compared to the shallow zone.

Since the submission of the 2015 SCR/RAP, the benzene concentration in MW-8 (located approximately 43 feet downgradient of the UST cavity on the adjacent property to the south) has increased from 370 ug/L to 2,110 ug/L. The data indicate that the dissolved phase groundwater plume is continuing to migrate offsite, as well.

Contaminant concentrations in MW-15 have increased since the well was installed in October 2015 (the benzene concentration has increased from <1.00 to 127 ug/L). The data indicate that contamination has expanded westward from the UST cavity.

**Figure 4** shows 1) the historical extent of impact to groundwater based on data included in the 2015 SCR/RAP and 2) the revised extent of impact to groundwater based on recent analytical data.

### 2.3 Soil Vapor

Vapor monitoring point VM-4 was installed in the electrical conduit trench adjacent to the convenience store building as requested by the PADEP in the SCR/RAP approval letter to evaluate a potential preferred vapor intrusion pathway. Soil vapor monitoring will be completed following excavation.

## 3.0 ADDITIONAL PILOT TESTING

### 3.1 Previous In Situ Chemical Oxidation Pilot Test

As described in the March 2015 SCR/RAP, an *in situ* chemical oxidation pilot test was completed at the site in November 2014. A test pit measuring 10 feet long by 2 feet wide and 5.5 feet deep was excavated into the groundwater table, and PersulfOx was applied to the test pit between 3 and 5.5 feet bgs. Prior to backfilling, a 2-inch diameter PVC Standpipe was installed to a depth of 5.5 feet in the excavation.

As a follow-up to the pilot test, DO concentrations were measured in selected wells on June 5, 2015. The results are included in **Table 4.0**. Approximately 15 additional pounds of PersulfOx was injected into the Standpipe on February 11, 2015, and 20 additional pounds of PersulfOx was injected into the Standpipe on May 8, 2015, in order to maintain the treatment zone created in the trench during pilot testing.

### 3.2 Canopy Downspout Investigations

#### 3.2.1 Camera Study

On June 5, 2015, a Wohler inspection camera was used to inspect the drain line that leads from the overhead canopy downspout to a discharge point along the hillside south of the canopy. It was determined that the line is blocked. IGI plans to repair the line during remediation.

### 3.2.2 Dye Study

A dye study was completed to investigate a potential connection between the overhead canopy downspout and the UST cavity. On November 17, 2015, fluorescent yellow/green liquid tracing dye was injected into the overhead canopy downspout and chased with approximately 50 gallons of potable water. Groundwater samples were collected from selected wells immediately following injection to check for visual fluorescence under ambient light and ultraviolet light. No fluorescence was observed. Three days after the dye injection, additional groundwater samples were collected before and after purging of each well to check for fluorescence. Trace fluorescence was observed in the samples collected from EW-1 and EW-2. The results are summarized in **Table 5.0**. A map showing the locations of the canopy downspout and wells showing trace fluorescence is provided as **Figure 5**. The results suggest that some connection exists between the canopy downspout and the UST cavity.

## 3.3 UST Cavity Investigations

### 3.3.1 Vacuum Extraction Pilot Study

On December 7 and 8, 2015, IGI completed a vacuum extraction pilot study using EW-2 to evaluate the potential for dewatering the UST cavity. Prior to beginning the test, baseline depth-to-water measurements were recorded for all site wells.

A vacuum truck was used to apply a vacuum to EW-2 for a period of approximately 28½ hours. The total volume of groundwater extracted was measured approximately every 30 minutes. The data were used to calculate groundwater extraction rates during 30-minute intervals. Total volume measurements and calculated groundwater extraction rates are summarized in **Table 6.0** and presented graphically on **Figure 6**. The initial extraction rate was approximately 0.3 gpm. The extraction rate increased over the first 8 hours of the test to a maximum of approximately 1.4 gpm, and then decreased over the next 16 hours. After 24 hours of extraction, several 120-minute intervals passed with no groundwater being extracted, indicating that the UST cavity was dewatered to the extent feasible. Vacuum extraction was terminated at 28.5 hours. The total volume of groundwater extracted was 787 gallons.

During the test, depth-to-water measurements were recorded periodically for all site wells. The data are summarized in **Table 7.0.** The maximum drawdown observed in each well is summarized in **Table 8.0**. Drawdown ranging from 0.1 feet to 1.45 feet was observed in MW-1, MW-3, MW-8, MW-11, EW-1, CP-4, and the standpipe. The greatest drawdown was observed in MW-1, EW-1, CP-4, and the standpipe. A map showing the area of groundwater drawdown is provided as **Figure 7**. Graphs showing changes in depth to water for each well during and immediately after the test are provided as **Figure 8**.

It is important to note that wells screened exclusively in the shallow zone [EW-1 (0-3 feet), CP-4 (0-3½ feet), Standpipe (2.5 to 5.5 feet)] exhibited notable drawdown during the test, whereas the piezometers, which are screened exclusively in the deeper zone (approximately 12 to 15 feet bgs), did not exhibit any drawdown during the test. The results indicate that the shallow zone is more permeable, and the majority of groundwater movement at the site is through the shallow zone.

For those wells exhibiting drawdown, graphs showing changes in depth to water over a longer period of time are provided as **Figure 9** (beginning at the start of the test and ending 7 days after the test) and **Figure 10** (beginning 17 days before the test and ending 80 days after the test). Some wells continued to drawdown after extraction ceased (Standpipe, MW-3, MW-11, and MW-8). In general, these wells were located farther from the UST cavity than wells that began to recover immediately. Many wells required approximately 80 days to fully recover (EW-1, MW-1, EW-1, CP-4, Standpipe, MW-11).

During the test, subsurface vacuum measurements were also recorded for selected observation wells (EW-1, PT-1, MW-1, MW-3, MW-6, MW-15, P-1, P-2, and the standpipe). The data are summarized in **Table 9.0**. A maximum vacuum of 0.05 inches of water was observed in MW-1 and EW-1. MW-1, EW-1 and EW-2 are hydrogeologically connected to the UST cavity.

Groundwater samples were collected from EW-2 seven weeks before the test, immediately prior to the start of the test, near the middle of the test, near the end of the test, and one week after the test and submitted for laboratory analysis of unleaded gasoline parameters. The groundwater analytical results are summarized in **Table 10.0**. The benzene concentration increased during extraction, and decreased following the completion of the test. Concentrations of other parameters (naphthalene, toluene, 1,2,4-trimethylbenzene, 1,3-5-trimethylbenzene, and total xylenes) decreased during extraction, and rebounded following the completion of the test.

### 3.3.2 Dye Study

A dye study was completed to evaluate the connection between the UST cavity and the surrounding monitoring wells and extraction wells. On December 9, 2015, fluorescent yellow/green liquid tracing dye was injected into three UST cavity injection points (CP-2, CP-3, and CP-4). Approximately 2 fluid ounces of dye was injected into each point. The dye was chased with approximately 94 gallons of potable water in CP-2, 135 gallons in CP-3, and 21 gallons in CP-4.

Groundwater samples were collected from selected wells during and immediately after injection, and up to 11 weeks after injection to check for fluorescence. Soon after injection notable fluorescence (visible under ambient light) was observed post-injection in EW-2, and trace fluorescence (visible under ultraviolet light) was also observed in MW-1, MW-3 and EW-1. Additional groundwater samples were collected to check for fluorescence after 6 days, 1 month, 2½ months, 4 months, 5½ months, and 7 months. Notable fluorescence was still present in MW-1, EW-1, EW-2, and CP-4 after 7 months. Trace fluorescence was observed in MW-3 within hours after injection and remained for at least 7 months. Trace fluorescence was observed in the Standpipe within 6 days after injection and remained for at least 7 months. Trace fluorescence was observed in MW-15 after approximately 4 months. The results are summarized in **Table 11.0**. A map showing the locations of the dye injection locations and wells showing fluorescence is provided as **Figure 11**.

Three additional UST cavity injection wells (CP-5, CP-6, and CP-7) were installed in the western portion of the UST cavity. Additional dye was injected into the new UST cavity injection wells on July 12, 2016, to evaluate the connection between the UST cavity and MW-15 to the west. Approximately 4 fluid ounces of fluorescent yellow/green liquid tracing dye was injected into each point (CP-5, CP-6, and CP-7). The dye was chased with approximately 127 gallons of

potable water in CP-5, 25 gallons in CP-6, and 135 gallons in CP-7. Groundwater samples were collected before injection, immediately after injection, and 7 days after injection. An increase in fluorescence was observed in EW-1 and EW-2 after injection. No fluorescence was observed in MW-15 within 7 days post-injection. Following the previous dye injection, trace fluorescence was observed in MW-15 after 4 months.

The results of both dye studies suggest that a connection exists between the UST cavity and nearby wells. The most notable connections are between the UST cavity and EW-1, EW-2, and MW-1. The results also suggest that groundwater movement through the site is slow. The majority of the dye remained within and proximal to the UST cavity for more than 7 months following injection; little dye moved downgradient.

#### 3.3.3 UST Cavity Fill Material

IGI spoke with Rex Allshouse, a certified UST installer who has experience with the UST system at the site. Mr. Allshouse believes that river sand, rich with silt, or crushed shale was used as backfill in the UST cavity. Based on IGI's field observations, pea gravel is also present around the tops of the tanks. Based on this information, the upper portion of the UST cavity is likely to be more permeable that the lower portion.

#### 3.3.4 Conclusions

The conclusions of the UST cavity investigations are summarized below:

- The shallow zone (0 to 5 feet) appears to be more permeable than the deeper zones (5 to 15 feet), and the majority of groundwater movement at the site is through the shallow zone.
- Within the UST cavity the shallow fill material (gravel) is more permeable than the fill material in the deeper zone (silty sand or crushed shale).
- The UST cavity (particularly the upper portions of the UST cavity) appears to act as a groundwater reservoir that recharges the shallow zone. When the UST cavity is partially dewatered, groundwater recovery in and downgradient of the UST cavity is relatively slow (weeks to months).
- Monitoring well MW-1 and extraction wells EW-1 and EW-2 are hydrogeologically connected to the UST cavity. MW-3, MW-15, and the Standpipe are also hydrogeologically connected to the UST cavity, but to a lesser degree.

### 3.4 Bench Top Surfactant Study

Use of surfactant was considered as an alternative to RegenOx Part A for desorbing adsorbed phase contaminant mass in the UST cavity. Groundwater samples were collected from the site and submitted to Tersus Environmental for a bench top phase behavior study using TASK surfactant. The goal of the bench top study was to 1) determine if a middle phase microemulsion could be formed, and 2) determine the optimal salt concentration for forming the middle phase microemulsion. The results of the bench top study indicate that 1) a middle phase

microemulsion can be formed, and 2) a salt concentration between 0.9 and 1.1 wt. % NaCL may be optimal for microemulsion formation. A copy of the Tersus Environmental report is provided as **Attachment C**. The use of surfactant is no longer being considered due to the possibility of plume mobilization.

## 4.0 REVISED REMEDIAL APPROACH

The proposed remediation described in the March 2015 SCR/RAP included excavation of impacted soil above the water table, excavation of a portion of the adsorbed phase mass below the water table, in situ chemical oxidation using PersulfOx to remediate additional adsorbed phase mass below the water table, in situ chemical oxidation using RegenOx and vacuum extraction to desorb and recover adsorbed mass in the UST cavity, and installation of a PlumeStop Colloidal Biomatrix (PlumeStop) downgradient of the UST cavity to prevent offsite migration of the remaining dissolved phase plume. The area east of the UST cavity was to be backfilled with clay.

A discussion of the proposed modifications to the remedial approach is provided in Sections 4.1 through 4.6. A summary is provided below:

- The horizontal and vertical extents of the proposed excavation have been increased to address all accessible adsorbed phase mass.
- PersulfOx will not be used to address adsorbed phase mass below the water table. Instead, this soil is now planned for excavation.
- Instead of backfilling the entire area east of the UST cavity with clay, a clay barrier will be installed around the eastern and southern edges of UST cavity.
- The PlumeStop barrier will extend to approximately 17 feet bgs instead of 5 feet bgs.
- If dissolved phase contaminant concentrations remain elevated in downgradient monitoring wells (MW-8, MW-10, and MW-13) following excavation, an injection of oxidant, such as ORC Advanced, will be completed to address the remaining dissolved phase plume.

A map showing the revised remedial approach, including the proposed area of excavation, clay barrier, PlumeStop barrier, and RegenOx treatment, is provided as **Figure 12**. A summary of the revised remediation technologies and the estimated total contaminant mass to be addressed by each is provided below:

| Contaminant Source | Previous Remedial Approach | | Revised Remedial Approach | |
|---|---|---|---|---|
| | Proposed Remediation | Estimated Total Contaminant Mass | **Proposed Remediation** | **Estimated Total Contaminant Mass** |
| Adsorbed Phase Mass Above Water Table (Extent of Impact to Soil) | Excavation | 21 pounds | Excavation | 21 pounds |
| Adsorbed Phase Mass Below the Water Table | Excavation to the Extent Feasible | 55 pounds | Excavation to the Extent Feasible | 118 pounds |
| | Mix with PersulfOx to the Extent Feasible | 33 pounds | | |
| | Adsorbed Phase Mass Left in Place will be Addressed with a PlumeStop Barrier | 47 pounds | Adsorbed Phase Mass Left in Place will be Addressed with a PlumeStop Barrier | 28 pounds |
| Adsorbed Phase Mass in the UST Cavity | Treat with RegenOx and Vacuum Extraction | 35 pounds | Treat with RegenOx and Vacuum Extraction | 35 pounds |
| Dissolved Phase Mass in UST Cavity | Treat with RegenOx and Extraction | 2.6 pounds | Treat with RegenOx and Extraction | 2.6 pounds |
| Dissolved Phase Mass in the Rest of the Groundwater Plume | Excavation / Mix with PersulfOx / PlumeStop Barrier | 2.4 pounds | Excavation / PlumeStop Barrier | 1.6 pounds |
| | *TOTAL Contaminant Mass:* | *196 pounds* | *TOTAL Contaminant Mass:* | *206 pounds* |

## 4.1 Expanded Soil Excavation and Elimination of PersulfOx Treatment

The proposed area of soil excavation will extend farther to the north to include the area around B-6 and farther to the west to include the area around B-16 and B-17. The total area of proposed excavation is increased from 2,480 to 3,530 square feet, as shown on **Figure 13**. If benching becomes necessary, the total area of excavation may be expanded.

Originally, only a portion of the adsorbed phase contaminant mass below the water table was planned for excavation (to a maximum depth between 5 and 12 feet bgs), and in situ chemical oxidation using PersulfOx was planned to address additional adsorbed phase contaminant mass below the excavation. The revised remedial approach includes excavation of all accessible adsorbed phase contaminant mass to a maximum depth of 17 feet bgs and eliminates the use of PersulfOx. Because PersulfOx will not be used, post PersulfOx application monitoring (described in Section 9.2 of the SCR/RAP) will not be necessary.

Previously, excavation deeper than 4-feet adjacent to the UST cavity was not planned due to the potential to undermine the UST cavity containing pea gravel backfill. The revised remedial approach includes the use of trench boxes in order to excavate deeper adjacent to the UST cavity.

The estimated volume of impacted soil to be excavated was previously calculated to be approximately 459 cubic yards (689 tons). The current estimate, based on the revised remedial approach, is approximately 1,111 cubic yards (1,667 tons).

During the October 2015 drilling event, soil samples were collected for disposal profiling purposes (see Section 2.1). A Form FC-1 Notification of Intent to Dispose of Soil Contaminated by Virgin Petroleum Fuel was prepared by IGI and Advanced Disposal and submitted to the PADEP. In March 2016, the PADEP granted Greentree Landfill authorization to accept the impacted soil.

The previous remedial approach included backfilling the majority of the excavated area with clay fill. Alternatively, the revised remedial approach includes placement of a clay barrier along the eastern and southern edges of the UST cavity, as shown on **Figure 12**.

### 4.2 In Situ Chemical Oxidation in the UST Cavity

The proposed injection of RegenOx Part A into the UST cavity to desorb and oxidize contaminants will be completed as described in the 2015 SCR/RAP with one exception: the additional UST cavity injection wells installed on July 12, 2016 (CP-5 through CP-7) will also be utilized for injection in order to address impacts in the western portion of the UST cavity.

### 4.3 Expanded PlumeStop Barrier

The SCR/RAP proposed the application of PlumeStop Colloidal Biomatrix and ORC Advanced Pellets during backfilling of the excavation in an area immediately upgradient of the downgradient property boundary. The PlumeStop barrier remains part of the remedial approach with the following modifications:

- The footprint of the proposed PlumeStop barrier has been reduced from 630 square feet to 450 square feet.
- The total depth of the proposed barrier has been extended from 5 feet bgs to 17 feet bgs in order to address any groundwater impacts migrating at depth.
- The amount of PlumeStop product and ORC Advanced Pellets to be applied has been increased due to the larger volume of the treatment zone, as summarized below:

| | Original Remedial Approach | Revised Remedial Approach |
|---|---|---|
| Total Area | 630 square feet | 450 square feet |
| Depth | 2 to 5 feet bgs | 2 to 17 feet bgs |
| Volume | 1,890 cubic feet | 6,750 cubic feet |
| Total Amount of PlumeStop Product to be Applied | 1,200 pounds | 4,000 pounds |
| Total Amount of ORC Advanced Pellets to be Applied | 160 pounds | 520 pounds |

Vertical injection wells or horizontal injection galleries will be installed within the PlumeStop treatment zone during backfilling. The injection wells/galleries may be used for future injection of ORC, if necessary. The design basis for PlumeStop and ORC application is provided as **Attachment D**.

### 4.4 Performance Monitoring

During and after RegenOx treatment of the UST cavity, IGI will monitor pH and DO concentrations in selected wells adjacent to or downgradient of the UST cavity.

Following excavation and application of RegenOx, PlumeStop, and ORC Advanced, groundwater samples will be collected from selected wells (including MW-3R, MW-4R, and MW-8) on a monthly basis for three months for performance monitoring purposes. Groundwater samples will be analyzed for unleaded gasoline parameters.

### 4.5 Quarterly Groundwater Monitoring and Reporting

Four quarters of groundwater monitoring and reporting will be completed as described in the SCR/RAP, but will include one additional monitoring well (MW-15). The following monitoring wells are proposed as point-of-compliance monitoring wells MW-3R, MW-4R, MW-8, MW-13, and MW-14.

### 4.6 Treatment of the Downgradient Plume

During excavation, two horizontal injection galleries will be installed downgradient of the area of excavation for future use if additional treatment is required to address the downgradient portion of the dissolved phase plume. One gallery will be installed between the area of excavation and MW-8. The second gallery will be installed farther downgradient between MW-8 and MW-10.

It is expected that excavation of impacted soil and installation of the PlumeStop barrier will result in a reduction in dissolved phase contaminant concentrations in downgradient monitoring wells (MW-8, MW-13, and MW-10). IGI will evaluate the analytical data for evidence of a decreasing trend. If no decreasing trend is observed, or if the magnitude of the decreasing trend is not sufficient to reach the SHS-RUA within four quarters, IGI will recommend additional treatment using RegenOx and/or ORC Advanced to address the remaining dissolved phase plume. RegenOX and/or ORC Advanced can be injected in slurry form into the horizontal injection galleries to oxidize and promote biodegradation of the remaining dissolved phase contaminants. The amount of product to be used will be determined based on the dissolved phase concentrations present in the downgradient portion of the plume at that time.

## 5.0 CONCLUSIONS

The proposed remediation includes excavation of impacted soil above the water table, excavation of adsorbed phase mass below the water table, in situ chemical oxidation of adsorbed phase and dissolved phase mass in the UST cavity using RegenOx, and installation of a PlumeStop barrier to eliminate offsite migration of the remaining dissolved phase plume. The proposed remediation is expected to achieve attainment of the SHS-RUA for both soil and groundwater and attainment of the $MSC_{SG}$ for soil vapor.

# FIGURES

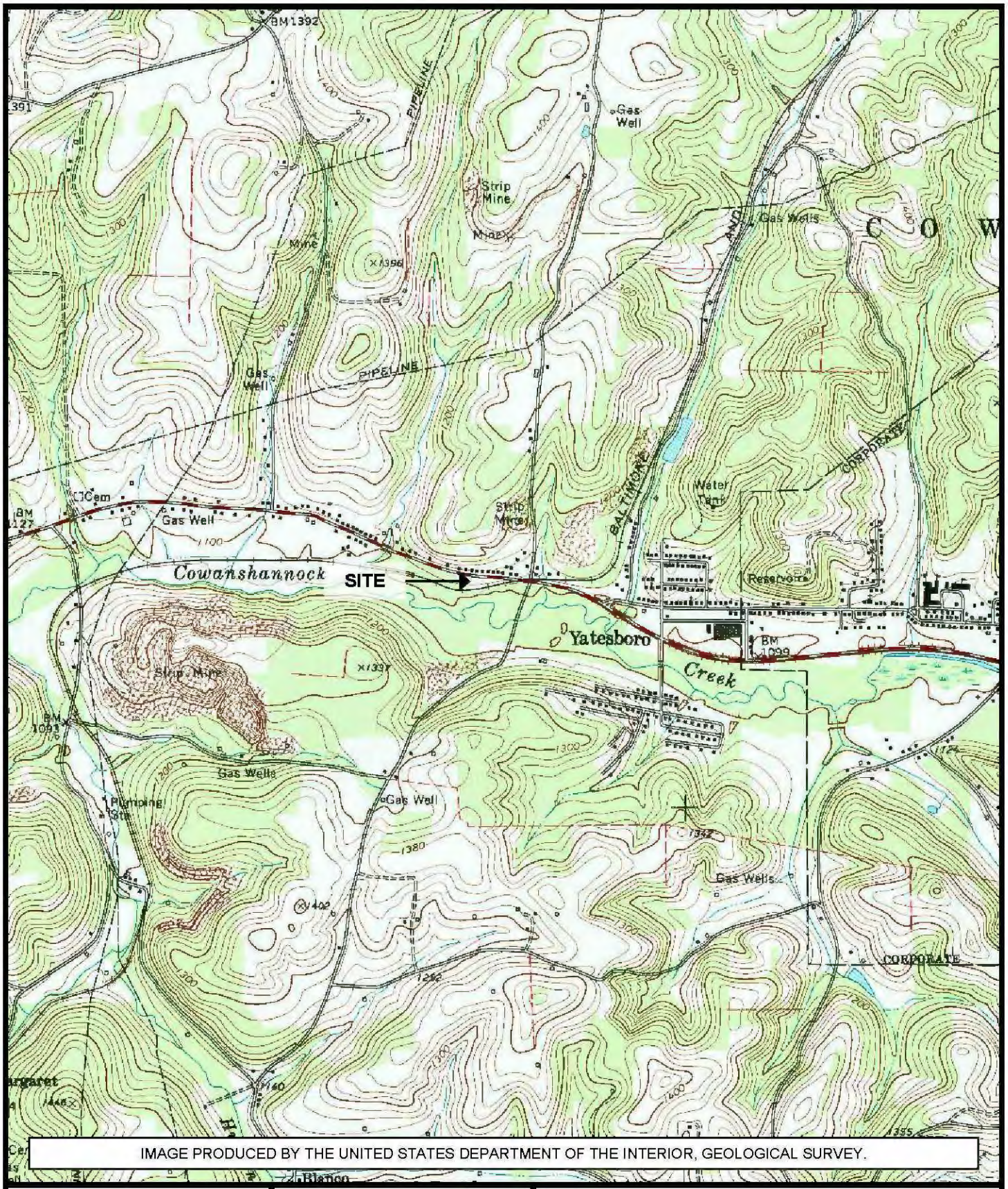


IMAGE PRODUCED BY THE UNITED STATES DEPARTMENT OF THE INTERIOR, GEOLOGICAL SURVEY.

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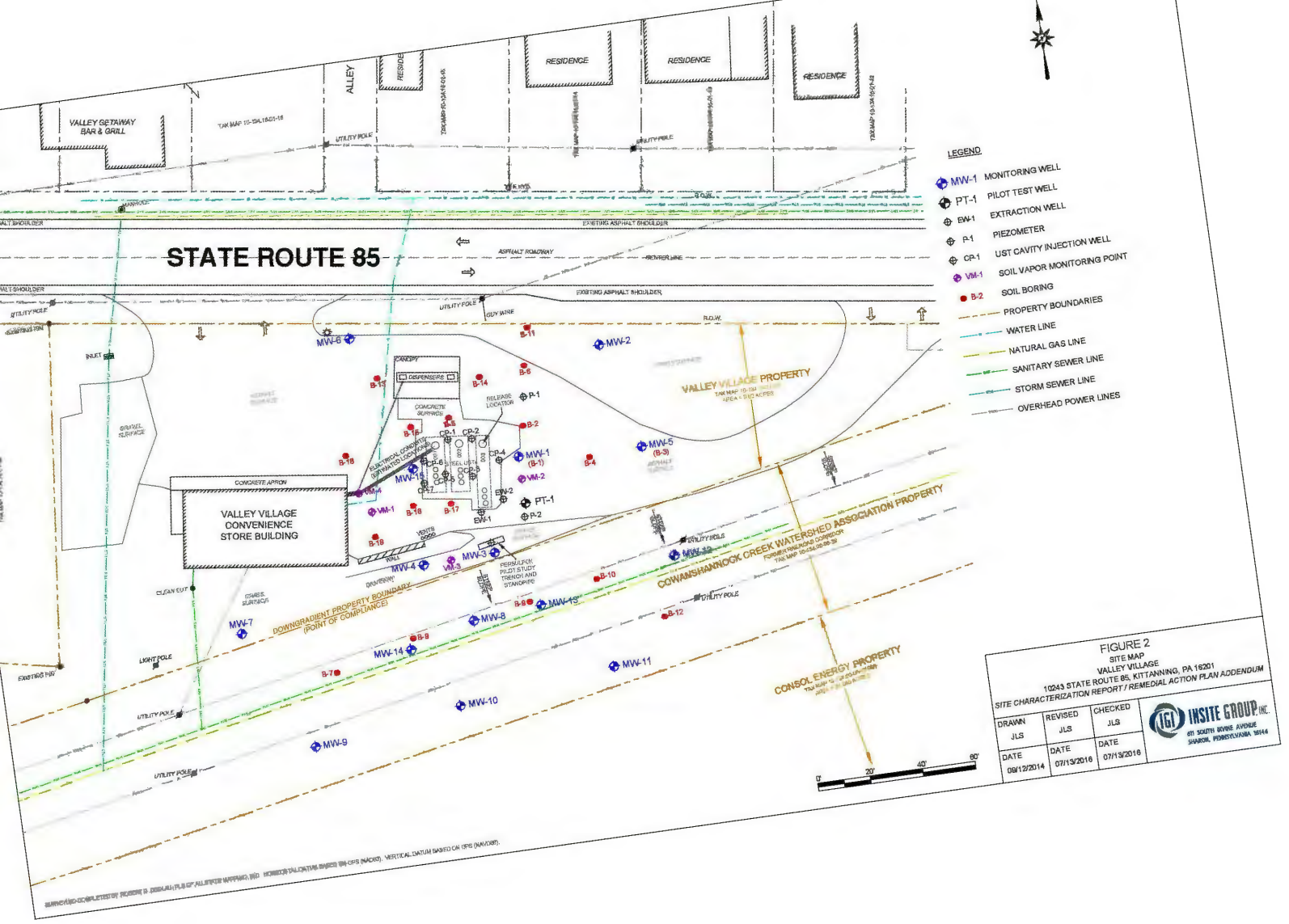
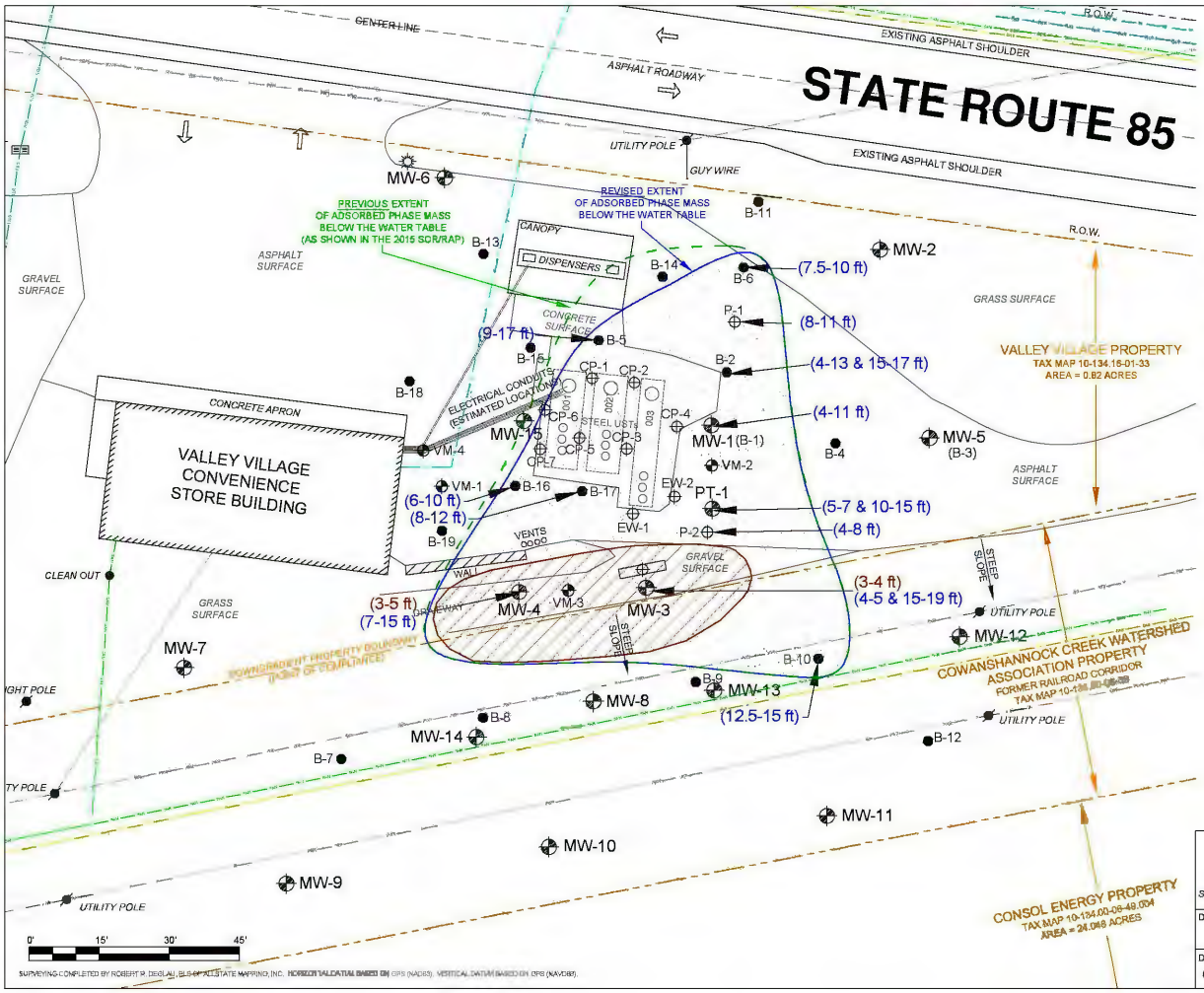
RURAL VALLEY, PA QUADRANGLE
1969
PHOTOINSPECTED 1990

7.5-MINUTE SERIES
CONTOUR INTERVAL 20 FEET

FIGURE 1
TOPOGRAPHIC MAP
VALLEY VILLAGE
10243 STATE ROUTE 85, KITTANNING, PA 16201-8165
*SITE CHARACTERIZATION REPORT / REMEDIAL ACTION PLAN ADDENDUM*


STATE ROUTE 85
VALLEY GETAWAY BAR & GRILL
ALLEY
RESIDENCE
RESIDENCE
RESIDENCE
RESIDENCE
EXISTING ASPHALT SHOULDER
ASPHALT ROADWAY
EXISTING ASPHALT SHOULDER
UTILITY POLE
GUY WIRE
R.O.W.
VALLEY VILLAGE PROPERTY
VALLEY VILLAGE CONVENIENCE STORE BUILDING
CONCRETE APRON
CANOPY
DISPENSERS
CONCRETE SURFACES
RELEASE LOCATION
ELECTRICAL CONDUIT ESTIMATED LOCATIONS
FUEL UST
GRAVEL SURFACE
INLET
CLEAN CUT
LIGHT POLE
EXISTING FENCE
VENTS
WALL
DRAINAGE
PERMULFOX PILOT STUDY TRENDS AND STANDPIPE
DOWNGRADIENT PROPERTY BOUNDARY (POINT OF COMPLIANCE)
COWANSHANNOCK CREEK WATERSHED ASSOCIATION PROPERTY
CONSOL ENERGY PROPERTY
MW-1 (B-1)
MW-2
MW-3
MW-4
MW-5 (B-3)
MW-6
MW-7
MW-8
MW-9
MW-10
MW-11
MW-12
MW-13
MW-14
MW-15
MW-16
VM-1
VM-2
VM-3
VM-4
EW-1
EW-2
PT-1
P-1
P-2
CP-1
CP-2
CP-3
CP-4
CP-5
CP-6
CP-7
CP-8
B-1
B-2
B-4
B-5
B-6
B-7
B-8
B-9
B-10
B-11
B-12
B-13
B-14
B-15
B-16
B-17
B-18
0' 20' 40' 60'
LEGEND
MW-1 MONITORING WELL
PT-1 PILOT TEST WELL
EW-1 EXTRACTION WELL
P-1 PIEZOMETER
CP-1 UST CAVITY INJECTION WELL
VM-1 SOIL VAPOR MONITORING POINT
B-2 SOIL BORING
PROPERTY BOUNDARIES
WATER LINE
NATURAL GAS LINE
SANITARY SEWER LINE
STORM SEWER LINE
OVERHEAD POWER LINES
FIGURE 2
SITE MAP
VALLEY VILLAGE
10243 STATE ROUTE 85, KITTANNING, PA 16201
SITE CHARACTERIZATION REPORT / REMEDIAL ACTION PLAN ADDENDUM
DRAWN JLS
REVISED JLS
CHECKED JLS
DATE 09/12/2014
DATE 07/13/2016
DATE 07/13/2016
INSITE GROUP, INC.
611 SOUTH IRVINE AVENUE
SHARON, PENNSYLVANIA 16146




LEGEND

- EXTENT OF IMPACT TO SOIL ABOVE THE WATER TABLE (1,306 SQUARE FEET)
- (3-5 ft) DEPTH OF SOIL IMPACT (ABOVE THE WATER TABLE)
- PREVIOUS EXTENT OF ADSORBED PHASE MASS BELOW THE WATER TABLE (5,789 SQUARE FEET)
- REVISED EXTENT OF ADSORBED PHASE MASS BELOW THE WATER TABLE (5,358 SQUARE FEET)
- (4-11 ft) DEPTH OF SOIL IMPACT (BELOW WATER TABLE)
- MW-1 MONITORING WELL
- PT-1 PILOT TEST WELL
- EW-1 EXTRACTION WELL
- CP-1 UST CAVITY INJECTION WELL
- VM-1 SOIL VAPOR MONITORING POINT
- B-2 SOIL BORING
- PROPERTY BOUNDARIES
- WATER LINE
- NATURAL GAS LINE
- SANITARY SEWER LINE
- STORM SEWER LINE
- OVERHEAD POWER LINES

FIGURE 3
REVISED EXTENT OF IMPACT TO SOIL
VALLEY VILLAGE
10243 STATE ROUTE 85, KITTANNING, PA 16201
*SITE CHARACTERIZATION REPORT / REMEDIAL ACTION PLAN ADDENDUM*

| DRAWN | REVISED | CHECKED |
|---|---|---|
| JLS | JLS | SJG |
| DATE 07/12/2016 | DATE 07/28/2016 | DATE 07/28/2016 |

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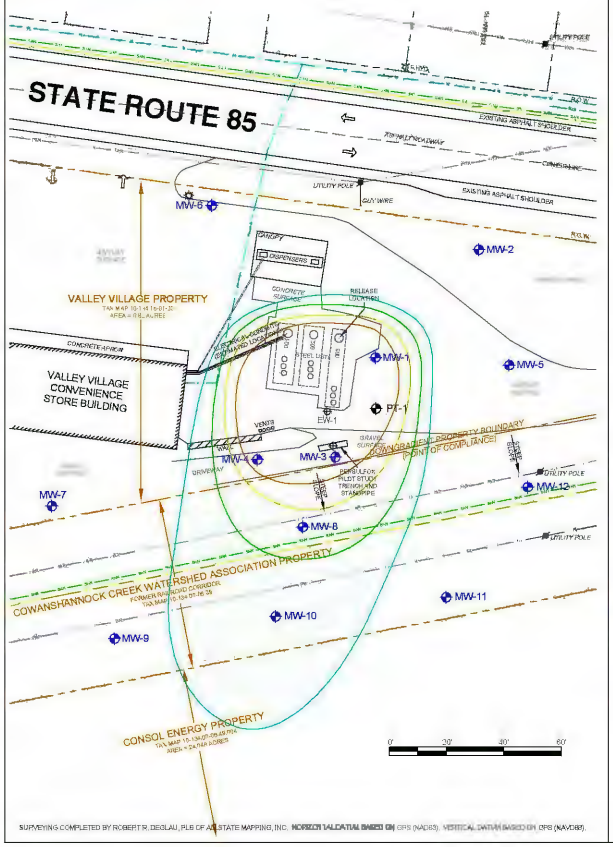
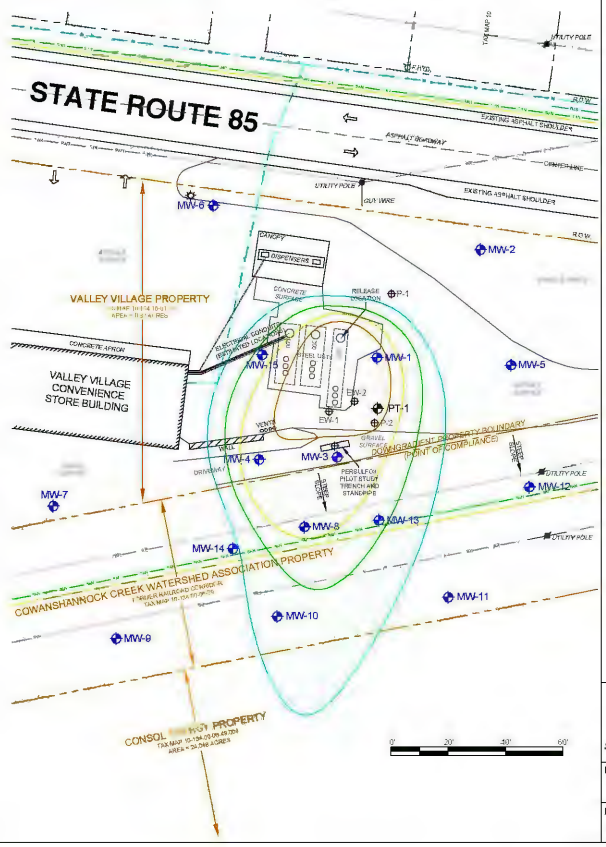
SHARON, PENNSYLVANIA 16146

**□ROUND□ ATER PLUME**
BASED ON DATA INCLUDED IN THE 2015 SCR/RAP




SURVEYING COMPLETED BY ROBERT R. DEGLAU, PLS OF ABSTATE MAPPING, INC. HORIZONTAL DATUM BASED ON GPS (NAD83). VERTICAL DATUM BASED ON GPS (NAVD88).

**REVISED □ROUND□ ATER PLUME**
BASED ON 2016 DATA




LEGEND

- MW-1 MONITORING WELL
- PT-1 PILOT TEST WELL
- EW-1 EXTRACTION WELL
- P-1 PIEZOMETER
- PROPERTY BOUNDARIES
- WATER LINE
- NATURAL GAS LINE
- SANITARY SEWER LINE
- STORM SEWER LINE
- OVERHEAD POWER LINES

**DISSOLVED P□ASE PLUME □TOTAL COC□□**

- > 10,000 ug/L
- 1,000 - 10,000 ug/L
- 100 - 1,000 ug/L
- 10 - 100 ug/L

FIGURE 4
REVISED EXTENT OF IMPACT TO GROUNDWATER
VALLEY VILLAGE
10243 STATE ROUTE 85, KITTANNING, PA 16201
*SITE CHARACTERIZATION REPORT / REMEDIAL ACTION PLAN ADDENDUM*

| DRAWN | REVISED | CHECKED | INSITE GROUP, INC. 611 SOUTH IRVINE AVENUE SHARON, PENNSYLVANIA 16146 |
|---|---|---|---|
| JLS | | | |
| DATE 07/12/2016 | DATE | DATE | |

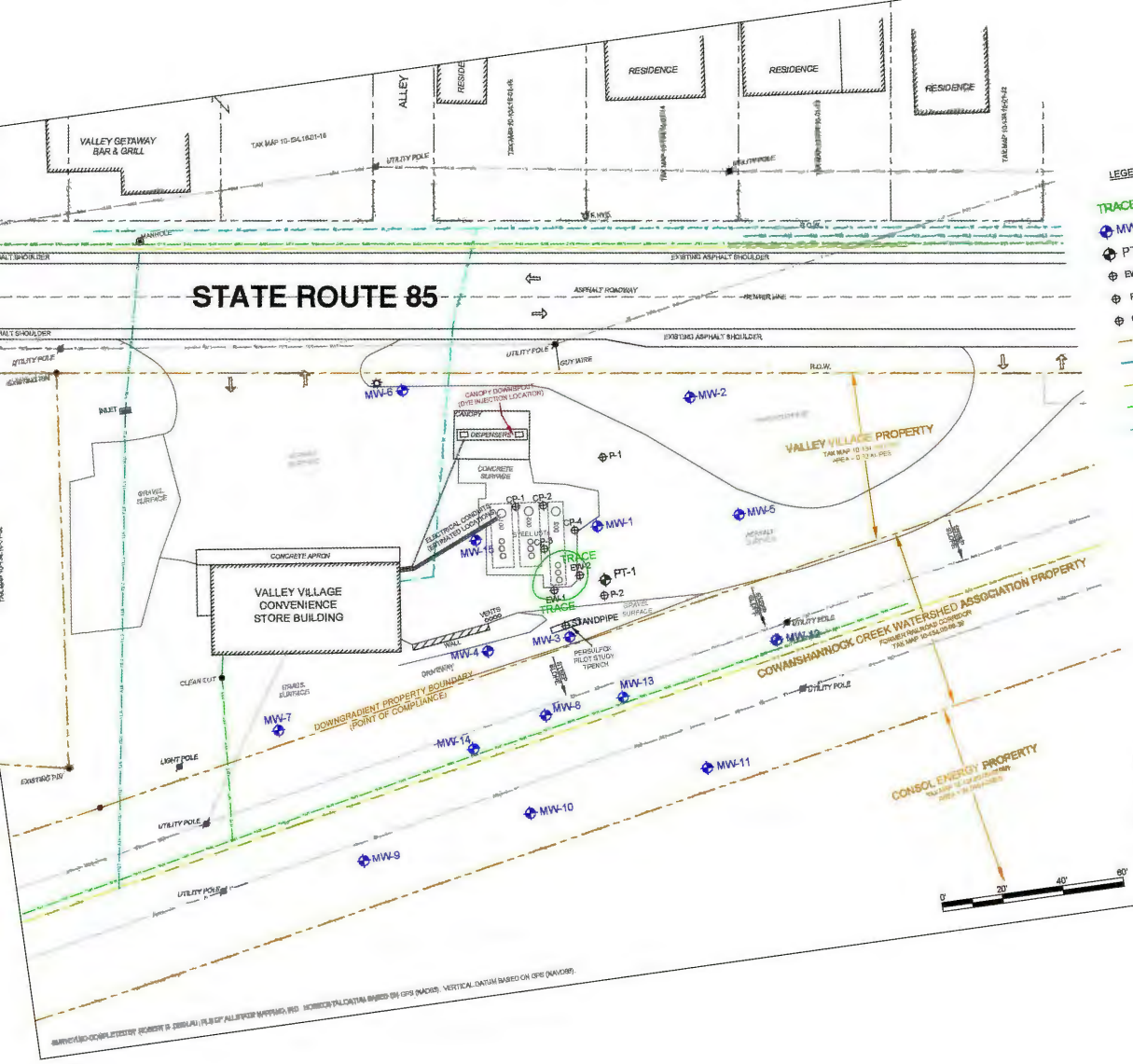



FIGURE 5
CANOPY DOWNSPOUT DYE STUDY RESULTS
VALLEY VILLAGE
10243 STATE ROUTE 85, KITTANNING, PA 16201
SITE CHARACTERIZATION REPORT / REMEDIAL ACTION PLAN ADDENDUM

| DRAWN | REVISED | CHECKED |
|---|---|---|
| JLS | JLS | SJG |
| DATE 01/08/2016 | DATE 03/18/2016 | DATE 01/13/2016 |

INSITE GROUP, INC.
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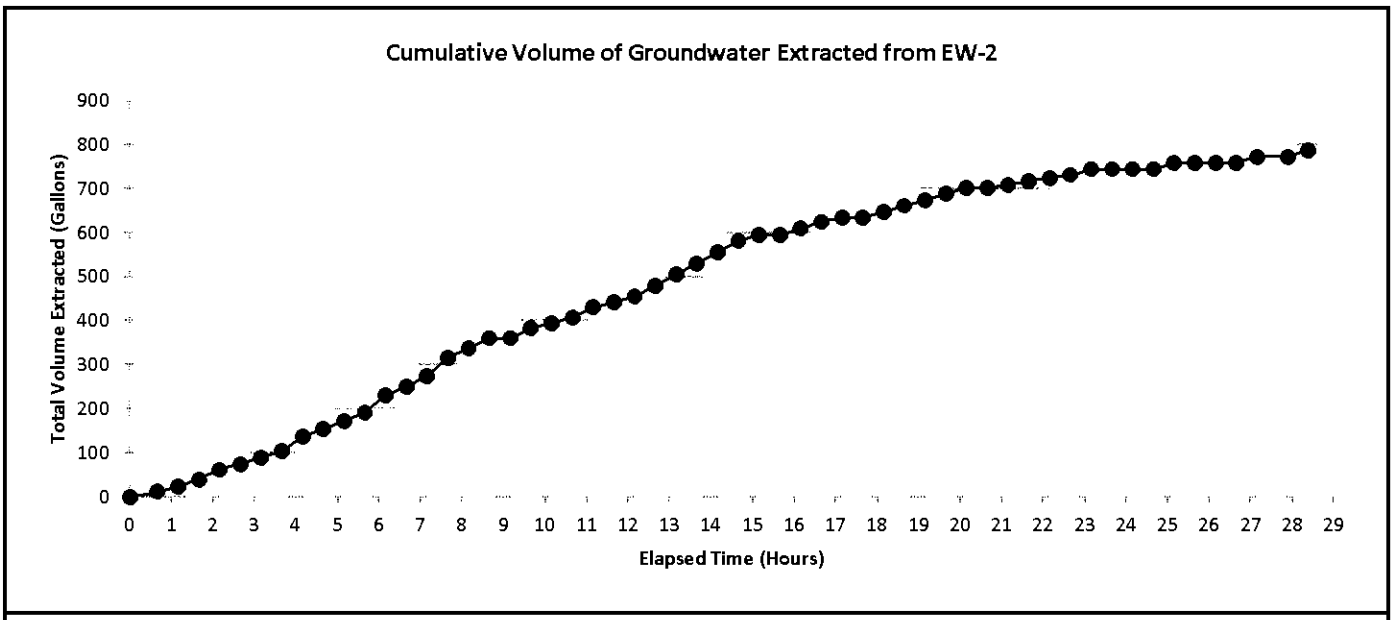
SHARON, PENNSYLVANIA 16146

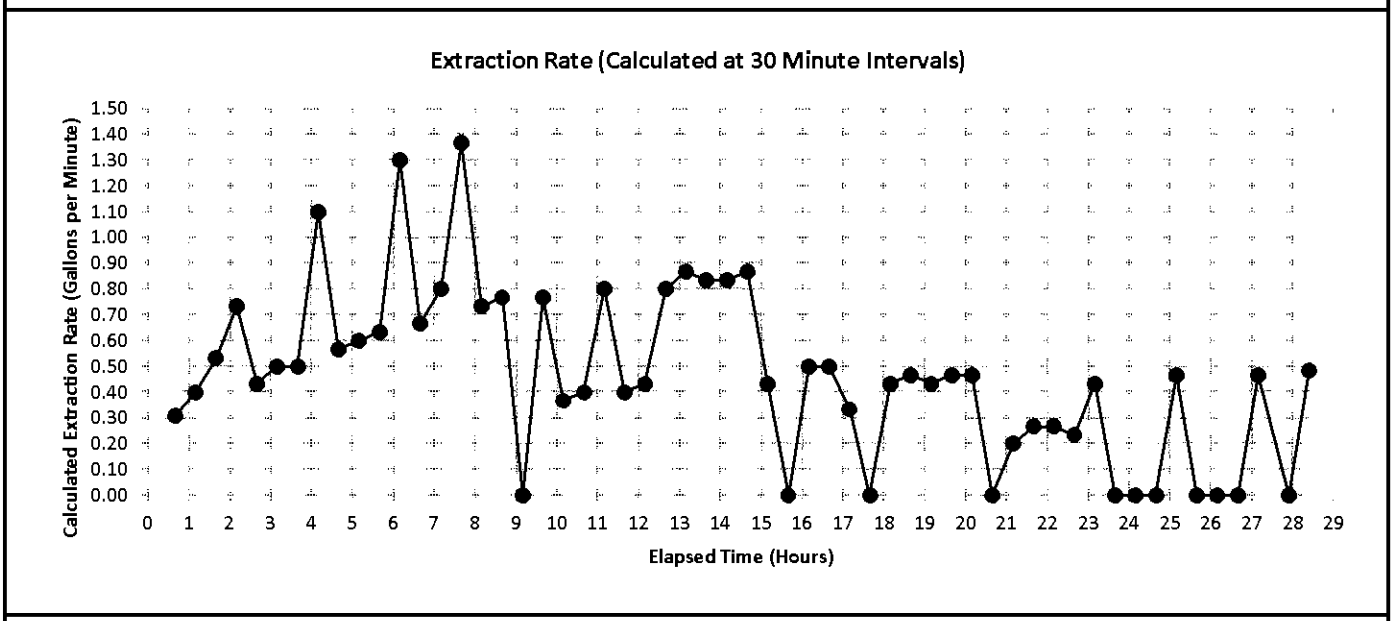
**Figure 6: Vacuum Extraction Pilot Study - Extraction Volume Graphs**

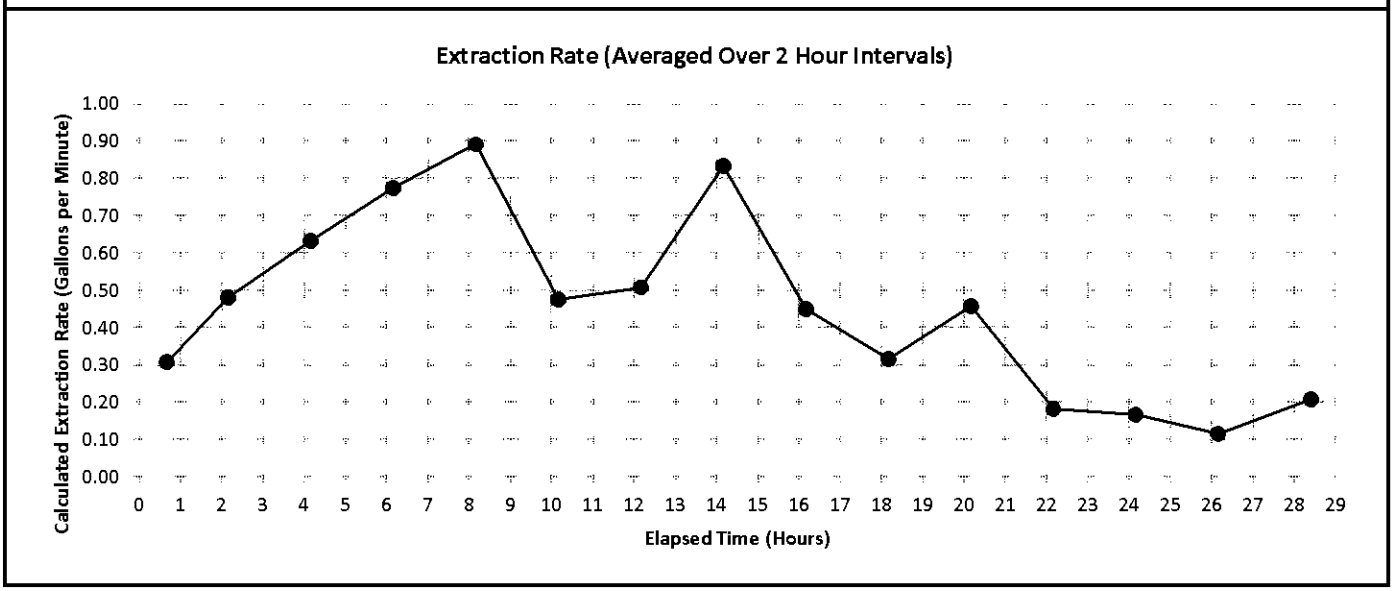
Valley Village

10243 State Route 85, Kittanning, PA 16201

*Site Characterization Report / Remedial Action Plan Addendum*



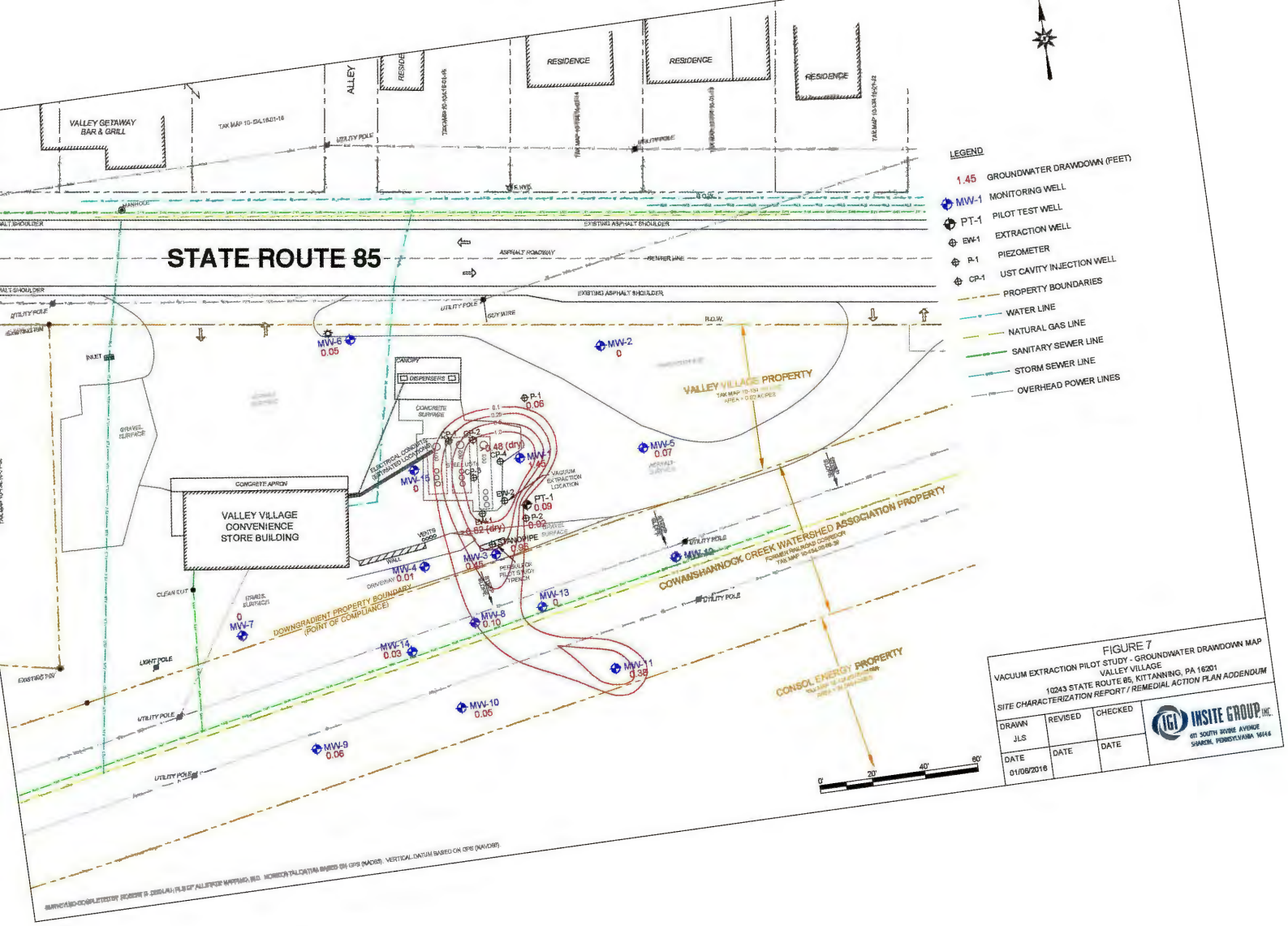

STATE ROUTE 85
VALLEY GETAWAY BAR & GRILL
ALLEY
RESIDENCE
RESIDENCE
RESIDENCE
EXISTING ASPHALT SHOULDER
ASPHALT ROADWAY
CENTER LINE
R.O.W.
UTILITY POLE
GUY WIRE
INLET
GRAVEL SURFACE
CANOPY
DISPENSERS
CONCRETE SURFACE
CONCRETE APRON
VALLEY VILLAGE CONVENIENCE STORE BUILDING
VALLEY VILLAGE PROPERTY
COWANSHANNOCK CREEK WATERSHED ASSOCIATION PROPERTY
CONSOL ENERGY PROPERTY
DOWNGRADIENT PROPERTY BOUNDARY (POINT OF COMPLIANCE)
CLEAN CUT
LIGHT POLE
VENTS
WALL
DRIVEWAY
VACUUM EXTRACTION LOCATION
ELECTRICAL CONDUIT SEPARATED LOCATIONS
MW-1 1.45
MW-2 0
MW-3 0.05
MW-4 0.01
MW-5 0.07
MW-6 0.05
MW-7 0
MW-8 0.10
MW-9 0.06
MW-10 0.05
MW-11 0.38
MW-13 0
MW-14 0.03
MW-15 0
MW-16
P-1 0.06
P-2 0.02
PT-1 0.09
EW-1 0.62 (dry)
EW-2 0.48 (dry)
CP-1
CP-2
CP-3
CP-4
STANDPIPE 0.98
PERMEABLE PILOT STUDY TRENCH
0' 20' 40' 60'
LEGEND
1.45 GROUNDWATER DRAWDOWN (FEET)
MW-1 MONITORING WELL
PT-1 PILOT TEST WELL
EW-1 EXTRACTION WELL
P-1 PIEZOMETER
CP-1 UST CAVITY INJECTION WELL
PROPERTY BOUNDARIES
WATER LINE
NATURAL GAS LINE
SANITARY SEWER LINE
STORM SEWER LINE
OVERHEAD POWER LINES
FIGURE 7
VACUUM EXTRACTION PILOT STUDY - GROUNDWATER DRAWDOWN MAP
VALLEY VILLAGE
10243 STATE ROUTE 85, KITTANNING, PA 16201
SITE CHARACTERIZATION REPORT / REMEDIAL ACTION PLAN ADDENDUM
DRAWN JLS
REVISED
CHECKED
DATE 01/08/2016
DATE
DATE
INSITE GROUP, INC.
611 SOUTH RIVERE AVENUE
SHARON, PENNSYLVANIA 16146

**Figure 8: Vacuum Extraction Pilot Study - Depth to Water Graphs (Period of Extraction through 24 Hours Post Extraction)**

Valley Village, 10243 State Route 85, Kittanning, PA 16201

*Site Characterization Report / Remedial Action Plan Addendum*

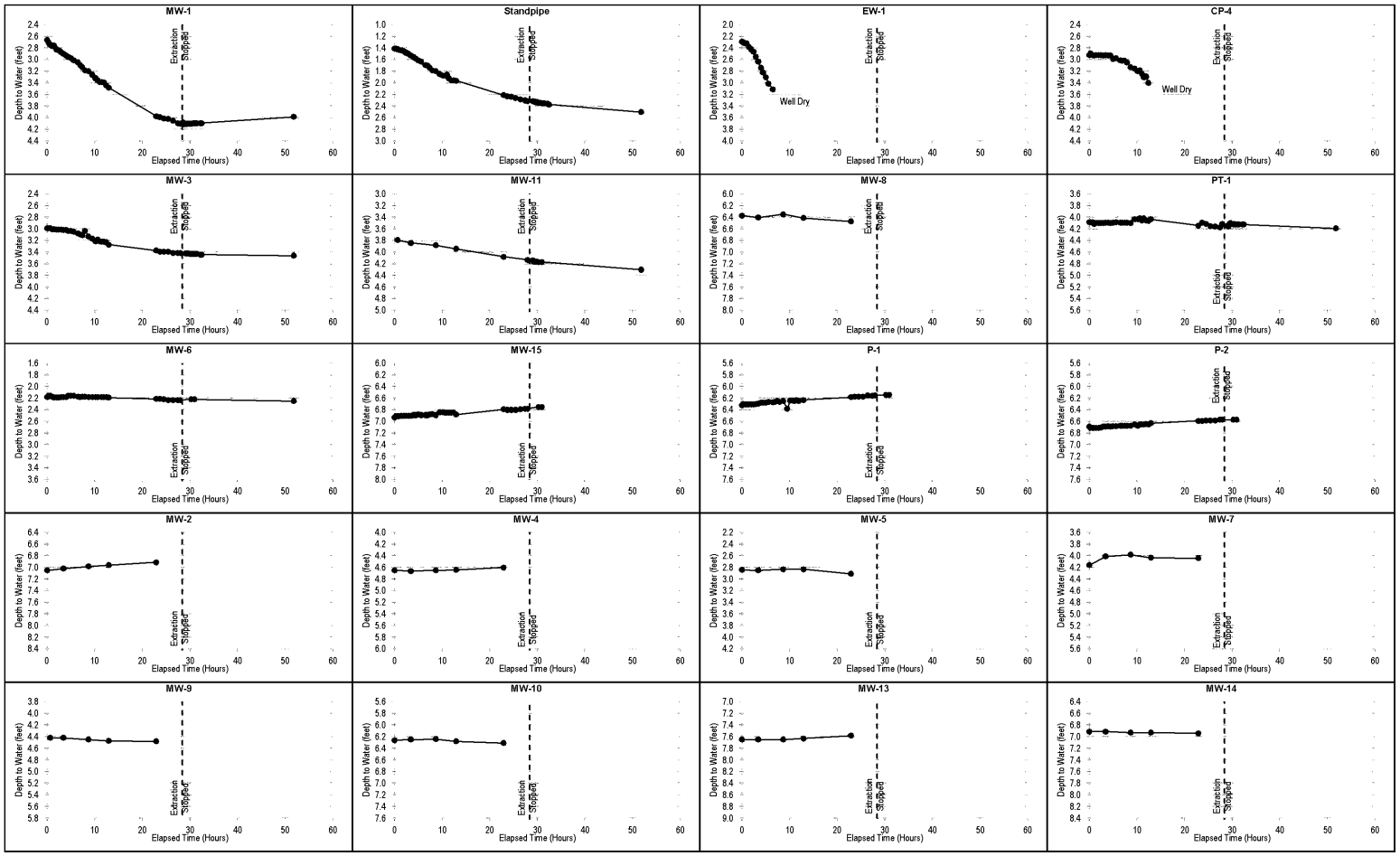


**Figure 9: Vacuum Extraction Pilot Study - Depth to Water Graphs**
**(Period of Extraction through 7 Days Post Extraction)**

Valley Village
10243 State Route 85, Kittanning, PA 16201
*Site Characterization Report / Remedial Action Plan Addendum*

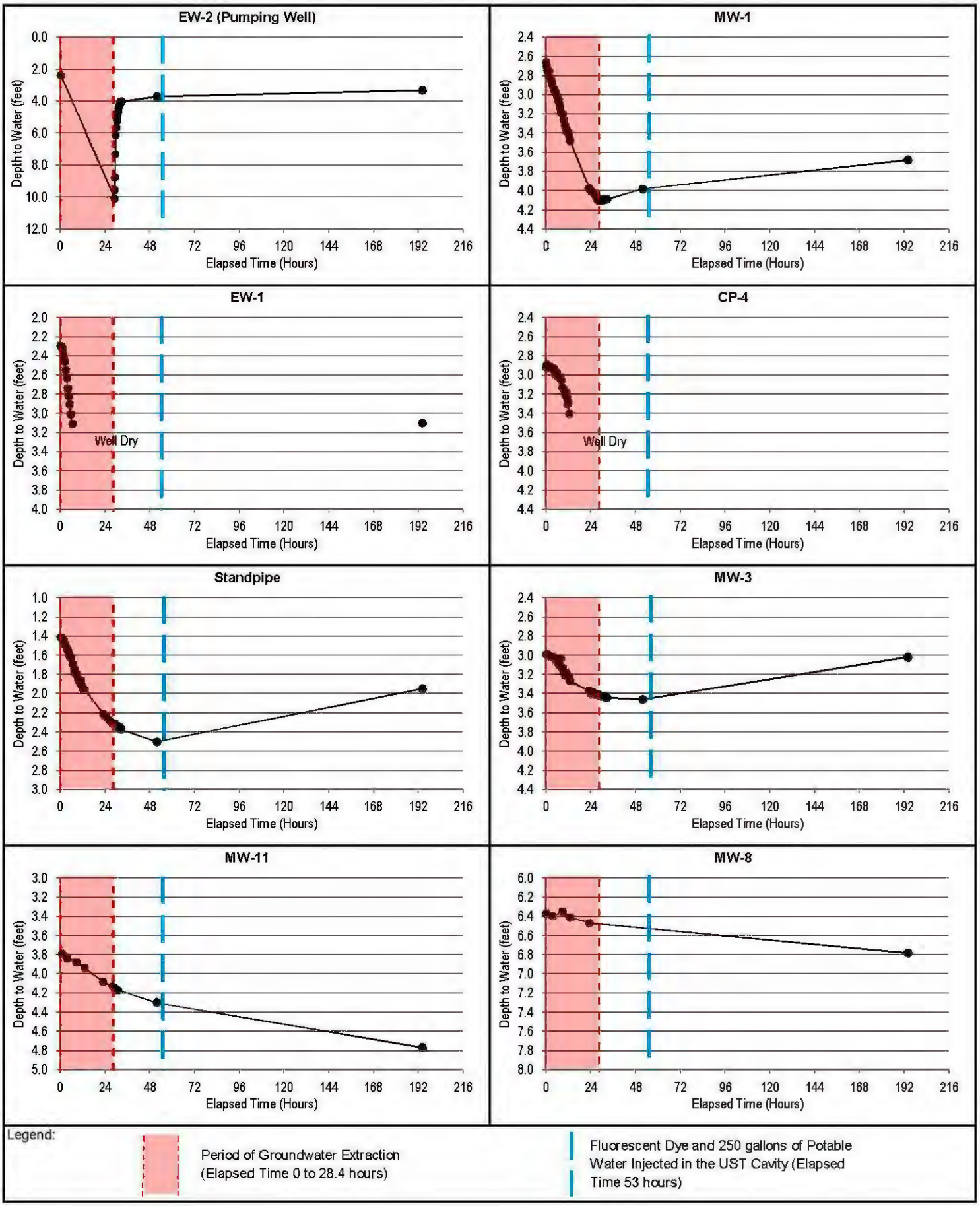
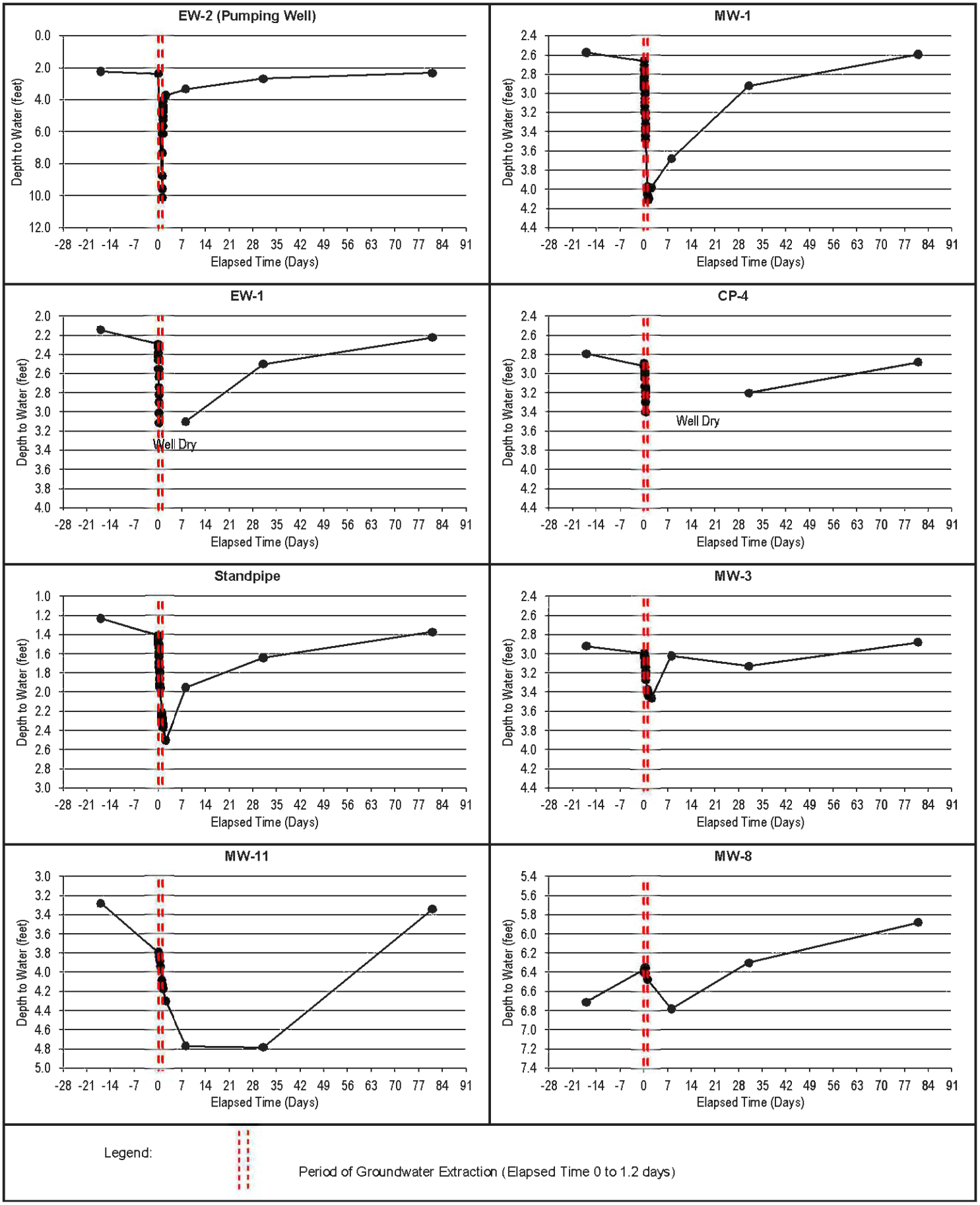


**Figure 10: Vacuum Extraction Pilot Study - Depth to Water Graphs**
**(17 Days Before Extraction through 80 Days Post Extraction)**

Valley Village
10243 State Route 85, Kittanning, PA 16201
*Site Characterization Report / Remedial Action Plan Addendum*



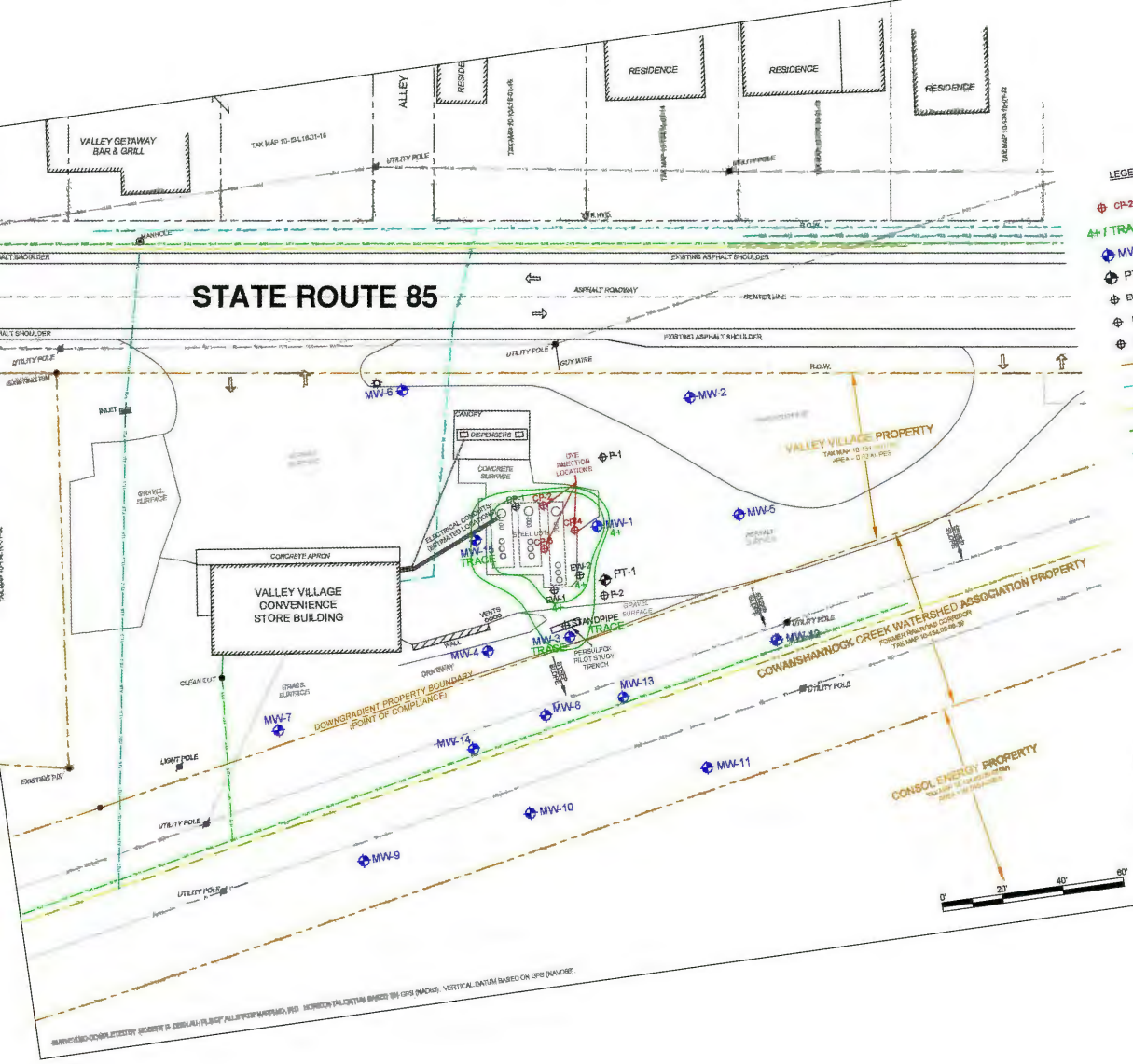
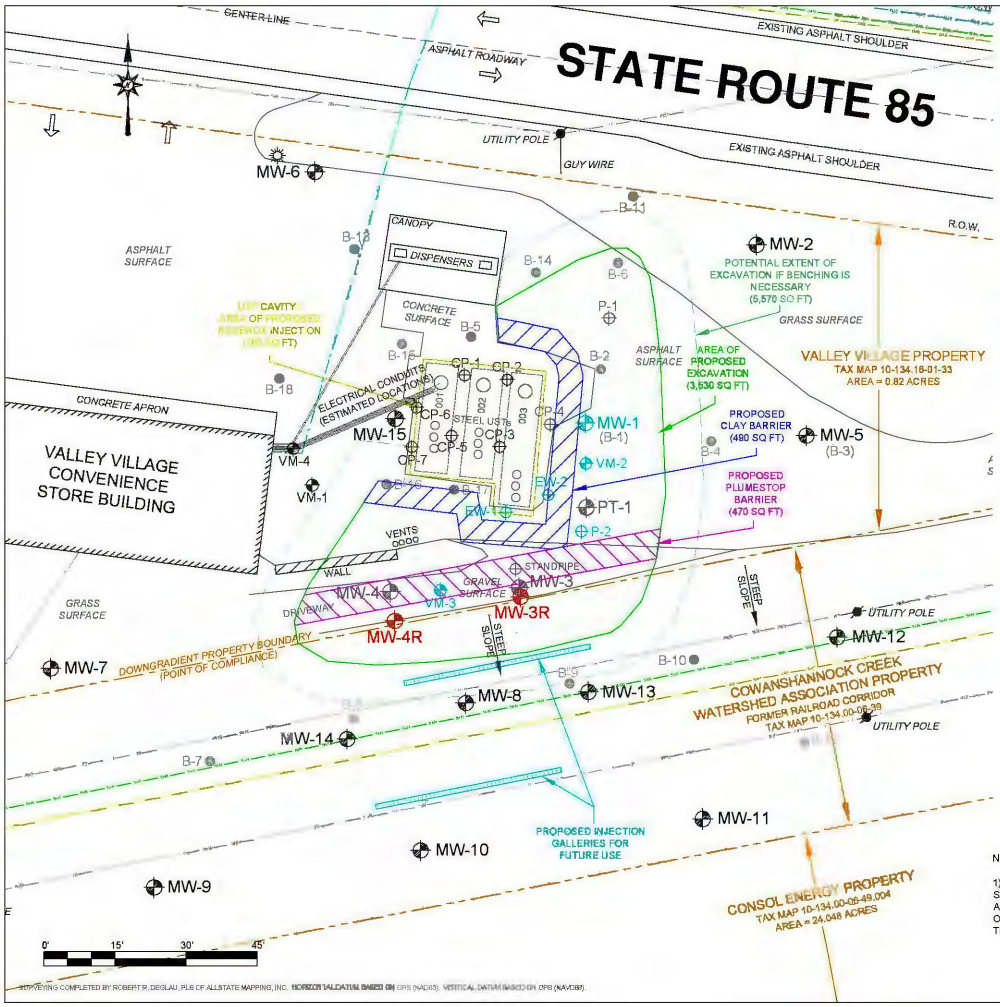



FIGURE 11
UST CAVITY DYE STUDY RESULTS
VALLEY VILLAGE
10243 STATE ROUTE 85, KITTANNING, PA 16201
SITE CHARACTERIZATION REPORT / / REMEDIAL ACTION PLAN ADDENDUM

| DRAWN | REVISED | CHECKED |
|---|---|---|
| JLS | JLS | SJG |
| DATE 01/08/2016 | DATE 07/13/2016 | DATE 01/13/2016 |

INSITE GROUP, INC.
611 SOUTH RIVERE AVENUE
SHARON, PENNSYLVANIA 16146




LEGEND

- MW-2 EXISTING MONITORING WELL
- MW-1 EXISTING WELL TO BE REMOVED DURING EXCAVATION AND REPLACED AT THE SAME LOCATION.
- MW-3 EXISTING WELL TO BE REMOVED DURING EXCAVATION AND NOT REPLACED
- MW-3R PROPOSED REPLACEMENT MONITORING WELL
- EW-1 EXISTING EXTRACTION WELL
- CP-1 EXISTING UST CAVITY INJECTION WELL
- VM-1 EXISTING SOIL VAPOR MONITORING POINT
- P-1 EXISTING PIEZOMETER
- B-2 FORMER SOIL BORING
- PROPOSED INJECTION GALLERIES
- PROPERTY BOUNDARIES
- WATER LINE
- NATURAL GAS LINE
- SANITARY SEWER LINE
- STORM SEWER LINE
- OVERHEAD POWER LINES

**AREA OF PROPOSED EXCAVATION** (~ 3,530 SQUARE FEET)
- ADSORBED PHASE MASS ABOVE AND BELOW THE WATER TABLE WILL BE EXCAVATED TO AN ESTIMATED TOTAL DEPTH OF UP TO 17 FEET BGS. TOTAL VOLUME = ~ 2,223 CUBIC YARDS.

**PROPOSED CLAY BARRIER** (~ 490 SQUARE FEET)
- THE PORTION OF THE EXCAVATION IMMEDIATELY ADJACENT TO THE UST CAVITY WILL BE BACKFILLED CLAY REUSE SOIL TO CREATE A CLAY BARRIER AROUND THE UST CAVITY.

**PROPOSED PLUMESTOP BARRIER** (~ 470 SQUARE FEET)
- FOLLOWING BACKFILLING, A TRENCH WILL BE EXCAVATED NEAR THE DOWNGRADIENT PROPERTY BOUNDARY. THE MATERIAL EXCAVATED WILL BE MIXED WITH SAND.
- PLUMESTOP WILL BE MIXED WITH THE SOIL IN THE TRENCH DURING BACKFILLING APPLIED FROM 2 TO 17 FEET BGS.

**UST CAVITY** (~ 700 SQUARE FEET)
- REGENOX PART A WILL BE INJECTED INTO THE UST CAVITY TO DESORB AND OXIDIZE CONTAMINANT MASS.
- FOLLOWING INJECTION, GROUNDWATER WILL BE EXTRACTED FROM THE UST CAVITY TO REMOVE THE LIBERATED CONTAMINANT MASS.

**WELLS TO BE REMOVED DURING EXCAVATION**

| | |
|---|---|
| MW-1 | TO BE REPLACED AS MW-1R AT SAME LOCATION. |
| MW-3 | TO BE REPLACED AS MW-3R AT LOCATION INDICATED. |
| MW-4 | TO BE REPLACED AS MW-4R AT LOCATION INDICATED. |
| P-1 | WILL NOT BE REPLACED. |
| P-2 | TO BE REPLACED AS P-2R AT SAME LOCATION. |
| PT-1 | WILL NOT BE REPLACED. |
| STANDPIPE | WILL NOT BE REPLACED. |
| VM-2 | TO BE REPLACED AS VM-2R AT SAME LOCATION. |
| VM-3 | TO BE REPLACED AS VM-3R AT SAME LOCATION. |
| EW-1 | TO BE REPLACED AS EW-1R AT SAME LOCATION. |
| EW-2 | TO BE REPLACED AS EW-2R AT SAME LOCATION. |
| CP-4 | WILL NOT BE REPLACED. |

NOTE:

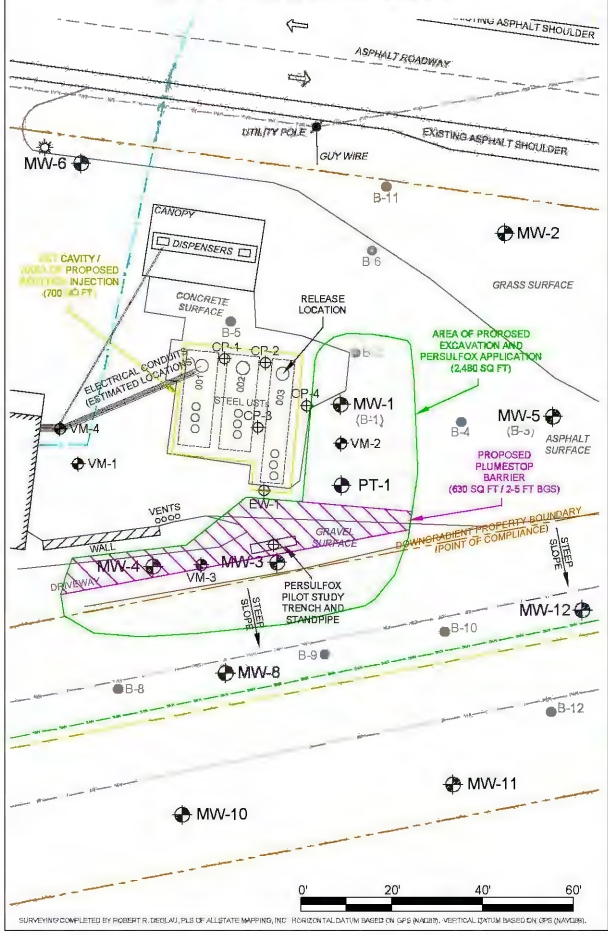
1) THE PROPOSED AREA OF EXCAVATION SHOWN IS AN ESTIMATE. THE ACTUAL AREA OF EXCAVATION MAY VARY BASED ON SITE CONDITIONS ENCOUNTERED IN THE FIELD.

FIGURE 12
PROPOSED REMEDIATION (REVISED)
VALLEY VILLAGE
10243 STATE ROUTE 85, KITTANNING, PA 16201
*SITE CHARACTERIZATION REPORT / REMEDIAL ACTION PLAN ADDENDUM*

| DRAWN | REVISED | CHECKED |
|---|---|---|
| JLS | JLS | SJG |
| DATE 02/19/2015 | DATE 07/21/2016 | DATE 07/21/2016 |

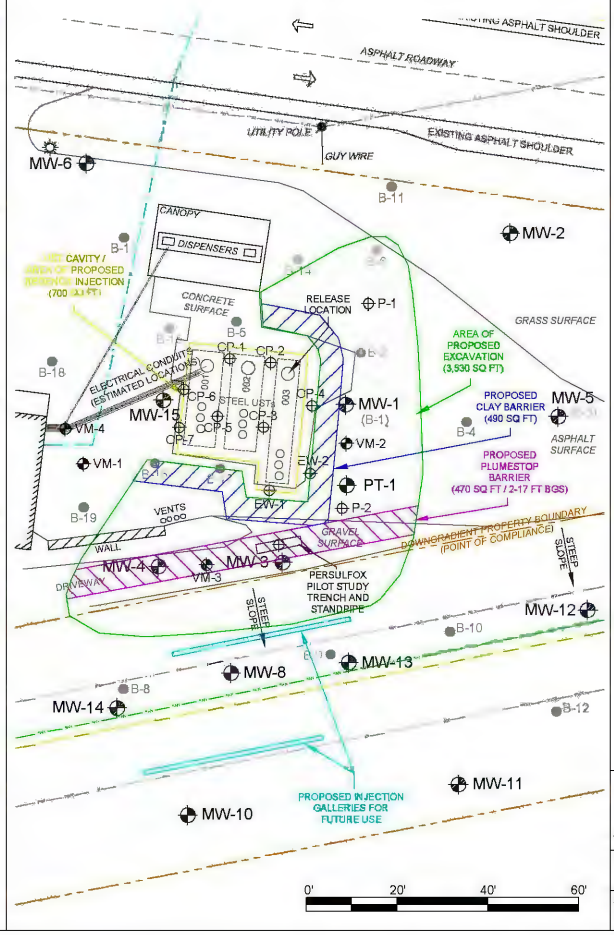
INSITE GROUP INC.
611 SOUTH IRVINE AVENUE
SHARON, PENNSYLVANIA 16146

## PREVIOUS REMEDIAL APPROAC
AS PRESENTED IN THE 2015 SCR/RAP




SURVEYING COMPLETED BY ROBERT R. DEDLAU, PLS OF ALLSTATE MAPPING, INC. HORIZONTAL DATUM BASED ON GPS (NAD83). VERTICAL DATUM BASED ON GPS (NAVD88).

## REVISED REMEDIAL APPROAC




LEGEND

- MW-1 MONITORING WELL
- PT-1 PILOT TEST WELL
- EW-1 EXTRACTION WELL
- P-1 PIEZOMETER
- CP-1 UST CAVITY INJECTION WELL
- VM-1 SOIL VAPOR MONITORING POINT
- B-2 SOIL BORING
- PROPERTY BOUNDARIES
- WATER LINE
- NATURAL GAS LINE
- SANITARY SEWER LINE
- STORM SEWER LINE
- OVERHEAD POWER LINES

FIGURE 13
PREVIOUS REMEDIAL APPROACH VS. REVISED REMEDIAL APPROACH
VALLEY VILLAGE
10243 STATE ROUTE 85, KITTANNING, PA 16201
*SITE CHARACTERIZATION REPORT / REMEDIAL ACTION PLAN ADDENDUM*

| DRAWN | REVISED | CHECKED |
|---|---|---|
| JLS | JLS | |
| DATE | DATE | DATE |
| 07/12/2016 | 07/21/2016 | |

INSITE GROUP, INC.
611 SOUTH IRVINE AVENUE
SHARON, PENNSYLVANIA 16146

# TABLES

## Table 1.0: Soil Analytical Results

| Sample ID | Depth (feet) | Date | Unleaded Gasoline Parameters (mg/kg) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Benzene | Ethyl-benzene | Cumene | MTBE | Naph-thalene | Toluene | 1,2,4-Trimethyl-benzene | 1,3,5-Trimethyl-benzene | Xylenes (total) |
| *Statewide Health Standard, Direct Contact, Residential 0-15 feet* | | | *57* | *10,000* | *7,700* | *1,700* | *4,400* | *10,000* | *130* | *110* | *1,900* |
| *Statewide Health Standard, Soil to GW, Residential, Used Aquifer* | | | *0.5* | *70* | *600* | *2* | *25* | *100* | *8.4* | *2.3* | *1,000* |
| **B-14** | 8 - 10 | 10/06/15 | <0.00114 | 0.00973 | 0.00153 | 0.00274 | <0.00570 | <0.00570 | 0.00316 | 0.00154 | 0.0148 |
| **B-14** | 14 - 16 | 10/06/15 | 0.0852 | 0.0702 | 0.00484 | 0.00658 | 0.00932 | 0.448 | 0.0241 | 0.0112 | 0.303 |
| **B-15** | 1 | 10/01/15 | 0.00201 | 0.00167 | <0.00108 | 0.00218 | 0.0173 | <0.00541 | 0.00701 | 0.00279 | 0.00923 |
| **B-15** | 8 - 10 | 10/07/15 | 0.0117 | <0.00113 | <0.00113 | <0.00113 | <0.00566 | <0.00566 | <0.00113 | <0.00113 | <0.00340 |
| **B-16** | 4.5 | 10/01/15 | 0.158 | 0.00945 | <0.00121 | <0.00121 | <0.00606 | <0.00606 | 0.00246 | <0.00121 | 0.0351 |
| **B-16** | 6 - 8 | 10/08/15 | **3.32** | 3.36 | 0.271 | <0.0869 | 1.72 | 16.3 | 6.62 | 1.58 | 20.9 |
| **B-16** | 8 - 10 | 10/08/15 | **6.84** | 3.94 | 0.0181 | 0.0200 | <0.00579 | 2.76 | 0.0820 | 0.0411 | 3.62 |
| **B-17** | 8 - 10 | 10/07/15 | **1.11** | 0.536 | 0.0965 | 0.0171 | 0.165 | 0.704 | 0.777 | 0.212 | 2.19 |
| **B-17** | 10 - 12 | 10/07/15 | **0.759** | 2.61 | 0.334 | <0.157 | 0.895 | 3.89 | 6.44 | 1.83 | 14.5 |
| **B-17** | 14 - 16 | 10/07/15 | 0.00410 | 0.00509 | <0.00112 | 0.00465 | 0.00715 | 0.00746 | 0.00216 | 0.00160 | 0.0216 |
| **MW-15** | 5 | 10/01/15 | 0.0640 | 0.300 | 0.0320 | <0.0231 | 0.259 | 0.418 | 0.801 | 0.192 | 1.85 |
| **MW-15** | 5 - 6 | 10/07/15 | 0.147 | 0.541 | 0.0879 | <0.00112 | 0.0555 | 1.32 | 1.14 | 0.290 | 3.42 |
| **EW-2** | 2 | 10/12/15 | <0.0251 | <0.0251 | <0.0251 | <0.0251 | <0.125 | <0.125 | <0.0251 | <0.0251 | <0.0753 |
| **P-1** | 4 - 6 | 10/05/15 | 0.0612 | 0.0439 | 0.00555 | <0.00108 | 0.0153 | 0.371 | 0.0544 | 0.0188 | 0.228 |
| **P-1** | 8 - 10 | 10/05/15 | **0.820** | 7.39 | 1.07 | <0.0222 | 3.56 | 21.7 | **21.4** | **5.96** | 44.3 |
| **P-1** | 11 - 13 | 10/08/15 | 0.378 | 0.182 | 0.0151 | <0.00111 | 0.0417 | 2.01 | 0.182 | 0.0655 | 2.52 |
| **P-2** | 4 - 6 | 10/05/15 | **0.628** | 0.456 | 0.512 | 0.124 | 0.731 | 1.31 | 0.801 | 0.187 | 2.19 |
| **P-2** | 6 - 8 | 10/05/15 | **1.99** | 6.14 | 0.694 | <0.422 | <2.11 | 8.97 | **12.4** | **3.68** | 29.5 |
| **P-2** | 12 - 14 | 10/08/15 | 0.113 | 0.830 | 0.0399 | 0.0162 | 0.100 | 0.904 | 3.09 | 0.170 | 3.82 |

Notes: 1) Concentrations exceeding their respective SHS-RUA values are shown in **bold**.
2) Samples were analyzed by EPA Method 5035 / 8260B.

## Table 2.0: Soil Analytical Results – Additional Parameters for FC-1 Disposal

| Sample ID | Depth (feet) | Date | Parameters (mg/kg) | | |
|---|---|---|---|---|---|
| | | | Extracted TOX | Lead | TPH (GC/FID) Low Fraction |
| **B-16** | 6 - 8 | 10/08/15 | <29.0 | 18.6 | 139 |
| **B-17** | 8 - 10 | 10/07/15 | <29.0 | 19.8 | 18.0 |
| **B-17** | 10 - 12 | 10/07/15 | <26.5 | 9.08 | 149 |
| **EW-2** | 2 | 10/12/15 | <27.9 | 16.6 | 1.73 |
| **P-1** | 4 - 6 | 10/05/15 | <26.9 | 13.3 | 3.66 |
| **P-1** | 8 - 10 | 10/05/15 | 14.4 | 10.4 | 476 |
| **P-1** | 11 - 13 | 10/08/15 | <27.8 | 10.9 | 8.72 |
| **P-2** | 4 - 6 | 10/05/15 | <31.0 | 21.3 | 25.9 |
| **P-2** | 6 - 8 | 10/05/15 | <29.7 | 15.6 | 317 |
| **P-2** | 12 - 14 | 10/08/15 | <28.2 | 14.2 | 10.0 |

## Table 3.0: Historical Groundwater Analytical Results (page 1 of 4)

| Sample ID | Date | Depth to Water (feet) | GW Elevation (feet) | Unleaded Gasoline Parameters (ug/L) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Benzene | Ethyl-benzene | Cumene | MTBE | Naph-thalene | Toluene | 1,2,4-Trimethyl-benzene | 1,3,5-Trimethyl-benzene | Total Xylenes |
| *Statewide Health Standard, Residential, Used Aquifer* | | | | *5* | *700* | *840* | *20* | *100* | *1,000* | *15* | *13* | *10,000* |
| | | | | | | | | | | | | |
| **MW-1** | 07/10/14 | 2.49 | 1,118.01 | **14,000** | **1,800** | <250 | <92 | **<250** | **17,000** | **990** | **260** | 10,000 |
| | | | | | | | | | | | | |
| **MW-1** | 12/04/14 | 2.59 | 1,117.91 | **9,200** | **2,100** | <250 | <92 | **330** | **11,000** | **1,700** | **460** | **11,000** |
| **MW-1** | 01/15/15 | 3.37 | 1,117.13 | **14,000** | **2,600** | 120 | 18 | **420** | **13,000** | **1,900** | **560** | **14,000** |
| **MW-1** | 07/01/15 | 1.57 | 1,118.93 | **11,000** | **2,400** | 110 | <37 | **390** | **9,100** | **2,000** | **530** | **11,000** |
| **MW-1** | 09/23/15 | 3.02 | 1,117.48 | **11,200** | **2,780** | **1,520** | **162** | **6,020** | **10,200** | **2,140** | **6,780** | **14,200** |
| **MW-1** | 12/15/15 | 3.68 | 1,116.82 | **13,700** | **2,580** | <200 | <73.4 | **426** | **9,570** | **2,130** | **592** | **14,400** |
| **MW-1** | 02/23/16 | 2.59 | 1,117.91 | **5,620** | **2,090** | <200 | <73.4 | **334** | **3,680** | **2,010** | **501** | **10,200** |
| **MW-1** | 05/20/16 | 2.75 | 1,117.75 | **6,540** | **2,340** | <200 | <73.4 | **3,280** | **5,010** | **6,210** | **1,810** | **13,600** |
| | | | | | | | | | | | | |
| **MW-2** | 07/10/14 | 9.70 | 1,113.90 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-2** | 12/04/14 | 10.59 | 1,113.01 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-2** | 01/15/15 | 7.97 | 1,115.63 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-2** | 07/01/15 | 6.42 | 1,117.18 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-2** | 09/23/15 | 9.94 | 1,113.66 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-2** | 12/15/15 | 6.44 | 1,117.16 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-2** | 02/23/16 | 3.79 | 1,119.81 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-2** | 05/20/16 | 7.30 | 1,116.30 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | 1.71 | <3.00 |
| | | | | | | | | | | | | |
| **MW-3** | 07/10/14 | 2.99 | 1,115.94 | **4,600** | 280 | <25 | **120** | 71 | **1,300** | **650** | **230** | 3,700 |
| **MW-3** | 11/24/14 | 3.58 | 1,115.35 | **7,600** | **2,000** | 73 | **55** | **250** | **1,400** | **970** | **280** | 5,500 |
| **MW-3** | 12/04/14 | 3.10 | 1,115.83 | **6,300** | **1,400** | <100 | **51** | **140** | **2,000** | **680** | **230** | 3,800 |
| | | | | | | | | | | | | |
| **MW-3** | 12/10/14 | 1.89 | 1,117.04 | **5,200** | **1,600** | 73 | <9.2 | **270** | **2,100** | **1,300** | **310** | 7,800 |
| **MW-3** | 12/18/14 | 2.22 | 1,116.71 | **4,600** | **1,500** | <250 | <92 | **300** | **3,100** | **1,400** | **340** | 7,900 |
| **MW-3** | 01/15/15 | 2.60 | 1,116.33 | **4,700** | **1,700** | 82 | <37 | **300** | **2,000** | **1,500** | **360** | 7,700 |
| | | | | | | | | | | | | |
| **MW-3** | 06/05/15 | -- | -- | **6,910** | **2,350** | 107 | 15.1 | **395** | 175 | **2,030** | **507** | 6,210 |
| **MW-3** | 07/01/15 | 1.63 | 1,117.30 | **5,500** | **1,700** | 82 | <37 | **240** | 830 | **1,400** | **310** | 3,900 |
| | | | | | | | | | | | | |
| **MW-3** | 09/23/15 | 3.13 | 1,115.80 | **4,650** | **1,090** | <100 | <36.7 | **131** | <500 | **459** | **75.1** | 1,180 |
| | | | | | | | | | | | | |
| **MW-3** | 12/15/15 | 3.02 | 1,115.91 | **4,240** | **842** | <100 | <36.7 | <100 | <500 | **554** | **39.2** | 1,060 |
| | | | | | | | | | | | | |
| **MW-3** | 02/23/16 | 2.88 | 1,116.05 | **3,670** | **1,200** | 62.7 | 12.8 | **124** | 669 | **798** | **124** | 3,140 |
| | | | | | | | | | | | | |
| **MW-3** | 05/20/16 | 3.64 | 1,115.29 | **4,280** | **1,120** | <100 | **110** | <100 | <500 | **288** | **<38.7** | 811 |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| **MW-4** | 07/10/14 | 8.39 | 1,109.34 | **9,000** | 470 | <100 | **430** | **200** | **13,000** | **1,400** | **370** | 10,000 |
| **MW-4** | 12/04/14 | 5.78 | 1,111.95 | **7,200** | **1,400** | <100 | **300** | **150** | **6,100** | **1,300** | **360** | 6,600 |
| **MW-4** | 01/15/15 | 5.72 | 1,112.01 | **5,400** | 320 | <100 | **300** | <100 | **6,800** | **410** | **230** | 3,800 |
| **MW-4** | 07/01/15 | 4.34 | 1,113.39 | **4,700** | **860** | 35 | **240** | **110** | **1,900** | **650** | **240** | 3,200 |
| **MW-4** | 09/23/15 | 5.52 | 1,112.21 | **5,010** | **1,200** | 55.8 | **279** | **152** | **2,530** | **879** | **278** | 3,820 |
| **MW-4** | 12/15/15 | 4.64 | 1,113.09 | **4,440** | 620 | <100 | **220** | <100 | 705 | **384** | **134** | 1,270 |
| **MW-4** | 02/23/16 | 4.35 | 1,113.38 | **4,020** | 644 | 33.1 | **256** | 72.5 | 871 | **513** | **176** | 1,590 |
| **MW-4** | 05/20/16 | 4.83 | 1,112.90 | **5,310** | **878** | <100 | **348** | **124** | **1,580** | **649** | **224** | 2,230 |

Notes: 1) Concentrations exceeding the SHS are shown in **bold**.
2) DUP = blind duplicate sample.
3) Samples were analyzed by EPA Method 5030B / 8260B.

## Table 3.0: Historical Groundwater Analytical Results (page 2 of 4)

| Sample ID | Date | Depth to Water (feet) | GW Elevation (feet) | Unleaded Gasoline Parameters (ug/L) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Benzene | Ethyl-benzene | Cumene | MTBE | Naph-thalene | Toluene | 1,2,4-Trimethyl-benzene | 1,3,5-Trimethyl-benzene | Total Xylenes |
| *Statewide Health Standard, Residential, Used Aquifer* | | | | *5* | *700* | *840* | *20* | *100* | *1,000* | *15* | *13* | *10,000* |
| | | | | | | | | | | | | |
| **MW-5** | 07/10/14 | 2.99 | 1,116.00 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-5** | 12/04/14 | 3.97 | 1,115.02 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-5** | 01/15/15 | 3.11 | 1,115.88 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-5** | 07/01/15 | 3.47 | 1,115.52 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-5** | 09/23/15 | 5.79 | 1,113.20 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-5** | 12/15/15 | 3.19 | 1,115.80 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-5** | 02/23/16 | 2.50 | 1,116.49 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-5** | 05/20/16 | 2.68 | 1,116.31 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| | | | | | | | | | | | | |
| **MW-6** | 09/03/14 | 4.33 | 1,119.12 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-6** | 12/04/14 | 2.63 | 1,120.82 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-6** | 01/15/15 | 2.38 | 1,121.07 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-6** | 07/01/15 | 2.18 | 1,121.27 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-6** | 09/23/15 | 4.44 | 1,119.01 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-6** | 12/15/15 | 2.30 | 1,121.15 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-6** | 02/23/16 | 2.12 | 1,121.33 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-6** | 05/20/16 | 3.95 | 1,119.50 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| | | | | | | | | | | | | |
| **MW-7** | 09/03/14 | 3.15 | 1,111.05 | <1.0 | <1.0 | <1.0 | 1.5 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-7** | 12/04/14 | 5.04 | 1,109.16 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-7** | 01/15/15 | 4.26 | 1,109.94 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-7** | 07/01/15 | 3.90 | 1,110.30 | <1.0 | <1.0 | <1.0 | 1.2 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-7** | 09/23/15 | 5.77 | 1,108.43 | <1.00 | <1.00 | <1.00 | 2.11 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-7** | 12/15/15 | 4.10 | 1,110.10 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-7** | 02/23/16 | 3.56 | 1,110.64 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-7** | 05/20/16 | 3.62 | 1,110.58 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| | | | | | | | | | | | | |
| **MW-8** | 09/03/14 | 5.91 | 1,109.76 | **30** | <1.0 | <1.0 | **340** | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| | | | | | | | | | | | | |
| **MW-8** | 11/24/14 | 7.34 | 1,108.33 | <1.0 | <1.0 | <1.0 | **27** | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-8** | 12/04/14 | 7.15 | 1,108.52 | **230** | 6.1 | <5.0 | **310** | <25 | <25 | <5.0 | <5.0 | <15 |
| **MW-8** | 12/18/14 | 6.48 | 1,109.19 | **120** | <50 | <50 | **350** | <50 | <250 | <19 | <19 | <150 |
| **MW-8** | 01/15/15 | 6.58 | 1,109.09 | **370** | 16 | <5.0 | **340** | <25 | <25 | 7.0 | <5.0 | 19 |
| **MW-8** | 07/01/15 | 5.03 | 1,110.64 | **1,600** | 28 | 16 | **300** | <25 | <25 | <5.0 | <5.0 | <15 |
| **MW-8** | 09/23/15 | 9.95 | 1,105.72 | **327** | <25.0 | <25.0 | **298** | <25.0 | <125 | <9.32 | <9.68 | <75.0 |
| **MW-8** | 12/15/15 | 6.78 | 1,108.89 | **385** | 6.67 | <5.00 | **343** | <25.0 | <25.0 | 5.09 | <5.00 | <15.0 |
| **MW-8** | 02/23/16 | 5.88 | 1,109.79 | **1,340** | 31.3 | 14.8 | **237** | 13.8 | 34.4 | 8.57 | 6.49 | 28.8 |
| **MW-8** | 05/20/16 | 7.00 | 1,108.67 | **2,110** | 29.2 | 19.2 | **107** | 22.7 | 23.7 | 7.08 | 10.4 | 29.4 |
| | | | | | | | | | | | | |
| **MW-9** | 09/03/14 | 4.36 | 1,109.46 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-9** | 12/04/14 | 4.26 | 1,109.56 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-9** | 01/15/15 | 4.77 | 1,109.05 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-9** | 07/01/15 | 3.81 | 1,110.01 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-9** | 09/23/15 | 10.52 | 1,103.30 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-9** | 12/15/15 | 4.63 | 1,109.19 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-9** | 02/23/16 | 4.08 | 1,109.74 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-9** | 05/20/16 | 5.27 | 1,108.55 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |

Notes: 1) Concentrations exceeding the SHS are shown in **bold**.
2) DUP = blind duplicate sample.
3) Samples were analyzed by EPA Method 5030B / 8260B.

## Table 3.0: Historical Groundwater Analytical Results (page 3 of 4)

| Sample ID | Date | Depth to Water (feet) | GW Elevation (feet) | Unleaded Gasoline Parameters (ug/L) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Benzene | Ethyl-benzene | Cumene | MTBE | Naph-thalene | Toluene | 1,2,4-Trimethyl-benzene | 1,3,5-Trimethyl-benzene | Total Xylenes |
| *Statewide Health Standard, Residential, Used Aquifer* | | | | *5* | *700* | *840* | *20* | *100* | *1,000* | *15* | *13* | *10,000* |
| | | | | | | | | | | | | |
| **MW-10** | 09/03/14 | 5.18 | 1,108.45 | <1.0 | <1.0 | <1.0 | **84** | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-10** | 11/24/14 | 6.23 | 1,107.40 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-10** | 12/04/14 | 6.27 | 1,107.36 | <1.0 | <1.0 | <1.0 | **120** | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-10** | 12/18/14 | 5.67 | 1,107.96 | <1.0 | <1.0 | <1.0 | 11 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-10** | 01/15/15 | 5.91 | 1,107.72 | <1.0 | <1.0 | <1.0 | **110** | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-10** | 07/01/15 | 4.31 | 1,109.32 | <1.0 | <1.0 | <1.0 | **140** | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-10** | 09/23/15 | 9.55 | 1,104.08 | <1.00 | <1.00 | <1.00 | **151** | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-10** | 12/15/15 | 6.75 | 1,107.40 | <1.00 | <1.00 | <1.00 | **46.2** | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-10** | 02/23/16 | 6.15 | 1,108.00 | <1.00 | <1.00 | <1.00 | **132** | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-10** | 05/20/16 | 6.90 | 1,107.25 | <1.00 | <1.00 | <1.00 | **72.4** | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| | | | | | | | | | | | | |
| **MW-11** | 09/03/14 | 3.81 | 1,110.22 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-11** | 12/04/14 | 3.81 | 1,110.22 | <1.0 | <1.0 | <1.0 | 1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-11** | 01/15/15 | 4.43 | 1,109.60 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-11** | 07/01/15 | 3.17 | 1,110.86 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-11** | 09/23/15 | 9.62 | 1,104.41 | <1.00 | <1.00 | <1.00 | 7.51 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-11** | 12/15/15 | 4.77 | 1,109.26 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-11** | 02/23/16 | 3.34 | 1,110.69 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-11** | 05/20/16 | 5.96 | 1,108.07 | <1.00 | <1.00 | <1.00 | 1.89 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| | | | | | | | | | | | | |
| **MW-12** | 12/22/14 | 18.80 | 1,098.67 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-12** | 01/15/15 | 6.79 | 1,110.68 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-12** | 07/01/15 | 4.88 | 1,112.59 | <1.0 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **MW-12** | 09/23/15 | 9.14 | 1,108.33 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-12** | 12/15/15 | 6.97 | 1,110.50 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-12** | 02/23/16 | 5.72 | 1,111.75 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-12** | 05/20/16 | 7.15 | 1,110.32 | <1.00 | <1.00 | <1.00 | <1.00 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| | | | | | | | | | | | | |
| **MW-13** | 11/17/15 | 10.18 | 1,106.62 | <1.00 | <1.00 | <1.00 | **153** | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-13** | 12/15/15 | 7.40 | 1,109.40 | 2.14 | <1.00 | <1.00 | **307** | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-13** | 02/23/16 | 6.69 | 1,110.11 | <1.00 | <1.00 | <1.00 | **135** | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-13** | 05/20/16 | 7.34 | 1,109.46 | <1.00 | <1.00 | <1.00 | **50.9** | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| | | | | | | | | | | | | |
| **MW-14** | 11/17/15 | 8.66 | 1,107.90 | <1.00 | <1.00 | <1.00 | 3.72 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-14** | 12/15/15 | 7.29 | 1,109.27 | <1.00 | <1.00 | <1.00 | 10.9 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-14** | 02/23/16 | 6.22 | 1,110.34 | <1.00 | <1.00 | <1.00 | 3.25 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-14** | 05/20/16 | 7.36 | 1,109.20 | <1.00 | <1.00 | <1.00 | 2.10 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| | | | | | | | | | | | | |
| **MW-15** | 11/17/15 | 9.84 | 1,111.71 | <1.00 | <1.00 | <1.00 | 4.97 | <5.00 | <5.00 | <1.00 | <1.00 | <3.00 |
| **MW-15** | 12/15/15 | 6.34 | 1,115.21 | 4.67 | <1.00 | <1.00 | 7.14 | <5.00 | <5.00 | <1.00 | <1.00 | 5.45 |
| **MW-15** | 02/23/16 | 5.25 | 1,116.30 | **69.7** | 18.5 | <1.00 | 6.64 | <5.00 | 75.2 | 6.92 | 3.48 | 94.3 |
| **MW-15** | 05/20/16 | 4.99 | 1,116.56 | **127** | 37.1 | 1.10 | 3.90 | <5.00 | 33.9 | **17.0** | 7.28 | 144 |

Notes: 1) Concentrations exceeding the SHS are shown in **bold**.
2) DUP = blind duplicate sample.
3) Samples were analyzed by EPA Method 5030B / 8260B.

## Table 3.0: Historical Groundwater Analytical Results (page 4 of 4)

| Sample ID | Date | Depth to Water (feet) | GW Elevation (feet) | Unleaded Gasoline Parameters (ug/L) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Benzene | Ethyl-benzene | Cumene | MTBE | Naph-thalene | Toluene | 1,2,4-Trimethyl-benzene | 1,3,5-Trimethyl-benzene | Total Xylenes |
| *Statewide Health Standard, Residential, Used Aquifer* | | | | *5* | *700* | *840* | *20* | *100* | *1,000* | *15* | *13* | *10,000* |
| | | | | | | | | | | | | |
| **EW-1** | 02/11/15 | 2.18 | -- | **975** | **1,040** | 115 | **66.7** | **983** | **2,620** | **2,020** | **602** | 8,800 |
| **EW-1** | 12/15/15 | 3.10 | -- | Well contained an insufficient volume of water to sample. | | | | | | | | |
| **EW-1** | 02/23/16 | 2.22 | -- | **1,610** | 492 | 55.3 | <10.0 | **401** | **1,480** | **2,860** | **677** | 5,420 |
| **EW-1** | 05/20/16 | 2.39 | -- | **950** | 545 | <100 | **48.7** | **490** | **1,910** | **2,900** | **786** | 6,110 |
| | | | | | | | | | | | | |
| **EW-2** | 10/15/15 | 2.33 | 1,117.93 | **2830** | **1,810** | 114 | **52.4** | **574** | **6,990** | **2,540** | **655** | **13,600** |
| **EW-2** | 12/07/15 | -- | -- | **1640** | 381 | 23.5 | **189** | **260** | 937 | **1,510** | **366** | 6,590 |
| **EW-2** | 12/15/15 | 3.31 | 1,116.95 | **869** | 565 | 65.6 | <18.4 | **545** | **1,570** | **4,520** | **1340** | **12,400** |
| **EW-2** | 02/23/16 | 2.30 | 1,117.96 | **1,560** | 566 | 61.3 | <10.0 | **497** | **2,440** | **3,570** | **931** | 8,660 |
| **EW-2** | 05/20/16 | 2.43 | 1,117.83 | **1,120** | 643 | 66.5 | **24.7** | **782** | **2,440** | **4,240** | **1,160** | 9,490 |
| | | | | | | | | | | | | |
| **PT-1** | 09/03/14 | 4.67 | -- | **2,800** | 170 | 24 | **160** | <50 | **6,400** | **660** | **260** | 4,600 |
| **PT-1** | 12/04/14 | 4.54 | -- | **1,800** | **710** | 52 | **240** | **110** | **1,100** | **910** | **300** | 3,600 |
| **PT-1** | 01/15/15 | 4.42 | -- | **1,600** | **220** | 18 | **420** | <50 | **1,200** | **250** | **140** | 1,500 |
| **PT-1** | 12/15/15 | 4.44 | -- | **993** | 523 | 38.3 | **455** | 27.5 | 541 | **131** | **77.4** | 685 |
| **PT-1** | 02/23/16 | 3.68 | -- | **1,050** | **1,300** | 90.6 | **361** | **219** | **1,780** | **1,310** | **406** | 5,040 |
| **PT-1** | 05/20/16 | 4.44 | -- | **980** | **751** | 56.9 | **407** | **144** | 644 | **594** | **260** | 1,600 |
| | | | | | | | | | | | | |
| **P-1** | 11/17/15 | 9.08 | 1,112.31 | **6,680** | **1,300** | 50.0 | <10.0 | **246** | **26,900** | **499** | **353** | 7,450 |
| **P-1** | 12/15/15 | 6.15 | 1,115.24 | **7,420** | **367** | <25.0 | <9.18 | 85.1 | **23,000** | **472** | **171** | 5,810 |
| **P-1** | 02/23/16 | 5.03 | 1,116.36 | **7,440** | **256** | 15.3 | <5.00 | **206** | **9,990** | **666** | **225** | 6,980 |
| **P-1** | 05/20/16 | 5.29 | 1,116.10 | **7,140** | 681 | <100 | **102** | **267** | **1,160** | **822** | **258** | 4,350 |
| | | | | | | | | | | | | |
| **P-2** | 11/17/15 | 9.20 | 1,110.09 | **248** | 40.5 | 3.43 | **31.6** | <5.00 | 308 | 11.7 | **28.7** | 293 |
| **P-2** | 12/15/15 | 5.80 | 1,113.49 | **3,570** | 637 | 31.7 | **173** | 31.9 | 841 | **405** | **151** | 2,900 |
| **P-2** | 02/23/16 | 5.16 | 1,114.13 | Well did not recover after purging. | | | | | | | | |
| **P-2** | 05/20/16 | 5.64 | 1,113.65 | **2,600** | 431 | <100 | **305** | <100 | <500 | **301** | **159** | 736 |
| | | | | | | | | | | | | |
| **Standpipe** | 12/04/14 | 1.23 | -- | **29** | 51 | 6.7 | <1.0 | <5.0 | 32 | **24** | <1.0 | 120 |
| **Standpipe** | 12/10/14 | 1.10 | -- | **10** | 14 | 1.2 | <1.0 | <5.0 | 8.5 | 2.4 | 1.3 | 66 |
| **Standpipe** | 12/18/14 | 1.23 | -- | 2.1 | <1.0 | <1.0 | <1.0 | <5.0 | <5.0 | <1.0 | <1.0 | <3.0 |
| **Standpipe** | 01/15/15 | 2.12 | -- | **8.8** | 16 | 3.2 | <1.0 | 5.9 | 17 | **34** | 12 | 78 |
| **Standpipe** | 06/05/15 | -- | -- | <1.0 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <1.0 | <1.0 | <3.0 |
| **Standpipe** | 12/15/15 | 1.95 | -- | **74.8** | 25.2 | 1.12 | <1.00 | <5.00 | 17.2 | 6.88 | <1.00 | 52.1 |
| **Standpipe** | 02/23/16 | 1.37 | -- | **35.7** | 8.38 | <1.00 | 2.97 | <5.00 | 15.6 | 8.28 | 2.94 | 50.0 |
| **Standpipe** | 05/20/16 | 1.48 | -- | **149** | 75.0 | 3.35 | <1.00 | 32.6 | 82.9 | **86.2** | 4.84 | 213 |
| | | | | | | | | | | | | |
| **CP-4** | 02/23/16 | 2.88 | -- | **4,440** | 170 | <5.00 | <5.00 | <25.0 | **3,180** | **107** | **40.6** | 1,120 |

Notes: 1) Concentrations exceeding the SHS are shown in **bold**.
2) DUP = blind duplicate sample.
3) Samples were analyzed by EPA Method 5030B / 8260B.

## Table 4.0: Post PersulfOx Application Monitoring

| Sample ID | Date | Dissolved Oxygen | Temperature | pH | Conductivity | ORP | Sodium Persulfate |
|---|---|---|---|---|---|---|---|
| | | ppm | deg. C. | S.U. | ppm | mV | ppm |
| | | | | | | | |
| **Standpipe** | 11/24/14 | PersulfOx (115 pounds) Applied to Test Pit | | | | | |
| **Standpipe** | 12/04/14 | 10.0 | 5.8 | 10.4 | 1,800 | 191 | 1400 |
| **Standpipe** | 12/10/14 | 10.0 | -- | 9.6 | 897 | 169 | 350 |
| **Standpipe** | 12/18/14 | 10.0 | -- | 9.2 | 690 | 161 | 140 |
| **Standpipe** | 01/15/15 | 9.0 | 2.9 | 7.0 | 3,850 | 143 | -- |
| **Standpipe** | 02/11/15 | PersulfOx (15 pounds) Slurry Injected into Standpipe | | | | | |
| **Standpipe** | 05/08/15 | PersulfOx (20 pounds) Slurry Injected into Standpipe | | | | | |
| **Standpipe** | 06/05/15 | 6.0 | -- | -- | -- | -- | -- |
| **Standpipe** | 12/15/15 | 3.0 | 9.8 | 7.7 | 596 | 39 | -- |
| **Standpipe** | 02/23/16 | 2.0 | 5.6 | 7.5 | 9,930 | 48 | -- |
| | | | | | | | |
| **MW-3** | 07/10/14 | 1.0 | 19.9 | 6.1 | 1,046 | 116 | -- |
| **MW-3** | 11/24/14 | PersulfOx (115 pounds) Applied to Test Pit | | | | | |
| **MW-3** | 12/04/14 | 2.5 | 12.5 | 7.3 | 1,460 | 112 | 42 |
| **MW-3** | 12/10/14 | 4.0 | -- | 9.0 | 1,870 | 143 | 4.2 |
| **MW-3** | 12/18/14 | 3.0 | -- | 8.0 | 1,248 | 92 | 2.8 |
| **MW-3** | 01/15/15 | 4.5 | 8.3 | 7.0 | 1,369 | 151 | 0.7 |
| **MW-3** | 02/11/15 | PersulfOx (15 pounds) Slurry Injected into Standpipe | | | | | |
| **MW-3** | 05/08/15 | PersulfOx (20 pounds) Slurry Injected into Standpipe | | | | | |
| **MW-3** | 06/05/15 | <1.0 | -- | -- | -- | -- | -- |
| **MW-3** | 07/01/15 | 4.0 | 16.8 | 6.8 | 1,255 | 78 | -- |
| **MW-3** | 09/23/15 | 5.0 | 20.3 | 6.7 | 1,406 | 47 | -- |
| **MW-3** | 12/15/15 | 4.0 | 12.3 | 6.8 | 1,198 | 56 | -- |
| **MW-3** | 02/23/16 | 5.5 | 8.3 | 6.6 | 6,020 | 78 | -- |
| | | | | | | | |
| **MW-8** | 09/03/14 | 4.0 | 18.6 | 6.0 | 967 | 133 | -- |
| **MW-8** | 11/24/14 | PersulfOx (115 pounds) Applied to Test Pit | | | | | |
| **MW-8** | 12/04/14 | 1.0 | 12.2 | 6.7 | 845 | 66 | 7.0 |
| **MW-8** | 12/10/14 | 2.5 | -- | 8.8 | 776 | 99 | 0.7 |
| **MW-8** | 12/18/14 | 3.0 | -- | 11.0 | 691 | 214 | <0.7 |
| **MW-8** | 01/15/15 | 1.5 | 10.2 | 6.0 | 834 | 153 | -- |
| **MW-8** | 02/11/15 | PersulfOx (15 pounds) Slurry Injected into Standpipe | | | | | |
| **MW-8** | 05/08/15 | PersulfOx (20 pounds) Slurry Injected into Standpipe | | | | | |
| **MW-8** | 07/01/15 | 1.0 | 13.3 | 5.4 | 795 | 129 | -- |
| **MW-8** | 09/23/15 | 2.5 | 15.1 | 6.4 | 982 | 99 | -- |
| **MW-8** | 12/15/15 | 1.0 | 12.4 | 6.1 | 889 | 199 | -- |
| **MW-8** | 02/23/16 | 1.0 | 10.0 | 6.4 | 805 | 170 | -- |
| | | | | | | | |
| **MW-10** | 09/03/14 | 5.0 | 16.2 | 5.8 | 419 | 143 | -- |
| **MW-10** | 11/24/14 | PersulfOx (115 pounds) Applied to Test Pit | | | | | |
| **MW-10** | 12/04/14 | 1.5 | 11.4 | 6.8 | 337 | 66 | 1.4 |
| **MW-10** | 12/10/14 | 4.0 | -- | 9.0 | 316 | 95 | <0.7 |
| **MW-10** | 12/18/14 | 3.5 | -- | 10.3 | 314 | 221 | <0.7 |
| **MW-10** | 01/15/15 | 3.0 | 9.4 | 7.0 | 368 | 124 | -- |
| **MW-10** | 02/11/15 | PersulfOx (15 pounds) Slurry Injected into Standpipe | | | | | |
| **MW-10** | 05/08/15 | PersulfOx (20 pounds) Slurry Injected into Standpipe | | | | | |
| **MW-10** | 07/01/15 | 1.0 | 12.0 | 6.3 | 333 | 107 | -- |
| **MW-10** | 09/23/15 | 1.5 | 13.5 | 6.3 | 345 | 191 | -- |
| **MW-10** | 12/15/15 | 3.0 | 11.8 | 6.4 | 153 | 188 | -- |
| **MW-10** | 02/23/16 | 2.0 | 9.4 | 6.3 | 189 | 155 | -- |

## Table 5.0: Canopy Downspout Dye Study Results

| Well ID | Sample Collection Notes | Date | Visual Evidence of Dye Under Ambient Light | Fluorescence Under UV Light |
|---|---|---|---|---|
| | | | | |
| *Dye Injected into Canopy Drain on 11/17/2015* | | | | |
| | | | | |
| MW-1 | | 11/17/15 | None | None |
| EW-1 | | 11/17/15 | None | None |
| CP-4 | | 11/17/15 | None | None |
| | | | | |
| MW-1 | before purging | 11/20/15 | None | None |
| EW-1 | before purging | 11/20/15 | None | None |
| EW-2 | before purging | 11/20/15 | None | None |
| CP-4 | before purging | 11/20/15 | None | None |
| | | | | |
| MW-1 | after purging | 11/20/15 | None | None |
| **EW-1** | after purging | **11/20/15** | None | **Trace** |
| **EW-2** | after purging | **11/20/15** | None | **Trace** |
| CP-4 | after purging | 11/20/15 | None | None |

## Table 6.0: Vacuum Extraction Pilot Study – Extraction Volume Data

| Day | Time | Total Volume of Water in Truck (gallons) | Gallons Added Since Last Reading | Time Since Last Reading (minutes) | Calculated Extraction Rate Since Last Reading (GPM) | Total Hours of Operation | Notes |
|---|---|---|---|---|---|---|---|
| 12/7/2015 | 8:36 | 0 | | | | 0.0 | **START** |
| 12/7/2015 | 9:15 | 12 | 12 | 39 | **0.31** | 0.7 | |
| 12/7/2015 | 9:45 | 24 | 12 | 30 | **0.40** | 1.2 | |
| 12/7/2015 | 10:15 | 40 | 16 | 30 | **0.53** | 1.7 | |
| 12/7/2015 | 10:45 | 62 | 22 | 30 | **0.73** | 2.2 | |
| 12/7/2015 | 11:15 | 75 | 13 | 30 | **0.43** | 2.7 | |
| 12/7/2015 | 11:45 | 90 | 15 | 30 | **0.50** | 3.2 | |
| 12/7/2015 | 12:15 | 105 | 15 | 30 | **0.50** | 3.7 | |
| 12/7/2015 | 12:45 | 138 | 33 | 30 | **1.10** | 4.2 | |
| 12/7/2015 | 13:15 | 155 | 17 | 30 | **0.57** | 4.7 | |
| 12/7/2015 | 13:45 | 173 | 18 | 30 | **0.60** | 5.2 | |
| 12/7/2015 | 14:15 | 192 | 19 | 30 | **0.63** | 5.7 | |
| 12/7/2015 | 14:45 | 231 | 39 | 30 | **1.30** | 6.2 | |
| 12/7/2015 | 15:15 | 251 | 20 | 30 | **0.67** | 6.7 | |
| 12/7/2015 | 15:45 | 275 | 24 | 30 | **0.80** | 7.2 | |
| 12/7/2015 | 16:15 | 316 | 41 | 30 | **1.37** | 7.7 | |
| 12/7/2015 | 16:45 | 338 | 22 | 30 | **0.73** | 8.2 | |
| 12/7/2015 | 17:15 | 361 | 23 | 30 | **0.77** | 8.7 | |
| 12/7/2015 | 17:45 | 361 | 0 | 30 | **0.00** | 9.2 | |
| 12/7/2015 | 18:15 | 384 | 23 | 30 | **0.77** | 9.7 | |
| 12/7/2015 | 18:45 | 395 | 11 | 30 | **0.37** | 10.2 | |
| 12/7/2015 | 19:15 | 407 | 12 | 30 | **0.40** | 10.7 | |
| 12/7/2015 | 19:45 | 431 | 24 | 30 | **0.80** | 11.2 | |
| 12/7/2015 | 20:15 | 443 | 12 | 30 | **0.40** | 11.7 | |
| 12/7/2015 | 20:45 | 456 | 13 | 30 | **0.43** | 12.2 | |
| 12/7/2015 | 21:15 | 480 | 24 | 30 | **0.80** | 12.7 | |
| 12/7/2015 | 21:45 | 506 | 26 | 30 | **0.87** | 13.2 | |
| 12/7/2015 | 22:15 | 531 | 25 | 30 | **0.83** | 13.7 | |
| 12/7/2015 | 22:45 | 556 | 25 | 30 | **0.83** | 14.2 | |
| 12/7/2015 | 23:15 | 582 | 26 | 30 | **0.87** | 14.7 | |
| 12/7/2015 | 23:45 | 595 | 13 | 30 | **0.43** | 15.2 | |
| 12/8/2015 | 0:15 | 595 | 0 | 30 | **0.00** | 15.7 | |
| 12/8/2015 | 0:45 | 610 | 15 | 30 | **0.50** | 16.2 | |
| 12/8/2015 | 1:15 | 625 | 15 | 30 | **0.50** | 16.7 | |
| 12/8/2015 | 1:45 | 635 | 10 | 30 | **0.33** | 17.2 | |
| 12/8/2015 | 2:15 | 635 | 0 | 30 | **0.00** | 17.7 | |
| 12/8/2015 | 2:45 | 648 | 13 | 30 | **0.43** | 18.2 | |
| 12/8/2015 | 3:15 | 662 | 14 | 30 | **0.47** | 18.7 | |
| 12/8/2015 | 3:45 | 675 | 13 | 30 | **0.43** | 19.2 | |
| 12/8/2015 | 4:15 | 689 | 14 | 30 | **0.47** | 19.7 | |
| 12/8/2015 | 4:45 | 703 | 14 | 30 | **0.47** | 20.2 | |
| 12/8/2015 | 5:15 | 703 | 0 | 30 | **0.00** | 20.7 | |
| 12/8/2015 | 5:45 | 709 | 6 | 30 | **0.20** | 21.2 | |
| 12/8/2015 | 6:15 | 717 | 8 | 30 | **0.27** | 21.7 | |
| 12/8/2015 | 6:45 | 725 | 8 | 30 | **0.27** | 22.2 | |
| 12/8/2015 | 7:15 | 732 | 7 | 30 | **0.23** | 22.7 | |
| 12/8/2015 | 7:45 | 745 | 13 | 30 | **0.43** | 23.2 | |
| 12/8/2015 | 8:15 | 745 | 0 | 30 | **0.00** | 23.7 | |
| 12/8/2015 | 8:45 | 745 | 0 | 30 | **0.00** | 24.2 | |
| 12/8/2015 | 9:15 | 745 | 0 | 30 | **0.00** | 24.7 | |
| 12/8/2015 | 9:45 | 759 | 14 | 30 | **0.47** | 25.2 | |
| 12/8/2015 | 10:15 | 759 | 0 | 30 | **0.00** | 25.7 | |
| 12/8/2015 | 10:45 | 759 | 0 | 30 | **0.00** | 26.2 | |
| 12/8/2015 | 11:15 | 759 | 0 | 30 | **0.00** | 26.7 | |
| 12/8/2015 | 11:45 | 773 | 14 | 30 | **0.47** | 27.2 | |
| 12/8/2015 | 12:30 | 773 | 0 | 45 | **0.00** | 27.9 | |
| 12/8/2015 | 12:59 | 787 | 14 | 29 | **0.48** | 28.4 | **STOP** |

## Table 7.0: Vacuum Extraction Pilot Study – Depth to Water Measurements

| Date | Time | Elapsed Time (Hrs) | Elapsed Time (Days) | Depth to Water (feet) | | | | | | | | | | | | | | | | | | | | | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | EW-1 | EW-2 | CP-1 | CP-2 | CP-4 | PT-1 | MW-1 | MW-3 | MW-6 | MW-15 | Standpipe | P-1 | P-2 | MW-2 | MW-4 | MW-5 | MW-7 | MW-8 | MW-9 | MW-10 | MW-11 | MW-12 | MW-13 | MW-14 | | |
| 11/20/15 | 9:40 | -409.0 | -17.04 | 2.14 | 2.21 | Dry | Dry | 2.79 | 4.01 | 2.57 | 2.92 | 2.11 | 9.59 | 1.23 | 8.23 | 9.55 | 8.94 | 5.02 | 2.83 | 4.37 | 6.71 | 3.97 | 6.53 | 3.28 | 6.55 | 9.39 | 8.29 | | **BASELINE** |
| 12/7/15 | 8:30 | 0.0 | 0.00 | 2.29 | 2.36 | Dry | Dry | 2.92 | 4.08 | 2.66 | 2.99 | 2.18 | 6.93 | 1.41 | 6.32 | 6.69 | 7.05 | 4.65 | 2.84 | 4.16 | 6.37 | | 6.26 | | 6.59 | 7.65 | 6.91 | | **BASELINE** |
| 12/7/15 | 8:36 | 0.0 | 0.00 | | | | | | | | | | | | | | | | | | | | | | | | | | **START** |
| 12/7/15 | 8:50 | 0.2 | 0.01 | 2.30 | | Dry | Dry | 2.89 | 4.08 | 2.70 | 2.99 | 2.16 | 6.91 | 1.41 | 6.30 | 6.71 | | | | | | | | | | | | | |
| 12/7/15 | 9:15 | 0.7 | 0.03 | 2.32 | | Dry | Dry | 2.92 | 4.08 | 2.74 | 2.99 | 2.16 | 6.91 | 1.42 | 6.31 | 6.71 | | | | | | 4.42 | | 3.79 | | | | | |
| 12/7/15 | 9:35 | 1.0 | 0.04 | 2.32 | | Dry | Dry | 2.93 | 4.11 | 2.76 | 3.00 | 2.17 | 6.91 | 1.43 | 6.31 | 6.71 | | | | | | | | | | | | | |
| 12/7/15 | 10:00 | 1.4 | 0.06 | 2.38 | | Dry | Dry | 2.92 | 4.10 | 2.76 | 3.00 | 2.19 | 6.90 | 1.44 | 6.31 | 6.71 | | | | | | | | | | | | | |
| 12/7/15 | 10:30 | 1.9 | 0.08 | 2.42 | | Dry | Dry | 2.92 | 4.10 | 2.82 | 3.01 | 2.19 | 6.90 | 1.45 | 6.31 | 6.71 | | | | | | | | | | | | | |
| 12/7/15 | 11:00 | 2.4 | 0.10 | 2.46 | | Dry | Dry | 2.92 | 4.10 | 2.84 | 3.01 | 2.19 | 6.90 | 1.48 | 6.31 | 6.70 | | | | | | | | | | | | | |
| 12/7/15 | 11:30 | 2.9 | 0.12 | 2.55 | | | | 2.93 | 4.10 | 2.87 | 3.01 | 2.18 | 6.90 | 1.50 | 6.30 | 6.69 | | | | | | | | | | | | | |
| 12/7/15 | 12:00 | 3.4 | 0.14 | 2.63 | | Dry | Dry | 2.92 | 4.09 | 2.90 | 3.02 | 2.18 | 6.90 | 1.53 | 6.29 | 6.69 | 7.02 | 4.66 | 2.85 | 4.01 | 6.40 | 4.42 | 6.25 | 3.84 | -- | 7.65 | 6.91 | | |
| 12/7/15 | 12:35 | 4.0 | 0.17 | 2.74 | | | | 2.93 | 4.09 | 2.93 | 3.02 | 2.18 | 6.89 | 1.55 | 6.28 | 6.68 | | | | | | | | | | | | | |
| 12/7/15 | 13:00 | 4.4 | 0.18 | 2.82 | | Dry | Dry | 2.93 | 4.10 | 2.95 | 3.03 | 2.16 | 6.89 | 1.58 | 6.28 | 6.69 | | | | | | | | | | | | | |
| 12/7/15 | 13:35 | 5.0 | 0.21 | 2.90 | | Dry | Dry | 2.99 | 4.09 | 2.97 | 3.03 | 2.16 | 6.88 | 1.61 | 6.28 | 6.68 | | | | | | | | | | | | | |
| 12/7/15 | 14:10 | 5.6 | 0.23 | 3.01 | | Dry | Dry | 2.97 | 4.08 | 3.01 | 3.05 | 2.16 | 6.89 | 1.63 | 6.26 | 6.68 | | | | | | | | | | | | | |
| 12/7/15 | 15:05 | 6.5 | 0.27 | 3.11 | | Dry | Dry | 3.01 | 4.09 | 3.05 | 3.08 | 2.17 | 6.89 | 1.69 | 6.27 | 6.67 | | | | | | | | | | | | | |
| 12/7/15 | 15:30 | 6.9 | 0.29 | Dry | | | | 3.02 | 4.09 | 3.09 | 3.09 | 2.18 | 6.89 | 1.70 | 6.26 | 6.67 | | | | | | | | | | | | | |
| 12/7/15 | 16:00 | 7.4 | 0.31 | Dry | | Dry | Dry | 3.02 | 4.09 | 3.13 | 3.11 | 2.17 | 6.88 | 1.74 | 6.25 | 6.67 | | | | | | | | | | | | | |
| 12/7/15 | 16:30 | 7.9 | 0.33 | Dry | | Dry | Dry | 3.05 | 4.09 | 3.18 | 3.03 | 2.17 | 6.87 | 1.78 | 6.26 | 6.67 | | | | | | | | | | | | | |
| 12/7/15 | 17:15 | 8.7 | 0.36 | Dry | | Dry | Dry | 3.13 | 4.10 | 3.20 | 3.13 | 2.18 | 6.89 | 1.80 | 6.25 | 6.67 | 6.98 | 4.65 | 2.83 | 3.98 | 6.35 | 4.45 | 6.24 | 3.88 | -- | 7.65 | 6.93 | | |
| 12/7/15 | 18:05 | 9.5 | 0.40 | Dry | | Dry | Dry | 3.15 | 4.03 | 3.26 | 3.17 | 2.18 | 6.84 | 1.85 | 6.38 | 6.65 | | | | | | | | | | | | | |
| 12/7/15 | 18:45 | 10.2 | 0.42 | Dry | | Dry | Dry | 3.20 | 4.03 | 3.32 | 3.21 | 2.18 | 6.84 | 1.87 | 6.24 | 6.67 | | | | | | | | | | | | | |
| 12/7/15 | 19:10 | 10.6 | 0.44 | Dry | | Dry | Dry | 3.18 | 4.02 | 3.35 | 3.18 | 2.18 | 6.85 | 1.87 | 6.24 | 6.65 | | | | | | | | | | | | | |
| 12/7/15 | 19:35 | 11.0 | 0.46 | Dry | | | | 3.24 | 4.05 | 3.38 | 3.21 | | 6.85 | 1.86 | 6.25 | 6.65 | | | | | | | | | | | | | |
| 12/7/15 | 20:00 | 11.4 | 0.48 | Dry | | Dry | Dry | 3.30 | 4.02 | 3.38 | 3.22 | 2.18 | 6.85 | 1.92 | 6.23 | 6.65 | | | | | | | | | | | | | |
| 12/7/15 | 20:30 | 11.9 | 0.50 | Dry | | Dry | Dry | 3.29 | 4.05 | 3.39 | 3.22 | 2.18 | 6.85 | 1.95 | 6.25 | 6.64 | | | | | | | | | | | | | |
| 12/7/15 | 21:00 | 12.4 | 0.52 | Dry | | | | 3.40 | 4.06 | 3.44 | 3.23 | 2.18 | 6.85 | 1.95 | | 6.65 | | | | | | | | | | | | | |
| 12/7/15 | 21:30 | 12.9 | 0.54 | Dry | | Dry | Dry | Dry | 4.03 | 3.48 | 3.27 | 2.19 | 6.88 | 1.96 | 6.23 | 6.63 | 6.96 | 4.64 | 2.83 | 4.03 | 6.41 | 4.47 | 6.28 | 3.94 | -- | 7.63 | 6.93 | | |
| 12/8/15 | 7:30 | 22.9 | 0.95 | Dry | | | | Dry | 4.14 | 3.97 | 3.37 | 2.21 | 6.79 | 2.21 | 6.18 | 6.59 | 6.91 | 4.60 | 2.91 | 4.04 | 6.47 | 4.48 | 6.31 | 4.08 | -- | 7.58 | 6.94 | | |
| 12/8/15 | 8:15 | 23.7 | 0.99 | Dry | | | | | 4.09 | 3.99 | 3.39 | 2.21 | 6.80 | 2.23 | 6.17 | 6.59 | | | | | | | | | | | | | |
| 12/8/15 | 9:05 | 24.5 | 1.02 | | | Dry | Dry | | 4.11 | 4.01 | 3.39 | 2.22 | 6.80 | 2.24 | 6.17 | 6.58 | | | | | | | | | | | | | |
| 12/8/15 | 10:00 | 25.4 | 1.06 | | | Dry | Dry | | 4.15 | 4.02 | 3.39 | 2.23 | 6.80 | 2.26 | 6.17 | 6.58 | | | | | | | | | | | | | |
| 12/8/15 | 11:00 | 26.4 | 1.10 | Dry | | | | Dry | 4.16 | 4.05 | 3.41 | 2.23 | 6.79 | 2.28 | 6.15 | 6.58 | | | | | | | | | | | | | |
| 12/8/15 | 12:00 | 27.4 | 1.14 | Dry | | Dry | Dry | Dry | 4.17 | 4.09 | 3.41 | 2.23 | 6.78 | 2.30 | 6.16 | 6.57 | | | | | | | | | | | | | |
| 12/8/15 | 12:30 | 27.9 | 1.16 | | | | | | 4.11 | 4.10 | 3.41 | 2.23 | 6.78 | 2.31 | 6.15 | 6.57 | | | | | | | | 4.13 | | | | | |
| 12/8/15 | 12:59 | 28.4 | 1.18 | | | | | | | | | | | | | | | | | | | | | | | | | | **STOP** |
| 12/8/15 | 13:05 | 28.5 | 1.19 | Dry | | | | Dry | | | | | | | | | | | | | | | | | | | | | |
| 12/8/15 | 13:06 | 28.5 | 1.19 | | | | | | | 4.08 | | | | | | | | | | | | | | | | | | | |
| 12/8/15 | 13:09 | 28.5 | 1.19 | | | | | | | 4.09 | | | | | | | | | | | | | | | | | | | |
| 12/8/15 | 13:11 | 28.6 | 1.19 | | | | | | | 4.10 | | | | | | | | | | | | | | | | | | | |
| 12/8/15 | 13:15 | 28.7 | 1.19 | Dry | | | | Dry | | 4.11 | | | | | | | | | | | | | | | | | | | |
| 12/8/15 | 13:17 | 28.7 | 1.20 | | | | | | | 4.11 | | | | | | | | | | | | | | | | | | | |
| 12/8/15 | 13:25 | 28.8 | 1.20 | Dry | | | | Dry | | 4.11 | | | | | | | | | | | | | | | | | | | |
| 12/8/15 | 13:35 | 29.0 | 1.21 | Dry | 10.09 | | | Dry | 4.14 | 4.10 | 3.42 | | | 2.31 | | | | | | | | | | 4.14 | | | | | |
| 12/8/15 | 13:41 | 29.1 | 1.21 | Dry | 9.55 | | | Dry | | 4.10 | | | | | | | | | | | | | | | | | | | |
| 12/8/15 | 13:46 | 29.2 | 1.22 | Dry | 8.75 | | | Dry | 4.16 | 4.11 | 3.42 | | | 2.32 | | | | | | | | | | 4.16 | | | | | |
| 12/8/15 | 14:00 | 29.4 | 1.23 | Dry | 7.32 | | | Dry | 4.11 | 4.10 | 3.42 | | | 2.32 | | | | | | | | | | 4.16 | | | | | |
| 12/8/15 | 14:15 | 29.7 | 1.24 | Dry | 6.12 | | | Dry | 4.10 | 4.10 | 3.42 | | | 2.33 | | | | | | | | | | 4.16 | | | | | |
| 12/8/15 | 14:30 | 29.9 | 1.25 | Dry | 5.63 | | | Dry | 4.11 | 4.10 | 3.43 | | | 2.33 | | | | | | | | | | 4.16 | | | | | |
| 12/8/15 | 14:50 | 30.2 | 1.26 | Dry | 5.23 | | | Dry | 4.12 | 4.10 | 3.43 | 2.22 | 6.75 | 2.34 | 6.14 | 6.57 | | | | | | | | 4.17 | | | | | |
| 12/8/15 | 15:00 | 30.4 | 1.27 | Dry | 5.01 | | | Dry | 4.11 | 4.10 | 3.43 | | | 2.34 | | | | | | | | | | | | | | | |
| 12/8/15 | 15:15 | 30.7 | 1.28 | Dry | 4.76 | | | Dry | 4.12 | 4.09 | 3.43 | | | 2.34 | | | | | | | | | | | | | | | |
| 12/8/15 | 15:30 | 30.9 | 1.29 | Dry | 4.59 | | | Dry | 4.12 | 4.09 | 3.43 | 2.22 | 6.75 | 2.35 | 6.14 | 6.57 | | | | | | | | 4.17 | | | | | |
| 12/8/15 | 15:45 | 31.2 | 1.30 | Dry | 4.42 | | | Dry | 4.12 | 4.09 | 3.43 | | | 2.35 | | | | | | | | | | | | | | | |
| 12/8/15 | 16:00 | 31.4 | 1.31 | Dry | 4.32 | | | Dry | 4.12 | 4.09 | 3.43 | | | 2.35 | | | | | | | | | | | | | | | |
| 12/8/15 | 16:45 | 32.2 | 1.34 | Dry | 4.10 | | | Dry | 4.12 | 4.09 | 3.44 | | | 2.36 | | | | | | | | | | | | | | | |
| 12/8/15 | 17:00 | 32.4 | 1.35 | Dry | 4.02 | | | Dry | 4.12 | 4.09 | 3.44 | | | 2.37 | | | | | | | | | | | | | | | |
| 12/9/15 | 12:20 | 51.7 | 2.16 | Dry | 3.72 | | | Dry | 4.19 | 3.98 | 3.46 | 2.25 | | 2.50 | | | | | | | | | | 4.30 | | | | | |
| 12/15/15 | 10:36 | 194.0 | 8.08 | 3.10 | 3.31 | Dry | Dry | Dry | 4.44 | 3.68 | 3.02 | 2.30 | 6.34 | 1.95 | 6.15 | 5.80 | 6.44 | 4.64 | 3.19 | 4.10 | 6.78 | 4.63 | 6.75 | 4.77 | 6.97 | 7.40 | 7.29 | | |
| 1/7/16 | | | 31.00 | 2.50 | 2.66 | | | ~3.2 | 4.39 | 2.92 | 3.13 | | 7.68 | 1.64 | 5.24 | 6.78 | | 5.38 | | | 6.30 | | 6.61 | 4.78 | 6.42 | 6.80 | | | |
| 2/26/16 | | | 81.00 | 2.22 | 2.30 | Dry | Dry | 2.88 | 3.68 | 2.59 | 2.88 | 2.12 | 5.25 | 1.37 | 5.03 | 5.16 | 3.79 | 4.35 | 2.50 | 3.56 | 5.88 | 4.08 | 6.15 | 3.34 | 5.72 | 6.69 | 6.22 | | |

## Table 8.0: Vacuum Extraction Pilot Study – Drawdown in Observation Wells

| Well ID | Baseline Depth to Water (feet) | Maximum Depth to Water (feet) | Change in Depth to Water (feet) | Notes |
|---|---|---|---|---|
| MW-1 | 2.66 | 4.11 | **-1.45** | |
| MW-2 | 7.05 | 7.05 | 0.00 | |
| MW-3 | 2.99 | 3.44 | **-0.45** | |
| MW-4 | 4.65 | 4.66 | -0.01 | |
| MW-5 | 2.84 | 2.91 | -0.07 | |
| MW-6 | 2.18 | 2.23 | -0.05 | |
| MW-7 | 4.16 | 4.16 | 0.00 | |
| MW-8 | 6.37 | 6.47 | **-0.10** | |
| MW-9 | 4.42 | 4.48 | -0.06 | |
| MW-10 | 6.26 | 6.31 | -0.05 | |
| MW-11 | 3.79 | 4.17 | **-0.38** | |
| MW-13 | 7.65 | 7.65 | 0.00 | |
| MW-14 | 6.91 | 6.94 | -0.03 | |
| MW-15 | 6.93 | 6.93 | 0.00 | |
| EW-1 | 2.29 | 3.11 | **-0.82** | Well Became Dry |
| EW-2 | 2.36 | 12.62 | **-10.26** | Extraction Well |
| CP-1 | Dry | Dry | n/a | |
| CP-2 | Dry | Dry | n/a | |
| CP-4 | 2.92 | 3.40 | **-0.48** | Well Became Dry |
| PT-1 | 4.08 | 4.17 | -0.09 | |
| Standpipe | 1.41 | 2.37 | **-0.96** | |
| P-1 | 6.32 | 6.38 | -0.06 | |
| P-2 | 6.69 | 6.71 | -0.02 | |

Note: Changes in depth to water greater than 0.1 feet are shown in **bold**.

## Table 9.0: Vacuum Extraction Pilot Study – Subsurface Vacuum Measurements

| Date | Time | Elapsed Time (Hrs) | Pressure / Vacuum (inches of water) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | **EW-1** | **PT-1** | **MW-1** | **MW-3** | **MW-6** | **MW-15** | **Standpipe** | **P-1** | **P-2** |
| 12/7/15 | 10:30 | 1.9 | -0.05 | 0 | -0.02 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12/7/15 | 13:00 | 4.4 | 0 | 0 | -0.05 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12/7/15 | 16:30 | 7.9 | -0.01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12/7/15 | 18:05 | 9.5 | -0.01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 12/8/15 | 9:05 | 24.5 | -0.01 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

## Table 10.0: Vacuum Extraction Pilot Study – EW-2 Analytical Data

| Sample ID | Date | Time | Unleaded Gasoline Parameters (ug/L) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Benzene | Ethyl-benzene | Cumene | MTBE | Naph-thalene | Toluene | 1,2,4-Trimethyl-benzene | 1,3,5-Trimethyl-benzene | Total Xylenes |
| *SHS-RUA* | | | *5* | *700* | *840* | *20* | *100* | *1,000* | *15* | *13* | *10,000* |
| | | | | | | | | | | | |
| *BASELINE (Seven Weeks Before Pilot Test)* | | | | | | | | | | | |
| **EW-2** | 10/15/15 | -- | **2,830** | **1,810** | 114 | **52.4** | **574** | **6,990** | **2,540** | **655** | **13,600** |
| | | | | | | | | | | | |
| *BASELINE (Immediately Before Pilot Test)* | | | | | | | | | | | |
| **EW-2A** | 12/07/15 | 8:35 | **1,640** | 381 | 23.5 | **189** | **260** | 937 | **1,510** | **366** | 6,590 |
| | | | | | | | | | | | |
| *During Pilot Test* | | | | | | | | | | | |
| **EW-2B** | 12/08/15 | 8:32 | **2,620** | 146 | 7.15 | 19.6 | **139** | 234 | **453** | **133** | 908 |
| **EW-2C** | 12/08/15 | 17:11 | **7,070** | 631 | 13.3 | **21.7** | 78.9 | 438 | **288** | **84.4** | 849 |
| | | | | | | | | | | | |
| *One Week After Pilot Test* | | | | | | | | | | | |
| **EW-2** | 12/15/15 | -- | **869** | 565 | 65.6 | <18.4 | **545** | **1,570** | **4,520** | **1,340** | **12,400** |

## Table 11.0: UST Cavity Dye Study Results

| | 12/09/15 | | 12/15/15 | 01/07/16 | 02/23/16 | 04/12/16 | 05/20/16 | 07/12/16 | | | 07/19/16 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **CP-4** | Dye Injected into CP-2, CP-3, and CP-4. | | | 4+ | 2+ | | 2+ | 1+ | Dye Injected into CP-5, CP-6, and CP-7. | 1+ | 2+ |
| **EW-1** | | Trace | 1+ | 4+ | 1+ | | 1+ | 1+ | | 4+ | 4+ |
| **EW-2** | | 4+ | 4+ | 3+ | 1+ | | 1+ | 1+ | | 3+ | 3+ |
| **MW-1** | | Trace | 3+ to 4+ | 3+ | 1+ | | 1+ | 1+ | | 1+ | 1+ |
| **MW-3** | | Trace | Trace | Trace | Trace | | | Trace | | Trace | Trace |
| MW-4 | | | None | None | | | | None | | None | Non |
| MW-8 | | | None | None | None | | | | | | |
| MW-10 | | | | None | None | | | | | | |
| MW-11 | | | None | None | None | | | | | | |
| MW-12 | | | None | None | | | | | | | |
| MW-13 | | | None | None | None | | | | | | |
| **MW-15** | | | None | None | | Trace | Trace | None | | None | None |
| PT-1 | | None | None | None | | | | | | | |
| **Standpipe** | | None | Trace | Trace | Trace | | | Trace | | Trace | Trace |
| P-1 | | | None | None | | | | | | | |
| P-2 | | | None | None | | | | | | | |

Notes: 1) On December 9, 2015, approximately 2 fluid ounces of fluorescent yellow/green liquid tracing dye was injected into each CP-2, CP-3 and CP-4. The dye was chased with a total of 250 gallons of potable water (94 gallons in CP-2, 135 gallons in CP-3, and 21 gallons in CP-4).

2) On July 12, 2016, approximately 4 fluid ounces of fluorescent yellow/green liquid tracing dye was injected into each CP-5, CP-6 and CP-7. The dye was chased with a total of 287 gallons of potable water (127 gallons in CP-5, 25 gallons in CP-6, and 135 gallons in CP-7).

3) "**Trace**" indicates that fluorescence was observable under ultraviolet light, but no ambient light.

4) "**1+**" through "**4+**" indicate that fluorescence was observable under ambient light.

# ATTACHMENT A

| Project: Valley Village | Boring/Well ID: B-13 | Page 1 of 1 |
|---|---|---|
| Location: Rural Valley, PA<br>Drilling Co.: Cribbs & Associates<br>Driller: Calvin / Tyler / Dustin<br>Logged By: Rogers / Keeliher | Depth of Boring: 18 ft.<br>Date Started: 10/02/2015<br>Date Completed: 10/06/2015 | Monitoring Well Construction<br>Depth of Well n/a ft.<br>Diameter of Casing ____in.<br>Well Screen ____ length ____Slot<br>TOC Elev. _____ |

| Depth (feet) | Sample No. | Blows/.5 ft | Recovery- ft | PID - ppm | DESCRIPTION | Lithology | Well Construction | Comments/Details |
|---|---|---|---|---|---|---|---|---|
| 0 | | | | | Asphalt | | No well installed. Backfilled with bentonite chips. | |
| 1–3 | Hand Clear | | | 0 | GRAVEL, then brown CLAY, then gray CLAY, moist, weak odor. (Fill) | | | |
| 4 | | | | | | | | Wet zone at 4 feet. |
| 5 | SS-1 | 2 10 17 15 | 1.6 | 0 | Brown SILTY CLAY with weathered sandstone fragments, moist, very stiff, no odor, no staining, wet at 4 feet, some shale fragments between 10 and 12 feet, no odor, no staining. (Colluvial) | | | |
| 7 | SS-2 | 9 13 12 14 | 1.3 | 0 | | | | |
| 9 | SS-3 | 8 12 13 18 | 1.5 | 0 | | | | |
| 11 | SS-4 | 14 18 14 13 | 1.1 | 0 | | | | |
| 13 | SS-5 | 6 6 8 12 | 1.7 | 1 | | | | |
| 15 | SS-6 | 4 9 9 12 | 1.5 | 0 | Mottled gray and tan SILTY CLAY with sandstone and shale fragments, moist, very stiff, no odor, no staining. (Colluvial) | | | |
| 16 | | | | | | | | Thin wet zones between 16 and 18 feet. |
| 17 | SS-7 | 4 7 10 8 | 1.5 | 1 | Mottled gray and tan SILTY CLAY with sandy lenses, moist with thin wet zones, very stiff, no odor, no staining. (Colluvial) | | | |
| 18–28 | | | | | Total Depth 18' | | | |

| Project: Valley Village | Boring/Well ID: B-14 | Page 1 of 1 |
|---|---|---|
| Location: Rural Valley, PA<br>Drilling Co.: Cribbs & Associates<br>Driller: Calvin / Tyler / Dustin<br>Logged By: Rogers / Keeliher | Depth of Boring: 20 ft.<br>Date Started: 10/02/2015<br>Date Completed: 10/06/2015 | Monitoring Well Construction<br>Depth of Well n/a ft.<br>Diameter of Casing ____in.<br>Well Screen ____ length ____Slot<br>TOC Elev. _____ |

| Depth (feet) | Sample No. | Blows/.5 ft | Recovery- ft | PID - ppm | DESCRIPTION | Lithology | Well Construction | Comments/Details |
|---|---|---|---|---|---|---|---|---|
| 0 | | | | | Asphalt | | No well installed. Backfilled with bentonite chips. | |
| 1 | Hand Clear | | | 0 | Brown SAND & SHALE. (Fill) | | | |
| 2 | | | | | | | | |
| 3 | | | | | Brown and tan mottled SILTY CLAY, trace large gravel, moist, very stiff, no odor, no staining. (Colluvial) | | | |
| 4 | | | | | | | | |
| 5 | SS-1 | 9<br>13<br>23<br>25 | 1.1 | 3 | | | | |
| 6 | | | | | Light brown SILTY CLAY, moist, stiff to very stiff, trace coal and organics. Thin wet zones between 10 and 12 feet, at 16 feet, and at 19.5 feet. Weak gasoline odor from 8 to 12 feet, no staining. (Colluvial) | | | |
| 7 | SS-2 | 18<br>27<br>17<br>14 | 1.1 | 3 | | | | |
| 8 | | | | | | | | |
| 9 | SS-3 | 7<br>15<br>19<br>15 | 1.3 | 317<br>LAB | | | | |
| 10 | | | | | | | | Thin wet zones between 10 and 12 feet. |
| 11 | SS-4 | 5<br>10<br>12<br>12 | 1.7 | 336 | | | | |
| 12 | | | | | | | | |
| 13 | SS-5 | 9<br>10<br>15<br>11 | 1.3 | 44 | | | | |
| 14 | | | | | | | | |
| 15 | SS-6 | 7<br>10<br>13<br>15 | 1.4 | 333<br>LAB | | | | |
| 16 | | | | | | | | Thin wet zone at 16 feet. |
| 17 | SS-7 | 10<br>11<br>13<br>11 | 1.2 | 2 | | | | |
| 18 | | | | | | | | |
| 19 | SS-8 | 7<br>7<br>7<br>7 | 2.0 | 1 | | | | |
| 20 | | | | | | | | Thin wet zone at 19.5 feet. |
| 21 | | | | | Total Depth 20' | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |

| Project: Valley Village | Boring/Well ID: B-15 | Page 1 of 1 |
|---|---|---|
| Location: Rural Valley, PA<br>Drilling Co.: Cribbs & Associates<br>Driller: Calvin / Tyler / Dustin<br>Logged By: Rogers / Keeliher | Depth of Boring: 20 ft.<br>Date Started: 10/01/2015<br>Date Completed: 10/07/2015 | Monitoring Well Construction<br>Depth of Well n/a ft.<br>Diameter of Casing ____in.<br>Well Screen ____ length ____Slot<br>TOC Elev. _____ |

| Depth (feet) | Sample No. | Blows/.5 ft | Recovery- ft | PID - ppm | DESCRIPTION | Lithology | Well Construction | Comments/Details |
|---|---|---|---|---|---|---|---|---|
| 0 | | | | | Asphalt | | No well installed. Backfilled with bentonite chips. | |
| 1 | Hand Clear | | | 38 LAB | Brown SAND & GRAVEL, moist, moderate gasoline odor. (Fill) | | | |
| 2 | | | | 2 | Brown CLAY with some SAND & GRAVEL, moist, weak gasoline odor. (Fill) | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | SS-1 | 4 8 13 14 | 1.8 | 28 | Brown mottled SILTY CLAY with weathered sandstone fragments and traces of coal, sandy scoria, and shaley scoria, moist, very stiff, weak gasoline odor at 10 feet, no staining. (Colluvial) | | | |
| 6 | | | | | | | | |
| 7 | SS-2 | 6 9 12 13 | 1.8 | 13 | | | | |
| 8 | | | | | | | | |
| 9 | SS-3 | 6 11 15 15 | 1.9 | 51 LAB | | | | |
| 10 | | | | | | | | |
| 11 | SS-4 | 9 10 19 22 | 1.3 | 21 | | | | |
| 12 | | | | | | | | |
| 13 | SS-5 | 8 12 12 14 | 1.8 | 43 | | | | |
| 14 | | | | | | | | |
| 15 | SS-6 | 7 10 11 16 | 1.8 | 19 | | | | |
| 16 | | | | | | | | |
| 17 | SS-7 | 4 7 11 11 | 1.6 | 3 | | | | |
| 18 | | | | | | | | |
| 19 | SS-8 | 4 5 6 11 | 1.7 | 1 | Gray SILTY CLAY, slightly plastic, moist, stiff, trace sandstone, no odor, no staining. (Residual) | | | |
| 20 | | | | | | | | |
| 21 | | | | | Total Depth 20' | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |

| Project: Valley Village | Boring/Well ID: B-16 | Page 1 of 1 |
|---|---|---|
| Location: Rural Valley, PA<br>Drilling Co.: Cribbs & Associates<br>Driller: Calvin / Tyler / Dustin<br>Logged By: Rogers / Keeliher | Depth of Boring: 20 ft.<br>Date Started: 10/01/2015<br>Date Completed: 10/08/2015 | Monitoring Well Construction<br>Depth of Well n/a ft.<br>Diameter of Casing ____in.<br>Well Screen ____ length ____Slot<br>TOC Elev. _____ |

| Depth (feet) | Sample No. | Blows/.5 ft | Recovery- ft | PID - ppm | DESCRIPTION | Lithology | Well Construction | Comments/Details |
|---|---|---|---|---|---|---|---|---|
| 0 | | | | | Asphalt | | No well installed. Backfilled with bentonite chips. | |
| 1–3 | Hand Clear | | | | Brown SAND & GRAVEL, some CLAY, no odor, no staining. (Fill) | | | |
| 4 | | | | | | | | Wet zones between 4 and 6 feet. |
| 5 | SS-1 | 1 2 4 6 | 1.4 | 210 | Brown SILTY CLAY with sandstone fragments, moist with some wet zones between 4 and 6 feet, medium stiff to very stiff, gray from 19.5 to 20 feet, gasoline odor from 4 to 12 feet, no staining. (Colluvial) | | | |
| 7 | SS-2 | 7 8 9 11 | 1.9 | 1388 LAB | | | | |
| 9 | SS-3 | 5 10 14 12 | 1.5 | 244 LAB | | | | |
| 11 | SS-4 | 9 10 12 14 | 2.0 | 28 | | | | |
| 13 | SS-5 | 9 13 13 17 | 1.3 | 12 | | | | |
| 15 | SS-6 | 8 10 11 11 | 1.5 | 9 | | | | |
| 17 | SS-7 | 4 8 9 11 | 1.9 | 6 | | | | |
| 19 | SS-8 | 9 8 8 10 | 1.7 | 2 | | | | |
| 20–28 | | | | | Total Depth 20' | | | |

*Note: Sample collected from 4.5 feet during hand clearing, PID reading 30 ppm. (LAB)*

| Project: Valley Village | Boring/Well ID: B-17 | Page 1 of 1 |
|---|---|---|
| Location: Rural Valley, PA<br>Drilling Co.: Cribbs & Associates<br>Driller: Calvin / Tyler / Dustin<br>Logged By: Rogers / Keeliher | Depth of Boring: 20 ft.<br>Date Started: 10/01/2015<br>Date Completed: 10/07/2015 | Monitoring Well Construction<br>Depth of Well n/a ft.<br>Diameter of Casing ____in.<br>Well Screen ____ length ____Slot<br>TOC Elev. _____ |

| Depth (feet) | Sample No. | Blows/.5 ft | Recovery- ft | PID - ppm | DESCRIPTION | Lithology | Well Construction | Comments/Details |
|---|---|---|---|---|---|---|---|---|
| 0 | | | | | Asphalt | | No well installed. Backfilled with bentonite chips. | |
| 1 | Hand Clear | | | 1 | SILTY SAND & GRAVEL with shale fragments, moist, wet at 3.5 feet, gasoline odor from 2 to 4 feet. | | | |
| 2 | | | | 32 | | | | |
| 3 | | | | 21 | | | | |
| 4 | | | | 26 | | | | Wet zones between 4 and 6 feet. |
| 5 | SS-1 | 1 2 2 5 | 1.0 | 2 | Brown to gray SILTY CLAY with sandstone fragments, moist with some wet zones between 4 and 6 feet, soft to very stiff, gasoline odor from 6 to 12 feet, no staining. (Colluvial) | | | |
| 6 | | | | | | | | |
| 7 | SS-2 | 5 11 13 15 | 2.0 | 93 | | | | |
| 8 | | | | | | | | |
| 9 | SS-3 | 10 11 14 13 | 1.8 | 250 LAB | | | | |
| 10 | | | | | | | | |
| 11 | SS-4 | 10 12 14 18 | 1.9 | 454 LAB | | | | |
| 12 | | | | | | | | |
| 13 | SS-5 | 8 13 15 16 | 1.8 | 153 | | | | |
| 14 | | | | | | | | |
| 15 | SS-6 | 5 10 10 14 | 1.7 | 152 LAB | | | | |
| 16 | | | | | | | | |
| 17 | SS-7 | 6 12 11 14 | 1.0 | 7 | | | | |
| 18 | | | | | | | | |
| 19 | SS-8 | 9 14 16 19 | 1.7 | 4 | | | | |
| 20 | | | | | | | | |
| 21 | | | | | Total Depth 20' | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |

| Project: Valley Village | Boring/Well ID: B-18 | Page 1 of 1 |
|---|---|---|
| Location: Rural Valley, PA<br>Drilling Co.: Cribbs & Associates<br>Driller: Calvin / Tyler / Dustin<br>Logged By: Rogers / Keeliher | Depth of Boring: 20 ft.<br>Date Started: 10/02/2015<br>Date Completed: 10/07/2015 | Monitoring Well Construction<br>Depth of Well n/a ft.<br>Diameter of Casing ____in.<br>Well Screen ____ length ____Slot<br>TOC Elev. _____ |

| Depth (feet) | Sample No. | Blows/.5 ft | Recovery- ft | PID - ppm | DESCRIPTION | Lithology | Well Construction | Comments/Details |
|---|---|---|---|---|---|---|---|---|
| 0 | | | | | Asphalt | | No well installed. Backfilled with bentonite chips. | |
| 1 | | | | | | | | |
| 2 | Hand Clear | | | 0 | Brown to gray CLAY, moist, no odor, no staining. | | | |
| 3 | | | | | | | | |
| 4 | | | | 0 | | | | Wet zones between 4 and 6 feet. |
| 5 | SS-1 | 3<br>1<br>2<br>3 | 1.3 | 0 | Brown mottled SILTY CLAY with sandstone fragments, trace coal and red scoria, moist with thin wet zones between 4 and 6 feet and between 18 and 20 feet, soft to very stiff, no gasoline odor, no staining. (Colluvial) | | | |
| 6 | | | | | | | | |
| 7 | SS-2 | 4<br>6<br>9<br>10 | 2.0 | 0 | | | | |
| 8 | | | | | | | | |
| 9 | SS-3 | 5<br>5<br>9<br>16 | 2.0 | 0 | | | | |
| 10 | | | | | | | | |
| 11 | SS-4 | 11<br>11<br>13<br>16 | 1.8 | 0 | | | | |
| 12 | | | | | | | | |
| 13 | SS-5 | 8<br>12<br>12<br>15 | 2.0 | 0 | | | | |
| 14 | | | | | | | | |
| 15 | SS-6 | 4<br>8<br>11<br>13 | 0.9 | 0 | | | | |
| 16 | | | | | | | | |
| 17 | SS-7 | 4<br>6<br>8<br>11 | 1.7 | 0 | | | | |
| 18 | | | | | | | | Thin wet zones between 18 and 20 feet. |
| 19 | SS-8 | 6<br>9<br>14<br>15 | 1.2 | 0 | | | | |
| 20 | | | | | | | | |
| 21 | | | | | Total Depth 20' | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |

| Project: Valley Village | Boring/Well ID: B-19 | Page 1 of 1 |
|---|---|---|
| Location: Rural Valley, PA<br>Drilling Co.: Cribbs & Associates<br>Driller: Calvin / Tyler / Dustin<br>Logged By: Jen Swogger | Depth of Boring: 21 ft.<br>Date Started: 11/03/2015<br>Date Completed: 11/03/2015 | Monitoring Well Construction<br>Depth of Well n/a ft.<br>Diameter of Casing ____in.<br>Well Screen ____ length ____Slot<br>TOC Elev. _____ |

| Depth (feet) | Sample No. | Blows/.5 ft | Recovery- ft | PID - ppm | DESCRIPTION | Lithology | Well Construction | Comments/Details |
|---|---|---|---|---|---|---|---|---|
| 0 | | | | | Asphalt | | No well installed. Backfilled with bentonite chips. | |
| 1–4 | Hand Clear | | | 3 | Brown SILTY, GRAVELLY CLAY, dry to moist, no petroleum odor or staining. (Fill) | | | |
| 5–6 | SS-1 | 3 5 7 11 | 1.8 | 4 | Brown and gray mottled SILTY CLAY, trace iron staining, moist, stiff, very faint gasoline odor from 5 to 7 feet. (Colluvial) | | | |
| 7–8 | SS-2 | 7 9 13 17 | 2.0 | 5 | | | | |
| 9–10 | SS-3 | 2 12 18 19 | 1.3 | 3 | Brown and gray mottled SILTY CLAY with sandstone fragments, trace iron staining, moist, stiff, no petroleum odor or staining. (Colluvial) | | | |
| 11–12 | SS-4 | 6 9 13 15 | 1.6 | 5 | | | | |
| 13–14 | SS-5 | 11 13 12 14 | 1.8 | 3 | | | | |
| 15–16 | SS-6 | 8 9 12 14 | 1.5 | 2 | | | | |
| 17–18 | SS-7 | 3 9 14 15 | 1.3 | 4 | | | | |
| 19–20 | SS-8 | 5 6 12 18 | 1.8 | 4 | Interbedded layers of gray plastic SILTY CLAY and brown & gray mottled SILTY CLAY, moist, wet zone from 19'8" to 19'11", no odor or staining. | | | 3-inch wet zone from 19' 8" to 19' 11" |
| 21–28 | | | | | Total Depth 21' | | | |

| Project: Valley Village | Boring/Well ID: MW-13 | Page 1 of 1 |
|---|---|---|
| Location: Rural Valley, PA<br>Drilling Co.: Cribbs & Associates<br>Driller: Calvin / Tyler / Dustin<br>Logged By: Rogers / Swogger | Depth of Boring: 13 ft.<br>Date Started: 10/02/2015<br>Date Completed: 10/12/2015 | Monitoring Well Construction<br>Depth of Well 13 ft.<br>Diameter of Casing 2.0 in.<br>Well Screen 10' length 0.020 Slot<br>TOC Elev. _____ |

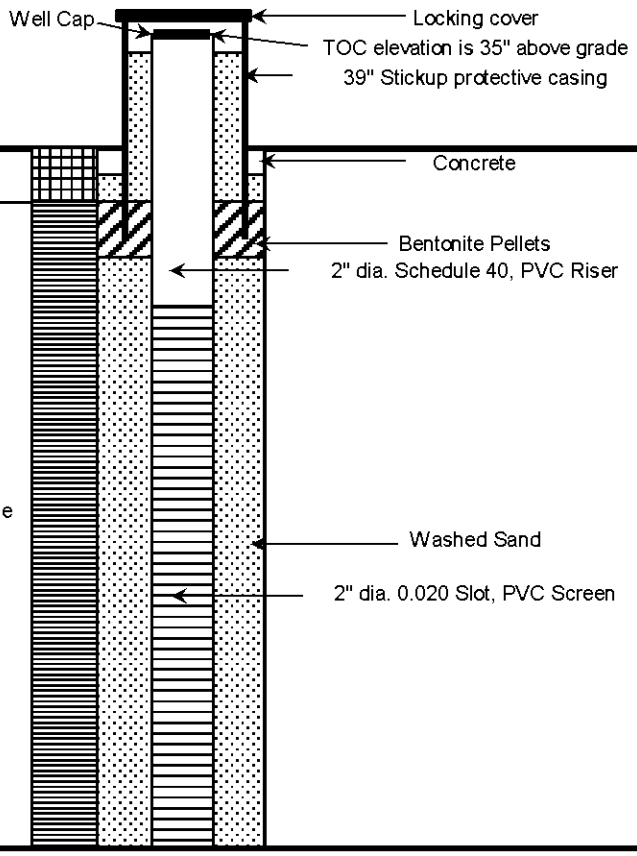
| Depth (feet) | Sample No. | Blows/.5 ft | Recovery- ft | PID - ppm | DESCRIPTION | Lithology | Well Construction | Comments/Details |
|---|---|---|---|---|---|---|---|---|
| 0 | | | | | Black cinders. | | | |
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |

Hand Clear

Auger

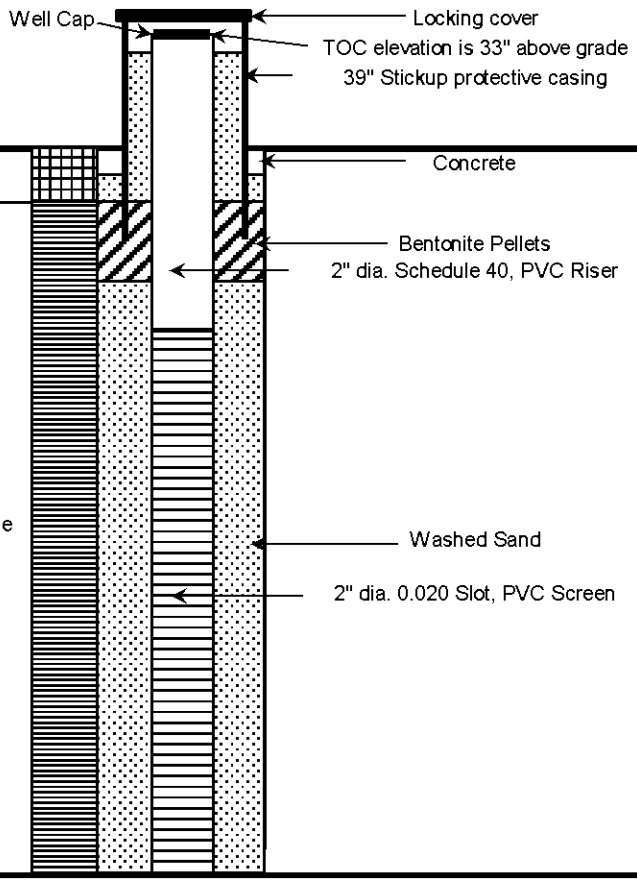
Brown SILTY CLAY with sandstone fragments.

Total Depth 13'



| Project: Valley Village | Boring/Well ID: MW-14 | Page 1 of 1 |
|---|---|---|
| Location: Rural Valley, PA<br>Drilling Co.: Cribbs & Associates<br>Driller: Calvin / Tyler / Dustin<br>Logged By: Rogers / Swogger | Depth of Boring: 13 ft.<br>Date Started: 10/02/2015<br>Date Completed: 10/12/2015 | Monitoring Well Construction<br>Depth of Well 13 ft.<br>Diameter of Casing 2.0 in.<br>Well Screen 10' length 0.020 Slot<br>TOC Elev. _____ |

| Depth (feet) | Sample No. | Blows/.5 ft | Recovery- ft | PID - ppm | DESCRIPTION | Lithology | Well Construction | Comments/Details |
|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | |
| 1 | | | | | Black cinders. | | | |
| 2 | Hand Clear | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | Brown SILTY CLAY with sandstone fragments. | | | |
| 8 | | | | | | | | |
| 9 | Auger | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |
| 12 | | | | | | | | |
| 13 | | | | | | | | |
| 14 | | | | | Total Depth 13.5' | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |



| Project: Valley Village | Boring/Well ID: MW-15 | Page 1 of 1 |
|---|---|---|
| Location: Rural Valley, PA<br>Drilling Co.: Cribbs & Associates<br>Driller: Calvin / Tyler / Dustin<br>Logged By: Rogers / Keeliher | Depth of Boring: 20 ft.<br>Date Started: 10/01/2015<br>Date Completed: 10/12/2015 | Monitoring Well Construction<br>Depth of Well 13 ft.<br>Diameter of Casing 2.0 in.<br>Well Screen 10' length 0.020 Slot<br>TOC Elev. _____ |

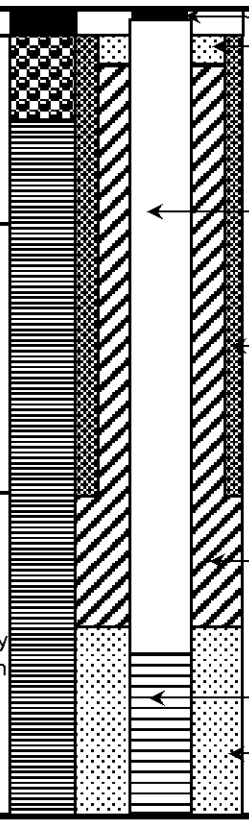
| Depth (feet) | Sample No. | Blows/.5 ft | Recovery- ft | PID - ppm | DESCRIPTION | Lithology | Well Construction | Comments/Details |
|---|---|---|---|---|---|---|---|---|
| 0 | | | | | Asphalt | | | End Cap |
| 1 | | | | | Gray CLAY with rock fragments, weak gasoline odor. (Fill) | | | Washed Sand |
| 2 | Hand Clear | | | 6 | | | | Bentonite |
| | | | | | Brown and gray CLAY, very moist, moderate gasoline odor. | | | 2" dia. Schedule 40, PVC Riser |
| 3 | | | | 5 | Brown SAND & GRAVEL, strong gasoline odor at 5 feet. | | | |
| 4 | | | | | | | | Wet from 4 to 4.8 feet. |
| 5 | SS-1 | 2 9 13 16 | 1.8 | 381 | | | | |
| 6 | | | | | | | | |
| 7 | SS-2 | 6 15 22 13 | 1.5 | 157 | | | | |
| 8 | | | | | | | | |
| 9 | SS-3 | 7 5 8 11 | 2.0 | 25 | | | | 2" dia. 0.020 Slot, PVC Screen |
| 10 | | | | | Brown to gray SILTY CLAY with sandstone fragments and some shale fragments, moist with wet zone from 4 to 4.8 feet, very stiff, trace scoria, gasoline odor from 4 to 6 feet, no staining. (Colluvial) | | | |
| 11 | SS-4 | 10 14 16 18 | 2.0 | 15 | | | | Washed Sand |
| 12 | | | | | | | | |
| 13 | SS-5 | 8 12 13 12 | 1.8 | 2 | | | | |
| 14 | | | | | | | | |
| 15 | SS-6 | 6 8 10 11 | 1.6 | 2 | | | | Bentonite |
| 16 | | | | | | | | |
| 17 | SS-7 | 13 15 11 12 | 1.8 | 2 | | | | Washed Sand |
| 18 | | | | | | | | |
| 19 | SS-8 | 6 5 6 8 | 1.9 | 1 | Gray SILTY CLAY, moist, plastic, stiff, no odor or staining. (Residual) | | | |
| 20 | | | | | | | | |
| 21 | | | | | Total Depth 20' | | | |
| 22 | | | | | *Note: Sample collected from 5 feet during hand clearing, PID reading 942 ppm. (LAB)* | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |

| Project: Valley Village | Boring/Well ID: EW-2 | Page 1 of 1 |
|---|---|---|
| Location: Rural Valley, PA<br>Drilling Co.: Cribbs & Associates<br>Driller: Calvin / Tyler / Dustin<br>Logged By: Rogers | Depth of Boring: 13 ft.<br>Date Started: 10/12/2015<br>Date Completed: 10/12/2015 | Monitoring Well Construction<br>Depth of Well 13 ft.<br>Diameter of Casing 4.0 in.<br>Well Screen 10' length 0.020 Slot<br>TOC Elev. _____ |

| Depth (feet) | Sample No. | Blows/.5 ft | Recovery- ft | PID - ppm | DESCRIPTION | Lithology | Well Construction | Comments/Details |
|---|---|---|---|---|---|---|---|---|
| 0 | | | | | Asphalt | | | End Cap |
| 1 | | | | | | | | Washed Sand |
| 2 | Hand Clear | | | 48<br>LAB<br>28<br>9 | Brown and gray CLAY with shale fragments, gravelly at 4 feet, aged gasoline odor. Water seeping into hole at 3 feet. (Fill) | | | Bentonite<br>4" dia. Schedule 40, PVC Riser |
| 3 | | | | | | | | Wet from 3 to 7 feet. |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | SS-1 | 2<br>2<br>4<br>6 | 1.2 | 3 | Brown SILTY CLAY with sandstone fragments and fine gravel, wet from 5 to 7 feet, then moist to 13 feet, stiff to hard, no odor or staining. (Colluvial) | | | |
| 7 | | | | | | | | |
| 8 | SS-2 | 6<br>11<br>13<br>14 | 1.4 | 1 | | | | 4" dia. 0.020 Slot, PVC Screen |
| 9 | | | | | | | | |
| 10 | SS-3 | 12<br>15<br>18<br>25 | 2.0 | 2 | | | | |
| 11 | | | | | | | | Washed Sand |
| 12 | SS-4 | 10<br>15<br>18<br>17 | 1.1 | 2 | | | | |
| 13 | | | | | | | | |
| 14 | | | | | Total Depth 13' | | | |
| 15 | | | | | | | | |
| 16 | | | | | | | | |
| 17 | | | | | | | | |
| 18 | | | | | | | | |
| 19 | | | | | | | | |
| 20 | | | | | | | | |
| 21 | | | | | | | | |
| 22 | | | | | | | | |
| 23 | | | | | | | | |
| 24 | | | | | | | | |
| 25 | | | | | | | | |
| 26 | | | | | | | | |
| 27 | | | | | | | | |
| 28 | | | | | | | | |

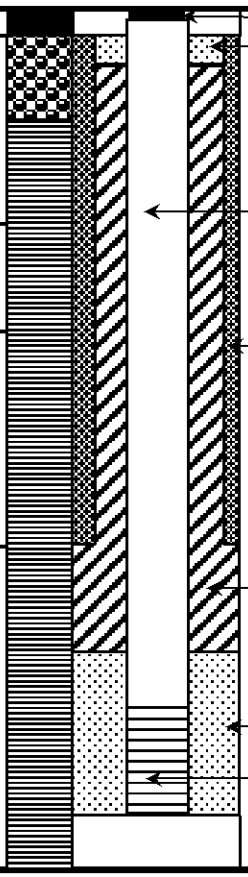
| Project: Valley Village | Boring/Well ID: P-1 | Page 1 of 1 |
|---|---|---|
| Location: Rural Valley, PA<br>Drilling Co.: Cribbs & Associates<br>Driller: Calvin / Tyler / Dustin<br>Logged By: Rogers / Swogger | Depth of Boring: 15 ft.<br>Date Started: 10/01/2015<br>Date Completed: 10/08/2015 | Monitoring Well Construction<br>Depth of Well 15 ft.<br>Diameter of Casing 2.0 in.<br>Well Screen 3' length 0.020 Slot<br>TOC Elev. _____ |

| Depth (feet) | Sample No. | Blows/.5 ft | Recovery- ft | PID - ppm | DESCRIPTION |
|---|---|---|---|---|---|
| 0–3 | Hand Clear | | | 5 | Asphalt surface.<br>Brown SAND & GRAVEL, then brown CLAY with GRAVEL. Weak gasoline odor at 3 feet. (Fill) |
| 4–5 | SS-1 | 18 28 33 27 | 1.5 | 387 LAB | Brown CLAY with sandstone fragments, stiff, moist, weak gasoline odor, no staining. (Colluvial) |
| 6–7 | SS-2 | 17 30 25 27 | 1.2 | 168 | |
| 8 | SS-3 | 18 17 | 1.1 | 1591 LAB | |
| 9–10 | SS-4 | 7 11 11 9 | 1.8 | 1542 | Brown SILTY CLAY with sandstone fragments, very stiff, gasoline odor very strong from 9 to 11 feet, moderate from 11 to 15 feet. (Colluvial) |
| 11–12 | SS-5 | 9 11 16 17 | 2.0 | 394 LAB | |
| 13–14 | SS-6 | 12 11 14 14 | 1.7 | 215 | |
| 15–28 | | | | | Total Depth 15' |

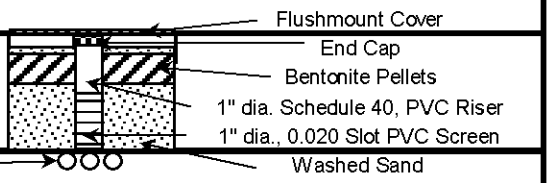


| Project: Valley Village | Boring/Well ID: P-2 | Page 1 of 1 |
|---|---|---|
| Location: Rural Valley, PA<br>Drilling Co.: Cribbs & Associates<br>Driller: Calvin / Tyler / Dustin<br>Logged By: Rogers / Swogger | Depth of Boring: 15 ft.<br>Date Started: 10/01/2015<br>Date Completed: 10/08/2015 | Monitoring Well Construction<br>Depth of Well 15 ft.<br>Diameter of Casing 2.0 in.<br>Well Screen 3' length 0.020 Slot<br>TOC Elev. _____ |

| Depth (feet) | Sample No. | Blows/.5 ft | Recovery- ft | PID - ppm | DESCRIPTION |
|---|---|---|---|---|---|
| 0 | | | | | Asphalt surface. |
| 1–3 | | | | 29<br>20 | Brown SAND & GRAVEL with SILT and CLAY. Weak gasoline odor. (Fill) |
| 4–5 | SS-1 | 2<br>4<br>5<br>6 | 1.4 | 588<br>LAB | Mottled brown and gray CLAY, moist, stiff, trace rootlets, moderate gasoline odor 4 to 5 feet, no staining. (Colluvial) |
| 6–7 | SS-2 | 8<br>12<br>12<br>11 | 1.8 | 223<br>LAB | Mottled brown and gray SILTY CLAY, moist to very moist, stiff to very stiff, trace gravel, weak gasoline odor, no staining. (Colluvial) |
| 8–9 | SS-3 | 6<br>8<br>9<br>10 | 2.0 | 11 | |
| 10–11 | SS-4 | 6<br>5<br>10<br>11 | 2.0 | 50 | Brown SILTY CLAY with brown to tan sandstone fragments, moist, very stiff, some red scoria. (Colluvial) |
| 12–13 | SS-5 | 8<br>11<br>13<br>13 | 1.8 | 1927<br>LAB | |
| 14–15 | SS-6 | 8<br>9<br>13<br>15 | 1.8 | 225 | |
| 16–28 | | | | | Total Depth 16' |



| Project: Valley Village | Boring/Well ID: VM-4 | Page 1 of 1 |
|---|---|---|
| Location: Rural Valley, PA<br>Drilling Co.: Cribbs & Associates<br>Driller: Calvin / Tyler / Dusty<br>Logged By: Paul Rogers | Depth of Boring 1 ft.<br>Date Started: 10/02/2015<br>Date Completed: 10/02/2015 | Well Construction<br>Depth of Well 1 ft<br>Diameter of Casing 1 in.<br>Well Screen 0.020 Slot: Length: 1 ft. |

| Depth (feet) | Sample No/type | Blows/.5 ft | Recovery- feet | PID Reading-ppm | DESCRIPTION | Lithology | Well Construction | Comments/Details |
|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | |  | |
| | Hand Dig | | | | Asphalt surface. | | | |
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
| 9 | | | | | | | | |
| 10 | | | | | | | | |
| 11 | | | | | | | | |



Total Depth 1'

# ATTACHMENT B

# ANALYTICAL REPORT

October 26, 2015

## Insite Group

| | |
|---|---|
| Sample Delivery Group: | L794720 |
| Samples Received: | 10/15/2015 |
| Project Number: | VALLEY VILLAGE |
| Description: | Soil-FC1 |
| Site: | 03-06500 |
| Report To: | Ms. Sara Giordano<br>611 S. Irvine Avenue<br>Sharon, PA 16146-1165 |

Entire Report Reviewed By:

Craig Cothron
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures. 060302, 060303, and 060304.

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## EW-2 2 FT L794720-01 Solid

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| J. Swogger | 10/12/15 08:40 | 10/15/15 09:00 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analysis Analyst |
|---|---|---|---|---|---|
| Metals (ICP) by Method 6010B | WG823069 | 1 | 10/19/15 18:36 | 10/20/15 21:34 | ST |
| Total Solids by Method 2540 G-2011 | WG822595 | 1 | 10/16/15 15:57 | 10/19/15 08:19 | KDW |
| Volatile Organic Compounds (GC) by Method 8015B | WG822439 | 1 | 10/16/15 08:11 | 10/16/15 17:34 | SWG |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG822857 | 22.5 | 10/22/15 11:49 | 10/22/15 16:07 | BRA |
| Wet Chemistry by Method 9023 | WG821431 | 1 | 10/16/15 09:42 | 10/16/15 12:34 | LLS |

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Craig Cothron
Technical Service Representative

## Total Solids by Method 2540 G-2011

| Analyte | Result % | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| Total Solids | 89.7 | | 1 | 10/19/2015 08:19 | WG822595 |

## Wet Chemistry by Method 9023

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Extracted TOX | U | | 9.45 | 27.9 | 1 | 10/16/2015 12:34 | WG821431 |

## Metals (ICP) by Method 6010B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Lead | 16.6 | | 0.190 | 0.558 | 1 | 10/20/2015 21:34 | WG823069 |

## Volatile Organic Compounds (GC) by Method 8015B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPHG C6 - C12 | 1.73 | | 0.0339 | 0.112 | 1 | 10/16/2015 17:34 | WG822439 |
| *(S) α,α,α-Trifluorotoluene(FID)* | *90.4* | | | *59.0-128* | | *10/16/2015 17:34* | WG822439 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Benzene | U | | 0.00608 | 0.0251 | 22.5 | 10/22/2015 16:07 | WG822857 |
| Ethylbenzene | U | | 0.00668 | 0.0251 | 22.5 | 10/22/2015 16:07 | WG822857 |
| Isopropylbenzene | U | | 0.00547 | 0.0251 | 22.5 | 10/22/2015 16:07 | WG822857 |
| Methyl tert-butyl ether | 0.00560 | J | 0.00477 | 0.0251 | 22.5 | 10/22/2015 16:07 | WG822857 |
| Naphthalene | U | | 0.0225 | 0.125 | 22.5 | 10/22/2015 16:07 | WG822857 |
| Toluene | U | | 0.00976 | 0.125 | 22.5 | 10/22/2015 16:07 | WG822857 |
| 1,2,4-Trimethylbenzene | 0.0195 | J | 0.00475 | 0.0251 | 22.5 | 10/22/2015 16:07 | WG822857 |
| 1,3,5-Trimethylbenzene | U | | 0.00598 | 0.0251 | 22.5 | 10/22/2015 16:07 | WG822857 |
| Total Xylenes | 0.0278 | J | 0.0157 | 0.0753 | 22.5 | 10/22/2015 16:07 | WG822857 |
| *(S) Toluene-d8* | *96.4* | | | *88.7-115* | | *10/22/2015 16:07* | WG822857 |
| *(S) Dibromofluoromethane* | *90.4* | | | *76.3-123* | | *10/22/2015 16:07* | WG822857 |
| *(S) 4-Bromofluorobenzene* | *102* | | | *69.7-129* | | *10/22/2015 16:07* | WG822857 |

**Sample Narrative:**

8260B L794720-01 WG822857: No bisulfates remain for analysis.

## Method Blank (MB)

(MB) 10/19/15 08:18

| Analyte | MB Result | MB Qualifier | MB RDL |
|---|---|---|---|
| | % | | % |
| Total Solids | 0.000500 | | |

## L794715-04 Original Sample (OS) • Duplicate (DUP)

(OS) 10/19/15 08:18 • (DUP) 10/19/15 08:19

| Analyte | Original Result | DUP Result | Dilution | DUP RPD | DUP Qualifier | DUP RPD Limits |
|---|---|---|---|---|---|---|
| | % | % | | % | | % |
| Total Solids | 87.6 | 83.7 | 1 | 4.57 | | 5 |

## Laboratory Control Sample (LCS)

(LCS) 10/19/15 08:18

| Analyte | Spike Amount | LCS Result | LCS Rec. | Rec. Limits | LCS Qualifier |
|---|---|---|---|---|---|
| | % | % | % | % | |
| Total Solids | 50.0 | 50.0 | 100 | 85.0-115 | |

## Method Blank (MB)

(MB) 10/14/15 20:09

| Analyte | MB Result mg/kg | MB Qualifier | MB MDL mg/kg | MB RDL mg/kg |
|---|---|---|---|---|
| Extracted TOX | U | | 9.45 | 25.0 |

## L793705-01 Original Sample (OS) • Duplicate (DUP)

(OS) 10/15/15 20:16 • (DUP) 10/15/15 20:27

| Analyte | Original Result mg/kg | DUP Result mg/kg | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Extracted TOX | ND | ND | 1 | 0.000 | | 20 |

## L794097-03 Original Sample (OS) • Duplicate (DUP)

(OS) 10/16/15 11:16 • (DUP) 10/16/15 11:29

| Analyte | Original Result mg/kg | DUP Result mg/kg | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Extracted TOX | ND | ND | 1 | 37.2 | J P1 | 20 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 10/14/15 21:08 • (LCSD) 10/15/15 18:22

| Analyte | Spike Amount mg/kg | LCS Result mg/kg | LCSD Result mg/kg | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Extracted TOX | 250 | 253 | 237 | 101 | 94.7 | 85.0-115 | | | 6.69 | 20 |

## L793705-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 10/15/15 20:16 • (MS) 10/15/15 21:06 • (MSD) 10/15/15 21:17

| Analyte | Spike Amount mg/kg | Original Result mg/kg | MS Result mg/kg | MSD Result mg/kg | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Extracted TOX | 1000 | 5.80 | 975 | 993 | 97.5 | 99.3 | 1 | 80.0-120 | | | 1.75 | 20 |

## Method Blank (MB)

(MB) 10/20/15 20:18

| Analyte | MB Result mg/kg | MB Qualifier | MB MDL mg/kg | MB RDL mg/kg |
|---|---|---|---|---|
| Lead | U | | 0.19 | 0.500 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 10/20/15 20:21 • (LCSD) 10/20/15 20:24

| Analyte | Spike Amount mg/kg | LCS Result mg/kg | LCSD Result mg/kg | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Lead | 100 | 99.7 | 101 | 100 | 101 | 80-120 | | | 1 | 20 |

## L794715-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 10/20/15 20:27 • (MS) 10/20/15 20:35 • (MSD) 10/20/15 20:38

| Analyte | Spike Amount mg/kg | Original Result mg/kg | MS Result mg/kg | MSD Result mg/kg | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lead | 100 | 1.26 | 104 | 102 | 103 | 101 | 1 | 75-125 | | | 2 | 20 |

## Method Blank (MB)

(MB) 10/16/15 07:31

| Analyte | MB Result mg/kg | MB Qualifier | MB MDL mg/kg | MB RDL mg/kg |
|---|---|---|---|---|
| TPHG C6 - C12 | U | | 0.0339 | 0.100 |
| *(S) a,a,a-Trifluorotoluene(FID)* | *94.3* | | | *59.0-128* |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 10/16/15 06:25 • (LCSD) 10/16/15 06:47

| Analyte | Spike Amount mg/kg | LCS Result mg/kg | LCSD Result mg/kg | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| TPHG C6 - C12 | 5.50 | 5.62 | 5.60 | 102 | 102 | 62.2-127 | | | 0.440 | 20 |
| *(S) a,a,a-Trifluorotoluene(FID)* | | | | *102* | *102* | *59.0-128* | | | | |

## L794425-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 10/16/15 14:14 • (MS) 10/16/15 13:08 • (MSD) 10/16/15 13:30

| Analyte | Spike Amount mg/kg | Original Result mg/kg | MS Result mg/kg | MSD Result mg/kg | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPHG C6 - C12 | 5.50 | ND | 21.9 | 23.1 | 79.8 | 83.9 | 5 | 20.5-134 | | | 5.07 | 23.8 |
| *(S) a,a,a-Trifluorotoluene(FID)* | | | | | *99.9* | *100* | | *59.0-128* | | | | |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## Method Blank (MB)

(MB) 10/22/15 13:06

| Analyte | MB Result mg/kg | MB Qualifier | MB MDL mg/kg | MB RDL mg/kg |
|---|---|---|---|---|
| Benzene | U | | 0.000270 | 0.00100 |
| Ethylbenzene | U | | 0.000297 | 0.00100 |
| Isopropylbenzene | U | | 0.000243 | 0.00100 |
| Methyl tert-butyl ether | U | | 0.000212 | 0.00100 |
| Naphthalene | U | | 0.00100 | 0.00500 |
| Toluene | U | | 0.000434 | 0.00500 |
| 1,2,4-Trimethylbenzene | U | | 0.000211 | 0.00100 |
| 1,3,5-Trimethylbenzene | U | | 0.000266 | 0.00100 |
| Xylenes, Total | U | | 0.000698 | 0.00300 |
| *(S) Toluene-d8* | *102* | | | *88.7-115* |
| *(S) Dibromofluoromethane* | *103* | | | *76.3-123* |
| *(S) 4-Bromofluorobenzene* | *93.6* | | | *69.7-129* |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 10/22/15 11:42 • (LCSD) 10/22/15 12:03

| Analyte | Spike Amount mg/kg | LCS Result mg/kg | LCSD Result mg/kg | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 0.0250 | 0.0231 | 0.0221 | 92.6 | 88.5 | 72.6-120 | | | 4.45 | 20 |
| Ethylbenzene | 0.0250 | 0.0215 | 0.0208 | 85.9 | 83.2 | 78.6-124 | | | 3.21 | 20 |
| Isopropylbenzene | 0.0250 | 0.0222 | 0.0221 | 88.9 | 88.3 | 79.4-126 | | | 0.690 | 20 |
| Methyl tert-butyl ether | 0.0250 | 0.0233 | 0.0215 | 93.4 | 86.1 | 70.2-122 | | | 8.12 | 20 |
| Naphthalene | 0.0250 | 0.0224 | 0.0212 | 89.7 | 84.8 | 69.9-132 | | | 5.64 | 20 |
| Toluene | 0.0250 | 0.0226 | 0.0210 | 90.6 | 84.1 | 76.7-116 | | | 7.42 | 20 |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.0220 | 0.0218 | 87.9 | 87.1 | 77.1-124 | | | 0.910 | 20 |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.0220 | 0.0218 | 87.9 | 87.0 | 79.0-125 | | | 1.03 | 20 |
| Xylenes, Total | 0.0750 | 0.0657 | 0.0642 | 87.6 | 85.6 | 78.1-123 | | | 2.25 | 20 |
| *(S) Toluene-d8* | | | | *101* | *101* | *88.7-115* | | | | |
| *(S) Dibromofluoromethane* | | | | *98.6* | *100* | *76.3-123* | | | | |
| *(S) 4-Bromofluorobenzene* | | | | *97.2* | *98.4* | *69.7-129* | | | | |

## L794885-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 10/22/15 14:29 • (MS) 10/22/15 15:04 • (MSD) 10/22/15 15:25

| Analyte | Spike Amount mg/kg | Original Result mg/kg | MS Result mg/kg | MSD Result mg/kg | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 0.0250 | ND | 0.0882 | 0.0779 | 70.6 | 62.3 | 5 | 47.8-131 | | | 12.4 | 22.8 |
| Ethylbenzene | 0.0250 | ND | 0.0370 | 0.0304 | 29.6 | 24.3 | 5 | 44.8-135 | J6 | J6 | 19.8 | 26.9 |
| Isopropylbenzene | 0.0250 | ND | 0.0309 | 0.0230 | 24.7 | 18.4 | 5 | 41.9-139 | J6 | J6 | 29.2 | 29.3 |
| Methyl tert-butyl ether | 0.0250 | ND | 0.105 | 0.0925 | 83.8 | 74.0 | 5 | 50.4-131 | | | 12.3 | 24.8 |
| Naphthalene | 0.0250 | 0.00821 | 0.0101 | 0.00191 | 1.53 | 0.000 | 5 | 18.4-145 | J6 | J3 J6 | 136 | 34 |
| Toluene | 0.0250 | ND | 0.0701 | 0.0598 | 56.1 | 47.8 | 5 | 47.8-127 | | | 15.9 | 24.3 |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.000491 | 0.0214 | 0.0116 | 16.7 | 8.86 | 5 | 32.9-139 | J6 | J3 J6 | 59.5 | 30.6 |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.0362 | 0.110 | 0.0634 | 58.9 | 21.7 | 5 | 37.1-138 | | J3 J6 | 53.6 | 30.6 |
| Xylenes, Total | 0.0750 | 0.00216 | 0.164 | 0.126 | 43.1 | 33.0 | 5 | 42.7-135 | J6 | J3 J6 | 26.3 | 26.6 |
| *(S) Toluene-d8* | | | | | *98.4* | *98.2* | | *88.7-115* | | | | |
| *(S) Dibromofluoromethane* | | | | | *99.6* | *96.9* | | *76.3-123* | | | | |
| *(S) 4-Bromofluorobenzene* | | | | | *116* | *111* | | *69.7-129* | | | | |

## Abbreviations and Definitions

| | |
|---|---|
| SDG | Sample Delivery Group. |
| MDL | Method Detection Limit. |
| RDL | Reported Detection Limit. |
| ND,U | Not detected at the Reporting Limit (or MDL where applicable). |
| RPD | Relative Percent Difference. |
| (dry) | Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils]. |
| Original Sample | The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG. |
| (S) | Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media. |
| Rec. | Recovery. |
| SDL | Sample Detection Limit. |
| MQL | Method Quantitation Limit. |
| Unadj. MQL | Unadjusted Method Quantitation Limit. |

| Qualifier | Description |
|---|---|
| J | The identification of the analyte is acceptable; the reported value is an estimate. |
| J3 | The associated batch QC was outside the established quality control range for precision. |
| J6 | The sample matrix interfered with the ability to make any accurate determination; spike value is low. |
| P1 | RPD value not applicable for sample concentrations less than 5 times the reporting limit. |

# ACCREDITATIONS & LOCATIONS

ONE LAB. NATIONWIDE.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross-contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**



## State Accreditations

| | | | |
|---|---|---|---|
| Alabama | 40660 | Nevada | TN-03-2002-34 |
| Alaska | UST-080 | New Hampshire | 2975 |
| Arizona | AZ0612 | New Jersey–NELAP | TN002 |
| Arkansas | 88-0469 | New Mexico | TN00003 |
| California | 01157CA | New York | 11742 |
| Colorado | TN00003 | North Carolina | Env375 |
| Connecticut | PH-0197 | North Carolina [1] | DW21704 |
| Florida | E87487 | North Carolina [2] | 41 |
| Georgia | NELAP | North Dakota | R-140 |
| Georgia [1] | 923 | Ohio–VAP | CL0069 |
| Idaho | TN00003 | Oklahoma | 9915 |
| Illinois | 200008 | Oregon | TN200002 |
| Indiana | C-TN-01 | Pennsylvania | 68-02979 |
| Iowa | 364 | Rhode Island | 221 |
| Kansas | E-10277 | South Carolina | 84004 |
| Kentucky [1] | 90010 | South Dakota | n/a |
| Kentucky [2] | 16 | Tennessee [1,4] | 2006 |
| Louisiana | AI30792 | Texas | T 104704245-07-TX |
| Maine | TN0002 | Texas [5] | LAB0152 |
| Maryland | 324 | Utah | 6157585858 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 109 |
| Minnesota | 047-999-395 | Washington | C1915 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 9980939910 |
| Montana | CERT0086 | Wyoming | A2LA |
| Nebraska | NE-OS-15-05 | | |

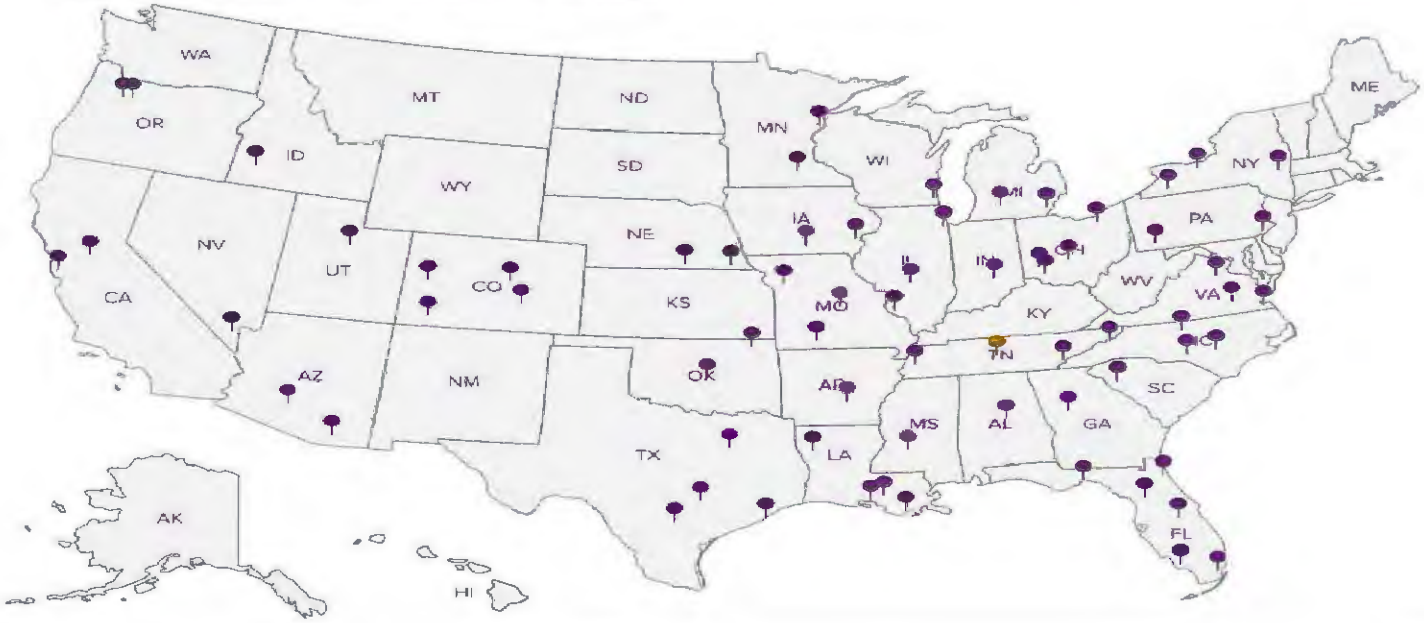
[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Accreditation not applicable

## Third Party & Federal Accreditations

| | | | |
|---|---|---|---|
| A2LA – ISO 17025 | 1461.01 | AIHA | 100789 |
| Canada | 1461.01 | DOD | 1461.01 |
| EPA–Crypto | TN00003 | USDA | S-67674 |

## Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



**Insite Group**

611 S. Irvine Avenue
Sharon, PA 16146-1165

Billing Information:
Ms. Sara Giordano
611 S. Irvine Avenue
Sharon, PA 16146-1165

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

ESC

Report to: Ms. Sara Giordano

Email To: lab@insitegroup.org,sgiordano@insitegroup.org

Project Description: ~~Vall~~ Soil - FCL

City/State Collected: K. Hanna, PA

Phone: 724-347-2101
Fax: 724-347-2139

Client Project #: Valley Village

Lab Project #: ~~INSITE-SS~~ INSITE 0806145

Collected by (print): J. Swogger

Site/Facility ID #: 03-06500

P.O. #:

Collected by (signature): J. Swogger/LK

Immediately Packed on Ice: N ✓ Y

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

Date Results Needed:

Email? No X Yes
FAX? No ___ Yes

| Sample ID | Comp/Grab | Matrix* | Depth | Date | Time | # of Cntrs | TS 4oz Clr NoPres | VS 260B (1X MNI 40ml/NaBis/Syr/MeOH) | VOC SCREEN 2oz Clr NoPres | TPH-GRO (C6-C12) | EDX (TCX) | Lead |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EW-2 (2/+) | Grab | SS | | 10/12/15 | 08:45 | 8 | X | X | X | X | X | X |
| | | SS | | | | 5 | X | X | X | | | |
| | | SS | | | | 5 | X | X | X | | | |
| | | SS | | | | 5 | X | X | X | | | |
| | | SS | | | | 5 | X | X | X | | | |
| | | SS | | | | 5 | X | X | X | | | |
| | | SS | | | | 5 | X | X | X | | | |
| | | SS | | | | 5 | X | X | X | | | |
| | | SS | | | | 5 | X | X | X | | | |
| | | SS | | | | 5 | X | X | X | | | |

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

Remarks: DI Priority Check # Insite 0806145

pH: Temp:
Flow: Other:

Relinquished by: (Signature) Kristen Kelly
Date: 10/14/15
Time: 1411
Received by: (Signature)

Relinquished by: (Signature)
Date:
Time:
Received by: (Signature) 3443 355 2586

Relinquished by: (Signature)
Date:
Time:
Received for lab by: (Signature)

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐
Temp: 3.2 °C
Bottles Received: 8 + TB
Date: 10-15-15
Time: 0900

Hold #:
Condition:
Lab use only: a JW7
COC Seal Intact: ___ Y ___ N ___ NA
pH Checked: NFT

L# 79470
F187

Acctnum: INSITE
Template: T60941
Prelogin: P517771
TSR: 034 - Craig Cothron
PB: 7-20-15 MG
Shipped Via: FedEX Ground

ESC LAB SCIENCES
YOUR LAB OF CHOICE

# ANALYTICAL REPORT

October 15, 2015

myESC
REAL TIME DATA ACCESS

## Insite Group

| | |
|---|---|
| Sample Delivery Group: | L792840 |
| Samples Received: | 10/06/2015 |
| Project Number: | VALLEY VILLAGE |
| Description: | Soil |
| Site: | 03-06500 |
| Report To: | Ms. Sara Giordano<br>611 S. Irvine Avenue<br>Sharon, PA 16146-1165 |

Entire Report Reviewed By:

Craig Cothron
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures. 060302, 060303, and 060304.

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## B-15 1FT L792840-01 Solid

Collected by: Paul Rogers
Collected date/time: 10/01/15 13:24
Received date/time: 10/06/15 09:00

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analysis Analyst |
|---|---|---|---|---|---|
| Total Solids by Method 2540 G-2011 | WG820574 | 1 | 10/08/15 10:22 | 10/09/15 06:32 | MEL |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG821417 | 1 | 10/12/15 16:00 | 10/13/15 06:29 | KLO |

## B-16 4.5FT L792840-02 Solid

Collected by: Paul Rogers
Collected date/time: 10/01/15 11:23
Received date/time: 10/06/15 09:00

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analysis Analyst |
|---|---|---|---|---|---|
| Total Solids by Method 2540 G-2011 | WG820574 | 1 | 10/08/15 10:22 | 10/09/15 06:33 | MEL |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG821803 | 1 | 10/14/15 04:00 | 10/14/15 10:17 | MCB |

## MW-15 5FT L792840-03 Solid

Collected by: Paul Rogers
Collected date/time: 10/01/15 13:00
Received date/time: 10/06/15 09:00

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analysis Analyst |
|---|---|---|---|---|---|
| Total Solids by Method 2540 G-2011 | WG820574 | 1 | 10/08/15 10:22 | 10/09/15 06:33 | MEL |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG821803 | 20 | 10/14/15 04:00 | 10/14/15 10:35 | MCB |

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Craig Cothron
Technical Service Representative

## Total Solids by Method 2540 G-2011

| Analyte | Result % | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| Total Solids | 92.4 | | 1 | 10/09/2015 06:32 | WG820574 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Benzene | 0.00201 | | 0.000270 | 0.00108 | 1 | 10/13/2015 06:29 | WG821417 |
| Ethylbenzene | 0.00167 | | 0.000297 | 0.00108 | 1 | 10/13/2015 06:29 | WG821417 |
| Isopropylbenzene | 0.000479 | J | 0.000243 | 0.00108 | 1 | 10/13/2015 06:29 | WG821417 |
| Methyl tert-butyl ether | 0.00218 | | 0.000212 | 0.00108 | 1 | 10/13/2015 06:29 | WG821417 |
| Naphthalene | 0.0173 | | 0.00100 | 0.00541 | 1 | 10/13/2015 06:29 | WG821417 |
| Toluene | 0.00416 | J | 0.000434 | 0.00541 | 1 | 10/13/2015 06:29 | WG821417 |
| 1,2,4-Trimethylbenzene | 0.00701 | | 0.000211 | 0.00108 | 1 | 10/13/2015 06:29 | WG821417 |
| 1,3,5-Trimethylbenzene | 0.00279 | | 0.000266 | 0.00108 | 1 | 10/13/2015 06:29 | WG821417 |
| Xylenes, Total | 0.00923 | | 0.000698 | 0.00325 | 1 | 10/13/2015 06:29 | WG821417 |
| *(S) Toluene-d8* | *98.9* | | | *88.7-115* | | *10/13/2015 06:29* | WG821417 |
| *(S) Dibromofluoromethane* | *95.5* | | | *76.3-123* | | *10/13/2015 06:29* | WG821417 |
| *(S) 4-Bromofluorobenzene* | *106* | | | *69.7-129* | | *10/13/2015 06:29* | WG821417 |

## Total Solids by Method 2540 G-2011

| Analyte | Result % | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| Total Solids | 82.6 | | 1 | 10/09/2015 06:33 | WG820574 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Benzene | 0.158 | | 0.000270 | 0.00121 | 1 | 10/14/2015 10:17 | WG821803 |
| Ethylbenzene | 0.00945 | | 0.000297 | 0.00121 | 1 | 10/14/2015 10:17 | WG821803 |
| Isopropylbenzene | 0.000390 | J | 0.000243 | 0.00121 | 1 | 10/14/2015 10:17 | WG821803 |
| Methyl tert-butyl ether | U | | 0.000212 | 0.00121 | 1 | 10/14/2015 10:17 | WG821803 |
| Naphthalene | U | | 0.00100 | 0.00606 | 1 | 10/14/2015 10:17 | WG821803 |
| Toluene | 0.00429 | J | 0.000434 | 0.00606 | 1 | 10/14/2015 10:17 | WG821803 |
| 1,2,4-Trimethylbenzene | 0.00246 | | 0.000211 | 0.00121 | 1 | 10/14/2015 10:17 | WG821803 |
| 1,3,5-Trimethylbenzene | 0.000830 | J | 0.000266 | 0.00121 | 1 | 10/14/2015 10:17 | WG821803 |
| Xylenes, Total | 0.0351 | | 0.000698 | 0.00363 | 1 | 10/14/2015 10:17 | WG821803 |
| *(S) Toluene-d8* | *107* | | | *88.7-115* | | *10/14/2015 10 17* | WG821803 |
| *(S) Dibromofluoromethane* | *95 7* | | | *76 3-123* | | *10/14/2015 10:17* | WG821803 |
| *(S) 4-Bromofluorobenzene* | *98 8* | | | *69.7-129* | | *10/14/2015 10 17* | WG821803 |

## Total Solids by Method 2540 G-2011

| Analyte | Result % | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| Total Solids | 86.6 | | 1 | 10/09/2015 06:33 | WG820574 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Benzene | 0.0640 | | 0.00540 | 0.0231 | 20 | 10/14/2015 10:35 | WG821803 |
| Ethylbenzene | 0.300 | | 0.00594 | 0.0231 | 20 | 10/14/2015 10:35 | WG821803 |
| Isopropylbenzene | 0.0320 | | 0.00486 | 0.0231 | 20 | 10/14/2015 10:35 | WG821803 |
| Methyl tert-butyl ether | U | | 0.00424 | 0.0231 | 20 | 10/14/2015 10:35 | WG821803 |
| Naphthalene | 0.259 | | 0.0200 | 0.115 | 20 | 10/14/2015 10:35 | WG821803 |
| Toluene | 0.418 | | 0.00868 | 0.115 | 20 | 10/14/2015 10:35 | WG821803 |
| 1,2,4-Trimethylbenzene | 0.801 | | 0.00422 | 0.0231 | 20 | 10/14/2015 10:35 | WG821803 |
| 1,3,5-Trimethylbenzene | 0.192 | | 0.00532 | 0.0231 | 20 | 10/14/2015 10:35 | WG821803 |
| Xylenes, Total | 1.85 | | 0.0140 | 0.0693 | 20 | 10/14/2015 10:35 | WG821803 |
| *(S) Toluene-d8* | *102* | | | *88.7-115* | | *10/14/2015 10:35* | WG821803 |
| *(S) Dibromofluoromethane* | *92.6* | | | *76.3-123* | | *10/14/2015 10:35* | WG821803 |
| *(S) 4-Bromofluorobenzene* | *106* | | | *69.7-129* | | *10/14/2015 10:35* | WG821803 |

## Method Blank (MB)

(MB) 10/09/15 06:32

| Analyte | MB Result % | MB Qualifier | MB RDL % |
|---|---|---|---|
| Total Solids | 0.000 | | |

## L792840-01 Original Sample (OS) • Duplicate (DUP)

(OS) 10/09/15 06:32 • (DUP) 10/09/15 06:32

| Analyte | Original Result % | DUP Result % | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Total Solids | 92.4 | 91.8 | 1 | 0.702 | | 5 |

## Laboratory Control Sample (LCS)

(LCS) 10/09/15 06:32

| Analyte | Spike Amount % | LCS Result % | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Total Solids | 50.0 | 50.0 | 100 | 85.0-115 | |

## Method Blank (MB)

(MB) 10/12/15 21:38

| Analyte | MB Result mg/kg | MB Qualifier | MB MDL mg/kg | MB RDL mg/kg |
|---|---|---|---|---|
| Benzene | U | | 0.000270 | 0.00100 |
| Ethylbenzene | U | | 0.000297 | 0.00100 |
| Isopropylbenzene | U | | 0.000243 | 0.00100 |
| Methyl tert-butyl ether | U | | 0.000212 | 0.00100 |
| Naphthalene | U | | 0.00100 | 0.00500 |
| Toluene | U | | 0.000434 | 0.00500 |
| 1,2,4-Trimethylbenzene | U | | 0.000211 | 0.00100 |
| 1,3,5-Trimethylbenzene | U | | 0.000266 | 0.00100 |
| Xylenes, Total | U | | 0.000698 | 0.00300 |
| *(S) Toluene-d8* | *101* | | | *88.7-115* |
| *(S) Dibromofluoromethane* | *95.7* | | | *76.3-123* |
| *(S) 4-Bromofluorobenzene* | *97.5* | | | *69.7-129* |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 10/12/15 22:01 • (LCSD) 10/12/15 22:24

| Analyte | Spike Amount mg/kg | LCS Result mg/kg | LCSD Result mg/kg | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 0.0250 | 0.0227 | 0.0231 | 90.7 | 92.4 | 72.6-120 | | | 1.83 | 20 |
| Ethylbenzene | 0.0250 | 0.0220 | 0.0233 | 88.0 | 93.2 | 78.6-124 | | | 5.77 | 20 |
| Isopropylbenzene | 0.0250 | 0.0223 | 0.0238 | 89.4 | 95.1 | 79.4-126 | | | 6.28 | 20 |
| Methyl tert-butyl ether | 0.0250 | 0.0216 | 0.0220 | 86.6 | 87.8 | 70.2-122 | | | 1.44 | 20 |
| Naphthalene | 0.0250 | 0.0227 | 0.0237 | 90.8 | 94.8 | 69.9-132 | | | 4.35 | 20 |
| Toluene | 0.0250 | 0.0229 | 0.0233 | 91.6 | 93.2 | 76.7-116 | | | 1.76 | 20 |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.0224 | 0.0237 | 89.8 | 95.0 | 77.1-124 | | | 5.58 | 20 |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.0228 | 0.0243 | 91.4 | 97.2 | 79.0-125 | | | 6.14 | 20 |
| Xylenes, Total | 0.0750 | 0.0671 | 0.0715 | 89.5 | 95.4 | 78.1-123 | | | 6.35 | 20 |
| *(S) Toluene-d8* | | | | *102* | *100* | *88.7-115* | | | | |
| *(S) Dibromofluoromethane* | | | | *101* | *97.7* | *76.3-123* | | | | |
| *(S) 4-Bromofluorobenzene* | | | | *96.0* | *97.8* | *69.7-129* | | | | |

## L792806-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 10/13/15 00:19 • (MS) 10/12/15 23:10 • (MSD) 10/12/15 23:33

| Analyte | Spike Amount mg/kg | Original Result mg/kg | MS Result mg/kg | MSD Result mg/kg | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 0.0250 | ND | 0.0187 | 0.0119 | 74.7 | 47.7 | 1 | 47.8-131 | | J3 J6 | 44.1 | 22.8 |
| Ethylbenzene | 0.0250 | ND | 0.0190 | 0.0116 | 76.2 | 46.5 | 1 | 44.8-135 | | J3 | 48.4 | 26.9 |
| Isopropylbenzene | 0.0250 | ND | 0.0197 | 0.0122 | 78.9 | 48.8 | 1 | 41.9-139 | | J3 | 47.3 | 29.3 |
| Methyl tert-butyl ether | 0.0250 | ND | 0.0222 | 0.0139 | 88.6 | 55.4 | 1 | 50.4-131 | | J3 | 46.1 | 24.8 |
| Naphthalene | 0.0250 | ND | 0.0253 | 0.0150 | 101 | 60.0 | 1 | 18.4-145 | | J3 | 51.2 | 34 |
| Toluene | 0.0250 | ND | 0.0192 | 0.0120 | 76.8 | 48.0 | 1 | 47.8-127 | | J3 | 46.2 | 24.3 |
| 1,2,4-Trimethylbenzene | 0.0250 | ND | 0.0202 | 0.0122 | 80.7 | 48.9 | 1 | 32.9-139 | | J3 | 49.1 | 30.6 |
| 1,3,5-Trimethylbenzene | 0.0250 | ND | 0.0201 | 0.0123 | 80.4 | 49.1 | 1 | 37.1-138 | | J3 | 48.3 | 30.6 |
| Xylenes, Total | 0.0750 | ND | 0.0592 | 0.0362 | 78.9 | 48.2 | 1 | 42.7-135 | | J3 | 48.3 | 26.6 |
| *(S) Toluene-d8* | | | | | *101* | *101* | | *88.7-115* | | | | |
| *(S) Dibromofluoromethane* | | | | | *101* | *98.8* | | *76.3-123* | | | | |
| *(S) 4-Bromofluorobenzene* | | | | | *96.2* | *95.8* | | *69.7-129* | | | | |

## Method Blank (MB)

(MB) 10/14/15 08:27

| Analyte | MB Result mg/kg | MB Qualifier | MB MDL mg/kg | MB RDL mg/kg |
|---|---|---|---|---|
| Benzene | U | | 0.000270 | 0.00100 |
| Ethylbenzene | U | | 0.000297 | 0.00100 |
| Isopropylbenzene | U | | 0.000243 | 0.00100 |
| Methyl tert-butyl ether | U | | 0.000212 | 0.00100 |
| Naphthalene | U | | 0.00100 | 0.00500 |
| Toluene | U | | 0.000434 | 0.00500 |
| 1,2,4-Trimethylbenzene | U | | 0.000211 | 0.00100 |
| 1,3,5-Trimethylbenzene | U | | 0.000266 | 0.00100 |
| Xylenes, Total | U | | 0.000698 | 0.00300 |
| *(S) Toluene-d8* | *102* | | | *88.7-115* |
| *(S) Dibromofluoromethane* | *95.9* | | | *76.3-123* |
| *(S) 4-Bromofluorobenzene* | *106* | | | *69.7-129* |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 10/14/15 06:20 • (LCSD) 10/14/15 06:38

| Analyte | Spike Amount mg/kg | LCS Result mg/kg | LCSD Result mg/kg | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 0.0250 | 0.0225 | 0.0224 | 90.1 | 89.4 | 72.6-120 | | | 0.750 | 20 |
| Ethylbenzene | 0.0250 | 0.0262 | 0.0261 | 105 | 105 | 78.6-124 | | | 0.270 | 20 |
| Isopropylbenzene | 0.0250 | 0.0254 | 0.0254 | 102 | 102 | 79.4-126 | | | 0.140 | 20 |
| Methyl tert-butyl ether | 0.0250 | 0.0240 | 0.0242 | 96.2 | 96.6 | 70.2-122 | | | 0.450 | 20 |
| Naphthalene | 0.0250 | 0.0283 | 0.0268 | 113 | 107 | 69.9-132 | | | 5.48 | 20 |
| Toluene | 0.0250 | 0.0234 | 0.0231 | 93.8 | 92.3 | 76.7-116 | | | 1.56 | 20 |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.0264 | 0.0260 | 106 | 104 | 77.1-124 | | | 1.56 | 20 |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.0264 | 0.0262 | 106 | 105 | 79.0-125 | | | 0.840 | 20 |
| Xylenes, Total | 0.0750 | 0.0735 | 0.0755 | 98.0 | 101 | 78.1-123 | | | 2.73 | 20 |
| *(S) Toluene-d8* | | | | *102* | *106* | *88.7-115* | | | | |
| *(S) Dibromofluoromethane* | | | | *95.4* | *97.1* | *76.3-123* | | | | |
| *(S) 4-Bromofluorobenzene* | | | | *107* | *107* | *69.7-129* | | | | |

## Abbreviations and Definitions

| | |
|---|---|
| SDG | Sample Delivery Group. |
| MDL | Method Detection Limit. |
| RDL | Reported Detection Limit. |
| ND,U | Not detected at the Reporting Limit (or MDL where applicable). |
| RPD | Relative Percent Difference. |
| (dry) | Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils]. |
| Original Sample | The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG. |
| (S) | Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media. |
| Rec. | Recovery. |
| SDL | Sample Detection Limit. |
| MQL | Method Quantitation Limit. |
| Unadj. MQL | Unadjusted Method Quantitation Limit. |

| Qualifier | Description |
|---|---|
| J | The identification of the analyte is acceptable; the reported value is an estimate. |
| J3 | The associated batch QC was outside the established quality control range for precision. |
| J6 | The sample matrix interfered with the ability to make any accurate determination; spike value is low. |

# ACCREDITATIONS & LOCATIONS

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross-contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**



## State Accreditations

| | | | |
|---|---|---|---|
| Alabama | 40660 | Nevada | TN-03-2002-34 |
| Alaska | UST-080 | New Hampshire | 2975 |
| Arizona | AZ0612 | New Jersey–NELAP | TN002 |
| Arkansas | 88-0469 | New Mexico | TN00003 |
| California | 01157CA | New York | 11742 |
| Colorado | TN00003 | North Carolina | Env375 |
| Connecticut | PH-0197 | North Carolina [1] | DW21704 |
| Florida | E87487 | North Carolina [2] | 41 |
| Georgia | NELAP | North Dakota | R-140 |
| Georgia [1] | 923 | Ohio–VAP | CL0069 |
| Idaho | TN00003 | Oklahoma | 9915 |
| Illinois | 200008 | Oregon | TN200002 |
| Indiana | C-TN-01 | Pennsylvania | 68-02979 |
| Iowa | 364 | Rhode Island | 221 |
| Kansas | E-10277 | South Carolina | 84004 |
| Kentucky [1] | 90010 | South Dakota | n/a |
| Kentucky [2] | 16 | Tennessee [1,2] | 2006 |
| Louisiana | AI30792 | Texas | T 104704245-07-TX |
| Maine | TN0002 | Texas [5] | LAB0152 |
| Maryland | 324 | Utah | 6157585858 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 109 |
| Minnesota | 047-999-395 | Washington | C1915 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 9980939910 |
| Montana | CERT0086 | Wyoming | A2LA |
| Nebraska | NE-OS-15-05 | | |

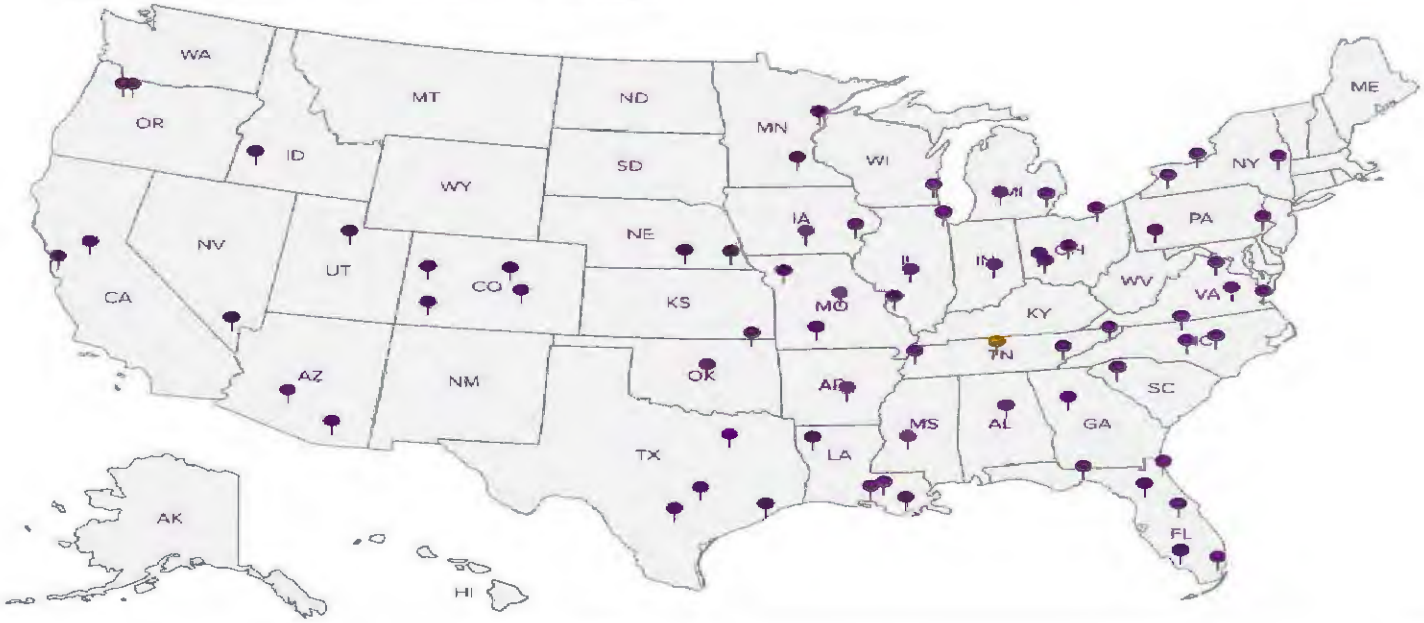
[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Accreditation not applicable

## Third Party & Federal Accreditations

| | | | |
|---|---|---|---|
| A2LA – ISO 17025 | 1461.01 | AIHA | 100789 |
| Canada | 1461.01 | DOD | 1461.01 |
| EPA–Crypto | TN00003 | USDA | S-67674 |

## Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



Insite Group, Inc.
611 S. Irvine Ave.
Sharon, PA 16146

Alternate billing information: INSITE080614S

Report to: Sara Giordano
Email to: lab@insitegroup.org

Project Description: Soil
City, State Collected: Rural Valley, PA
Phone: 724 347 2101
FAX: 724 347 2139
Client Project #: Valley Village
ESC Key: INSITE080614S
Collected by: Paul Rogers
Site/Facility ID#: 03-06500
P.O.#:
Collected by (signature): Paul Rogers
Packed on Ice N: Y X

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

Date Results Needed:
Email? __No ✓Yes
FAX? ✓No __Yes

Analysis/Container/Preservative

| Sample ID | Comp/Grab | Matrix* | Depth | Date | Time | No. of Cntrs | V8260UGPA / 40mlAmb / NaBIS/Syr/MeOH | VOC Screen / 2ozClr / no pres | Total Solids / 4ozClr / no pres | Remarks/Contaminant | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B-15 (1') | Grab | SS | | 10/01/15 | 1324 | 5 | X | X | X | | -01 |
| B-16 (4.5') | Grab | SS | | 10/01/15 | 1123 | 5 | X | X | X | | -02 |
| MW-15 (5') | Grab | SS | | 10/01/15 | 1300 | 5 | X | X | X | | -03 |

*Matrix: SS - Soil/Solid GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other ____ pH ____ Temp ____

Remarks: Di Ricardy 6361 0185 5325 Flow ____ Other ____

| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) | Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ ____ | Condition: (lab use only) |
|---|---|---|---|---|---|
| | 10/5/15 | 1340 | | | |

| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) | Temp: | Bottles Received: |
|---|---|---|---|---|---|
| | | | | 3.4 | 15+2+B |

| Relinquished by: (Signature) | Date: | Time: | Received for lab by: (Signature) | Date: | Time: | pH Checked: | NCF: |
|---|---|---|---|---|---|---|---|
| | | | | 10-6-15 | 09:00 | | |

Chain of Custody
Page 1 of 1

Prepared by:

ENVIRONMENTAL SCIENCE CORP.
13065 Lebanon Road
Mt. Juliet, TN 37122
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J211

CoCode: (lab use only)
Template/Prelogin
Shipped Via: FedEx

ESC LAB SCIENCES
YOUR LAB OF CHOICE

# ANALYTICAL REPORT

October 19, 2015

myESC
REAL TIME DATA ACCESS

## Insite Group

| | |
|---|---|
| Sample Delivery Group: | L793630 |
| Samples Received: | 10/09/2015 |
| Project Number: | VALLEY VILLAGE |
| Description: | Soil |
| Site: | 03-06500 |
| Report To: | Ms. Sara Giordano<br>611 S. Irvine Avenue<br>Sharon, PA 16146-1165 |

Entire Report Reviewed By:

Craig Cothron
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures. 060302, 060303, and 060304.

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## B-14 8-10 FT L793630-01 Solid

Collected by: Jen Swogger | Collected date/time: 10/06/15 09:10 | Received date/time: 10/09/15 09:00

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analysis Analyst |
|---|---|---|---|---|---|
| Total Solids by Method 2540 G-2011 | WG821139 | 1 | 10/12/15 10:53 | 10/13/15 08:26 | KDW |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG821813 | 1 | 10/15/15 18:56 | 10/15/15 22:23 | KLO |

## B-14 14-16 FT L793630-02 Solid

Collected by: Jen Swogger | Collected date/time: 10/06/15 10:30 | Received date/time: 10/09/15 09:00

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analysis Analyst |
|---|---|---|---|---|---|
| Total Solids by Method 2540 G-2011 | WG821139 | 1 | 10/12/15 10:53 | 10/13/15 08:26 | KDW |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG821813 | 1 | 10/15/15 18:56 | 10/15/15 22:43 | KLO |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG821834 | 19.25 | 10/16/15 10:49 | 10/16/15 16:21 | MEG |

## B-15 8-10 FT L793630-03 Solid

Collected by: Jen Swogger | Collected date/time: 10/06/15 08:55 | Received date/time: 10/09/15 09:00

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analysis Analyst |
|---|---|---|---|---|---|
| Total Solids by Method 2540 G-2011 | WG821139 | 1 | 10/12/15 10:53 | 10/13/15 08:26 | KDW |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG821813 | 1 | 10/15/15 18:56 | 10/15/15 23:03 | KLO |

## MW-15 5-6 FT L793630-04 Solid

Collected by: Jen Swogger | Collected date/time: 10/06/15 12:20 | Received date/time: 10/09/15 09:00

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analysis Analyst |
|---|---|---|---|---|---|
| Total Solids by Method 2540 G-2011 | WG821139 | 1 | 10/12/15 10:53 | 10/13/15 08:27 | KDW |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG821813 | 1 | 10/15/15 18:56 | 10/15/15 23:23 | KLO |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG821834 | 21.25 | 10/16/15 10:49 | 10/16/15 16:40 | MEG |

## B-17 14-16 FT L793630-05 Solid

Collected by: Jen Swogger | Collected date/time: 10/06/15 15:05 | Received date/time: 10/09/15 09:00

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analysis Analyst |
|---|---|---|---|---|---|
| Total Solids by Method 2540 G-2011 | WG821139 | 1 | 10/12/15 10:53 | 10/13/15 08:28 | KDW |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG821813 | 1 | 10/15/15 18:56 | 10/15/15 23:44 | KLO |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG821834 | 1 | 10/16/15 10:49 | 10/16/15 16:58 | MEG |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Craig Cothron
Technical Service Representative

## Total Solids by Method 2540 G-2011

| Analyte | Result % | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| Total Solids | 87.8 | | 1 | 10/13/2015 08:26 | WG821139 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Benzene | U | | 0.000270 | 0.00114 | 1 | 10/15/2015 22:23 | WG821813 |
| Ethylbenzene | 0.00973 | | 0.000297 | 0.00114 | 1 | 10/15/2015 22:23 | WG821813 |
| Isopropylbenzene | 0.00153 | | 0.000243 | 0.00114 | 1 | 10/15/2015 22:23 | WG821813 |
| Methyl tert-butyl ether | 0.00274 | | 0.000212 | 0.00114 | 1 | 10/15/2015 22:23 | WG821813 |
| Naphthalene | 0.00272 | J | 0.00100 | 0.00570 | 1 | 10/15/2015 22:23 | WG821813 |
| Toluene | 0.00280 | J | 0.000434 | 0.00570 | 1 | 10/15/2015 22:23 | WG821813 |
| 1,2,4-Trimethylbenzene | 0.00316 | | 0.000211 | 0.00114 | 1 | 10/15/2015 22:23 | WG821813 |
| 1,3,5-Trimethylbenzene | 0.00154 | | 0.000266 | 0.00114 | 1 | 10/15/2015 22:23 | WG821813 |
| Xylenes, Total | 0.0148 | | 0.000698 | 0.00342 | 1 | 10/15/2015 22:23 | WG821813 |
| *(S) Toluene-d8* | *102* | | | *88.7-115* | | *10/15/2015 22:23* | WG821813 |
| *(S) Dibromofluoromethane* | *104* | | | *76.3-123* | | *10/15/2015 22:23* | WG821813 |
| *(S) 4-Bromofluorobenzene* | *99.0* | | | *69.7-129* | | *10/15/2015 22:23* | WG821813 |

## Total Solids by Method 2540 G-2011

| Analyte | Result % | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| Total Solids | 85.7 | | 1 | 10/13/2015 08:26 | WG821139 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Benzene | 0.0852 | | 0.000270 | 0.00117 | 1 | 10/15/2015 22:43 | WG821813 |
| Ethylbenzene | 0.0702 | | 0.000297 | 0.00117 | 1 | 10/15/2015 22:43 | WG821813 |
| Isopropylbenzene | 0.00484 | | 0.000243 | 0.00117 | 1 | 10/15/2015 22:43 | WG821813 |
| Methyl tert-butyl ether | 0.00658 | | 0.000212 | 0.00117 | 1 | 10/15/2015 22:43 | WG821813 |
| Naphthalene | 0.00932 | | 0.00100 | 0.00583 | 1 | 10/15/2015 22:43 | WG821813 |
| Toluene | 0.448 | | 0.00835 | 0.112 | 19.25 | 10/16/2015 16:21 | WG821834 |
| 1,2,4-Trimethylbenzene | 0.0241 | | 0.000211 | 0.00117 | 1 | 10/15/2015 22:43 | WG821813 |
| 1,3,5-Trimethylbenzene | 0.0112 | | 0.000266 | 0.00117 | 1 | 10/15/2015 22:43 | WG821813 |
| Xylenes, Total | 0.303 | | 0.000698 | 0.00350 | 1 | 10/15/2015 22:43 | WG821813 |
| *(S) Toluene-d8* | *104* | | | *88.7-115* | | *10/15/2015 22:43* | WG821813 |
| *(S) Dibromofluoromethane* | *102* | | | *76.3-123* | | *10/15/2015 22:43* | WG821813 |
| *(S) 4-Bromofluorobenzene* | *97.2* | | | *69.7-129* | | *10/15/2015 22:43* | WG821813 |

## Total Solids by Method 2540 G-2011

| Analyte | Result % | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| Total Solids | 88.3 | | 1 | 10/13/2015 08:26 | WG821139 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Benzene | 0.0117 | | 0.000270 | 0.00113 | 1 | 10/15/2015 23:03 | WG821813 |
| Ethylbenzene | 0.000517 | J | 0.000297 | 0.00113 | 1 | 10/15/2015 23:03 | WG821813 |
| Isopropylbenzene | U | | 0.000243 | 0.00113 | 1 | 10/15/2015 23:03 | WG821813 |
| Methyl tert-butyl ether | 0.000628 | J | 0.000212 | 0.00113 | 1 | 10/15/2015 23:03 | WG821813 |
| Naphthalene | 0.00140 | J | 0.00100 | 0.00566 | 1 | 10/15/2015 23:03 | WG821813 |
| Toluene | 0.00288 | J | 0.000434 | 0.00566 | 1 | 10/15/2015 23:03 | WG821813 |
| 1,2,4-Trimethylbenzene | U | | 0.000211 | 0.00113 | 1 | 10/15/2015 23:03 | WG821813 |
| 1,3,5-Trimethylbenzene | U | | 0.000266 | 0.00113 | 1 | 10/15/2015 23:03 | WG821813 |
| Xylenes, Total | 0.00159 | J | 0.000698 | 0.00340 | 1 | 10/15/2015 23:03 | WG821813 |
| *(S) Toluene-d8* | *104* | | | *88.7-115* | | *10/15/2015 23:03* | WG821813 |
| *(S) Dibromofluoromethane* | *104* | | | *76.3-123* | | *10/15/2015 23:03* | WG821813 |
| *(S) 4-Bromofluorobenzene* | *98.1* | | | *69.7-129* | | *10/15/2015 23:03* | WG821813 |

## Total Solids by Method 2540 G-2011

| Analyte | Result % | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| Total Solids | 89.1 | | 1 | 10/13/2015 08:27 | WG821139 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Benzene | 0.147 | | 0.000270 | 0.00112 | 1 | 10/15/2015 23:23 | WG821813 |
| Ethylbenzene | 0.541 | | 0.00631 | 0.0239 | 21.25 | 10/16/2015 16:40 | WG821834 |
| Isopropylbenzene | 0.0879 | | 0.000243 | 0.00112 | 1 | 10/15/2015 23:23 | WG821813 |
| Methyl tert-butyl ether | U | | 0.000212 | 0.00112 | 1 | 10/15/2015 23:23 | WG821813 |
| Naphthalene | 0.0555 | | 0.00100 | 0.00561 | 1 | 10/15/2015 23:23 | WG821813 |
| Toluene | 1.32 | | 0.00922 | 0.119 | 21.25 | 10/16/2015 16:40 | WG821834 |
| 1,2,4-Trimethylbenzene | 1.14 | | 0.00448 | 0.0239 | 21.25 | 10/16/2015 16:40 | WG821834 |
| 1,3,5-Trimethylbenzene | 0.290 | | 0.00565 | 0.0239 | 21.25 | 10/16/2015 16:40 | WG821834 |
| Xylenes, Total | 3.42 | | 0.0148 | 0.0716 | 21.25 | 10/16/2015 16:40 | WG821834 |
| *(S) Toluene-d8* | *85.8* | J2 | | *88.7-115* | | *10/15/2015 23:23* | WG821813 |
| *(S) Dibromofluoromethane* | *98.6* | | | *76.3-123* | | *10/15/2015 23:23* | WG821813 |
| *(S) 4-Bromofluorobenzene* | *114* | | | *69.7-129* | | *10/15/2015 23:23* | WG821813 |

## Total Solids by Method 2540 G-2011

| Analyte | Result % | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| Total Solids | 89.4 | | 1 | 10/13/2015 08:28 | WG821139 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Benzene | 0.00410 | | 0.000270 | 0.00112 | 1 | 10/15/2015 23:44 | WG821813 |
| Ethylbenzene | 0.00509 | | 0.000297 | 0.00112 | 1 | 10/16/2015 16:58 | WG821834 |
| Isopropylbenzene | 0.000731 | J | 0.000243 | 0.00112 | 1 | 10/15/2015 23:44 | WG821813 |
| Methyl tert-butyl ether | 0.00485 | | 0.000212 | 0.00112 | 1 | 10/15/2015 23:44 | WG821813 |
| Naphthalene | 0.00715 | | 0.00100 | 0.00559 | 1 | 10/15/2015 23:44 | WG821813 |
| Toluene | 0.00746 | | 0.000434 | 0.00559 | 1 | 10/16/2015 16:58 | WG821834 |
| 1,2,4-Trimethylbenzene | 0.00216 | | 0.000211 | 0.00112 | 1 | 10/16/2015 16:58 | WG821834 |
| 1,3,5-Trimethylbenzene | 0.00160 | | 0.000266 | 0.00112 | 1 | 10/16/2015 16:58 | WG821834 |
| Xylenes, Total | 0.0216 | | 0.000698 | 0.00335 | 1 | 10/16/2015 16:58 | WG821834 |
| *(S) Toluene-d8* | *102* | | | *88.7-115* | | *10/15/2015 23:44* | WG821813 |
| *(S) Dibromofluoromethane* | *101* | | | *76.3-123* | | *10/15/2015 23:44* | WG821813 |
| *(S) 4-Bromofluorobenzene* | *99.4* | | | *69.7-129* | | *10/15/2015 23:44* | WG821813 |

## Method Blank (MB)

(MB) 10/13/15 08:25

| Analyte | MB Result % | MB Qualifier | MB RDL % |
|---|---|---|---|
| Total Solids | 0.00150 | | |

## L793628-06 Original Sample (OS) • Duplicate (DUP)

(OS) 10/13/15 08:25 • (DUP) 10/13/15 08:25

| Analyte | Original Result % | DUP Result % | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Total Solids | 84.6 | 84.7 | 1 | 0.117 | | 5 |

## Laboratory Control Sample (LCS)

(LCS) 10/13/15 08:25

| Analyte | Spike Amount % | LCS Result % | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Total Solids | 50.0 | 50.0 | 100 | 85.0-115 | |

## Method Blank (MB)

(MB) 10/15/15 20:40

| Analyte | MB Result mg/kg | MB Qualifier | MB MDL mg/kg | MB RDL mg/kg |
|---|---|---|---|---|
| Benzene | U | | 0.000270 | 0.00100 |
| Ethylbenzene | U | | 0.000297 | 0.00100 |
| Isopropylbenzene | U | | 0.000243 | 0.00100 |
| Methyl tert-butyl ether | U | | 0.000212 | 0.00100 |
| Naphthalene | U | | 0.00100 | 0.00500 |
| Toluene | U | | 0.000434 | 0.00500 |
| 1,2,4-Trimethylbenzene | U | | 0.000211 | 0.00100 |
| 1,3,5-Trimethylbenzene | U | | 0.000266 | 0.00100 |
| Xylenes, Total | U | | 0.000698 | 0.00300 |
| *(S) Toluene-d8* | *102* | | | *88.7-115* |
| *(S) Dibromofluoromethane* | *99.3* | | | *76.3-123* |
| *(S) 4-Bromofluorobenzene* | *96.4* | | | *69.7-129* |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 10/15/15 18:59 • (LCSD) 10/15/15 19:19

| Analyte | Spike Amount mg/kg | LCS Result mg/kg | LCSD Result mg/kg | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 0.0250 | 0.0263 | 0.0267 | 105 | 107 | 72.6-120 | | | 1.58 | 20 |
| Ethylbenzene | 0.0250 | 0.0265 | 0.0269 | 106 | 108 | 78.6-124 | | | 1.28 | 20 |
| Isopropylbenzene | 0.0250 | 0.0263 | 0.0267 | 105 | 107 | 79.4-126 | | | 1.44 | 20 |
| Methyl tert-butyl ether | 0.0250 | 0.0270 | 0.0276 | 108 | 111 | 70.2-122 | | | 2.44 | 20 |
| Naphthalene | 0.0250 | 0.0268 | 0.0303 | 107 | 121 | 69.9-132 | | | 12.2 | 20 |
| Toluene | 0.0250 | 0.0254 | 0.0256 | 102 | 103 | 76.7-116 | | | 1.03 | 20 |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.0262 | 0.0266 | 105 | 106 | 77.1-124 | | | 1.43 | 20 |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.0262 | 0.0263 | 105 | 105 | 79.0-125 | | | 0.490 | 20 |
| Xylenes, Total | 0.0750 | 0.0772 | 0.0788 | 103 | 105 | 78.1-123 | | | 2.02 | 20 |
| *(S) Toluene-d8* | | | | *102* | *102* | *88.7-115* | | | | |
| *(S) Dibromofluoromethane* | | | | *99.9* | *101* | *76.3-123* | | | | |
| *(S) 4-Bromofluorobenzene* | | | | *95.7* | *98.7* | *69.7-129* | | | | |

## L793646-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 10/15/15 22:02 • (MS) 10/15/15 21:01 • (MSD) 10/15/15 21:21

| Analyte | Spike Amount mg/kg | Original Result mg/kg | MS Result mg/kg | MSD Result mg/kg | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 0.0250 | ND | 0.0159 | 0.0170 | 63.6 | 67.9 | 1 | 47.8-131 | | | 6.54 | 22.8 |
| Ethylbenzene | 0.0250 | ND | 0.0118 | 0.0130 | 47.3 | 51.9 | 1 | 44.8-135 | | | 9.30 | 26.9 |
| Isopropylbenzene | 0.0250 | ND | 0.0113 | 0.0125 | 45.3 | 50.1 | 1 | 41.9-139 | | | 10.0 | 29.3 |
| Methyl tert-butyl ether | 0.0250 | ND | 0.0255 | 0.0246 | 102 | 98.5 | 1 | 50.4-131 | | | 3.42 | 24.8 |
| Naphthalene | 0.0250 | 0.000603 | 0.00682 | 0.0107 | 24.9 | 40.3 | 1 | 18.4-145 | | J3 | 44.0 | 34 |
| Toluene | 0.0250 | ND | 0.0130 | 0.0137 | 52.0 | 55.0 | 1 | 47.8-127 | | | 5.65 | 24.3 |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.00848 | 0.0219 | 0.0200 | 53.8 | 46.2 | 1 | 32.9-139 | | | 9.00 | 30.6 |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.00233 | 0.0124 | 0.0134 | 40.3 | 44.3 | 1 | 37.1-138 | | | 7.89 | 30.6 |
| Xylenes, Total | 0.0750 | 0.000550 | 0.0348 | 0.0382 | 45.7 | 50.1 | 1 | 42.7-135 | | | 9.06 | 26.6 |
| *(S) Toluene-d8* | | | | | *99.2* | *98.9* | | *88.7-115* | | | | |
| *(S) Dibromofluoromethane* | | | | | *104* | *105* | | *76.3-123* | | | | |
| *(S) 4-Bromofluorobenzene* | | | | | *83.0* | *88.2* | | *69.7-129* | | | | |

## Method Blank (MB)

(MB) 10/16/15 11:28

| Analyte | MB Result mg/kg | MB Qualifier | MB MDL mg/kg | MB RDL mg/kg |
|---|---|---|---|---|
| Ethylbenzene | U | | 0.000297 | 0.00100 |
| Toluene | U | | 0.000434 | 0.00500 |
| 1,2,4-Trimethylbenzene | U | | 0.000211 | 0.00100 |
| 1,3,5-Trimethylbenzene | U | | 0.000266 | 0.00100 |
| Xylenes, Total | U | | 0.000698 | 0.00300 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 10/16/15 10:29 • (LCSD) 10/16/15 10:48

| Analyte | Spike Amount mg/kg | LCS Result mg/kg | LCSD Result mg/kg | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Ethylbenzene | 0.0250 | 0.0254 | 0.0243 | 102 | 97.4 | 78.6-124 | | | 4.33 | 20 |
| Toluene | 0.0250 | 0.0220 | 0.0215 | 88.1 | 86.1 | 76.7-116 | | | 2.34 | 20 |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.0258 | 0.0251 | 103 | 100 | 77.1-124 | | | 3.02 | 20 |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.0256 | 0.0244 | 102 | 97.7 | 79.0-125 | | | 4.82 | 20 |
| Xylenes, Total | 0.0750 | 0.0750 | 0.0735 | 100 | 98.0 | 78.1-123 | | | 1.95 | 20 |

## L793860-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 10/16/15 15:05 • (MS) 10/16/15 15:24 • (MSD) 10/16/15 15:43

| Analyte | Spike Amount mg/kg | Original Result mg/kg | MS Result mg/kg | MSD Result mg/kg | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ethylbenzene | 0.0250 | ND | 0.108 | 0.108 | 86.4 | 86.1 | 5 | 44.8-135 | | | 0.280 | 26.9 |
| Toluene | 0.0250 | 0.000375 | 0.0976 | 0.0984 | 77.8 | 78.4 | 5 | 47.8-127 | | | 0.830 | 24.3 |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.000424 | 0.103 | 0.102 | 82.2 | 81.5 | 5 | 32.9-139 | | | 0.750 | 30.6 |
| 1,3,5-Trimethylbenzene | 0.0250 | ND | 0.105 | 0.102 | 84.4 | 81.5 | 5 | 37.1-138 | | | 3.48 | 30.6 |
| Xylenes, Total | 0.0750 | ND | 0.323 | 0.316 | 86.1 | 84.3 | 5 | 42.7-135 | | | 2.11 | 26.6 |

## Abbreviations and Definitions

| | |
|---|---|
| SDG | Sample Delivery Group. |
| MDL | Method Detection Limit. |
| RDL | Reported Detection Limit. |
| ND,U | Not detected at the Reporting Limit (or MDL where applicable). |
| RPD | Relative Percent Difference. |
| (dry) | Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils]. |
| Original Sample | The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG. |
| (S) | Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media. |
| Rec. | Recovery. |
| SDL | Sample Detection Limit. |
| MQL | Method Quantitation Limit. |
| Unadj. MQL | Unadjusted Method Quantitation Limit. |

| Qualifier | Description |
|---|---|
| J | The identification of the analyte is acceptable; the reported value is an estimate. |
| J2 | Surrogate recovery limits have been exceeded; values are outside lower control limits. |
| J3 | The associated batch QC was outside the established quality control range for precision. |

# ACCREDITATIONS & LOCATIONS

ONE LAB. NATIONWIDE.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross-contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**



## State Accreditations

| | | | |
|---|---|---|---|
| Alabama | 40660 | Nevada | TN-03-2002-34 |
| Alaska | UST-080 | New Hampshire | 2975 |
| Arizona | AZ0612 | New Jersey–NELAP | TN002 |
| Arkansas | 88-0469 | New Mexico | TN00003 |
| California | 01157CA | New York | 11742 |
| Colorado | TN00003 | North Carolina | Env375 |
| Connecticut | PH-0197 | North Carolina [1] | DW21704 |
| Florida | E87487 | North Carolina [2] | 41 |
| Georgia | NELAP | North Dakota | R-140 |
| Georgia [1] | 923 | Ohio–VAP | CL0069 |
| Idaho | TN00003 | Oklahoma | 9915 |
| Illinois | 200008 | Oregon | TN200002 |
| Indiana | C-TN-01 | Pennsylvania | 68-02979 |
| Iowa | 364 | Rhode Island | 221 |
| Kansas | E-10277 | South Carolina | 84004 |
| Kentucky [1] | 90010 | South Dakota | n/a |
| Kentucky [2] | 16 | Tennessee [1,2] | 2006 |
| Louisiana | AI30792 | Texas | T 104704245-07-TX |
| Maine | TN0002 | Texas [5] | LAB0152 |
| Maryland | 324 | Utah | 6157585858 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 109 |
| Minnesota | 047-999-395 | Washington | C1915 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 9980939910 |
| Montana | CERT0086 | Wyoming | A2LA |
| Nebraska | NE-OS-15-05 | | |

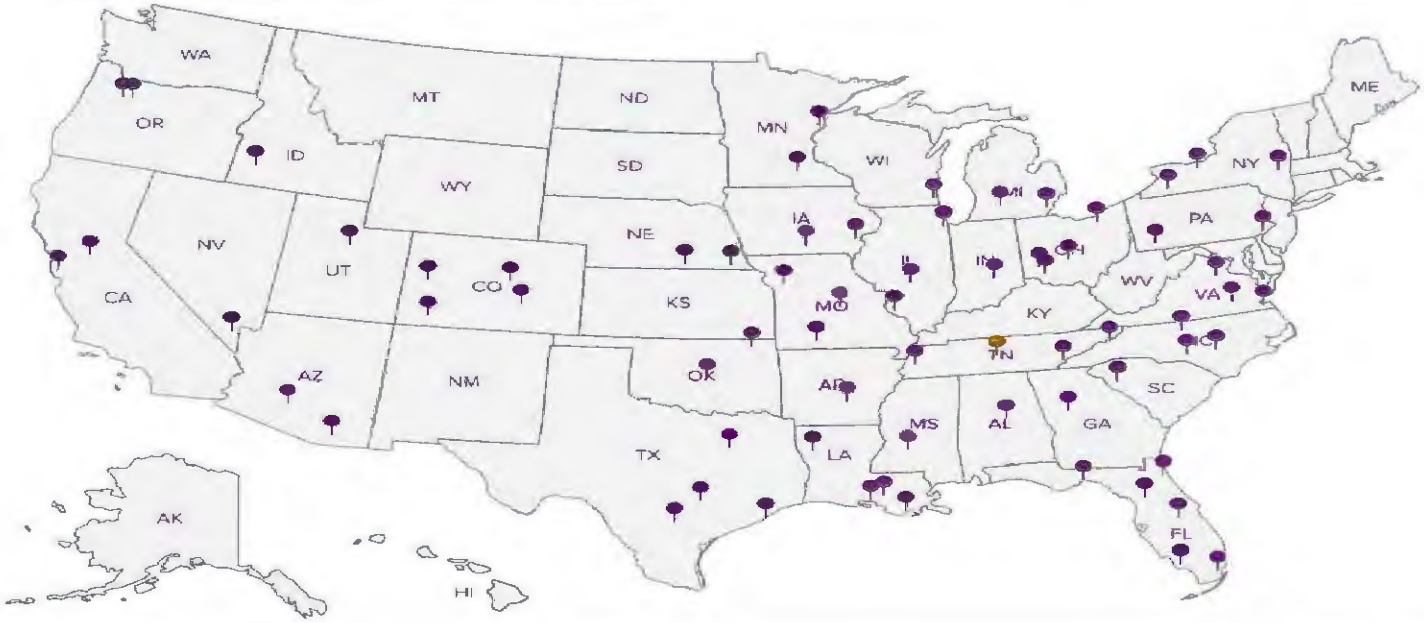
[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Accreditation not applicable

## Third Party & Federal Accreditations

| | | | |
|---|---|---|---|
| A2LA – ISO 17025 | 1461.01 | AIHA | 100789 |
| Canada | 1461.01 | DOD | 1461.01 |
| EPA–Crypto | TN00003 | USDA | S-67674 |

## Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



Insite Group, Inc.
611 S. Irvine Ave.
Sharon, PA 16146

Alternate billing information: INSITE080614S

Report to: Sara Giordano
Email to: lab@insitegroup.org

Project Description: Soil
Site Sample Collected: Kittanning, PA
Phone: 724 347 2101
FAX: 724 347 2139
Client Project #: Valley Village
ESC Key: INSITE080614S
Collected by: Jen Swogger
Site/Facility ID#: 03-06500
P.O.#
Collected by (signature): Jen Swogger/KK
Packed on Ice: Y
Rush? (Lab MUST Be Notified) ___ Same Day.....200% ___ Next Day.....100% ___ Two Day.....50%
Date Results Needed:
Email? ___No ✓Yes
FAX? ✓No ___Yes

Analysis/Container/Preservative

Chain of Custody Page 1 of 1

Prepared by:
ENVIRONMENTAL SCIENCE CORP.
12065 Lebanon Road
Mt. Juliet, TN 37122
Phone (615) 758-5858
Phone (800) 767-5859
FAX (615) 758-5859
G091

CoCode (lab use only)
Template/Prelogin
Shipped Via

| Sample ID | Comp/Grab | Matrix* | Depth | Date | Time | No of Cntrs | V8260UGPA / 40mlAmb / NaBIS/Syr/MeOH | VOC Screen / 2ozClr / no pres | Total Solids / 4ozClr / no pres | Remarks/Contaminant | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| B-14 (8-10ft) | Grab | SS | | 10/6/15 | 09:10 | 5 | X | X | X | | 79362-01 |
| B-14 (14-16 ft) | Grab | SS | | 10/6/15 | 10:30 | 5 | X | X | X | | 02 |
| B-15 (8-10 ft) | Grab | SS | | 10/7/15 | 08:55 | 5 | X | X | X | | 03 |
| MW-15 (5-6 ft) | Grab | SS | | 10/7/15 | 12:20 | 5 | X | X | X | | 04 |
| B-17 (14-16 ft) | Grab | SS | | 10/7/15 | 15:05 | 5 | X | X | X | | 05 |

*Matrix: SS - Soil/Solid GW - Groundwater WW - Wastewater DW - Drinking Water OT - Other ___

pH ___ Temp ___
Flow ___ Other ___

Remarks: 01 Priority

| Relinquished by: (Signature) | Date | Time | Received by: (Signature) | Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ ___ | Condition: (lab use only) |
|---|---|---|---|---|---|
| Lauren Kelly | 10/8/15 | ~~1413~~ 1414 | | | TDH 1035 |
| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) | Temp: 24°C / Bottles Received: 25 | |
| Relinquished by: (Signature) | Date: | Time: | Received for lab by: (Signature) | Date: 10/9/15 / Time: 0400 | pH Checked: NCF: |

ESC LAB SCIENCES
YOUR LAB OF CHOICE

# ANALYTICAL REPORT

October 19, 2015

myESC
REAL TIME DATA ACCESS

## Insite Group

| | |
|---|---|
| Sample Delivery Group: | L793705 |
| Samples Received: | 10/09/2015 |
| Project Number: | VALLEY VILLAGE |
| Description: | FC-1 Soil |
| Site: | 03-06500 |
| Report To: | Ms. Sara Giordano<br>611 S. Irvine Avenue<br>Sharon, PA 16146-1165 |

Entire Report Reviewed By:

Craig Cothron
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures. 060302, 060303, and 060304.

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1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

## P-1 4-6 FT L793705-01 Solid

Collected by: Jen Swogger | Collected date/time: 10/05/15 12:12 | Received date/time: 10/09/15 09:00

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analysis Analyst |
|---|---|---|---|---|---|
| Metals (ICP) by Method 6010B | WG821791 | 1 | 10/14/15 12:37 | 10/14/15 20:04 | ST |
| Total Solids by Method 2540 G-2011 | WG821307 | 1 | 10/12/15 12:07 | 10/13/15 08:45 | KDW |
| Volatile Organic Compounds (GC) by Method 8015B | WG821288 | 1 | 10/12/15 10:41 | 10/15/15 04:52 | MCB |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG821813 | 1 | 10/15/15 18:56 | 10/16/15 01:45 | KLO |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG821820 | 21.5 | 10/16/15 11:18 | 10/16/15 15:44 | KLO |
| Wet Chemistry by Method 9023 | WG821431 | 1 | 10/14/15 20:00 | 10/15/15 20:16 | LLS |

## P-1 8-10 FT L793705-02 Solid

Collected by: Jen Swogger | Collected date/time: 10/05/15 12:32 | Received date/time: 10/09/15 09:00

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analysis Analyst |
|---|---|---|---|---|---|
| Metals (ICP) by Method 6010B | WG821791 | 1 | 10/14/15 12:37 | 10/14/15 20:07 | ST |
| Total Solids by Method 2540 G-2011 | WG821307 | 1 | 10/12/15 12:07 | 10/13/15 08:45 | KDW |
| Volatile Organic Compounds (GC) by Method 8015B | WG821288 | 200 | 10/12/15 10:41 | 10/15/15 05:22 | MCB |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG821813 | 20 | 10/15/15 18:56 | 10/16/15 02:05 | KLO |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG821820 | 200 | 10/16/15 11:18 | 10/16/15 16:02 | KLO |
| Wet Chemistry by Method 9023 | WG821431 | 1 | 10/14/15 20:00 | 10/15/15 21:48 | LLS |

## P-2 4-6 FT L793705-03 Solid

Collected by: Jen Swogger | Collected date/time: 10/05/15 09:40 | Received date/time: 10/09/15 09:00

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analysis Analyst |
|---|---|---|---|---|---|
| Metals (ICP) by Method 6010B | WG821791 | 1 | 10/14/15 12:37 | 10/14/15 20:10 | ST |
| Total Solids by Method 2540 G-2011 | WG821307 | 1 | 10/12/15 12:07 | 10/13/15 08:45 | KDW |
| Volatile Organic Compounds (GC) by Method 8015B | WG821288 | 20.75 | 10/12/15 10:41 | 10/15/15 05:44 | MCB |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG821813 | 20.75 | 10/15/15 18:56 | 10/16/15 02:26 | KLO |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG821820 | 20.75 | 10/16/15 11:18 | 10/16/15 16:20 | KLO |
| Wet Chemistry by Method 9023 | WG821431 | 1 | 10/14/15 20:00 | 10/15/15 22:21 | LLS |

## P-2 6-8 FT L793705-04 Solid

Collected by: Jen Swogger | Collected date/time: 10/05/15 09:45 | Received date/time: 10/09/15 09:00

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analysis Analyst |
|---|---|---|---|---|---|
| Metals (ICP) by Method 6010B | WG821791 | 1 | 10/14/15 12:37 | 10/14/15 20:13 | ST |
| Total Solids by Method 2540 G-2011 | WG821307 | 1 | 10/12/15 12:07 | 10/13/15 08:45 | KDW |
| Volatile Organic Compounds (GC) by Method 8015B | WG822610 | 35.5 | 10/17/15 10:40 | 10/17/15 20:54 | SWG |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG822750 | 355 | 10/17/15 16:22 | 10/18/15 03:00 | MEG |
| Wet Chemistry by Method 9023 | WG821431 | 1 | 10/14/15 20:00 | 10/15/15 22:43 | LLS |

## B-17 8-10 FT L793705-05 Solid

Collected by: Jen Swogger | Collected date/time: 10/05/15 14:32 | Received date/time: 10/09/15 09:00

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analysis Analyst |
|---|---|---|---|---|---|
| Metals (ICP) by Method 6010B | WG821791 | 1 | 10/14/15 12:37 | 10/14/15 20:16 | ST |
| Total Solids by Method 2540 G-2011 | WG821307 | 1 | 10/12/15 12:07 | 10/13/15 08:46 | KDW |
| Volatile Organic Compounds (GC) by Method 8015B | WG822610 | 41.5 | 10/17/15 10:40 | 10/17/15 21:16 | SWG |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG821813 | 1 | 10/15/15 18:56 | 10/16/15 03:06 | KLO |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG821820 | 20.75 | 10/16/15 11:18 | 10/16/15 16:55 | KLO |
| Wet Chemistry by Method 9023 | WG821431 | 1 | 10/14/15 20:00 | 10/15/15 22:58 | LLS |

## B-17 10-12 FT L793705-06 Solid

| Collected by | Collected date/time | Received date/time |
|---|---|---|
| Jen Swogger | 10/05/15 14:40 | 10/09/15 09:00 |

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analysis Analyst |
|---|---|---|---|---|---|
| Metals (ICP) by Method 6010B | WG821791 | 1 | 10/14/15 12:37 | 10/14/15 20:19 | ST |
| Total Solids by Method 2540 G-2011 | WG821307 | 1 | 10/12/15 12:07 | 10/13/15 08:46 | KDW |
| Volatile Organic Compounds (GC) by Method 8015B | WG821288 | 18.5 | 10/12/15 10:41 | 10/15/15 06:48 | MCB |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG821820 | 148 | 10/16/15 11:18 | 10/16/15 17:13 | KLO |
| Wet Chemistry by Method 9023 | WG821431 | 1 | 10/14/15 20:00 | 10/15/15 23:14 | LLS |

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Craig Cothron
Technical Service Representative

## Total Solids by Method 2540 G-2011

| Analyte | Result % | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| Total Solids | 92.8 | | 1 | 10/13/2015 08:45 | WG821307 |

## Wet Chemistry by Method 9023

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Extracted TOX | U | | 9.45 | 26.9 | 1 | 10/15/2015 20:16 | WG821431 |

## Metals (ICP) by Method 6010B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Lead | 13.3 | | 0.190 | 0.539 | 1 | 10/14/2015 20:04 | WG821791 |

## Volatile Organic Compounds (GC) by Method 8015B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPHG C6 - C12 | 3.66 | | 0.0339 | 0.108 | 1 | 10/15/2015 04:52 | WG821288 |
| *(S) α,α,α-Trifluorotoluene(FID)* | *95.2* | | | *59.0-128* | | *10/15/2015 04:52* | WG821288 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Benzene | 0.0612 | | 0.000270 | 0.00108 | 1 | 10/16/2015 01:45 | WG821813 |
| Ethylbenzene | 0.0439 | | 0.000297 | 0.00108 | 1 | 10/16/2015 01:45 | WG821813 |
| Isopropylbenzene | 0.00555 | | 0.000243 | 0.00108 | 1 | 10/16/2015 01:45 | WG821813 |
| Methyl tert-butyl ether | 0.000600 | J | 0.000212 | 0.00108 | 1 | 10/16/2015 01:45 | WG821813 |
| Naphthalene | 0.0153 | | 0.00100 | 0.00539 | 1 | 10/16/2015 01:45 | WG821813 |
| Toluene | 0.371 | | 0.00933 | 0.116 | 21.5 | 10/16/2015 15:44 | WG821820 |
| 1,2,4-Trimethylbenzene | 0.0544 | | 0.000211 | 0.00108 | 1 | 10/16/2015 01:45 | WG821813 |
| 1,3,5-Trimethylbenzene | 0.0188 | | 0.000266 | 0.00108 | 1 | 10/16/2015 01:45 | WG821813 |
| Xylenes, Total | 0.228 | | 0.000698 | 0.00323 | 1 | 10/16/2015 01:45 | WG821813 |
| *(S) Toluene-d8* | *103* | | | *88.7-115* | | *10/16/2015 01:45* | WG821813 |
| *(S) Dibromofluoromethane* | *99.8* | | | *76.3-123* | | *10/16/2015 01:45* | WG821813 |
| *(S) 4-Bromofluorobenzene* | *99.1* | | | *69.7-129* | | *10/16/2015 01:45* | WG821813 |

## Total Solids by Method 2540 G-2011

| Analyte | Result % | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| Total Solids | 90.1 | | 1 | 10/13/2015 08:45 | WG821307 |

## Wet Chemistry by Method 9023

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Extracted TOX | 14.4 | J | 9.45 | 27.8 | 1 | 10/15/2015 21:48 | WG821431 |

## Metals (ICP) by Method 6010B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Lead | 10.4 | | 0.190 | 0.555 | 1 | 10/14/2015 20:07 | WG821791 |

## Volatile Organic Compounds (GC) by Method 8015B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPHG C6 - C12 | 476 | | 6.78 | 22.2 | 200 | 10/15/2015 05:22 | WG821288 |
| *(S) α,α,α-Trifluorotoluene(FID)* | *103* | | | *59.0-128* | | *10/15/2015 05:22* | WG821288 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Benzene | 0.820 | | 0.00540 | 0.0222 | 20 | 10/16/2015 02:05 | WG821813 |
| Ethylbenzene | 7.39 | | 0.0594 | 0.222 | 200 | 10/16/2015 16:02 | WG821820 |
| Isopropylbenzene | 1.07 | | 0.00486 | 0.0222 | 20 | 10/16/2015 02:05 | WG821813 |
| Methyl tert-butyl ether | U | | 0.00424 | 0.0222 | 20 | 10/16/2015 02:05 | WG821813 |
| Naphthalene | 3.56 | | 0.0200 | 0.111 | 20 | 10/16/2015 02:05 | WG821813 |
| Toluene | 21.7 | | 0.0868 | 1.11 | 200 | 10/16/2015 16:02 | WG821820 |
| 1,2,4-Trimethylbenzene | 21.4 | | 0.0422 | 0.222 | 200 | 10/16/2015 16:02 | WG821820 |
| 1,3,5-Trimethylbenzene | 5.96 | | 0.0532 | 0.222 | 200 | 10/16/2015 16:02 | WG821820 |
| Xylenes, Total | 44.3 | | 0.140 | 0.666 | 200 | 10/16/2015 16:02 | WG821820 |
| *(S) Toluene-d8* | *93.0* | | | *88.7-115* | | *10/16/2015 02:05* | WG821813 |
| *(S) Dibromofluoromethane* | *95.5* | | | *76.3-123* | | *10/16/2015 02:05* | WG821813 |
| *(S) 4-Bromofluorobenzene* | *115* | | | *69.7-129* | | *10/16/2015 02:05* | WG821813 |

## Total Solids by Method 2540 G-2011

| Analyte | Result % | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| Total Solids | 80.7 | | 1 | 10/13/2015 08:45 | WG821307 |

## Wet Chemistry by Method 9023

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Extracted TOX | U | | 9.45 | 31.0 | 1 | 10/15/2015 22:21 | WG821431 |

## Metals (ICP) by Method 6010B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Lead | 21.3 | | 0.190 | 0.620 | 1 | 10/14/2015 20:10 | WG821791 |

## Volatile Organic Compounds (GC) by Method 8015B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPHG C6 - C12 | 25.9 | | 0.703 | 2.57 | 20.75 | 10/15/2015 05:44 | WG821288 |
| *(S) α,α,α-Trifluorotoluene(FID)* | *104* | | | *59.0-128* | | *10/15/2015 05:44* | WG821288 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Benzene | 0.628 | | 0.00560 | 0.0257 | 20.75 | 10/16/2015 02:26 | WG821813 |
| Ethylbenzene | 0.456 | | 0.00616 | 0.0257 | 20.75 | 10/16/2015 16:20 | WG821820 |
| Isopropylbenzene | 0.0512 | | 0.00504 | 0.0257 | 20.75 | 10/16/2015 02:26 | WG821813 |
| Methyl tert-butyl ether | 0.124 | | 0.00440 | 0.0257 | 20.75 | 10/16/2015 02:26 | WG821813 |
| Naphthalene | 0.731 | | 0.0208 | 0.129 | 20.75 | 10/16/2015 02:26 | WG821813 |
| Toluene | 1.31 | | 0.00900 | 0.129 | 20.75 | 10/16/2015 16:20 | WG821820 |
| 1,2,4-Trimethylbenzene | 0.801 | | 0.00438 | 0.0257 | 20.75 | 10/16/2015 16:20 | WG821820 |
| 1,3,5-Trimethylbenzene | 0.187 | | 0.00552 | 0.0257 | 20.75 | 10/16/2015 16:20 | WG821820 |
| Xylenes, Total | 2.19 | | 0.0145 | 0.0772 | 20.75 | 10/16/2015 16:20 | WG821820 |
| *(S) Toluene-d8* | *102* | | | *88.7-115* | | *10/16/2015 02:26* | WG821813 |
| *(S) Dibromofluoromethane* | *91.8* | | | *76.3-123* | | *10/16/2015 02:26* | WG821813 |
| *(S) 4-Bromofluorobenzene* | *108* | | | *69.7-129* | | *10/16/2015 02:26* | WG821813 |

## Total Solids by Method 2540 G-2011

| Analyte | Result % | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| Total Solids | 84.1 | | 1 | 10/13/2015 08:45 | WG821307 |

## Wet Chemistry by Method 9023

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Extracted TOX | U | | 9.45 | 29.7 | 1 | 10/15/2015 22:43 | WG821431 |

## Metals (ICP) by Method 6010B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Lead | 15.6 | | 0.190 | 0.595 | 1 | 10/14/2015 20:13 | WG821791 |

## Volatile Organic Compounds (GC) by Method 8015B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPHG C6 - C12 | 317 | | 1.20 | 4.22 | 35.5 | 10/17/2015 20:54 | WG822610 |
| *(S) α,α,α-Trifluorotoluene(FID)* | *113* | | | *59.0-128* | | *10/17/2015 20:54* | WG822610 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Benzene | 1.99 | | 0.0958 | 0.422 | 355 | 10/18/2015 03:00 | WG822750 |
| Ethylbenzene | 6.14 | | 0.105 | 0.422 | 355 | 10/18/2015 03:00 | WG822750 |
| Isopropylbenzene | 0.694 | | 0.0863 | 0.422 | 355 | 10/18/2015 03:00 | WG822750 |
| Methyl tert-butyl ether | U | | 0.0753 | 0.422 | 355 | 10/18/2015 03:00 | WG822750 |
| Naphthalene | 1.43 | J | 0.355 | 2.11 | 355 | 10/18/2015 03:00 | WG822750 |
| Toluene | 8.97 | | 0.154 | 2.11 | 355 | 10/18/2015 03:00 | WG822750 |
| 1,2,4-Trimethylbenzene | 12.4 | | 0.0749 | 0.422 | 355 | 10/18/2015 03:00 | WG822750 |
| 1,3,5-Trimethylbenzene | 3.68 | | 0.0944 | 0.422 | 355 | 10/18/2015 03:00 | WG822750 |
| Xylenes, Total | 29.5 | | 0.248 | 1.27 | 355 | 10/18/2015 03:00 | WG822750 |
| *(S) Toluene-d8* | *102* | | | *88.7-115* | | *10/18/2015 03:00* | WG822750 |
| *(S) Dibromofluoromethane* | *90.8* | | | *76.3-123* | | *10/18/2015 03:00* | WG822750 |
| *(S) 4-Bromofluorobenzene* | *103* | | | *69.7-129* | | *10/18/2015 03:00* | WG822750 |

## Total Solids by Method 2540 G-2011

| Analyte | Result % | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| Total Solids | 86.1 | | 1 | 10/13/2015 08:46 | WG821307 |

## Wet Chemistry by Method 9023

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Extracted TOX | U | | 9.45 | 29.0 | 1 | 10/15/2015 22:58 | WG821431 |

## Metals (ICP) by Method 6010B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Lead | 19.8 | | 0.190 | 0.581 | 1 | 10/14/2015 20:16 | WG821791 |

## Volatile Organic Compounds (GC) by Method 8015B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPHG C6 - C12 | 18.0 | | 1.41 | 4.82 | 41.5 | 10/17/2015 21:16 | WG822610 |
| *(S) α,α,α-Trifluorotoluene(FID)* | *92.8* | | | *59.0-128* | | *10/17/2015 21:16* | WG822610 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Benzene | 1.11 | | 0.00560 | 0.0241 | 20.75 | 10/16/2015 16:55 | WG821820 |
| Ethylbenzene | 0.536 | | 0.00616 | 0.0241 | 20.75 | 10/16/2015 16:55 | WG821820 |
| Isopropylbenzene | 0.0965 | | 0.000243 | 0.00116 | 1 | 10/16/2015 03:06 | WG821813 |
| Methyl tert-butyl ether | 0.0171 | | 0.000212 | 0.00116 | 1 | 10/16/2015 03:06 | WG821813 |
| Naphthalene | 0.165 | | 0.00100 | 0.00581 | 1 | 10/16/2015 03:06 | WG821813 |
| Toluene | 0.704 | | 0.00900 | 0.120 | 20.75 | 10/16/2015 16:55 | WG821820 |
| 1,2,4-Trimethylbenzene | 0.777 | | 0.00438 | 0.0241 | 20.75 | 10/16/2015 16:55 | WG821820 |
| 1,3,5-Trimethylbenzene | 0.212 | | 0.00552 | 0.0241 | 20.75 | 10/16/2015 16:55 | WG821820 |
| Xylenes, Total | 2.19 | | 0.0145 | 0.0723 | 20.75 | 10/16/2015 16:55 | WG821820 |
| *(S) Toluene-d8* | *72.7* | J2 | | *88.7-115* | | *10/16/2015 03:06* | WG821813 |
| *(S) Dibromofluoromethane* | *93.8* | | | *76.3-123* | | *10/16/2015 03:06* | WG821813 |
| *(S) 4-Bromofluorobenzene* | *106* | | | *69.7-129* | | *10/16/2015 03:06* | WG821813 |

## Total Solids by Method 2540 G-2011

| Analyte | Result % | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| Total Solids | 94.3 | | 1 | 10/13/2015 08:46 | WG821307 |

## Wet Chemistry by Method 9023

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Extracted TOX | U | | 9.45 | 26.5 | 1 | 10/15/2015 23:14 | WG821431 |

## Metals (ICP) by Method 6010B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Lead | 9.08 | | 0.190 | 0.530 | 1 | 10/14/2015 20:19 | WG821791 |

## Volatile Organic Compounds (GC) by Method 8015B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPHG C6 - C12 | 149 | | 0.627 | 1.96 | 18.5 | 10/15/2015 06:48 | WG821288 |
| *(S) α,α,α-Trifluorotoluene(FID)* | *108* | | | *59.0-128* | | *10/15/2015 06:48* | WG821288 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Benzene | 0.759 | | 0.0400 | 0.157 | 148 | 10/16/2015 17:13 | WG821820 |
| Ethylbenzene | 2.61 | | 0.0440 | 0.157 | 148 | 10/16/2015 17:13 | WG821820 |
| Isopropylbenzene | 0.334 | | 0.0360 | 0.157 | 148 | 10/16/2015 17:13 | WG821820 |
| Methyl tert-butyl ether | U | | 0.0314 | 0.157 | 148 | 10/16/2015 17:13 | WG821820 |
| Naphthalene | 0.895 | | 0.148 | 0.785 | 148 | 10/16/2015 17:13 | WG821820 |
| Toluene | 3.89 | | 0.0642 | 0.785 | 148 | 10/16/2015 17:13 | WG821820 |
| 1,2,4-Trimethylbenzene | 6.44 | | 0.0312 | 0.157 | 148 | 10/16/2015 17:13 | WG821820 |
| 1,3,5-Trimethylbenzene | 1.83 | | 0.0394 | 0.157 | 148 | 10/16/2015 17:13 | WG821820 |
| Xylenes, Total | 14.5 | | 0.103 | 0.471 | 148 | 10/16/2015 17:13 | WG821820 |
| *(S) Toluene-d8* | *99.4* | | | *88.7-115* | | *10/16/2015 17:13* | WG821820 |
| *(S) Dibromofluoromethane* | *94.2* | | | *76.3-123* | | *10/16/2015 17:13* | WG821820 |
| *(S) 4-Bromofluorobenzene* | *103* | | | *69.7-129* | | *10/16/2015 17:13* | WG821820 |

## Method Blank (MB)

(MB) 10/13/15 08:43

| Analyte | MB Result | MB Qualifier | MB RDL |
|---|---|---|---|
| | % | | % |
| Total Solids | 0.000 | | |

## L793705-03 Original Sample (OS) • Duplicate (DUP)

(OS) 10/13/15 08:45 • (DUP) 10/13/15 08:45

| Analyte | Original Result | DUP Result | Dilution | DUP RPD | DUP Qualifier | DUP RPD Limits |
|---|---|---|---|---|---|---|
| | % | % | | % | | % |
| Total Solids | 80.7 | 81.1 | 1 | 0.495 | | 5 |

## Laboratory Control Sample (LCS)

(LCS) 10/13/15 08:44

| Analyte | Spike Amount | LCS Result | LCS Rec. | Rec. Limits | LCS Qualifier |
|---|---|---|---|---|---|
| | % | % | % | % | |
| Total Solids | 50.0 | 50.1 | 100 | 85.0-115 | |

## Method Blank (MB)

(MB) 10/14/15 20:09

| Analyte | MB Result mg/kg | MB Qualifier | MB MDL mg/kg | MB RDL mg/kg |
|---|---|---|---|---|
| Extracted TOX | U | | 9.45 | 25.0 |

## L793705-01 Original Sample (OS) • Duplicate (DUP)

(OS) 10/15/15 20:16 • (DUP) 10/15/15 20:27

| Analyte | Original Result mg/kg | DUP Result mg/kg | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Extracted TOX | ND | ND | 1 | 0.000 | | 20 |

## L794097-03 Original Sample (OS) • Duplicate (DUP)

(OS) 10/16/15 11:16 • (DUP) 10/16/15 11:29

| Analyte | Original Result mg/kg | DUP Result mg/kg | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Extracted TOX | ND | ND | 1 | 37.2 | J P1 | 20 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 10/14/15 21:08 • (LCSD) 10/15/15 18:22

| Analyte | Spike Amount mg/kg | LCS Result mg/kg | LCSD Result mg/kg | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Extracted TOX | 250 | 253 | 237 | 101 | 94.7 | 85.0-115 | | | 6.69 | 20 |

## L793705-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 10/15/15 20:16 • (MS) 10/15/15 21:06 • (MSD) 10/15/15 21:17

| Analyte | Spike Amount mg/kg | Original Result mg/kg | MS Result mg/kg | MSD Result mg/kg | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Extracted TOX | 1000 | 5.80 | 975 | 993 | 97.5 | 99.3 | 1 | 80.0-120 | | | 1.75 | 20 |

## Method Blank (MB)

(MB) 10/14/15 19:29

| Analyte | MB Result mg/kg | MB Qualifier | MB MDL mg/kg | MB RDL mg/kg |
|---|---|---|---|---|
| Lead | U | | 0.19 | 0.500 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 10/14/15 19:32 • (LCSD) 10/14/15 19:34

| Analyte | Spike Amount mg/kg | LCS Result mg/kg | LCSD Result mg/kg | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Lead | 100 | 97.0 | 94.9 | 97 | 95 | 80-120 | | | 2 | 20 |

## L793457-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 10/14/15 19:38 • (MS) 10/14/15 19:46 • (MSD) 10/14/15 19:49

| Analyte | Spike Amount mg/kg | Original Result mg/kg | MS Result mg/kg | MSD Result mg/kg | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lead | 100 | 3.37 | 98.0 | 99.2 | 95 | 96 | 1 | 75-125 | | | 1 | 20 |

## Method Blank (MB)

(MB) 10/15/15 00:13

| Analyte | MB Result mg/kg | MB Qualifier | MB MDL mg/kg | MB RDL mg/kg |
|---|---|---|---|---|
| TPHG C6 - C12 | U | | 0.0339 | 0.100 |
| *(S) a,a,a-Trifluorotoluene(FID)* | *103* | | | *59.0-128* |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 10/14/15 23:08 • (LCSD) 10/14/15 23:30

| Analyte | Spike Amount mg/kg | LCS Result mg/kg | LCSD Result mg/kg | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| TPHG C6 - C12 | 5.50 | 5.42 | 5.53 | 98.6 | 101 | 62.2-127 | | | 1.94 | 20 |
| *(S) a,a,a-Trifluorotoluene(FID)* | | | | *104* | *104* | *59.0-128* | | | | |

## L793682-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 10/15/15 01:39 • (MS) 10/15/15 00:34 • (MSD) 10/15/15 00:56

| Analyte | Spike Amount mg/kg | Original Result mg/kg | MS Result mg/kg | MSD Result mg/kg | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPHG C6 - C12 | 5.50 | 0.0896 | 14.4 | 13.7 | 52.0 | 49.4 | 5 | 20.5-134 | | | 5.09 | 23.8 |
| *(S) a,a,a-Trifluorotoluene(FID)* | | | | | *100* | *97.9* | | *59.0-128* | | | | |

## Method Blank (MB)

(MB) 10/17/15 16:17

| Analyte | MB Result mg/kg | MB Qualifier | MB MDL mg/kg | MB RDL mg/kg |
|---|---|---|---|---|
| TPHG C6 - C12 | U | | 0.0339 | 0.100 |
| *(S) a,a,a-Trifluorotoluene(FID)* | *92.0* | | | *59.0-128* |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 10/17/15 15:11 • (LCSD) 10/17/15 15:33

| Analyte | Spike Amount mg/kg | LCS Result mg/kg | LCSD Result mg/kg | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| TPHG C6 - C12 | 5.50 | 5.06 | 4.97 | 91.9 | 90.4 | 62.2-127 | | | 1.62 | 20 |
| *(S) a,a,a-Trifluorotoluene(FID)* | | | | *100* | *99.9* | *59.0-128* | | | | |

## L793868-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 10/17/15 17:13 • (MS) 10/17/15 19:03 • (MSD) 10/17/15 19:25

| Analyte | Spike Amount mg/kg | Original Result mg/kg | MS Result mg/kg | MSD Result mg/kg | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPHG C6 - C12 | 5.50 | 0.0829 | 16.3 | 17.2 | 58.8 | 62.2 | 5 | 20.5-134 | | | 5.51 | 23.8 |
| *(S) a,a,a-Trifluorotoluene(FID)* | | | | | *97.0* | *97.5* | | *59.0-128* | | | | |

## Method Blank (MB)

(MB) 10/15/15 20:40

| Analyte | MB Result mg/kg | MB Qualifier | MB MDL mg/kg | MB RDL mg/kg |
|---|---|---|---|---|
| Benzene | U | | 0.000270 | 0.00100 |
| Ethylbenzene | U | | 0.000297 | 0.00100 |
| Isopropylbenzene | U | | 0.000243 | 0.00100 |
| Methyl tert-butyl ether | U | | 0.000212 | 0.00100 |
| Naphthalene | U | | 0.00100 | 0.00500 |
| 1,2,4-Trimethylbenzene | U | | 0.000211 | 0.00100 |
| 1,3,5-Trimethylbenzene | U | | 0.000266 | 0.00100 |
| Xylenes, Total | U | | 0.000698 | 0.00300 |
| *(S) Toluene-d8* | *102* | | | *88.7-115* |
| *(S) Dibromofluoromethane* | *99.3* | | | *76.3-123* |
| *(S) 4-Bromofluorobenzene* | *96.4* | | | *69.7-129* |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 10/15/15 18:59 • (LCSD) 10/15/15 19:19

| Analyte | Spike Amount mg/kg | LCS Result mg/kg | LCSD Result mg/kg | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 0.0250 | 0.0263 | 0.0267 | 105 | 107 | 72.6-120 | | | 1.58 | 20 |
| Ethylbenzene | 0.0250 | 0.0265 | 0.0269 | 106 | 108 | 78.6-124 | | | 1.28 | 20 |
| Isopropylbenzene | 0.0250 | 0.0263 | 0.0267 | 105 | 107 | 79.4-126 | | | 1.44 | 20 |
| Methyl tert-butyl ether | 0.0250 | 0.0270 | 0.0276 | 108 | 111 | 70.2-122 | | | 2.44 | 20 |
| Naphthalene | 0.0250 | 0.0268 | 0.0303 | 107 | 121 | 69.9-132 | | | 12.2 | 20 |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.0262 | 0.0266 | 105 | 106 | 77.1-124 | | | 1.43 | 20 |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.0262 | 0.0263 | 105 | 105 | 79.0-125 | | | 0.490 | 20 |
| Xylenes, Total | 0.0750 | 0.0772 | 0.0788 | 103 | 105 | 78.1-123 | | | 2.02 | 20 |
| *(S) Toluene-d8* | | | | *102* | *102* | *88.7-115* | | | | |
| *(S) Dibromofluoromethane* | | | | *99.9* | *101* | *76.3-123* | | | | |
| *(S) 4-Bromofluorobenzene* | | | | *95.7* | *98.7* | *69.7-129* | | | | |

## L793646-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 10/15/15 22:02 • (MS) 10/15/15 21:01 • (MSD) 10/15/15 21:21

| Analyte | Spike Amount mg/kg | Original Result mg/kg | MS Result mg/kg | MSD Result mg/kg | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 0.0250 | ND | 0.0159 | 0.0170 | 63.6 | 67.9 | 1 | 47.8-131 | | | 6.54 | 22.8 |

## L793646-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 10/15/15 22:02 • (MS) 10/15/15 21:01 • (MSD) 10/15/15 21:21

| Analyte | Spike Amount mg/kg | Original Result mg/kg | MS Result mg/kg | MSD Result mg/kg | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ethylbenzene | 0.0250 | ND | 0.0118 | 0.0130 | 47.3 | 51.9 | 1 | 44.8-135 | | | 9.30 | 26.9 |
| Isopropylbenzene | 0.0250 | ND | 0.0113 | 0.0125 | 45.3 | 50.1 | 1 | 41.9-139 | | | 10.0 | 29.3 |
| Methyl tert-butyl ether | 0.0250 | ND | 0.0255 | 0.0246 | 102 | 98.5 | 1 | 50.4-131 | | | 3.42 | 24.8 |
| Naphthalene | 0.0250 | 0.000603 | 0.00682 | 0.0107 | 24.9 | 40.3 | 1 | 18.4-145 | | J3 | 44.0 | 34 |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.00848 | 0.0219 | 0.0200 | 53.8 | 46.2 | 1 | 32.9-139 | | | 9.00 | 30.6 |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.00233 | 0.0124 | 0.0134 | 40.3 | 44.3 | 1 | 37.1-138 | | | 7.89 | 30.6 |
| Xylenes, Total | 0.0750 | 0.000550 | 0.0348 | 0.0382 | 45.7 | 50.1 | 1 | 42.7-135 | | | 9.06 | 26.6 |
| *(S) Toluene-d8* | | | | | *99.2* | *98.9* | | *88.7-115* | | | | |
| *(S) Dibromofluoromethane* | | | | | *104* | *105* | | *76.3-123* | | | | |
| *(S) 4-Bromofluorobenzene* | | | | | *83.0* | *88.2* | | *69.7-129* | | | | |

## Method Blank (MB)

(MB) 10/16/15 12:20

| Analyte | MB Result mg/kg | MB Qualifier | MB MDL mg/kg | MB RDL mg/kg |
|---|---|---|---|---|
| Benzene | U | | 0.000270 | 0.00100 |
| Ethylbenzene | U | | 0.000297 | 0.00100 |
| Isopropylbenzene | U | | 0.000243 | 0.00100 |
| Methyl tert-butyl ether | U | | 0.000212 | 0.00100 |
| Naphthalene | U | | 0.00100 | 0.00500 |
| Toluene | U | | 0.000434 | 0.00500 |
| 1,2,4-Trimethylbenzene | U | | 0.000211 | 0.00100 |
| 1,3,5-Trimethylbenzene | U | | 0.000266 | 0.00100 |
| Xylenes, Total | U | | 0.000698 | 0.00300 |
| *(S) Toluene-d8* | *99.4* | | | *88.7-115* |
| *(S) Dibromofluoromethane* | *99.0* | | | *76.3-123* |
| *(S) 4-Bromofluorobenzene* | *92.2* | | | *69.7-129* |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 10/16/15 11:09 • (LCSD) 10/16/15 11:27

| Analyte | Spike Amount mg/kg | LCS Result mg/kg | LCSD Result mg/kg | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 0.0250 | 0.0252 | 0.0252 | 101 | 101 | 72.6-120 | | | 0.000 | 20 |
| Ethylbenzene | 0.0250 | 0.0259 | 0.0253 | 103 | 101 | 78.6-124 | | | 2.34 | 20 |
| Isopropylbenzene | 0.0250 | 0.0253 | 0.0250 | 101 | 100 | 79.4-126 | | | 1.34 | 20 |
| Methyl tert-butyl ether | 0.0250 | 0.0256 | 0.0257 | 102 | 103 | 70.2-122 | | | 0.260 | 20 |
| Naphthalene | 0.0250 | 0.0238 | 0.0239 | 95.1 | 95.4 | 69.9-132 | | | 0.360 | 20 |
| Toluene | 0.0250 | 0.0243 | 0.0243 | 97.1 | 97.3 | 76.7-116 | | | 0.190 | 20 |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.0247 | 0.0247 | 98.7 | 98.7 | 77.1-124 | | | 0.0100 | 20 |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.0250 | 0.0250 | 100 | 100 | 79.0-125 | | | 0.0900 | 20 |
| Xylenes, Total | 0.0750 | 0.0775 | 0.0766 | 103 | 102 | 78.1-123 | | | 1.18 | 20 |
| *(S) Toluene-d8* | | | | *100* | *101* | *88.7-115* | | | | |
| *(S) Dibromofluoromethane* | | | | *97.3* | *96.6* | *76.3-123* | | | | |
| *(S) 4-Bromofluorobenzene* | | | | *96.6* | *94.9* | *69.7-129* | | | | |

## L794047-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 10/16/15 14:16 • (MS) 10/16/15 14:34 • (MSD) 10/16/15 14:51

| Analyte | Spike Amount mg/kg | Original Result mg/kg | MS Result mg/kg | MSD Result mg/kg | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 0.0250 | ND | 0.131 | 0.132 | 105 | 106 | 5 | 47.8-131 | | | 0.690 | 22.8 |
| Ethylbenzene | 0.0250 | ND | 0.129 | 0.134 | 103 | 107 | 5 | 44.8-135 | | | 4.13 | 26.9 |
| Isopropylbenzene | 0.0250 | ND | 0.126 | 0.129 | 101 | 103 | 5 | 41.9-139 | | | 2.82 | 29.3 |
| Methyl tert-butyl ether | 0.0250 | ND | 0.130 | 0.133 | 104 | 107 | 5 | 50.4-131 | | | 3.40 | 24.8 |
| Naphthalene | 0.0250 | 0.00144 | 0.110 | 0.122 | 87.1 | 96.6 | 5 | 18.4-145 | | | 10.2 | 34 |
| Toluene | 0.0250 | ND | 0.126 | 0.127 | 101 | 102 | 5 | 47.8-127 | | | 1.07 | 24.3 |
| 1,2,4-Trimethylbenzene | 0.0250 | ND | 0.121 | 0.122 | 97.0 | 97.9 | 5 | 32.9-139 | | | 0.940 | 30.6 |
| 1,3,5-Trimethylbenzene | 0.0250 | ND | 0.123 | 0.124 | 98.8 | 98.9 | 5 | 37.1-138 | | | 0.110 | 30.6 |
| Xylenes, Total | 0.0750 | ND | 0.385 | 0.398 | 103 | 106 | 5 | 42.7-135 | | | 3.18 | 26.6 |
| *(S) Toluene-d8* | | | | | *99.8* | *99.8* | | *88.7-115* | | | | |
| *(S) Dibromofluoromethane* | | | | | *96.9* | *96.8* | | *76.3-123* | | | | |
| *(S) 4-Bromofluorobenzene* | | | | | *92.9* | *96.0* | | *69.7-129* | | | | |

## Method Blank (MB)

(MB) 10/17/15 19:51

| Analyte | MB Result mg/kg | MB Qualifier | MB MDL mg/kg | MB RDL mg/kg |
|---|---|---|---|---|
| Benzene | U | | 0.000270 | 0.00100 |
| Ethylbenzene | U | | 0.000297 | 0.00100 |
| Isopropylbenzene | U | | 0.000243 | 0.00100 |
| Methyl tert-butyl ether | U | | 0.000212 | 0.00100 |
| Naphthalene | U | | 0.00100 | 0.00500 |
| Toluene | U | | 0.000434 | 0.00500 |
| 1,2,4-Trimethylbenzene | U | | 0.000211 | 0.00100 |
| 1,3,5-Trimethylbenzene | U | | 0.000266 | 0.00100 |
| Xylenes, Total | U | | 0.000698 | 0.00300 |
| *(S) Toluene-d8* | *101* | | | *88.7-115* |
| *(S) Dibromofluoromethane* | *93.4* | | | *76.3-123* |
| *(S) 4-Bromofluorobenzene* | *105* | | | *69.7-129* |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 10/17/15 17:57 • (LCSD) 10/17/15 18:20

| Analyte | Spike Amount mg/kg | LCS Result mg/kg | LCSD Result mg/kg | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 0.0250 | 0.0214 | 0.0213 | 85.6 | 85.3 | 72.6-120 | | | 0.330 | 20 |
| Ethylbenzene | 0.0250 | 0.0252 | 0.0243 | 101 | 97.2 | 78.6-124 | | | 3.79 | 20 |
| Isopropylbenzene | 0.0250 | 0.0241 | 0.0244 | 96.3 | 97.7 | 79.4-126 | | | 1.44 | 20 |
| Methyl tert-butyl ether | 0.0250 | 0.0208 | 0.0210 | 83.4 | 83.9 | 70.2-122 | | | 0.680 | 20 |
| Naphthalene | 0.0250 | 0.0227 | 0.0235 | 90.6 | 93.8 | 69.9-132 | | | 3.47 | 20 |
| Toluene | 0.0250 | 0.0224 | 0.0228 | 89.7 | 91.4 | 76.7-116 | | | 1.86 | 20 |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.0232 | 0.0235 | 92.7 | 94.1 | 77.1-124 | | | 1.54 | 20 |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.0236 | 0.0236 | 94.5 | 94.6 | 79.0-125 | | | 0.110 | 20 |
| Xylenes, Total | 0.0750 | 0.0735 | 0.0744 | 98.0 | 99.3 | 78.1-123 | | | 1.23 | 20 |
| *(S) Toluene-d8* | | | | *102* | *103* | *88.7-115* | | | | |
| *(S) Dibromofluoromethane* | | | | *93.6* | *94.4* | *76.3-123* | | | | |
| *(S) 4-Bromofluorobenzene* | | | | *104* | *105* | *69.7-129* | | | | |

## L793849-15 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 10/17/15 21:21 • (MS) 10/17/15 20:13 • (MSD) 10/17/15 20:36

| Analyte | Spike Amount mg/kg | Original Result mg/kg | MS Result mg/kg | MSD Result mg/kg | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 0.0250 | 0.00643 | 1.94 | 1.81 | 77.2 | 72.1 | 100 | 47.8-131 | | | 6.85 | 22.8 |
| Ethylbenzene | 0.0250 | 1.33 | 4.10 | 3.81 | 111 | 99.3 | 100 | 44.8-135 | | | 7.26 | 26.9 |
| Isopropylbenzene | 0.0250 | 1.00 | 3.58 | 3.29 | 103 | 91.5 | 100 | 41.9-139 | | | 8.53 | 29.3 |
| Methyl tert-butyl ether | 0.0250 | ND | 1.86 | 1.79 | 74.3 | 71.8 | 100 | 50.4-131 | | | 3.42 | 24.8 |
| Naphthalene | 0.0250 | 2.85 | 6.34 | 6.65 | 140 | 152 | 100 | 18.4-145 | | J5 | 4.72 | 34 |
| Toluene | 0.0250 | 0.0109 | 2.18 | 1.98 | 86.7 | 78.9 | 100 | 47.8-127 | | | 9.43 | 24.3 |
| 1,2,4-Trimethylbenzene | 0.0250 | 25.1 | 37.2 | 35.1 | 485 | 401 | 100 | 32.9-139 | V | V | 5.81 | 30.6 |
| 1,3,5-Trimethylbenzene | 0.0250 | 7.88 | 13.5 | 12.6 | 226 | 187 | 100 | 37.1-138 | J5 | J5 | 7.48 | 30.6 |
| Xylenes, Total | 0.0750 | 9.11 | 20.1 | 18.5 | 146 | 126 | 100 | 42.7-135 | J5 | J5 | 7.92 | 26.6 |
| *(S) Toluene-d8* | | | | | *102* | *103* | | *88.7-115* | | | | |
| *(S) Dibromofluoromethane* | | | | | *92.3* | *90.1* | | *76.3-123* | | | | |
| *(S) 4-Bromofluorobenzene* | | | | | *100* | *103* | | *69.7-129* | | | | |

## Abbreviations and Definitions

| | |
|---|---|
| SDG | Sample Delivery Group. |
| MDL | Method Detection Limit. |
| RDL | Reported Detection Limit. |
| ND,U | Not detected at the Reporting Limit (or MDL where applicable). |
| RPD | Relative Percent Difference. |
| (dry) | Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils]. |
| Original Sample | The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG. |
| (S) | Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media. |
| Rec. | Recovery. |
| SDL | Sample Detection Limit. |
| MQL | Method Quantitation Limit. |
| Unadj. MQL | Unadjusted Method Quantitation Limit. |

| Qualifier | Description |
|---|---|
| J | The identification of the analyte is acceptable; the reported value is an estimate. |
| J2 | Surrogate recovery limits have been exceeded; values are outside lower control limits. |
| J3 | The associated batch QC was outside the established quality control range for precision. |
| J5 | The sample matrix interfered with the ability to make any accurate determination; spike value is high. |
| P1 | RPD value not applicable for sample concentrations less than 5 times the reporting limit. |
| V | The sample concentration is too high to evaluate accurate spike recoveries. |

# ACCREDITATIONS & LOCATIONS

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross-contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**



## State Accreditations

| | | | |
|---|---|---|---|
| Alabama | 40660 | Nevada | TN-03-2002-34 |
| Alaska | UST-080 | New Hampshire | 2975 |
| Arizona | AZ0612 | New Jersey–NELAP | TN002 |
| Arkansas | 88-0469 | New Mexico | TN00003 |
| California | 01157CA | New York | 11742 |
| Colorado | TN00003 | North Carolina | Env375 |
| Connecticut | PH-0197 | North Carolina [1] | DW21704 |
| Florida | E87487 | North Carolina [2] | 41 |
| Georgia | NELAP | North Dakota | R-140 |
| Georgia [1] | 923 | Ohio–VAP | CL0069 |
| Idaho | TN00003 | Oklahoma | 9915 |
| Illinois | 200008 | Oregon | TN200002 |
| Indiana | C-TN-01 | Pennsylvania | 68-02979 |
| Iowa | 364 | Rhode Island | 221 |
| Kansas | E-10277 | South Carolina | 84004 |
| Kentucky [1] | 90010 | South Dakota | n/a |
| Kentucky [2] | 16 | Tennessee [1,2] | 2006 |
| Louisiana | AI30792 | Texas | T 104704245-07-TX |
| Maine | TN0002 | Texas [5] | LAB0152 |
| Maryland | 324 | Utah | 6157585858 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 109 |
| Minnesota | 047-999-395 | Washington | C1915 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 9980939910 |
| Montana | CERT0086 | Wyoming | A2LA |
| Nebraska | NE-OS-15-05 | | |

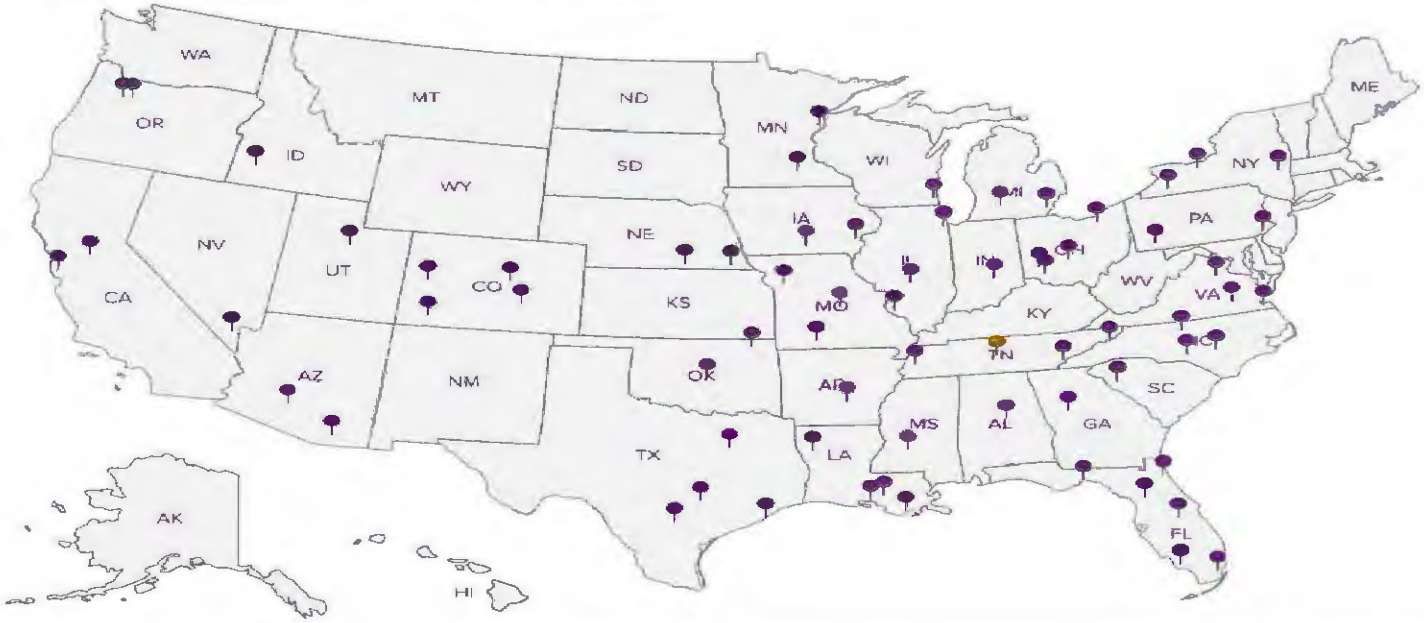
[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Accreditation not applicable

## Third Party & Federal Accreditations

| | | | |
|---|---|---|---|
| A2LA – ISO 17025 | 1461.01 | AIHA | 100789 |
| Canada | 1461.01 | DOD | 1461.01 |
| EPA–Crypto | TN00003 | USDA | S-67674 |

## Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



Insite Group, Inc.
611 S. Irvine Ave.
Sharon, PA 16146

Alternate billing information: INSITE080614S

Report to: Sara Giordano
E-mail to: lab@insitegroup.org

Project Description: FC-1 Soil
City Site Collected: Kittanning, PA
Phone: 724 347 2101
FAX: 724 347 2139
Client Project #: Valley Village
ESC Key: INSITE080614S
Collected by: Jen Swogger
Site/Facility ID#: 03-06500
P.O.#:
Collected by (signature):
Rush? ( Lab MUST Be Notified )
Same Day.....200%
Next Day.....100%
Two Day.....50%
Date Results Needed:
Email? No Yes
FAX? No Yes
No. of Cntrs

Analysis/Container/Preservative

Chain of Custody
Page 1 of 1

Prepared by:
ENVIRONMENTAL SCIENCE CORP.
12065 Lebanon Road
Mt. Juliet, TN 37122
Phone (615) 758-5858
Phone (800) 767-5859
FAX (615) 758-5859
C038

CoCode (lab use only)
Template/Prelogin
Shipped Via:

| Sample ID | Comp/Grab | Matrix* | Depth | Date | Time | No. of Cntrs | V8260UGPA / 40ml/Amb / NaBIS/Syr/MeOH | Total Solids / 4oz Clr / no pres | EOX(TOX) | TPH GRO (C6-C12) | LEAD | Remarks/Contaminant | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P-1 (4-6 ft) | Grab | SS | X | 10/5/15 | 12:12 | 27 | X | X | X | X | X | | 793705-01 |
| P-1 (8-10 ft) | Grab | SS | X | 10/5/15 | 12:32 | 27 | X | X | X | X | X | | 02 |
| P-2 (4-6 ft) | Grab | SS | X | 10/5/15 | 09:40 | 27 | X | X | X | X | X | | 03 |
| P-2 (6-8 ft) | Grab | SS | X | 10/5/15 | 09:45 | 27 | X | X | X | X | X | | 04 |
| B-17 (8-10 ft) | Grab | SS | X | 10/7/15 | 14:32 | 27 | X | X | X | X | X | | 05 |
| B-17 (10-12 ft) | Grab | SS | X | 10/7/15 | 14:40 | 27 | X | X | X | X | X | | 06 |

*Matrix: SS - Soil/Solid GW - Groundwater WW - WasteWater DW - Drinking Water OT - Other

pH ____ Temp ____
Flow ____ Other ____

Remarks: DI Rinsate

| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) | Samples returned via: ☐ UPS ☒ FedEx ☐ Courier | Condition (lab use only) |
|---|---|---|---|---|---|
| Lester Kelly | 10/9/15 | 1413 | | | |
| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) | Temp: 2.3 | Bottles Received: 48 |
| Relinquished by: (Signature) | Date: | Time: | Received for lab by: (Signature) | Date: 10/9/15 | Time: 0900 |

pH Checked: NCF:

ESC LAB SCIENCES
YOUR LAB OF CHOICE

# ANALYTICAL REPORT

October 21, 2015

myESC
REAL TIME DATA ACCESS

## Insite Group

| | |
|---|---|
| Sample Delivery Group: | L794097 |
| Samples Received: | 10/13/2015 |
| Project Number: | VALLEY VILLAGE |
| Description: | FC-1 / Soil |
| Site: | 03-06500 |
| Report To: | Ms. Sara Giordano<br>611 S. Irvine Avenue<br>Sharon, PA 16146-1165 |

Entire Report Reviewed By:

Craig Cothron
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures. 060302, 060303, and 060304.

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## B-16 6-8FT L794097-01 Solid

Collected by: J. Swogger | Collected date/time: 10/08/15 08:30 | Received date/time: 10/13/15 09:00

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analysis Analyst |
|---|---|---|---|---|---|
| Metals (ICP) by Method 6010B | WG822339 | 1 | 10/17/15 09:02 | 10/19/15 02:11 | CCE |
| Total Solids by Method 2540 G-2011 | WG821867 | 1 | 10/14/15 13:37 | 10/15/15 07:12 | MEL |
| Volatile Organic Compounds (GC) by Method 8015B | WG822439 | 75 | 10/16/15 08:11 | 10/16/15 14:37 | SWG |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG822097 | 75 | 10/15/15 07:00 | 10/17/15 20:26 | MEG |
| Wet Chemistry by Method 9023 | WG821431 | 1 | 10/14/15 20:00 | 10/16/15 11:08 | LLS |

## B-16 8-10FT L794097-02 Solid

Collected by: J. Swogger | Collected date/time: 10/08/15 08:40 | Received date/time: 10/13/15 09:00

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analysis Analyst |
|---|---|---|---|---|---|
| Total Solids by Method 2540 G-2011 | WG821867 | 1 | 10/14/15 13:37 | 10/15/15 07:12 | MEL |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG822097 | 1 | 10/15/15 07:00 | 10/17/15 20:51 | MEG |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG823364 | 21 | 10/20/15 16:50 | 10/21/15 01:39 | BRA |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG823364 | 84 | 10/20/15 16:50 | 10/21/15 08:14 | BRA |

## P-2 12-14FT L794097-03 Solid

Collected by: J. Swogger | Collected date/time: 10/08/15 10:25 | Received date/time: 10/13/15 09:00

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analysis Analyst |
|---|---|---|---|---|---|
| Metals (ICP) by Method 6010B | WG822339 | 1 | 10/17/15 09:02 | 10/19/15 02:14 | CCE |
| Total Solids by Method 2540 G-2011 | WG821867 | 1 | 10/14/15 13:37 | 10/15/15 07:12 | MEL |
| Volatile Organic Compounds (GC) by Method 8015B | WG822439 | 1 | 10/16/15 08:11 | 10/16/15 14:59 | SWG |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG822097 | 1 | 10/15/15 07:00 | 10/17/15 21:15 | MEG |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG823364 | 21.75 | 10/20/15 16:50 | 10/21/15 02:02 | BRA |
| Wet Chemistry by Method 9023 | WG821431 | 1 | 10/14/15 20:00 | 10/16/15 11:16 | LLS |

## P-1 11-13FT L794097-04 Solid

Collected by: J. Swogger | Collected date/time: 10/08/15 15:20 | Received date/time: 10/13/15 09:00

| Method | Batch | Dilution | Preparation date/time | Analysis date/time | Analysis Analyst |
|---|---|---|---|---|---|
| Metals (ICP) by Method 6010B | WG822339 | 1 | 10/17/15 09:02 | 10/19/15 02:17 | CCE |
| Total Solids by Method 2540 G-2011 | WG821867 | 1 | 10/14/15 13:37 | 10/15/15 07:12 | MEL |
| Volatile Organic Compounds (GC) by Method 8015B | WG822439 | 1 | 10/16/15 08:11 | 10/16/15 15:21 | SWG |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG822097 | 1 | 10/15/15 07:00 | 10/17/15 21:39 | MEG |
| Volatile Organic Compounds (GC/MS) by Method 8260B | WG823364 | 22.75 | 10/20/15 16:50 | 10/21/15 02:24 | BRA |
| Wet Chemistry by Method 9023 | WG821431 | 1 | 10/14/15 20:00 | 10/16/15 12:14 | LLS |

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Craig Cothron
Technical Service Representative

## Total Solids by Method 2540 G-2011

| Analyte | Result % | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| Total Solids | 86.3 | | 1 | 10/15/2015 07:12 | WG821867 |

## Wet Chemistry by Method 9023

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Extracted TOX | 23.9 | J | 9.45 | 29.0 | 1 | 10/16/2015 11:08 | WG821431 |

## Metals (ICP) by Method 6010B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Lead | 18.6 | | 0.190 | 0.579 | 1 | 10/19/2015 02:11 | WG822339 |

## Volatile Organic Compounds (GC) by Method 8015B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPHG C6 - C12 | 139 | | 2.54 | 8.69 | 75 | 10/16/2015 14:37 | WG822439 |
| *(S) α,α,α-Trifluorotoluene(FID)* | *91.2* | | | *59.0-128* | | *10/16/2015 14:37* | WG822439 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Benzene | 3.32 | | 0.0202 | 0.0869 | 75 | 10/17/2015 20:26 | WG822097 |
| Ethylbenzene | 3.36 | | 0.0223 | 0.0869 | 75 | 10/17/2015 20:26 | WG822097 |
| Isopropylbenzene | 0.271 | | 0.0182 | 0.0869 | 75 | 10/17/2015 20:26 | WG822097 |
| Methyl tert-butyl ether | U | | 0.0159 | 0.0869 | 75 | 10/17/2015 20:26 | WG822097 |
| Naphthalene | 1.72 | | 0.0750 | 0.435 | 75 | 10/17/2015 20:26 | WG822097 |
| Toluene | 16.3 | | 0.0326 | 0.435 | 75 | 10/17/2015 20:26 | WG822097 |
| 1,2,4-Trimethylbenzene | 6.62 | | 0.0158 | 0.0869 | 75 | 10/17/2015 20:26 | WG822097 |
| 1,3,5-Trimethylbenzene | 1.58 | | 0.0200 | 0.0869 | 75 | 10/17/2015 20:26 | WG822097 |
| Xylenes, Total | 20.9 | | 0.0524 | 0.261 | 75 | 10/17/2015 20:26 | WG822097 |
| *(S) Toluene-d8* | *103* | | | *88.7-115* | | *10/17/2015 20:26* | WG822097 |
| *(S) Dibromofluoromethane* | *99.6* | | | *76.3-123* | | *10/17/2015 20:26* | WG822097 |
| *(S) 4-Bromofluorobenzene* | *109* | | | *69.7-129* | | *10/17/2015 20:26* | WG822097 |

## Total Solids by Method 2540 G-2011

| Analyte | Result % | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| Total Solids | 86.4 | | 1 | 10/15/2015 07:12 | WG821867 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Benzene | 6.84 | | 0.0227 | 0.0972 | 84 | 10/21/2015 08:14 | WG823364 |
| Ethylbenzene | 3.94 | | 0.00624 | 0.0243 | 21 | 10/21/2015 01:39 | WG823364 |
| Isopropylbenzene | 0.0181 | | 0.000243 | 0.00116 | 1 | 10/17/2015 20:51 | WG822097 |
| Methyl tert-butyl ether | 0.0200 | | 0.000212 | 0.00116 | 1 | 10/17/2015 20:51 | WG822097 |
| Naphthalene | 0.00209 | J | 0.00100 | 0.00579 | 1 | 10/17/2015 20:51 | WG822097 |
| Toluene | 2.78 | | 0.00911 | 0.121 | 21 | 10/21/2015 01:39 | WG823364 |
| 1,2,4-Trimethylbenzene | 0.0820 | | 0.000211 | 0.00116 | 1 | 10/17/2015 20:51 | WG822097 |
| 1,3,5-Trimethylbenzene | 0.0411 | | 0.000266 | 0.00116 | 1 | 10/17/2015 20:51 | WG822097 |
| Xylenes, Total | 3.62 | | 0.0146 | 0.0729 | 21 | 10/21/2015 01:39 | WG823364 |
| *(S) Toluene-d8* | *103* | | | *88.7-115* | | *10/17/2015 20:51* | WG822097 |
| *(S) Dibromofluoromethane* | *135* | J1 | | *76.3-123* | | *10/17/2015 20:51* | WG822097 |
| *(S) 4-Bromofluorobenzene* | *89.9* | | | *69.7-129* | | *10/17/2015 20:51* | WG822097 |

## Total Solids by Method 2540 G-2011

| Analyte | Result % | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| Total Solids | 88.5 | | 1 | 10/15/2015 07:12 | WG821867 |

## Wet Chemistry by Method 9023

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Extracted TOX | 13.3 | J P1 | 9.45 | 28.2 | 1 | 10/16/2015 11:16 | WG821431 |

## Metals (ICP) by Method 6010B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Lead | 14.2 | | 0.190 | 0.565 | 1 | 10/19/2015 02:14 | WG822339 |

## Volatile Organic Compounds (GC) by Method 8015B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPHG C6 - C12 | 10.0 | | 0.0339 | 0.113 | 1 | 10/16/2015 14:59 | WG822439 |
| *(S) α,α,α-Trifluorotoluene(FID)* | *96.9* | | | *59.0-128* | | *10/16/2015 14:59* | WG822439 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Benzene | 0.113 | | 0.00587 | 0.0246 | 21.75 | 10/21/2015 02:02 | WG823364 |
| Ethylbenzene | 0.830 | | 0.00646 | 0.0246 | 21.75 | 10/21/2015 02:02 | WG823364 |
| Isopropylbenzene | 0.0399 | | 0.000243 | 0.00113 | 1 | 10/17/2015 21:15 | WG822097 |
| Methyl tert-butyl ether | 0.0162 | | 0.000212 | 0.00113 | 1 | 10/17/2015 21:15 | WG822097 |
| Naphthalene | 0.100 | | 0.00100 | 0.00565 | 1 | 10/17/2015 21:15 | WG822097 |
| Toluene | 0.904 | | 0.00944 | 0.123 | 21.75 | 10/21/2015 02:02 | WG823364 |
| 1,2,4-Trimethylbenzene | 3.09 | | 0.00459 | 0.0246 | 21.75 | 10/21/2015 02:02 | WG823364 |
| 1,3,5-Trimethylbenzene | 0.170 | | 0.000266 | 0.00113 | 1 | 10/17/2015 21:15 | WG822097 |
| Xylenes, Total | 3.82 | | 0.0152 | 0.0737 | 21.75 | 10/21/2015 02:02 | WG823364 |
| *(S) Toluene-d8* | *104* | | | *88.7-115* | | *10/17/2015 21:15* | WG822097 |
| *(S) Dibromofluoromethane* | *102* | | | *76.3-123* | | *10/17/2015 21:15* | WG822097 |
| *(S) 4-Bromofluorobenzene* | *97.2* | | | *69.7-129* | | *10/17/2015 21:15* | WG822097 |

## Total Solids by Method 2540 G-2011

| Analyte | Result % | Qualifier | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|
| Total Solids | 90.0 | | 1 | 10/15/2015 07:12 | WG821867 |

## Wet Chemistry by Method 9023

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Extracted TOX | 24.0 | J | 9.45 | 27.8 | 1 | 10/16/2015 12:14 | WG821431 |

## Metals (ICP) by Method 6010B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Lead | 10.9 | | 0.190 | 0.556 | 1 | 10/19/2015 02:17 | WG822339 |

## Volatile Organic Compounds (GC) by Method 8015B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| TPHG C6 - C12 | 8.72 | | 0.0339 | 0.111 | 1 | 10/16/2015 15:21 | WG822439 |
| *(S) α,α,α-Trifluorotoluene(FID)* | *79.3* | | | *59.0-128* | | *10/16/2015 15:21* | WG822439 |

## Volatile Organic Compounds (GC/MS) by Method 8260B

| Analyte | Result (dry) mg/kg | Qualifier | MDL mg/kg | RDL (dry) mg/kg | Dilution | Analysis date / time | Batch |
|---|---|---|---|---|---|---|---|
| Benzene | 0.378 | | 0.00614 | 0.0253 | 22.75 | 10/21/2015 02:24 | WG823364 |
| Ethylbenzene | 0.182 | | 0.000297 | 0.00111 | 1 | 10/17/2015 21:39 | WG822097 |
| Isopropylbenzene | 0.0151 | | 0.000243 | 0.00111 | 1 | 10/17/2015 21:39 | WG822097 |
| Methyl tert-butyl ether | U | | 0.000212 | 0.00111 | 1 | 10/17/2015 21:39 | WG822097 |
| Naphthalene | 0.0417 | | 0.00100 | 0.00556 | 1 | 10/17/2015 21:39 | WG822097 |
| Toluene | 2.01 | | 0.00987 | 0.126 | 22.75 | 10/21/2015 02:24 | WG823364 |
| 1,2,4-Trimethylbenzene | 0.182 | | 0.000211 | 0.00111 | 1 | 10/17/2015 21:39 | WG822097 |
| 1,3,5-Trimethylbenzene | 0.0655 | | 0.000266 | 0.00111 | 1 | 10/17/2015 21:39 | WG822097 |
| Xylenes, Total | 2.52 | | 0.0159 | 0.0759 | 22.75 | 10/21/2015 02:24 | WG823364 |
| *(S) Toluene-d8* | *103* | | | *88.7-115* | | *10/17/2015 21:39* | WG822097 |
| *(S) Dibromofluoromethane* | *105* | | | *76.3-123* | | *10/17/2015 21:39* | WG822097 |
| *(S) 4-Bromofluorobenzene* | *106* | | | *69.7-129* | | *10/17/2015 21:39* | WG822097 |

## Method Blank (MB)

(MB) 10/15/15 07:11

| Analyte | MB Result % | MB Qualifier | MB RDL % |
|---|---|---|---|
| Total Solids | 0.000300 | | |

## L794092-11 Original Sample (OS) • Duplicate (DUP)

(OS) 10/15/15 07:11 • (DUP) 10/15/15 07:11

| Analyte | Original Result % | DUP Result % | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Total Solids | 81.4 | 81.6 | 1 | 0.240 | | 5 |

## Laboratory Control Sample (LCS)

(LCS) 10/15/15 07:11

| Analyte | Spike Amount % | LCS Result % | LCS Rec. % | Rec. Limits % | LCS Qualifier |
|---|---|---|---|---|---|
| Total Solids | 50.0 | 50.0 | 100 | 85.0-115 | |

## Method Blank (MB)

(MB) 10/14/15 20:09

| Analyte | MB Result mg/kg | MB Qualifier | MB MDL mg/kg | MB RDL mg/kg |
|---|---|---|---|---|
| Extracted TOX | U | | 9.45 | 25.0 |

## L793705-01 Original Sample (OS) • Duplicate (DUP)

(OS) 10/15/15 20:16 • (DUP) 10/15/15 20:27

| Analyte | Original Result mg/kg | DUP Result mg/kg | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Extracted TOX | ND | ND | 1 | 0.000 | | 20 |

## L794097-03 Original Sample (OS) • Duplicate (DUP)

(OS) 10/16/15 11:16 • (DUP) 10/16/15 11:29

| Analyte | Original Result mg/kg | DUP Result mg/kg | Dilution | DUP RPD % | DUP Qualifier | DUP RPD Limits % |
|---|---|---|---|---|---|---|
| Extracted TOX | ND | ND | 1 | 37.2 | J P1 | 20 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 10/14/15 21:08 • (LCSD) 10/15/15 18:22

| Analyte | Spike Amount mg/kg | LCS Result mg/kg | LCSD Result mg/kg | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Extracted TOX | 250 | 253 | 237 | 101 | 94.7 | 85.0-115 | | | 6.69 | 20 |

## L793705-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 10/15/15 20:16 • (MS) 10/15/15 21:06 • (MSD) 10/15/15 21:17

| Analyte | Spike Amount mg/kg | Original Result mg/kg | MS Result mg/kg | MSD Result mg/kg | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Extracted TOX | 1000 | 5.80 | 975 | 993 | 97.5 | 99.3 | 1 | 80.0-120 | | | 1.75 | 20 |

## Method Blank (MB)

(MB) 10/19/15 01:21

| Analyte | MB Result mg/kg | MB Qualifier | MB MDL mg/kg | MB RDL mg/kg |
|---|---|---|---|---|
| Lead | U | | 0.19 | 0.500 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 10/19/15 01:24 • (LCSD) 10/19/15 01:26

| Analyte | Spike Amount mg/kg | LCS Result mg/kg | LCSD Result mg/kg | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Lead | 100 | 104 | 104 | 104 | 104 | 80-120 | | | 1 | 20 |

## L794517-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 10/19/15 01:29 • (MS) 10/19/15 01:38 • (MSD) 10/19/15 01:41

| Analyte | Spike Amount mg/kg | Original Result mg/kg | MS Result mg/kg | MSD Result mg/kg | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lead | 100 | 3.63 | 104 | 110 | 101 | 106 | 1 | 75-125 | | | 6 | 20 |

## Method Blank (MB)

(MB) 10/16/15 07:31

| Analyte | MB Result mg/kg | MB Qualifier | MB MDL mg/kg | MB RDL mg/kg |
|---|---|---|---|---|
| TPHG C6 - C12 | U | | 0.0339 | 0.100 |
| *(S) a,a,a-Trifluorotoluene(FID)* | *94.3* | | | *59.0-128* |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 10/16/15 06:25 • (LCSD) 10/16/15 06:47

| Analyte | Spike Amount mg/kg | LCS Result mg/kg | LCSD Result mg/kg | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| TPHG C6 - C12 | 5.50 | 5.62 | 5.60 | 102 | 102 | 62.2-127 | | | 0.440 | 20 |
| *(S) a,a,a-Trifluorotoluene(FID)* | | | | *102* | *102* | *59.0-128* | | | | |

## L794425-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 10/16/15 14:14 • (MS) 10/16/15 13:08 • (MSD) 10/16/15 13:30

| Analyte | Spike Amount mg/kg | Original Result mg/kg | MS Result mg/kg | MSD Result mg/kg | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TPHG C6 - C12 | 5.50 | ND | 21.9 | 23.1 | 79.8 | 83.9 | 5 | 20.5-134 | | | 5.07 | 23.8 |
| *(S) a,a,a-Trifluorotoluene(FID)* | | | | | *99.9* | *100* | | *59.0-128* | | | | |

## Method Blank (MB)

(MB) 10/17/15 16:02

| Analyte | MB Result mg/kg | MB Qualifier | MB MDL mg/kg | MB RDL mg/kg |
|---|---|---|---|---|
| Benzene | U | | 0.000270 | 0.00100 |
| Ethylbenzene | U | | 0.000297 | 0.00100 |
| Isopropylbenzene | U | | 0.000243 | 0.00100 |
| Methyl tert-butyl ether | U | | 0.000212 | 0.00100 |
| Naphthalene | U | | 0.00100 | 0.00500 |
| Toluene | U | | 0.000434 | 0.00500 |
| 1,2,4-Trimethylbenzene | U | | 0.000211 | 0.00100 |
| 1,3,5-Trimethylbenzene | U | | 0.000266 | 0.00100 |
| Xylenes, Total | U | | 0.000698 | 0.00300 |
| *(S) Toluene-d8* | *105* | | | *88.7-115* |
| *(S) Dibromofluoromethane* | *99.1* | | | *76.3-123* |
| *(S) 4-Bromofluorobenzene* | *106* | | | *69.7-129* |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 10/17/15 14:01 • (LCSD) 10/17/15 14:25

| Analyte | Spike Amount mg/kg | LCS Result mg/kg | LCSD Result mg/kg | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 0.0250 | 0.0229 | 0.0233 | 91.5 | 93.2 | 72.6-120 | | | 1.90 | 20 |
| Ethylbenzene | 0.0250 | 0.0237 | 0.0252 | 95.0 | 101 | 78.6-124 | | | 5.79 | 20 |
| Isopropylbenzene | 0.0250 | 0.0246 | 0.0261 | 98.3 | 104 | 79.4-126 | | | 5.88 | 20 |
| Methyl tert-butyl ether | 0.0250 | 0.0245 | 0.0237 | 97.9 | 94.7 | 70.2-122 | | | 3.39 | 20 |
| Naphthalene | 0.0250 | 0.0234 | 0.0246 | 93.7 | 98.6 | 69.9-132 | | | 5.02 | 20 |
| Toluene | 0.0250 | 0.0239 | 0.0240 | 95.7 | 96.2 | 76.7-116 | | | 0.520 | 20 |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.0250 | 0.0255 | 100 | 102 | 77.1-124 | | | 1.84 | 20 |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.0234 | 0.0243 | 93.7 | 97.4 | 79.0-125 | | | 3.88 | 20 |
| Xylenes, Total | 0.0750 | 0.0711 | 0.0743 | 94.8 | 99.0 | 78.1-123 | | | 4.35 | 20 |
| *(S) Toluene-d8* | | | | *108* | *107* | *88.7-115* | | | | |
| *(S) Dibromofluoromethane* | | | | *99.1* | *98.8* | *76.3-123* | | | | |
| *(S) 4-Bromofluorobenzene* | | | | *105* | *100* | *69.7-129* | | | | |

## L794099-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 10/17/15 17:38 • (MS) 10/17/15 16:26 • (MSD) 10/17/15 16:50

| Analyte | Spike Amount mg/kg | Original Result mg/kg | MS Result mg/kg | MSD Result mg/kg | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 0.0250 | ND | 0.111 | 0.120 | 88.5 | 96.1 | 5 | 47.8-131 | | | 8.23 | 22.8 |
| Ethylbenzene | 0.0250 | ND | 0.106 | 0.117 | 84.9 | 93.4 | 5 | 44.8-135 | | | 9.60 | 26.9 |
| Isopropylbenzene | 0.0250 | ND | 0.107 | 0.115 | 85.3 | 91.7 | 5 | 41.9-139 | | | 7.18 | 29.3 |
| Methyl tert-butyl ether | 0.0250 | ND | 0.121 | 0.118 | 96.6 | 94.2 | 5 | 50.4-131 | | | 2.56 | 24.8 |
| Naphthalene | 0.0250 | ND | 0.121 | 0.122 | 96.9 | 97.6 | 5 | 18.4-145 | | | 0.730 | 34 |
| Toluene | 0.0250 | 0.000879 | 0.110 | 0.117 | 87.5 | 93.1 | 5 | 47.8-127 | | | 6.12 | 24.3 |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.000663 | 0.114 | 0.120 | 91.0 | 95.3 | 5 | 32.9-139 | | | 4.62 | 30.6 |
| 1,3,5-Trimethylbenzene | 0.0250 | 0.000400 | 0.108 | 0.115 | 86.4 | 91.8 | 5 | 37.1-138 | | | 6.02 | 30.6 |
| Xylenes, Total | 0.0750 | 0.00109 | 0.317 | 0.336 | 84.2 | 89.4 | 5 | 42.7-135 | | | 5.91 | 26.6 |
| *(S) Toluene-d8* | | | | | *107* | *108* | | *88.7-115* | | | | |
| *(S) Dibromofluoromethane* | | | | | *101* | *102* | | *76.3-123* | | | | |
| *(S) 4-Bromofluorobenzene* | | | | | *99.4* | *101* | | *69.7-129* | | | | |

## Method Blank (MB)

(MB) 10/20/15 23:46

| Analyte | MB Result mg/kg | MB Qualifier | MB MDL mg/kg | MB RDL mg/kg |
|---|---|---|---|---|
| Benzene | U | | 0.000270 | 0.00100 |
| Ethylbenzene | U | | 0.000297 | 0.00100 |
| Toluene | U | | 0.000434 | 0.00500 |
| 1,2,4-Trimethylbenzene | U | | 0.000211 | 0.00100 |
| Xylenes, Total | U | | 0.000698 | 0.00300 |

## Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) 10/20/15 22:16 • (LCSD) 10/20/15 22:38

| Analyte | Spike Amount mg/kg | LCS Result mg/kg | LCSD Result mg/kg | LCS Rec. % | LCSD Rec. % | Rec. Limits % | LCS Qualifier | LCSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 0.0250 | 0.0207 | 0.0211 | 82.8 | 84.4 | 72.6-120 | | | 1.91 | 20 |
| Ethylbenzene | 0.0250 | 0.0261 | 0.0260 | 104 | 104 | 78.6-124 | | | 0.120 | 20 |
| Toluene | 0.0250 | 0.0226 | 0.0226 | 90.3 | 90.6 | 76.7-116 | | | 0.320 | 20 |
| 1,2,4-Trimethylbenzene | 0.0250 | 0.0240 | 0.0241 | 95.9 | 96.6 | 77.1-124 | | | 0.640 | 20 |
| Xylenes, Total | 0.0750 | 0.0765 | 0.0763 | 102 | 102 | 78.1-123 | | | 0.190 | 20 |

## L794475-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) 10/21/15 01:16 • (MS) 10/21/15 00:09 • (MSD) 10/21/15 00:31

| Analyte | Spike Amount mg/kg | Original Result mg/kg | MS Result mg/kg | MSD Result mg/kg | MS Rec. % | MSD Rec. % | Dilution | Rec. Limits % | MS Qualifier | MSD Qualifier | RPD % | RPD Limits % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | 0.0250 | 0.258 | 121 | 115 | 73.0 | 69.4 | 6600 | 47.8-131 | | | 4.98 | 22.8 |
| Ethylbenzene | 0.0250 | 186 | 269 | 265 | 50.9 | 48.2 | 6600 | 44.8-135 | | | 1.65 | 26.9 |
| Toluene | 0.0250 | 4.70 | 134 | 129 | 78.3 | 75.5 | 6600 | 47.8-127 | | | 3.46 | 24.3 |
| 1,2,4-Trimethylbenzene | 0.0250 | 515 | 484 | 479 | 0.000 | 0.000 | 6600 | 32.9-139 | J6 | J6 | 0.870 | 30.6 |
| Xylenes, Total | 0.0750 | 683 | 870 | 863 | 37.7 | 36.2 | 6600 | 42.7-135 | J6 | J6 | 0.880 | 26.6 |

## Abbreviations and Definitions

| | |
|---|---|
| SDG | Sample Delivery Group. |
| MDL | Method Detection Limit. |
| RDL | Reported Detection Limit. |
| ND,U | Not detected at the Reporting Limit (or MDL where applicable). |
| RPD | Relative Percent Difference. |
| (dry) | Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils]. |
| Original Sample | The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG. |
| (S) | Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media. |
| Rec. | Recovery. |
| SDL | Sample Detection Limit. |
| MQL | Method Quantitation Limit. |
| Unadj. MQL | Unadjusted Method Quantitation Limit. |

| Qualifier | Description |
|---|---|
| J | The identification of the analyte is acceptable; the reported value is an estimate. |
| J1 | Surrogate recovery limits have been exceeded; values are outside upper control limits. |
| J6 | The sample matrix interfered with the ability to make any accurate determination; spike value is low. |
| P1 | RPD value not applicable for sample concentrations less than 5 times the reporting limit. |

# ACCREDITATIONS & LOCATIONS

ONE LAB. NATIONWIDE.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross-contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**



## State Accreditations

| | | | |
|---|---|---|---|
| Alabama | 40660 | Nevada | TN-03-2002-34 |
| Alaska | UST-080 | New Hampshire | 2975 |
| Arizona | AZ0612 | New Jersey–NELAP | TN002 |
| Arkansas | 88-0469 | New Mexico | TN00003 |
| California | 01157CA | New York | 11742 |
| Colorado | TN00003 | North Carolina | Env375 |
| Connecticut | PH-0197 | North Carolina [1] | DW21704 |
| Florida | E87487 | North Carolina [2] | 41 |
| Georgia | NELAP | North Dakota | R-140 |
| Georgia [1] | 923 | Ohio–VAP | CL0069 |
| Idaho | TN00003 | Oklahoma | 9915 |
| Illinois | 200008 | Oregon | TN200002 |
| Indiana | C-TN-01 | Pennsylvania | 68-02979 |
| Iowa | 364 | Rhode Island | 221 |
| Kansas | E-10277 | South Carolina | 84004 |
| Kentucky [1] | 90010 | South Dakota | n/a |
| Kentucky [2] | 16 | Tennessee [1,4] | 2006 |
| Louisiana | AI30792 | Texas | T 104704245-07-TX |
| Maine | TN0002 | Texas [5] | LAB0152 |
| Maryland | 324 | Utah | 6157585858 |
| Massachusetts | M-TN003 | Vermont | VT2006 |
| Michigan | 9958 | Virginia | 109 |
| Minnesota | 047-999-395 | Washington | C1915 |
| Mississippi | TN00003 | West Virginia | 233 |
| Missouri | 340 | Wisconsin | 9980939910 |
| Montana | CERT0086 | Wyoming | A2LA |
| Nebraska | NE-OS-15-05 | | |

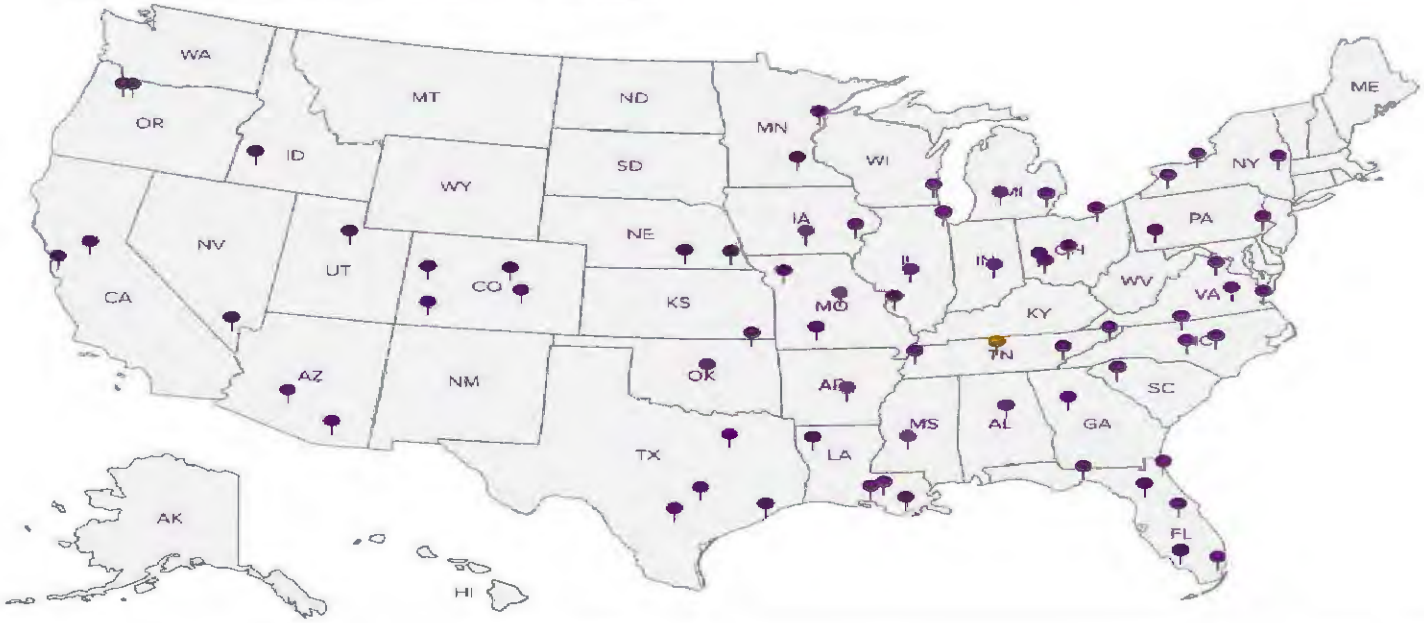
[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Accreditation not applicable

## Third Party & Federal Accreditations

| | | | |
|---|---|---|---|
| A2LA – ISO 17025 | 1461.01 | AIHA | 100789 |
| Canada | 1461.01 | DOD | 1461.01 |
| EPA–Crypto | TN00003 | USDA | S-67674 |

## Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



Insite Group, Inc.
611 S. Irvine Ave.
Sharon, PA 16146

Alternate billing information: INSITE080614S

Report to: Sara Giordano
Email to: lab@insitegroup.org

Project Description: FC-1 / Soil
City Site Collected: KITTANNING, PA
Phone: 724 347 2101
FAX: 724 347 2139
Client Project #: VALLEY VILLAGE
ESC Key: INSITE080614S
Collected by: J. SWOGGER
Site/Facility ID#: 03-06500
P.O.#:
Collected by (signature): J Swogger
Packed on Ice: N

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

Date Results Needed:
Email? No ✓ Yes
FAX? ✓ No Yes

Analysis/Container/Preservative

Chain of Custody
Page 1 of 1

Prepared by

ENVIRONMENTAL SCIENCE CORP.
12065 Lebanon Road
Mt. Juliet, TN 37122
Phone (615) 758-5858
Phone (800) 767-5859
FAX (615) 758-5859
C071

CoCode (lab use only)
Template/Prelogin
Shipped Via

| Sample ID | Comp/Grab | Matrix* | Depth | Date | Time | No. of Ctrs | V8260/GPA / 40mlAmb / NaBIS/Syr/MeOH | VOC Screen / 2oz/Clr / no pres | Total Solids / 4ozClr / no pres | TPH GRO (C6-C12) | EOX (TOX) | LEAD | Remarks/Contaminant | Sample # (lab only) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| B-16 (6-8 FT) | Grab | SS | X | 10/08/15 | 08:30 | 7 | X | X | X | X | X | X | | L794097-01 |
| B-16 (8-10 FT) | Grab | SS | | 10/08/15 | 08:40 | 5 | X | X | X | | | | | 02 |
| P-2 (12-14 FT) | Grab | SS | X | 10/08/15 | 10:25 | 7 | X | X | X | X | X | X | | 03 |
| P-1 (11-13 FT) | Grab | SS | X | 10/08/15 | 15:20 | 7 | X | X | X | X | X | X | | 04 |

*Matrix: SS - Soil/Solid GW - Groundwater WW - Wastewater DW - Drinking Water OT - Other

pH Temp
Flow Other

Remarks: D1 Priority

| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) | Samples returned via: ☐ FedEx ☐ Courier ☐ UPS | Condition: | (lab use only) |
|---|---|---|---|---|---|---|
| Relinquished by: (Signature) | Date: | Time: | Received by: (Signature) | Temp: 2.4c | Bottles Received: | |
| Relinquished by: (Signature) | Date: | Time: | Received for lab by: (Signature) | Date: | Time: 0900 | pH Checked: NCF: |

# ATTACHMENT C

**Tersus Environmental, LLC**

# Bench-Scale Phase Behavior Test Report
# Valley Village Site
# 10243 State Route 85, Kittanning, PA 16201

Prepared For:

Sara Giordano, PhD
Project Coordinator
Insite group, Inc.
611 S. Irvine Ave.
Sharon, PA 16146
sgiordano@insitegroup.org

Tersus Project No. Q16-2103
April 29, 2016

1116 Colonial Club Road
Wake Forest, NC 27587
Ph: 919.453.5577 • info@tersusenv.com
tersusenv.com

April 29, 2016

Sara Giordano, PhD
Project Coordinator
Insite group, Inc.
611 S. Irvine Ave.
Sharon, PA 16146

**Reference:** Laboratory Scale phase Behavior Analysis
Valley Village Site
10243 State Route 85, Kittanning, PA 16201
Tersus Project No. Q16-2103

Dear Sara,

Per your authorization, our Surfactant Scientific Advisors at the University of Oklahoma performed a phase behavior study for the Valley Village Site. Please find enclosed the corresponding report.

The scope of the work consisted of evaluating microemulsion behavior using TASK™ surfactant and site ground water. An ultra-low interfacial tension, evidenced through a middle phase microemulsion, will most likely be achievable at a concentration of 0.94 percent by weight of active surfactant, as indicated in the report. A viable range of electrolyte concentrations (sodium and calcium chloride) is provided in the report to optimize the surfactant formulation.

We appreciate your interest in Tersus Environmental and the companies we represent. If you have any questions, please contact us. We look forward to discussing the results with you.

Best regards,

**Tersus Environmental, LLC**

*David F Alden*

David F. Alden, P.E.
Technical Associate

*Gary M. Birk*

Gary M. Birk, P.E.
Managing Partner

*For Every Part of Your Plume, We've Got You Covered!*

## Contents

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Phase Behavior Study Methods ..... 3
Phase Behavior Study Results ..... 4
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## Bench-Scale Phase Behavior Test Report

## Valley Village Site, 10243 State Route 85, Kittanning, PA 16201

### Purpose

Insite Group, Inc. contracted Tersus Environmental to conduct a laboratory phase behavior study for the purpose of determining the potential of the TASK surfactant to form middle phase microemulsions with non-aqueous phase liquid (NAPL) and ground water from the Valley Village Site in Kittanning, PA (Site). The ability to form middle phase microemulsions indicates a strong potential to effectively mobilize and remove the targeted NAPL trapped in a contaminated zone. Samples of site ground water were collected and shipped to University of Oklahoma (OU) laboratories for this study.

### Introduction

A middle phase microemulsion is a thermodynamically stable phase and its occurrence indicates the evidence of ultra-low interfacial tension between the NAPL and water phases. The presence of a middle phase microemulsion phase produces both the most effective mobilization of contaminants and the maximum solubilization of contaminants in the aqueous phase (supersolubilization). Often the microemulsion phase is falsely attributed as a non-equilibrium macroemulsion phase. A macroemulsion phase is similar to a microemulsion phase, but its appearance changes over time and eventually disappears. In general, the ideal microemulsion system will coalesce in a few minutes (< 10 minutes) and equilibrate in a few hours. A stable macroemulsion system appears opaque and lasts for several days or weeks before completely separating.

### Phase Behavior Study Methods

These studies consisted of using 15-mL test tubes in which 5 mL of NAPL and 5 mL of a well-mixed aqueous solution (composed of Site ground water, surfactant, and varying salt concentrations) were combined. The surfactant concentrations and salinities are expressed as weight percent in the aqueous phase. The tubes were mildly shaken by hand and then left at room temperature for at least 24 hours in order to assure equilibrium had been achieved.

The occurrence of a middle-phase microemulsion was verified by visual observation. A surfactant system that has a faster coalescence rate of the middle phase formation tends to exhibit lower interfacial tension. Visual observation continued for another three to five days to observe any further phase separation of microemulsions and/or any signs of gelation and liquid crystal.

**Phase Behavior Study Results**

TASK formulation with an active surfactant concentration of 0.94 wt. % served to prepare the phase behavior study. Because of the difficulty to obtain a NAPL sample from the Site's treatment zone, based on the chromatograms for the site, a laboratory gasoline sample served to represent the Site's NAPL. The ground water sample sent from the Site served to prepare test tubes of surfactant-NAPL-water systems. A salinity scan consisted of testing Sodium chloride (NaCl) concentrations ranging from 0.8 to 1.7 wt. % and served to verify a favorable salinity.

According to the phase behavior study, the middle phase microemulsion formed at salinity of 1.0 wt. % as shown in Figure 1. The coalescence time for middle phase formation is shown at the top of the vial in Figure 1. The coalescence time is defined as the time required for both interfaces to become well defined. A time of 10 minutes or less is desired for surfactant formulations being considered for potential field application. The favorable result occurred at around 1.0 wt. % NaCl.

**Figure 1. Test tubes with TASK surfactant (.94% active), sodium chloride at varying concentrations, gasoline, and ground water.**

**Summary**

1. TASK formulation on the laboratory NAPL and Site ground water allowed forming a middle phase microemulsion. The result of this batch phase behavior test confirms TASK's potential to mobilize trapped NAPL contaminant in the site's treatment zone.
2. The NAPL properties of the Site's NAPL might be different from results obtained from this report. Preliminary result suggests a salt concentration window between 0.9 and 1.1 wt. % NaCl might allow an ultra-low interfacial tensions between the NAPL and the diluted surfactant solution.

## Preparing Tersus Surfactants (TASK)

Tersus provides specialty formulated surfactants to accommodate site specific geochemistry and off-the-shelf surfactants for gasoline, diesel and heating oil remediation. Tersus supports surfactant enhanced aquifer remediation (SEAR) with design and engineering services. The Tersus technical team includes University Oklahoma professors who lead the country in SEAR research, system integrators and experienced field implementers.

## TASK Mixing Instructions

Tersus recommends using gloves, goggles and site-appropriate personal protective equipment (PPE) when handling TASK. Please use the mixing table guideline immediately below, when preparing a desired injection batch.

| Batch Volume | TASK | | NaCl | Water |
|---|---|---|---|---|
| Gallons | Gallons | Pounds | Pounds | Gallons |
| 275 (typical IBC-Tote Size) | 5 | 41 | 23 | 270 |
| 500 | 8 | 75 | 42 | 492 |
| 3,342 | 56 | 500 (1 drum) | 279 | 3,286 |
| 6,684 (total surfactant solution) | 112 | 1,000 (2 drums) | 557 | 6,571 |

Example:

To prepare 500 gal. of surfactant solution, slowly add 17 gal. of the TASK formulation to 492 liters of water (i.e., a roughly 1:55 TASK to water ratio). Mixing times will vary depending on mixing method. Large batches (>5,000 gal.) may require over 2 hours of mixing. If homogenized, samples from both the top and bottom of the mixing tank should be fairly clear. After initial mixing, add 42 lbs. of sodium chloride into the batch and continue mixing until all salt is completely dissolved. Use of an antifoamer/defoamer agent may be required during mixing.

## Recycling

Due to cost and liability considerations, the vast majority of our clients do not ship empty containers back to Tersus. Fortunately, you can find local recycling services located throughout the United States. Their business is to collect, prepare and resell used drums.

## Questions

If you need any assistance whatsoever, please call 919-453-5577.

## Tersus Customer Care

Tersus distinguishes itself from other solutions providers with a unique range of products and testing services combined with unparalleled technical support. It is our passion to provide excellent customer service and unique and innovative technologies that support your projects in an efficient and cost effective manner.

### YOUR PRIMARY CONTACTS

**Customer Care**

Sherri Scott
Business Development
Office: 919.453.5577 x2003
Cell: 919.527.9781
sherri.scott@tersusenv.com

**Project Management / Technical Support**

David F. Alden, P.E.
Technical Associate
Phone: 919.453.5577 x2002
Cell: 919.523.6233
david.alden@tersusenv.com

**Surfactant Practice National Sales Leader**

Mark Kluger
Office: 302.655.6651
Cell: 302.494.6050
mkluger@dajak.com

**Gas inFusion Parts & Accessories**

Don Ray
Office: 850.385.7790
Cell: 850.294.3757
don.ray@tersusenv.com

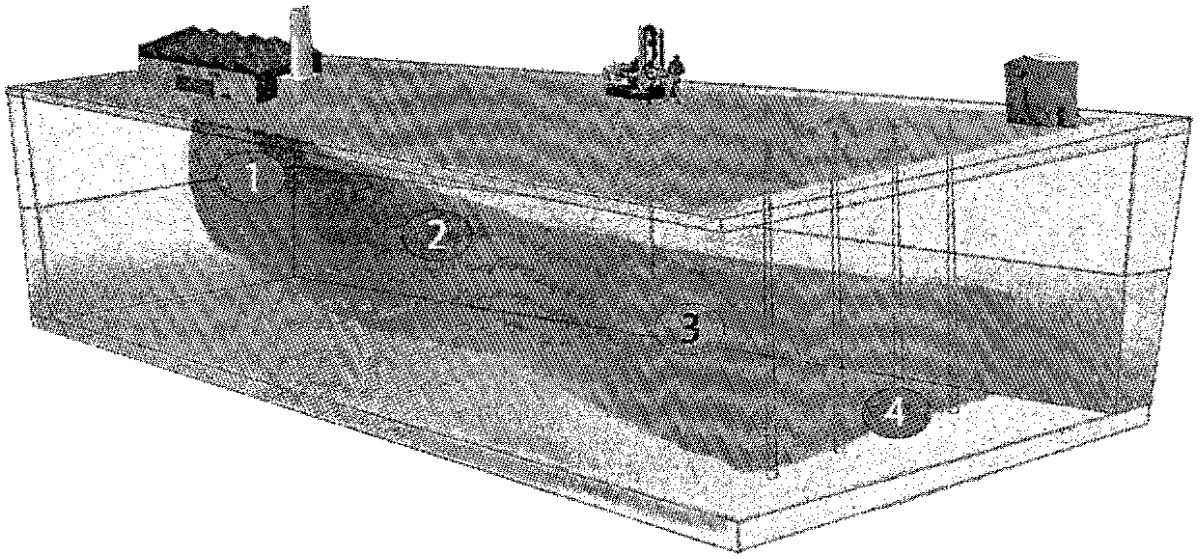
**Accounting**

Liz Raimo
Accounting Administrator
Office: 919.453.5577 x2004
liz.raimo@tersusenv.com

**Logistics**

Bethany McLain
Project Administrator
Office: 919.453.5577 x2005
bethany.mclain@tersusenv.com

## Tersus Product Offerings




### 1 Vadose Zone Remediation

- Emulsified zero-valent iron (eZVI)
- RemBind™ chemical fixation
- TASK™ surfactants

### 2 Saturated Zone NAPL Treatment

- TASK™ Surfactants
- Emulsified zero-valent iron (eZVI)
- NutriBind™ sorption and biotic treatment

### 3 Dissolved Contaminant Anaerobic Remediation

- Emulsified vegetable oils (EVO): EDS-ER™
- Soluble electron donor and nutrients: EDS-QR™, Nutrimens®
- Vitamin $B_{12}$ Supplement for Dhc
- Buffers: Dipotassium Phosphate
- Bioaugmentation: KB-1® culture and anoxic media (L-Cysteine Base)
- NutriBind™ sorption and bioremediation
- Nutrisulfate® soluble electron acceptor

### 4 Dissolved Contaminant Aerobic Remediation

- Gas infusion technology: ISOC®, HiSOC®, BioFlo®, gPRO® and inFusor™
- TersOx™ oxygen releasing compounds

### Implementation and Monitoring Systems

- Surfactant enhanced aquifer remediation systems
- Groundwater treatment and recirculation systems
- PerfluorAd™ PFAS remediation systems
- Drinking water point of entry (POE)
- RemBind™ Systems
- Laboratory Treatability Studies

### Soil and groundwater remediation of:

- Chlorinated Solvents
- Petroleum Hydrocarbons
- Pesticides
- Metals
- Per- and Polyfluoroalkyl Substances (PFAS)

## Appendices

# TASK® Surfactant SDS

## 1. Product and Company Identification

Product Name: **TASK**
Company Information: Surbec Environmental, LLC
PO Box 722605
Norman, Oklahoma 73070
Phone: 405-364-9726 Fax: 405-366-1798
Emergency Number: 1-800-424-9300 (CHEMTREC)
Recommended Use: Remediation of groundwater and soil.
Restrictions on Use: None

## 2. Hazard Identification

**CLASSIFICATION**
UN – 3082. Class 9; Packing Group III, *Marine Pollution: P.* Reportable Quantity (RQ): *not component is listed*

**EMERGENCY OVERVIEW: WARNING**
May cause eye and skin irritation. If ingested, may cause nausea, diarrhea and vomiting.

**PRIMARY ROUTES OF EXPOSURE:** EYE CONTACT, SKIN ABSORPTION AND CONTACT, INGESTION, INHALATION

**POTENTIAL HEALTH EFFECTS:**
***Eyes***: Brief contact may cause mild irritation, temporary impairment of vision and redness of the eye. Prolonged contact may result in corneal injury.

## 3. Composition and Information on Ingredients

Anionic Surfactant Mixture, >50%

Isopropanol, >3%

Propylene glycol, < 5%

## 4. First Aid Measures

***EYE CONTACT***: Immediately flush eyes thoroughly with water for 30 minutes. Consult a physician, preferably an ophthalmologist.
***SKIN CONTACT***: Wash skin for 10 minutes. Clothing contacted with material should be washed. If skin irritation develops, consult a physician.
***INGESTION***: Drink several glasses of water and consult a physician. Do not induce vomiting.
***INHALATION***: Move the person to fresh air and clear the airways. If not breathing, give artificial respiration. Immediately consult a physician.

## 5. Fire Fighting Measures

Flash Point (°C): 120
Flammability: Solution is non-flammable
Fire-Extinguishing Media: Large fires: water spray or alcohol-type foam.
Small fires: Dry chemicals or carbon dioxide.
Explosion/Fire Hazards: None known.
Special Instructions for Firefighting Personnel: Wear full personal protective equipment and positive pressure breathing apparatus.

## 6. Accidental Release Measures

Transportation Spills: CHEMTREC 1-800-424-9300

Wear full personal protective equipment and positive pressure breathing apparatus. If possible, ventilate the area and attempt to contain the spill. Remove usable material if possible. Use sand, dirt or absorbent material to soak

## 8. Exposure controls and personal protection

Engineering Controls: No special equipment required.
Eye Protection: Full face shield. Eye wash station.
Skin Protection: Exposed areas on the skin should be minimized by use of long-sleeved shirt and pants and chemical-resistant gloves.
Respiratory Protection: If vapor or mist is present, use NIOSH approved respirator.
Ventilation: Area where the material is used should be well-ventilated. If not, a NIOSH approved respirator should be worn.

## 9. Physical and Chemical Properties

Appearance: Clear liquid
Color: clear yellow to clear brown
Odor: Alcohol odor
pH: (10% in water): 6.5-7.5
Melting Point (°C): not determined
Boiling Point (°C): 100°C (212°F)
Flash Point (°C): 120°C
Specific Gravity (water=1): 1.10
Water Solubility (%): >10
Viscosity: 500cSt at 40°C (104°F)
Vapor Pressure (mmHg): not determined

## 10. Stability and reactivity

Stability: Stable at normal temperatures and pressures.
Incompatibility: None
Hazardous Polymerizations: Do not occur.
Hazardous Decomposition: This product may produce toxic levels of the following compounds when heated to decomposition:

## 12. Ecological Information

Chemical Fate Information: Product is readily biodegradable in wastewater treatment systems but is moderately toxic to aquatic life.
Biodegradability: Product components are classified as biodegradable under aerobic test conditions.

## 13. Disposal Considerations

Dispose according to federal, state and local laws.

## 14. Transport Information

Proper Shipping Name: Not regulated.
DOT Hazard Class: Not regulated.
Identification Number: Not regulated.
Packaging Group: Not regulated.

## 15. Regulatory Information

Federal EPA
SARA Title III:

Section 302/304 Extremely Hazardous Substances: None
Section 311 Hazardous Categorization:
Acute✓ Chronic✓ Fire✓ Pressure Reactive N/A
Section 313 Toxic Chemicals: None

CERCLA Hazardous Substances: None
Volatile Organic Compounds: Isopropanol, 1,2-Propylene glycol
TSCA Status: All chemicals in this product are on the TSCA Chemical Substances Inventory.
**State Right-to-Know**
New Jersey: Subject to the New Jersey labeling requirements on package and bulk storage tanks.
**International Regulations**
[illegible]

## 16. Other Information

The information contained in this sheet is for information purposes only. Its completeness and accuracy are not guaranteed.

Last Revised [illegible]

# Tersus Environmental, LLC
# Research Study Terms & Conditions
# (Attachment A)

The following terms and conditions ("T&Cs") apply to any research study ("Research Study") performed by Tersus Environmental, LLC (Tersus) or by companies it represents. Such Research Study is initiated by a purchase order, quote or acceptance of a proposal ("Order"). By placing an Order, the Client agrees to be bound by these T&Cs, which constitute the entire agreement between the Client and Tersus.

**Invoicing and Payment:** Tersus, in order to cover the material cost to set up the Research Study, will invoice Client 50% of the total budget for the Research Study established in the Order upon receipt of the Order. Thereafter, Tersus will invoice Client on a time and materials basis up to the total authorized cost. The balance shall be invoiced upon submission of the Research Study report. Payment is due within 30 days of receipt of Tersus' invoice. In the event the Research Study is pursuant to a prime contract between Client and its client, payment for a Research Study greater than $5,000 shall be made the earlier of Client's receipt of payment from its client or 60 days from receipt of Tersus' invoice. Client shall pay an additional charge of one and a half percent (1.5%) of the amount of the invoice per month or the maximum percentage allowed by law, whichever is the lesser, for any payment received by Tersus beyond the payment terms set forth herein.

**Samples and Reporting:** Unless otherwise set forth in the Order, Client will obtain samples and ship to Tersus at Client's expense. At Client's request, Tersus will provide sample containers. Tersus is responsible for resampling costs while samples are in its care, custody and control only to the extent loss or damage to the samples arises out of Tersus' negligence or willful misconduct. The results of the Research Study will be delivered to Client in Tersus' standard report format. In the event that Client desires a different report format, Client agrees to provide a sample to Tersus prior to the performance of the Research Study. Client understands and agrees that the unit prices in the Order assume standard report format and may be adjusted in the event such special reporting format results in an increased level of effort.

**Standard of Care and Indemnity:** Tersus will perform the Research Study and will dispose of samples in accordance with the schedule (if any) set forth in the Order, and applicable federal, provincial, state or local laws and regulations. The Research Study will be in accordance with Tersus' general operating quality assurance and control program. Tersus will defend, indemnify and hold harmless Client for losses, claims or causes of action to the extent arising out of Tersus' professional negligence or willful misconduct.

**Confidentiality:** Tersus will maintain as confidential any documents or information provided by Client and Research Study reports and will not release, distribute or publish the same to any third party without prior permission from Client, unless compelled by law or order of a court or regulatory body of competent jurisdiction. In such event, Tersus will provide advance written notice to Client prior to release.

**Force Majeure/Consequential Damages:** Neither party will hold the other responsible for damages or delays in performance caused by force majeure, acts of God, or other events beyond the reasonable control of the delayed party. In no event will either party be liable to the other for any incidental or consequential damages arising in connection with the Research Study.

**Termination:** Client may terminate the Order prior to the commencement of the Research Study by written notice to Tersus.

**Validity:** These T&Cs will be enforced to the fullest extent permitted by law. If any provision is found to be invalid or unenforceable, the provision will be construed and applied in a way that comes as close as possible to expressing the intention of the parties and that saves the validity and enforceability of the provision.

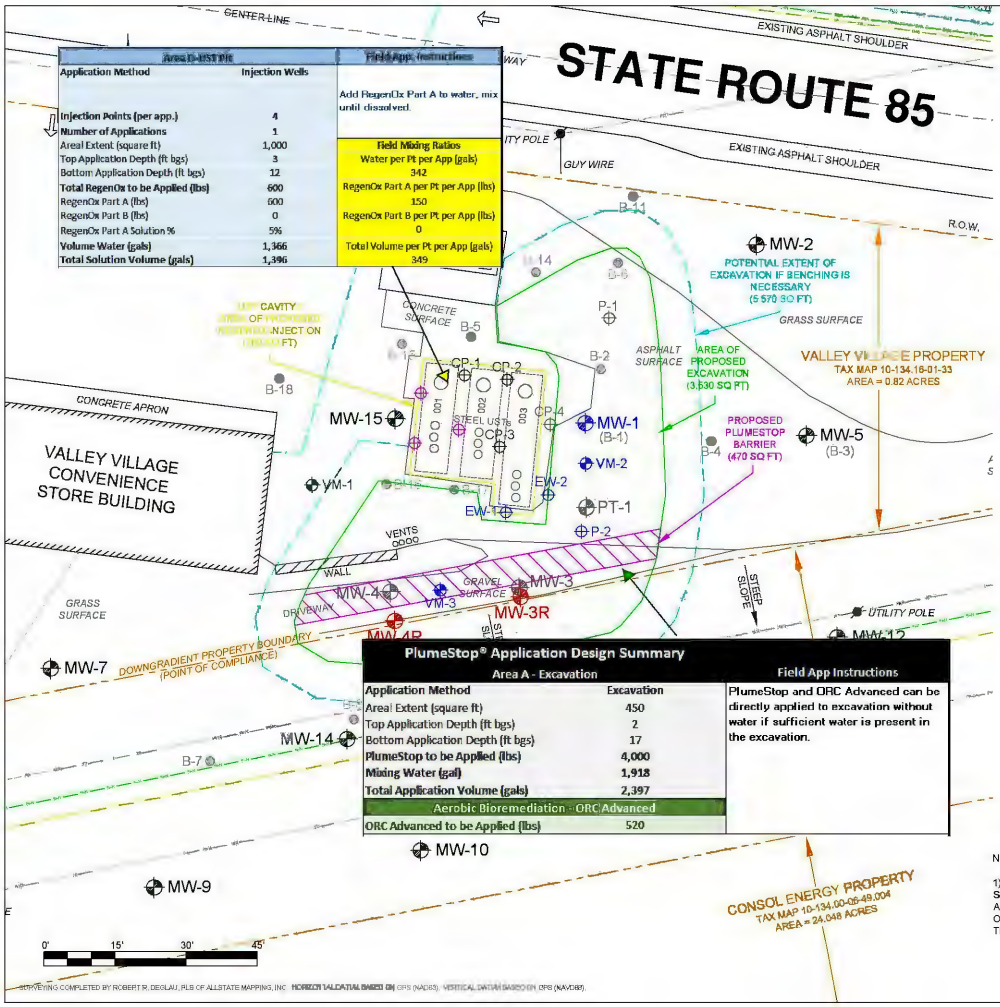
**No Third Party Rights:** These T&Cs will not create any rights or benefits to parties other than Client and Tersus, provided, however, that if Client is a prime contractor, then Client's client shall be entitled to rely upon the Research Study reports to the same extent as Client, subject to these T&Cs.

**Notices:** Any information or notices required or permitted under the Order will be deemed to have been sufficiently given if in writing and delivered either personally or by mail to the representatives of the parties as set forth in the Order or as otherwise designated by the parties. Notice given by mail will also be transmitted by facsimile or email at the time of mailing.

**Client's Prime Contract:** In the event that Client is obligated to flow down the provisions of its prime contract, Client shall provide a copy to Tersus concurrent with its execution of this document to which these T&Cs are attached. Tersus reserves the right to review and accept the mandatory flow down provisions of the prime contract prior to its performance. Tersus shall be bound to the Terms and conditions of the prime contract only to the extent that they are expressly imposed upon Client's subcontractors. Tersus' signature on the document to which these T&Cs are attached shall evidence its acceptance of the prime contract flow down requirements.

**Integrated Writing:** The Order and these T&Cs, together with any Supplemental T&Cs attached hereto, constitute a final and complete repository of the agreements between Client and Tersus and supersede all prior or contemporaneous communications, representations, or agreements, whether oral or written and shall only be modified through a mutually acceptable written addendum hereto. It is expressly agreed by the parties that if Client issues a Purchase Order or similar document, it shall be solely for financial authorization purposes and any terms and conditions contained therein shall not modify these T&Cs.

# ATTACHMENT D




| Area D-UST Pit | |
|---|---|
| Application Method | Injection Wells |
| Injection Points (per app.) | 4 |
| Number of Applications | 1 |
| Areal Extent (square ft) | 1,000 |
| Top Application Depth (ft bgs) | 3 |
| Bottom Application Depth (ft bgs) | 12 |
| Total RegenOx to be Applied (lbs) | 600 |
| RegenOx Part A (lbs) | 600 |
| RegenOx Part B (lbs) | 0 |
| RegenOx Part A Solution % | 5% |
| Volume Water (gals) | 1,366 |
| Total Solution Volume (gals) | 1,396 |

**Field App. Instructions**

Add RegenOx Part A to water, mix until dissolved.

**Field Mixing Ratios**

| | |
|---|---|
| Water per Pt per App (gals) | 342 |
| RegenOx Part A per Pt per App (lbs) | 150 |
| RegenOx Part B per Pt per App (lbs) | 0 |
| Total Volume per Pt per App (gals) | 349 |

**PlumeStop® Application Design Summary**

| Area A - Excavation | |
|---|---|
| Application Method | Excavation |
| Areal Extent (square ft) | 450 |
| Top Application Depth (ft bgs) | 2 |
| Bottom Application Depth (ft bgs) | 17 |
| PlumeStop to be Applied (lbs) | 4,000 |
| Mixing Water (gal) | 1,918 |
| Total Application Volume (gals) | 2,397 |
| Aerobic Bioremediation - ORC Advanced | |
| ORC Advanced to be Applied (lbs) | 520 |

**Field App Instructions**

PlumeStop and ORC Advanced can be directly applied to excavation without water if sufficient water is present in the excavation.

LEGEND

- MW-2 EXISTING MONITORING WELL
- MW-1 EXISTING WELL TO BE REMOVED DURING EXCAVATION AND REPLACED AT THE SAME LOCATION.
- MW-3 EXISTING WELL TO BE REMOVED DURING EXCAVATION AND NOT REPLACED
- MW-3R PROPOSED REPLACEMENT MONITORING WELL
- PT-1 EXISTING PILOT TEST WELL
- EW-1 EXISTING EXTRACTION WELL
- CP-1 EXISTING UST CAVITY INJECTION WELL
- PROPOSED UST CAVITY INJECTION WELL
- VM-1 EXISTING SOIL VAPOR MONITORING POINT
- P-1 EXISTING PIEZOMETER
- B-2 FORMER SOIL BORING
- PROPERTY BOUNDARIES
- WATER LINE
- NATURAL GAS LINE
- SANITARY SEWER LINE
- STORM SEWER LINE
- OVERHEAD POWER LINES

**AREA OF PROPOSED EXCAVATION** (~ 3,530 SQUARE FEET)
- ADSORBED PHASE MASS ABOVE AND BELOW THE WATER TABLE WILL BE EXCAVATED TO AN ESTIMATED TOTAL DEPTH OF UP TO 17 FEET BGS. TOTAL VOLUME = ~ 2,223 CUBIC YARDS.

**PROPOSED PLUMESTOP BARRIER** (~ 470 SQUARE FEET)
- FOLLOWING BACKFILLING, A TRENCH WILL BE EXCAVATED NEAR THE DOWNGRADIENT6 PROPERTY BOUNDARY AND PLUMESTOP WILL BE APPLIED FROM 2 TO 17 FEET BGS.

**UST CAVITY** (~ 700 SQUARE FEET)
- REGENOX PART A WILL BE INJECTED INTO THE UST CAVITY TO DESORB AND OXIDIZE CONTAMINANT MASS.
- FOLLOWING INJECTION, GROUNDWATER WILL BE EXTRACTED FROM THE UST CAVITY TO REMOVE THE LIBERATED CONTAMINANT MASS.

**WELLS TO BE REMOVED DURING EXCAVATION**

| | |
|---|---|
| MW-1 | TO BE REPLACED AS MW-1R AT SAME LOCATION. |
| MW-3 | TO BE REPLACED AS MW-3R AT LOCATION INDICATED. |
| MW-4 | TO BE REPLACED AS MW-4R AT LOCATION INDICATED. |
| P-1 | WILL NOT BE REPLACED. |
| P-2 | TO BE REPLACED AS P-2R AT SAME LOCATION. |
| PT-1 | WILL NOT BE REPLACED. |
| STANDPIPE | WILL NOT BE REPLACED. |
| VM-2 | TO BE REPLACED AS VM-1R AT SAME LOCATION. |
| VM-3 | TO BE REPLACED AS VM-2R AT SAME LOCATION. |
| EW-1 | TO BE REPLACED AS EW-1R AT SAME LOCATION. |
| EW-2 | TO BE REPLACED AS EW-2R AT SAME LOCATION. |
| CP-2 | WILL NOT BE REPLACED. |
| CP-3 | WILL NOT BE REPLACED. |
| CP-4 | WILL NOT BE REPLACED. |

NOTE:

1) THE PROPOSED AREA OF EXCAVATION SHOWN IS AN ESTIMATE. THE ACTUAL AREA OF EXCAVATION MAY VARY BASED ON SITE CONDITIONS ENCOUNTERED IN THE FIELD.

FIGURE 1
CONCEPTUAL REMEDIAL DESIGN
VALLEY VILLAGE
10243 STATE ROUTE 85, KITTANNING, PA 16201

| DRAWN | REVISED | CHECKED |
|---|---|---|
| JLS | JLS | SJG |
| DATE 02/19/2015 | DATE 06/23/2016 | DATE 06/23/2016 |

INSITE GROUP INC.
611 SOUTH IRVINE AVENUE
SHARON, PENNSYLVANIA 16146

SURVEYING COMPLETED BY: ROBERT R. DEGLAU, PLS OF ALLSTATE MAPPING, INC. HORIZONTAL DATUM BASED ON: GPS (NAD83). VERTICAL DATUM BASED ON: GPS (NAVD88).

REGENESIS

**Total Product Cost Summary**
**Insite Group - Valley Village Site**
**7/5/2016**

| Treatment Unit | Treatment Surface Area (sq ft) | Treatment Thickness (ft) | Cubic Yards (cy) | Technology | Product Quantity (lbs) | Volume (gals) |
|---|---|---|---|---|---|---|
| DG Prop Line Barrier | 450 | 15 | 250 | **PlumeStop** | 4,000 | 2,397 |
| DG Prop Line Barrier | 450 | 15 | 250 | **ORC Advanced Pellets** | 520 | 26 |

| | | |
|---|---|---|
| ***Total PlumeStop (lbs)*** | ***4,000*** | ***$10,600*** |
| ***Total ORC Advanced Pellets (lbs)*** | ***520*** | ***$4,654*** |

| Treatment Unit | Treatment Surface Area (sq ft) | Treatment Thickness (ft) | Cubic Yards (cy) | Technology | Product Quantity (lbs) | Injection Volume (gals) |
|---|---|---|---|---|---|---|
| UST Pit | 1,000 | 9 | 333 | **RegenOx** | 600 | 1,396 |

| | | |
|---|---|---|
| ***Total RegenOx (lbs)*** | ***600*** | ***$1,638*** |

| | |
|---|---|
| ***Totol Product Cost*** | ***$16,892*** |
| Estimated Tax/Freight | $3,041 |
| ***Total Product Cost w/ Estimated Tax/Freight*** | ***$19,933*** |

REGENESIS

## Project Info

**Valley Village**
**Kittanning, PA**
**PlumeStop/ORC-A Barrier**
Prepared For:
**Client (Firm)**

| Target Treatment Zone (TTZ) Info | Unit | Value |
|---|---|---|
| Treatment Area | $ft^2$ | 450 |
| Top Treat Depth | ft | 2.0 |
| Bot Treat Depth | ft | 17.0 |
| Vertical Treatment Interval | ft | 15.0 |
| Treatment Zone Volume | $ft^3$ | 6,750 |
| Treatment Zone Volume | cy | 250 |
| Soil Type | --- | clay |
| Porosity | $cm^3/cm^3$ | 0.33 |
| Effective Porosity | $cm^3/cm^3$ | 0.10 |
| Treatment Zone Pore Volume | gals | 16,663 |
| Treatment Zone Effective Pore Volume | gals | 5,049 |
| Fraction Organic Carbon (foc) | g/g | 0.010 |
| Soil Density | $g/cm^3$ | 1.5 |
| Soil Density | $lb/ft^3$ | 94 |
| Soil Weight | lbs | 6.3E+05 |
| | | |
| Hydraulic Conductivity | ft/day | 0.0 |
| Hydraulic Conductivity | cm/sec | 3.53E-07 |
| Hydraulic Gradient | ft/ft | 0.100 |
| GW Velocity | ft/day | 0.00 |
| GW Velocity | ft/yr | 0 |

| Sources of Oxygen Demand | Unit | Value |
|---|---|---|
| Dissolved Phase Contaminant Mass | lbs | 3 |
| Sorbed Phase Contaminant Mass | lbs | 0 |
| Reduced Metals (Fe2+ and Mn2+) Mass | lbs | 4 |
| BOD mass equivalent | lbs | 0 |
| COD mass equivalent | lbs | 7 |
| **Total Mass Contributing to $O_2$ Demand** | **lbs** | **14** |

| Stoichiometric Demand | Unit | Value |
|---|---|---|
| Stoichiometric $O_2$ Demand | lbs | 17 |
| **Stoichiometric ORC Advanced Demand** | **lbs** | **102** |

| Application Dosing | Unit | Value |
|---|---|---|
| **Plume Stop to be Applied** | **lbs** | **4,000** |
| **ORC Advanced to be Applied** | **lbs** | **520** |

## PlumeStop® Application Design Summary

| PlumeStop/ORC-A Barrier | |
|---|---|
| **Application Method** | **Excavation** |
| Areal Extent (square ft) | 450 |
| Top Application Depth (ft bgs) | 2 |
| Bottom Application Depth (ft bgs) | 17 |
| **PlumeStop to be Applied (lbs)** | **4,000** |
| **Mixing Water (gal)** | **1,918** |
| **Total Application Volume (gals)** | **2,397** |

**Aerobic Bioremediation - ORC Advanced**

| | |
|---|---|
| ORC Advanced to be Applied (lbs) | 520 |

**Field App Instructions**

**PlumeStop and ORC Advanced can be directly applied to excavation without water if sufficient water is present in the excavation.**

**Technical Notes/Discussion**

*Prepared By: Doug Davis - Central Region Technical Manager*
*Date: 7/5/2016*

**Assumptions/Qualifications**

In generating this preliminary estimate, Regenesis relied upon professional judgment and site specific information provided by others. Using this information as input, we performed calculations based upon known chemical and geologic relationships to generate an estimate of the mass of product and subsurface placement required to affect remediation of the site.

REGENESIS

## Dissolved Phase Geochemistry, Contaminant Mass and Product Demand Summary
## Valley Village
## PlumeStop/ORC-A Barrier

| Petroleum VOCs-Dissolved Phase | Unit | Value | Mass in GW (lbs) | $O_2$ stoich wt/$O_2$ /wt cont. | ORC Advanced Required (lbs) |
|---|---|---|---|---|---|
| Benzene | µg/L | 7000 | 1.0 | 3.1 | 17.8 |
| Toluene | µg/L | 8000 | 1.1 | 3.1 | 20.3 |
| Ethylbenzene | µg/L | 800 | 0.1 | 3.2 | 2.1 |
| Xylenes | µg/L | 6000 | 0.8 | 3.2 | 15.7 |
| Naphthalene | µg/L | 70 | 0.0 | 3.0 | 0.2 |
| Trimethylbenzenes (1,2,4+1,3,5 TMBs) | µg/L | 1000 | 0.1 | 3.2 | 2.6 |
| | | *subtotal PHC VOCs* | *3.2* | — | *58.6* |

| Oxygenates-Dissolved Phase | Unit | Value | Mass in GW (lbs) | $O_2$ stoich wt/$O_2$ /wt cont. | ORC Advanced Required (lbs) |
|---|---|---|---|---|---|
| MTBE | µg/L | 100 | 0.0 | 2.7 | 0.2 |
| | | *subtotal oxygenates* | *0.0* | --- | *0.2* |

| | | | |
|---|---|---|---|
| *Total Dissolved Cont. Mass and Demand (lbs)----------->* | 3 | --- | *59* |

## Sorbed Phase Contaminant Mass and Product Demand Summary
## Valley Village
## PlumeStop/ORC-A Barrier

| Petroleum VOCs-Sorbed Phase | Unit | Value | Mass in Soil (lbs) | $O_2$ stoich wt/$O_2$ /wt cont. | ORC Advanced Required (lbs) |
|---|---|---|---|---|---|
| Benzene | µg/kg | | 0.0 | 3.10 | 0.0 |
| Toluene | µg/kg | | 0.0 | 3.10 | 0.0 |
| Ethylbenzene | µg/kg | | 0.0 | 3.20 | 0.0 |
| Xylenes | µg/kg | | 0.0 | 3.20 | 0.0 |
| Naphthalene | µg/kg | | 0.0 | 3.00 | 0.0 |
| Trimethylbenzenes (1,2,4+1,3,5 TMBs) | µg/kg | | 0.0 | 3.20 | 0.0 |
| | | *subtotal PHC VOCs* | *0.0* | — | *0.0* |

| | | | | | |
|---|---|---|---|---|---|
| *Total Sorbed Mass and Demand* | *lbs* | *0.0* | *0.0* | — | *0.0* |

**Notes**

1) Groundwater Values from MW-3 (Dec 2014).

2) Soil Values not entered - clean backfill assumed

REGENESIS

## Project Information

**Valley Village**
**Kittanning, PA**
**UST Pit**
Prepared For:
**Client (Firm)**

| Target Treatment Zone (TTZ) Info | Unit | Value |
|---|---|---|
| Treatment Area | $ft^2$ | 1,000 |
| Top Treat Depth | ft | 3.0 |
| Bot Treat Depth | ft | 12.0 |
| Vertical Treatment Interval | ft | 9.0 |
| Treatment Zone Volume | $ft^3$ | 9,000 |
| Treatment Zone Volume | cy | 333 |
| Soil Type | --- | gravel |
| Porosity | $cm^3/cm^3$ | 0.30 |
| Effective Porosity | $cm^3/cm^3$ | 0.25 |
| Treatment Zone Pore Volume | gals | 20,197 |
| Treatment Zone Effective Pore Volume | gals | 16,831 |
| Fraction Organic Carbon (foc) | g/g | 0.001 |
| Soil Density | $g/cm^3$ | 1.8 |
| Soil Density | $lb/ft^3$ | 112 |
| Soil Weight | lbs | 1.0E+06 |
| Hydraulic Conductivity | ft/day | 2.0 |
| Hydraulic Conductivity | cm/sec | 1.76E-01 |
| Hydraulic Gradient | ft/ft | 0.001 |
| GW Velocity | ft/day | 2.00 |
| GW Velocity | ft/yr | 731 |
| **Sources of Oxidant Demand** | **Unit** | **Value** |
| Sorbed Phase Contaminant Mass | lbs | 13 |
| Dissolved Phase Contaminant Mass | lbs | 7.9 |
| Total Contaminant Mass | lbs | 21 |
| Stoichiometric RegenOx Oxidant Demand | lbs | 363 |
| **Efficiency/Safety Factor** | --- | **1.0** |
| Stoichiometric RegenOx Required | lbs | 363 |
| Additional Soil Oxidant Demand (SOD) | g/kg | 0.0 |
| RegenOx Required for Additional SOD | lbs | 0 |
| **Total RegenOx Oxidant Required** | **lbs** | **363** |

### Application Dosing

| | | |
|---|---|---|
| **RegenOx to be Applied** | **lbs** | **600** |
| **RegenOx Part A to be Applied** | **lbs** | **600** |
| **RegenOx Part B to be Applied** | **lbs** | **0** |

## RegenOx® Application Design Summary

| UST Pit | |
|---|---|
| **Application Method** | **Injection Wells** |
| **Injection Points (per app.)** | **4** |
| **Number of Applications** | **1** |
| Areal Extent (square ft) | 1,000 |
| Top Application Depth (ft bgs) | 3 |
| Bottom Application Depth (ft bgs) | 12 |
| **Total RegenOx to be Applied (lbs)** | **600** |
| RegenOx Part A (lbs) | 600 |
| RegenOx Part B (lbs) | 0 |
| RegenOx Part A Solution % | 5% |
| **Volume Water (gals)** | **1,366** |
| **Total Solution Volume (gals)** | **1,396** |

### Field App. Instructions

Add RegenOx Part A to water, mix until dissolved.

| Field Mixing Ratios |
|---|
| Water per Pt per App (gals) |
| 342 |
| RegenOx Part A per Pt per App (lbs) |
| 150 |
| RegenOx Part B per Pt per App (lbs) |
| 0 |
| Total Volume per Pt per App (gals) |
| 349 |
| 39 |
| Volume per vertical ft gals) |

### Technical Notes/Discussion

*Prepared By: Doug Davis - Central Region Technical Manager*
*Date: 7/5/2016*

### Assumptions/Qualifications

In generating this preliminary estimate, Regenesis relied upon professional judgment and site specific information provided by others. Using this information as input, we performed calculations based upon known chemical and geologic relationships to generate an estimate of the mass of product and subsurface placement required to affect remediation of the site.

REGENESIS

## Dissolved Phase Geochemistry, Contaminant Mass and Product Demand Summary
## Valley Village
## UST Pit

| Petroleum VOCs-Dissolved Phase | Unit | Value | Mass in GW (lbs) | [illegible] | [illegible] |
|---|---|---|---|---|---|
| Benzene | µg/L | 14000 | 2.4 | 12.7 | 39.0 |
| Toluene | µg/L | 13000 | 2.2 | 11.9 | 33.9 |
| Ethylbenzene | µg/L | 2600 | 0.4 | 15.7 | 8.9 |
| Xylenes | µg/L | 14000 | 2.4 | 15.7 | 48.2 |
| Naphthalene + Cumene | µg/L | 540 | 0.1 | 9.8 | 1.2 |
| Trimethylbenzenes (1,2,4+1,3,5 TMBs) | µg/L | 2460 | 0.4 | 11.3 | 6.1 |
| | | *subtotal PHC VOCs* | *7.9* | --- | *137.2* |

| Oxygenates-Dissolved Phase | Unit | Value | Mass in GW (lbs) | [illegible] | [illegible] |
|---|---|---|---|---|---|
| MTBE | µg/L | 100 | 0.0 | 9.6 | 0.2 |
| | | *subtotal oxygenates* | *0.0* | --- | *0.2* |

| | | | |
|---|---|---|---|
| *Total Dissolved Cont. Mass and Demand (lbs)----------->* | *8* | --- | *137* |

## Sorbed Phase Contaminant Mass and Product Demand Summary
## Valley Village
## UST Pit

| Petroleum VOCs-Sorbed Phase | Unit | Value | Mass in Soil (lbs) | [illegible] | [illegible] |
|---|---|---|---|---|---|
| Benzene | µg/kg | 1722 | 1.7 | 12.7 | 28.8 |
| Toluene | µg/kg | 3471 | 3.5 | 11.9 | 54.3 |
| Ethylbenzene | µg/kg | 850 | 0.9 | 15.7 | 17.5 |
| Xylenes | µg/kg | 4172 | 4.2 | 15.7 | 86.1 |
| Naphthalene | µg/kg | 540 | 0.5 | 9.8 | 7.0 |
| Trimethylbenzenes (1,2,4+1,3,5 TMBs) | µg/kg | 2175 | 2.2 | 11.3 | 32.3 |
| | | *subtotal PHC VOCs* | *13.1* | --- | *226.0* |

| Oxygenates - Sorbed Phase | Unit | Value | Mass in Soil (lbs) | [illegible] | [illegible] |
|---|---|---|---|---|---|
| MTBE | µg/kg | 1 | 0.0 | 9.6 | 0.0 |
| | | *subtotal oxygenates* | *0.0* | --- | *0.0* |

| | | | |
|---|---|---|---|
| *Total Sorbed Mass and Demand (lbs)---------->* | *13* | --- | *226* |

**Notes**

1) Groundwater Values from MW-1.

2) Soil Values are estimated from groundwater concentrations by equation: Concgw x foc x KOC.