

April 2015



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32-1-17678

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ACRONYMS AND ABBREVIATIONS

ADEC	Alaska Department of Environmental Conservation
Adjacent parcel	295 East Pioneer Avenue, Homer, Alaska
AK	Alaska Method
bgs	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, and Xylenes
Client	Alaska Department of Environmental Conservation
COC	Contaminants of Concern
CSM	Conceptual Site Model
Discovery	Discovery Drilling Inc. of Anchorage, Alaska
DQO	Data Quality Objective
DRO	Diesel Range Organics
EDB	Ethylene Dibromide
EPA	Environmental Protection Agency
GRO	Gasoline Range Organics
HSA	Hollow Stem Auger
L/min	Liters per Minute
LCS/LCSD	Laboratory Control Sample/Laboratory Control Sample Duplicate
LNAPL	Light nonaqueous phase liquid
NTU	Nephelometric Turbidity Units
MAC	Maximum allowable concentration
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
MS/MSD	Matrix Spike/Matrix Spike Duplicate
mV	Millivolt
PAH	Polyaromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
PID	Photoionization Detector
ppm	Parts per Million
Property	305 East Pioneer Avenue, Homer Alaska
RL	Reporting Limit
RPD	Relative Percent Difference
RRO	Residual Range Organics

RSE	Restoration Science Engineering, LLC
Shannon & Wilson	Shannon & Wilson, Inc.
TestAmerica	TestAmerica Laboratories, Inc.
TMB	Trimethylbenzene
UST	Underground Storage Tank
VOC	Volatile Organic Compound

**SITE ASSESSMENT
SOUTHCENTRAL TESORO
HOMER, ALASKA
ADEC HAZARD ID 25172**

1.0 INTRODUCTION

This report presents the results of Shannon & Wilson, Inc.'s (Shannon & Wilson) ADEC Hazard ID 25172 site assessment, which comprised an investigation of subsurface conditions at the former Southcentral Tesoro Leaking Underground Storage Tank (LUST) site at 305 East Pioneer Avenue, Homer, Alaska (the Property). The investigation included areas both on the Property and the adjacent property at 295 East Pioneer Avenue, Homer Alaska (the adjacent parcel).

This project is being conducted under Shannon & Wilson's ADEC Hazardous Substance Spill Prevention and Cleanup Term Contract 18-8036-03. The Alaska Department of Conservation (ADEC) authorization to proceed was received on August 11, 2014 with Notice to Proceed Number 18-8036-03-026. The project tasks were conducted in general accordance with our October 15, 2014 work plan.

2.0 SITE AND PROJECT DESCRIPTION

2.1 Site Location

The Property is located at 305 East Pioneer Avenue, near the intersection of East Pioneer Avenue and Svedlund Street in downtown Homer, Alaska. Dan Aalfs currently owns the Property, which operated as a retail fuel and service station from approximately 1973 to 1991. A vicinity map is included as Figure 1 and a site plan as Figure 2.

The Property surface is a gravel fill pad that slopes gently to the south. A vegetated embankment borders the southern property edge. Developed commercial parcels border the Property to the east and west, and Pioneer Avenue borders the Property to the north.

2.2 Background

Restoration Science & Engineering, LLC's (RSE) November 2011 report *Limited Site Assessment* notes that one 3,000-gallon and one 4,000-gallon gasoline underground storage tank (UST), one 8,000-gallon diesel UST, and associated piping and dispensers were removed from the site in 1991 without proper UST closure documentation. The Old Gas Station Office building and a gas station canopy were also removed from the site at an unspecified date. Exact locations of the Old Gas Station Office, USTs, and gas station canopy are not specified in the report. We identify the suspected location of the former USTs on Figure 2. Automotive

maintenance activities occurred in two existing structures on the Property, identified as the “Old Garage” and the “New Garage.” RSE confirmed the garage drain system is connected to the public sanitary sewer with tracer dye. Additional maintenance activities may have also occurred in the Former Wood Framed Shop building, which was removed at an unspecified date.

RSE advanced six test pits at the site during the 2011 limited site assessment at the approximate locations shown on Figure 2. The location of Test Pit TP1 corresponds with the former dispensing islands, Test Pit TP2 was advanced in the vicinity of the former USTs, and Test Pit TP6 was advanced partially within the footprint of the Old Wood Framed Shop building. Test Pits TP3, TP4, and TP5 were advanced north, west, and south of the suspected location of the former USTs, respectively. RSE collected a total of nine analytical soil samples and one duplicate from the six test pits at depths ranging from 3 feet to 13 feet below ground surface (bgs). RSE did not collect groundwater samples during their investigation. Samples were analyzed for gasoline range organics (GRO), diesel range organics (DRO), residual range organics (RRO), and/or benzene, toluene, ethylbenzene, and xylenes (BTEX). The sample collected from Test Pit TP4 at 13 feet was also analyzed for volatile organic compounds (VOCs). RSE compared sample results to ADEC Method 2 Migration-to-Groundwater cleanup levels; cleanup level exceedances were as follows:

- GRO was detected above the ADEC cleanup level of 300 milligram per kilogram (mg/kg) at 6 and 11 feet bgs in Test Pit TP2 and at 12 and 13 feet bgs in TP4, with a maximum GRO concentration of 2,050 mg/kg at 11 feet bgs in Test Pit TP2;
- DRO was detected above the ADEC cleanup level of 250 mg/kg in Test Pits TP1, TP2, TP4, and TP6 at depths ranging from 3 to 13 feet bgs, with a maximum DRO concentration of 39,700 mg/kg at 12 feet bgs in Test Pit TP6;
- Benzene was detected above the ADEC cleanup level of 0.025 mg/kg in Test Pits TP2, TP4, TP5, and TP6 at depths ranging from 6 to 13 feet bgs, with a maximum benzene concentration of 28 mg/kg at 11 feet bgs in Test Pit TP2;
- Toluene, ethylbenzene, and total xylenes exceeded their respective cleanup levels in Test Pits TP2 and TP4 at depths ranging from 6 to 12 feet bgs; and
- 1,2,4-Trimethylbenzene (TMB) was detected above the ADEC cleanup level of 23 mg/kg in Test Pit TP4 with a concentration of 61.7 mg/kg at 13 feet bgs.

The highest concentrations of DRO (39,700 mg/kg at 12 feet bgs in Test Pit 6) and GRO (2,050 mg/kg at 11 feet bgs in Test Pit TP2) measured at the site exceeded the ADEC maximum allowable concentrations (MACs) of 12,500 mg/kg DRO and 1,400 mg/kg GRO.

The soil sample collected from Test Pit TP3 did not contain analytes in concentrations exceeding their respective cleanup levels, and RRO was not detected in concentrations exceeding the

ADEC migration-to-groundwater cleanup level of 11,000 mg/kg at the site. The highest analytical result for GRO, DRO, RRO, and 1,2,4-TMB in the test pit samples are shown on Figure 2.

RSE concluded the following:

- the region near the suspected former USTs (Test Pits TP2 and TP4) is likely the unique source area for GRO contamination at the site;
- Test Pit TP6 contained the highest levels of DRO at the site and may indicate a unique source area;
- contaminants detected in Test Pit TP5 may be migrating to this location from the source area near the former USTs.

2.3 Purpose and Objectives

The overall project purpose was to evaluate risks to human health or the environment posed by petroleum impacted soil and groundwater. The project objective was to determine the extent of impacted soil and groundwater, with a focus on the former USTs and associated piping and dispensers. It is noted that other potential sources were identified, including former on-site vehicle maintenance activities, which may have contributed to the site contamination.

2.4 Work Plan Variances

Variations from the work plan are listed below and were approved by the ADEC Project Manager, Paul Horwath, prior to implementation.

Task 1 – Soil Borings

- Only Borings B03, B04, and B10 were advanced to groundwater contact. Groundwater in the remaining borings was not encountered at the anticipated depth (between 15 and 20 feet bgs); therefore, borings were advanced to 10 feet below potentially impacted soil as evidenced by hydrocarbon odor, sheen, or elevated photoionization detector (PID) readings.
- Only the first 13 feet of Boring B01 was advanced with direct push technology. Due to dense to very dense subsurface conditions, direct push was found to be impracticable. Therefore, hollow stem auger (HSA) drilling methods were used to complete Boring B01 and the remaining borings. As a result, soil cores for logging and sampling were generally retrieved at 2.5-foot to 5-foot intervals using a 3-inch diameter split spoon rather than continuously with a Macro-Core® sleeve.

- Four soil boring locations were modified from the original proposed locations to delineate vertical and horizontal extent of impacted soil and accommodate existing site conditions. The two proposed borings upgradient of the suspected UST source area (Proposed Borings PB-02 and PB-03) were moved onto the adjacent parcel. Proposed Boring PB-02 was advanced as Boring B04 to assess the presence of impacted soil at the southeast adjacent parcel corner, and Proposed Boring PB-03 was advanced as Boring B09 to assess subsurface conditions adjacent to the southwest building corner. Proposed Boring PB-09 (advanced as Boring B03) was placed as close to the southeast corner of the Property as topography, vegetation, and underground utilities would allow. Proposed Boring PB-10 (advanced as Boring B10) was moved approximately 30 feet north due to topography, vegetation, and the presence of underground utilities.
- A total of 21 soil samples and one duplicate were submitted for analytical testing to characterize the lateral and vertical extent of soil contamination; 15 soil samples and one duplicate were originally proposed in the work plan.

Task 2 – Monitoring Well Installation and Development.

- Because the water table was not encountered in seven of the 10 soil borings, only two soil borings were completed as groundwater monitoring wells instead of the five proposed in the work plan.

Task 5 – Surveying

- Three monitoring wells are required to calculate groundwater flow direction and gradient. Because only two wells were installed, a level loop survey to establish relative groundwater elevation was not conducted.

3.0 FIELD ACTIVITIES

Field activities for this project consisted of advancing ten soil borings, collecting soil samples, completing two of the soil borings as monitoring wells, and developing and sampling the wells. Field work was conducted by ADEC-qualified personnel, as defined by 18 AAC 75.990. Site photographs are provided in Appendix A and copies of the field notes are included in Appendix B.

3.1 Soil Boring and Sample Collection

Ten soil borings were advanced between October 20 and 23, 2014. As shown on Figure 2, Borings B04, B07, B08, and B09 were advanced on the adjacent parcel; the remaining borings were advanced on the Property.

Drilling was performed by Discovery Drilling, Inc. (Discovery) of Anchorage, Alaska using a truck-mounted CME 75 drill rig with a 3.25- or 4.25-inch inside diameter HSA, except for Boring B01. The first 13 feet of Boring B01 were advanced using the CME 75 truck mounted drill rig with a 2.25-inch sampling rod. At 13 feet bgs, very dense subsurface conditions made direct-push methods impracticable and HSA drilling methods were implemented to complete Boring B01.

Prior to drilling, on-site utilities were marked and access was arranged with the Property owner, the adjacent parcel owners, and the current adjacent parcel tenants. Boring B01 was advanced in the northeast corner of the Property (Photo 1) to assess soil conditions generally upgradient of the former source areas and along the property boundary. Borings B02 and B02R were advanced in the vicinity of RSE 2011 Test Pit TP2 to assess vertical extent of impacted soil near the former USTs. Borings B03 (Photo 2), B04, and B10 were advanced to assess soil conditions along the southern property boundaries. Borings B07 (Photo 3), B08, and B09 were advanced on the adjacent parcel to characterize impacted soil west of the former UST source area. Boring B06 was advanced to delineate vertical and southern extent of impacted soil in the vicinity of the UST source area. Boring B05 was advanced to delineate vertical extent of impacted soil in the vicinity of the Former Old Wood Shop. Borings B01, B02R, B03, B05, B06, and B10 were advanced on the Property to between approximately 19 and 29 feet bgs, with an average total depth of 25.5 feet bgs. Borings B04, B07, B08, and B09 were advanced on the adjacent parcel to between 21.5 feet and 25.9 feet bgs, with an average total depth of 24.1 feet bgs.

Soil sampling was conducted using a 3-inch outside diameter split-spoon sampler driven by a 300-lb hammer, except in the upper 13 feet of Boring B01. Soil retrieved from this interval was collected with a 2.25-inch outside diameter rod fitted with a Macro-Core® sleeve. Soil samples were retrieved continuously from Boring B01 to a depth of 20.5 feet bgs, where dense subsurface conditions rendered continuous sampling impracticable. Remaining soil samples were collected from Boring B01 at 2.5-foot intervals. Soil samples from Borings B02 through B10 were generally collected at 2.5-foot increments from 0 to 15 feet bgs and 5-foot increments from 15 feet to the bottom of boring.

Each removed sample was visually assessed for soil type and screened for volatile petroleum hydrocarbons. Field screening was conducted using a PID and an ADEC-approved headspace screening technique. The PID was calibrated before screening activities with 100 parts per million (ppm) isobutylene standard gas. The field screening samples were collected in re-sealable plastic bags, warmed to a common temperature, and tested within 60 minutes following collection. Sample descriptions and PID readings are listed in Table 1 and shown on the boring logs provided in Appendix C as Figures C-1 through C-13.

One soil sample for potential laboratory analysis was collected from each soil interval not saturated with water. One to three soil samples were submitted for analytical testing from each boring, as described in Section 4.0. The number and depth of the selected soil samples were dependant on PID results, subsurface soil conditions, and project data collection objectives. Soil samples not selected for analyses were discarded at the laboratory. The field representative used clean stainless steel spoons and new nitrile gloves to collect soil from the spilt spoon or Macro-Core® sleeve and place the soil in laboratory-supplied containers. To collect the sample for GRO and VOC analysis, at least 25 grams of soil, but no more than what could be completely submerged with 25-milliliters of methanol, were placed into a pre-weighed, 4-ounce glass jar with a septa lid. A 25-milliliter aliquot of methanol containing laboratory-added surrogates was added to the sample jar to submerge the soil sample.

Twenty-two soil samples, including one duplicate, were submitted to TestAmerica for analytical testing in October 2014. Two soil samples were submitted for analytical testing from Soil Borings B02R, B04, B05, B06, B07, B08, B09 and B10: one soil sample from the interval with the highest PID reading and a second sample to delineate vertical extent of impacted soil. Because evidence of hydrocarbon contamination was not present in Boring B01, only one sample was submitted from this boring. Because groundwater was encountered within 10 feet of fuel-impacted soil in Boring B3, only one sample was submitted from this boring. An additional soil sample was collected and submitted to the laboratory and placed on hold from Borings B02R, B05, B07, and B08. The additional samples from Borings B02R, B07, and B08 were analyzed after receipt of initial results to further delineate vertical extent of impacted soil.

Drill cuttings were placed in four labeled 55-gallon drums pending receipt of analytical results.

3.2 Monitoring Well Installation, Development, and Sampling

Soil borings drilled at the southeast property boundaries of the adjacent parcel and the Property (generally downgradient of the source areas) were completed as monitoring wells to assess the condition of groundwater leaving the properties.

3.2.1 Monitoring Well Installation

Monitoring Well MW1 (Photo 4) was installed through the hollow-stem casing at Boring B03 and Monitoring Well MW2 (Photo 5) was installed through the hollow-stem casing at Boring B04 on October 23, 2014. The monitoring wells were constructed using 2-inch nominal inside diameter schedule 40 PVC pipe with threaded connections. The lower portion of each well consisted of an approximate 10-foot section of 0.010-inch slotted well screen. The slotted well screen in Well MW1 was positioned such that the slots extended from 18 feet bgs, approximately 1 foot above the bottom of the boring, to about 5 feet above the soil-water interface observed during drilling. The slotted well screen in Well MW2 was positioned such

that the slots extended from the bottom of the boring to approximately 1 foot below a lens of saturated soil at approximately 11.1 to 12.0 feet bgs. A continuous sand pack of #20-#40 sand was used to backfill around the well screens to approximately 2 feet above the screened interval in Well MW1 and to approximately 1 foot above the screened interval in Well MW2. Bentonite chips were used to backfill around the PVC piping in the vadose zone to approximately 2 feet bgs. Soil cuttings were used between 2 feet and 1 foot below grade. A flush mount protective casing was used around each well and embedded in cement. Well construction details are provided in Appendix C as Figures C-5 and C-7.

3.2.2 Monitoring Well Development

Monitoring Wells MW1 and MW2 were developed on October 25, 2014. Prior to development, the water depth was measured in the well with an electronic water level indicator. The monitoring wells were generally developed using alternating 3 to 5 minute periods of surging (using a surge block) and purging (using a submersible pump and dedicated vinyl tubing). Well MW2 was purged dry during both the first and second purge cycle. The well recharged quickly, and the well was surged until the water column recharged to at least 80 percent of its original height. Water quality parameters, including pH, temperature, conductivity, oxidation reduction potential, and turbidity were measured with Tubidimeter and YSI water quality instruments during well development. Well development was considered complete when three consecutive measurements indicate that: pH was within 0.1 unit, conductivity was within 3 percent, ORP was within 10 millivolts (mV), temperature was within 3 percent (minimum 0.2 degree Celsius), and turbidity was within 10 percent or is less than 10 nephelometric turbidity units (NTUs). Both wells stabilized during development.

A sheen of product was not present on the development water; therefore, the water was discharged to the ground surface in the vicinity of the former USTs.

3.3 Monitoring Well Sampling

Analytical water samples were collected from Wells MW1 and MW2 after well development on October 25, 2014 and again on January 16, 2015.

Sampling during each event was initiated by measuring the depth to water using an electronic water-indicating device. The wells were then sampled using low-flow methods. A submersible pump and disposable tubing were placed approximately 1 to 2 feet below the water table and within the screened interval to avoid sediment disturbance. Note the water level in Well MW2 was above the screened well section during both sampling events. The October 2014 sample was collected using low flow sampling techniques from within the screened interval and sample

results are unaffected. The January 2015 Well MW2 sample was collected from a pump placed approximately 1 foot above the screened section and results may be biased low.

In October 2014, the pump rate was set at approximately 0.1 liter per minute (L/min) during sampling. Parameters were recorded immediately prior to sampling. Because water samples were collected within 24 hours of developing both wells, additional purging was not conducted.

In January 2015, the pump rate was set at 0.1 to 0.3 L/min during sampling with a maximum water drawdown of 0.25 foot in Well MW-1 and 0.26 foot in Well MW-2. When water quality parameters stabilized over three consecutive readings (pH was within 0.1 units, conductivity was within 3 percent, temperature was within 3 percent, and turbidity was within 10 percent or three consecutive readings of less than 10 NTUs), purging was considered complete.

Analytical samples were collected in decreasing order of volatility by transferring water directly from the pump tubing into laboratory-supplied containers. Depth-to-water measurements and final October 2014 and January 2015 water quality parameters are summarized in Tables 2a and 2b, respectively.

For quality control purposes, one field duplicate sample, designated Sample MW12, was collected from Well MW2 during both events and one field duplicate, designated Sample MW11, was collected from MW1 during the January 2015 event. The groundwater samples were transferred to laboratory supplied containers in order of most volatile to least volatile and placed in a chilled cooler for delivery to the laboratory.

The purge water generated during sampling activities did not display a hydrocarbon sheen and was discharged to the ground surface in the vicinity of the former USTs, as per the work plan.

4.0 LABORATORY ANALYSES

Analytical samples were submitted to TestAmerica Laboratories, Inc. (TestAmerica) of Anchorage, Alaska on a standard turnaround time using chain-of-custody procedures.

Twenty-two soil samples, including one duplicate sample, and three water samples, including one duplicate, were submitted to TestAmerica for analytical testing in October 2014. Four water samples, including one duplicate from each well, were submitted to TestAmerica for analytical testing in January 2015.

Each soil sample and groundwater sample was analyzed for GRO by Alaska Method (AK) 101; BTEX, 1,3,5-TMB, and 1,2,4,-TMB by Environmental Protection Agency (EPA) Method 8260C; DRO by AK 102; and RRO by AK 103. Two laboratory-prepared water trip blanks and three soil trip blanks were also submitted. The October 2014 soil results are summarized in

Table 3 and groundwater results from both events are summarized in Table 4. The TestAmerica laboratory reports and ADEC data review checklists are provided in Appendix D. The highest soil result for GRO, DRO, benzene, and 1,2,4-TMB in each boring is shown on Figure 2.

Under the sample numbering scheme used for this project, a typical analytical sample number is 17678-B08-01 for soil boring samples and 17678-MW1 for groundwater samples. The “17678-” indicates the Shannon & Wilson job number and the “B08-01” and “MW1” designations represent sample identification numbers. For brevity in the text of this report, the “17678-” prefix is omitted.

5.0 SUBSURFACE CONDITIONS

The subsurface material at the site comprised approximately 2 feet to 9 feet of fill material underlain by gravelly silts and silty gravels intercalated with sandy silts, silty sands, and poorly graded sands and gravels. Trace to little charcoal (by volume) was present in one or more layers in each boring. Most borings had silt and/or clay with variable gravel and sand content between approximately 14 and 18 feet bgs. Clay was identified from approximately 16.2 to 17.0 feet bgs in Boring B04, from approximately 14.5 to 18.3 feet bgs in Boring B05, and from approximately 23 feet bgs to the bottom of boring (23.9 feet bgs) in Boring B07. An approximately 0.8-foot to 2.5-foot thick layer of organic soil to fibrous peat was present in each soil boring, except Borings B01 through B03 and Boring B05, at depths ranging from 8.8 feet bgs to 14.5 feet bgs.

Hydrocarbon odors were encountered in each boring except Borings B01, B03, B04, and B09 at depths ranging from 6.3 feet to 14.5 feet bgs. Light non-aqueous phase liquid (LNAPL) was observed from 8.6 feet to 8.8 feet bgs in Boring B08 and from 10.0 feet to 11.1 feet bgs in Boring B06.

Groundwater was encountered in Borings B03, B04, and B10 at approximately 12 feet bgs, 17 feet bgs, and 18.3 feet bgs, respectively. A definitive groundwater contact typical of an unconfined aquifer was not encountered in the other borings. However, an approximately 1-foot thick layer of saturated soil indicating the presence of perched water was noted in each soil boring, except Borings B08 and B09, at depths ranging from 9.0 feet to 14.0 feet bgs.

6.0 DISCUSSION OF ANALYTICAL RESULTS

Site assessment activities were conducted under the State of Alaska Oil and Other Hazardous Substances Pollution Control regulations (18 AAC 75). The ADEC cleanup standards for individual chemicals in soil are based on the Method Two cleanup levels listed in Tables B1 and B2, 18 AAC 75.341 (October 2014), for the “under-40-inch precipitation zone.” Cleanup standards for groundwater are the ADEC groundwater cleanup levels listed in Table C, 18 AAC

75.345. The cleanup levels and analytical results for the soil and groundwater samples collected for this project are provided in Tables 3 and 4, respectively.

6.1 Soil Sample Analytical Results

Twenty-one soil samples and one duplicate sample were submitted to TestAmerica for laboratory analysis. GRO concentrations measured in Samples B02R-02 (7.5 to 9.0 feet bgs) and B07-03B (7.8 to 9.0 feet bgs) exceed the most stringent ADEC cleanup level of 300 mg/kg. Sample B02R-05 (15.0 to 16.5 feet bgs), collected from beneath B02R-02, did not contain measureable concentrations of GRO. Sample B07-06 (15.0 to 16.5 feet bgs), collected from beneath B07-03B, contained GRO at a concentration less than the ADEC cleanup level.

DRO concentrations measured in Samples B02R-02, B05-05, B06-04, B06-04D, B07-03B, B08-03B, and B10-05 exceed the most stringent ADEC cleanup level of 250 mg/kg. Deeper samples from these borings contained DRO at concentrations less than the ADEC cleanup level.

Benzene concentrations measured in Samples B02R-02, B03-04, B04-06, B06-04, B06-04D, B07-06, B07-08, B08-03B, and B08-06 exceed the most stringent ADEC cleanup level of 0.025 mg/kg. Deeper analytical samples from Borings B03, B04, and B07 were not submitted for analytical testing. Sample B02R-05 (15.0 to 16.5 feet bgs) contained an estimated concentration of benzene below the cleanup level, and Sample B02R-06 (20.0 to 21.5 feet bgs) did not contain a measureable concentration of benzene. Sample B06-06 (20.0 to 21.5 feet bgs), collected beneath the Sample B06-04/B06-04D duplicate pair, contained benzene at a concentration less than the ADEC cleanup level. Sample B08-08 (25.0 to 26.5 feet bgs), collected from beneath Samples B08-03B and B08-06, contained a potentially biased low benzene concentration (see Section 6.3 for details) below the ADEC cleanup level. Note all concentrations are less than human health cleanup levels for direct contact. All concentrations are less than human health cleanup levels for outdoor air inhalation, except 1,2,4-TMB in Boring B02R.

The ethylbenzene and total xylenes concentrations measured in Sample B02R-02 exceed their respective most stringent ADEC cleanup levels of 6.9 mg/kg and 63 mg/kg. The 1,2,4-TMB concentrations measured in Samples B02R-02, B07-03B, and B10-05 exceed the ADEC cleanup level of 23 mg/kg. Analytical samples collected from beneath the impacted samples did not contain these analytes at concentrations exceeding ADEC cleanup levels. No other target analytes were measured at concentrations greater than ADEC cleanup levels.

6.2 Groundwater Sample Analytical Results

6.2.1 October 2014 Event

Two groundwater samples and one duplicate groundwater sample were submitted for laboratory analysis. DRO and benzene were detected in the sample duplicate pair from Well MW2 at concentrations exceeding the ADEC cleanup levels of 1.5 milligram per liter (mg/L) DRO and 0.005 mg/L benzene, respectively. Of the duplicate results, the highest benzene concentration was 0.325 mg/L and the highest DRO concentration was 2.10 mg/L. No other target analytes were measured at concentrations greater than ADEC cleanup levels in the Well MW2 sample duplicate pair. DRO, RRO, benzene, total xylenes, and 1,2,4-TMB were detected in Sample MW1 at concentrations less than applicable cleanup levels. The other target analytes were not detected in Sample MW1.

6.2.2 January 2015 Event

Two groundwater samples and two duplicate groundwater samples were submitted for laboratory analysis. Benzene, DRO, and RRO were detected in the sample duplicate pair from Well MW2 at concentrations equal to or exceeding the ADEC cleanup levels of 0.005 mg/L, 1.5 mg/L, and 1.1 mg/L, respectively. Of the duplicate results, the highest benzene concentration was 0.37 mg/L, the highest DRO concentration was 2.7 mg/L, and the highest RRO concentration was 1.2 mg/L. No other target analytes were measured at concentrations greater than ADEC cleanup levels in Well MW2. RRO was detected in the sample duplicate pair from Well MW1 at concentrations equal to or exceeding the ADEC cleanup level 1.1 mg/L. Of the duplicate results, the highest RRO concentration was 1.2 mg/L. The other target analytes were not detected in Well MW1 duplicate pair.

In general, Well MW1 results were higher in October 2014 than in January 2015, except RRO. RRO was measured in the October 2014 Sample MW1 at a concentration of 0.701 mg/L, compared to the January 2015 Sample MW1/MW11 duplicate pair results of 1.2 mg/L and 1.1 mg/L, respectively. In general, Well MW2 results were higher in January 2015 than in October 2014. Water level in MW-1 was 12.74 feet below top of casing in October 2014 and 9.87 feet in January 2015. Water level in MW-2 was 13.97 feet below top of casing in October and 10.21 feet in January 2015. The fluctuation in contaminant concentrations in the wells may be related to seasonal changes in groundwater elevation and flow direction.

6.3 Quality Control Samples

The project laboratory implements on-going quality assurance/quality control procedures to evaluate conformance to applicable ADEC and EPA data quality objectives (DQOs). Internal laboratory quality controls for this project included surrogates, method blanks, laboratory control

sample/laboratory control sample duplicates (LCS/LCSD), and matrix spike/matrix spike (MS/MSD) duplicates. If a DQO for one of the controls is not met, the laboratory provides a brief explanation in the case narrative of their report (See Appendix D).

External quality controls include field records, one soil field duplicate sample, and three groundwater field duplicate samples. The primary and duplicate sample results were compared using the calculated relative percent difference (RPD) values. The RPD between the project sample and associated duplicate results is a measure of precision affected by matrix heterogeneity, sampling technique, and laboratory analyses. The ADEC recommends an RPD of less than 50 percent for soil analysis and 30 percent for water analysis. The RPDs for the project duplicate samples are summarized in Tables 5a and 5b, and the effects on data quality and usability are discussed in the completed ADEC Laboratory-Data-Review Checklist (LDRC) in Appendix D.

Laboratory-prepared trip blank samples accompanied the project sample jars from the laboratory to the site during sampling activities and back again to TestAmerica to assess the potential for external and sample-cross contamination; method blanks were prepared for analysis with project samples to assess the potential for laboratory contamination. Multiple target analytes were measured in one or more trip blanks or method blanks. Affected data are flagged in Tables 3 and 4 and effects on data quality and usability are discussed in the LDRC in Appendix D.

Shannon & Wilson conducted a limited data assessment to review the laboratory's compliance with precision, accuracy, sensitivity, and completeness to the data quality objectives. Shannon & Wilson reviewed the TestAmerica data deliverables and completed the ADEC's LDRC, which are included in Appendix D. No non-conformances that would adversely affect data usability were identified, except the following in October 2014:

- The RLs for non-detect benzene results in Soil Samples B07-03B and B10-05 exceed the ADEC cleanup level for benzene; therefore, it is not possible to assess whether benzene exists above the ADEC cleanup level, but below the RL in these samples.
- Soil Samples B07-08, B08-08, and B02R-06 were analyzed outside of hold time; associated sample results are considered biased low estimates and are flagged "J-" in Table 3. Non-detect results in these samples are potentially false negatives.

In our opinion, we find the project data to be complete and usable to support the project purpose and objectives.

7.0 INVESTIGATION DERIVED WASTE

Potentially contaminated soil cuttings were placed in labeled 55-gallon drums and temporarily stored on site. Four 55-gallon drums containing soil cuttings remain on the site (Photo 6). Potentially clean soil cuttings were used as boring backfill or spread across the ground surface in the vicinity of the former UST source areas. Purge water generated during well development and sampling was discharged to the ground surface in the vicinity of the former UST source areas.

8.0 CONCEPTUAL SITE MODEL

A conceptual site model (CSM) was prepared to identify known and potential exposure pathways associated with petroleum hydrocarbons at the Property. The CSM was developed using the ADEC's guidance CSM Scoping Form. The ADEC forms are included in Appendix E, with discussions of the extent of contamination and the potential exposure pathways provided below. The narrative includes descriptions of site-specific considerations that increase or decrease the viability of each pathway at this site.

8.1 Extent of Contamination

The discussion regarding the lateral and vertical extent of contamination at the site is limited to petroleum hydrocarbon compounds that have been measured at concentrations greater than the most stringent ADEC cleanup levels. In addition, the focus of this assessment is releases associated with the former USTs and associated dispensers although it is possible that other sources, including suspected vehicle maintenance activities at the two garage structures and the former Old Wood Framed Shop, may have contributed to the impacted media.

8.1.1 Impacted Soil

Soil impacted with petroleum hydrocarbons has been documented on the Property and the adjacent parcel to the west. Remedial action has not been conducted at the site. The estimated vertical and lateral extent of impacted soil, discussed herein, has been interpolated from analytical soil sample data collected during RSE's November 2011 *Limited Site Assessment* and the 2014 site assessment described herein.

8.1.1.1 Former Dispensing Area

DRO was measured above cleanup levels in Test Pit TP1, which was advanced in the vicinity of the former dispensing area. The maximum concentration of DRO measured in the Test Pit was 5,160 mg/kg at 3 feet bgs. DRO was also measured at concentrations exceeding ADEC cleanup levels at 8 feet bgs, the bottom of Test Pit TP1.

Other target analytes have not been measured above ADEC cleanup levels in the vicinity of the former dispensing area.

Analytical concentrations (less than cleanup levels) at Boring B01 (northeast of former dispensing area) and Test Pit TP3 (southwest of former dispensing area) indicate the lateral extent of impacted soil related to dispensing-area use is likely limited in extent. Due to the location of East Pioneer Avenue and existing on-site structures, the extent of impacted soil to the north and south of Test Pit TP1 has not been investigated and remains undefined. Due to the generally south-sloping topography, contaminants would be expected to preferentially migrate southward, possibly beneath the Old Garage building.

DRO-impacted soil is known to exist from 3 to 8 feet bgs in Test Pit TP1, but deeper soil data has not been collected; therefore the vertical extent of impacted soil near the former dispensers remains undefined.

8.1.1.2 Former USTs

Impacted soil has been documented on the Property in the vicinity of the former USTs during both this investigation and the 2011 *Limited Site Investigation*. GRO has been measured at concentrations exceeding the cleanup level in Borings B02 and B07 and Test Pits TP2 and TP4. DRO has been measured at concentrations exceeding the ADEC cleanup level in Borings B02R, B05, B06, B07, B08, and B10 and Test Pits TP2, TP4, and TP6. Benzene has been measured at concentrations exceeding the ADEC cleanup level in Borings B02R, B03, B04, B05, B06, B07, and B08 and Test Pits TP2, TP4, TP5, and TP6. 1,2,4-TMB has been measured at concentrations exceeding the ADEC cleanup level in Borings B02R, B07 and B10 and Test Pit TP4. Target analytes have not been measured above cleanup levels in Boring B09 and Test Pit TP3.

The lateral extent of contamination related to the former USTs has been partially delineated to the north and west. The northern extent of impacted soil on the Property from the former USTs is likely between Test Pit TP3 and Boring B02R. Multiple target analytes were detected above ADEC cleanup levels in Borings B07 and B08 on the adjacent parcel to the west. However, Boring B09 did not contain concentrations of target analytes exceeding ADEC cleanup levels and likely represents the western extent of impacted soil. The adjacent parcel's on-site structure is located between Boring 09 and Borings B07 and B08; therefore, the extent and magnitude of potential contamination beneath the adjacent parcel's on-site structure remains undefined.

The lateral extent of contamination has not been delineated to the east or south of the former USTs, as impacted soil has been identified along the southern and eastern boundaries of the Property. In fact, the highest DRO concentrations at the site (39,700 mg/kg at 12 feet) and elevated benzene concentrations (0.653 mg/kg at 12 feet) were measured in a soil sample from the bottom of Test Pit TP6, which was placed 50-plus feet southeast of the suspected former UST location and partially within the footprint of the Former Old Wood Framed Shop. The maximum DRO and benzene concentrations measured in Boring B05, which was placed approximately 5 feet south of Test Pit TP6, were identified in the 12.5 to 14.0 foot interval at concentrations of 1,060 mg/kg and 0.00921 J mg/kg, respectively. The sample collected from Boring B05 at 20 to 21.5 feet bgs did not contain target analytes at concentrations exceeding ADEC cleanup levels. Soil to the north (beneath the New Garage and Old Garage), east (on the adjacent property), and directly beneath Test Pit TP6 has not been fully defined. Moreover, it is not clear if the source of petroleum hydrocarbons in the southernmost borings (Borings B03, B04, B05, B06, and B10) is attributable to the former USTs, the Former Old Wood Framed Shop, a previously unidentified source, or a combination of the above.

Vertical extent of contamination has been partially delineated in the vicinity of the former USTs. Impacted soil was encountered on the Property and the adjacent parcel at depths as shallow as 7.5 feet bgs and as deep as 23.9 feet bgs. Potentially “clean” conditions were confirmed beneath identified contamination in Borings B02, B05, B06, B08, and B10 at depths ranging from 15 feet bgs to 25 feet bgs. One or more target analytes were measured at concentrations exceeding ADEC cleanup levels in the deepest soil samples collected from Borings B04 and B07 and Test Pits TP2, TP4, TP5, and TP6. In addition to the presence of petroleum hydrocarbon contamination at the base of the borings and test pits listed above, the presence of impacted groundwater south of the source area suggests soil is impacted at the soil water interface although the depth of impacted soil in the saturated zone was not investigated.

8.1.2 Groundwater Plume

Groundwater samples were collected from monitoring wells installed in Borings B03 and B04. Groundwater results indicate that petroleum hydrocarbon contamination is present at concentrations exceeding ADEC standards at the southeast property boundaries of the adjacent parcel and the Property. Groundwater has not been investigated beneath potential source areas.

Groundwater was not encountered during the 2011 *Limited Site Assessment* and was only encountered in the three southernmost soil borings, Borings B10, B03, and B04 during this investigation. RSE notes perched water layers were observed in several test pits. An approximately 1-foot thick layer of saturated soil was noted in each 2014 soil boring, except

Borings B08 and B09, at depths ranging from 9.0 feet to 14.0 feet bgs. Additional lenses of saturated sands and gravels were noted in multiple borings at various depths. Although not sampled directly, these lenses of apparently perched water may be impacted and have the potential to transmit contaminants down gradient at concentrations exceeding ADEC standards, as evidenced by elevated petroleum hydrocarbons in Wells MW1 and MW2 and elevated benzene concentrations in soil samples collected from Borings B03 and B04 (southernmost borings). The extent and gradient of the groundwater plume has not been fully defined.

8.1.3 LNAPL

LNAPL was observed from 10 to 11.1 feet bgs in Boring B06 and from 6.8 to 8.8 feet bgs in Boring B08. Target analytes were not detected in the deepest samples collected from both borings (25 to 26.5 in Boring B06 and 20.0 to 21.5 in Boring B08) at concentrations exceeding ADEC cleanup levels. Although a vertically-continuous water table was not encountered in either boring, a saturated zone was encountered from approximately 12.6 to 13 feet bgs in Boring B06.

8.2 Soil – Direct Contact

Direct contact with impacted soil for this site is limited to the incidental ingestion exposure route. During this investigation and the 2011 *Limited Site Investigation*, GRO, DRO, RRO, BTEX, 1,3,5-TMB, and 1,2,4-TMB impacted soil was found at depths between 3 and 26.5 feet bgs in multiple borings and test pits. The adjacent parcel is currently being used for residential and commercial use, and it is assumed that this use will continue. Therefore, the direct contact exposure pathway is potentially complete for current and future on-site residents, commercial workers, site visitors, trespassers, and construction workers. Concentrations reported at the site have been less than the direct contact cleanup level, except DRO in Test Pit TP6, GRO in Test Pit TP2, and LNAPL observed in Borings B06 and B08. DRO was measured at concentrations exceeding the ADEC MAC of 12,500 mg/kg in the duplicate sample pair collected from the base of Test Pit TP6 (12 feet bgs). A shallower sample was not collected. GRO was measured at concentrations exceeding the ADEC MAC of 1,400 mg/kg in the sample collected from the base of Test Pit TP2 (11 feet bgs). A sample was also collected at 6 feet bgs at Test Pit TP2; results did not exceed the MAC or direct contact cleanup levels. However, the presence of 2 to 9 feet of clean fill across most of the site helps mitigate the incidental ingestion exposure route by creating a buffer between impacted soil and potential receptors.

8.3 Groundwater

ADEC guidance stipulates that ingestion of groundwater be considered a potentially complete exposure pathway unless a groundwater use determination is conducted in accordance with 18

AAC 75.350, and that determination finds that the groundwater is not a current, or a reasonably expected future, source of drinking water. The Property and adjacent parcel are connected to municipal drinking water and do not have drinking water wells on site. In addition, RSE conducted a water well search in 2011. There were no drinking water wells identified within Township 6 South, Range 13 West, Section 20. Therefore, ingestion of groundwater does not currently present an unacceptable risk to human health. However, on- and off-site residents, commercial workers, site visitors, trespassers, and construction workers are retained as potential future receptors in the event that drinking water wells are installed on or in the vicinity of the Property and the adjacent parcel.

8.4 Air

Volatile contaminants of concern (COCs) have the potential to impact current and future residents, commercial workers, site visitors, trespassers, and construction workers through outdoor and indoor inhalation. In the 2011 *Limited Site Investigation*, GRO, DRO, benzene, 1,2,4-TMB, and total xylenes were detected at concentrations exceeding the outdoor air inhalation cleanup levels in one or more test pits at depths ranging from 3 to 13 feet bgs. In the 2014 investigation, only 1,2,4-TMB was detected at a concentration exceeding the outdoor air inhalation soil cleanup level; this exceedance was measured in the soil sample from Boring B02R at a depth from 7.5 feet to 9 feet bgs. For vapor intrusion, DRO, GRO, BTEX, and 1,2,4-TMB have been detected in soil within 30 feet of an on-site structure. Although the ADEC has not established a soil cleanup level for the indoor air inhalation pathway, the ADEC may require a vapor intrusion evaluation for buildings on the Property and the adjacent parcel.

8.5 Surface Water

There is no known nexus between impacted media at this site and permanent or seasonal water bodies.

8.6 Other

Other impacted media, including sediment, surface water, and biota, were not identified at the site.

8.7 CSM Summary

Multiple complete or potentially complete exposure pathways have been identified at the site associated with the former UST and dispenser sources. DRO and GRO concentrations exceeding the MACs (corresponding to outdoor air inhalation exposure pathway) were measured in the vicinity of Test Pits TP6 and TP2, respectively. In addition, DRO, GRO, benzene, 1,2,4-TMB and total xylenes have been identified at concentrations exceeding outdoor-air inhalation

standards in Boring B02R, Test Pit TP2, Test Pit TP4, and/or Test Pit TP6. Note that only 1,2,4-TMB was measured above the outdoor air inhalation cleanup level in the 2014 soil samples. Additional investigation may be needed to characterize the potential risk posed by the indoor air pathway.

The risk to human health posed by groundwater ingestion at the site appears to be generally within acceptable levels, as evident by the absence of a currently viable receptor (e.g., no drinking water wells in the Property vicinity).

Based on our current understanding of contaminant concentration and distribution, it is our opinion that additional investigation is appropriate to more fully evaluate risk to on-site and off-site potential human receptors. In addition, potential source(s) in addition to the former USTs were identified, and may contribute to the documented petroleum contamination. Other potential contaminants of concern associated with these sources, including solvents, polyaromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and metals, have not been investigated. It is recognized that changes in the site use or other site conditions may affect the viability of potential exposure pathways. In particular, the CSM will need to be re-evaluated and revised as necessary if new buildings are constructed at the site, or if a change in land use occurs.

9.0 CONCLUSIONS

Field activities for this project consisted of advancing and sampling ten soil borings, installing one groundwater monitoring well in each of two soil borings, and sampling groundwater. The project objective was to assist the ADEC in defining the vertical and horizontal extent of UST-related soil and groundwater contamination at the site, with an overall purpose to evaluate risks to human health and the environment.

Soil samples from the 2014 boreholes verify impacted soil at each location except Borings B01 and B09. Based on this investigation and the 2011 *Limited Site Investigation*, the lateral and vertical extents of petroleum hydrocarbons have not been fully defined. The impacted soil extends onto the adjacent parcel to the west and may extend beneath on-site structures on that parcel. Impacted soil also appears to extend off site to the east and south. Impacted soil was encountered on the Property and the adjacent parcel at depths as shallow as 7.5 feet bgs and as deep as 23.9 feet bgs. Potentially “clean” conditions were confirmed beneath identified contamination in Borings B02, B05, B06, B08, and B10 at depths ranging from 15 feet bgs to 25 feet bgs. Analytes were measured at concentrations above cleanup levels in the deepest samples collected from Borings B04 and B07 and Test Pits TP1, TP2, TP4, TP5, and TP6; therefore, the vertical extent of soil contamination has not been delineated at these locations. Potentially contaminated soil cuttings were placed in labeled 55-gallon drums which remain on site.

Although groundwater was not characterized in the potential source areas, one monitoring well was installed in the southeast corner of both the Property (Monitoring Well MW1) and the adjacent parcel (Monitoring Well MW2). DRO, RRO, and/or benzene exceeding ADEC standards were identified in the October 2014 sample collected from Well MW2 and the January 2015 groundwater samples collected from Wells MW1 and MW2. The remaining analytes were not detected above cleanup levels in groundwater samples.

Although groundwater was only encountered in the three southernmost soil borings, lenses of saturated soil possibly representative of perched water were identified in each boring. Contaminants may be dispersed across the Property through these saturated zones. LNAPL was observed from 6.8 to 8.8 feet bgs in Boring B08 and from 10 to 11.1 feet bgs in Boring B06, suggesting groundwater is impacted at these locations.

The CSM was updated to evaluate the potential risks to human health effects. GRO, DRO, benzene, 1,2,4-TMB and total xylenes have been identified at concentrations exceeding outdoor-air inhalation cleanup level within 15 feet of the ground surface at Boring B02R, Test Pit TP2, Test Pit TP4, and/or Test Pit TP6, although only 1,2,4-TMB was measured at a concentration greater than this level in the 2014 samples. The risk to human health posed by groundwater ingestion at the site appears to be generally within acceptable levels, as evident by the absence of a currently viable receptor (e.g., no drinking water wells in the Property vicinity). Based on our current understanding of contaminant concentration and distribution, it is our opinion that additional investigation is appropriate to more fully evaluate risk to on-site and off-site potential human receptors. In addition, potential contaminants of concern associated with other potential sources associated with suspected former on-site vehicle maintenance activities, have not been investigated.

10.0 CLOSURE/LIMITATIONS

This report is an instrument of service prepared by Shannon & Wilson for the exclusive use of the ADEC (Client), and its affiliates. This report was prepared for the exclusive use of the Client for evaluating the Property as it relates to the environmental aspects discussed herein. The findings we have presented within this report are based on the limited research, sampling, and analyses that we conducted. They should not be construed as definite conclusions regarding the site's soil or groundwater quality. It is possible that our tests missed higher levels of petroleum hydrocarbon constituents, although our intention was to sample areas in accordance with the ADEC-approved work plan. As a result, the analysis and sampling performed can provide you with only our professional judgment as to the environmental characteristics of this site, and in no way guarantees that an agency or its staff will reach the same conclusions as Shannon & Wilson, Inc. The data presented in this report should be considered representative of the time of our site assessment. Changes in site conditions can occur over time, due to natural forces or human

activity. In addition, changes in government codes, regulations, or laws may occur. Because of such changes beyond our control, our observations and interpretations may need to be revised.

You are advised that various state and federal agencies (ADEC, EPA, etc.) may require the reporting of this information. Shannon & Wilson does not assume the responsibility for reporting these findings and therefore will not disclose the results of this study, except with your permission or as required by law.

Copies of documents that may be relied upon by our client are limited to the printed copies (also known as hard copies) that are signed or sealed by Shannon & Wilson with a wet, blue ink signature. Files provided in electronic media format are furnished solely for the convenience of the client. Any conclusion or information derived from electronic files shall be at the user's sole risk. If there is a discrepancy between the electronic files and the hard copies, or you question the authenticity of the report, please contact the undersigned.

Shannon & Wilson has prepared the attachments in Appendix F, "Important Information About Your Geotechnical/Environmental Report," to assist you and others in understanding the use and limitations of our report.

We appreciate this opportunity to be of service. Please contact the undersigned at (907) 561-2120 with questions or comments concerning the contents of this report.

SHANNON & WILSON, INC.



Trevelyn Lough
Geology Staff

TAL/SIM:MSH



Matthew S. Hemry, P.E.
Vice President

TABLE 1
OCTOBER 2014 AND JANUARY 2015 SAMPLE LOCATIONS AND DESCRIPTIONS

SHANNON & WILSON, INC.

Sample Number	Date	Sample Location (See Figure 2)	Depth (feet bgs)	Headspace (ppm) ^	Sample Description (See Appendix C)**
OCTOBER 2014 SOIL SAMPLES					
Boring B01					
B01-01	10/20/2014	Northeast corner of Property	0.2 - 5.0	0.0	Dark red-brown, <i>Poorly Graded Sand with Gravel (SP)</i> ; moist; trace organics above 0.4 foot.
B01-02	10/20/2014	Northeast corner of Property	5.0 - 7.5	0.7	5.0 to 7.3 feet: Dark red-brown, <i>Poorly Graded Sand with Gravel (SP)</i> ; moist; wood from 7.0 to 7.3 feet; lensed with gray to dark brown <i>Silt (ML)</i> . 7.3 to 7.5 feet: Light gray, <i>Silty Sand with Gravel (SM)</i> ; moist.
B01-03	10/20/2014	Northeast corner of Property	7.5 - 10.0	0.0	7.5 to 9.0 feet: Light gray, <i>Silty Sand with Gravel (SM)</i> ; moist; trace charcoal below 8.7 feet. 9.0 to 10.0 feet: Light gray, <i>Silt with Gravel (ML)</i> ; moist; little charcoal; few lenses of very fine to fine <i>Poorly Graded Sand (SP)</i> .
* B01-04	10/20/2014	Northeast corner of Property	10.0 - 11.5	0.0	Light gray, <i>Silt with Gravel (ML)</i> ; moist; trace organics (roots), little charcoal.
B01-05	10/20/2014	Northeast corner of Property	11.5 - 13.0	0.0	11.5 to 12.0 feet: Light gray, <i>Silt with Gravel (ML)</i> ; moist; trace organics (roots); little charcoal; 0.2-foot lens of green-gray, medium to coarse, <i>Poorly Graded Sand (SP)</i> at 11.7 feet. 12.0 to 13.0 feet: Brown to yellow, <i>Sandy Silt with Gravel (ML)</i> ; moist.
B01-06	10/20/2014	Northeast corner of Property	13.0 - 14.5	0.7	Very dense, brown to yellow, <i>Sandy Silt with Gravel and Cobbles (ML)</i> ; moist.
B01-07	10/20/2014	Northeast corner of Property	14.5 - 16.0	0.5	Very dense, brown to yellow-brown, <i>Sandy Silt with Gravel and Cobbles ((ML)</i> ;
B01-08	10/20/2014	Northeast corner of Property	16.0 - 17.2	0.6	Very dense, dark gray, <i>Gravelly Silt (ML)</i> ; moist.
B01-09	10/20/2014	Northeast corner of Property	17.2 - 18.0	1.0	Very dense, dark gray, <i>Gravelly Silt (ML)</i> ; moist.
B01-10	10/20/2014	Northeast corner of Property	18.0 - 19.5	1.4	Very dense, dark gray, <i>Gravelly Silt (ML)</i> ; moist.
B01-11	10/20/2014	Northeast corner of Property	19.5 - 20.9	0.0	Very dense, dark gray, <i>Gravelly Silt (ML)</i> ; moist; 0.3-foot piece of charcoal at 20.9'
B01-12	10/20/2014	Northeast corner of Property	22.5 - 23.4	0.1	Very dense, dark gray, <i>Gravelly Silt (ML)</i> ; moist; few charcoal.
B01-13	10/20/2014	Northeast corner of Property	25.0 - 26.5	0.0	Very dense, dark gray, <i>Gravelly Silt (ML)</i> ; moist.

Notes:

- * = Sample analyzed by the project laboratory (See Tables 3 and 4)
- ** = Sample description applies to the portion of the specified sample interval from which the sample was collected.
- ^ = Field screening instrument was a Thermo Environmental Instruments 580B photoionization detector (PID).
- ppm = parts per million
- bgs = below ground surface

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SHANNON & WILSON, INC.

Sample Number	Date	Sample Location (See Figure 2)	Depth (feet bgs)	Headspace (ppm) ^	Sample Description (See Appendix C)**
OCTOBER 2014 SOIL SAMPLES					
Boring B01					
B01-01	10/20/2014	Northeast corner of Property	0.2 - 5.0	0.0	Dark red-brown, <i>Poorly Graded Sand with Gravel (SP)</i> ; moist; trace organics above 0.4 foot.
B01-02	10/20/2014	Northeast corner of Property	5.0 - 7.5	0.7	5.0 to 7.3 feet: Dark red-brown, <i>Poorly Graded Sand with Gravel (SP)</i> ; moist; wood from 7.0 to 7.3 feet; lensed with gray to dark brown <i>Silt (ML)</i> . 7.3 to 7.5 feet: Light gray, <i>Silty Sand with Gravel (SM)</i> ; moist.
B01-03	10/20/2014	Northeast corner of Property	7.5 - 10.0	0.0	7.5 to 9.0 feet: Light gray, <i>Silty Sand with Gravel (SM)</i> ; moist; trace charcoal below 8.7 feet. 9.0 to 10.0 feet: Light gray, <i>Silt with Gravel (ML)</i> ; moist; little charcoal; few lenses of very fine to fine <i>Poorly Graded Sand (SP)</i> .
* B01-04	10/20/2014	Northeast corner of Property	10.0 - 11.5	0.0	Light gray, <i>Silt with Gravel (ML)</i> ; moist; trace organics (roots), little charcoal.
B01-05	10/20/2014	Northeast corner of Property	11.5 - 13.0	0.0	11.5 to 12.0 feet: Light gray, <i>Silt with Gravel (ML)</i> ; moist; trace organics (roots); little charcoal; 0.2-foot lens of green-gray, medium to coarse, <i>Poorly Graded Sand (SP)</i> at 11.7 feet. 12.0 to 13.0 feet: Brown to yellow, <i>Sandy Silt with Gravel (ML)</i> ; moist.
B01-06	10/20/2014	Northeast corner of Property	13.0 - 14.5	0.7	Very dense, brown to yellow, <i>Sandy Silt with Gravel and Cobbles (ML)</i> ; moist.
B01-07	10/20/2014	Northeast corner of Property	14.5 - 16.0	0.5	Very dense, brown to yellow-brown, <i>Sandy Silt with Gravel and Cobbles ((ML)</i> ;
B01-08	10/20/2014	Northeast corner of Property	16.0 - 17.2	0.6	Very dense, dark gray, <i>Gravelly Silt (ML)</i> ; moist.
B01-09	10/20/2014	Northeast corner of Property	17.2 - 18.0	1.0	Very dense, dark gray, <i>Gravelly Silt (ML)</i> ; moist.
B01-10	10/20/2014	Northeast corner of Property	18.0 - 19.5	1.4	Very dense, dark gray, <i>Gravelly Silt (ML)</i> ; moist.
B01-11	10/20/2014	Northeast corner of Property	19.5 - 20.9	0.0	Very dense, dark gray, <i>Gravelly Silt (ML)</i> ; moist; 0.3-foot piece of charcoal at 20.9'
B01-12	10/20/2014	Northeast corner of Property	22.5 - 23.4	0.1	Very dense, dark gray, <i>Gravelly Silt (ML)</i> ; moist; few charcoal.
B01-13	10/20/2014	Northeast corner of Property	25.0 - 26.5	0.0	Very dense, dark gray, <i>Gravelly Silt (ML)</i> ; moist.

Notes:

- * = Sample analyzed by the project laboratory (See Tables 3 and 4)
- ** = Sample description applies to the portion of the specified sample interval from which the sample was collected.
- ^ = Field screening instrument was a Thermo Environmental Instruments 580B photoionization detector (PID).
- ppm = parts per million
- bgs = below ground surface

TABLE 1
OCTOBER 2014 AND JANUARY 2015 SAMPLE LOCATIONS AND DESCRIPTIONS

SHANNON & WILSON, INC.

Sample Number	Date	Sample Location (See Figure 2)	Depth (feet bgs)	Headspace (ppm) ^	Sample Description (See Appendix C)**
Boring B02					
B02-01	10/21/2014	West of Old Garage, in former Test Pit TP2	2.5 - 4.0	0.3	Loose, red-brown, <i>Poorly Graded Sand with Gravel (SP)</i> ; moist; few lenses of dark brown <i>Silt (ML)</i> .
B02-02	10/21/2014	West of Old Garage, in former Test Pit TP2	5.0 - 6.5	2.2	5.0 to 6.3 feet: Very loose, red-brown, <i>Poorly Graded Sand with Gravel (SP)</i> ; moist; few lenses of dark brown <i>Silt (ML)</i> ; plastic liner at 6.3 feet. 6.3 to 6.5 feet: Very loose, dark red-brown, <i>Silt (ML)</i> ; moist; hydrocarbon odor.
B02-03	10/21/2014	West of Old Garage, in former Test Pit TP2	7.5 - 9.0	26	7.5 to 8.7 feet: Very loose, gray-brown, <i>Poorly Graded Sand with Silt and Gravel (SP-SM)</i> ; moist; trace organics; hydrocarbon odor. 8.7 to 9.0 feet: Very loose, gray, <i>Gravelly Silt (ML)</i> ; moist to very moist; lenses of <i>Organic Soil (OL)</i> ; hydrocarbon odor.
B02R-01	10/21/2014	West of Old Garage, in former Test Pit TP2	5.0 - 6.5	1.6	Loose, red-brown, <i>Poorly Graded Sand with Gravel (SP)</i> ; moist; trace organics.
* B02R-02	10/21/2014	West of Old Garage, in former Test Pit TP2	7.5 - 9.0	140	7.5 to 8.0 feet: Very loose, red-brown, <i>Poorly Graded Sand with Gravel (SP)</i> ; moist; trace organics. 8.0 to 9.0 feet: Very loose, gray, <i>Silty Gravel (GM)</i> ; moist; hydrocarbon odor; lenses of gray, <i>Poorly Graded Sand (SP)</i> , very moist.
B02R-03	10/21/2014	West of Old Garage, in former Test Pit TP2	10.0 - 11.3	130	10.0 to 11.0 feet: Very loose, brown, <i>Poorly Graded Gravel with Sand (GP)</i> ; moist; trace organics; hydrocarbon odor. 11.0 to 11.3 feet: Very loose, gray, <i>Silty Gravel (GM)</i> ; moist; hydrocarbon odor.
B02R-04	10/21/2014	West of Old Garage, in former Test Pit TP2	13.5 - 14.0	30	13.5 to 14.0 feet: Very dense, gray, <i>Gravelly Silt with Sand (ML)</i> ; moist; few charcoal.
* B02R-05	10/21/2014	West of Old Garage, in former Test Pit TP2	15.0 - 16.5	0.8	Dense, dark gray, <i>Gravelly Silt with Sand (ML)</i> ; moist.
* B02R-06	10/21/2014	West of Old Garage, in former Test Pit TP2	20.0 - 21.5	0.9	Dense, dark gray, <i>Gravelly Silt with Sand (ML)</i> ; moist.
B02R-07	10/21/2014	West of Old Garage, in former Test Pit TP2	25.0 - 26.5	4.2	Very dense, dark gray, <i>Gravelly Silt with Sand (ML)</i> ; moist.

Notes:

- * = Sample analyzed by the project laboratory (See Tables 3 and 4)
- ** = Sample description applies to the portion of the specified sample interval from which the sample was collected.
- ^ = Field screening instrument was a Thermo Environmental Instruments 580B photoionization detector (PID).
- ppm = parts per million
- bgs = below ground surface

TABLE 1
OCTOBER 2014 AND JANUARY 2015 SAMPLE LOCATIONS AND DESCRIPTIONS

SHANNON & WILSON, INC.

Sample Number	Date	Sample Location (See Figure 2)	Depth (feet bgs)	Headspace (ppm) ^	Sample Description (See Appendix C)**
Boring B03/Well MW1					
B03-01	10/23/2014	Southeast corner of Property	2.5 - 4.0	15	Very loose, red-brown, <i>Poorly Graded Sand with Silt and Gravel (GP-GM)</i> ; moist; trace organics; few lenses of <i>Silt (ML)</i> .
B03-02	10/23/2014	Southeast corner of Property	5.0 - 6.5	0.4	Very loose, red-brown, <i>Silt with Sand (ML)</i> ; moist; trace charcoal.
B03-03	10/23/2014	Southeast corner of Property	7.5 - 9.0	0.0	Loose, gray, <i>Silt with Sand (ML)</i> ; moist; trace charcoal.
* B03-04	10/23/2014	Southeast corner of Property	10.0 - 11.5	39	10.0 to 10.7 feet: Loose, dark gray; <i>Silty Sand with Gravel (SM)</i> ; moist. 10.7 to 11.3 feet: Loose, red brown, <i>Silt with Sand (ML)</i> ; moist; few organics. 11.3 to 11.5 feet: Loose, gray, <i>Silt with Sand (ML)</i> ; moist; trace charcoal.
B03-05	10/23/2014	Southeast corner of Property	12.5 - 14.0	1.8	12.5 to 13.6 feet: Loose, gray-brown, <i>Silt (ML)</i> ; wet; few sand. 13.6 to 14.0 feet: Loose, gray, <i>Poorly Graded Gravel with Silt and Sand (GP-GM)</i> ; wet.
B03-06	10/23/2014	Southeast corner of Property	15.0 - 16.5	1.1	15.0 to 16.3 feet: Loose, gray, <i>Poorly Graded Gravel with Silt and Sand (GP-GM)</i> ; wet. 16.3 to 16.5 feet: Loose, gray, <i>Silt with Gravel (ML)</i> ; wet; trace charcoal.
B03-07	10/23/2014	Southeast corner of Property	18.5 - 18.7	2.2	Loose, gray, <i>Silt with Gravel (ML)</i> ; moist; trace charcoal.

Notes:

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- ^ = Field screening instrument was a Thermo Environmental Instruments 580B photoionization detector (PID).
- = Measurement not recorded or not applicable
- ppm = parts per million
- bgs = below ground surface

TABLE 1
OCTOBER 2014 AND JANUARY 2015 SAMPLE LOCATIONS AND DESCRIPTIONS

SHANNON & WILSON, INC.

Sample Number	Date	Sample Location (See Figure 2)	Depth (feet bgs)	Headspace (ppm) ^	Sample Description (See Appendix C)**
Boring B04/Well MW2					
B04-01	10/23/2014	Near southwest corner of property on adjacent parcel	2.5 - 4.0	0.7	2.5 to 3.7 feet: Loose, red-brown, <i>Silt with Gravel (ML)</i> ; moist; trace organics. 3.7 to 4.0 feet: Loose, red-brown, <i>Silty Sand with Gravel (SM)</i> ; moist.
B04-02	10/23/2014	Near southwest corner of property on adjacent parcel	5.0 - 6.5	0.3	Very loose, dark red-brown, <i>Sandy Silt with Gravel (ML)</i> ; moist; trace organics, mostly fibrous wood from 5.0 to 5.3 feet.
B04-03	10/23/2014	Near southwest corner of property on adjacent parcel	7.5 - 9.0	1.6	7.5 to 7.9 feet: Very loose, dark gray, <i>Poorly Graded Gravel with Sand (GP)</i> ; moist to very moist. 7.9 to 9.0 feet: Very loose, gray, <i>Silt with Sand (ML)</i> ; moist.
* B04-04	10/23/2014	Near southwest corner of property on adjacent parcel	10.0 - 11.1	19	Very loose, red-brown, <i>Silty Sand with Gravel (ML)</i> ; moist; trace organics.
B04-05	10/23/2014	Near southwest corner of property on adjacent parcel	12.5 - 14.0	19	Very loose, dark red-brown to red-brown, <i>Organic Soil (OL)</i> ; moist; few fibrous organics; few sand below 13.8 feet.
* B04-06	10/23/2014	Near southwest corner of property on adjacent parcel	15.0 - 16.5	6.0	15.0 to 16.2 feet: Gray, <i>Silty Sand with Gravel (SM)</i> ; very moist. 16.2 to 16.5 feet: Light gray, <i>Fat Clay (CH)</i> ; moist.
B04-07	10/23/2014	Near southwest corner of property on adjacent parcel	17.5 - 19.0	12	Medium dense, gray, <i>Silty Sand with Gravel (SM)</i> ; wet; few organics.
B04-08	10/23/2014	Near southwest corner of property on adjacent parcel	20.5 - 20.8	6.1	Medium dense, gray, <i>Silt with Gravel (ML)</i> ; moist to very moist; few sand.

Notes:

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- ^ = Field screening instrument was a Thermo Environmental Instruments 580B photoionization detector (PID).
- ppm = parts per million
- bgs = below ground surface

TABLE 1
OCTOBER 2014 AND JANUARY 2015 SAMPLE LOCATIONS AND DESCRIPTIONS

SHANNON & WILSON, INC.

Sample Number	Date	Sample Location (See Figure 2)	Depth (feet bgs)	Headspace (ppm) ^	Sample Description (See Appendix C)**
Boring B05					
B05-01	10/21/2014	South of Former Old Wood Framed Shop	2.5 - 4.0	0.0	Very loose, dark brown, <i>Sandy Silt with Gravel (ML)</i> ; moist; trace organics.
B05-02	10/21/2014	South of Former Old Wood Framed Shop	5.0 - 6.5	0.3	Very loose, dark brown, <i>Sandy Silt with Gravel (ML)</i> ; moist; trace organics.
B05-03A	10/21/2014	South of Former Old Wood Framed Shop	7.5 - 8.8	2.0	Loose, gray, <i>Silt with Gravel (ML)</i> ; moist; trace organics; hydrocarbon odor below 8.6 feet.
B05-03B	10/21/2014	South of Former Old Wood Framed Shop	8.8 - 9.0	22	Loose, dark gray, <i>Poorly Graded Sand with Gravel (SP)</i> ; moist; trace fines; hydrocarbon odor.
B05-04	10/21/2014	South of Former Old Wood Framed Shop	10.0 - 11.5	100	10.0 to 10.2 feet: Very loose, dark gray, <i>Poorly Graded Sand with Gravel (SP)</i> ; moist; hydrocarbon odor. 10.2 to 11.5 feet: Very loose, brown to dark brown, <i>Silt (SM)</i> ; moist to very moist below 11.2 feet; few organics; hydrocarbon odor; little lenses of <i>Organic Soil (OL)</i> .
* B05-05	10/21/2014	South of Former Old Wood Framed Shop	12.5 - 14.0	120	Very loose, gray, <i>Silt (ML)</i> ; moist; few charcoal; hydrocarbon odor.
B05-06	10/21/2014	South of Former Old Wood Framed Shop	15.0 - 16.5	1.9	Medium dense, gray, <i>Lean Clay (CL)</i> ; moist.
* B05-07	10/21/2014	South of Former Old Wood Framed Shop	20.0 - 21.5	0.7	Very dense, gray, <i>Gravelly Silt with Sand (ML)</i> ; moist; few charcoal.
B05-08	10/21/2014	South of Former Old Wood Framed Shop	25.0 - 25.9	2.3	Very dense, gray, <i>Gravelly Silt with Sand and Cobbles (ML)</i> ; wet.
B05-09	10/21/2014	South of Former Old Wood Framed Shop	27.5 - 29.0	0.3	Very dense, gray, <i>Gravelly Silt with Sand (ML)</i> ; moist.

Notes:

- * = Sample analyzed by the project laboratory (See Tables 3 and 4)
- ** = Sample description applies to the portion of the specified sample interval from which the sample was collected.
- ^ = Field screening instrument was a Thermo Environmental Instruments 580B photoionization detector (PID).
- ppm = parts per million
- bgs = below ground surface

TABLE 1
OCTOBER 2014 AND JANUARY 2015 SAMPLE LOCATIONS AND DESCRIPTIONS

SHANNON & WILSON, INC.

Sample Number	Date	Sample Location (See Figure 2)	Depth (feet bgs)	Headspace (ppm) ^	Sample Description (See Appendix C)**
Boring B06					
B06-01	10/22/2014	Southwest of New Garage	2.5 - 4.0	2.4	Medium dense, red-brown to gray, <i>Poorly Graded Sand with Silt and Gravel (SP)</i> -
B06-02	10/22/2014	Southwest of New Garage	5.0 - 6.5	30	Loose, red-brown, <i>Silty Sand with Gravel (SM)</i> ; moist; trace organics.
B06-03	10/22/2014	Southwest of New Garage	7.5 - 9.0	320	7.5 to 8.6 feet: Medium dense, gray, <i>Silty Sand with Gravel (SM)</i> ; moist, product below 8.4 feet; trace organics, 0.2-foot piece of wood at 8.4 feet; hydrocarbon odor. 8.6 to 9.0 feet: Medium dense, gray, <i>Gravelly Silt with Sand (ML)</i> ; moist; trace organics, hydrocarbon odor.
* B06-04 / B06-04D (Duplicate)	10/22/2014	Southwest of New Garage	10.0 - 11.5	350	10.0 to 11.1 feet: Very loose, gray, <i>Poorly Graded Sand with Gravel (SP)</i> ; moist with product; trace charcoal; hydrocarbon odor. 11.3 to 11.5 feet: Very loose, dark brown, <i>Organic Soil (OL)</i> ; moist; some fibrous organics; strong hydrocarbon odor.
B06-05A	10/22/2014	Southwest of New Garage	12.5 - 13.7	170	Very loose, gray, <i>Silt (ML)</i> ; moist to very moist; few charcoal; hydrocarbon odor; <i>Poorly Graded Sand (SP)</i> from 12.7 feet to 12.9 feet.
B06-05B	10/22/2014	Southwest of New Garage	13.7 - 14.0	50	Very loose, gray, <i>Silt (ML)</i> ; moist; few sand; few charcoal.
* B06-06	10/22/2014	Southwest of New Garage	20.0 - 21.5	2.8	Very dense, gray, <i>Gravelly Silt with Sand (ML)</i> ; moist.
B06-07	10/22/2014	Southwest of New Garage	25.0 - 26.5	3.1	Very dense, gray, <i>Gravelly Silt with Sand (ML)</i> ; moist.

Notes:

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- ** = Sample description applies to the portion of the specified sample interval from which the sample was collected.
- ^ = Field screening instrument was a Thermo Environmental Instruments 580B photoionization detector (PID).
- ppm = parts per million
- bgs = below ground surface

TABLE 1
OCTOBER 2014 AND JANUARY 2015 SAMPLE LOCATIONS AND DESCRIPTIONS

SHANNON & WILSON, INC.

Sample Number	Date	Sample Location (See Figure 2)	Depth (feet bgs)	Headspace (ppm) ^	Sample Description (See Appendix C)**
Boring B07					
B07-01	10/21/2014	East of Adjacent Parcel Structure	2.5 - 4.0	6.1	2.5 to 2.8 feet: Loose, dark red-brown, <i>Poorly Graded Sand with Gravel (SP)</i> ; moist. 2.8 to 4.0 feet: Loose, gray with red-yellow mottling, <i>Silty Sand with Gravel (SM)</i> ; moist.
B07-02	10/21/2014	East of Adjacent Parcel Structure	5.0 - 6.5	5.5	Loose, gray with red-yellow mottling, <i>Silty Sand with Gravel (SM)</i> ; moist.
B07-03A	10/21/2014	East of Adjacent Parcel Structure	7.5 - 7.8	15	Loose, red-brown, <i>Silt (ML)</i> ; moist; trace organics.
* B07-03B	10/21/2014	East of Adjacent Parcel Structure	7.8 - 9.0	460	7.8 to 8.7 feet: Loose, gray, <i>Poorly Graded Sand (SP)</i> ; moist; trace gravel and fines; trace organics; wood from 8.3 feet to 8.7 feet, hydrocarbon odor. 8.7 to 9.0 feet: Loose, dark brown, <i>Organic Soil (OL)</i> ; moist; trace fibrous organics; hydrocarbon odor.
B07-04	10/21/2014	East of Adjacent Parcel Structure	10.0 - 11.5	200	10.0 to 10.4 feet: Loose, light gray-brown, <i>Silt (ML)</i> ; moist to very moist; little organics; little lenses of gray, fine to medium <i>Poorly Graded Sand (SP)</i> with a hydrocarbon odor. 10.4 to 11.5 feet: Loose, gray, <i>Silty Gravel with Sand (GM)</i> , moist to very moist; trace organics; hydrocarbon odor.
B07-05A	10/21/2014	East of Adjacent Parcel Structure	12.5 - 12.9	80	Medium Dense, gray, <i>Sandy Silt with Gravel (ML)</i> ; moist to very moist; trace organics, hydrocarbon odor.
B07-05B	10/21/2014	East of Adjacent Parcel Structure	12.9 - 13.8	17	12.9 to 13.7 feet: Medium dense, gray, <i>Silty Gravel (GM)</i> ; moist; few charcoal above 13.1 feet. 13.7 to 13.8 feet: Medium dense, gray; <i>Poorly Graded Sand (SP)</i> ; moist.
* B07-06	10/21/2014	East of Adjacent Parcel Structure	15.0 - 16.5	12	Dense, gray, <i>Gravelly Silt with Sand (ML)</i> ; moist.
B07-07	10/21/2014	East of Adjacent Parcel Structure	20.0 - 21.5	9.4	Very dense, gray, <i>Gravelly Silt with Sand (ML)</i> ; moist.
* B07-08	10/21/2014	East of Adjacent Parcel Structure	22.5 - 23.9	4.2	22.5 to 23.0 feet: Very dense, gray, <i>Gravelly Silt with Sand (ML)</i> ; moist. 23.0 to 23.9 feet: Very dense, gray, <i>Fat Clay and Cobbles (CH)</i> ; moist.

Notes:

- * = Sample analyzed by the project laboratory (See Tables 3 and 4)
- ** = Sample description applies to the portion of the specified sample interval from which the sample was collected.
- ^ = Field screening instrument was a Thermo Environmental Instruments 580B photoionization detector (PID).
- ppm = parts per million

TABLE 1
OCTOBER 2014 AND JANUARY 2015 SAMPLE LOCATIONS AND DESCRIPTIONS

SHANNON & WILSON, INC.

bgs = below ground surface

Sample Number	Date	Sample Location (See Figure 2)	Depth (feet bgs)	Headspace (ppm) ^	Sample Description (See Appendix C)**
Boring B08					
B08-01	10/21/2014	Southeast of Adjacent Parcel Structure	2.5 - 4.0	4.8	2.5 to 2.9 feet: Loose, red-brown, <i>Poorly Graded Sand with Gravel (SP)</i> ; moist; trace organics. 2.9 to 4.0 feet: Loose, gray, <i>Gravelly Silt with Sand (ML)</i> ; moist; trace charcoal.
B08-02	10/21/2014	Southeast of Adjacent Parcel Structure	5.0 - 6.5	6.1	Loose, gray with red-yellow mottling, <i>Gravelly Silt with Sand (ML)</i> ; moist; trace charcoal.
B08-03A	10/21/2014	Southeast of Adjacent Parcel Structure	7.5 - 7.8	23	Loose, gray with red-yellow mottling, <i>Gravelly Silt with Sand (ML)</i> ; moist; trace charcoal.
* B08-03B	10/21/2014	Southeast of Adjacent Parcel Structure	7.8 - 8.8	300	Loose, gray, <i>Poorly Graded Sand with Gravel (GP)</i> ; moist, product below 8.6 feet; hydrocarbon odor and sheen.
B08-04	10/21/2014	Southeast of Adjacent Parcel Structure	10.0 - 11.5	66	Very loose, dark brown, <i>Organic Soil (OL)</i> ; moist; trace fibrous organics; hydrocarbon odor; lenses of gray, <i>Poorly Graded Sand (SP)</i> above 11.0 feet.
B08-05	10/21/2014	Southeast of Adjacent Parcel Structure	12.5 - 14.0	6.1	Very loose, gray with red-yellow mottling, <i>Silt (ML)</i> ; moist to very moist; few charcoal.
* B08-06	10/21/2014	Southeast of Adjacent Parcel Structure	15.0 - 16.5	6.2	Medium dense, gray, <i>Silt with Sand (ML)</i> ; moist; trace charcoal.
B08-07	10/21/2014	Southeast of Adjacent Parcel Structure	20.0 - 21.5	4.9	Very dense, gray, <i>Gravelly Silt with Sand (ML)</i> ; moist.
* B08-08	10/21/2014	Southeast of Adjacent Parcel Structure	25.0 - 26.5	4.2	Very dense, gray, <i>Gravelly Silt with Sand (ML)</i> ; moist.

Notes:

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- ** = Sample description applies to the portion of the specified sample interval from which the sample was collected.
- ^ = Field screening instrument was a Thermo Environmental Instruments 580B photoionization detector (PID).
- ppm = parts per million
- bgs = below ground surface

TABLE 1
OCTOBER 2014 AND JANUARY 2015 SAMPLE LOCATIONS AND DESCRIPTIONS

SHANNON & WILSON, INC.

Sample Number	Date	Sample Location (See Figure 2)	Depth (feet bgs)	Headspace (ppm) ^	Sample Description (See Appendix C)**
Boring B09					
B09-01	10/23/2014	Southwest of Adjacent Parcel Structure	2.5 - 4.0	0.1	Loose, light gray, <i>Gravelly Silt (ML)</i> ; moist; little organics below 3.7 feet.
B09-02	10/23/2014	Southwest of Adjacent Parcel Structure	5.0 - 6.5	0.6	Loose, red-brown, <i>Gravelly Silt (ML)</i> ; moist; trace organics; 0.3-foot-thick layer of Dark Brown, <i>Organic Soil (OL)</i> at 5.0 feet.
B09-03	10/23/2014	Southwest of Adjacent Parcel Structure	7.5 - 9.0	2.4	Loose, red-brown, <i>Gravelly Silt (ML)</i> ; moist; trace organics.
B09-04	10/23/2014	Southwest of Adjacent Parcel Structure	10.1 - 11.5	2.5	Very loose, dark brown, <i>Organic Soil (OL)</i> ; moist; few fibrous organics; 0.2-foot-thick layer of <i>Silty Sand (ML)</i> at 10.1 feet.
* B09-05	10/23/2014	Southwest of Adjacent Parcel Structure	12.9 - 14.0	5.8	Loose, light gray, <i>Silt with Sand (ML)</i> , moist; trace organics; trace charcoal.
B09-06	10/23/2014	Southwest of Adjacent Parcel Structure	15.0 - 16.5	0.0	Medium Dense, gray; <i>Silty Sand (SM)</i> ; very moist; trace gravel; trace charcoal.
* B09-07	10/23/2014	Southwest of Adjacent Parcel Structure	17.5 - 19.0	0.0	Dense, gray, <i>Gravelly Silt with Sand (ML)</i> ; moist; trace charcoal.
B09-08	10/23/2014	Southwest of Adjacent Parcel Structure	20.0 - 21.5	0.2	Very dense, gray, <i>Gravelly Silt with Sand (ML)</i> ; moist; trace charcoal.
B09-09	10/23/2014	Southwest of Adjacent Parcel Structure	25.0 - 26.2	0.0	Very dense, gray, <i>Silty Sand (SM)</i> ; moist; trace charcoal.

Notes:

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- ** = Sample description applies to the portion of the specified sample interval from which the sample was collected.
- ^ = Field screening instrument was a Thermo Environmental Instruments 580B photoionization detector (PID).
- ppm = parts per million
- bgs = below ground surface

TABLE 1
OCTOBER 2014 AND JANUARY 2015 SAMPLE LOCATIONS AND DESCRIPTIONS

SHANNON & WILSON, INC.

Sample Number	Date	Sample Location (See Figure 2)	Depth (feet bgs)	Headspace (ppm) ^	Sample Description (See Appendix C)**
Boring B10					
B10-01	10/22/2014	Southcentral portion of Property	2.5 - 4.0	1.7	Medium dense, red-brown, <i>Poorly Graded Sand with Silt and Gravel (SP-SM)</i> ; moist; trace organics, few lenses of <i>Silt (ML)</i> ; trace lenses of <i>Organic Soil (OL)</i> .
B10-02	10/22/2014	Southcentral portion of Property	5.0 - 6.5	1.9	Loose, red-brown, <i>Poorly Graded Sand with Silt and Gravel (SP-SM)</i> ; moist; trace organics, few lenses of <i>Silt (ML)</i> .
B10-03	10/22/2014	Southcentral portion of Property	7.5 - 9.0	160	Very loose, gray-brown to gray, <i>Silt with Sand (ML)</i> ; very moist to moist below 8.1 feet; trace charcoal; hydrocarbon odor.
B10-04	10/22/2014	Southcentral portion of Property	10.0 - 11.5	230	Very loose, gray-brown to gray, <i>Silt with Sand (ML)</i> ; moist; some organics below 11.2 feet; trace charcoal; hydrocarbon odor.
* B10-05	10/22/2014	Southcentral portion of Property	12.5 - 13.6	310	12.5 to 12.9 feet: Medium dense, dark brown to black, <i>Organic Soil (OL)</i> ; moist; few fibrous organics; hydrocarbon odor. 12.9 to 13.6 feet: Medium dense, red-brown, <i>Silt (ML)</i> ; moist; hydrocarbon odor.
* B10-06	10/22/2014	Southcentral portion of Property	15.0 - 16.5	3.4	Loose, gray, <i>Silt with Gravel (ML)</i> ; moist; trace sand; trace charcoal.
B10-07	10/22/2014	Southcentral portion of Property	20.0 - 21.5	1.3	Medium dense, dark gray, <i>Poorly Graded Sand with Gravel (SP)</i> ; wet; trace fines; few charcoal.
B10-08	10/22/2014	Southcentral portion of Property	25.0 - 26.5	1.3	Very dense, dark gray, <i>Silty Sand (ML)</i> ; wet.

Notes:

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- ** = Sample description applies to the portion of the specified sample interval from which the sample was collected.
- ^ = Field screening instrument was a Thermo Environmental Instruments 580B photoionization detector (PID).
- ppm = parts per million
- bgs = below ground surface

TABLE 1
OCTOBER 2014 AND JANUARY 2015 SAMPLE LOCATIONS AND DESCRIPTIONS

SHANNON & WILSON, INC.

Sample Number	Date	Sample Location (See Figure 2)	Depth (feet bgs)	Headspace (ppm) ^	Sample Description (See Appendix C)**
<u>October 2014 Groundwater Samples</u>					
* MW1	10/25/2014	Monitoring Well MW1	13.08	-	Groundwater, yellow-brown, hydrocarbon odor
* MW2	10/25/2014	Monitoring Well MW2	14.29	-	Groundwater, brown, hydrocarbon odor
* MW12	10/25/2014	Duplicate of Well MW2	14.29	-	Groundwater, brown, hydrocarbon odor
<u>January 2015 Groundwater Samples</u>					
* MW1	1/16/2015	Monitoring Well MW1	10.21	-	Groundwater, light brown
* MW11	1/16/2015	Duplicate of Well MW1	10.21	-	Groundwater, light brown
* MW2	1/16/2015	Monitoring Well MW2	10.53	-	Groundwater, clear
* MW12	1/16/2015	Duplicate of Well MW2	10.53	-	Groundwater, clear
<u>Quality Control Samples</u>					
* TB1	10/19/2014	Soil Trip Blank	-	-	Ottawa sand with methanol added in the laboratory
* TB2	10/19/2014	Soil Trip Blank	-	-	Ottawa sand with methanol added in the laboratory
* TB3	10/19/2014	Soil Trip Blank	-	-	Ottawa sand with methanol added in the laboratory
* TB4	10/25/2014	Water Trip Blank	-	-	Organic-free water blank supplied by the laboratory
* TB	1/16/2015	Water Trip Blank	-	-	Organic-free water blank supplied by the laboratory

Notes:

- * = Sample analyzed by the project laboratory (See Tables 3 and 4)
- ** = Sample description applies to the portion of the specified sample interval from which the sample was collected.
- ^ = Field screening instrument was a Thermo Environmental Instruments 580B photoionization detector (PID).
- = Measurement not recorded or not applicable
- ppm = parts per million
- bgs = below ground surface

TABLE 2a
OCTOBER 2014 WELL DEVELOPMENT AND SAMPLING LOG

	Monitoring Well Number	
	MW1	MW2
Water Level Measurement Data**		
Date Water Level Measured	10/25/2015	10/25/2014
Time Water Level Measured	14:50	10:30
Depth to Water Below MP, Feet	11.81	11.92
Depth to MP (ft bgs)	0.34	0.32
Depth to Water bgs (ft)	12.15	12.24
Development Data		
Date Developed	10/25/2015	10/25/2015
Time Development Initiated	15:00	10:50
Time Development Completed	16:15	13:07
Development Method	Surge Block / Submersible pump	Surge Block / Submersible pump
Gallons of Water Removed	22.75	18.25
Purging/Sampling Data		
Date Sampled	10/25/2014	10/25/2014
Time Sampled	17:18	13:54
Depth to Water Below MP, Feet	12.74	13.97
Total Depth of Well Below MP, Feet	17.72	23.33
Water Column in Well, Feet	4.98	9.36
Gallons per Foot	0.16	0.16
Gallons in Well	0.80	1.50
Total Gallons Pumped	1.25	2.0
Purging/Sampling Method	Submersible pump	Submersible pump
Diameter of Well Casing	2 inch	2 inch
Water Quality Data at Time of Sampling*		
Temperature, °C	8.25	7.52
Specific Conductance, µS/cm	291	6.58
pH, standard units	6.10	5.97
Oxidation Reduction Potential (mV)	50.8	27.6
Turbidity, NTU	283.3	222.5
Remarks	hydrocarbon odor low-flow	hydrocarbon odor low-flow

Notes:

- * Water quality parameters were measured with a YSI-556 instrument.
- ** = pre-well development
- °C = degrees Celsius
- µS/cm = microsiemens per centimeter
- MP = measuring point
- NTU = Nephthelometric Turbidity Unit
- bgs = below ground surface

TABLE 2b
JANUARY 2015 GROUNDWATER SAMPLING LOG

	Monitoring Well Number	
	MW1	MW2
Water Level Measurement Data		
Date Water Level Measured	1/16/2015	1/16/2015
Time Water Level Measured	11:01	11:11
Depth to Water Below MP, Feet	9.87	10.21
Depth to MP (ft bgs)	0.34	0.32
Depth to Water bgs (ft)	10.21	10.53
Purging/Sampling Data		
Date Sampled	1/16/2015	1/16/2015
Time Sampled	13:30	12:20
Depth to Water Below MP, Feet	9.87	10.21
Total Depth of Well Below MP, Feet	17.72	23.33
Water Column in Well, Feet	7.85	13.12
Gallons per Foot	0.16	0.16
Gallons in Well	1.26	2.10
Total Gallons Pumped/Bailed	0.9	1.3
Purging/Sampling Method	Submersible pump	Submersible pump
Diameter of Well Casing	2 inch	2 inch
Water Quality Data at Time of Sampling*		
Temperature, °C	5.83	5.79
Specific Conductance, µS/cm	777	1,593
Dissolved Oxygen (mg/L)	3.46	3.81
pH, standard units	6.28	6.19
Oxidation Reduction Potential (mV)	-44.8	-62.2
Turbidity, NTU	81.73	2.02
Remarks	low-flow	low-flow

Notes:

- * Water quality parameters were measured with a YSI-556 instrument.
- ** = pre-well development
- °C = degrees Celsius
- µS/cm = microsiemens per centimeter
- NTU = Nephthelometric Turbidity Unit
- mg/L = milligrams per liter
- mV = millivolt
- MP = measuring point
- bgs = below ground surface

TABLE 3
OCTOBER 2014 SOIL SAMPLE ANALYTICAL RESULTS

Parameter Tested	Method*	Cleanup Level (mg/kg)**	Sample ID Number† and Soil Sample Depth in Feet bgs											
			Subject Property					Adjacent Parcel		Subject Property				
			Boring B01	Boring B02R		Boring B03	Boring B04		Boring B05		Boring B06			
			B01-04	B02R-02	B02R-05	B02R-06	B03-04	B04-04	B04-06	B05-05	B05-07	B06-04	B06-04D~	B06-06
			10.0 to 11.5	7.5 to 9.0	15.0 to 16.5	20.0 to 21.5	10.0 to 11.5	10.0 to 11.1	15.0 to 16.5	12.5 to 14.0	20.0 to 21.5	10.0 to 11.5	10.0 to 11.5	20.0 to 21.5
PID Headspace Reading - ppm	580B PID	-	0.0	140	0.8	0.9	39	19	6.0	120	0.7	350	350	2.8
Gasoline Range Organics (GRO) - mg/kg	AK 101	300	< 5.69 B	427	< 3.47 B	< 3.59 B J-	6.65	< 4.85 B	< 3.10 B	< 3.07 B	< 3.42 B	74.7	143	< 3.33 B
Diesel Range Organics (DRO) - mg/kg	AK 102	250	14.4	1,650	17.7	13.1^ J-	104	93.0	7.05 J	1,060	14.3	2,530	2,500	9.10 J
Residual Range Organics (RRO) - mg/kg	AK 103	10,000	80.7	186	45.5	32.4^ J-	64.0	97.8	4.42 J	1,570	40.0	235 J	254	30.4
Volatile Organic Compounds (VOCs)														
Benzene - mg/kg	EPA 8260C	0.025	< 0.0227	1.16 J	0.00972 J	< 0.0144 J-	0.0609	0.0209	0.0874	0.00921 J	< 0.0137	0.777	1.36	0.0237
Toluene - mg/kg	EPA 8260C	6.5	< 0.114	< 7.51	< 0.0694	0.0104 J-	< 0.0631	< 0.0720	< 0.0620	< 0.0614	< 0.0684	< 0.637	0.106 J	< 0.0667
Ethylbenzene - mg/kg	EPA 8260C	6.9	< 0.114	18.6	0.0177 J	< 0.0718 J-	0.114	< 0.0720	< 0.0620	0.101	< 0.0684	2.46	3.91	< 0.0667
Xylenes - mg/kg	EPA 8260C	63	< 0.682	77.7	0.0718 J	0.0151 J-	0.460	0.0471 J	0.0267 J	0.0681 J	< 0.411	11.0	15.2	< 0.400
1,3,5-Trimethylbenzene - mg/kg	EPA 8260C	23	< 0.114	13.7	0.0153 J	< 0.0718 J-	0.130	0.0201 J	0.0146 J	0.0954	< 0.0684	3.70	4.58	< 0.0667
1,2,4-Trimethylbenzene - mg/kg	EPA 8260C	23	< 0.114	51.7	0.0489 J	< 0.0718 J-	0.400	0.0838	0.0744	0.0908	< 0.0684	12.9	17.0	< 0.0667

Notes:

- * = See Appendix D for compounds tested, methods, and laboratory reporting limits
- ** = Soil cleanup level is the most stringent ADEC Method 2 standard listed in Table B1 or B2, 18 AAC 75 (October 2014), for the "under 40 inches (precipitation) zone"
- † = Sample ID number preceded by "17678-" on the chain of custody form
- mg/kg = milligram per kilogram
- = Not applicable or sample not tested for this analyte
- bgs = below ground surface
- ~ = Field duplicate of preceeding sample
- ^ = Hydrocarbon pattern on the gas chromatography chromatogram suggests potential biogenic interference
- B = Reported concentration potentially affected by method blank detection; see Laboratory Data Review Checklist in Appendix D for details
- J = Reported concentration is an estimate below the reporting limit
- J+ = Reported concentration is an estimate (biased high) due to one or more quality control non-conformances. See Laboratory Data Review Checklist in Appendix D for details
- J- = Reported concentration is an estimate (biased low) due to a hold time exceedance or a surrogate control recovery failure. See Laboratory Data Review Checklist in Appendix D for details
- 14.4 = Analyte detected in sample at 14.4 mg/kg
- < 0.0227 = Analyte not detected; laboratory reporting limit of 0.0227 mg/kg
- < 1.75 = Sample is not detected at a reporting limit that exceeds the ADEC cleanup level; compound may be present above the cleanup level, but below the reporting limit
- 427 = Reported concentration equals or exceeds the regulated cleanup level

TABLE 3
OCTOBER 2014 SOIL SAMPLE ANALYTICAL RESULTS

Parameter Tested	Method*	Cleanup Level (mg/kg)**	Sample ID Number† and Soil Sample Depth in Feet bgs													
			Adjacent Parcel									Subject Property		QC Samples		
			Boring B07			Boring B08			Boring B09			Boring B10		Trip Blanks		
			B07-03B	B07-06	B07-08	B08-03B	B08-06	B08-08	B09-05	B09-07	B10-05	B10-06	TB1	TB2	TB3	
			7.8 to 9.0	15.0 to 16.5	22.5 to 23.9	7.8 to 8.8	15.0 to 16.5	25.0 to 26.5	12.9 to 14.0	17.5 to 19.0	12.5 to 13.6	15.0 to 16.5	-	-	-	
PID Headspace Reading - ppm	580B PID	-	460	12	4.2	300	6.2	4.2	5.8	0.0	310	3.4	-	-	-	
Gasoline Range Organics (GRO) - mg/kg	AK 101	300	419	5.34	< 4.21 B J-	294 J+	< 3.39 B	< 2.37 B J-	< 4.80 B	< 2.92 B	165	< 4.19 B	<5.00 B	< 5.00 B	< 5.00 B	
Diesel Range Organics (DRO) - mg/kg	AK 102	250	3,810	13.5	13.0^ J-	3,720	26.6	18.1^ J-	13.5	12.1	2,750 J+	16.8	-	-	-	
Residual Range Organics (RRO) - mg/kg	AK 103	10,000	164 J	50.1	26.0^ J-	296 J	60.3	63.2^ J-	61.7	40.6	346	16.9 J	-	-	-	
Volatile Organic Compounds (VOCs)																
Benzene - mg/kg	EPA 8260C	0.025	< 1.75	0.562	0.0267 J-	0.252	0.0607	0.0216 J-	< 0.0192	< 0.0117	< 0.420	0.0176	< 0.0200	< 0.0200	< 0.0200	
Toluene - mg/kg	EPA 8260C	6.5	< 8.74	< 0.0512	0.0120 J-	< 0.601	< 0.0679	0.00712 J-	< 0.0960	< 0.0584	< 2.10	< 0.0838	< 0.100	< 0.100	< 0.100	
Ethylbenzene - mg/kg	EPA 8260C	6.9	8.04 J	0.00922 J	0.0171 J-	0.667	0.0146 J	0.00831 J-	< 0.0960	< 0.0584	2.22	< 0.0838	< 0.100	< 0.100	< 0.100	
Xylenes - mg/kg	EPA 8260C	63	38.3 J	0.0271 J	0.0704 J-	4.18	0.0448 J	0.0306 J-	< 0.576	< 0.0350	9.99 J	0.0402 J	< 0.600	< 0.600	< 0.600	
1,3,5-Trimethylbenzene - mg/kg	EPA 8260C	23	12.4	< 0.0512	0.0117 J-	5.11 J+	< 0.0609	< 0.0475 J-	< 0.0960	< 0.0584	7.16	0.0402 J	< 0.100	< 0.100	< 0.100	
1,2,4-Trimethylbenzene - mg/kg	EPA 8260C	23	43.7	< 0.0512	0.0312 J-	12.1 J+	0.0153 J	0.00902 J-	< 0.0960	< 0.0584	23.0	0.0968	< 0.100	< 0.100	< 0.100	

Notes:

- * = See Appendix D for compounds tested, methods, and laboratory reporting limits
- ** = Soil cleanup level is the most stringent ADEC Method 2 standard listed in Table B1 or B2, 18 AAC 75 (October 2014), for the "under 40 inches (precipitation) zone"
- † = Sample ID number preceded by "17678-" on the chain of custody form
- mg/kg = milligram per kilogram
- = Not applicable or sample not tested for this analyte
- bgs = below ground surface
- ^ = Hydrocarbon pattern on the gas chromatography chromatogram suggests potential biogenic interference
- B = Reported concentration potentially affected by method blank detection; see Laboratory Data Review Checklist in Appendix D for details
- J = Reported concentration is an estimate below the reporting limit.
- J+ = Reported concentration is an estimate (biased high) due to one or more quality control non-conformances. See Laboratory Data Review Checklist in Appendix D in Appendix D for details
- J- = Reported concentration is an estimate (biased low) due a hold time exceedance or a surrogate control recovery failure. See Laboratory Data Review Checklist in Appendix D for details
- 13.5 = Analyte detected in sample at 13.5 mg/kg
- < 0.0200 = Analyte not detected; laboratory reporting limit of 0.0200 mg/kg
- < 1.75 = Sample is not detected at a reporting limit that exceeds the ADEC cleanup level; compound may be present above the cleanup level, but below the reporting limit
- 419 = Reported concentration equals or exceeds the regulated cleanup level

TABLE 4
OCTOBER 2014 AND JANUARY 2015 GROUNDWATER SAMPLE ANALYTICAL RESULTS

Parameter Tested	Method*	Cleanup Level**	Sample ID Number^ and Depth to Groundwater from MP								
			October 2014 Sampling Event				January 2015 Sampling Event				
			Monitoring Wells			Trip Blank	Monitoring Wells				Trip Blank
			MW1 12.74	MW2 13.97	MW12~ 13.97	TB4 -	MW1 9.87	MW11~ 9.87	MW2 10.21	MW12~ 10.21	TB -
Gasoline Range Organics (GRO) - mg/L	AK101	2.2	< 0.100	1.18	1.20	< 0.100	< 0.050	< 0.0500	0.78	1.3	< 0.050
Diesel Range Organics (DRO) - mg/L	AK 102	1.5	1.28	2.10	2.02	-	< 1.0 B	< 1.2 B	2.6	2.7	-
Residual Range Organics (RRO) - mg/L	AK 103	1.1	0.701	0.691	0.760	-	1.2	1.1	1.1	1.2	-
Volatile Organic Compounds (VOCs)											
Benzene - mg/L	EPA 8260C	0.005	0.000340	0.325	0.325	< 0.000200	< 0.00050 B	< 0.00050 B	0.37	0.35	0.00019 J
Toluene - mg/L	EPA 8260C	1.0	< 0.00100	< 0.0001 B	< 0.0001 B	0.000100 J	< 0.0010	< 0.0010	< 0.0010	0.00072 J	< 0.0010
Ethylbenzene - mg/L	EPA 8260C	0.7	< 0.00100	0.00203	0.00205	< 0.00100	< 0.0010	< 0.0010	0.041 J	0.0037	< 0.00010 B
Xylenes - mg/L	EPA 8260C	10	0.000170 J	0.0421	0.0421	< 0.00300	< 0.0010	< 0.0010	0.055	0.052	< 0.0010
1,3,5-Trimethylbenzene - mg/L	EPA 8260C	1.8	< 0.00100	0.0183	0.0188	< 0.00100	< 0.0010	< 0.0010	0.027	0.027	< 0.0010
1,2,4-Trimethylbenzene - mg/L	EPA 8260C	1.8	0.000240 J	0.0611	0.0632	< 0.00100	< 0.0010	< 0.0010	0.092	0.090	< 0.0010

- Notes:
- * See Appendix D for compounds tested, methods, and laboratory reporting limits
 - ** Groundwater cleanup levels are listed in Table C, 18 AAC 75.345 (October 2014)
 - ^ = Sample ID number preceded by "17678-" on the chain of custody form
 - ~ = Field duplicate of preceding sample
 - mg/L = milligrams per liter
 - <0.0100 = Analyte not detected; laboratory reporting limit of 0.0100 mg/L
 - 1.28 = Analyte detected in sample at 1.28 mg/L
 - 2.10 = Reported concentration equals or exceeds the regulated cleanup level
 - B = Reported concentration potentially affected by blank detection; see Laboratory Data Review Checklist in Appendix D for details
 - J = Analyte detected, but at a concentration less than the reporting limit
 - = Sample not tested for this analyte
 - MP = Measuring Point - top of casing

TABLE 5a
OCTOBER 2014 QUALITY CONTROL DATA

Parameter Tested	Primary Sample B06-04	Duplicate Sample B06-04D	Precision (RPD)	Precision QC Limit
Gasoline Range Organics (GRO) - mg/kg	74.7	143	63%	50%
Diesel Range Organics (DRO) - mg/kg	2,530	2,500	1%	50%
Residual Range Organics (RRO) - mg/kg	235	254	8%	50%
Volatile Organic Compounds (VOCs)				
Benzene - mg/kg	0.777	1.36	55%	50%
Toluene - mg/kg	< 0.637	0.106 J	N/A	50%
Ethylbenzene - mg/kg	2.46	3.91	46%	50%
Xylene - mg/kg	11.0	15.2	32%	50%
1,3,5-Trimethylbenzene - mg/kg	3.70	4.58	21%	50%
1,2,4-Trimethylbenzene - mg/kg	12.9	17.0	27%	50%
Parameter Tested	Primary Sample MW2	Duplicate Sample MW12	Precision (RPD)	Precision QC Limit
Gasoline Range Organics (GRO) - mg/L	1.18	1.20	2%	30%
Diesel Range Organics (DRO) - mg/L	2.10	2.02	4%	30%
Residual Range Organics (RRO) - mg/L	0.691	0.760	10%	30%
Volatile Organic Compounds (VOCs)				
Benzene - mg/L	0.325	0.325	0%	30%
Toluene - mg/L	0.00059 B	0.000620 B	N/A	30%
Ethylbenzene - mg/L	0.00203	0.00205	1%	30%
Xylene - mg/L	0.0421	0.0421	0%	30%
1,3,5-Trimethylbenzene - mg/L	0.0183	0.0188	3%	30%
1,2,4-Trimethylbenzene - mg/L	0.0611	0.0632	3%	30%

Notes:

RPD = Relative percent difference

QC = Quality control

63% = RPD exceeds QC limit; associated results are considered estimated concentrations. See LDRC in Appendix D

E = Estimated result due to a relative percent difference failure between the field duplicate and its parent sample

J = Analyte detected, but at a concentration less than the reporting limit

NA = RPD not calculated due to non-detectable results

mg/L = Milligrams per liter

mg/kg = milligrams per kilogram

TABLE 5b
JANUARY 2015 QUALITY CONTROL DATA

Parameter Tested	Primary Sample MW1	Duplicate Sample MW11	Precision (RPD)	Precision QC Limit
Gasoline Range Organics (GRO) - mg/L	< 0.050	< 0.0500	N/A	30%
Diesel Range Organics (DRO) - mg/L	< 1.0 B	1.20 B	N/A	30%
Residual Range Organics (RRO) - mg/L	1.2	1.1	N/A	30%
Volatile Organic Compounds (VOCs)				
Benzene - mg/L	< 0.00050 B	< 0.00050 B	N/A	30%
Toluene - mg/L	< 0.0010	< 0.0010	N/A	30%
Ethylbenzene - mg/L	< 0.0010	< 0.0010	N/A	30%
Xylene - mg/L	< 0.0010	< 0.0010	N/A	30%
1,3,5-Trimethylbenzene - mg/L	< 0.0010	< 0.0010	N/A	30%
1,2,4-Trimethylbenzene - mg/L	< 0.0010	< 0.0010	N/A	30%
Parameter Tested	Primary Sample MW2	Duplicate Sample MW12	Precision (RPD)	Precision QC Limit
Gasoline Range Organics (GRO) - mg/L	0.78	1.3	46%	30%
Diesel Range Organics (DRO) - mg/L	2.6	2.7	4%	30%
Residual Range Organics (RRO) - mg/L	1.1	1.2	9%	30%
Volatile Organic Compounds (VOCs)				
Benzene - mg/L	0.37	0.35	6%	30%
Toluene - mg/L	< 0.0010	0.00072 J	N/A	30%
Ethylbenzene - mg/L	0.041 J	0.0037	N/A	30%
Xylene - mg/L	0.055	0.052	6%	30%
1,3,5-Trimethylbenzene - mg/L	0.027	0.027	0%	30%
1,2,4-Trimethylbenzene - mg/L	0.092	0.090	2%	30%

Notes:

RPD = Relative percent difference

QC = Quality control

46% = RPD exceeds QC limit; associated results are considered estimated concentrations. See LDRC in Appendix D

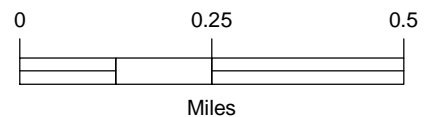
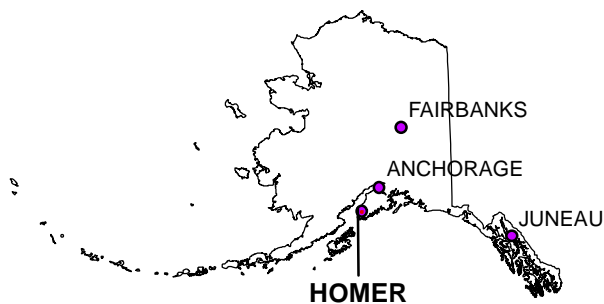
B = Reported concentration potentially affected by blank detection; see Laboratory Data Review Checklist in Appendix D for details


E = Estimated result due to a relative percent difference failure between the field duplicate and its parent sample

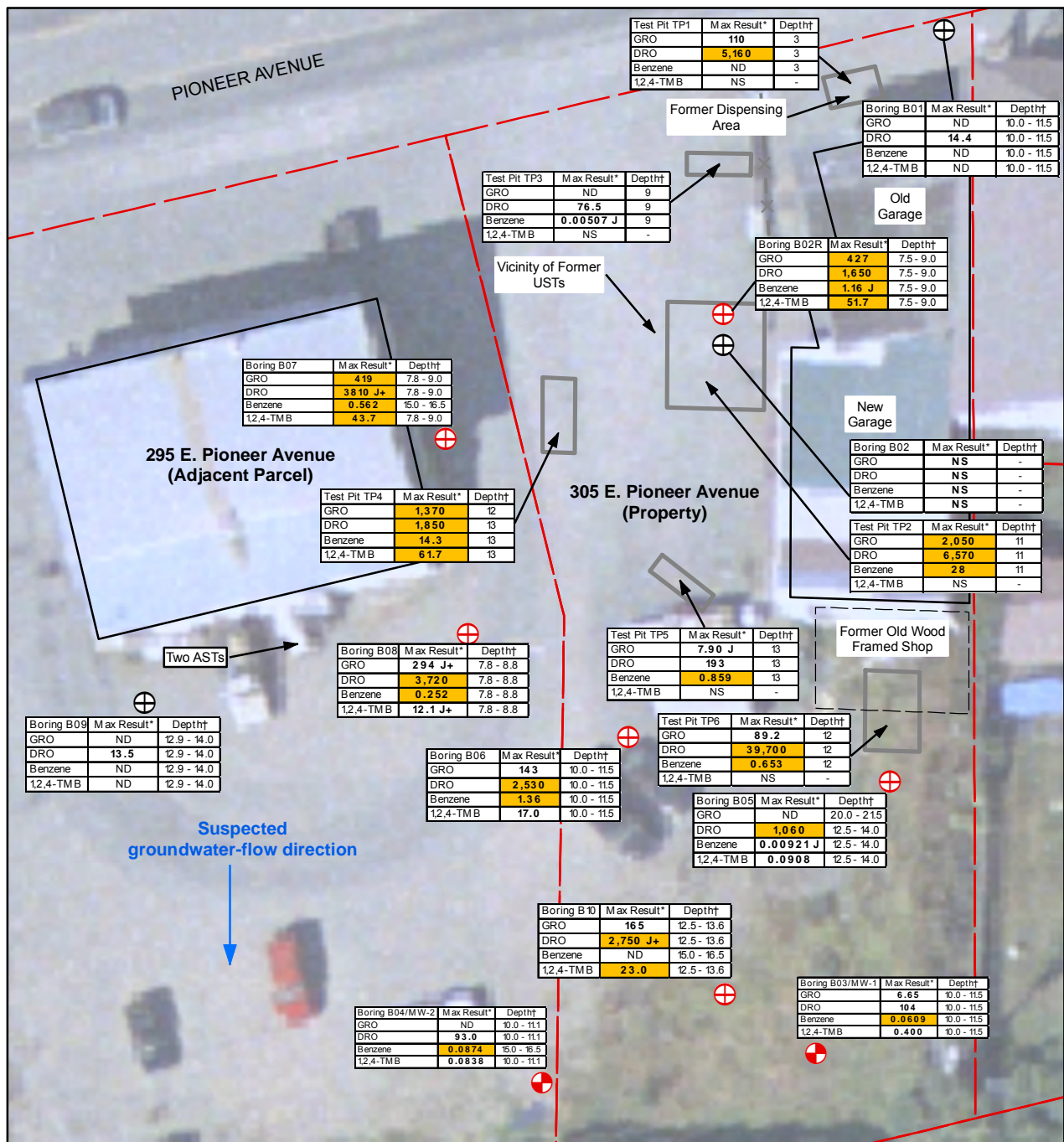
J = Analyte detected, but at a concentration less than the reporting limit

NA = RPD not calculated due to non-detectable results

mg/L = Milligrams per liter



Southcentral Tesoro Homer, Alaska	
VICINITY MAP	
April 2015	32-1-17678
 SHANNON & WILSON, INC. <small>GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS</small>	Figure 1



Legend

- ⊕ SWI 2014 Soil Boring Location; no target analytes were measured at concentrations greater than the most stringent ADEC Method 2 cleanup levels.
- ⊕ SWI 2014 Soil Boring Location; one or more target analytes were measured at concentrations greater than the most stringent ADEC Method 2 cleanup levels.
- ⊕ SWI 2014 Soil Boring Location, completed as Monitoring Well; one or more target analytes were measured at concentrations greater than the most stringent ADEC Method 2 cleanup levels.

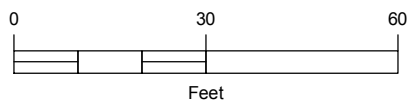
× — × Fence

2011 RSE Test Pit

Former Building

Existing Building

Approximate Property Boundaries



Notes:

Please see Table 3 notes for definitions of data qualifiers

* = Maximum result measured in boring or test pit in milligrams per kilogram

† = Sample depth in feet below ground surface

- = Not applicable

Bold = Analyte detected

Cells Shaded Orange = Result exceeds most stringent ADEC Method 2 cleanup level

ND = Analyte not detected

NS = Sample not collected for this analyte

Southcentral Tesoro
Homer, Alaska

SITE PLAN

April 2015

32-1-17678

SHANNON & WILSON, INC.
GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS

Figure 2

APPENDIX A
SITE PHOTOGRAPHS

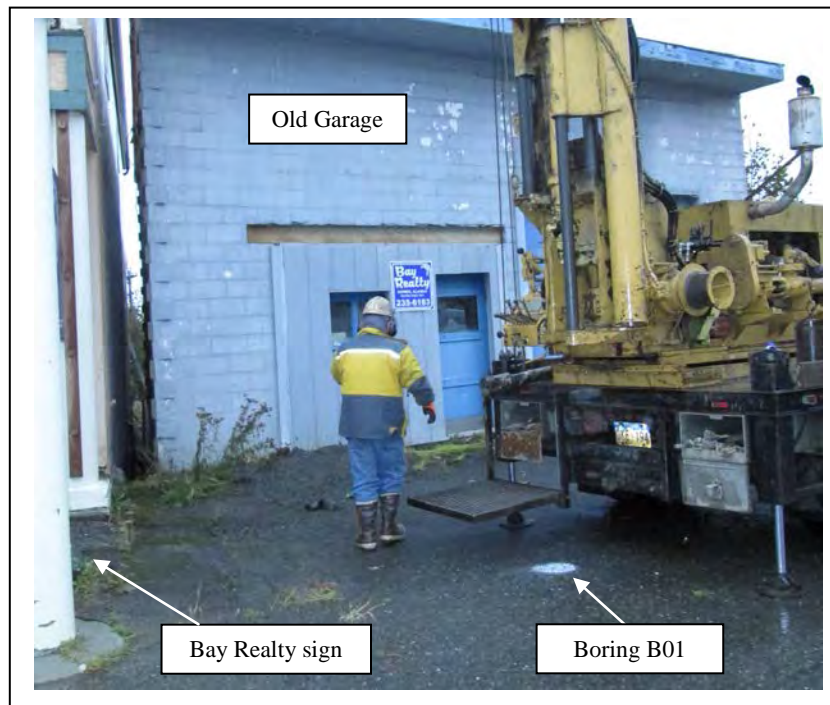


Photo 1: Preparing to advance Boring B01; looking southwest.
(October 20, 2014)



Photo 2: Removing auger from Boring B03, looking east.
(October 23, 2014)

Southcentral Tesoro
Homer, Alaska

PHOTOS 1 AND 2

April 2015

32-1-17678



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A-1



Photo 3: Setting up to advance boring B07; looking southwest.
(October 21, 2014)



Photo 4: Well MW1; looking southeast. (October 24, 2014)

Southcentral Tesoro
Homer, Alaska

PHOTOS 3 AND 4

April 2015

32-1-17678



SHANNON & WILSON, INC.
Geotechnical & Environmental Consultants

A-2

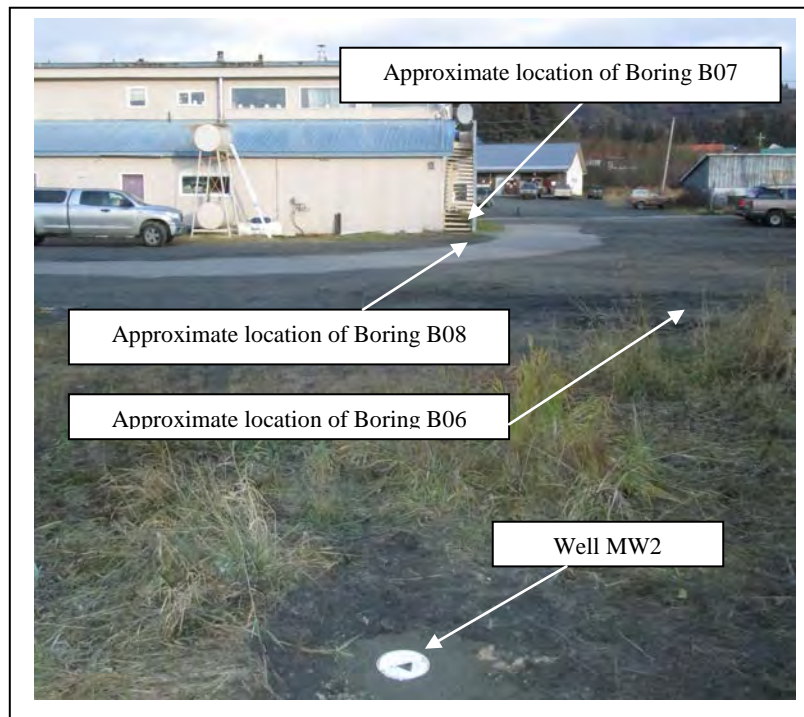


Photo 5: Monitoring Well MW2 and approximate locations of Borings B06, B07, and B08; looking north. (October 24, 2014)



Photo 6: Drums containing soil cuttings stored on the Property; looking north. (October 26, 2014)

APPENDIX B
FIELD NOTES

10/19/14

17678 Homer Tesoro
40s partly cloudy
personnel TAC

1245 pack vehicle
1305 leave SWJ for Homer
1315-1325 gas
1325
1720 arrive Lands End
1750 truck unloaded 5.1 hrs

7:10: calibrate DIO

7:40 mob to site

800: on site

Enstar locator on site

marking lines

805 telephone on site marking locats

820 Enstar/Homer telephone leave site

900 ~~Anchor~~ Homer city → has clear idea of
where sewer lines go w/ 305 bridging

915 call Shayla to tech base, she would like
us to let the drillers know that we are
not 100% sure where sewer line falls &
with CAT should drill cautiously in this area

924 Jesse w/ H2A

- line runs in 3' - 40" deep

- he has good signal, good to drill within 2 feet

935 call Doug Miller HPW

- sewer lines run 5-20' deep

- water lines run 7-10' deep

945 - pictures + mark drill locations

1015 - speak w/ owner + operators of coffee shop. They
would prefer we drill after 11 + not impact
asphalt to minimize disruptions

1100 - call Matt Noyes w/ Discover + confirm
still on track for 1200 start time

1145 Mob w/ Discover on site

1200 - site walkthrough, Matt calls rector for ix to
drill even though not positive where water
& sewer falls on 205 & Pioneer Ave
rector asks to have Shayla call

10/20/14

30s-40s cloudy
ac rain

17678 Tesoro Homer
personnel: TAC

1205 Shayla says she will talk to Kette.
We should move PB-05 south of water
line, not north

1210 talk to woman at Bay Realty front about
- we are drilling on adjacent property
- we would like to have two vehicles on
their property

→ she says this is ok with her, the
Broker will be back in $\approx 1/2$ hr we
can set up, but there is a chance we
will need to move when the broker comes
in

1220 - set up on PB-01
- will begin drilling when Matt gets
or from Ketter

1235 - Check w/ Shayla abt. Decon
- decon all too long

1245 - Scott (nationally (drilling agent) will show me
- where sewer enters building
- we take a look, it is ~~where~~ the water line
- sewer line is the SW end of building w/ no obvious
exit direction
- Scott does not think it goes to pipe (clean at pipe), ^{as present} ~~it~~ maybe
he thinks it goes to SE or SW property line

1330 - call Shayla
- it is OK to stop continuous SS sampling due
to refusal to switch to every 2.5 ft

1430 - can SIM touch base
→ drillers out of tooling + will backfill boring

1700 → SIM phone call

- Paul H. would like us to drill in hottest spot
- No analytical from top 10 ft, but do take
screening
- Start collecting analytical below base of Test pit
+ drill 10-15 ft past contamination based on
SS results
- if you get water, place a well, if not, don't
worry about it, ~~it~~
- stop at 45 ft

- SIM will double check w/ ~~ben~~ w/ Paul on which analyte to follow
- need to drum soils if
- not worried about private locales, Paul not worried

1740 - pack up + demob

1745-1750 gas

1815 - back at hotel + unpacked

1900 - check email for update from Paul + Shayla

clean sample spurs

charge PID

11 hr 17678, 0.7 hr equip repair + maintenance

10/21/14 THZ

17678 Horner TCSOR

30-40° overcast

715 load truck

800 meet Discovery onsite

810 measure out PB-02 in former TP-2

815 attempt to touch base w/ SIM regarding PID, leave message

825 swing trip to PB-01 + PB-02

826 SIM calls - she will send PID

can collect HS samples until new PID arrives, just keep cool.

830 set up on PB-02

845 begin drilling PB-02

0930 call SIM - hit liner at 6.3' in PB-02, TP-02

Should have gone to 11 ft, we may be on edge of hot pit. Decide to move North ~5 ft adjacent to scar in ground → possibly form TP, possibly former stockpile. If not TP, move south of PB-02 + try again. If encounter elevated HS readings in third hole, continue to water or 45 ft or bottom of cont.

945 abandon PB-02, fill w/ bentonite, move 5' north + begin PB-02R

1020 hit contamination at ~8', no liner. Call Shayla → OK to keep drilling this boring even though not at max depth

- 1049 call SIM to let her know saturated soil ~ 12.5 to 13.5.
we saw wet rod at ~ this depth yesterday, but no
saturated soil. possibly plugged sampler? Place screen + let killed water
- 1110 - Matt shows me power line that came up while
removing auger ^{at PB-02R} Not near HSA mark → old
wire?
- 1125 - leave site to pick up PID from airport
- 1135 - retrieve PID from airport
- 1140 - calibrate PID + mob to site
- 1210 - at site
- 1220 - DTW in DB-02R
- 1225 - talk to SIM
- set well at 14', she will talk to Paul + see how
to proceed. Screen water rose to ~9.1' bgs
- 1230 - ~~re-drill~~
SIM calls, Paul would like us to drill to
- 45ft or
- water (he thinks what we found is seasonal) or
- 10-15 ft below cont.
→ whichever is shallower
- 5 ft sampling is OK
- 1240 - ^{then} continue drilling PB-02R
- 1330 - call shayla to let know + 10ft ~~not~~ beyond cont. -
no water at 26.5' She would like
- backfill, no well
- move to PB-07
- check in after PB-07
- 1340 - let coffee shop owner know we are moving to PB-07
- 1400 - backfilled PB-02R to 2' bgs w/ pea gravel + bentonite
chips + pea gravel from 2 ft to surface
move to PB-07
- 1425 - begin drilling at PB-07
- 1540 - call SIM - let her know conditions for 15'
of PB-07. She will call back + let us know
how to proceed
- 1545 - complete PB-07 10' below cont.
- 1630 - text from SIM → move to PB-08 at
current location
- 1645 - Discovery backfills PB-07
- SIM requests we move to PB-08 today +
+ then PB-05 + PB-06. Touch base if conditions
in any of these borings differ from what

we have been seeing

1715- set up on PB-08

1845- Complete ~~backfill~~ PB-08, backfill w/ bentonite

1900- pack up, label drums, leave site

1945- back at hotel & unpacked

10/22/14

17678 Southcentral Texas TCM

TM; 30-40°, clear

8:00 meet Discovery on-site

8:20 set up on PB-05

1050 PB-05 complete, backfill w/ bentonite to 2" bgs, rec
gravel to surface

1125 set up on PB-06

1130 call Steve at A test America, he will send 48
more sample jars for DRO/RKO + GRO/VOCs + MeOH +
1 TB for arrival in Homer ASAP

- touch base w/ SIM → next boring will be along
property line (S) between PB-06 & PB-05, if
cont. in PB-06 will drill through this day, but
likely not Friday

1315 terminate PB-06 at 25 ft & backfill

1330- Steve - is shipping a new type of MeOH w/ additional sample
jars. When shipment comes in, stop using old MeOH &
only use new. Old MeOH has OCC. interfered w/
GRO results. Write "old" on lids & LOC to help
ID jars w/ old type of MeOH.

1430 set up on PB-10 - could not get adjacent to property
line due to sewer cleanout and trees.

1440 refusal at 2' (boulder), move ~~to~~ NEW ~2' & drilled
~~SIM would be~~

1605 let SIM know H₂O at 20.0 ft in PB-10, she says
go ahead & backfill to prevent cross contamination

1645 pick up additional sample jars from airport

1730 leave site

1735 SPB for additional gloves

1800 back at hotel & unpacked

1805 SIM calls w/ plan for tomorrow. Do as much as possible in reasonable work
1. advance ~~well~~ 50-70 ft west of PB-08. South of ~~drill~~

Southwest building corner OK

- ② install well SE 245th 305 & Pioneer property boundary if same conditions as PB-10
- ③ attempt to contact owner of 332 Klondike Ave.
 - do not knock on door alone
 - she will email site access agreement
 - don't spend a lot of time on this, if no one available, move on to next priority

* I let her know central building on 332 Klondike Ave has been deemed, may be vacant lot

- ④ advance boring N of TP4 b/w PB-07 & PB-03
- ⑤ place well ~~South~~ soil boring west of PB-10 & S of PB-8 on 295 & Pioneer Ave. S property boundary. Do this before #4.

* Shayla says OK to start w/ well installation on Monday morning so it will be ready to develop early Friday.

* will not be drilling on Friday, OK if we don't complete tests above
1540 call Matt to let him know the new plan

- 8 am start time
- start w/ ~25' well w/ 10' screen
- 4 additional borings, but OK if we don't get to all tomorrow, just do as much as we can in a reasonable work day.
- they may need to ~~let~~ accompany me to a neighbour's door to try & get site access.

10/23/14

TMR 17088

Southcentral Homer

Tuesdays

700 calibrate PID 306-405 clear

730 at site, Matt + Jurin decorating augers

745 let coffee shop know we will be drilling on their property (295 & Pioneer ave) this afternoon

800 set up on PB-03

830 begin drilling PB-03

930 NO cont. in PB-03, should we still set well 7 SIN will touch base w/ paul + let him know

⑥

- 1103 - SIM instructs to place a well based on P10 readings. As previously discussed, we do not have locate for 322 Klanklike + property has no trespassing signs + no sign of people present. Will not advance boring on this property today.
- 1030 - set well MW-01
- 1140 - well MW-01 complete, move to PB-04 as per 1130 conversation with SIM. Do boring + possible well in SE corner of lot if possible + then boring west of PB-08
- 1205 - begin drilling PB-03
- 1326 - call SIM have water at 15.3', but not seeing saturated soil until 17.5' where should we set the well? - mid point at 15 ft
- 1335 - water sat zone 10-11.5 → could impact layer below. SIM requests well set at from 24-14
- 1340 - begin to set MW-2
- 1540 - Matt leaves site to get additional concrete for to set monument. DTH in well after installation in 11.15' below TOL
- Begin collecting survey ties
- 1615 - Matt back
- 1630 - MW-02 monument set, Matt + Jareh move drums
- 1705 - Set up on PB-09
- 1830 - drilling too became dense/difficult at ~ 20' drill to 25' touch base w/ SIM
- No water
 - No contamination
 - she agrees we can call it
- 1850 - boring backfilled
- 1910 - Site clean + demog

10/24/14

Southern Central Water Tower

Thu 30-40° Clear

- 830 Calibrate YSI + turbidity meter
- 1000 arrive at site collect final
Swing ties
- 1020 curious coffee shop patrons stop to ask what I am
doing + why I am here
- measuring distances to monitoring wells so
we can find in snow etc. ...
- they continue on
- 1035 collect pictures of MWs from various angles to
help locate later
- 1045 set up to develop MW-1
- 1120 call SM - surge block brace in well. Pack up ~~to get~~
fisher, surge supplies
- 1430 surgeblock removed from well, need to build
new block. Spencers closed for inventory, will
return w/ block tomorrow

10/25/14

Southern Central Water Tower

Thu, 30-40°, clear

- 7:15 - calibrate YSI + turbidity meter
- 7:45 - leave for site
- 1030 - replacement surgeblock built, begin development at MW-2
- 1145 - speak w/ SM - well purging day
let recharge to 80% + purge day 3 times
collect sample even if turbid
- 1310 - parameters stable, but water still sed-muddy
SM says ok to sample ^{other} parameters stable
even if still have high turbidity
- well development complete (parameters stable)
 - let well recharge to 80%, raise pump to just below
water + begin low-flow purging until turbidity decreases
- 1420 - MW-2 sampling complete, plus drop move to MW-1
- 1440 - begin development at MW-1
- 1630 - parameters stable, leave site to get gas to let
water recharge + turbidity settle
- 1645 - Set up for sampling
- 1715 - sample MW-1
- 1745 - pickup, site + demo
- 1820 - at hotel + unpacked

FIELD LOG OF BORING

 DRILL COMPANY/DRILLER: Discovery Drilling
 DRILL RIG EQUIPMENT: CMR-75
 DRILLING METHOD: Direct Push / HSA
 HAMMER TYPE: Auto ROD TYPE/DIA.: NW5/2.5"
 HAMMER WEIGHT: 300 HAMMER DROP: 36"
 CASING SIZE/TYPER: 3 1/4 HOLE SIZE: 6"

 JOB NO: 32-1-17678 BORING NO: PB-01
 JOB NAME: Southcentral Texas, Harner
 LOGGED BY: TML
 LOCATION: 245 E Pioneer Ave ELEV.:
 START DATE: 10/20/14 END DATE: 10/20/14
 WEATHER DURING DRILLING: 35-40, light rain

SAMPLE DATA

TIME	SAMP. NO.	DEPTH	FROM	DRIVING	L. REC.	DRILL	CONTACTS /	PID	ENV.	CONST.	FIELD IDENTIFICATION
DATE	TYPE	TO	TO	RESISTANCE	# JARS	ACTION	GROUNDWATER		SAMPLE	%	[Density/consistency, color, Group Name (USCS); moisture; constituent properties (particle size, plasticity, etc.); organics; structure; other; unit name]
1317	01	0.2			2.8			0.0	N	G 40	dk rd br SP w/ Gr; moist;
10/20	DP	5.0		N/A	2					S 60	tr. fines; tr. orgs top 0.2'
										F Tr	
1340	02	5.0			1.5			0.7	N	G 40	Saa; lensed w/ gray to dk
	DP	7.3			2					S 60	brn ML; wood (100%) 7.0-7.3'
										F Tr	
	02	7.3								G 15	7.3-7.5 lt gr SM w/ Gr; moist.
	DP	7.5								S 65	
										F 20	
1350	03	7.5			1.5			0.0	N	G 15	Saa; fr charcoal below 8.7'
	DP	9.0			2					S 65	(< 5 mm diam); oc. red yellow
										F 20	mottling.
	03	9.0								G 15	lt gr w/ mostly red yellow mottling;
	DP	10.0								S 5	ML w/ Gr; moist; little blk
										F 80	charcoal ($< 0.1'$ diam); few lenses
1400	04	10.0			1.5			0.0	Y	G 15	lt gr ML w/ Gr; moist; little
	DP	11.5			2					S 5	blk charcoal ($< 0.1'$ diam);
										F 80	tr organics (roots)
1415	05	11.5			1.5			0.0	N	G 15	Saa; 0.2' dense green-gray m SP
	DP	12.0			2					S 5	at 11.7'
										F 80	

SUMMARY FIELD LOG OF BORING

DEPTH		USCS CLASSIF.	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG
FROM	TO		
0.2	7.3	SP	dark red brown Poorly Graded Sand with gravel; moist; trace fines, trace organics to 0.2'; lensed w/ gray to dk brown ML below 5.0; Peat (fibrous wood) below 7.0'. (Fill)
7.3	9.0	SM	light gray SM w/ gravel; moist; trace charcoal below 8.7' (< 5 mm diam); little red-yellow mottling below 7.5'.
9.0	12.0	ML	light gray ML w/ gravel to gravelly ML; moist; tr orgs (roots) from 10.0-11.5; little ^{blk} charcoal above 11.5'; few lenses vf-f, SP above 10.0'; 0.2' - thick lense of green-

COMMENTS (i.e. materials used, visitors, problems, etc.):

 - 0.2' asphalt
 - refusal w/ DP at 13'; switch to HSA at 11/20

GROUNDWATER DATA

WATER DEPTH	TIME	DATE
Not encountered		
Sat zone	seen on rods 11-12'	

SUMMARY OF TIME AND FOOTAGE

 FOOTAGE: 25 SAMPLES: 13 Attempted
 DRILLED: 13 Recovered
 DRILL/SAMPLE hrs. STANDBY: hrs.
 SETUP/CLEANUP: hrs. WELL INSTALL: hrs.
 OTHER:

 BORING: PB-01 SHEET 1 OF 3

FIELD LOG OF BORING

 DRILL COMPANY/DRILLER: Discovery/Watt
 DRILL RIG EQUIPMENT: CM-75
 DRILLING METHOD: Direct Push/HGA
 HAMMER TYPE: Auto ROD TYPE/DIA.: Nu5/2.5"
 HAMMER WEIGHT: 300 HAMMER DROP: 30"
 CASING SIZE/TYPE: 3 1/4 HOLE SIZE: 6"

 JOB NO: 32-1-17678 BORING NO: PB-01
 JOB NAME: Southcentral Tesoro, Home
 LOGGED BY: TM
 LOCATION: 295 E Pioneer Ave ELEV.:
 START DATE: 10/20/14 END DATE: 10/20/14
 WEATHER DURING DRILLING: 35-40, light rain

SAMPLE DATA

TIME	SAMP. NO.	DEPTH	FROM	DRIVING	L. REC.	DRILL	CONTACTS /	PID	ENV.	CONST.	FIELD IDENTIFICATION
DATE	TYPE	TO	TO	RESISTANCE	# JARS	ACTION	GROUNDWATER		SAMPLE	%	[Density/consistency, color, Group Name (USCS); moisture; constituent properties (particle size, plasticity, etc.); organics; structure; other; unit name]
	05	12.0		N/A					N	G 15	brn to yellow sandy ML w/
	DP	13.0							N	S 20	Gr; moist; vt-f sand.
									N	F 60	
1445	06	13.0			15			0.7	N	G 15	saa; few cobbles
	SS	14.5		20/31/35	2				N	S 20	
									N	F 60	
1455	07	14.5			1.4			0.5	N	G 15	saa
	SS	16.0		23/53/50	2				N	S 20	
									N	F 60	
1505	08	16.0			1.2			0.6	N	G 25	dk gr gravelly ML w/ 10% vt-f sand; moist;
	SS	17.2		34/50/50 for 2"	2				N	S 10	
									N	F 65	
1510	09	17.2			0.9			1.0	N	G 25	saa
	SS	18.0		35/50 for 3"	2				N	S 10	
									N	F 65	
1515	10	18.0			1.2			1.4	N	G 25	saa
	SS	19.5		12/34/50	2				N	S 10	
									N	F 65	
1525	11	19.5			1.4			0.0	N	G 25	saa; 0.3' piece of charcoal
		21.1		12/27/50 for 5"	0				N	S 10	at 20.9'
		20.9			0				N	F 65	

SUMMARY FIELD LOG OF BORING

DEPTH	USCS	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG
FROM	TO	CLASSIF.
		gray medium-to coarse SP at 11.7; mostly red-yellow mottling above 10.0.
12.0	16.0	ML brown to yellow sandy ML w/ gravel; moist; vt-f sand; few cobbles from 13.0-14.5'
16.0	26.5	ML dark gray gravelly ML; moist; 10% vt-f sand; 0.3' piece of charcoal at 20.9'; few pieces of charcoal (< 0.2-thick) from 22.5-23.4

COMMENTS (i.e. materials used, visitors, problems, etc.):

GROUNDWATER DATA

WATER DEPTH	TIME	DATE
See pg 1		

SUMMARY OF TIME AND FOOTAGE

 FOOTAGE: _____ SAMPLES: _____ Attempted
 DRILLED: _____ Recovered
 DRILL/SAMPLE _____ hrs. STANDBY: _____ hrs.
 SETUP/CLEANUP: _____ hrs. WELL INSTALL: _____ hrs.
 OTHER: _____

 BORING: PB-01 SHEET 2 OF 3

FIELD LOG OF BORING

DRILL COMPANY/DRILLER: Discovery/Matt
 DRILL RIG EQUIPMENT: CMG-75
 DRILLING METHOD: Direct push/HGA
 HAMMER TYPE: Act ROD TYPE/DIA.: 1203/2.5"
 HAMMER WEIGHT: 300 HAMMER DROP: 30"
 CASING SIZE/TYPE: 3 1/4 HOLE SIZE: 6"

JOB NO: 37-1-17678 BORING NO: PB-01
 JOB NAME: Southcentral House, 10000
 LOGGED BY: ML
 LOCATION: 295 E Pioneer Ave ELEV.:
 START DATE: 11/20/14 END DATE: 11/20/14
 WEATHER DURING DRILLING: 35-40 F, 10-15 mph

SAMPLE DATA

[illegible]

SUMMARY FIELD LOG OF BORING

[illegible]

COMMENTS (i.e. materials used, visitors, problems, etc.):

GROUNDWATER DATA

WATER DEPTH	TIME	DATE
see pg 1		

SUMMARY OF TIME AND FOOTAGE

FOOTAGE' _____ SAMPLES: _____ Attempted
 DRILLED: _____ Recovered
 DRILL/SAMPLE _____ hrs. STANDBY: _____ hrs.
 SETUP/CLEANUP: _____ hrs. WELL INSTALL: _____ hrs.
 OTHER: _____

BORING: PB-01 SHEET 3 OF 3

FIELD LOG OF BORING

DRILL COMPANY/DRILLER: <u>DISCOVERY</u> DRILL RIG EQUIPMENT: <u>CM2-75</u> DRILLING METHOD: <u>HT HSA</u> HAMMER TYPE: <u>Auto</u> ROD TYPE/DIA.: <u>NUT, 2.5"</u> HAMMER WEIGHT: <u>300</u> HAMMER DROP: <u>3'</u> CASING SIZE/TYPE: <u>4 1/4</u> HOLE SIZE: <u>8"</u>	JOB NO: <u>32-1-17678</u> BORING NO: <u>PB-02</u> JOB NAME: <u>Southcentral Homer Tesor</u> LOGGED BY: <u>TML</u> LOCATION: <u>295 E P. Ocher</u> ELEV.: _____ START DATE: <u>9/10/21/14</u> END DATE: <u>10/21/14</u> WEATHER DURING DRILLING: <u>30-40 overcast</u>
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SAMPLE DATA

TIME	SAMP. NO.	FROM	TO	DRIVING RESISTANCE BLOWS / 6 INCH	L. REC. # JARS	DRILL ACTION	CONTACTS / GROUNDWATER	PID	ENV. SAMPLE	CONST. %	FIELD IDENTIFICATION [Density/consistency, color, Group Name (USCS); moisture; constituent properties (particle size, plasticity, etc.); organics; structure; other; unit name]
9:00	01	2.5		3/3/3	0.8			0.3		G 45	rd brn SP w/ gravel; moist
	SS	4.0			0					S 55	trace fines; fine lenses 2.0'-long
										F Tr	at ML (dk brn w/ tr orgs)
9:05	02	5.0		2/1/3	1.1			2.2		G 45	sga, trace orgs; black plastic
	SS	6.3			0					S 55	lens at 6.3'
										F Tr	
		6.3								G 0	dk rd br ML; moist; strong
		6.5								S Tr	Hc odor
										F 100	
9:20	03	7.5		2/1/1	1.3			25.7		G 30	gr br SP-SM w/ for, for moist
		8.7								S 60	strong Hc odor; tr orgs (pieces
										F 10	of wood 2.0')
		8.7								G 25	gray gravelly ML lenses of
		9.0								S 10	org soil (<0.2' long); moist to
										F 65	v moist; Hc odor
										G	
										S	
										F	
										G	
										S	
										F	

SUMMARY FIELD LOG OF BORING

DEPTH	USCS CLASSIF.	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG
FROM TO		
0.0 0.2		asphalt
0.0 6.3	SP	red brown SP w/ gravel; moist; trace fines; trace organics below 4.5'; few lenses of 2.0'-long dk brn ML w/ trace orgs above 4.5'; black plastic liner at 6.3' (Fill)
6.3 7.0	ML	dark red brown ML; moist; strong Hc odor; trace sand
7.0 8.7	SP-SM	gray-brown SP-SM w/ gravel; moist; strong Hc odor; trace orgs (fibrous)
8.7 9.0	ML	gray gravelly ML; lenses of org soil (<0.2'-long); Hc odor

COMMENTS (risks, hazards, visitors, problems, etc.):

0.2' asphalt
 0-2.5' - same as sample 01
 9.30 abandon hole + backfill w/ bentonite to 2' bgs + pea gravel to surface, may not be in TF 2

GROUNDWATER DATA

WATER DEPTH	TIME	DATE

SUMMARY OF TIME AND FOOTAGE

FOOTAGE: 7.5 SAMPLES: 3 Attempted
 DRILLED: 3 Recovered
 DRILL/SAMPLE _____ hrs. STANDBY: _____ hrs.
 SETUP/CLEANUP: _____ hrs. WELL INSTALL: _____ hrs.
 OTHER: _____

BORING: PB-02 SHEET 1 OF 2

FIELD LOG OF BORING

 DRILL COMPANY/DRILLER: Discovery/Matt
 DRILL RIG EQUIPMENT: 142-75
 DRILLING METHOD: HSR
 HAMMER TYPE: Auto ROD TYPE/DIA.: 1 1/2" / 2.5"
 HAMMER WEIGHT: 300 HAMMER DROP: 3'
 CASING SIZE/TYPER: 4 1/4 HOLE SIZE: 8"

 JOB NO: 32-1-17678 BORING NO: PB-02R
 JOB NAME: Southcentral Water Tower
 LOGGED BY: NAL
 LOCATION: 245 305 E Pioneer Ave ELEV.:
 START DATE: 10/21/2014 END DATE: 10/24/14
 WEATHER DURING DRILLING: 30s-40s Overcast

SAMPLE DATA

TIME	SAMP. NO.	DEPTH	FROM	DRIVING RESISTANCE BLOWS / 6 INCH	L. REC. # JARS	DRILL ACTION	CONTACTS / GROUNDWATER	PID	ENV. SAMPLE	CONST. %	FIELD IDENTIFICATION [Density/consistency, color, Group Name (USCS); moisture; constituent properties (particle size, plasticity, etc.); organics; structure; other; unit name]
DATE	TYPE	TO									
1000	01 R	5.0		8 1/4	1.3			116		G 35	red brown SP w/ gravel; moist; tr orgs (roots)
		6.5								S 65	
										F Tr	
1015	02 R	7.5		4 1/2	0.9			1436	E	G 35	7.5-8.0 SGA
		8.0								S 65	
										F TR	
1031	03 R	9.0								G 70	gray GM; moist; strong H.C. odor; lenses of gr fine sand (v. moist), < 0.3' - thick
		9.0								S TR	
										F 30	
1039	03 R	10.0		1 1/2	1.7	begin to drill hard at 11.0'		1752		G 60	brn GP w sand; moist; tr org. (roots); H.C. odor
		11.0								S 40	
										F Tr	
		11.0								G 50	gr GM w/ sand, v. moist to wet below 11.3, H.C. odor
		11.5								S 20	
										F 90	
1100	04 R	12.5		12 1/2 / 23	0.6			216		G 60	brn GP w/ sand; moist; H.C. odor
		13.5			2					S 40	& sample from this layer
										F Tr	- discontinuous sh. in
		13.5								G 40	gr ML gravelly sil w/ sand; moist; few charcoal (< 0.2' - thick); too rocky for sample → no H.C. odor
		14.0								S 10	
										F 50	

SUMMARY FIELD LOG OF BORING

DEPTH	USCS CLASSIF.	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG
FROM	TO	
0	8.0	SP red brown GP w/ gravel; moist; trace orgs (roots). (Fol)
8.0	13.5	GP Brown GP with sand; moist; very moist from 11.0-11.3, wet from 11.3 to 13.5, tr org. (roots); intercalated w/ 0.5 to 2.0' thick layers of gray GM w/ sand w/ lenses of < 0.3' - long, v. moist lenses of fine sand, H.C. odor, sh. in below 12.5'.
13.5	26.5	ML gray to dark gray below 14.5'; gravelly ML w/ sand; moist; few charcoal (< 0.2' - thick)

COMMENTS (i.e. materials used, visitors, problems, etc.):

- 0-5' same as 6.0-6.5 in B02
 terminate boring at 13.40 + backfill w/ bentonite to 2' bgs + pea gravel to surface
 down soil cuttings below 6.0'

GROUNDWATER DATA

WATER DEPTH	TIME	DATE
sat soil	11.3 - 13.5	

SUMMARY OF TIME AND FOOTAGE

FOOTAGE: 25 SAMPLES: 7 Attempted
 DRILLED: 7 Recovered
 DRILL/SAMPLE _____ hrs. STANDBY: _____ hrs.
 SETUP/CLEANUP: _____ hrs. WELL INSTALL: _____ hrs.
 OTHER: _____

BORING: PB-02R SHEET 1 OF 2

FIELD LOG OF BORING

DRILL COMPANY/DRILLER: Discovery/Matt
DRILL RIG EQUIPMENT: CMG-75
DRILLING METHOD: HAST
HAMMER TYPE: Auto ROD TYPE/DIA.: NWJ/2.5"
HAMMER WEIGHT: 300 HAMMER DROP: 30"
CASING SIZE/TYPE: 4 1/4 HOLE SIZE: 8"

JOB NO: 32-1-17678 BORING NO: PB-02R
JOB NAME: Southcentral Humer Texas
LOGGED BY: ML
LOCATION: 305 G Pioneer Ave ELEV.:
START DATE: 10/21/14 END DATE: 10/21/14
WEATHER DURING DRILLING: 30-46 Overcast

SAMPLE DATA

[illegible]

SUMMARY FIELD LOG OF BORING

[illegible]

COMMENTS (i.e. materials used, visitors, problems, etc.):

- place well screen at 14' to see if water fills bearing. Water rises to 9.1' bgs in 1.5 hr

- abandon hole at 1400 + backfill w/ bentonite to 2' bgs & new gravel to surface

GROUNDWATER DATA

WATER DEPTH	TIME	DATE
perched	larger H.3-	13.5

SUMMARY OF TIME AND FOOTAGE

FOOTAGE: _____ SAMPLES: _____ Attempted
 DRILLED: _____ Recovered
 DRILL/SAMPLE _____ hrs. STANDBY: _____ hrs.
 SETUP/CLEANUP: _____ hrs. WELL INSTALL: _____ hrs.
 OTHER: _____

BORING: BB19.R SHEET 2 OF 2

FIELD LOG OF BORING

DRILL COMPANY/DRILLER: <u>Mart/Jareth/Discov</u> DRILL RIG EQUIPMENT: <u>CAGE-75</u> DRILLING METHOD: <u>HSD</u> HAMMER TYPE: <u>Auto</u> ROD TYPE/DIA.: <u>NWT 7.5"</u> HAMMER WEIGHT: <u>300</u> HAMMER DROP: <u>30"</u> CASING SIZE/TYPER: <u>4 1/4</u> HOLE SIZE: <u>8"</u>	JOB NO: <u>32-7-7678</u> BORING NO: <u>PB-03</u> JOB NAME: <u>Southern Central Horner Feas</u> LOGGED BY: <u>TPL</u> LOCATION: <u>305 E Pioneer Ave</u> ELEV.: <u></u> START DATE: <u>10/23/14</u> END DATE: <u>10/23/14</u> WEATHER DURING DRILLING: <u>30-40 clear</u>
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SAMPLE DATA

TIME	SAMP. NO.	DEPTH	FROM	DRIVING RESISTANCE BLOWS / 6 INCH	L. REC. # JARS	DRILL ACTION	CONTACTS / GROUNDWATER	PID	ENV. SAMPLE	CONST. %	FIELD IDENTIFICATION [Density/consistency, color, Group Name (USCS); moisture; constituent properties (particle size, plasticity, etc.); organics; structure; other; unit name]
DATE	TYPE	TO	TO								
840	01	2.5		1/2/1	0.6			15.3		G 90	rd br SP-SM w/ gravel; moist;
	SS	4.0			2					S 50	tr orgs (roots < 1 mm); few
										F 10	lenses < 0.2' thick of red brn
											ML
855	01	5.0		2/1/1	1.1			0.4		G 10	rd br ML w/ sand; moist; tr
	SS	6.5			2					S 10	charcoal < 0.05' thick
										F 80	
910	03	7.5			1.3			0.0		G 0	gr w/ few red-yellow mottling;
	SS	9.0		1/2/2	2					S 25	ML w/ sand; trace charcoal
										F 75	< 0.5' thick; moist
915	04	10.0		1/2/3	1.5			38.6	E	G 20	dk gr SM w/ gravel; moist;
	SS	10.7			2					S 50	vf-f sand
										F 30	
		10.7								G 0	rd brn ML w/ few red-yellow
										S 20	mottling; ML w/ sand; moist; vf-f
		11.3								F 80	sand; few organics (fibrous wood
											+ roots < 0.3 mm thick)
		11.3								G 15	gr w/ few red-yellow mottling;
										S 15	ML w/ sand; moist; tr charcoal
		11.5								F 70	< 0.5' thick
925	05	12.5		1/3/4	1.1			1.8		G 0	gr br ML; wet; + sand
		13.6			0					S 10	
										F 40	

SUMMARY FIELD LOG OF BORING

DEPTH	USCS CLASSIF.	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG
FROM	TO	
0.0	0.3	OL dk brn OL to red, moist; some to mixing grass + roots (topsoil)
0.3	1.5	ML dk gray gravelly ML w/ sand; moist
1.5	4.5	SP-SM red brn SP-SM w/ gravel; moist; tr orgs (roots < 1 mm); few lenses of 0.2' thick red brown ML (FND)
4.5	8.0	ML red brown ML w/ sand; moist; trace charcoal < 0.05' thick
8.0	9.5	ML gray w/ few red-yellow mottling; ML w/ sand; trace moisture; trace charcoal < 0.5' thick
9.5	10.7	SM dk gray w/ gravel; moist; vf-f sand

COMMENTS (i.e. materials used, visitors, problems, etc.):

0.0-0.3 dk brn OL to red, moist; some to mostly grass + roots.
 0.3-1.5 dk gray gravelly ML w/ sand 30/20/45
 1.5-2.5 same as 01
 1030 place well cut w/ 7.5 SP

GROUNDWATER DATA

WATER DEPTH	TIME	DATE
12-18.5	saturated	3/10/15
11.9 to 10.0	at 11:15 w/ draw water	

SUMMARY OF TIME AND FOOTAGE

FOOTAGE	17.5	SAMPLES:	7	Attempted
DRILLED:			7	Recovered
DRILL/SAMPLE	hrs.	STANDBY:	hrs.	
SETUP/CLEANUP:	hrs.	WELL INSTALL:	hrs.	
OTHER:				

BORING: PB-03 SHEET 1 OF 2

FIELD LOG OF BORING

DRILL COMPANY/DRILLER: <u>Matt/Discovery</u> DRILL RIG EQUIPMENT: <u>CMR-75</u> DRILLING METHOD: <u>HSA</u> HAMMER TYPE: <u>A20</u> ROD TYPE/DIA.: <u>1.5"</u> HAMMER WEIGHT: <u>300</u> HAMMER DROP: <u>110"</u> CASING SIZE/TYPER: <u>4 1/4</u> HOLE SIZE: <u>8"</u>	JOB NO: <u>32-17678</u> BORING NO: <u>PB-03</u> JOB NAME: <u>Southwestern Hunter Test</u> LOGGED BY: <u>THL</u> LOCATION: <u>305 E Pioneer Ave.</u> ELEV.: _____ START DATE: <u>10/23/14</u> END DATE: <u>10/23/14</u> WEATHER DURING DRILLING: <u>20-40 Clear</u>
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SAMPLE DATA

TIME	SAMP. NO.	FROM	TO	DRIVING RESISTANCE BLOWS / 6 INCH	L. REC. # JARS	DRILL ACTION	CONTACTS / GROUNDWATER	PID	ENV. SAMPLE	CONST. %	FIELD IDENTIFICATION (Density/consistency, color, Group Name (USCS); moisture; constituent properties (particle size, plasticity, etc.); organics; structure; other; unit name)
		13.6								G 50	gy GP-GM w/ sand; wet;
		14.0								S 40	
		15.0		2 1/5	1.5			1.1		G 50	gy sand; wet
		16.3			0					S 40	
		16.3								F 10	
		16.5								G 15	gy w. tr. red-yellow mottling; wet;
		16.5								S 10	all w/ gravel; 1/2" sand;
		16.5								F 75	tr charcoal 1/2"-thick pieces
		17.5		2 3/4	1.4			2.2		G 15	saa - wet; most below 19.5;
		19.0			0					S 10	charcoal layer 18.7-19.0
										F 75	
										G	
										S	
										F	
										G	
										S	
										F	
										G	
										S	
										F	

SUMMARY FIELD LOG OF BORING

DEPTH	USCS CLASSIF.	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG
FROM TO		
10.7 11.3	ML	red brown w/ few red-yellow mottling; ML w/ sand; moist; 1/2" sand; few small (fibrous) wood & roots
11.3 12.0	ML	gray w/ few red-yellow mottling; heavily silty w/ sand; moist; tr charcoal 1/2"-thick
12.0 13.6	ML	gy brown ML, wet
13.6 16.3	GP-GM	gray GP-GM w/ sand; wet
16.3 19.0	ML	gray w/ trace red-yellow mottling; ML w/ gravel; wet; to almost below 19.5' tr charcoal 1/2"-thick 100% charcoal below 18.7'

COMMENTS (i.e. materials used, visitors, problems, etc.):

GROUNDWATER DATA

WATER DEPTH	TIME	DATE

SUMMARY OF TIME AND FOOTAGE

FOOTAGE _____	SAMPLES: _____	Attempted _____
DRILLED: _____		Recovered _____
DRILL/SAMPLE _____ hrs.	STANDBY: _____	hrs.
SETUP/CLEANUP: _____ hrs.	WELL INSTALL: _____	hrs.
OTHER: _____		



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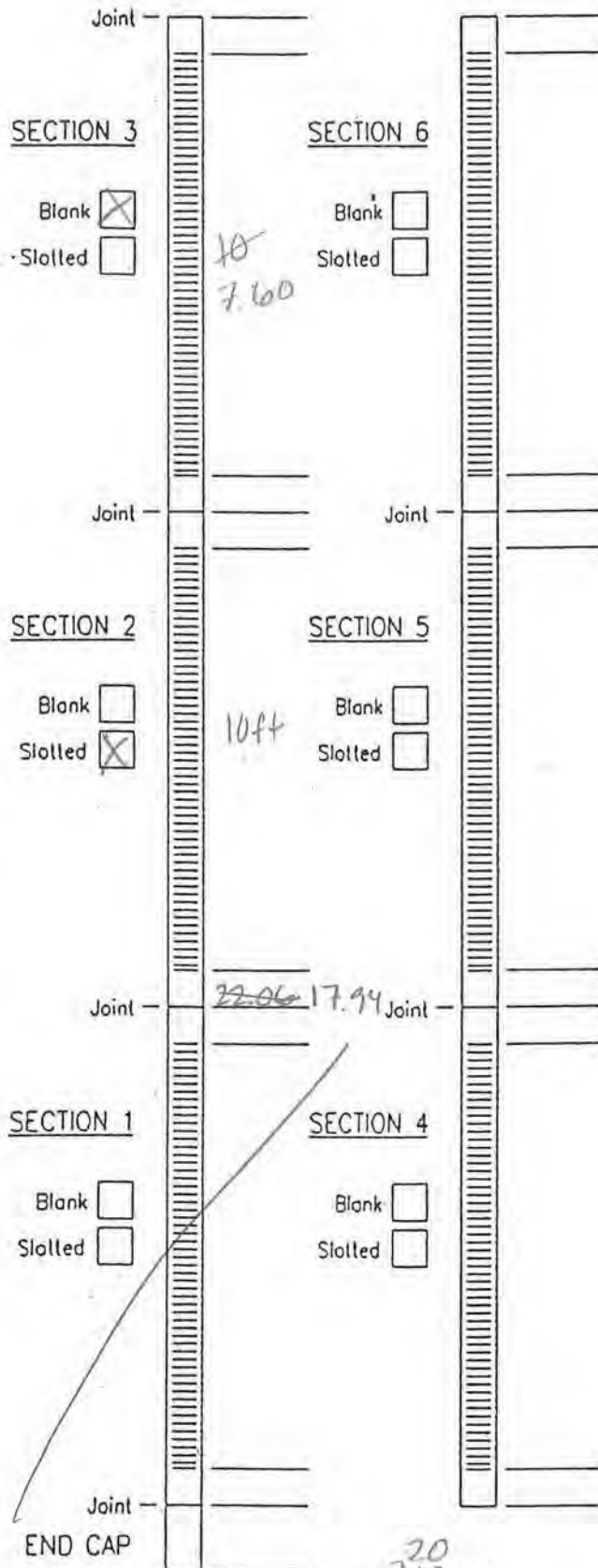
MONITORING WELL CONSTRUCTION DETAILS

Monitoring Well Number MW-01

Job Number 32-1-17678

Date Installed 10/23/14

Engineer or Geologist TAL



WELL DATA:

Pipe Type: PVC ☒
Stainless steel ☐
Other _____
Diameter: 2" ☒
4" ☐
Other _____
Slot size: 0.010 ☒
0.020 ☐
Other _____

SEALS:

	Depth below ground surface	
	From	To
Bentonite:	<u>5.5</u>	<u>1.7</u>
Clean airings	<u>1.7</u>	<u>0.8</u>
Cement:	<u>0.8</u>	<u>0.0</u>

MONUMENTS:

Flush mount ☒ Post ☐
Description 0.5' diam steel
Depth below surface 0
Stickup 0

JOINTS:

Type threaded

Pin end : Down ☐
Up ☒

SAND PACK:

Type or gradation 40/20 Colorado silica sand
Depth: From BOB To 5.5'

LOCKS: Type standard

Key number 2001

Length cutoffs, last section: cutoff = 2.40
last section = 7.60

Well stickup - 0.34

FIELD LOG OF BORING

DRILL COMPANY/DRILLER: Discovery/Matt
 DRILL RIG EQUIPMENT: CME-75
 DRILLING METHOD: HSA
 HAMMER TYPE: W20 ROD TYPE/DIA.: 1.5"/2.5"
 HAMMER WEIGHT: 200 HAMMER DROP: 30"
 CASING SIZE/TYPE: 4 1/4 HOLE SIZE: 8"

JOB NO: 32-1-7678 BORING NO: PB-04
 JOB NAME: South Central Huber Woods
 LOGGED BY: DAI
 LOCATION: 295 S Pioneer Ave ELEV.:
 START DATE: 10/23/14 END DATE: 10/23/14
 WEATHER DURING DRILLING: 30-40 Clear

SAMPLE DATA

TIME	SAMP. NO.	DEPTH	FROM	DRIVING RESISTANCE BLOWS / 6 INCH	L. REC. # JARS	DRILL ACTION	CONTACTS / GROUNDWATER	PID	ENV. SAMPLE	CONST. %	FIELD IDENTIFICATION [Density/consistency, color, Group Name (USCS); moisture; constituent properties (particle size, plasticity, etc.); organics; structure; other; unit name]
DATE	TYPE	TO	TO								
1225	01	2.5		2/4/4	1.1			0.7		G 15	rd brn ML w/ gravel; moist.
	SS	3.7			2					S 10	few orgs (roots & 1 mm),
										F 75	vc-f sand.
		3.7								G 20	dk red brn SM w/ gravel; moist;
		4.0								S 45	vt-f sand
										F 35	
1235	02	5.0		1 1/2	1.4			0.3		G 15	dk red brn ML w/ gravel; moist.
	SS	6.5			2					S 30	vc-f sand; trace wood (2.0-4.0)
										F 55	mostly fibrous wood from
											5.0-5.3
1310	03	7.5		1 1/2	0.8			1.6		G 60	dk gr GP w/ sand; moist to
	SS	7.9			2					S 40	v. moist;
										F Tr	
		7.9								G 5	gr ML w/ sand; moist; tr
		9.0								S 20	red-yellow mottling;
										F 75	
1345	04	10.0		2 1/2	1.3			14.2		G 30	rd br SM w/ gravel; moist to
	SS	11.5			2					S 40	wet below 11.1; trace orgs
										F 30	(roots 1 mm)
1330	05	12.5		1 1/2	1.5	Full spoon		14.0		G 0	dk red brn to red brown; moist
	SS	14.0			2					S 5	OL; few orgs (wood +
										F 15	roots < 3 mm). OL w/ sand
											below 13.8 10/15/85).

SUMMARY FIELD LOG OF BORING

DEPTH	USCS CLASSIF.	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG
FROM	TO	
0.0	2.3	OL; dk red brown OL to peat; moist;
		same to mostly roots + grass
2.3	3.7	ML; red-brown ML w/ gravel; moist;
		few orgs (roots < 1 mm) (Fill)
3.7	4.5	SM; dk red brown SM w/ gravel; moist;
4.5	7.0	ML; dk red brown sandy ML w/ gravel;
		moist; trace orgs; mostly fibrous
		wood from 5.0 to 5.3.
7.0	7.9	GP; dk gr GP w/ sand; moist to
		v. moist.
7.9	9.5	ML; gray ML w/ sand; moist; trace
		red yellow mottling;
9.5	12.0	SM; red brown SM w/ gravel; moist to
		wet below 11.1; trace orgs.

COMMENTS (i.e. materials used, visitors, problems, etc.):

0.0-2.3 dk red brn OL to peat; moist;
 same to mostly roots + grass
 2.3-2.5 same as 01
 placed LW-2 in boring at ~1345

GROUNDWATER DATA

WATER DEPTH	TIME	DATE
Saturated	Soil ~ 11.1 - 12.0	
Water at 15.3' w/ DW	at 1330	

SUMMARY OF TIME AND FOOTAGE

FOOTAGE: 20.0 SAMPLES: 08 Attempted
 DRILLED: 08 Recovered
 DRILL/SAMPLE _____ hrs. STANDBY: _____ hrs.
 SETUP/CLEANUP: _____ hrs. WELL INSTALL: _____ hrs.
 OTHER: _____

6724
721**FIELD LOG OF BORING**DRILL COMPANY/DRILLER: Leatt/DiscoveryDRILL RIG EQUIPMENT: CNC-75DRILLING METHOD: HSAHAMMER TYPE: AutoROD TYPE/DIA.: 1.50/2.5HAMMER WEIGHT: 300HAMMER DROP: 30"CASING SIZE/TYPE: 4 1/4HOLE SIZE: 8"JOB NO: 32-1-7678BORING NO: PB-04JOB NAME: Southcentral TexasLOGGED BY: TALLOCATION: 245 E Pioneer AveELEV.: START DATE: 10/23/14END DATE: 10/23/14WEATHER DURING DRILLING: clear, 30-40**SAMPLE DATA**

TIME	SAMP. NO.	DEPTH	FROM	DRIVING RESISTANCE	L. REC.	DRILL ACTION	CONTACTS / GROUNDWATER	PID	ENV. SAMPLE	CONST. %	FIELD IDENTIFICATION
DATE	TYPE	TO	TO	BLOWS / 6 INCH	# JARS						[Density/consistency, color, Group Name (USCS); moisture; constituent properties (particle size, plasticity, etc.); organics; structure; other; unit name]
1245	06	15.0			1.0			6.0	E	G 30	gray w/ tr red-yellow mottling
		16.2			2					S 40	SM w/ Gravel; v. moist; lens wet
		16.2								F 30	SP w/ sand (SS/US/Tr) at 15.9-16.1
		16.5								G 0	Light gray CH; moist
		16.5								S 0	
		16.5								F 100	
1255	07	17.5		3/5/5	0.8			12.0		G 20	gray w/ fine red-yellow mottling
	35	19.0			0					S 45	SM w/ gravel; wet; fine fibrous organics (fragments of wood < 2 mm wide)
	08	20.0			1.4					F 35	gray SP; wet; fine sand
1320	08	20.5		3/8/21	0			6.1		G 0	
		20.5								S 45	
		20.5								F 5	
		20.8								G 15	gray ML w/ gravel; moist to v. moist
		20.8								S 10	
		20.8								F 75	
		21.5								G	gray SM w/ gravel; wet; Tr. charcoal < 2 mm long pieces
		21.5								S	
		21.5								F	

SUMMARY FIELD LOG OF BORING

DEPTH		USCS CLASSIF.	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG
FROM	TO		
12.0	14.5	OL	dark red brown, OL; moist, OL w/ sand (0/15/85) below 13.8'
14.5	16.2	SM	gray w/ tr. red-yellow mottling, SM w/ Gravel; v. moist; lens of wet SP w/ sand (SS/US/Tr) at 15.9 to 16.1'
16.2	17.0	CH	Light gray CH; moist.
17.0	19.5	SM	gray w/ red-yellow mottling, SM w/ gravel; wet; fine fibrous organics
19.5	20.5	SP	gray SP; wet; fine sand.
20.5	20.8	ML	gray ML w/ gravel; moist to v. moist
20.8	21.5	SM	gray SM w/ gravel; wet; Tr. charcoal < 2 mm diam.

COMMENTS (i.e. materials used, visitors, problems, etc.):

GROUNDWATER DATA

WATER DEPTH	TIME	DATE

SUMMARY OF TIME AND FOOTAGE

FOOTAGE _____ SAMPLES: _____ Attempted
DRILLED: _____ Recovered

DRILL/SAMPLE _____ hrs. STANDBY: _____ hrs.

SETUP/CLEANUP: _____ hrs. WELL INSTALL: _____ hrs.

OTHER: _____

BORING: PB-04 SHEET 2 OF 2



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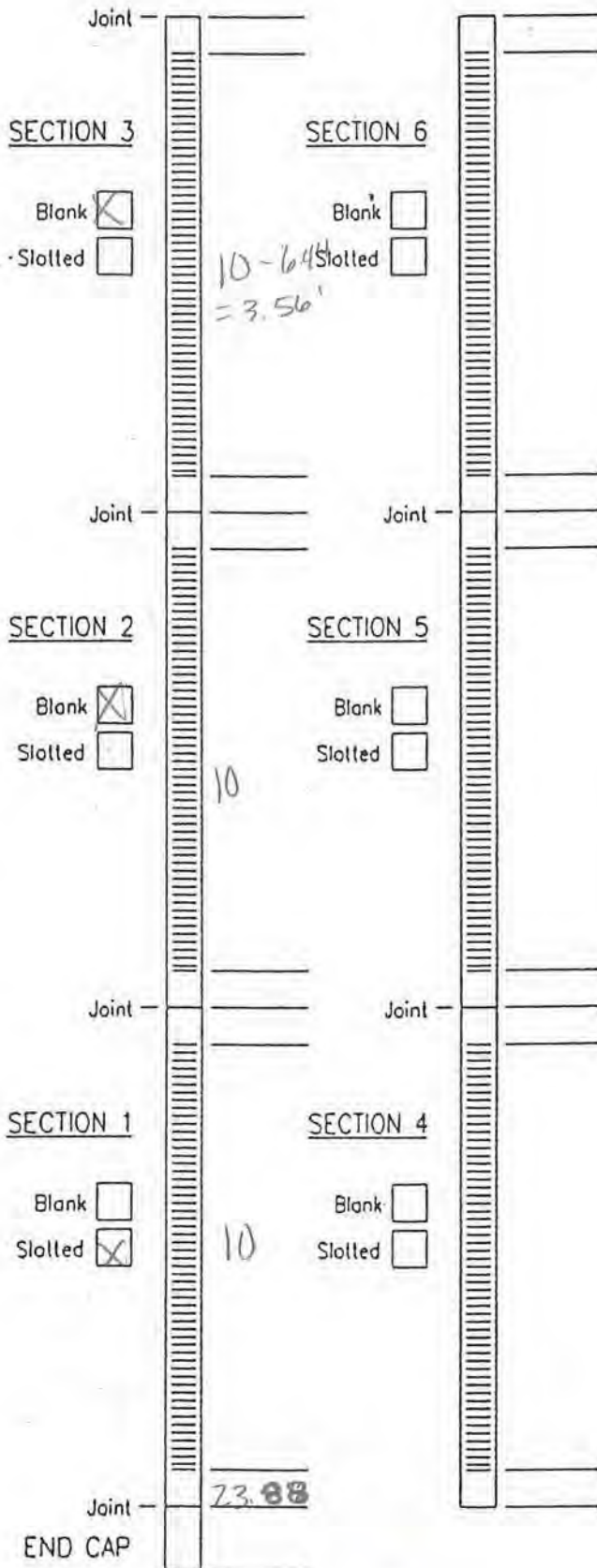
MONITORING WELL CONSTRUCTION DETAILS

Monitoring Well Number MW-2

Job Number 32-1-17678

Date Installed 10/23/14

Engineer or Geologist TW



WELL DATA:

Pipe Type: PVC ☒
Stainless steel ☐
Other _____

Diameter: 2" ☒
4" ☐
Other _____

Slot size: 0.010 ☒
0.020 ☐
Other _____

SEALS:

	Depth below ground surface	
	From	To
Bentonite:	<u>13</u>	<u>2</u>
Cuttings	<u>2</u>	<u>0.8</u>
Cement:	<u>0.0</u>	<u>0.8</u>

MONUMENTS:

Flush mount ☒ Post ☐
Description 0.5' - Galv steel
Depth below surface 0'
Stickup 0

JOINTS:

Type threaded

Pin end : Down ☐
Up ☒

SAND PACK:

Type or gradation 20/40 Colorado silica
Depth: From B08 To 13'

LOCKS: Type standard

Key number 2001

Length cutoffs, last section: cutoff 5.40 + 1.04 = 6.44

last section: 3.36

Well stickup - 0.32

FIELD LOG OF BORING

 DRILL COMPANY/DRILLER: Discovery/Matt
 DRILL RIG EQUIPMENT: CR18-75
 DRILLING METHOD: HSA
 HAMMER TYPE: 300 ROD TYPE/DIA.: AWO/1.5"
 HAMMER WEIGHT: Auto HAMMER DROP: 36"
 CASING SIZE/TYPER: 3 1/4 HOLE SIZE: 6'

 JOB NO: 82-1-17687 BORING NO: PB-05
 JOB NAME: Southcentral Home Town
 LOGGED BY: DR
 LOCATION: 245 305 E Pioneer St ELEV.:
 START DATE: 10/21/14 END DATE: 10/21/14
 WEATHER DURING DRILLING: 30-40 clear

SAMPLE DATA

TIME	SAMP. NO.	FILED	FROM	DRIVING	L. REC.	DRILL	CONTACTS /	PID	ENV.	CONST.	FIELD IDENTIFICATION
DATE	TYPE	TO	TO	RESISTANCE	# JARS	ACTION	GROUNDWATER		SAMPLE	%	[Density/consistency, color, Group Name (USCS); moisture; constituent properties (particle size, plasticity, etc.); organics; structure; other; unit name]
835	01	2.5		2/2/1	0.9			0.0		G 30	dk br sandy ML w/ gr; moist;
	SS	4.0			2					S 30	trace organics (roots & wood)
										F 40	(moist)
945	02	5.0		1/2/1	1.3			0.3		G 30	SSA
	SS	6.5			2					S 30	
										F 110	
855	03A	7.5		1/2/5	1.5			2.0		G 20	gray ML w/ gravel; moist;
	SS	8.8			2					S 5	trace organics (roots & wood);
										F 75	mild HC odor below 8.6'
	03B	8.8						22.2		G 20	dk gray SP w/ gravel; moist;
	SS	9.0			0					S 80	f-m sand; strong HC odor
										F Tr	
905	04	10.0		1/1/1	1.3	9' sandys		10.7		G 20	Sa, HC odor
		10.2				rocky				S 80	
										F Tr	
		10.2				11.5-12.5 wet				G Tr	br to dk brn ML; moist to
						rocks				S 10	v. moist below 11.2' - low
		11.5								F 90	orgs (roots & wood); some red
920	05	12.5		1/2/1	1.2			12.9		G Tr	dk brn to dk org soil 2.0' thick
	SS	14.0			2					S 10	HC odor
										F 90	HC odor

SUMMARY FIELD LOG OF BORING

DEPTH		USCS CLASSIF.	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG
FROM	TO		
0.0	0.4	OL	organic top soil
0.4	7.0	ML	dk brown sandy ML w/ gravel; moist, trace organics (roots & wood) (F.I.D.)
7.0	8.8	ML	Gray ML w/ gravel; moist; trace organics (<2 mm); mild HC odor below 8.6'
8.8	10.2	SP	dk gray SP w/ gravel; moist; Strong HC odor
10.2	14.5	ML	brown to dk brown to gray below 12.0; moist, v. moist from 11.2-12.0; few orgs above 12.0; few charcoal 10.3' long below 12.0'; little lenses of dk brn to blk

COMMENTS (i.e. materials used, visitors, problems, etc.):

84-25 same as 01
 04- organic top soil w/ grass mat
 footing filled w/ water at ~20' No
 evidence of sat. soil in 20-21.5' sample

GROUNDWATER DATA

WATER DEPTH	TIME	DATE
Saturated	Zone ~ 11.5-12.5	
	no sign. on footing	

SUMMARY OF TIME AND FOOTAGE

 FOOTAGE: _____ SAMPLES: _____ Attempted
 DRILLED: _____ Recovered
 DRILL/SAMPLE _____ hrs. STANDBY: _____ hrs.
 SETUP/CLEANUP: _____ hrs. WELL INSTALL: _____ hrs.
 OTHER: _____

 BORING: PB-05 SHEET 1 OF 2



JOB NO: 32-1-17687 BORING NO: PB-05
 JOB NAME: Southcentral Homer Terson
 LOGGED BY: TML
 LOCATION: 305 E Pioneer Ave ELEV.:
 START DATE: 10/21/14 END DATE: 10/21/14
 WEATHER DURING DRILLING: 30-40 clear

[illegible][illegible]

drill to 27.5 & drive split spoon to
confirm water

1050 terminate boring + backfill
to 2 ft bgs w/ bentonite

WATER DEPTH	TIME	DATE

FOOTAGE: 27.5 SAMPLES: 9 Attempted
 DRILLED: 9 Recovered
 DRILL/SAMPLE _____ hrs. STANDBY: _____ hrs.
 SETUP/CLEANUP: _____ hrs. WELL INSTALL: _____ hrs.
 OTHER: _____

BORING: PB-05 SHEET 2 OF 2

FIELD LOG OF BORING

 DRILL COMPANY/DRILLER: Discovery / Matt
 DRILL RIG EQUIPMENT: CMR-75
 DRILLING METHOD: HSA
 HAMMER TYPE: Auto ROD TYPE/DIA.: NW0/25"
 HAMMER WEIGHT: 300 HAMMER DROP: 30"
 CASING SIZE/TYPER: 3 1/4 HOLE SIZE: 6"

 JOB NO: 32-1-17678 BORING NO: PB-06
 JOB NAME: Southcentral Home Tunn
 LOGGED BY: TAL
 LOCATION: 305 E Pioneer Ave ELEV.:
 START DATE: 10/22/14 END DATE: 10/22/14
 WEATHER DURING DRILLING: 30-40, Clear

SAMPLE DATA

TIME	SAMP. NO.	DEPTH	FROM	DRIVING RESISTANCE BLOWS / 6 INCH	L. REC. # JARS	DRILL ACTION	CONTACTS / GROUNDWATER	PID	ENV. SAMPLE	CONST. %	FIELD IDENTIFICATION [Density/consistency, color, Group Name (USCS); moisture; constituent properties (particle size, plasticity, etc.); organics; structure; other; unit name]
1140	2.5	0.0			1.5					G 40	Gr SP-SM w/ gravel; moist;
	4.0	5.5		5/12/8	2			2.4		S 50	F-m sand; red-brown above 2.9 ft
										F 10	
1145	5.0	0.2			1.5					G 15	SM w/ gravel; red brown;
	6.5	0.5		2/2/3	2			30.4		S 45	moist; trace orgs (roots < 2mm)
										F 46	
1150	7.5	0.3			1.2					G 25	Gr SM w/ gravel; moist; f sand;
	8.8	5.5		5/4/5	2+amp			324.5		S 40	tr. orgs (roots < 3mm); HC odor;
										F 35	0.2' wood sat. w/ product at 8.4'
	8.6				1.5					G 30	Full spm
	9.0									S 10	Gr SM w/ little red-yellow;
										F 46	gravelly ML w/ sand; tr. orgs (roots < 1mm); HC odor
1210	10.0	0.4			1.3					G 30	Gr SP w/ gravel; moist; sat
	11.1	5.5		11/10	2+amp			347		S 70	w/ product; f-m sand; trace
										F Tr	charcoal L 0.11'-long; str HC odor
	11.1									G	dk brn organic soil (OL); moist;
	11.5									S	some organic (wood pieces
										F 95	L 0.3' long); peat above 11.3;
											strong HC odor
1230	5A/SB	12.5			1.4	SA 12.5-13.7	SA 10.6-13.7			G 0	Gr ml w/ some red-yellow mottling;
		14.0		11/2	2 + 5B 13.7-14.0	SB 49.5				S 10	moist wet from 12.6-13.0' from 13.0'
										F 90	+ 13.4' few charcoal L 0.1'-long; 0.2'-foot

SUMMARY FIELD LOG OF BORING

DEPTH	USCS CLASSIF.	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG
FROM TO		
0.0 4.5	SP-SM	gray SP-SM w/ gravel; moist; red-brown above 2.9' (Fill)
4.5 8.6	SM	red-brown to gray below 7.0' SM w/ gravel; moist; tr. orgs (roots < 3 mm); 0.2' foot piece of wood saturated w/ product at 8.4'; HC odor below 7.0'
8.6 9.5	ML	gray w/ little red-yellow mottling; gravelly ML w/ sand; trace orgs (roots < 1 mm); HC odor
9.5 11.1	SP	Gr SP w/ gravel; moist; trace charcoal L 0.11'-diam; strong HC odor & saturated w/ product
11.1 12.0	OL	dk brn OL; moist; peat above 11.3

COMMENTS (i.e. materials used, visitors, problems, etc.):

0-2.5 red-brn SP-SM w/ gravel; moist; f-m sand.

GROUNDWATER DATA

WATER DEPTH	TIME	DATE
Sat Soil	12.6-13.0	

SUMMARY OF TIME AND FOOTAGE

 FOOTAGE: 25.0 SAMPLES: 07 Attempted
 DRILLED: 06 Recovered
 DRILL/SAMPLE _____ hrs. STANDBY: _____ hrs.
 SETUP/CLEANUP: _____ hrs. WELL INSTALL: _____ hrs.
 OTHER: _____

 BORING: PB-06 SHEET 1 OF 2

FIELD LOG OF BORING

DRILL COMPANY/DRILLER: Discovery/Matt

DRILL RIG EQUIPMENT: CMG-75

DRILLING METHOD: 15A

HAMMER TYPE: Auto ROD TYPE/DIA.: 110J/2.5

HAMMER WEIGHT: 360 HAMMER DROP: 36"

CASING SIZE/TYPE: 3' 1/4 HOLE SIZE: 10"

JOB NO: 32-1-171078 BORING NO: BB-06

JOB NAME: Southcentral Tego's Homer

LOGGED BY: TAL

LOCATION: 205 E Pioneer Ave · ELEV.: 1000

START DATE: 10/22/14 END DATE: 10/27/14

WEATHER DURING DRILLING: 30-46 clear

SAMPLE DATA

[illegible]

SUMMARY FIELD LOG OF BORING

DEPTH		USCS CLASSIF.	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG
FROM	TO		
			Strong HC odor.
12.0	14.5	ML	^{Dr} Gray ML w/ some red-yellow mottling; moist; wet from B.O.-13.4; few charcoal 2.0"-diam; 0.2-foot-thick layer of fine SP at 12.7'; HC odor above 13.7.
14.5	26.1	ML	^{Dr} Gray gravelly ML w/ sand; moist.

COMMENTS (i.e. materials used, visitors, problems, etc.):

1315 turn waste bank + backfill w/
bentonite to 2' bgs. + pec gravel
+ clean cuttings to surface

GROUNDWATER DATA

WATER DEPTH	TIME	DATE

SUMMARY OF TIME AND FOOTAGE

FOOTAGE _____ SAMPLES: _____ Attempted
DRILLED: _____ Recovered

DRILL/SAMPLE hrs. STANDBY: hrs.

SETUP/CLEANUP: hrs. WELL INSTALL: hrs.

OTHER: _____ /

BORING: PB-1 SHEET 7 OF 2

FIELD LOG OF BORING

 DRILL COMPANY/DRILLER: Discovery/Matt
 DRILL RIG EQUIPMENT: CM 4-75
 DRILLING METHOD: HSA
 HAMMER TYPE: Auto ROD TYPE/DIA.: 1 1/2" / 2.5"
 HAMMER WEIGHT: 300 HAMMER DROP: 30"
 CASING SIZE/TYPE: 3 1/4 HOLE SIZE: 6"

 JOB NO: 32-1-7678 BORING NO: PB-07
 JOB NAME: Southcentral Home Teras
 LOGGED BY: 295 E Pioneer Ave
 LOCATION: Tm ELEV.:
 START DATE: 10/21/11 END DATE: 10/21/14
 WEATHER DURING DRILLING: 30s + 40s overcast

SAMPLE DATA

TIME	SAMP. NO.	FROM	TO	DRIVING RESISTANCE BLOWS / 6 INCH	L. REC. # JARS	DRILL ACTION	CONTACTS / GROUNDWATER	PID	ENV. SAMPLE	CONST. %	FIELD IDENTIFICATION
DATE	TYPE	TO	TO								[Density/consistency, color, Group Name (USCS); moisture; constituent properties (particle size, plasticity, etc.); organics; structure; other; unit name]
1435	01	2.5		414/3	1.3			6.1		G 45	dk red br gravelly SP, moist
		2.8								S 55	
										F Tr	
		2.8			1.2/1					G 15	gr w/ dk red yellow mottling
		4.0								S 50	SM w/ gravel; moist; vt. f sand
										F 35	
1445	02	5.0		3/4/3	1.4			5.5		G 15	sag
		6.5								S 50	
										F 35	
1455	03A	7.5		3/3/3	1.5					G Tr	dk brn. ML; moist; tr orgs
		7.8						14.6		S 0	loose
										F 100	
500	03B	7.8						4.5		G 5	gr SP; moist; HC odor; Tr
		8.3								S 95	gravel; HC odor; tr orgs (wood fragments); 0.4' thick
										F Tr	wood root at 8.3'
		8.7								G 0	dk br OL, organic soil; moist; strong HC odor; trace orgs (nuts, L 1mm)
		9.0								S 0	
										F 100	
1505	04	10.0		4 1/5/3	1.5			19.4		G 0	lt gr brown ML to gray w/ yellow mottling; moist to v. moist; no orgs (nuts, wood); no pieces of gr f-m sand
		10.4								S 0	
										F 100	HC odor, L 1mm

SUMMARY FIELD LOG OF BORING

DEPTH	USCS CLASSIF.	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG
FROM	TO	
0.0	0.3	OL Organic soil w/ grass mat (topsoil)
0.3	2.8	SP dk red brown gravelly SP, moist (fill)
2.8	7.0	SM gr w/ little red-yellow mottling; SM w/ gravel, moist
7.0	7.8	ML red brown ML, moist; tr orgs (nuts)
7.8	8.7	SP gray SP; moist; trace organics (wood fragments); 0.4' thick wood root at 8.3'; HC odor
8.7	9.5	OL dk brn OL; moist; tr orgs (nuts L 1mm); strong HC odor
9.5	10.4	ML loose, light gray brn to gray w/ red-yellow mottling; ML; moist to v. moist; little orgs (nuts)

COMMENTS (i.e. materials used, visitors, problems, etc.):

0.3' top soil w/ grass mat
 0.32.5 same as sample 01

GROUNDWATER DATA

WATER DEPTH	TIME	DATE
Water seen on today	2:40-10:00	10/21/11
		logs

SUMMARY OF TIME AND FOOTAGE

FOOTAGE: 22.5 SAMPLES: 08 Attempted
 DRILLED: 08 Recovered
 DRILL/SAMPLE _____ hrs. STANDBY: _____ hrs.
 SETUP/CLEANUP: _____ hrs. WELL INSTALL: _____ hrs.
 OTHER: _____

BORING: PB-07 SHEET 1 OF 2

FIELD LOG OF BORING

 DRILL COMPANY/DRILLER: Discovery / Matt
 DRILL RIG EQUIPMENT: CML-75
 DRILLING METHOD: HSA
 HAMMER TYPE: Auto ROD TYPE/DIA.: NWA / 2 1/2"
 HAMMER WEIGHT: 300 HAMMER DROP: 30"
 CASING SIZE/TYPER: 3 1/4 HOLE SIZE: 6"

 JOB NO: 32-1-7678 BORING NO: PB-07
 JOB NAME: Sautcherthal Hammer Test
 LOGGED BY: TAL
 LOCATION: 295 2 Pioneer Ave ELEV.:
 START DATE: 10/21/14 END DATE: 10/21/14
 WEATHER DURING DRILLING: 30-40 Overcast

SAMPLE DATA

TIME	SAMP. NO.	DEPTH	FROM	DRIVING	L. REC.	DRILL	CONTACTS /	PID	ENV.	CONST.	FIELD IDENTIFICATION
DATE	TYPE	TO	TO	RESISTANCE	# JARS	ACTION	GROUNDWATER		SAMPLE	%	[Density/consistency, color, Group Name (USCS); moisture; constituent properties (particle size, plasticity, etc.); organics; structure; other; unit name]
		10.5								G 40	GM w/ sand; gray; moist to v moist
		11.5								S 30	tr red-yellow mottling; trace
										F 20	orgs (roots < 2mm); HC odor
1320	05A	12.5		4 1/3 / 11	1.5			79.8		G 20	gr ML moist to v moist; tr
		12.9								S 30	orgs (roots < 2mm); HC
										F 40	odor
1540	05B	12.9						17.2		G 40	GM, gr w/ red-yellow mottling
		13.7								S 10	above 13.1; few charcoal
										F 30	above 13.1; moist
1540		13.7								G 0	gr SP; moist to wet below
		14.0		11/14/24						S 100	13.8; f sand.
										F 17	
1550	06	15.0		11/14/24				12.0		G 30	gr ML, moist; trace
		16.5			2					S 25	gravelly ML w/ sand; moist; gray
										F 45	
1600	07	20.0		50 for 5"	0.4			9.4		G 30	sac
		21.5			0					S 25	
										F 45	
1627	08	22.5		16/50 for 5"		refusal at ~ 22.5"		4.2		G	22.5-23.0 sac gravel; trace
		23.9				Matt will clean up rig & drive spoon here				S	23.0-23.9 gray, CH w/ gravel; moist;
										F	cobbles &/or boulders (drill action); 95/100

SUMMARY FIELD LOG OF BORING

DEPTH		USCS CLASSIF.	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG
FROM	TO		
			wood, little lenses of gr f-m sand w HC odor 20.3' - 20.7'
10.0	11.5	GM	gray GM w/ sand; moist to v moist; tr red-yellow mottling; trace organics; HC odor
11.5	12.9	ML	MD, gray ML w/ gravel; moist to v moist; tr. orgs (roots < 2mm); HC odor
12.9	13.7	GM	MD, gray; GM; ^{w/ red-yellow mottling above 13.1} few charcoal above 13.1'; moist
13.7	14.5	SP	MD, gr, SP, moist to wet below 13.8
14.5	23.0	ML	VD, gray, gravelly ML w/ sand; moist
23.0	23.9	CH	VD, gray, gravelly CH; moist; cobbles or boulders (drill action)

COMMENTS (i.e. materials used, visitors, problems, etc.):

1600 complete boring, backfill w/ bentonite to 2' bag & pea gravel to surface

GROUNDWATER DATA

WATER DEPTH	TIME	DATE

SUMMARY OF TIME AND FOOTAGE

 FOOTAGE DRILLED: _____ SAMPLES: _____ Attempted
 _____ Recovered
 DRILL/SAMPLE _____ hrs. STANDBY: _____ hrs.
 SETUP/CLEANUP: _____ hrs. WELL INSTALL: _____ hrs.
 OTHER: _____

 BORING: PB-07 SHEET 2 OF 2

FIELD LOG OF BORING

DRILL COMPANY/DRILLER: <u>Disarray / Matt</u> DRILL RIG EQUIPMENT: <u>449-75</u> DRILLING METHOD: <u>HSA</u> HAMMER TYPE: <u>Avh</u> ROD TYPE/DIA.: <u>1.5/1.5"</u> HAMMER WEIGHT: <u>300</u> HAMMER DROP: <u>30"</u> CASING SIZE/TYPER: <u>3 1/4</u> HOLE SIZE: <u>6"</u>	JOB NO: <u>32-1-17678</u> BORING NO: <u>PB-08</u> JOB NAME: <u>Southcentral Tesoro Home</u> LOGGED BY: <u>TML</u> LOCATION: <u>295 E Pioneer Ave</u> ELEV.: _____ START DATE: <u>10/21/14</u> END DATE: <u>10/21/14</u> WEATHER DURING DRILLING: <u>30-40 overcast</u>
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SAMPLE DATA

TIME	SAMP. NO.	DEPTH	FROM	DRIVING RESISTANCE	L. REC.	DRILL ACTION	CONTACTS / GROUNDWATER	PID	ENV. SAMPLE	CONST. %	FIELD IDENTIFICATION
DATE	TYPE	TO	TO	BLOWS / 6 INCH	# JARS						[Density/consistency, color, Group Name (USCS); moisture; constituent properties (particle size, plasticity, etc.); organics; structure; other; unit name]
1725	01	2.5		8/5/4	1.3			0.9		G 45	red brown SP w/ gravel; moist; tr. orgs (pieces of wood < 0.1")
		2.9			2			4.8		S 55	
		2.9								F Tr	
		4.0						6.0		G 30	or Ht gravelly ML; moist; tr. charcoal up to 0.3'-long
										S 20	
										F 40	
1731	02	5.0		3/2/3	1.4			6.0		G 20	sa. oc red-yellow w/ mottling
	SS	4.5			2					S 10	
										F 70	
1742	03A	1.5		1/1/3	7.5			22.5		G 20	sa.
	SS	2			7.8					S 10	
										F 90	
1750	03B	1			7.8			29.5		G 20	gr SP w/ gravel; moist; strong HC odor 1 sheeh. sat w/ product 8.6-8.8'
	SS	2			8.8					S 80	
										F 100	
	03B	1			8.8					G 0	dk brn to blk. Peat; moist; strong HC odor; mostly organics (fibrous wood frags).
	SS				9.0					S 0	
										F 100	
1803	SS	1.5		1/0/1	10.0			65.8		G	dk br org. soil (OL); moist; lenses gray f. sand up to 0.5' long above 11.0'; tr roots (< 1mm); HC odor
	04	2			11.5					S	
										F 100	

SUMMARY FIELD LOG OF BORING

DEPTH	USCS CLASSIF.	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG
FROM	TO	
0.0	2.1	SP red brn SP w/ gravel; moist; tr. orgs (fibrous wood).
2.9	7.4	ML L gray, gravelly ML; moist; tr. charcoal < 0.3'-diam; little
7.8		red yellow mottling from 4.5-7.0'
7.4	9.8	SP L gray, SP w/ gravel; moist; str. HC odor & smen. product estimated 8.6-8.8'
8.8	9.5	PT dk brn to blk. Peat; moist; mostly fibrous organics; str. HC odor.
9.5	12.0	OL VL dk brn (OL); moist; tr. roots (< 1mm); lenses of gray, f. SP up to 0.5'-long above 11.0'; HC odor.
12.0	14.5	
12.0	14.6	ML L gray, ML; moist to v. moist; tr. charcoal up to 0.3'-diam;

COMMENTS (i.e. materials used, visitors, problems, etc.):

0-2.5 Same as 35 01
 1845 terminate boring & backfill w/ bentonite to 2' bays & clean cuttings / pea gravel to surface

GROUNDWATER DATA

WATER DEPTH	TIME	DATE

SUMMARY OF TIME AND FOOTAGE

FOOTAGE 25.0 SAMPLES: 08 Attempted
 DRILLED: 08 Recovered
 DRILL/SAMPLE _____ hrs. STANDBY: _____ hrs.
 SETUP/CLEANUP: _____ hrs. WELL INSTALL: _____ hrs.
 OTHER: _____

BORING: PB-08 SHEET 1 OF 2

FIELD LOG OF BORING

DRILL COMPANY/DRILLER: Discovery/Matt
DRILL RIG EQUIPMENT: CMG-75
DRILLING METHOD: HSA
HAMMER TYPE: Auto ROD TYPE/DIA.: NW5/25"
HAMMER WEIGHT: 300 HAMMER DROP: 30"
CASING SIZE/TYPE: 3 1/4 HOLE SIZE: 6"

JOB NO: 32-1-17678 BORING NO: PR-08
 JOB NAME: Southcentral Homes Tracto
 LOGGED BY: M
 LOCATION: 295 E Pioneer Ave ELEV.:
 START DATE: 10/21/14 END DATE: 10/21/14
 WEATHER DURING DRILLING: 30-40 overcast

SAMPLE DATA

[illegible]

SUMMARY FIELD LOG OF BORING

[illegible]

COMMENTS (i.e. materials used, visitors, problems, etc.):

abandon hole, ~ 1850 + bauxite
w/ bentonite to 2' bgs +
pen gravel to surface

GROUNDWATER DATA

WATER DEPTH	TIME	DATE
Saturated zone ~11.5		5-12-5
as seen on boring		

SUMMARY OF TIME AND FOOTAGE

FOOTAGE: _____ SAMPLES: _____ Attempted
 DRILLED: _____ Recovered
 DRILL/SAMPLE _____ hrs. STANDBY: _____ hrs.
 SETUP/CLEANUP: _____ hrs. WELL INSTALL: _____ hrs.
 OTHER: _____

BORING: PB-08 SHEET 2 OF 2

FIELD LOG OF BORING

DRILL COMPANY/DRILLER: <u>Matt / Discovery</u> DRILL RIG EQUIPMENT: <u>CME-75</u> DRILLING METHOD: <u>ASA</u> HAMMER TYPE: <u>Auto</u> ROD TYPE/DIA.: <u>M15/2.5"</u> HAMMER WEIGHT: <u>200</u> HAMMER DROP: <u>30"</u> CASING SIZE/TYPER: <u>3 1/4</u> HOLE SIZE: <u>6"</u>	JOB NO: <u>32-1-18674</u> BORING NO: <u>PB-09</u> JOB NAME: <u>Homer Tesoro Sathicent's d</u> LOGGED BY: <u>TAL</u> LOCATION: <u>295 E Pioneer Ave</u> ELEV.: <u></u> START DATE: <u>11/23/10</u> END DATE: <u>10/23/14</u> WEATHER DURING DRILLING: <u>30-40° clear</u>
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SAMPLE DATA

TIME	SAMP. NO.	FROM	TO	DRIVING RESISTANCE BLOWS / 6 INCH	L. REC. # JARS	DRILL ACTION	CONTACTS / GROUNDWATER	PID	ENV. SAMPLE	CONST. %	FIELD IDENTIFICATION [Density/consistency, color, Group Name (USCS); moisture; constituent properties (particle size, plasticity, etc.); organics; structure; other; unit name]
1715	01	2.5		4/4/4	1.3			0.1		G 30	lt gr gravelly ML; moist; red brown below 3.7' little
	SS	4.0			2					S 10	organics below 3.7' (pieces of wood < 0.1' long)
1725	02	5.0		1/7/1	0.8			0.6		G 30	red brown gravelly ML; moist; trace organics (nuts < 2mm);
	SS	8.5			2					S 10	0.3' OL dk brown (S/D) at 5.0' w/ trace orgs (nuts & wood piece up to 4mm)
1735	03	7.5		2/2/2	1.5			2.4		G 20	red brown gravelly ML; moist; trace orgs (nuts & pieces of wood up to 4mm)
	SS	9.0			0					S 10	
1745	04	10.0		2/1/2	1.5			2.5		G 0	dk brn OL; moist; few orgs; pieces of wood up to 0.2' long;
	SS	11.5			2					S 0	0.1'-thick layer of peat at 10.0' (mostly fibrous wood) 0.2' layer SM at 10.1' (0.7-0.30) of sand
1755	05	12.5		2/5/3	1.5			5.8		G 0	lt gr SP-SM; wet; f-m sand
	SS	12.9			2					S 90	
		12.9								F 10	
		14.0								G 0	lt gr all red-yellow mottling (tr); moist; fine w/ sand; f-m sand; trace orgs (nuts < 2mm); trace charcoal up to 0.1'-long;
										S 25	
										F 75	
1805	06	15.0		3/2/14	0.9			6.0		G Tr	dk gr SM; v. moist; fr gravel; trace charcoal up to 2mm long; f sand.
		16.5			2					S 80	
										F 70	

SUMMARY FIELD LOG OF BORING

DEPTH FROM	TO	USCS CLASSIF.	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG
0.0	2.0	SP	red-brown SP w/ gravel; moist; few organics (nuts)
2.0	9.5	ML	light gray to red brown below 3.7' gravelly ML; moist; trace orgs below 3.7' (wood & nuts). 0.3'-thick layer of OL at 5.0'.
9.5	12.0	OL	L, dk brn OL; moist; few orgs; 0.1'-thick layer of peat at 10.0'; 0.2'-thick layer of SM at 10.1'.
12.0	12.9	SP-SM	L, light gray SP-SM; wet; f-m sand
12.9	14.5	ML	L, light gray w/ red-yellow mottling; moist; trace orgs (nuts < 2mm); trace charcoal up to 0.1'-diam

COMMENTS (i.e. materials used, visitors, problems, etc.):

0-2.2 red-brown SP w/ gravel; moist; few orgs (nuts); 1.9-10.0 Tr 2.0-2.5 same as OL

GROUNDWATER DATA

WATER DEPTH	TIME	DATE

SUMMARY OF TIME AND FOOTAGE

FOOTAGE: 26.5 SAMPLES: 09 Attempted
 DRILLED: 09 Recovered
 DRILL/SAMPLE _____ hrs. STANDBY: _____ hrs.
 SETUP/CLEANUP: _____ hrs. WELL INSTALL: _____ hrs.
 OTHER: _____

BORING: PB-09 SHEET 1 OF 2

FIELD LOG OF BORING

DRILL COMPANY/DRILLER: Discovery Drilling
 DRILL RIG EQUIPMENT: CMR-75
 DRILLING METHOD: HSA
 HAMMER TYPE: 300A ROD TYPE/DIA.: 1.25
 HAMMER WEIGHT: Auto HAMMER DROP: 30"
 CASING SIZE/TYPE: 3 1/4 HOLE SIZE: 6"

JOB NO: 32-1-17678 BORING NO: PB-09
 JOB NAME: Soxhential Home Treoro
 LOGGED BY: THZ
 LOCATION: 295 E Pioneer Ave ELEV.:
 START DATE: 10/23/14 END DATE: 10/23/14
 WEATHER DURING DRILLING:

SAMPLE DATA

TIME	SAMP. NO.	FROM	DRIVING	L. REC.	DRILL	CONTACTS /	PID	ENV.	CONST.	FIELD IDENTIFICATION
DATE	TYPE	DEPTH	RESISTANCE	# JARS	ACTION	GROUNDWATER		SAMPLE	%	(Density/consistency, color, Group Name (USCS); moisture; constituent properties (particle size, plasticity, etc.); organics; structure; other; unit name)
	07	17.5	12/18/23	1.5			0.0		G 20	gr. gravelly HL w/ sand, moist
	SS	19.0		2					S 20	2-4" sand: trace charcoal
									F 50	up to 0.3' thick
	08	20.0	40/50 for 3"	1.5			0.2		G 30	SSC
	SS	21.5		2					S 20	
									F 50	
	09	25.0	36/50 for 3"	1.5	full spoon		0.0		G Tr	gr. SM, moist, to gravel
	SS	26.5		2					S 80	2-4" sand: tr charcoal
									F 20	up to 0.2' thick: charcoal
										trace 26.2 - 26.5
									G	
									S	
									F	
									G	
									S	
									F	
									G	
									S	
									F	
									G	
									S	
									F	

SUMMARY FIELD LOG OF BORING

DEPTH		USCS CLASSIF.	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG
FROM	TO		
14.5	17.5	SM	MD, gray SM; moist, to gravel, trace charcoal & 3mm-diameter
17.5	22.7	ML	MD-VD, gr, gravelly ML w/ sand; moist; trace charcoal up to 0.3'-thick
22.7	26.5	SM	VD, gray SM; moist, to gravel; tr charcoal up to 0.2'-diam; lense of charcoal from 26.2-26.5

COMMENTS (i.e. materials used, visitors, problems, etc.):

WATER DEPTH	TIME	DATE

SUMMARY OF TIME AND FOOTAGE

FOOTAGE: 26.5 SAMPLES: 09 Attempted
 DRILLED: 09 Recovered
 DRILL/SAMPLE _____ hrs. STANDBY: _____ hrs.
 SETUP/CLEANUP: _____ hrs. WELL INSTALL: _____ hrs.
 OTHER: _____

BORING: PB-09 SHEET 1 OF 2

FIELD LOG OF BORING

 DRILL COMPANY/DRILLER: Discovery Drilling/Hoff
 DRILL RIG EQUIPMENT: CNG-75
 DRILLING METHOD: HSA
 HAMMER TYPE: Auto ROD TYPE/DIA.: NW/25"
 HAMMER WEIGHT: 300 HAMMER DROP: 30"
 CASING SIZE/TYPE: 3 1/4 HOLE SIZE: 6"

 JOB NO: 32-1-17678 BORING NO: PB-10
 JOB NAME: Homer Teoro
 LOGGED BY: TAL
 LOCATION: 305 E Pioneer Ave ELEV.:
 START DATE: 10/22/14 END DATE: 10/22/14
 WEATHER DURING DRILLING: 40's clear

SAMPLE DATA

TIME	SAMP. NO.	IN	FROM	DRIVING	L. REC.	DRILL	CONTACTS /	PID	ENV.	CONST.	FIELD IDENTIFICATION
DATE	TYPE	OUT	TO	RESISTANCE	# JARS	ACTION	GROUNDWATER		SAMPLE	%	[Density/consistency, color, Group Name (USCS); moisture; constituent properties (particle size, plasticity, etc.); organics; structure; other; unit name]
1450	01		2.5	3/8/4	1.3			1.7		G 35	red brown SP-SM; moist; trace
			4.0		2					S 45	organics (roots < 1mm); few lenses
										F 10	ML (red brown) (< 1/2" long);
											Tr lenses blk OL (16/0.1' long)
1500	02		5.0	5/4/2	1.5			1.9		G 35	saa, no lenses OL & ML, TM,
			6.5		2					S 45	
										F 10	
1510	03		7.5	4/2/1	1.1			156.2		G 10	gr brn to gr ML w/ arg TM sand;
			9.0		2					S 15	moist; moist brown s.l.; Tr
										F 50	charcoal. < 0.1' - long, HC odor
1520	04		10.0	1/3/1	0.9			227.2		G 10	saa - some orgs below 11.2' (pieces
			11.5		2					S 15	of wood < 0.2' long & roots < 2mm thick)
										F 96	HC odor
1530	05		12.5	4/1/10	1.5			314.0		G 0	dk brn to blk OL; moist; HC
			12.9		2					S 0	odor; few orgs (roots < 1mm &
										F 100	chunks of wood < 0.1' long)
			12.9	2/3/4						G 1	red brn ML; moist; HC odor;
			13.6							S 0	gr below 12.9; moist
										F 100	
			13.6							G 20	gr sa SP w/ gravel; wet;
										S 80	HC odor.
			14.0							F TR	

SUMMARY FIELD LOG OF BORING

DEPTH		USCS	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG
FROM	TO	CLASSIF.	
0.0	0.3	SP-SM	dk gr brn SP-SM w/ gravel; moist; little orgs.
0.3	7.0	SP-SM ^{MD}	red brn, SP-SM, moist, trace orgs (roots < 1mm); few lenses ML (red brown, < 0.2'-long); Tr lenses black OL ^{thin} 2.5-4.5.
7.0	12.0	ML	L-VL, gray brown to gray ML w/ sand; v. moist to moist below 8.1; trace charcoal < 0.1'-long; some orgs below 11.2'; HC odor.
12.0	12.9	OL	dk ^{MD} brn to blk OL; moist; HC odor
12.9	13.1	ML	dk ^{to gray} MD red brown ML; moist; HC odor
13.1	14.5	SP	MD, gray; SP w/ gravel; wet; HC odor

COMMENTS (i.e. materials used, visitors, problems, etc.);

0.0-0.3 dk br SP-SM w/ gravel; moist; little orgs (roots & grass)
 0.3-2.5 same as 01

GROUNDWATER DATA

WATER DEPTH	TIME	DATE
Sat Zone	13.1 - ~14.5	10/22
Sat Soil	18.5 - 20.5	10/22

SUMMARY OF TIME AND FOOTAGE

 FOOTAGE: 25.0 SAMPLES: 08 Attempted
 DRILLED: 01 Recovered
 DRILL/SAMPLE _____ hrs. STANDBY: _____ hrs.
 SETUP/CLEANUP: _____ hrs. WELL INSTALL: _____ hrs.
 OTHER: _____

 BORING: PB-10 SHEET 1 OF 2

FIELD LOG OF BORING

 DRILL COMPANY/DRILLER: Discovery/Matt
 DRILL RIG EQUIPMENT: CMG-75
 DRILLING METHOD: HSA
 HAMMER TYPE: Auto ROD TYPE/DIA.: MWJ/2.5"
 HAMMER WEIGHT: 300 HAMMER DROP: 30"
 CASING SIZE/TYPE: 3 1/2" HOLE SIZE: 6"

 JOB NO: 32-1-17678 BORING NO: PB-10
 JOB NAME: Sathicentral Homeowners
 LOGGED BY: TM
 LOCATION: 305 E Pioneer Ave ELEV.:
 START DATE: 1/27/14 END DATE: 10/22/14
 WEATHER DURING DRILLING: 30-40 clear

SAMPLE DATA

TIME	SAMP. NO.	DEPTH	FROM	DRIVING	L. REC.	DRILL	CONTACTS /	PID	ENV.	CONST.	FIELD IDENTIFICATION
DATE	TYPE	TO	TO	RESISTANCE	# JARS	ACTION	GROUNDWATER		SAMPLE	%	[Density/consistency, color, Group Name (USCS); moisture; constituent properties (particle size, plasticity, etc.); organics; structure; other; unit name]
1545	06	15.0		2/3/4	1.5			3.4		G 15	gr w/ little red-yellow mottling
		16.5			2					S 5	MC w/ gravel; moist; Trace
										F 80	charcoal < 0.05" - thick
1555	07	20.0		5/7/9	1.2			1.3		G 20	dk gr SP w/ gravel; wet; few
		21.5			0					S 90	charcoal up to 0.3' long;
										F 70	f-m sand
1600	08	25.0		11/50 for	1.1			1.3		G 0	dk gr SP-SM, wet; fine sand/MA
		26.5		6"	0					S 70	SM, wet; dk gr
										F 70	
										G	
										S	
										F	
										G	
										S	
										F	
										G	
										S	
										F	
										G	
										S	
										F	

SUMMARY FIELD LOG OF BORING

DEPTH		USCS CLASSIF.	GENERALIZED SOIL DESCRIPTION FOR DRAFTED GINT LOG
FROM	TO		
14.5	18.0	ML	MD, gray with little red-yellow mottling, MC w/ gravel; moist; to charcoal < 0.5' diam.
18.0	22.7	SP	MD, dark gray SP w/ gravel; wet; low charcoal up to 0.3' long;
22.7	26.5	SM	VD, dk gray SP SM, wet

COMMENTS (i.e. materials used, visitors, problems, etc.):

1615 terminate boring + backfill w/ bentonite to 2' bgs + clean soil cuttings/pea gravel to surface

GROUNDWATER DATA

WATER DEPTH	TIME	DATE
24.2' in boring	1805	
sat soil at 20.0 ft		

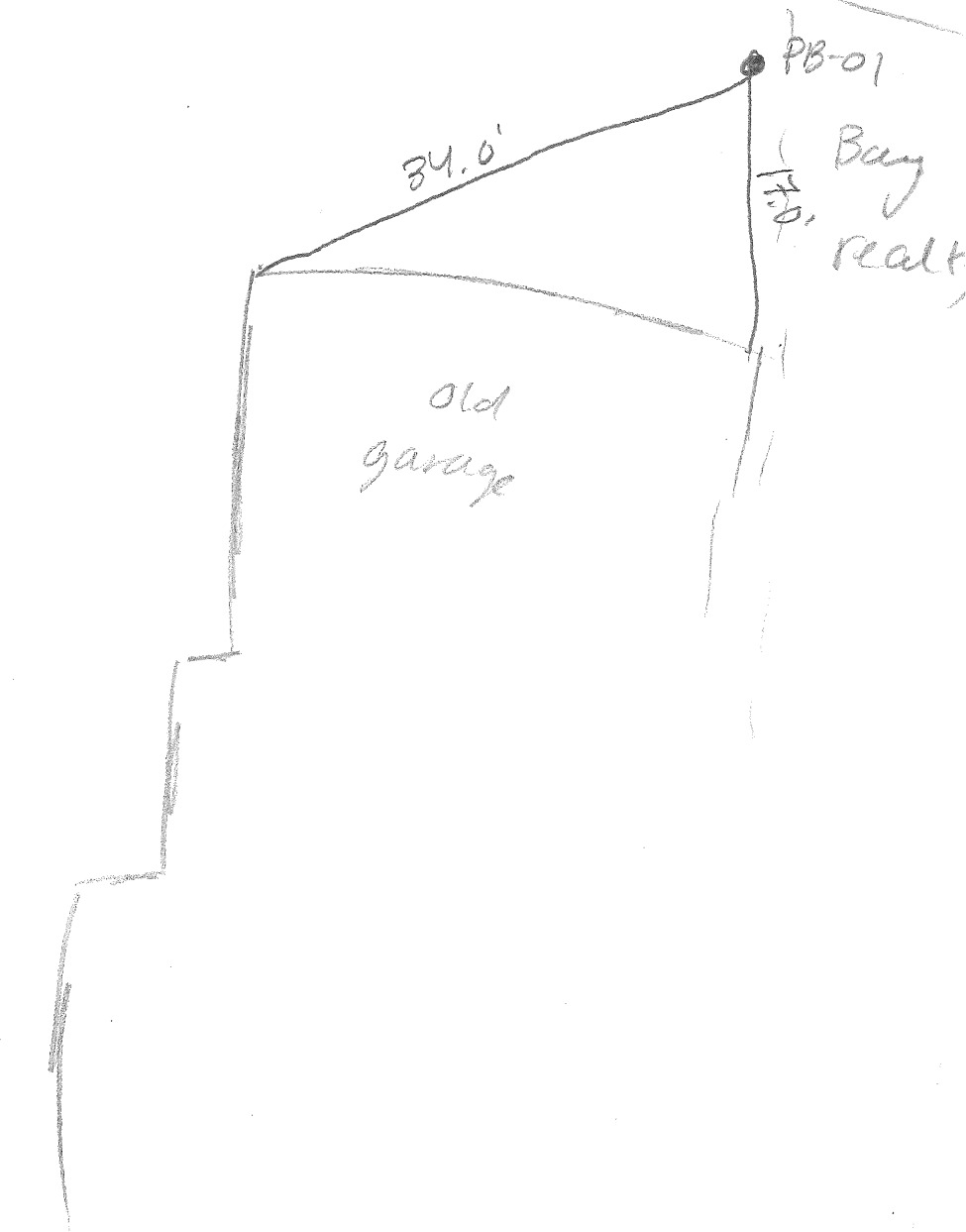
SUMMARY OF TIME AND FOOTAGE

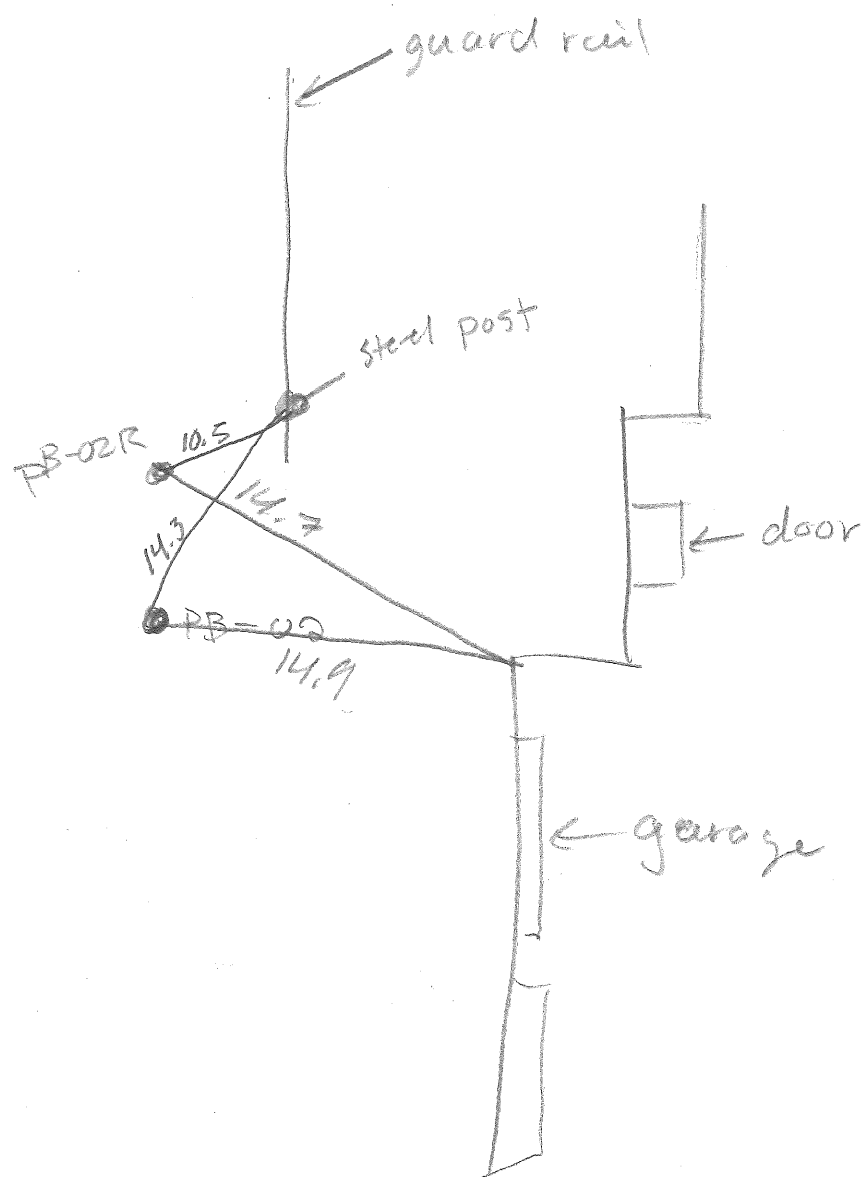
 FOOTAGE: 25 SAMPLES: 08 Attempted
 DRILLED: 08 Recovered
 DRILL/SAMPLE _____ hrs. STANDBY: _____ hrs.
 SETUP/CLEANUP: _____ hrs. WELL INSTALL: _____ hrs.
 OTHER: _____

 BORING: PB-10 SHEET 2 OF 2



sidewalk





295
E
Pioneer
Ave

305 E
Pioneer
Ave

asphalt

115.9'

● PB-10

19.5'

PB-03/

115.1' 23.6'

Klephas
Pine



295
E
Pineer
Ave

PB-07

grassy area

67.4

asphalt

2.1

New
garage

door

old garage



295 E. Pioneer Ave

asphalt

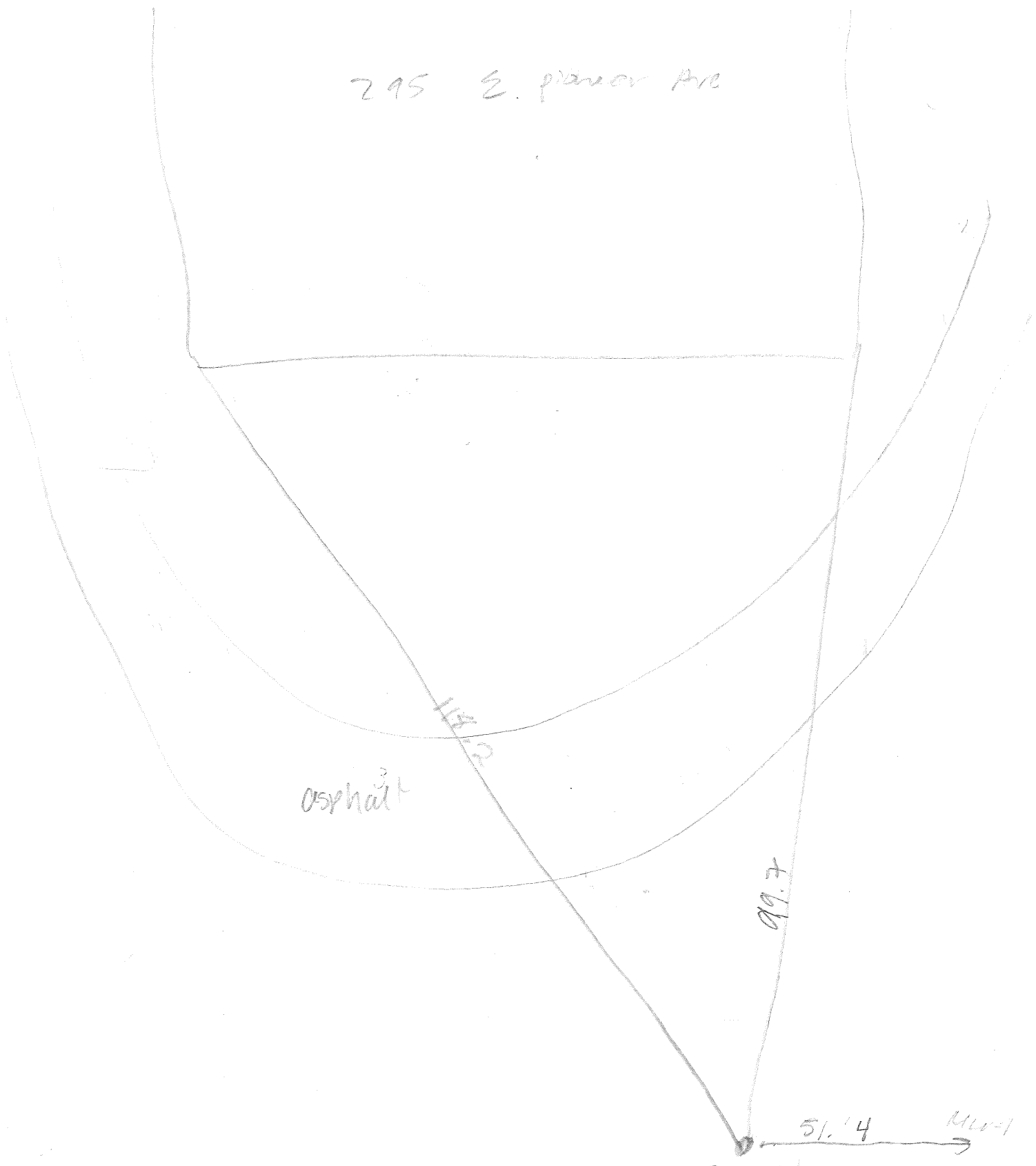
118.2

99.7

51.4

MW-1

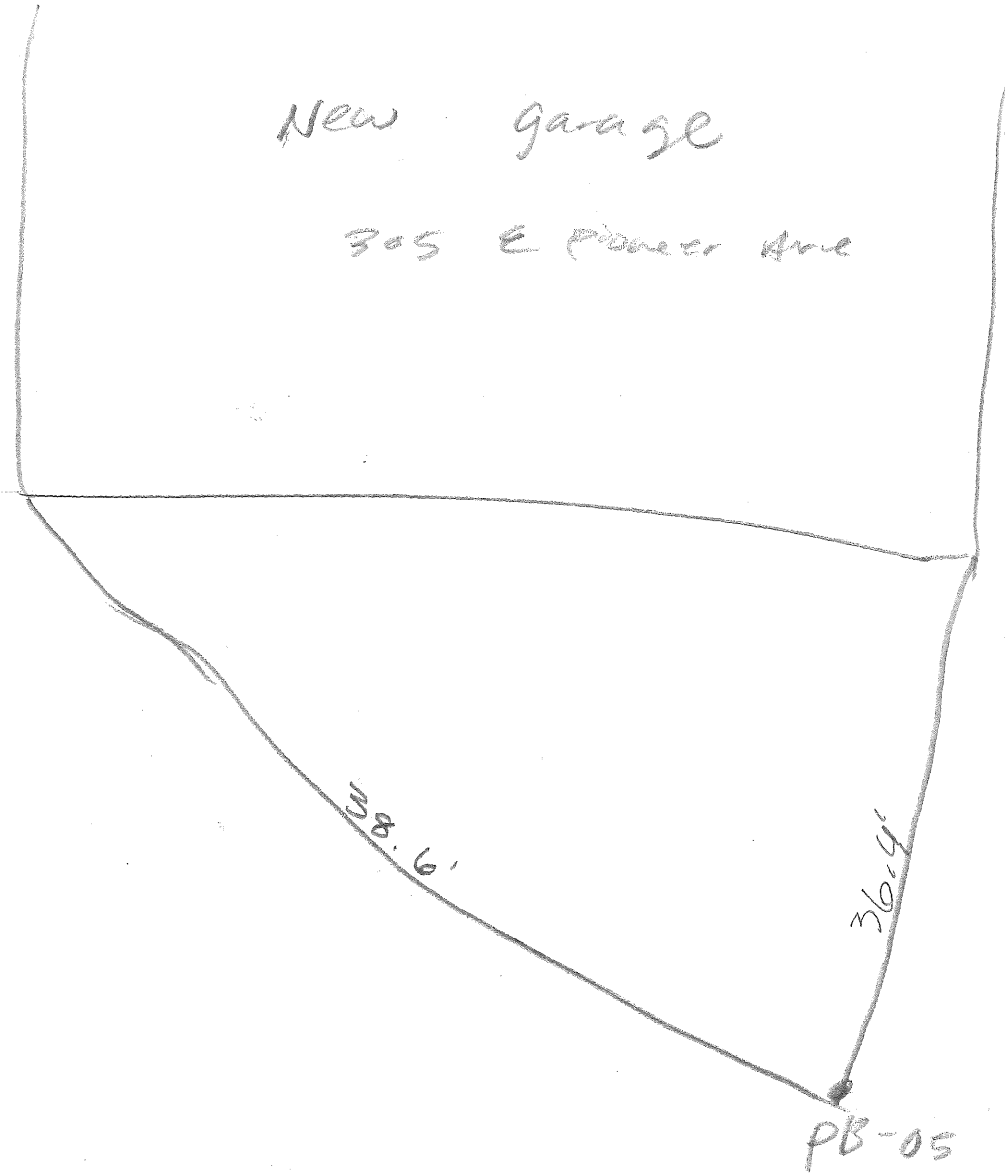
PD-04/MW-2



N
↑

New garage

305 E Pioneer Ave



7

295
E
Pine
Ave

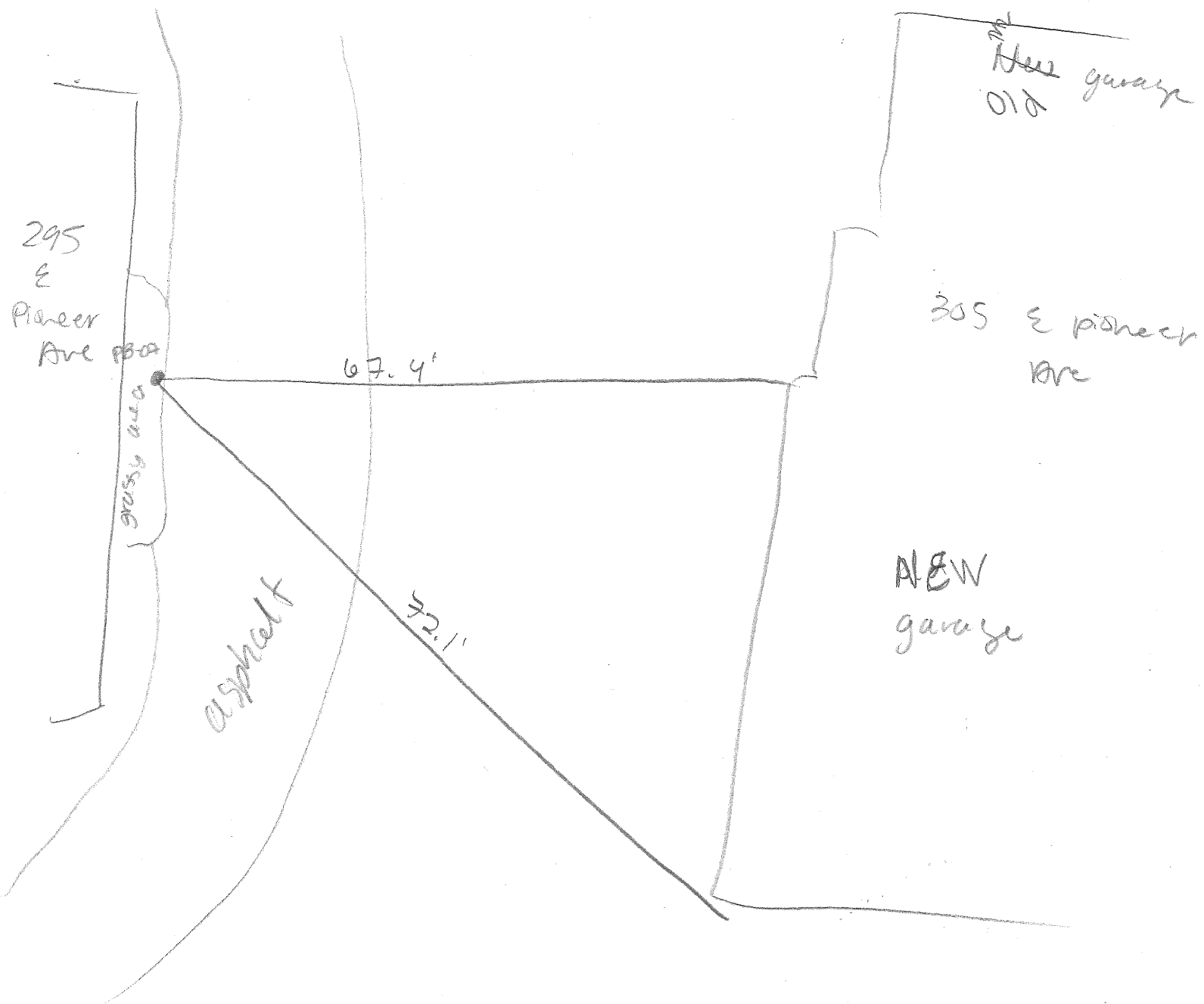
305
E
Pine
Ave

asphalt

48.3

40.0

PB-06





OLD
garage

305
power
line

NEW
garage

295 property

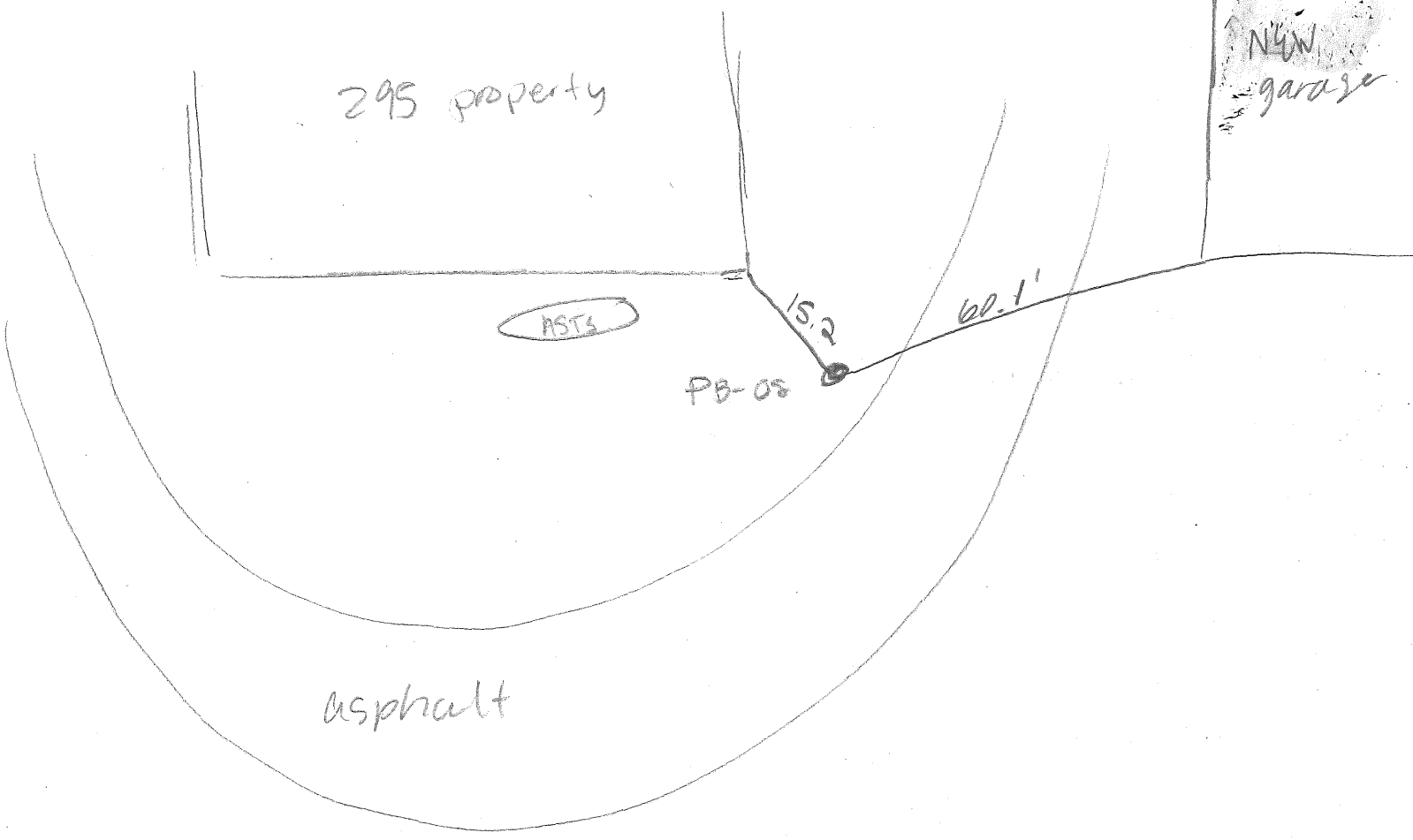
ASTS

PB-08

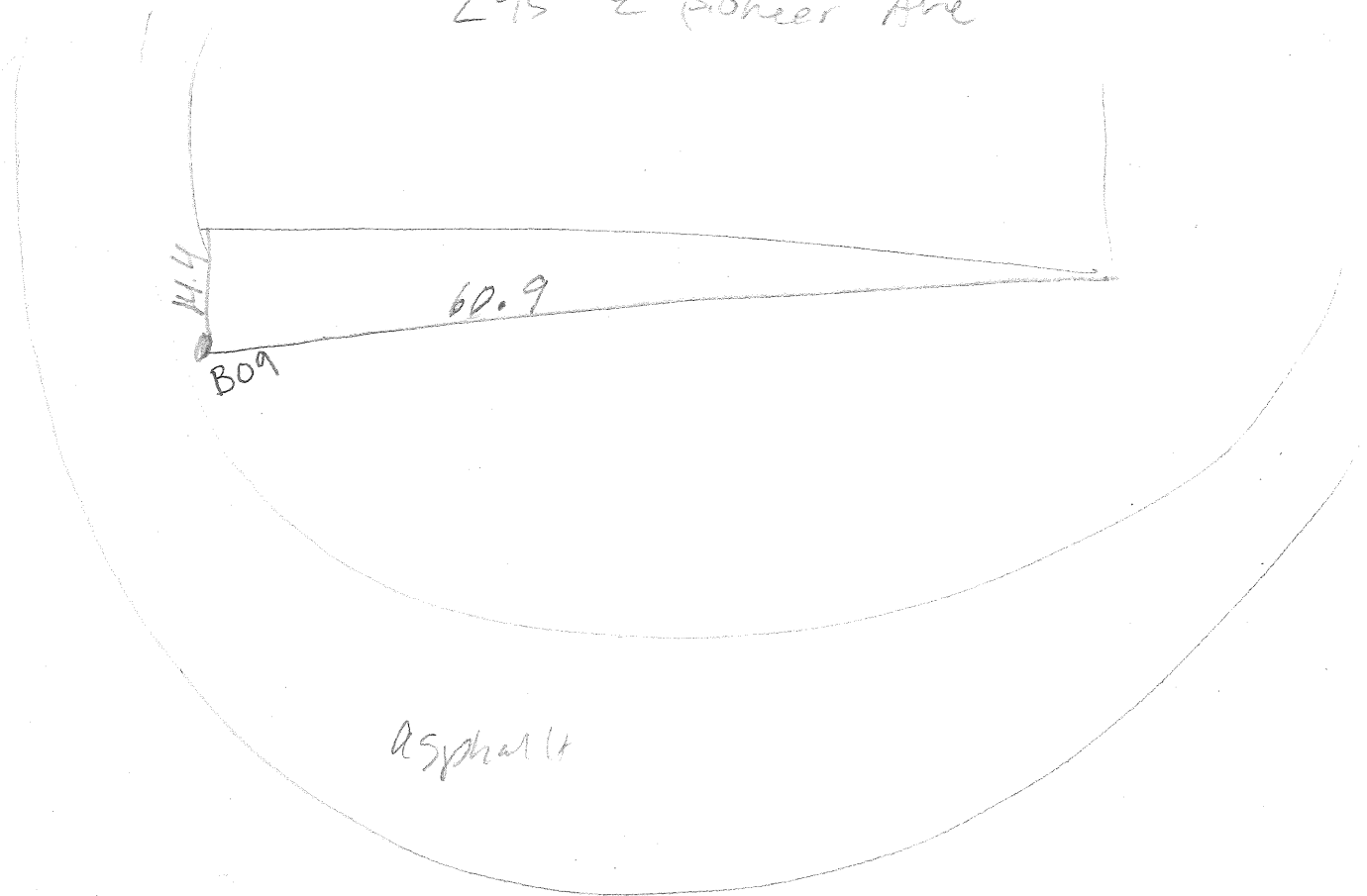
15.2

60.1'

asphalt



295 E Pioneer Ave



295
E
Pioneer

305 E
Pioneer

0.57 miles

16.8

PB-10

42.5

Telephone
pole

WELL DEVELOPMENT LOG

Shannon & Wilson, Inc.

Job No: 32-1-17078 Location: 505 E. Platteville Ave Weather: 30-40, clear
Concern: _____ Well No.: MW-1
Develop Date: 10/25/14 Time Started: 1440 Time Completed: 1630
Earliest allowed sample date/time after 48 hour break: 1030, 10/24/14

PURGING DATA

Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: _____
Time of Depth Measurement: 1450
Diameter of Casing: 1" ☐ 2" ☒
Total Depth of Well Below MP: 17.72
Depth-to-Water (DTW) Below MP: 11.81
Water Column in Well: 5.91 (Total Depth of Well Below MP - DTW Below MP)
Gallons per foot: 0.06
Gallons in Well: 0.35 (Water Column in Well x Gallons per foot)
Three-Well Volumes: 1.06 (Gallons in Well x 3)
Gallons Purged: 22.75

DEVELOPMENT DATA

Odor: mild HC odor Color: sl. turbid, brown

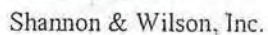
	Time:	Gallons:	Temp: (°C)	Sp. Cond.: (mS/cm)	pH: (S.U.)	ORP: (mV)	Turb: (ntu)	DTW
Surge	1500							
purge	1505	4.25	7.04	276	6.36	16.7	>1000	
Surge	1510							
purge	1515	8.50	6.89	266	6.07	32.1	>1000	
Surge	1520							
purge	1525	12.75	6.07	252	6.94	38.6	>1000	12.81
Surge	1530							
purge	1535	14.25	6.04	283	6.13	44.2	>1000	
Surge	1540							
purge	1545	16.75	6.23	284	6.10	45.3	>1000	12.89

Surging	Surging Time (minutes)	Gallons Purged	Time Recovered (minutes)
1			
2			
3			

Evacuation Method: Dedicated Bladder Pump / Other: vacu Surge Block: 3" nonreturn valve

Remarks: _____

Sampling Personnel: TH



Job No: 32-1-17678 Location: 305 E Pioneer Rd Weather: 36-46, clear
Well No.: MW-1
Date: 10/25/14 Time Started: 12:40 Time Completed: _____

[illegible]

Remarks: _____

Sampling Personnel: TH

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.64
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23



Shannon & Wilson, Inc.

LOW-FLOW WATER SAMPLING LOG

Job No: 32-1-17619 Location: 300 E Pioneer Ave Weather: 90-90° clear
Well No.: MW-1
Date: 10/25/14 Time Started: 1045 Time Completed: 1745
Develop Date: 10/25/14 Develop End Time: 1030 (24 hour break)

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1045 Date of Depth Measurement: 10/25/14
Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: _____
Diameter of Casing: 2" Well Screen Interval: 17.72 - 7.72
Total Depth of Well Below MP: 17.72 Product Thickness, if noted: _____
Depth-to-Water (DTW) Below MP: 12.74
Water Column in Well: 4.98 (Total Depth of Well Below MP - DTW Below MP)
Gallons per foot: 0.06
Gallons in Well: 0.90 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 10/25/14 Time Started: 1500 Time Completed: 1730
Three Well Volumes: 0.90 (Gallons in Well x 3)
Gallons Purged: 22.75 Depth of Pump (generally 2 ft from bottom): ~1 ft from bottom
Max. Drawdown (generally 0.3 ft): 1.16' Pump Rate: 0.23 gpm/min

Well Purged Dry: Yes ☐ No ☐ (If yes, use Well Purged Dry Log)

Time:	Gallons:	Pump Rate (L/min): gpm/min	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
<u>1716</u>	<u>1.25</u>	<u>0.06</u>	<u>12.69</u>	<u>-0.05</u>	<u>8.35</u>	<u>291</u>	<u>-</u>	<u>6.10</u>	<u>50.8</u>	<u>283.3</u>

SAMPLING DATA

Odor: no id H₂ Color: sl turbid → yellow brown
Sample Designation: 1718 MW-1 Time / Date: 1718 10/25/14
QC Sample Designation: - Time / Date: _____
QA Sample Designation: - Time / Date: _____

Evacuation Method: Bladder Pump / Submersible Pump / Other: _____

Sampling Method: Bladder Pump / Submersible Pump / Other: _____

Water Quality Instruments Used/Manufacturer/Model Number _____

Calibration Info (Time, Ranges, etc) 7.13 10/25/14 YSI + turbidity meter

Remarks: pump raised to w/h 1 foot of water level

for sampling, well developed w/h 24 hrs of sampling

Sampling Personnel: TML

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65

ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23



Shannon & Wilson, Inc.

WELL PURGED DRY LOG

Job No: 32-1-17678 Location: 295 E Pioneer Ave Weather: 30-40, clear
 Concern: _____ Well No.: MW-2
 Date: 10/25/14 Time Started: 1335 Time Completed: 1420

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 1340 Date of Depth Measurement: 10/25/14
 Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other:
 Diameter of Casing: 2" Well Screen Interval: 23.36 - 13.33
 Total Depth of Well Below MP: 23.33 Product Thickness, if noted: _____
 Depth-to-Water (DTW) Below MP: 13.97
 Water Column in Well: 9.37 (Total Depth of Well Below MP - DTW Below MP)
 Gallons per foot: 0.06
 Gallons in Well: 0.56 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 10/25/14 Time Started: 1336 Time Completed: 1405
 80% Recovery Water Column: 14.72 9.13 (Water Column in Well x 0.8)
 80% Recovery DTW: 14.20 (Initial DTW + (Water Col. - 80% Recovery Water Col.)

Time Well Purged Dry	Time Well Was 80% Recovered	DTW	Pump Rate
<u>1130</u>	<u>1340</u>	<u>13.97</u>	<u>0.2 gal/min</u>

FIELD PARAMETERS AT TIME OF SAMPLING

Time: <u>1348</u>	Gallons: <u>2.0</u>	Pump Rate (L/min): <u>0.2 gal/min</u>	DTW (ft BMP): <u>14.20</u>	Drawdown (ft BMP): _____	Temp: (°C) <u>7.52</u>	Sp. Cond.: (uS/cm) <u>155</u>	DO: (mg/L) <u>-</u>	pH: (S.U.) <u>59.7</u>	ORP: (mV) <u>27.6</u>	Turb: (NTU) <u>222.5</u>
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SAMPLING DATA

Odor: Slight H₂S odor Color: 30 Turbidity, 1200
 Sample Designation: MW-2 / 10/25/14 Time / Date: 1354 / 10/25/14
 QC Sample Designation: MW-12 Time / Date: 1349 / 10/25/14
 QA Sample Designation: _____ Time / Date: _____

Evacuation Method: Whale Pump/Bladder Pump / Other:
 Sampling Method: Whale Pump/Bladder Pump / Other:

Remarks: No seep, well developed immediately prior to sampling, see development log for details
 Sampling Personnel: 401

WELL DEVELOPMENT LOG

Shannon & Wilson, Inc.

Job No: 32-1-17078 Location: 295 E. Pioneer Ave Weather: 30-40 partly cloudy
Concern: _____ Well No.: 44-2
Develop Date: 10/25/14 Time Started: 10:30 Time Completed: 13:30
Earliest allowed sample date/time after 48 hour break: 1340 10/24/14

PURGING DATA

Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other: _____
Time of Depth Measurement: 10:30
Diameter of Casing: 1" ☐ 2" ☒
Total Depth of Well Below MP: 23.33
Depth-to-Water (DTW) Below MP: 11.92
Water Column in Well: 11.41 (Total Depth of Well Below MP - DTW Below MP)
Gallons per foot: 0.06
Gallons in Well: 0.68 (Water Column in Well x Gallons per foot)
Three-Well Volumes: 2.05 (Gallons in Well x 3)
Gallons Purged: 18.25

DEVELOPMENT DATA

Odor: mild H₂S odor Color: gray brown

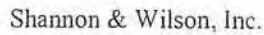
	Time:	Gallons:	Temp: (°C)	Sp. Cond.: (mS/cm)	pH: (S.U.)	ORP: (mV)	Turb: (ntu)	DTW
Surge	11:50	0						
Purge	11:00	Purge well dry (175 gal removed) self-recharged 71000 ntu						
Surge	11:20	Well recharged 50% at 14.13'						
Purge	11:38	11	Sedimentation					71000 14.13
Surge	11:48	Until recharged 80% at 14.09'						
Purge	12:04	13	6.86	560	5.76	54.7	76000	14.09
Surge	12:10							
Purge	12:16	14.5	6.85	582	5.54	43.2	71000	14.19
Surge	12:21				5.40 m	35.5 m		
Purge	12:26	15.75	5.85	614	5.90	35.8	71000	

Surging	Surging Time (minutes)	Gallons Purged	Time Recovered (minutes)
1			
2			
3			

Evacuation Method: Dedicated Bladder Pump / Other: whole pump Surge Block: 2.5" non-purge system

Remarks: _____

Sampling Personnel: _____



Job No: _____ Location: _____ Weather: _____
Well No.: _____
Date: _____ Time Started: _____ Time Completed: _____

[illegible]

Remarks: _____

Sampling Personnel: tal

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.64
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23



LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 32-1-17678 Location: Southcentral Tesoro Weather: 40's rain
Well No.: MW-1 40mer
Date: 1/16/15 Time Started: 12:55 Time Completed: 14:07

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 11:01 Date of Depth Measurement: 1/16/15
Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other:
Diameter of Casing: 2"
Total Depth of Well Below MP: 17.72
Depth-to-Water (DTW) Below MP: 9.87
Water Column in Well: 7.83 (Total Depth of Well Below MP - DTW Below MP)
Gallons per foot: 0.16
Gallons in Well: 1.25 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 1/16/15 Time Started: 13:07 Time Completed: 13:45
Three Well Volumes: 3.76 (Gallons in Well x 3)
Gallons Purged: 0.9 Depth of Pump: ~12 ft
Max. Drawdown (generally 0.3 ft): 0.25 Pump Rate: _____

Well Purged Dry: 9.5 Yes ☐ No ☒ (If yes, did well to recover 80% prior to sample collection _____)

Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
<u>13:11</u>	<u>0.2</u>		<u>10.91</u>	<u>0.15</u>	<u>5.56</u>	<u>0.751</u>	<u>6.30</u>	<u>6.41</u>	<u>-45.7</u>	<u>148.8</u>
<u>13:14</u>			<u>10.06</u>	<u>0.20</u>	<u>5.70</u>	<u>0.781</u>	<u>4.99</u>	<u>6.32</u>	<u>-44.7</u>	<u>144.7</u>
<u>13:17</u>	<u>0.5</u>		<u>10.08</u>	<u>0.22</u>	<u>5.75</u>	<u>0.781</u>	<u>4.36</u>	<u>6.30</u>	<u>-44.7</u>	<u>154.7</u>
<u>13:20</u>	<u>0.6</u>		<u>10.11</u>	<u>0.25</u>	<u>5.85</u>	<u>0.781</u>	<u>4.10</u>	<u>6.28</u>	<u>-44.4</u>	<u>118.3</u>
<u>13:23</u>	<u>0.807</u>		<u>10.06</u>	<u>0.20</u>	<u>5.87</u>	<u>0.779</u>	<u>3.90</u>	<u>6.27</u>	<u>-44.7</u>	<u>108.6</u>
<u>13:26</u>	<u>0.8</u>		<u>10.06</u>	<u>0.20</u>	<u>5.84</u>	<u>0.778</u>	<u>3.58</u>	<u>6.27</u>	<u>-45.0</u>	<u>109.6</u>
<u>13:29</u>	<u>0.9</u>		<u>10.08</u>	<u>0.25</u>	<u>5.83</u>	<u>0.777</u>	<u>3.46</u>	<u>6.28</u>	<u>-44.8</u>	<u>81.73</u>

SAMPLING DATA

Odor: no Color: light brown
Sample Designation: 17678-MW1 Time / Date: 13:30 1/16/15
Duplicate Sample Designation: 17678-MW11 Time / Date: 13:45 1/16/15
Evacuation Method: Bladder Pump / Submersible Pump / Other: _____
Sampling Method: Bladder Pump / Submersible Pump / Other: _____
Water Quality Instruments Used/Manufacturer/Model Number YSF 556 #2 / turb #3
Calibration Info (Time, Ranges, etc) 8:57 1/16/15
Remarks: no green

Sampling Personnel: JKH

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23



LOW-FLOW WATER SAMPLING LOG

Shannon & Wilson, Inc.

Job No: 32-1-17678 Location: Southcentral Tesoro Weather: Rain 40's
Well No.: MW-2
Date: 1/16/15 Time Started: 11:15 Time Completed: 12:55

INITIAL GROUNDWATER LEVEL DATA

Time of Depth Measurement: 11:11 Date of Depth Measurement: 1/16/15
Measuring Point (MP): Top of PVC Casing / Top of Steel Protective Casing / Other:
Diameter of Casing: 2"
Total Depth of Well Below MP: 23.33
Depth-to-Water (DTW) Below MP: 10.21
Water Column in Well: 13.12 (Total Depth of Well Below MP - DTW Below MP)
Gallons per foot: 0.16
Gallons in Well: 2.10 (Water Column in Well x Gallons per foot)

PURGING DATA

Date Purged: 1/16/15 Time Started: 11:43 Time Completed: 12:40
Three Well Volumes: 6.30 (Gallons in Well x 3)
Gallons Purged: 540.9 1.3 Depth of Pump: ~12.6
Max. Drawdown (generally 0.3 ft): 0.26 Pump Rate:

Well Purged Dry: Yes ☐ No ☒ (If yes, did well to recover 80% prior to sample collection)

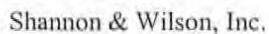
Time:	Gallons:	Pump Rate (L/min):	DTW (ft BMP):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
<u>11:48</u>	<u>0.3</u>		<u>11.06</u>	<u>0.25</u>	<u>5.71</u>	<u>1.342</u>	<u>51.5%</u>	<u>5.84</u>	<u>32.1</u>	<u>3.18</u>
<u>11:52</u>	<u>0.4</u>		<u>11.07</u>	<u>0.26</u>	<u>5.94</u>	<u>1.331</u>	<u>3.84%</u>	<u>5.96</u>	<u>-2.4</u>	<u>35.49</u>
<u>11:55</u>	<u>0.5</u>		<u>11.02</u>	<u>0.21</u>	<u>5.76</u> ✓	<u>1.338</u>	<u>4.03</u>	<u>6.04</u>	<u>-22.1</u>	<u>25.78</u>
<u>11:58</u>			<u>11.01</u>	<u>0.17</u>	<u>5.71</u> ✓	<u>1.371</u>	<u>3.87</u>	<u>6.07</u>	<u>-30.9</u>	<u>14.82</u>
<u>12:01</u>	<u>0.7</u>		<u>11.01</u>	<u>0.10</u>	<u>5.71</u> ✓	<u>1.396</u>	<u>3.52</u>	<u>6.10</u> ✓	<u>-39.4</u>	<u>8.85</u>
<u>12:06</u>	<u>0.9</u>		<u>10.96</u>	<u>0.15</u>	<u>5.83</u> ✓	<u>1.484</u>	<u>3.49</u>	<u>6.14</u> ✓	<u>-49.2</u>	<u>6.00</u>

SAMPLING DATA

Odor: no Color: clear
Sample Designation: 17678-MW2 Time / Date: 12:20 1/16/15
Duplicate Sample Designation: 17678-MW12 Time / Date: 12:40 1/16/15
Evacuation Method: Bladder Pump / Submersible Pump / Other:
Sampling Method: Bladder Pump / Submersible Pump / Other:
Water Quality Instruments Used/Manufacturer/Model Number YSI 556 #2 / turb #3
Calibration Info (Time, Ranges, etc) 8157 1/16/15
Remarks: no sheen

Sampling Personnel: JKH

WELL CASING VOLUMES (GAL/FT): 1" = 0.04 2" = 0.16 4" = 0.65
ANNULAR SPACE VOLUME (GAL/FT): 4" casing and 2" well = 0.23



Continued from previous page

Site: Homer

Date: 1/16/15

STABILIZATION PARAMETERS

	Interval (minutes)	Pump Rate (mL/min):	Drawdown (ft):	Temp: (°C)	Sp. Cond.: (uS/cm)	DO: (mg/L)	pH: (S.U.)	ORP: (mV)	Turb: (NTU)
ADEC (May 2010)	3 to 5	100 to 150	<0.0328	±3% or ±0.2	±3%	±10%	±0.1	±10	±10%
EPA (Jan. 2010)	5	50	<0.3	±3%	±3%	±10% or <0.5	±0.1	±10	±10% or <5 NTU

EPA guidance requires all parameters to stabilize for 3 consecutive readings before sampling. If not stable within 2 hours, collect sample.

ADEC guidance requires 3 parameters (4 if using temperature) to stabilize for 3 consecutive readings before sampling.

42

1/16/15 - JKH

Southcentral Tesoro, Homer AK

8:57 - calibrate turb #3, YSI 556 #2

load truck

check out of hotel

weather: 40's & heavy rain

10:48 - at site, not where shown on google

locate MW-1 & MW-2, dtw

* using rental water level from TIT

MW-1 9.87 ft @ 11:01

MW-2 10.21 ft @ 11:11

11:15 - set up MW-2 & sample at 12:20

set up MW-1 & sample @ 13:30

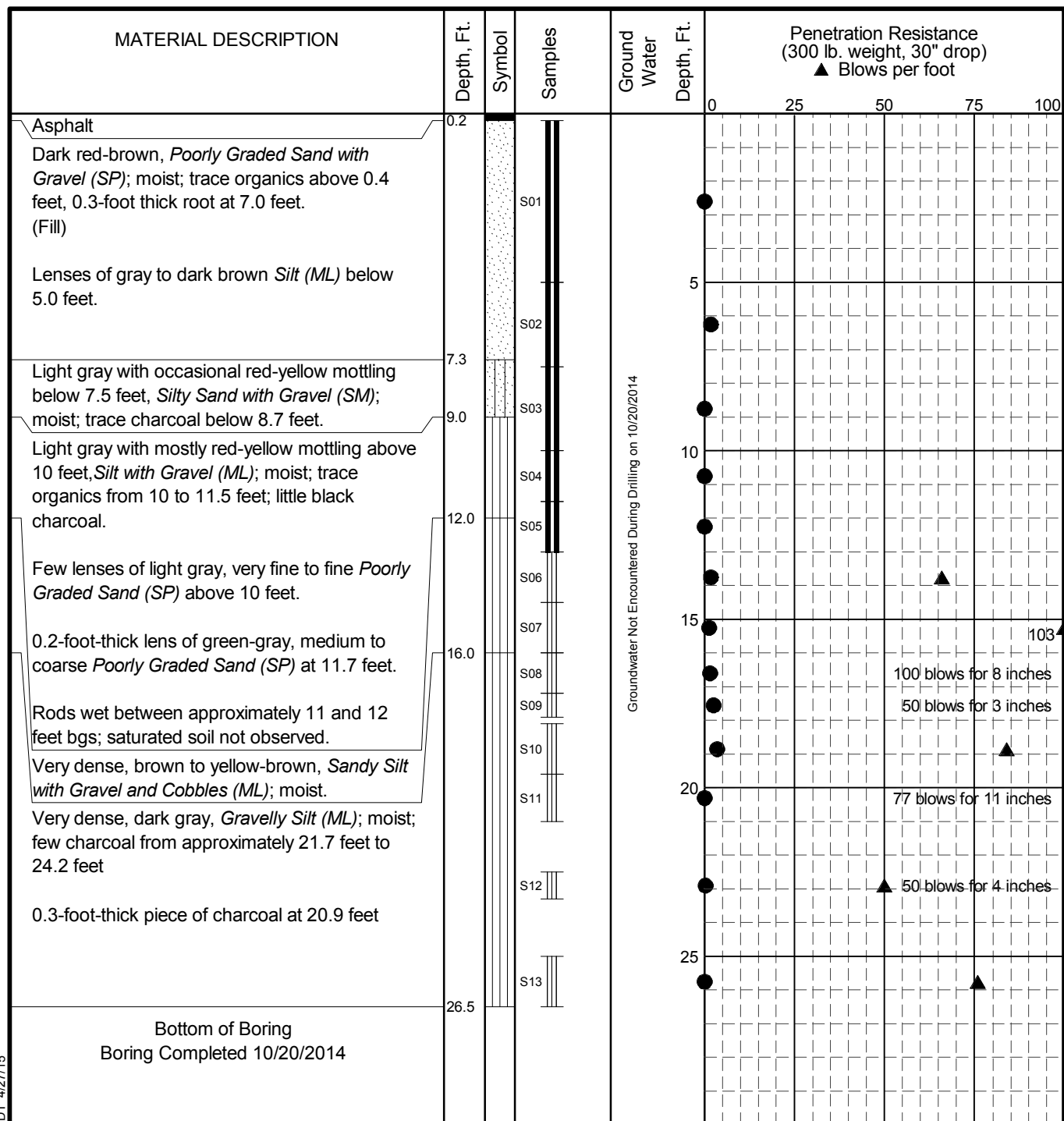
* No screen in either well so dispose of water to ground surface, tubing, etc. ~~go~~ waste generated during sampling disposed of at Homer Landfill

14:10 - leave site

APPENDIX C

BORING LOGS AND MONITORING WELL CONSTRUCTION DETAILS

ENVIRONMENTAL LOG 17678 BORING LOGS.GPJ S&W GEO1.GDT 4/27/15



LEGEND

- * Sample not recovered
- III 3" O.D. Split Spoon Sample
- II Direct Push

NOTES

- The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
- The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
- Water level, if indicated above, is for the date specified and may vary.
- USC letter symbol based on visual classification.

● PID Reading (ppm)

Southcentral Tesoro
Homer, Alaska

LOG OF BORING B01

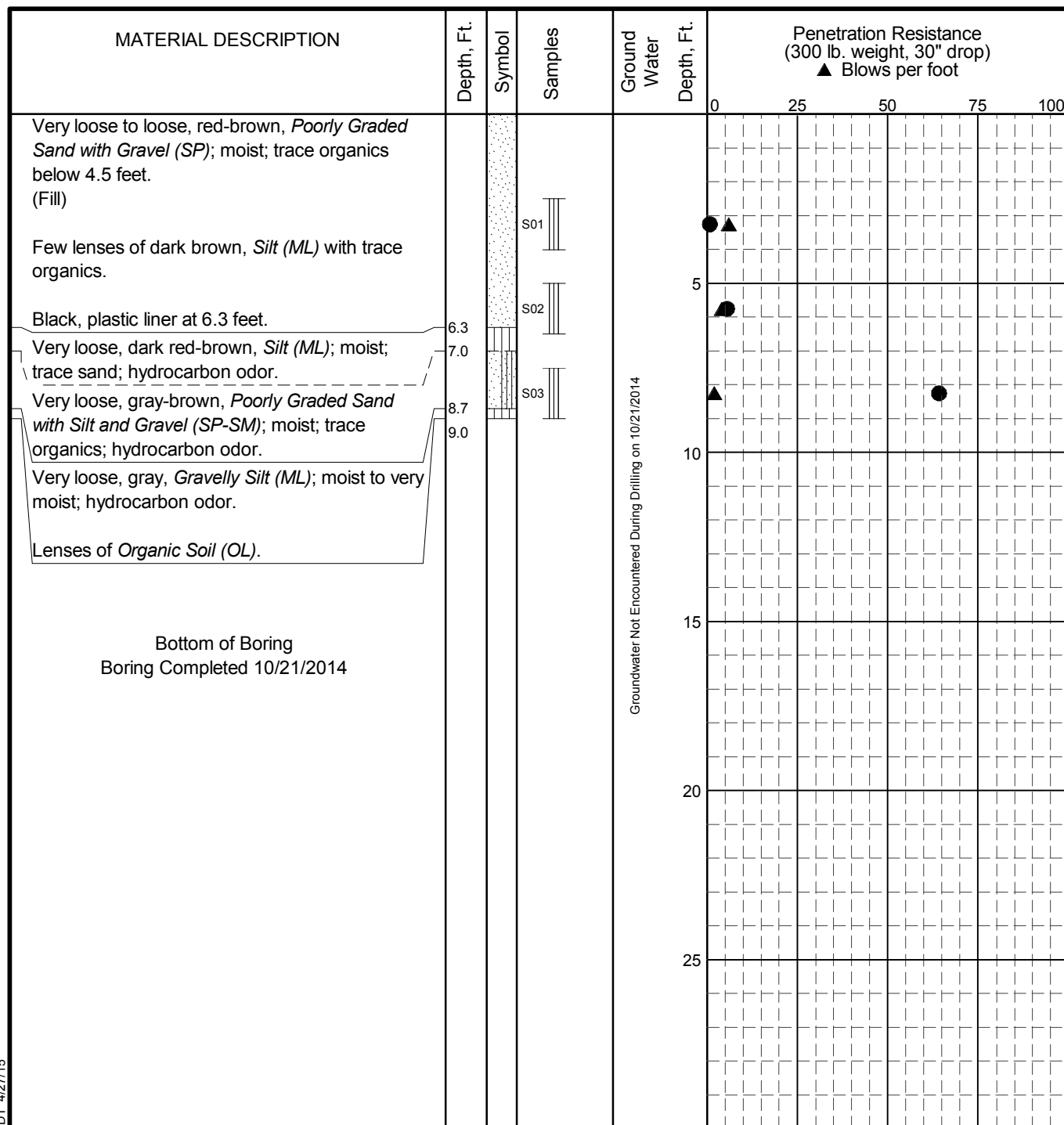
April 2015

32-1-17678-001

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Fig. C-1

ENVIRONMENTAL LOG 17678 BORING LOGS.GPJ S&W GEO1.GDT 4/27/15



LEGEND

- * Sample not recovered
- III 3" O.D. Split Spoon Sample
- II Direct Push

● PID Reading (ppm)

NOTES

- The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
- The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
- Water level, if indicated above, is for the date specified and may vary.
- USC letter symbol based on visual classification.

Southcentral Tesoro
Homer, Alaska

LOG OF BORING B02

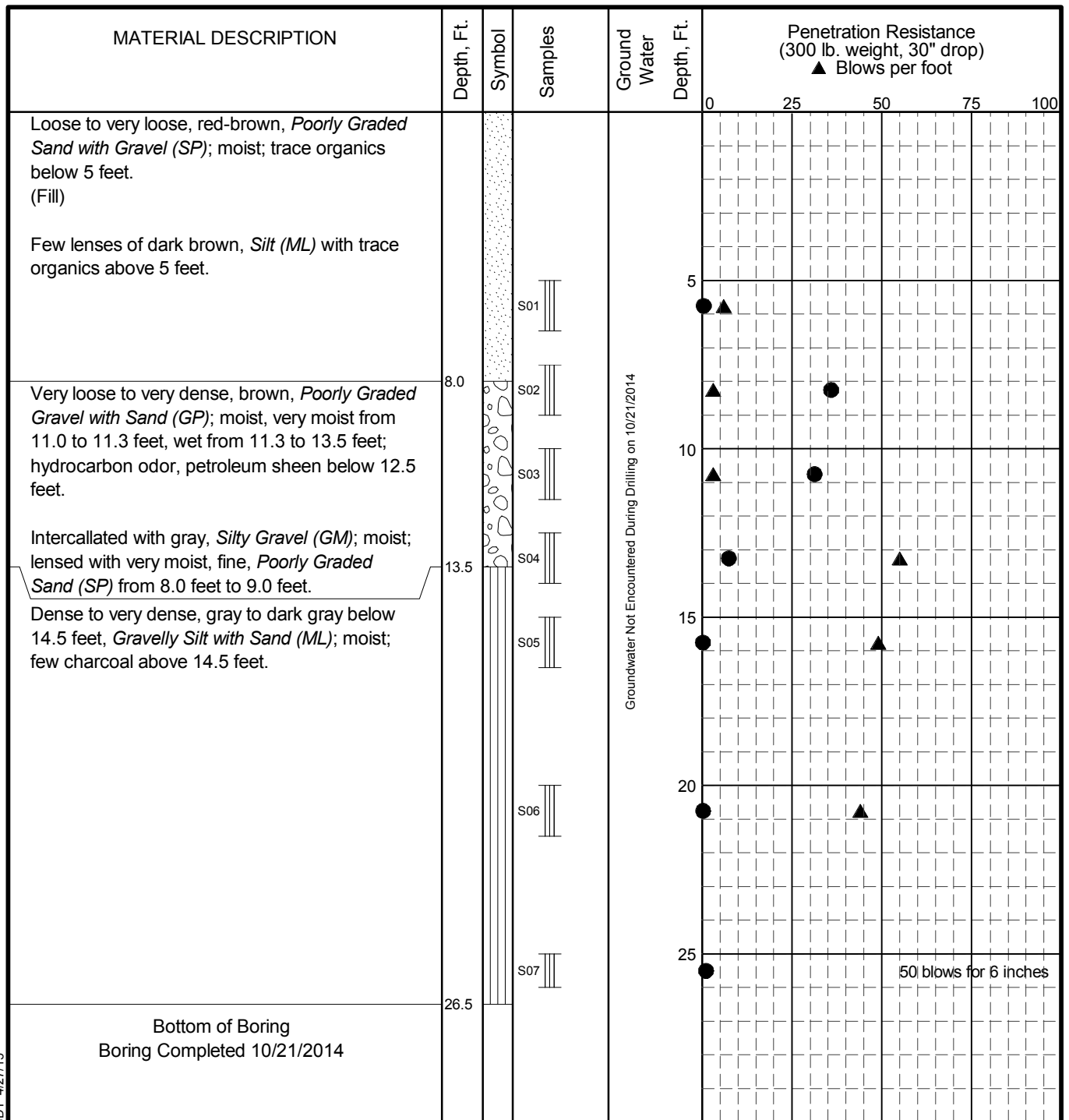
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Fig. C-2

ENVIRONMENTAL LOG 17678 BORING LOGS.GPJ S&W GEO1.GDT 4/27/15



LEGEND

- * Sample not recovered
- III 3" O.D. Split Spoon Sample
- II Direct Push

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.
4. USC letter symbol based on visual classification.

Southcentral Tesoro
Homer, Alaska

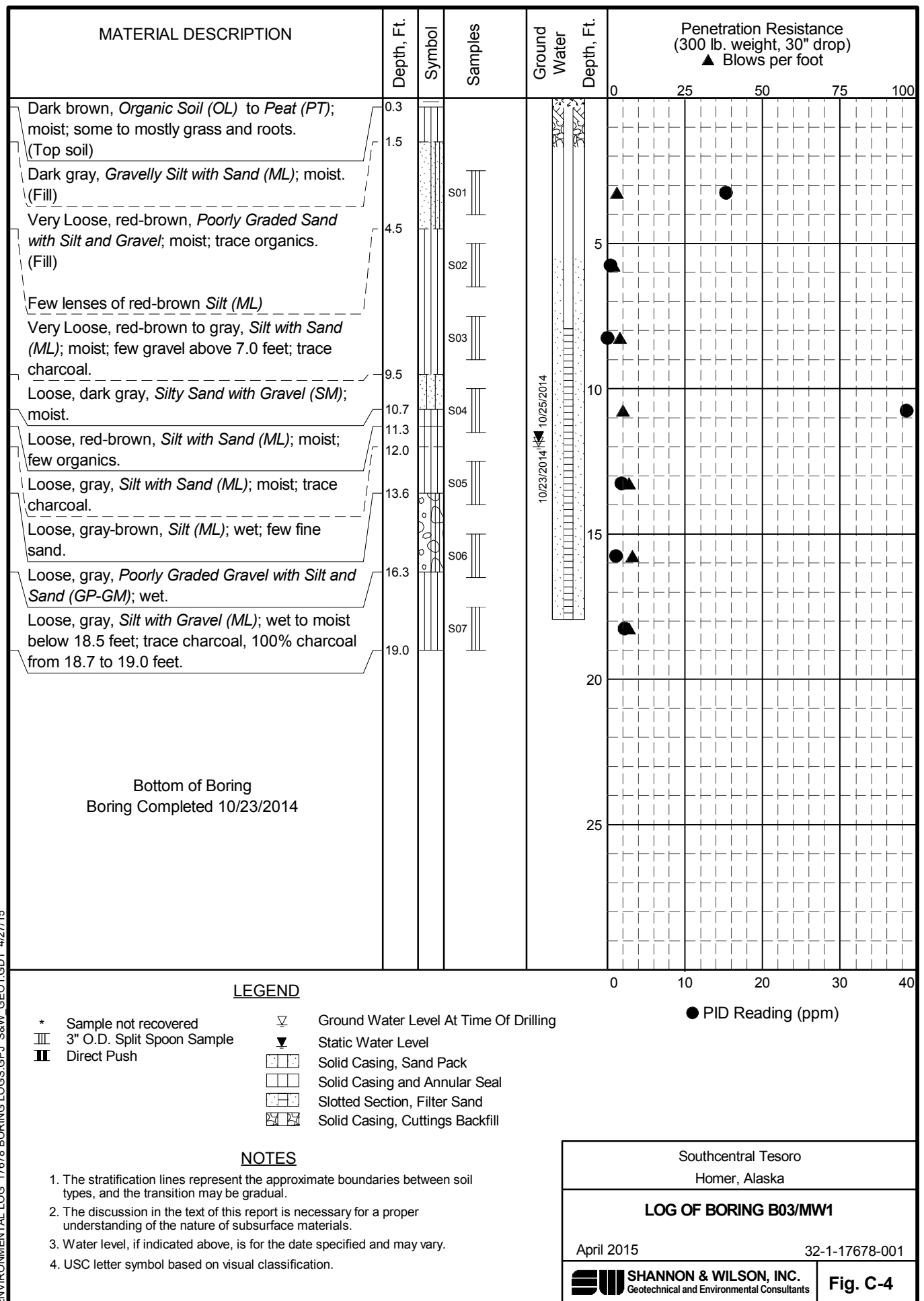
LOG OF BORING B02R

April 2015

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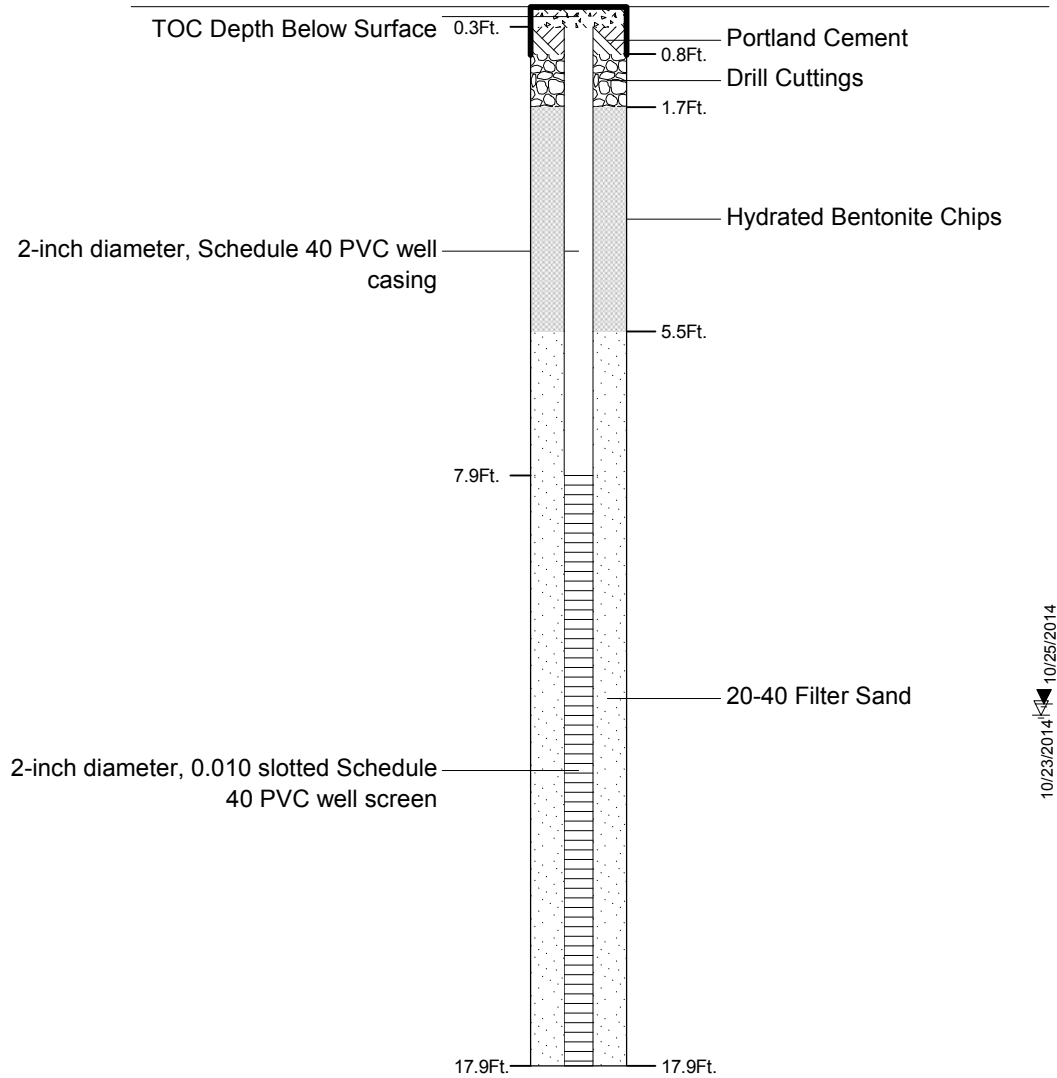
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Fig. C-3



Casing Description

Backfill Description



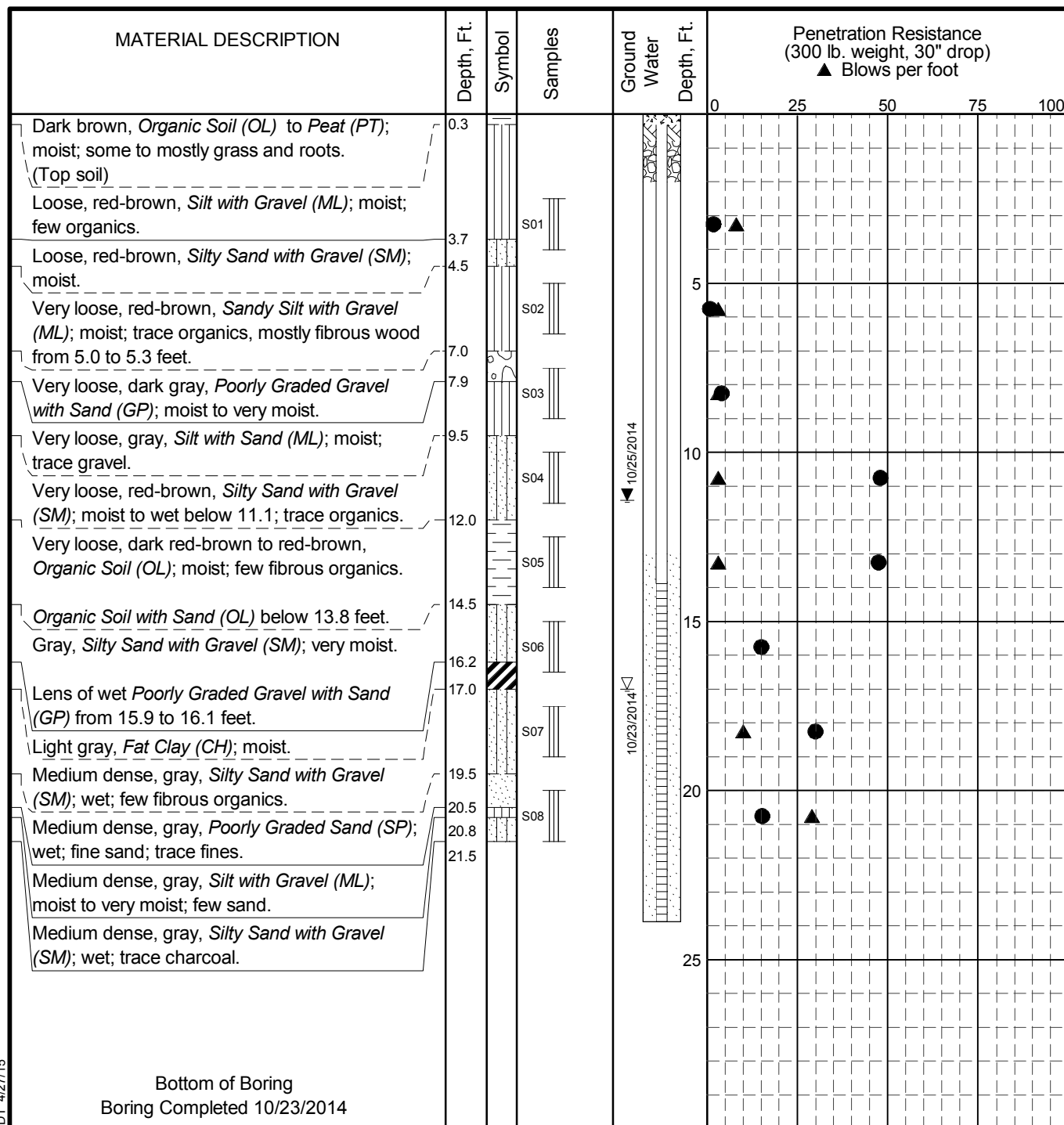
LEGEND

- ▽ Groundwater Level ATD
- ▼ Static Groundwater Level

NOTE: All joints use threaded connections.

Southcentral Tesoro Homer, Alaska	
MONITORING WELL MW1 CONSTRUCTION DETAIL	
April 2015	32-1-17678-001
SHANNON & WILSON, INC. Geotechnical and Environmental Consultants	Fig. C-5

ENVIRONMENTAL LOG 17678 BORING LOGS.GPJ S&W GEO1.GDT 4/27/15



LEGEND

- | | |
|--------------------------------|--|
| * Sample not recovered | ▽ Ground Water Level At Time Of Drilling |
| III 3" O.D. Split Spoon Sample | ▼ Static Water Level |
| II Direct Push | □ Solid Casing, Sand Pack |
| | □ Solid Casing and Annular Seal |
| | □ Slotted Section, Filter Sand |
| | □ Solid Casing, Cuttings Backfill |

NOTES

- The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
- The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
- Water level, if indicated above, is for the date specified and may vary.
- USC letter symbol based on visual classification.

Southcentral Tesoro
Homer, Alaska

LOG OF BORING B04/MW2

April 2015

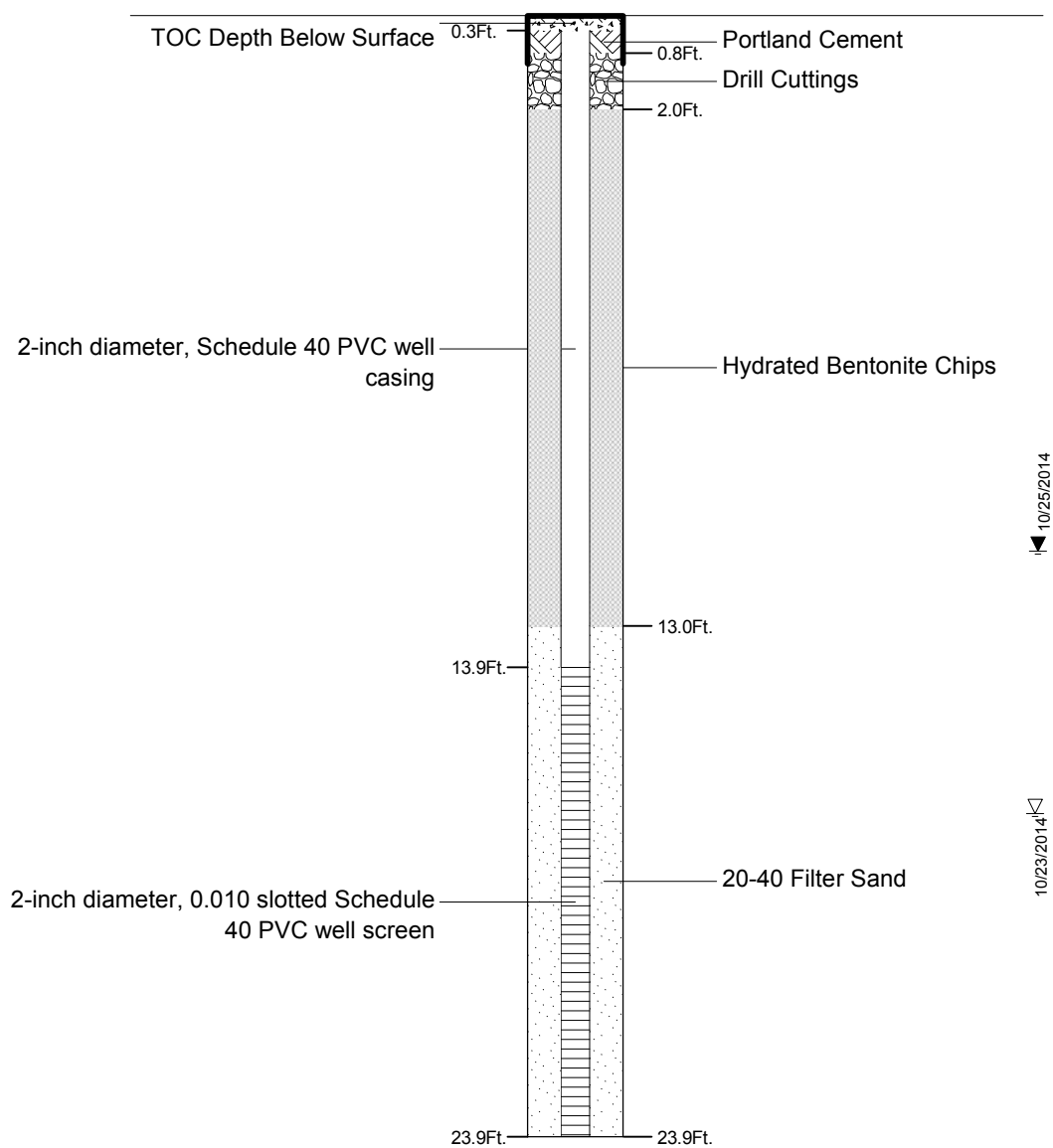
32-1-17678-001

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Fig. C-6

Casing Description

Backfill Description



LEGEND

- ▽ Groundwater Level ATD
- ▼ Static Groundwater Level

NOTE: All joints use threaded connections.

Southcentral Tesoro
Homer, Alaska

MONITORING WELL MW2 CONSTRUCTION DETAIL

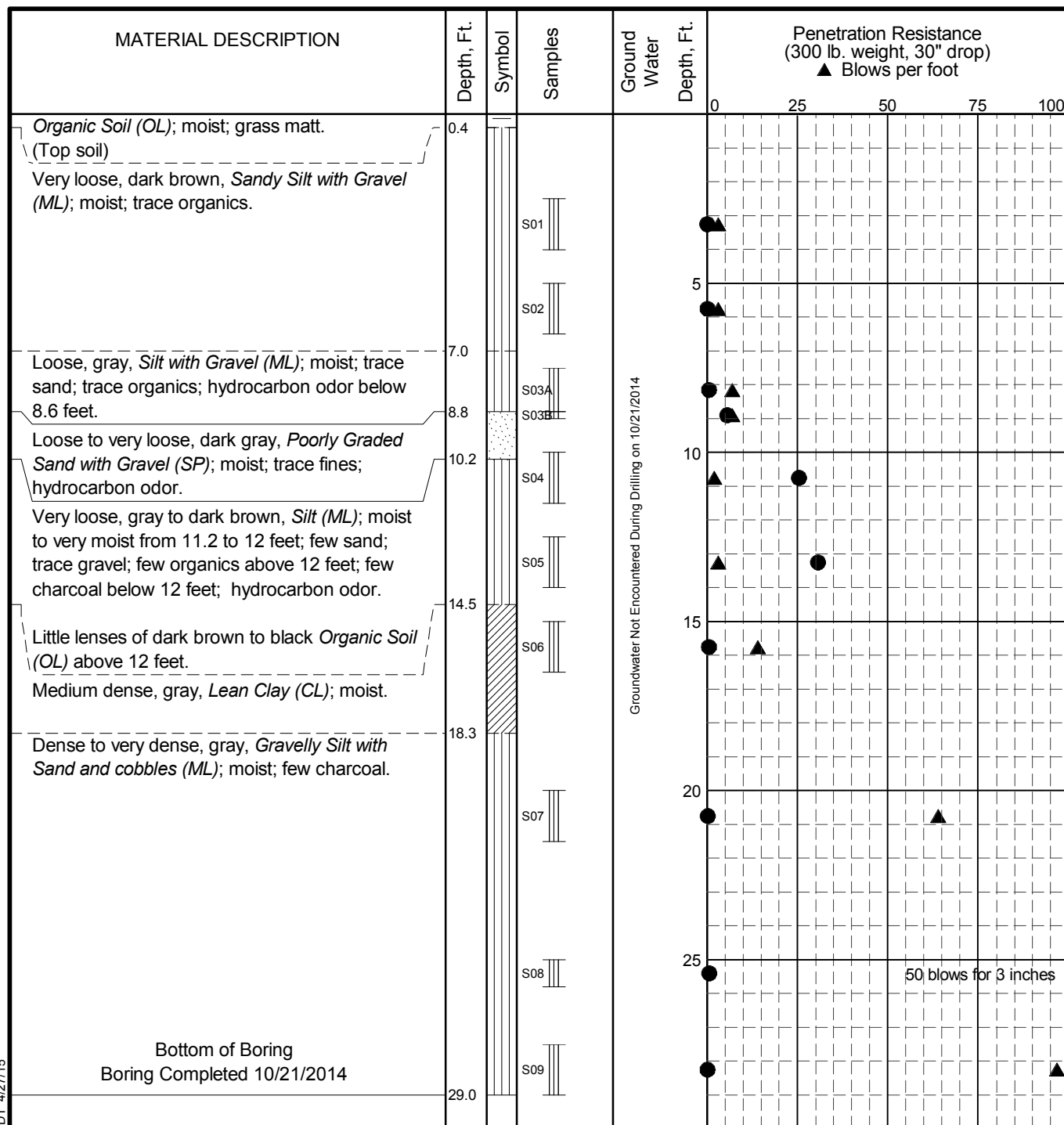
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Fig. C-7

ENVIRONMENTAL LOG 17678 BORING LOGS.GPJ S&W GEO1.GDT 4/27/15



LEGEND

- * Sample not recovered
- III 3" O.D. Split Spoon Sample
- II Direct Push

NOTES

1. The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
2. The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
3. Water level, if indicated above, is for the date specified and may vary.
4. USC letter symbol based on visual classification.

Southcentral Tesoro
Homer, Alaska

LOG OF BORING B05

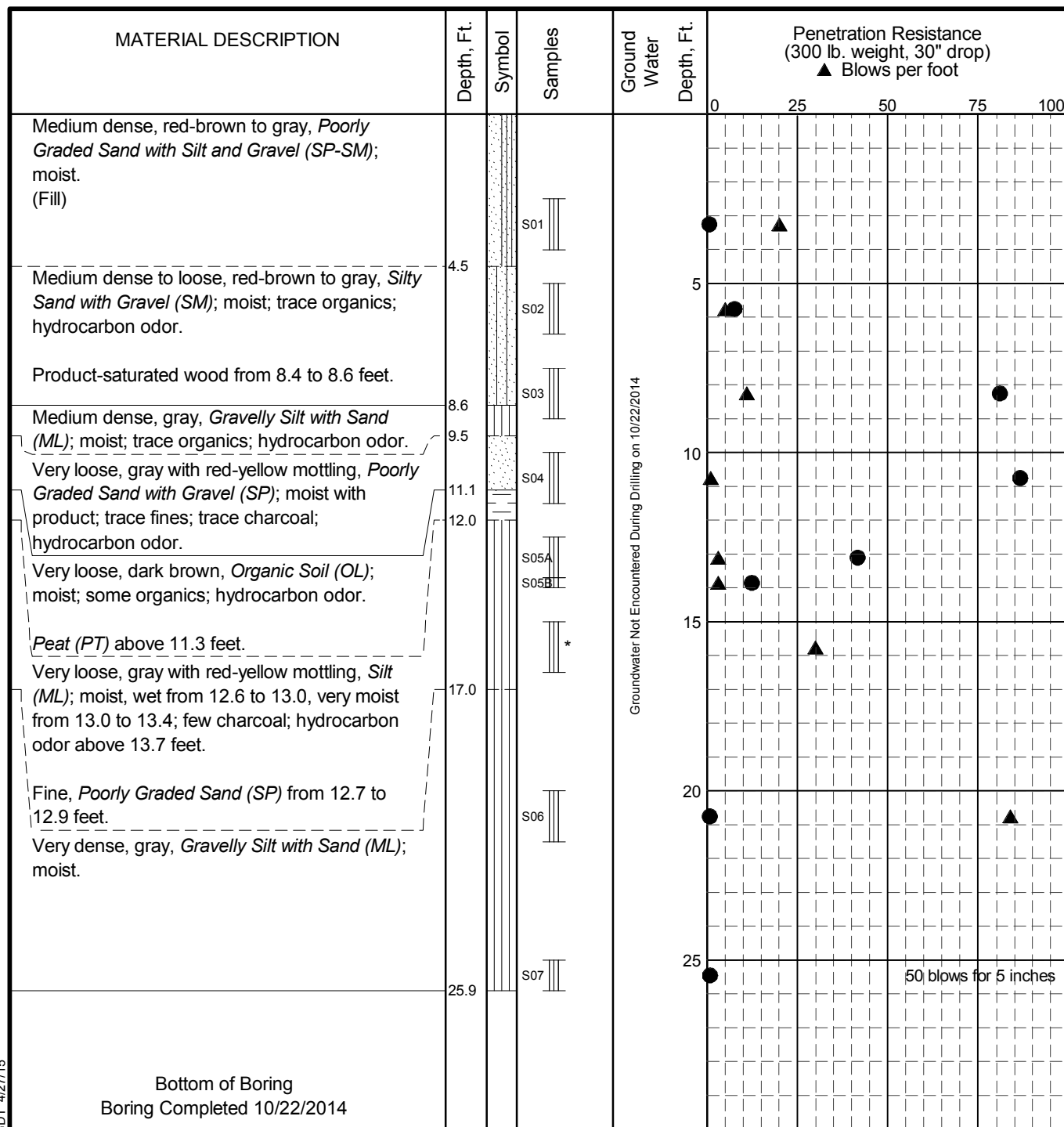
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Fig. C-8

ENVIRONMENTAL LOG 17678 BORING LOGS.GPJ S&W GEO1.GDT 4/27/15



LEGEND

- * Sample not recovered
- III 3" O.D. Split Spoon Sample
- II Direct Push

NOTES

- The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
- The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
- Water level, if indicated above, is for the date specified and may vary.
- USC letter symbol based on visual classification.

Southcentral Tesoro
Homer, Alaska

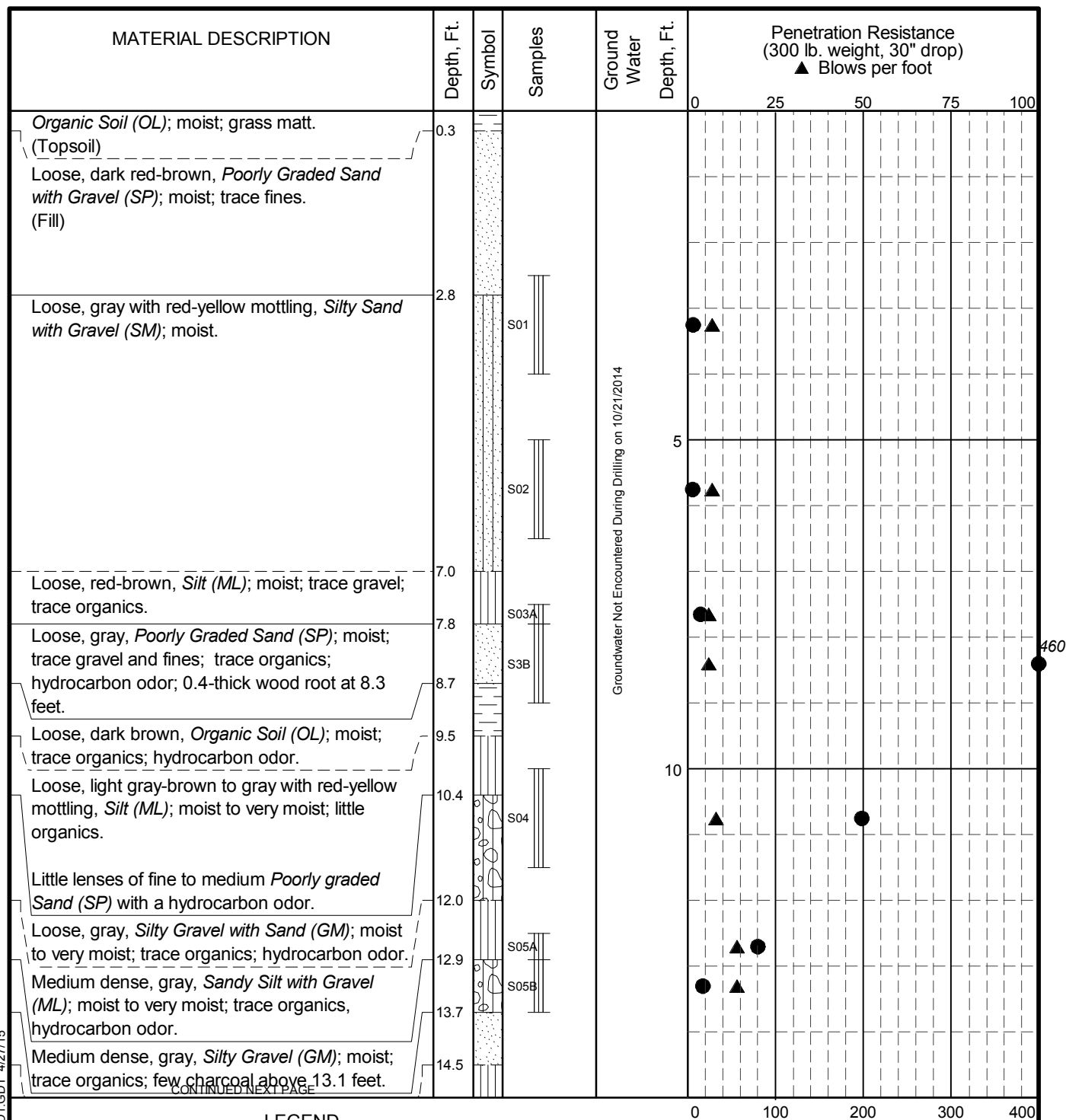
LOG OF BORING B06

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Fig. C-9



LEGEND

- * Sample not recovered
- III 3" O.D. Split Spoon Sample
- II Direct Push

NOTES

- The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
- The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
- Water level, if indicated above, is for the date specified and may vary.
- USC letter symbol based on visual classification.

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Homer, Alaska

LOG OF BORING B07

April 2015

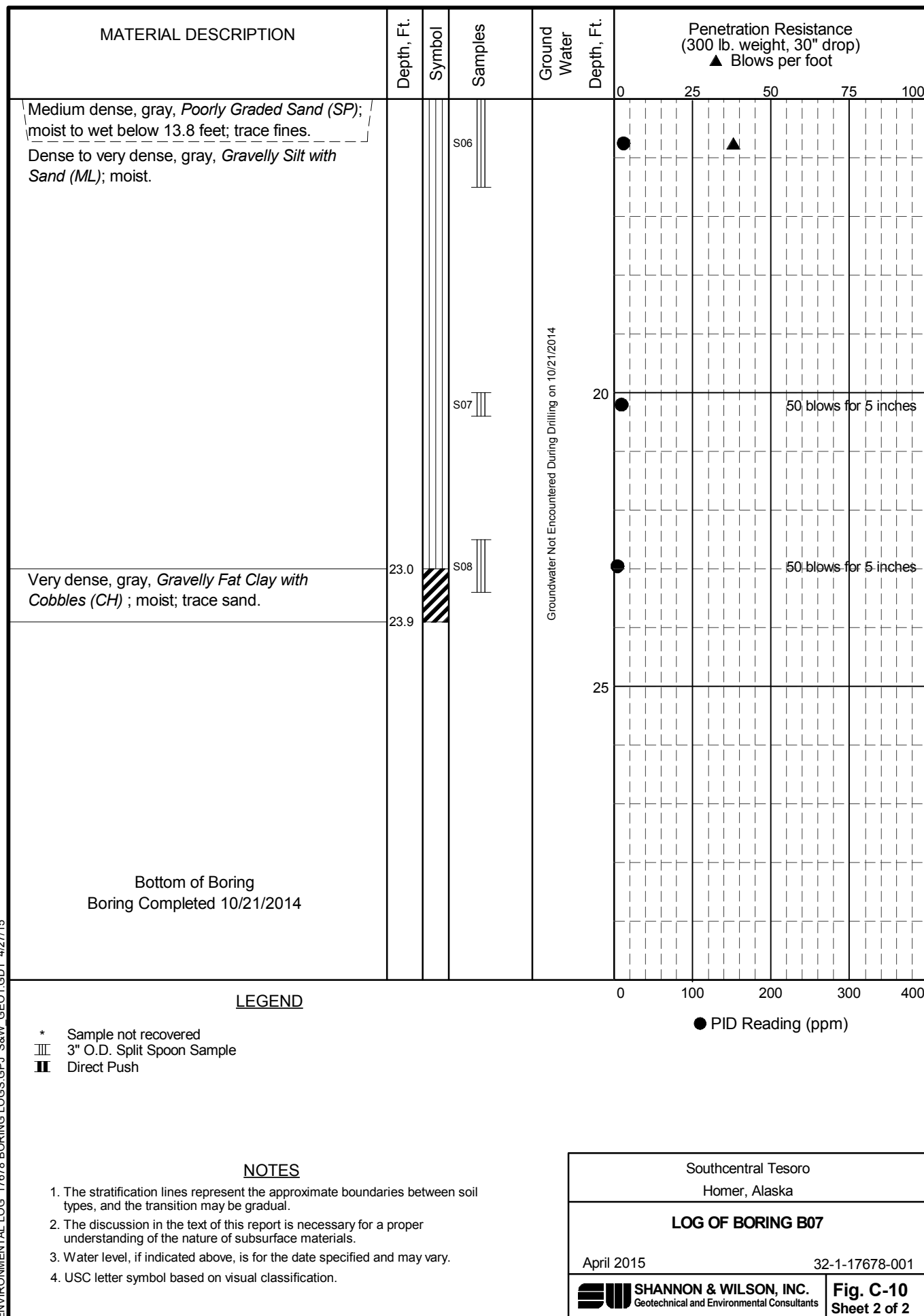
32-1-17678-001



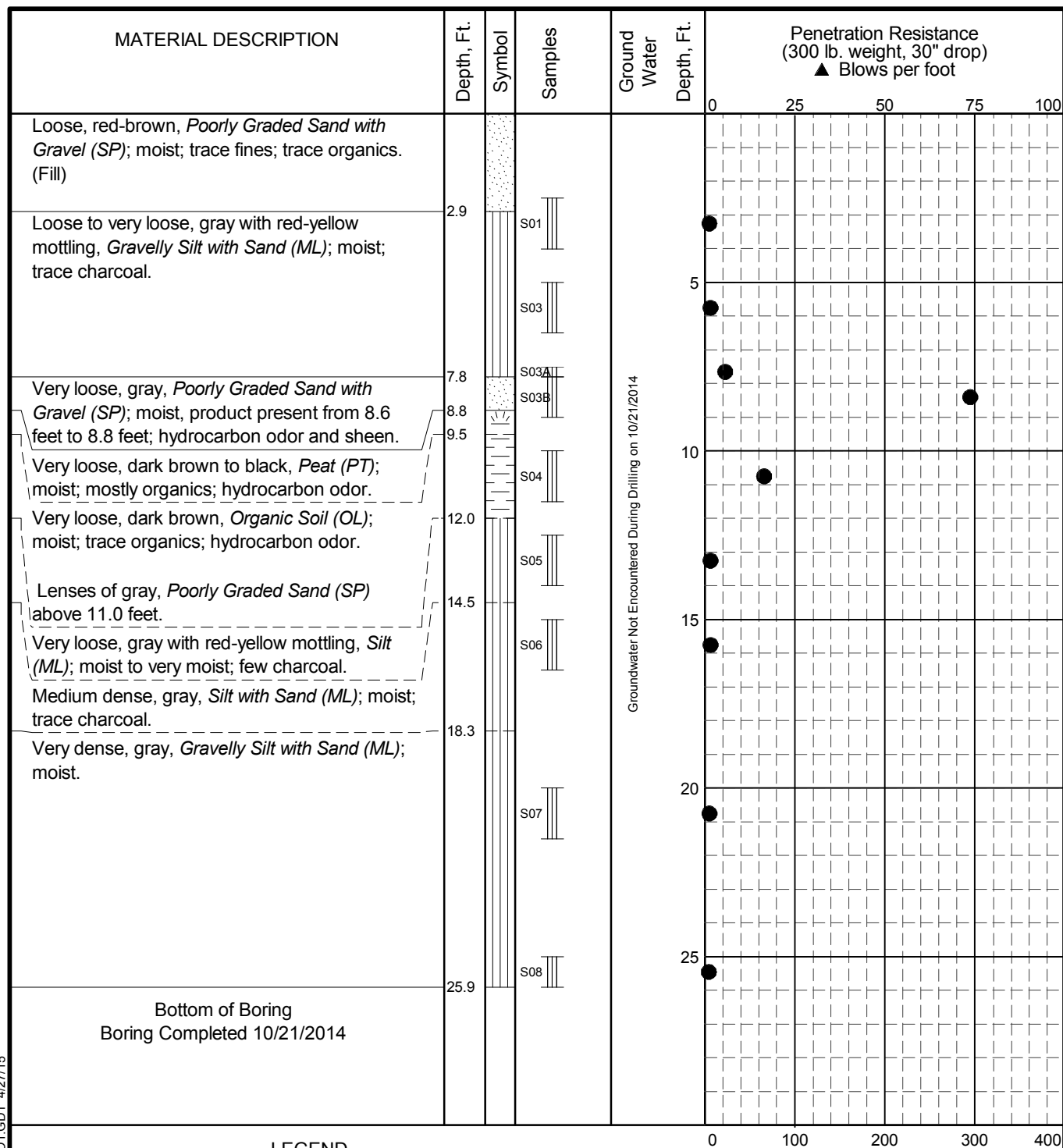
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Fig. C-10
Sheet 1 of 2

ENVIRONMENTAL LOG 17678 BORING LOGS.GPJ S&W GEO1.GDT 4/27/15



ENVIRONMENTAL LOG 17678 BORING LOGS.GPJ S&W GEO1.GDT 4/27/15



LEGEND

- * Sample not recovered
- III 3" O.D. Split Spoon Sample
- II Direct Push

NOTES

- The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
- The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
- Water level, if indicated above, is for the date specified and may vary.
- USC letter symbol based on visual classification.

Southcentral Tesoro
Homer, Alaska

LOG OF BORING B08

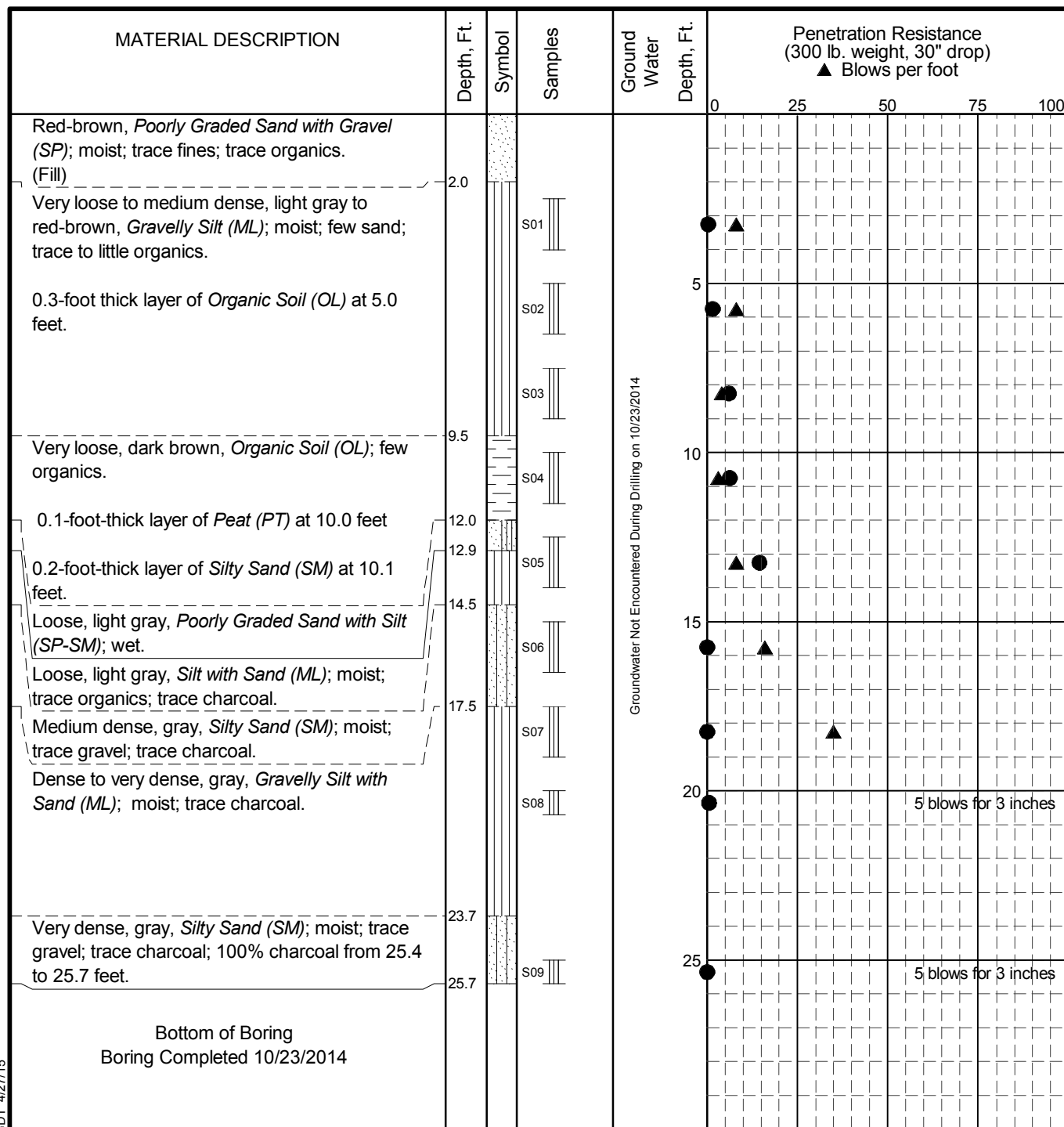
April 2015

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Fig. C-11

ENVIRONMENTAL LOG 17678 BORING LOGS.GPJ S&W GEO1.GDT 4/27/15



LEGEND

- * Sample not recovered
- [Symbol] 3" O.D. Split Spoon Sample
- [Symbol] Direct Push

NOTES

- The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
- The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
- Water level, if indicated above, is for the date specified and may vary.
- USC letter symbol based on visual classification.

● PID Reading (ppm)

Southcentral Tesoro
Homer, Alaska

LOG OF BORING B09

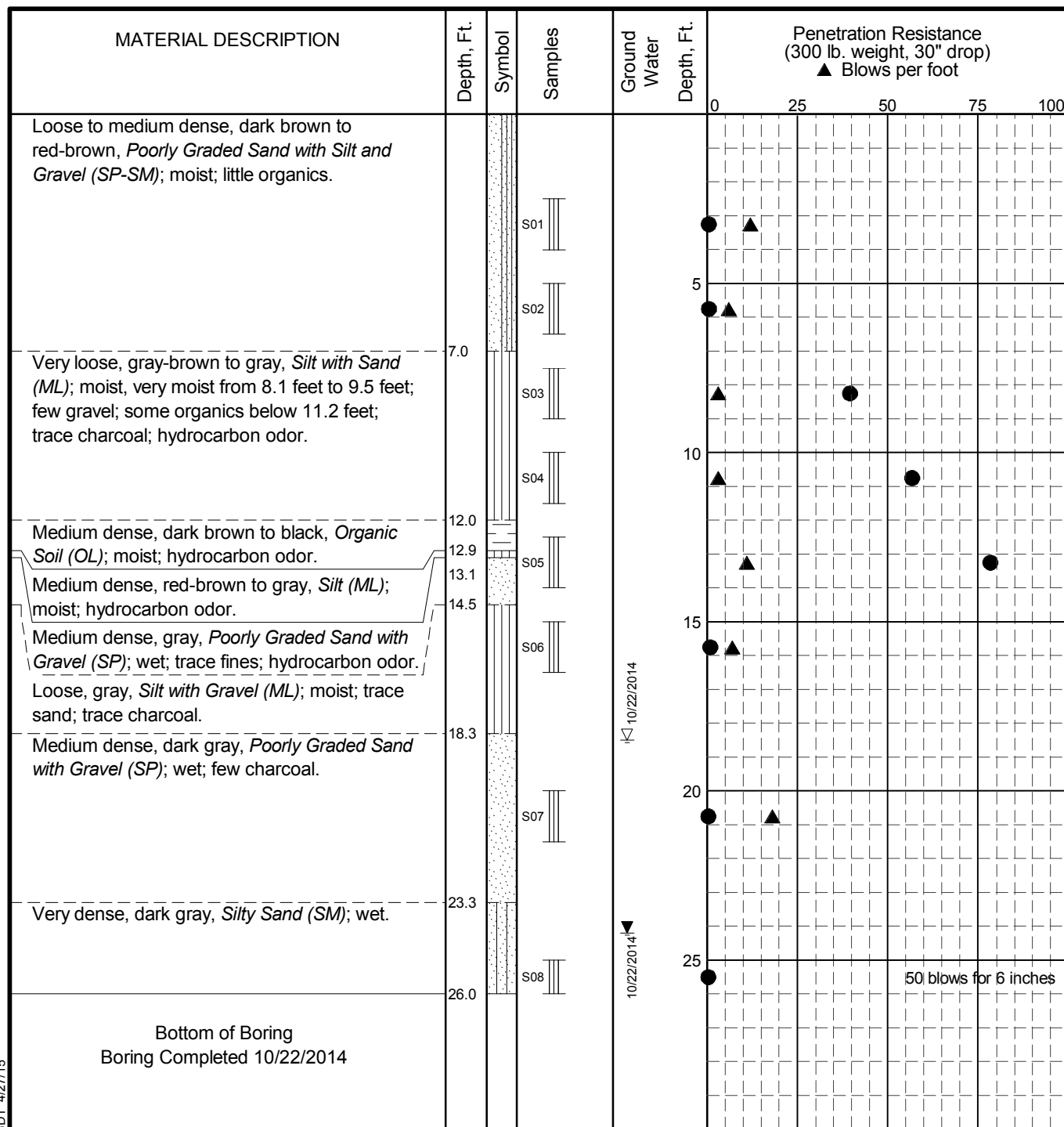
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Fig. C-12

ENVIRONMENTAL LOG 17678 BORING LOGS.GPJ S&W GEO1.GDT 4/27/15



LEGEND

- * Sample not recovered
- III 3" O.D. Split Spoon Sample
- II Direct Push

- ▽ Ground Water Level At Time Of Drilling
- ▼ Static Water Level

● PID Reading (ppm)

NOTES

- The stratification lines represent the approximate boundaries between soil types, and the transition may be gradual.
- The discussion in the text of this report is necessary for a proper understanding of the nature of subsurface materials.
- Water level, if indicated above, is for the date specified and may vary.
- USC letter symbol based on visual classification.

Southcentral Tesoro
Homer, Alaska

LOG OF BORING B10

April 2015

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Fig. C-13

Shannon & Wilson, Inc. (S&W), uses a soil identification system modified from the Unified Soil Classification System (USCS). Elements of the USCS and other definitions are provided on this and the following pages. Soil descriptions are based on visual-manual procedures (ASTM D2488) and laboratory testing procedures (ASTM D2487), if performed.

S&W INORGANIC SOIL CONSTITUENT DEFINITIONS

CONSTITUENT ²	FINE-GRAINED SOILS (50% or more fines) ¹	COARSE-GRAINED SOILS (less than 50% fines) ¹
Major	Silt, Lean Clay, Elastic Silt, or Fat Clay³	Sand or Gravel⁴
Modifying (Secondary) Precedes major constituent	30% or more coarse-grained: Sandy or Gravelly⁴	More than 12% fine-grained: Silty or Clayey³
Minor Follows major constituent	15% to 30% coarse-grained: with Sand or with Gravel⁴ 30% or more total coarse-grained and lesser coarse-grained constituent is 15% or more: with Sand or with Gravel⁵	5% to 12% fine-grained: with Silt or with Clay³ 15% or more of a second coarse-grained constituent: with Sand or with Gravel⁵

¹All percentages are by weight of total specimen passing a 3-inch sieve.

²The order of terms is: *Modifying Major with Minor*.

³Determined based on behavior.

⁴Determined based on which constituent comprises a larger percentage.

⁵Whichever is the lesser constituent.

MOISTURE CONTENT TERMS

Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, from below water table

STANDARD PENETRATION TEST (SPT) SPECIFICATIONS

Hammer:	140 pounds with a 30-inch free fall. Rope on 6- to 10-inch-diam. cathead 2-1/4 rope turns, > 100 rpm
	NOTE: If automatic hammers are used, blow counts shown on boring logs should be adjusted to account for efficiency of hammer.
Sampler:	10 to 30 inches long Shoe I.D. = 1.375 inches Barrel I.D. = 1.5 inches Barrel O.D. = 2 inches
N-Value:	Sum blow counts for second and third 6-inch increments. Refusal: 50 blows for 6 inches or less; 10 blows for 0 inches.
	NOTE: Penetration resistances (N-values) shown on boring logs are as recorded in the field and have not been corrected for hammer efficiency, overburden, or other factors.











PARTICLE SIZE DEFINITIONS

DESCRIPTION	SIEVE NUMBER AND/OR APPROXIMATE SIZE
FINES	< #200 (0.075 mm = 0.003 in.)
SAND Fine Medium Coarse	#200 to #40 (0.075 to 0.4 mm; 0.003 to 0.02 in.) #40 to #10 (0.4 to 2 mm; 0.02 to 0.08 in.) #10 to #4 (2 to 4.75 mm; 0.08 to 0.187 in.)
GRAVEL Fine Coarse	#4 to 3/4 in. (4.75 to 19 mm; 0.187 to 0.75 in.) 3/4 to 3 in. (19 to 76 mm)
COBBLES	3 to 12 in. (76 to 305 mm)
BOULDERS	> 12 in. (305 mm)

RELATIVE DENSITY / CONSISTENCY

COHESIONLESS SOILS		COHESIVE SOILS	
N, SPT, BLOWS/FT.	RELATIVE DENSITY	N, SPT, BLOWS/FT.	RELATIVE CONSISTENCY
< 4	Very loose	< 2	Very soft
4 - 10	Loose	2 - 4	Soft
10 - 30	Medium dense	4 - 8	Medium stiff
30 - 50	Dense	8 - 15	Stiff
> 50	Very dense	15 - 30	Very stiff
		> 30	Hard

WELL AND BACKFILL SYMBOLS

	Bentonite Cement Grout		Surface Cement Seal
	Bentonite Grout		Asphalt or Cap
	Bentonite Chips		Slough
	Silica Sand		Inclinometer or Non-perforated Casing
	Perforated or Screened Casing		Vibrating Wire Piezometer

PERCENTAGES TERMS^{1,2}

Trace	< 5%
Few	5 to 10%
Little	15 to 25%
Some	30 to 45%
Mostly	50 to 100%

¹Gravel, sand, and fines estimated by mass. Other constituents, such as organics, cobbles, and boulders, estimated by volume.

²Reprinted, with permission, from ASTM D2488 - 09a Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), copyright ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428. A copy of the complete standard may be obtained from ASTM International, www.astm.org.

Southcentral Tesoro
Homer, Alaska

SOIL DESCRIPTION AND LOG KEY

April 2015

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FIG. C-14
Sheet 1 of 3

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)
(Modified From USACE Tech Memo 3-357, ASTM D2487, and ASTM D2488)

MAJOR DIVISIONS			GROUP/GRAPHIC SYMBOL	TYPICAL IDENTIFICATIONS
COARSE-GRAINED SOILS (more than 50% retained on No. 200 sieve)	Gravels (more than 50% of coarse fraction retained on No. 4 sieve)	Gravel (less than 5% fines)	GW	Well-Graded Gravel; Well-Graded Gravel with Sand
			GP	Poorly Graded Gravel; Poorly Graded Gravel with Sand
		Silty or Clayey Gravel (more than 12% fines)	GM	Silty Gravel; Silty Gravel with Sand
			GC	Clayey Gravel; Clayey Gravel with Sand
	Sands (50% or more of coarse fraction passes the No. 4 sieve)	Sand (less than 5% fines)	SW	Well-Graded Sand; Well-Graded Sand with Gravel
			SP	Poorly Graded Sand; Poorly Graded Sand with Gravel
		Silty or Clayey Sand (more than 12% fines)	SM	Silty Sand; Silty Sand with Gravel
			SC	Clayey Sand; Clayey Sand with Gravel
FINE-GRAINED SOILS (50% or more passes the No. 200 sieve)	Sils and Clays (liquid limit less than 50)	Inorganic	ML	Silt; Silt with Sand or Gravel; Sandy or Gravelly Silt
			CL	Lean Clay; Lean Clay with Sand or Gravel; Sandy or Gravelly Lean Clay
		Organic	OL	Organic Silt or Clay; Organic Silt or Clay with Sand or Gravel; Sandy or Gravelly Organic Silt or Clay
	Sils and Clays (liquid limit 50 or more)	Inorganic	MH	Elastic Silt; Elastic Silt with Sand or Gravel; Sandy or Gravelly Elastic Silt
			CH	Fat Clay; Fat Clay with Sand or Gravel; Sandy or Gravelly Fat Clay
		Organic	OH	Organic Silt or Clay; Organic Silt or Clay with Sand or Gravel; Sandy or Gravelly Organic Silt or Clay
HIGHLY-ORGANIC SOILS	Primarily organic matter, dark in color, and organic odor		PT	Peat or other highly organic soils (see ASTM D4427)

NOTE: No. 4 size = 4.75 mm = 0.187 in.; No. 200 size = 0.075 mm = 0.003 in.

NOTES

- Dual symbols (symbols separated by a hyphen, i.e., SP-SM, Sand with Silt) are used for soils with between 5% and 12% fines or when the liquid limit and plasticity index values plot in the CL-ML area of the plasticity chart. Graphics shown on the logs for these soil types are a combination of the two graphic symbols (e.g., SP and SM).
- Borderline symbols (symbols separated by a slash, i.e., CL/ML, Lean Clay to Silt; SP-SM/SM, Sand with Silt to Silty Sand) indicate that the soil properties are close to the defining boundary between two groups.

Southcentral Tesoro
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**SOIL DESCRIPTION
AND LOG KEY**

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FIG. C-14
Sheet 2 of 3

GRADATION TERMS

Poorly Graded	Narrow range of grain sizes present or, within the range of grain sizes present, one or more sizes are missing (Gap Graded). Meets criteria in ASTM D2487, if tested.
Well-Graded	Full range and even distribution of grain sizes present. Meets criteria in ASTM D2487, if tested.

CEMENTATION TERMS¹

Weak	Crumbles or breaks with handling or slight finger pressure
Moderate	Crumbles or breaks with considerable finger pressure
Strong	Will not crumble or break with finger pressure

PLASTICITY²

DESCRIPTION	VISUAL-MANUAL CRITERIA	APPROX. PLASTICITY INDEX RANGE
Nonplastic	A 1/8-in. thread cannot be rolled at any water content.	< 4
Low	A thread can barely be rolled and a lump cannot be formed when drier than the plastic limit.	4 to 10
Medium	A thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. A lump crumbles when drier than the plastic limit.	10 to 20
High	It takes considerable time rolling and kneading to reach the plastic limit. A thread can be rerolled several times after reaching the plastic limit. A lump can be formed without crumbling when drier than the plastic limit.	> 20

ADDITIONAL TERMS

Mottled	Irregular patches of different colors.
Bioturbated	Soil disturbance or mixing by plants or animals.
Diamict	Nonsorted sediment; sand and gravel in silt and/or clay matrix.
Cuttings	Material brought to surface by drilling.
Slough	Material that caved from sides of borehole.
Sheared	Disturbed texture, mix of strengths.

PARTICLE ANGULARITY AND SHAPE TERMS¹

Angular	Sharp edges and unpolished planar surfaces.
Subangular	Similar to angular, but with rounded edges.
Subrounded	Nearly planar sides with well-rounded edges.
Rounded	Smoothly curved sides with no edges.
Flat	Width/thickness ratio > 3.
Elongated	Length/width ratio > 3.

¹Reprinted, with permission, from ASTM D2488 - 09a Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), copyright ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428. A copy of the complete standard may be obtained from ASTM International, www.astm.org.

²Adapted, with permission, from ASTM D2488 - 09a Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), copyright ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428. A copy of the complete standard may be obtained from ASTM International, www.astm.org.

ACRONYMS AND ABBREVIATIONS

ATD	At Time of Drilling
Diam.	Diameter
Elev.	Elevation
ft.	Feet
FeO	Iron Oxide
gal.	Gallons
Horiz.	Horizontal
HSA	Hollow Stem Auger
I.D.	Inside Diameter
in.	Inches
lbs.	Pounds
MgO	Magnesium Oxide
mm	Millimeter
MnO	Manganese Oxide
NA	Not Applicable or Not Available
NP	Nonplastic
O.D.	Outside Diameter
OW	Observation Well
pcf	Pounds per Cubic Foot
PID	Photo-Ionization Detector
PMT	Pressuremeter Test
ppm	Parts per Million
psi	Pounds per Square Inch
PVC	Polyvinyl Chloride
rpm	Rotations per Minute
SPT	Standard Penetration Test
USCS	Unified Soil Classification System
q _u	Unconfined Compressive Strength
VWP	Vibrating Wire Piezometer
Vert.	Vertical
WOH	Weight of Hammer
WOR	Weight of Rods
Wt.	Weight

STRUCTURE TERMS¹

Interbedded	Alternating layers of varying material or color with layers at least 1/4-inch thick; singular: bed.
Laminated	Alternating layers of varying material or color with layers less than 1/4-inch thick; singular: lamination.
Fissured	Breaks along definite planes or fractures with little resistance.
Slickensided	Fracture planes appear polished or glossy; sometimes striated.
Blocky	Cohesive soil that can be broken down into small angular lumps that resist further breakdown.
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay.
Homogeneous	Same color and appearance throughout.

Southcentral Tesoro
Homer, Alaska

**SOIL DESCRIPTION
AND LOG KEY**

April 2015

32-1-17678-001



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FIG. C-14
Sheet 3 of 3

APPENDIX D

**RESULTS OF ANALYTICAL TESTING BY TESTAMERICA LABORATORIES, INC.
OF ANCHORAGE, ALASKA AND
ADEC LABORATORY DATA REVIEW CHECKLISTS**

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Anchorage

2000 West International Airport Road

Suite A10

Anchorage, AK 99502-1119

Tel: (907)563-9200

TestAmerica Job ID: 230-361-1

Client Project/Site: 32-1-17678 Southcentral Tesoro

Revision: 2

For:

Shannon & Wilson

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Attn: Trevelyn Lough



Authorized for release by:

11/26/2014 12:25:31 PM

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Qualifiers

GCMS Volatiles

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
H1	Sample analysis performed past the method-specified holding time per client's approval.
ZX	Due to sample matrix effects, the surrogate recovery was outside the acceptance limits.

Fuels

Qualifier	Qualifier Description
H1	Sample analysis performed past the method-specified holding time per client's approval.
Q9	Hydrocarbon pattern most closely resembles biogenic interference.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
ZX	Due to sample matrix effects, the surrogate recovery was outside the acceptance limits.
Z3	The sample required a dilution due to the nature of the sample matrix. Because of this dilution, the surrogate spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.

GC Semi VOA

Qualifier	Qualifier Description
Y	The chromatographic response resembles a typical fuel pattern.

Glossary

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

Case Narrative

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Job ID: 230-361-1

Laboratory: TestAmerica Anchorage

Narrative

Job Narrative 230-361-1

Comments

The report is updated to evaluate results to the MDL. - Steve Crupi, 11/10/14
The report is updated a second time to add results for samples -4, -7, and -10, samples taken off of hold on 11/18/14 by Trevelyn Lough (S&W). The holding time expired for these analyses expired on 11/4/14, which is why an H1-flag is applied to the results for these three samples. - Steve Crupi, 11/25/14

Receipt

The samples were received on 10/27/2014 3:22 PM arriving in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 0.6° C and 1.2° C.

GC Semi VOA

Methods AK102 & 103: In analysis batch 174580, for samples 17678-MW1 (230-361-28), 17678-MW12 (230-361-30) and 17678-MW2 (230-361-29) from preparation batch 174455 contained a hydrocarbon pattern in the diesel range; however, the elution pattern was earlier than the typical diesel fuel pattern used by the laboratory for quantitative purposes: .

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

Organic Prep

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

Laboratory: TestAmerica Spokane

Narrative

Receipt

The samples were received on 10/28/2014 11:00:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.3 °C.

Per the client's request samples 230-361-4, 230-361-7 & 230-361-10 were re-logged past the method recommended holding times for methods AK101, AK102/103 & 8260C Volatiles.

GC/MS VOA Methods AK101 & 8260C

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

GC SVOA Method AK102/103

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

Detection Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B01-04

Lab Sample ID: 230-361-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	1.76	J	5.69	0.156	mg/kg dry	1.00	☼	EPA 8260C	Total
Diesel Range Hydrocarbons	14.4		11.2	1.87	mg/kg dry	1.00	☼	AK102/103	Total
Heavy Oil Range Hydrocarbons	80.7		22.4	2.49	mg/kg dry	1.00	☼	AK102/103	Total

Client Sample ID: 17678-B08-03B

Lab Sample ID: 230-361-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	294		30.0	0.823	mg/kg dry	10.0	☼	EPA 8260C	Total
Benzene	0.252		0.120	0.0583	mg/kg dry	10.0	☼	EPA 8260C	Total
Ethylbenzene	0.667		0.601	0.0973	mg/kg dry	10.0	☼	EPA 8260C	Total
m,p-Xylene	4.08		2.40	0.102	mg/kg dry	10.0	☼	EPA 8260C	Total
o-Xylene	0.0961	J	1.20	0.0787	mg/kg dry	10.0	☼	EPA 8260C	Total
1,3,5-Trimethylbenzene	5.11		0.601	0.112	mg/kg dry	10.0	☼	EPA 8260C	Total
1,2,4-Trimethylbenzene	12.1		0.601	0.0871	mg/kg dry	10.0	☼	EPA 8260C	Total
Xylenes (total)	4.18		3.61	0.181	mg/kg dry	10.0	☼	EPA 8260C	Total
Diesel Range Hydrocarbons	3720		408	68.2	mg/kg dry	20.0	☼	AK102/103	Total
Heavy Oil Range Hydrocarbons	296	J	817	91.1	mg/kg dry	20.0	☼	AK102/103	Total

Client Sample ID: 17678-B08-06

Lab Sample ID: 230-361-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	2.01	J	3.39	0.0930	mg/kg dry	1.00	☼	EPA 8260C	Total
Benzene	0.0607		0.0136	0.00658	mg/kg dry	1.00	☼	EPA 8260C	Total
Ethylbenzene	0.0146	J	0.0679	0.0110	mg/kg dry	1.00	☼	EPA 8260C	Total
m,p-Xylene	0.0448	J	0.271	0.0115	mg/kg dry	1.00	☼	EPA 8260C	Total
1,2,4-Trimethylbenzene	0.0153	J	0.0679	0.00984	mg/kg dry	1.00	☼	EPA 8260C	Total
Xylenes (total)	0.0448	J	0.407	0.0204	mg/kg dry	1.00	☼	EPA 8260C	Total
Diesel Range Hydrocarbons	26.6		10.1	1.68	mg/kg dry	1.00	☼	AK102/103	Total
Heavy Oil Range Hydrocarbons	60.3		20.1	2.25	mg/kg dry	1.00	☼	AK102/103	Total

Client Sample ID: 17678-B08-08

Lab Sample ID: 230-361-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	2.26	H1 J	2.37	0.0650	mg/kg dry	1.00	☼	EPA 8260C	Total
Benzene	0.0216	H1	0.00949	0.00460	mg/kg dry	1.00	☼	EPA 8260C	Total
Toluene	0.00712	H1 J	0.0475	0.00631	mg/kg dry	1.00	☼	EPA 8260C	Total
Ethylbenzene	0.00831	H1 J	0.0475	0.00769	mg/kg dry	1.00	☼	EPA 8260C	Total
m,p-Xylene	0.0306	H1 J	0.190	0.00807	mg/kg dry	1.00	☼	EPA 8260C	Total
1,2,4-Trimethylbenzene	0.00902	H1 J	0.0475	0.00688	mg/kg dry	1.00	☼	EPA 8260C	Total
Diesel Range Hydrocarbons	18.1	H1 Q9	10.4	1.74	mg/kg dry	1.00	☼	AK102/103	Total
Heavy Oil Range Hydrocarbons	63.2	H1 Q9	20.8	2.32	mg/kg dry	1.00	☼	AK102/103	Total

Client Sample ID: 17678-B07-03B

Lab Sample ID: 230-361-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	419		393	12.0	mg/kg dry	100	☼	EPA 8260C	Total
Ethylbenzene	8.04	J	8.74	1.42	mg/kg dry	100	☼	EPA 8260C	Total
m,p-Xylene	38.3		35.0	1.49	mg/kg dry	100	☼	EPA 8260C	Total
1,3,5-Trimethylbenzene	12.4		8.74	1.63	mg/kg dry	100	☼	EPA 8260C	Total
1,2,4-Trimethylbenzene	43.7		8.74	1.27	mg/kg dry	100	☼	EPA 8260C	Total

This Detection Summary does not include radiochemical test results.

TestAmerica Anchorage

Detection Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B07-03B (Continued)

Lab Sample ID: 230-361-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Xylenes (total)	38.3	J	52.4	2.63	mg/kg dry	100	☼	EPA 8260C	Total
Diesel Range Hydrocarbons	3810		571	95.4	mg/kg dry	50.0	☼	AK102/103	Total
Heavy Oil Range Hydrocarbons	164	J	1140	127	mg/kg dry	50.0	☼	AK102/103	Total

Client Sample ID: 17678-B07-06

Lab Sample ID: 230-361-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	5.34		2.56	0.0701	mg/kg dry	1.00	☼	EPA 8260C	Total
Benzene	0.562		0.0102	0.00497	mg/kg dry	1.00	☼	EPA 8260C	Total
Ethylbenzene	0.00922	J	0.0512	0.00830	mg/kg dry	1.00	☼	EPA 8260C	Total
m,p-Xylene	0.0271	J	0.205	0.00870	mg/kg dry	1.00	☼	EPA 8260C	Total
Xylenes (total)	0.0271	J	0.307	0.0154	mg/kg dry	1.00	☼	EPA 8260C	Total
Diesel Range Hydrocarbons	13.5		10.6	1.77	mg/kg dry	1.00	☼	AK102/103	Total
Heavy Oil Range Hydrocarbons	50.1		21.2	2.36	mg/kg dry	1.00	☼	AK102/103	Total

Client Sample ID: 17678-B07-08

Lab Sample ID: 230-361-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	4.21	H1	3.00	0.0821	mg/kg dry	1.00	☼	EPA 8260C	Total
Benzene	0.0267	H1	0.0120	0.00582	mg/kg dry	1.00	☼	EPA 8260C	Total
Toluene	0.0120	J H1	0.0600	0.00797	mg/kg dry	1.00	☼	EPA 8260C	Total
Ethylbenzene	0.0171	J H1	0.0600	0.00971	mg/kg dry	1.00	☼	EPA 8260C	Total
m,p-Xylene	0.0704	J H1	0.240	0.0102	mg/kg dry	1.00	☼	EPA 8260C	Total
1,3,5-Trimethylbenzene	0.0117	J H1	0.0600	0.0112	mg/kg dry	1.00	☼	EPA 8260C	Total
1,2,4-Trimethylbenzene	0.0312	J H1	0.0600	0.00869	mg/kg dry	1.00	☼	EPA 8260C	Total
Diesel Range Hydrocarbons	13.0	H1 Q9	10.5	1.75	mg/kg dry	1.00	☼	AK102/103	Total
Heavy Oil Range Hydrocarbons	26.0	H1 Q9	21.0	2.34	mg/kg dry	1.00	☼	AK102/103	Total

Client Sample ID: 17678-B02R-02

Lab Sample ID: 230-361-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	427		375	10.3	mg/kg dry	100	☼	EPA 8260C	Total
Benzene	1.16	J	1.50	0.728	mg/kg dry	100	☼	EPA 8260C	Total
Ethylbenzene	18.6		7.51	1.22	mg/kg dry	100	☼	EPA 8260C	Total
m,p-Xylene	76.0		30.0	1.28	mg/kg dry	100	☼	EPA 8260C	Total
o-Xylene	1.73	J	15.0	0.984	mg/kg dry	100	☼	EPA 8260C	Total
1,3,5-Trimethylbenzene	13.7		7.51	1.40	mg/kg dry	100	☼	EPA 8260C	Total
1,2,4-Trimethylbenzene	51.7		7.51	1.09	mg/kg dry	100	☼	EPA 8260C	Total
Xylenes (total)	77.7		45.0	2.26	mg/kg dry	100	☼	EPA 8260C	Total
Diesel Range Hydrocarbons	1650		11.9	1.99	mg/kg dry	1.00	☼	AK102/103	Total
Heavy Oil Range Hydrocarbons	186		23.8	2.65	mg/kg dry	1.00	☼	AK102/103	Total

Client Sample ID: 17678-B02R-05

Lab Sample ID: 230-361-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	2.25	J	3.47	0.0951	mg/kg dry	1.00	☼	EPA 8260C	Total
Benzene	0.00972	J	0.0139	0.00673	mg/kg dry	1.00	☼	EPA 8260C	Total
Ethylbenzene	0.0177	J	0.0694	0.0112	mg/kg dry	1.00	☼	EPA 8260C	Total
m,p-Xylene	0.0635	J	0.278	0.0118	mg/kg dry	1.00	☼	EPA 8260C	Total
1,3,5-Trimethylbenzene	0.0153	J	0.0694	0.0129	mg/kg dry	1.00	☼	EPA 8260C	Total

This Detection Summary does not include radiochemical test results.

TestAmerica Anchorage

Detection Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B02R-05 (Continued)

Lab Sample ID: 230-361-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,2,4-Trimethylbenzene	0.0489	J	0.0694	0.0101	mg/kg dry	1.00	☼	EPA 8260C	Total
Xylenes (total)	0.0718	J	0.417	0.0209	mg/kg dry	1.00	☼	EPA 8260C	Total
Diesel Range Hydrocarbons	17.7		10.3	1.72	mg/kg dry	1.00	☼	AK102/103	Total
Heavy Oil Range Hydrocarbons	45.5		20.5	2.29	mg/kg dry	1.00	☼	AK102/103	Total

Client Sample ID: 17678-B02R-06

Lab Sample ID: 230-361-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	1.29	J H1	3.59	0.0983	mg/kg dry	1.00	☼	EPA 8260C	Total
Toluene	0.0104	J H1	0.0718	0.00955	mg/kg dry	1.00	☼	EPA 8260C	Total
m,p-Xylene	0.0151	J H1	0.287	0.0122	mg/kg dry	1.00	☼	EPA 8260C	Total
Diesel Range Hydrocarbons	13.1	H1 Q9	11.0	1.84	mg/kg dry	1.00	☼	AK102/103	Total
Heavy Oil Range Hydrocarbons	32.4	H1 Q9	22.0	2.45	mg/kg dry	1.00	☼	AK102/103	Total

Client Sample ID: 17678-B09-05

Lab Sample ID: 230-361-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	1.20	J	4.80	0.132	mg/kg dry	1.00	☼	EPA 8260C	Total
Diesel Range Hydrocarbons	13.5		11.5	1.92	mg/kg dry	1.00	☼	AK102/103	Total
Heavy Oil Range Hydrocarbons	61.7		23.0	2.56	mg/kg dry	1.00	☼	AK102/103	Total

Client Sample ID: 17678-B09-07

Lab Sample ID: 230-361-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	1.06	J	2.92	0.0800	mg/kg dry	1.00	☼	EPA 8260C	Total
Diesel Range Hydrocarbons	12.1		10.6	1.77	mg/kg dry	1.00	☼	AK102/103	Total
Heavy Oil Range Hydrocarbons	40.6		21.2	2.36	mg/kg dry	1.00	☼	AK102/103	Total

Client Sample ID: 17678-B03-04

Lab Sample ID: 230-361-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	6.65		3.16	0.0864	mg/kg dry	1.00	☼	EPA 8260C	Total
Benzene	0.0609		0.0126	0.00612	mg/kg dry	1.00	☼	EPA 8260C	Total
Ethylbenzene	0.114		0.0631	0.0102	mg/kg dry	1.00	☼	EPA 8260C	Total
m,p-Xylene	0.408		0.252	0.0107	mg/kg dry	1.00	☼	EPA 8260C	Total
o-Xylene	0.0514	J	0.126	0.00827	mg/kg dry	1.00	☼	EPA 8260C	Total
1,3,5-Trimethylbenzene	0.130		0.0631	0.0117	mg/kg dry	1.00	☼	EPA 8260C	Total
1,2,4-Trimethylbenzene	0.400		0.0631	0.00915	mg/kg dry	1.00	☼	EPA 8260C	Total
Xylenes (total)	0.460		0.379	0.0190	mg/kg dry	1.00	☼	EPA 8260C	Total
Diesel Range Hydrocarbons	104		10.8	1.80	mg/kg dry	1.00	☼	AK102/103	Total
Heavy Oil Range Hydrocarbons	64.0		21.5	2.40	mg/kg dry	1.00	☼	AK102/103	Total

Client Sample ID: 17678-B04-04

Lab Sample ID: 230-361-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	4.85		3.60	0.0986	mg/kg dry	1.00	☼	EPA 8260C	Total
Benzene	0.0209		0.0144	0.00698	mg/kg dry	1.00	☼	EPA 8260C	Total
m,p-Xylene	0.0410	J	0.288	0.0122	mg/kg dry	1.00	☼	EPA 8260C	Total
1,3,5-Trimethylbenzene	0.0201	J	0.0720	0.0134	mg/kg dry	1.00	☼	EPA 8260C	Total
1,2,4-Trimethylbenzene	0.0838		0.0720	0.0104	mg/kg dry	1.00	☼	EPA 8260C	Total

This Detection Summary does not include radiochemical test results.

TestAmerica Anchorage

Detection Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B04-04 (Continued)

Lab Sample ID: 230-361-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Xylenes (total)	0.0471	J	0.432	0.0217	mg/kg dry	1.00	☼	EPA 8260C	Total
Diesel Range Hydrocarbons	93.0		11.0	1.84	mg/kg dry	1.00	☼	AK102/103	Total
Heavy Oil Range Hydrocarbons	97.8		22.1	2.46	mg/kg dry	1.00	☼	AK102/103	Total

Client Sample ID: 17678-B04-06

Lab Sample ID: 230-361-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	1.19	J	3.10	0.0850	mg/kg dry	1.00	☼	EPA 8260C	Total
Benzene	0.0874		0.0124	0.00602	mg/kg dry	1.00	☼	EPA 8260C	Total
m,p-Xylene	0.0267	J	0.248	0.0105	mg/kg dry	1.00	☼	EPA 8260C	Total
1,3,5-Trimethylbenzene	0.0146	J	0.0620	0.0115	mg/kg dry	1.00	☼	EPA 8260C	Total
1,2,4-Trimethylbenzene	0.0744		0.0620	0.00899	mg/kg dry	1.00	☼	EPA 8260C	Total
Xylenes (total)	0.0267	J	0.372	0.0187	mg/kg dry	1.00	☼	EPA 8260C	Total
Diesel Range Hydrocarbons	7.05	J	11.0	1.84	mg/kg dry	1.00	☼	AK102/103	Total
Heavy Oil Range Hydrocarbons	4.42	J	22.0	2.45	mg/kg dry	1.00	☼	AK102/103	Total

Client Sample ID: 17678-B10-05

Lab Sample ID: 230-361-16

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	165		105	2.88	mg/kg dry	10.0	☼	EPA 8260C	Total
Ethylbenzene	2.22		2.10	0.340	mg/kg dry	10.0	☼	EPA 8260C	Total
m,p-Xylene	9.24		8.41	0.357	mg/kg dry	10.0	☼	EPA 8260C	Total
o-Xylene	0.757	J	4.20	0.275	mg/kg dry	10.0	☼	EPA 8260C	Total
1,3,5-Trimethylbenzene	7.16		2.10	0.391	mg/kg dry	10.0	☼	EPA 8260C	Total
1,2,4-Trimethylbenzene	23.0		2.10	0.305	mg/kg dry	10.0	☼	EPA 8260C	Total
Xylenes (total)	9.99	J	12.6	0.633	mg/kg dry	10.0	☼	EPA 8260C	Total
Diesel Range Hydrocarbons	2750		22.2	3.71	mg/kg dry	1.00	☼	AK102/103	Total
Heavy Oil Range Hydrocarbons	346		44.5	4.96	mg/kg dry	1.00	☼	AK102/103	Total

Client Sample ID: 17678-B10-06

Lab Sample ID: 230-361-17

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	3.18	J	4.19	0.115	mg/kg dry	1.00	☼	EPA 8260C	Total
Benzene	0.0176		0.0168	0.00813	mg/kg dry	1.00	☼	EPA 8260C	Total
m,p-Xylene	0.0402	J	0.335	0.0143	mg/kg dry	1.00	☼	EPA 8260C	Total
1,3,5-Trimethylbenzene	0.0402	J	0.0838	0.0156	mg/kg dry	1.00	☼	EPA 8260C	Total
1,2,4-Trimethylbenzene	0.0968		0.0838	0.0122	mg/kg dry	1.00	☼	EPA 8260C	Total
Xylenes (total)	0.0402	J	0.503	0.0252	mg/kg dry	1.00	☼	EPA 8260C	Total
Diesel Range Hydrocarbons	16.8		11.7	1.95	mg/kg dry	1.00	☼	AK102/103	Total
Heavy Oil Range Hydrocarbons	16.9	J	23.4	2.61	mg/kg dry	1.00	☼	AK102/103	Total

Client Sample ID: 17678-B06-06

Lab Sample ID: 230-361-18

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	0.984	J	3.33	0.0914	mg/kg dry	1.00	☼	EPA 8260C	Total
Benzene	0.0237		0.0133	0.00647	mg/kg dry	1.00	☼	EPA 8260C	Total
Diesel Range Hydrocarbons	9.10	J	10.4	1.73	mg/kg dry	1.00	☼	AK102/103	Total
Heavy Oil Range Hydrocarbons	30.4		20.7	2.31	mg/kg dry	1.00	☼	AK102/103	Total

Client Sample ID: 17678-B06-04

Lab Sample ID: 230-361-19

This Detection Summary does not include radiochemical test results.

TestAmerica Anchorage

Detection Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B06-04 (Continued)

Lab Sample ID: 230-361-19

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	74.7		31.8	0.873	mg/kg dry	10.0	✱	EPA 8260C	Total
Benzene	0.777		0.127	0.0618	mg/kg dry	10.0	✱	EPA 8260C	Total
Ethylbenzene	2.46		0.637	0.103	mg/kg dry	10.0	✱	EPA 8260C	Total
m,p-Xylene	10.9		2.55	0.108	mg/kg dry	10.0	✱	EPA 8260C	Total
o-Xylene	0.111	J	1.27	0.0834	mg/kg dry	10.0	✱	EPA 8260C	Total
1,3,5-Trimethylbenzene	3.70		0.637	0.118	mg/kg dry	10.0	✱	EPA 8260C	Total
1,2,4-Trimethylbenzene	12.9		0.637	0.0924	mg/kg dry	10.0	✱	EPA 8260C	Total
Xylenes (total)	11.0		3.82	0.192	mg/kg dry	10.0	✱	EPA 8260C	Total
Diesel Range Hydrocarbons	2530		226	37.7	mg/kg dry	20.0	✱	AK102/103	Total
Heavy Oil Range Hydrocarbons	235	J	452	50.4	mg/kg dry	20.0	✱	AK102/103	Total

Client Sample ID: 17678-B06-04D

Lab Sample ID: 230-361-20

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	143		37.9	1.04	mg/kg dry	10.0	✱	EPA 8260C	Total
Benzene	1.36		0.152	0.0735	mg/kg dry	10.0	✱	EPA 8260C	Total
Toluene	0.106	J	0.758	0.101	mg/kg dry	10.0	✱	EPA 8260C	Total
Ethylbenzene	3.91		0.758	0.123	mg/kg dry	10.0	✱	EPA 8260C	Total
m,p-Xylene	14.4		3.03	0.129	mg/kg dry	10.0	✱	EPA 8260C	Total
o-Xylene	0.777	J	1.52	0.0992	mg/kg dry	10.0	✱	EPA 8260C	Total
1,3,5-Trimethylbenzene	4.58		0.758	0.141	mg/kg dry	10.0	✱	EPA 8260C	Total
1,2,4-Trimethylbenzene	17.0		0.758	0.110	mg/kg dry	10.0	✱	EPA 8260C	Total
Xylenes (total)	15.2		4.55	0.228	mg/kg dry	10.0	✱	EPA 8260C	Total
Diesel Range Hydrocarbons	2500		125	20.8	mg/kg dry	10.0	✱	AK102/103	Total
Heavy Oil Range Hydrocarbons	254		249	27.8	mg/kg dry	10.0	✱	AK102/103	Total

Client Sample ID: 17678-B05-05

Lab Sample ID: 230-361-21

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	3.05	J	3.07	0.0841	mg/kg dry	1.00	✱	EPA 8260C	Total
Benzene	0.00921	J	0.0123	0.00595	mg/kg dry	1.00	✱	EPA 8260C	Total
Ethylbenzene	0.101		0.0614	0.00994	mg/kg dry	1.00	✱	EPA 8260C	Total
m,p-Xylene	0.0644	J	0.245	0.0104	mg/kg dry	1.00	✱	EPA 8260C	Total
1,3,5-Trimethylbenzene	0.0954		0.0614	0.0114	mg/kg dry	1.00	✱	EPA 8260C	Total
1,2,4-Trimethylbenzene	0.0908		0.0614	0.00890	mg/kg dry	1.00	✱	EPA 8260C	Total
Xylenes (total)	0.0681	J	0.368	0.0185	mg/kg dry	1.00	✱	EPA 8260C	Total
Diesel Range Hydrocarbons	1060		230	38.4	mg/kg dry	20.0	✱	AK102/103	Total
Heavy Oil Range Hydrocarbons	1570		460	51.3	mg/kg dry	20.0	✱	AK102/103	Total

Client Sample ID: 17678-B05-07

Lab Sample ID: 230-361-22

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	0.957	J	3.42	0.0938	mg/kg dry	1.00	✱	EPA 8260C	Total
Diesel Range Hydrocarbons	14.3		9.77	1.63	mg/kg dry	1.00	✱	AK102/103	Total
Heavy Oil Range Hydrocarbons	40.0		19.5	2.18	mg/kg dry	1.00	✱	AK102/103	Total

Client Sample ID: 17678-B05-06

Lab Sample ID: 230-361-23

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Anchorage

Detection Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-TB1

Lab Sample ID: 230-361-24

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	2.91	J	5.00	0.137	mg/kg wet	1.00		EPA 8260C	Total

Client Sample ID: 17678-TB2

Lab Sample ID: 230-361-25

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	1.45	J	5.00	0.137	mg/kg wet	1.00		EPA 8260C	Total

Client Sample ID: 17678-TB3

Lab Sample ID: 230-361-26

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	1.78	J	5.00	0.137	mg/kg wet	1.00		EPA 8260C	Total

Client Sample ID: 17678-TB4

Lab Sample ID: 230-361-27

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Toluene	0.100	J	1.00	0.0380	ug/L	1.00		EPA 8260C	Total

Client Sample ID: 17678-MW1

Lab Sample ID: 230-361-28

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	0.340		0.200	0.0320	ug/L	1.00		EPA 8260C	Total
m,p-Xylene	0.170	J	2.00	0.124	ug/L	1.00		EPA 8260C	Total
1,2,4-Trimethylbenzene	0.240	J	1.00	0.0400	ug/L	1.00		EPA 8260C	Total
Xylenes (total)	0.170	J	3.00	0.0160	ug/L	1.00		EPA 8260C	Total
DRO (nC10-<nC25)	1.28	Y	0.101	0.0121	mg/L	1		AK102 & 103	Total/NA
RRO (nC25-nC36)	0.701	Y	0.101	0.0202	mg/L	1		AK102 & 103	Total/NA

Client Sample ID: 17678-MW2

Lab Sample ID: 230-361-29

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	1180		100	52.0	ug/L	1.00		EPA 8260C	Total
Toluene	0.590	J	1.00	0.0380	ug/L	1.00		EPA 8260C	Total
Ethylbenzene	2.03		1.00	0.0860	ug/L	1.00		EPA 8260C	Total
m,p-Xylene	41.4		2.00	0.124	ug/L	1.00		EPA 8260C	Total
o-Xylene	0.650	J	1.00	0.0620	ug/L	1.00		EPA 8260C	Total
1,3,5-Trimethylbenzene	18.3		1.00	0.0740	ug/L	1.00		EPA 8260C	Total
1,2,4-Trimethylbenzene	61.1		1.00	0.0400	ug/L	1.00		EPA 8260C	Total
Xylenes (total)	42.1		3.00	0.0160	ug/L	1.00		EPA 8260C	Total
Benzene - RE1	325		2.00	0.320	ug/L	10.0		EPA 8260C	Total
DRO (nC10-<nC25)	2.10	Y	0.0978	0.0117	mg/L	1		AK102 & 103	Total/NA
RRO (nC25-nC36)	0.691	Y	0.0978	0.0196	mg/L	1		AK102 & 103	Total/NA

Client Sample ID: 17678-MW12

Lab Sample ID: 230-361-30

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Gasoline Range Hydrocarbons	1200		100	52.0	ug/L	1.00		EPA 8260C	Total
Toluene	0.620	J	1.00	0.0380	ug/L	1.00		EPA 8260C	Total
Ethylbenzene	2.05		1.00	0.0860	ug/L	1.00		EPA 8260C	Total
m,p-Xylene	41.5		2.00	0.124	ug/L	1.00		EPA 8260C	Total
o-Xylene	0.660	J	1.00	0.0620	ug/L	1.00		EPA 8260C	Total

This Detection Summary does not include radiochemical test results.

TestAmerica Anchorage

Detection Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-MW12 (Continued)

Lab Sample ID: 230-361-30

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,3,5-Trimethylbenzene	18.8		1.00	0.0740	ug/L	1.00		EPA 8260C	Total
1,2,4-Trimethylbenzene	63.2		1.00	0.0400	ug/L	1.00		EPA 8260C	Total
Xylenes (total)	42.1		3.00	0.0160	ug/L	1.00		EPA 8260C	Total
Benzene - RE1	325		2.00	0.320	ug/L	10.0		EPA 8260C	Total
DRO (nC10-<nC25)	2.02	Y	0.100	0.0120	mg/L		1	AK102 & 103	Total/NA
RRO (nC25-nC36)	0.760	Y	0.100	0.0200	mg/L		1	AK102 & 103	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B01-04

Lab Sample ID: 230-361-1

Date Collected: 10/20/14 14:00

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 82.9

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	1.76	J	5.69	0.156	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:11	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	101		41.5 - 162				10/29/14 08:37	10/29/14 13:11	1.00
a,a,a - Trifluorotoluene	101		50 - 150				10/29/14 08:37	10/29/14 13:11	1.00

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0227	0.0110	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:11	1.00
Toluene	ND		0.114	0.0151	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:11	1.00
Ethylbenzene	ND		0.114	0.0184	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:11	1.00
m,p-Xylene	ND		0.455	0.0193	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:11	1.00
o-Xylene	ND		0.227	0.0149	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:11	1.00
1,3,5-Trimethylbenzene	ND		0.114	0.0211	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:11	1.00
1,2,4-Trimethylbenzene	ND		0.114	0.0165	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:11	1.00
Xylenes (total)	ND		0.682	0.0342	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:11	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dibromofluoromethane	100		80 - 120				10/29/14 08:37	10/29/14 13:11	1.00
Toluene-d8	104		78.5 - 125				10/29/14 08:37	10/29/14 13:11	1.00
4-bromofluorobenzene	101		69.8 - 140				10/29/14 08:37	10/29/14 13:11	1.00
a,a,a - Trifluorotoluene	101		50 - 150				10/29/14 08:37	10/29/14 13:11	1.00

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	14.4		11.2	1.87	mg/kg dry	☼	10/29/14 08:21	10/29/14 10:46	1.00
Heavy Oil Range Hydrocarbons	80.7		22.4	2.49	mg/kg dry	☼	10/29/14 08:21	10/29/14 10:46	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	101		50 - 150				10/29/14 08:21	10/29/14 10:46	1.00
n-Triacontane-d62	75.2		50 - 150				10/29/14 08:21	10/29/14 10:46	1.00

Client Sample ID: 17678-B08-03B

Lab Sample ID: 230-361-2

Date Collected: 10/21/14 17:50

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 92.3

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	294		30.0	0.823	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:33	10.0
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	164	ZX	41.5 - 162				10/29/14 08:37	10/29/14 13:33	10.0
a,a,a - Trifluorotoluene	102		50 - 150				10/29/14 08:37	10/29/14 13:33	10.0

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.252		0.120	0.0583	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:33	10.0
Toluene	ND		0.601	0.0799	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:33	10.0
Ethylbenzene	0.667		0.601	0.0973	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:33	10.0
m,p-Xylene	4.08		2.40	0.102	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:33	10.0
o-Xylene	0.0961	J	1.20	0.0787	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:33	10.0

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B08-03B

Lab Sample ID: 230-361-2

Date Collected: 10/21/14 17:50

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 92.3

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,3,5-Trimethylbenzene	5.11		0.601	0.112	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:33	10.0
1,2,4-Trimethylbenzene	12.1		0.601	0.0871	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:33	10.0
Xylenes (total)	4.18		3.61	0.181	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:33	10.0

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane	101		80 - 120	10/29/14 08:37	10/29/14 13:33	10.0
Toluene-d8	96.5		78.5 - 125	10/29/14 08:37	10/29/14 13:33	10.0
4-bromofluorobenzene	164	ZX	69.8 - 140	10/29/14 08:37	10/29/14 13:33	10.0
a,a,a - Trifluorotoluene	102		50 - 150	10/29/14 08:37	10/29/14 13:33	10.0

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	3720		408	68.2	mg/kg dry	☼	10/29/14 08:21	10/29/14 16:07	20.0
Heavy Oil Range Hydrocarbons	296	J	817	91.1	mg/kg dry	☼	10/29/14 08:21	10/29/14 16:07	20.0

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	71.9		50 - 150	10/29/14 08:21	10/29/14 16:07	20.0
n-Triacontane-d62	102		50 - 150	10/29/14 08:21	10/29/14 16:07	20.0

Client Sample ID: 17678-B08-06

Lab Sample ID: 230-361-3

Date Collected: 10/21/14 18:17

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 83.6

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	2.01	J	3.39	0.0930	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:55	1.00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	102		41.5 - 162	10/29/14 08:37	10/29/14 13:55	1.00
a,a,a - Trifluorotoluene	53.2		50 - 150	10/29/14 08:37	10/29/14 13:55	1.00

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.0607		0.0136	0.00658	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:55	1.00
Toluene	ND		0.0679	0.00903	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:55	1.00
Ethylbenzene	0.0146	J	0.0679	0.0110	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:55	1.00
m,p-Xylene	0.0448	J	0.271	0.0115	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:55	1.00
o-Xylene	ND		0.136	0.00889	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:55	1.00
1,3,5-Trimethylbenzene	ND		0.0679	0.0126	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:55	1.00
1,2,4-Trimethylbenzene	0.0153	J	0.0679	0.00984	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:55	1.00
Xylenes (total)	0.0448	J	0.407	0.0204	mg/kg dry	☼	10/29/14 08:37	10/29/14 13:55	1.00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane	99.5		80 - 120	10/29/14 08:37	10/29/14 13:55	1.00
Toluene-d8	107		78.5 - 125	10/29/14 08:37	10/29/14 13:55	1.00
4-bromofluorobenzene	102		69.8 - 140	10/29/14 08:37	10/29/14 13:55	1.00
a,a,a - Trifluorotoluene	53.2		50 - 150	10/29/14 08:37	10/29/14 13:55	1.00

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	26.6		10.1	1.68	mg/kg dry	☼	10/29/14 08:21	10/29/14 11:40	1.00

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B08-06

Lab Sample ID: 230-361-3

Date Collected: 10/21/14 18:17

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 83.6

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Heavy Oil Range Hydrocarbons	60.3		20.1	2.25	mg/kg dry	☼	10/29/14 08:21	10/29/14 11:40	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	105		50 - 150				10/29/14 08:21	10/29/14 11:40	1.00
<i>n</i> -Triacontane-d62	128		50 - 150				10/29/14 08:21	10/29/14 11:40	1.00

Client Sample ID: 17678-B08-08

Lab Sample ID: 230-361-4

Date Collected: 10/21/14 18:35

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 94.3

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	2.26	H1 J	2.37	0.0650	mg/kg dry	☼	11/20/14 10:25	11/20/14 12:59	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	102	H1	41.5 - 162				11/20/14 10:25	11/20/14 12:59	1.00
a,a,a - Trifluorotoluene	93.6	H1	50 - 150				11/20/14 10:25	11/20/14 12:59	1.00

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.0216	H1	0.00949	0.00460	mg/kg dry	☼	11/20/14 10:25	11/20/14 12:59	1.00
Toluene	0.00712	H1 J	0.0475	0.00631	mg/kg dry	☼	11/20/14 10:25	11/20/14 12:59	1.00
Ethylbenzene	0.00831	H1 J	0.0475	0.00769	mg/kg dry	☼	11/20/14 10:25	11/20/14 12:59	1.00
m,p-Xylene	0.0306	H1 J	0.190	0.00807	mg/kg dry	☼	11/20/14 10:25	11/20/14 12:59	1.00
o-Xylene	ND	H1	0.0949	0.00622	mg/kg dry	☼	11/20/14 10:25	11/20/14 12:59	1.00
1,3,5-Trimethylbenzene	ND	H1	0.0475	0.00883	mg/kg dry	☼	11/20/14 10:25	11/20/14 12:59	1.00
1,2,4-Trimethylbenzene	0.00902	H1 J	0.0475	0.00688	mg/kg dry	☼	11/20/14 10:25	11/20/14 12:59	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dibromofluoromethane	98.5	H1	80 - 120				11/20/14 10:25	11/20/14 12:59	1.00
Toluene-d8	103	H1	78.5 - 125				11/20/14 10:25	11/20/14 12:59	1.00
4-bromofluorobenzene	102	H1	69.8 - 140				11/20/14 10:25	11/20/14 12:59	1.00
a,a,a - Trifluorotoluene	93.6	H1	50 - 150				11/20/14 10:25	11/20/14 12:59	1.00

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	18.1	H1 Q9	10.4	1.74	mg/kg dry	☼	11/21/14 09:10	11/21/14 14:08	1.00
Heavy Oil Range Hydrocarbons	63.2	H1 Q9	20.8	2.32	mg/kg dry	☼	11/21/14 09:10	11/21/14 14:08	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	113	H1	50 - 150				11/21/14 09:10	11/21/14 14:08	1.00
<i>n</i> -Triacontane-d62	145	H1	50 - 150				11/21/14 09:10	11/21/14 14:08	1.00

Client Sample ID: 17678-B07-03B

Lab Sample ID: 230-361-5

Date Collected: 10/21/14 15:00

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 87.2

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	419		393	12.0	mg/kg dry	☼	10/29/14 08:37	10/29/14 14:17	100

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B07-03B

Lab Sample ID: 230-361-5

Date Collected: 10/21/14 15:00

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 87.2

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	104		41.5 - 162	10/29/14 08:37	10/29/14 14:17	100
a,a,a - Trifluorotoluene	87.6		50 - 150	10/29/14 08:37	10/29/14 14:17	100

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.75	0.848	mg/kg dry	☼	10/29/14 08:37	10/29/14 14:17	100
Toluene	ND		8.74	1.16	mg/kg dry	☼	10/29/14 08:37	10/29/14 14:17	100
Ethylbenzene	8.04	J	8.74	1.42	mg/kg dry	☼	10/29/14 08:37	10/29/14 14:17	100
m,p-Xylene	38.3		35.0	1.49	mg/kg dry	☼	10/29/14 08:37	10/29/14 14:17	100
o-Xylene	ND		17.5	1.14	mg/kg dry	☼	10/29/14 08:37	10/29/14 14:17	100
1,3,5-Trimethylbenzene	12.4		8.74	1.63	mg/kg dry	☼	10/29/14 08:37	10/29/14 14:17	100
1,2,4-Trimethylbenzene	43.7		8.74	1.27	mg/kg dry	☼	10/29/14 08:37	10/29/14 14:17	100
Xylenes (total)	38.3	J	52.4	2.63	mg/kg dry	☼	10/29/14 08:37	10/29/14 14:17	100

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane	99.5		80 - 120	10/29/14 08:37	10/29/14 14:17	100
Toluene-d8	105		78.5 - 125	10/29/14 08:37	10/29/14 14:17	100
4-bromofluorobenzene	104		69.8 - 140	10/29/14 08:37	10/29/14 14:17	100
a,a,a - Trifluorotoluene	87.6		50 - 150	10/29/14 08:37	10/29/14 14:17	100

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	3810		571	95.4	mg/kg dry	☼	10/29/14 08:21	10/29/14 16:07	50.0
Heavy Oil Range Hydrocarbons	164	J	1140	127	mg/kg dry	☼	10/29/14 08:21	10/29/14 16:07	50.0

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	188	Z3	50 - 150	10/29/14 08:21	10/29/14 16:07	50.0
n-Triacontane-d62	102		50 - 150	10/29/14 08:21	10/29/14 16:07	50.0

Client Sample ID: 17678-B07-06

Lab Sample ID: 230-361-6

Date Collected: 10/21/14 15:50

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 91.6

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	5.34		2.56	0.0701	mg/kg dry	☼	10/29/14 08:37	10/29/14 14:40	1.00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	99.7		41.5 - 162	10/29/14 08:37	10/29/14 14:40	1.00
a,a,a - Trifluorotoluene	102		50 - 150	10/29/14 08:37	10/29/14 14:40	1.00

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.562		0.0102	0.00497	mg/kg dry	☼	10/29/14 08:37	10/29/14 14:40	1.00
Toluene	ND		0.0512	0.00681	mg/kg dry	☼	10/29/14 08:37	10/29/14 14:40	1.00
Ethylbenzene	0.00922	J	0.0512	0.00830	mg/kg dry	☼	10/29/14 08:37	10/29/14 14:40	1.00
m,p-Xylene	0.0271	J	0.205	0.00870	mg/kg dry	☼	10/29/14 08:37	10/29/14 14:40	1.00
o-Xylene	ND		0.102	0.00671	mg/kg dry	☼	10/29/14 08:37	10/29/14 14:40	1.00
1,3,5-Trimethylbenzene	ND		0.0512	0.00952	mg/kg dry	☼	10/29/14 08:37	10/29/14 14:40	1.00
1,2,4-Trimethylbenzene	ND		0.0512	0.00742	mg/kg dry	☼	10/29/14 08:37	10/29/14 14:40	1.00
Xylenes (total)	0.0271	J	0.307	0.0154	mg/kg dry	☼	10/29/14 08:37	10/29/14 14:40	1.00

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B07-06

Lab Sample ID: 230-361-6

Date Collected: 10/21/14 15:50

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 91.6

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane	96.9		80 - 120	10/29/14 08:37	10/29/14 14:40	1.00
Toluene-d8	105		78.5 - 125	10/29/14 08:37	10/29/14 14:40	1.00
4-bromofluorobenzene	99.7		69.8 - 140	10/29/14 08:37	10/29/14 14:40	1.00
a,a,a - Trifluorotoluene	102		50 - 150	10/29/14 08:37	10/29/14 14:40	1.00

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	13.5		10.6	1.77	mg/kg dry	☼	10/29/14 08:21	10/29/14 12:04	1.00
Heavy Oil Range Hydrocarbons	50.1		21.2	2.36	mg/kg dry	☼	10/29/14 08:21	10/29/14 12:04	1.00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	103		50 - 150	10/29/14 08:21	10/29/14 12:04	1.00
n-Triacontane-d62	88.9		50 - 150	10/29/14 08:21	10/29/14 12:04	1.00

Client Sample ID: 17678-B07-08

Lab Sample ID: 230-361-7

Date Collected: 10/21/14 16:27

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 90.9

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	4.21	H1	3.00	0.0821	mg/kg dry	☼	11/20/14 10:25	11/20/14 13:21	1.00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	101	H1	41.5 - 162	11/20/14 10:25	11/20/14 13:21	1.00
a,a,a - Trifluorotoluene	74.3	H1	50 - 150	11/20/14 10:25	11/20/14 13:21	1.00

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.0267	H1	0.0120	0.00582	mg/kg dry	☼	11/20/14 10:25	11/20/14 13:21	1.00
Toluene	0.0120	J H1	0.0600	0.00797	mg/kg dry	☼	11/20/14 10:25	11/20/14 13:21	1.00
Ethylbenzene	0.0171	J H1	0.0600	0.00971	mg/kg dry	☼	11/20/14 10:25	11/20/14 13:21	1.00
m,p-Xylene	0.0704	J H1	0.240	0.0102	mg/kg dry	☼	11/20/14 10:25	11/20/14 13:21	1.00
o-Xylene	ND	H1	0.120	0.00785	mg/kg dry	☼	11/20/14 10:25	11/20/14 13:21	1.00
1,3,5-Trimethylbenzene	0.0117	J H1	0.0600	0.0112	mg/kg dry	☼	11/20/14 10:25	11/20/14 13:21	1.00
1,2,4-Trimethylbenzene	0.0312	J H1	0.0600	0.00869	mg/kg dry	☼	11/20/14 10:25	11/20/14 13:21	1.00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane	99.5	H1	80 - 120	11/20/14 10:25	11/20/14 13:21	1.00
Toluene-d8	99.3	H1	78.5 - 125	11/20/14 10:25	11/20/14 13:21	1.00
4-bromofluorobenzene	101	H1	69.8 - 140	11/20/14 10:25	11/20/14 13:21	1.00
a,a,a - Trifluorotoluene	74.3	H1	50 - 150	11/20/14 10:25	11/20/14 13:21	1.00

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	13.0	H1 Q9	10.5	1.75	mg/kg dry	☼	11/21/14 09:10	11/21/14 14:32	1.00
Heavy Oil Range Hydrocarbons	26.0	H1 Q9	21.0	2.34	mg/kg dry	☼	11/21/14 09:10	11/21/14 14:32	1.00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	106	H1	50 - 150	11/21/14 09:10	11/21/14 14:32	1.00
n-Triacontane-d62	129	H1	50 - 150	11/21/14 09:10	11/21/14 14:32	1.00

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B02R-02

Lab Sample ID: 230-361-8

Date Collected: 10/21/14 10:15

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 80.3

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	427		375	10.3	mg/kg dry	☼	10/29/14 08:37	10/29/14 15:02	100
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	101		41.5 - 162				10/29/14 08:37	10/29/14 15:02	100
a,a,a - Trifluorotoluene	118		50 - 150				10/29/14 08:37	10/29/14 15:02	100

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.16	J	1.50	0.728	mg/kg dry	☼	10/29/14 08:37	10/29/14 15:02	100
Toluene	ND		7.51	0.999	mg/kg dry	☼	10/29/14 08:37	10/29/14 15:02	100
Ethylbenzene	18.6		7.51	1.22	mg/kg dry	☼	10/29/14 08:37	10/29/14 15:02	100
m,p-Xylene	76.0		30.0	1.28	mg/kg dry	☼	10/29/14 08:37	10/29/14 15:02	100
o-Xylene	1.73	J	15.0	0.984	mg/kg dry	☼	10/29/14 08:37	10/29/14 15:02	100
1,3,5-Trimethylbenzene	13.7		7.51	1.40	mg/kg dry	☼	10/29/14 08:37	10/29/14 15:02	100
1,2,4-Trimethylbenzene	51.7		7.51	1.09	mg/kg dry	☼	10/29/14 08:37	10/29/14 15:02	100
Xylenes (total)	77.7		45.0	2.26	mg/kg dry	☼	10/29/14 08:37	10/29/14 15:02	100
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dibromofluoromethane	100		80 - 120				10/29/14 08:37	10/29/14 15:02	100
Toluene-d8	104		78.5 - 125				10/29/14 08:37	10/29/14 15:02	100
4-bromofluorobenzene	101		69.8 - 140				10/29/14 08:37	10/29/14 15:02	100
a,a,a - Trifluorotoluene	118		50 - 150				10/29/14 08:37	10/29/14 15:02	100

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	1650		11.9	1.99	mg/kg dry	☼	10/29/14 08:21	10/29/14 12:28	1.00
Heavy Oil Range Hydrocarbons	186		23.8	2.65	mg/kg dry	☼	10/29/14 08:21	10/29/14 12:28	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	102		50 - 150				10/29/14 08:21	10/29/14 12:28	1.00
n-Triacontane-d62	106		50 - 150				10/29/14 08:21	10/29/14 12:28	1.00

Client Sample ID: 17678-B02R-05

Lab Sample ID: 230-361-9

Date Collected: 10/21/14 13:05

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 92.2

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	2.25	J	3.47	0.0951	mg/kg dry	☼	10/29/14 08:37	10/29/14 15:47	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	101		41.5 - 162				10/29/14 08:37	10/29/14 15:47	1.00
a,a,a - Trifluorotoluene	79.8		50 - 150				10/29/14 08:37	10/29/14 15:47	1.00

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.00972	J	0.0139	0.00673	mg/kg dry	☼	10/29/14 08:37	10/29/14 15:47	1.00
Toluene	ND		0.0694	0.00923	mg/kg dry	☼	10/29/14 08:37	10/29/14 15:47	1.00
Ethylbenzene	0.0177	J	0.0694	0.0112	mg/kg dry	☼	10/29/14 08:37	10/29/14 15:47	1.00
m,p-Xylene	0.0635	J	0.278	0.0118	mg/kg dry	☼	10/29/14 08:37	10/29/14 15:47	1.00
o-Xylene	ND		0.139	0.00909	mg/kg dry	☼	10/29/14 08:37	10/29/14 15:47	1.00

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B02R-05

Lab Sample ID: 230-361-9

Date Collected: 10/21/14 13:05

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 92.2

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,3,5-Trimethylbenzene	0.0153	J	0.0694	0.0129	mg/kg dry	☼	10/29/14 08:37	10/29/14 15:47	1.00
1,2,4-Trimethylbenzene	0.0489	J	0.0694	0.0101	mg/kg dry	☼	10/29/14 08:37	10/29/14 15:47	1.00
Xylenes (total)	0.0718	J	0.417	0.0209	mg/kg dry	☼	10/29/14 08:37	10/29/14 15:47	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dibromofluoromethane	98.7		80 - 120				10/29/14 08:37	10/29/14 15:47	1.00
Toluene-d8	104		78.5 - 125				10/29/14 08:37	10/29/14 15:47	1.00
4-bromofluorobenzene	101		69.8 - 140				10/29/14 08:37	10/29/14 15:47	1.00
a,a,a - Trifluorotoluene	79.8		50 - 150				10/29/14 08:37	10/29/14 15:47	1.00

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	17.7		10.3	1.72	mg/kg dry	☼	10/29/14 08:21	10/29/14 12:28	1.00
Heavy Oil Range Hydrocarbons	45.5		20.5	2.29	mg/kg dry	☼	10/29/14 08:21	10/29/14 12:28	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	102		50 - 150				10/29/14 08:21	10/29/14 12:28	1.00
n-Triacontane-d62	86.7		50 - 150				10/29/14 08:21	10/29/14 12:28	1.00

Client Sample ID: 17678-B02R-06

Lab Sample ID: 230-361-10

Date Collected: 10/21/14 13:15

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 90.8

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	1.29	J H1	3.59	0.0983	mg/kg dry	☼	11/20/14 10:25	11/20/14 13:44	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	99.7	H1	41.5 - 162				11/20/14 10:25	11/20/14 13:44	1.00
a,a,a - Trifluorotoluene	78.3	H1	50 - 150				11/20/14 10:25	11/20/14 13:44	1.00

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND	H1	0.0144	0.00696	mg/kg dry	☼	11/20/14 10:25	11/20/14 13:44	1.00
Toluene	0.0104	J H1	0.0718	0.00955	mg/kg dry	☼	11/20/14 10:25	11/20/14 13:44	1.00
Ethylbenzene	ND	H1	0.0718	0.0116	mg/kg dry	☼	11/20/14 10:25	11/20/14 13:44	1.00
m,p-Xylene	0.0151	J H1	0.287	0.0122	mg/kg dry	☼	11/20/14 10:25	11/20/14 13:44	1.00
o-Xylene	ND	H1	0.144	0.00940	mg/kg dry	☼	11/20/14 10:25	11/20/14 13:44	1.00
1,3,5-Trimethylbenzene	ND	H1	0.0718	0.0134	mg/kg dry	☼	11/20/14 10:25	11/20/14 13:44	1.00
1,2,4-Trimethylbenzene	ND	H1	0.0718	0.0104	mg/kg dry	☼	11/20/14 10:25	11/20/14 13:44	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dibromofluoromethane	98.3	H1	80 - 120				11/20/14 10:25	11/20/14 13:44	1.00
Toluene-d8	99.5	H1	78.5 - 125				11/20/14 10:25	11/20/14 13:44	1.00
4-bromofluorobenzene	99.7	H1	69.8 - 140				11/20/14 10:25	11/20/14 13:44	1.00
a,a,a - Trifluorotoluene	78.3	H1	50 - 150				11/20/14 10:25	11/20/14 13:44	1.00

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	13.1	H1 Q9	11.0	1.84	mg/kg dry	☼	11/21/14 09:10	11/21/14 14:56	1.00
Heavy Oil Range Hydrocarbons	32.4	H1 Q9	22.0	2.45	mg/kg dry	☼	11/21/14 09:10	11/21/14 14:56	1.00

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B02R-06

Lab Sample ID: 230-361-10

Date Collected: 10/21/14 13:15

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 90.8

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	108	H1	50 - 150	11/21/14 09:10	11/21/14 14:56	1.00
<i>n</i> -Triacontane-d62	133	H1	50 - 150	11/21/14 09:10	11/21/14 14:56	1.00

Client Sample ID: 17678-B09-05

Lab Sample ID: 230-361-11

Date Collected: 10/23/14 17:55

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 83

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	1.20	J	4.80	0.132	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:09	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	99.3		41.5 - 162				10/29/14 08:37	10/29/14 16:09	1.00
a.a.a - Trifluorotoluene	88.7		50 - 150				10/29/14 08:37	10/29/14 16:09	1.00

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0192	0.00931	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:09	1.00
Toluene	ND		0.0960	0.0128	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:09	1.00
Ethylbenzene	ND		0.0960	0.0156	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:09	1.00
m,p-Xylene	ND		0.384	0.0163	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:09	1.00
o-Xylene	ND		0.192	0.0126	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:09	1.00
1,3,5-Trimethylbenzene	ND		0.0960	0.0179	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:09	1.00
1,2,4-Trimethylbenzene	ND		0.0960	0.0139	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:09	1.00
Xylenes (total)	ND		0.576	0.0289	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:09	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dibromofluoromethane	97.9		80 - 120				10/29/14 08:37	10/29/14 16:09	1.00
Toluene-d8	105		78.5 - 125				10/29/14 08:37	10/29/14 16:09	1.00
4-bromofluorobenzene	99.3		69.8 - 140				10/29/14 08:37	10/29/14 16:09	1.00
a,a,a - Trifluorotoluene	88.7		50 - 150				10/29/14 08:37	10/29/14 16:09	1.00

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	13.5		11.5	1.92	mg/kg dry	☼	10/29/14 08:21	10/29/14 12:52	1.00
Heavy Oil Range Hydrocarbons	61.7		23.0	2.56	mg/kg dry	☼	10/29/14 08:21	10/29/14 12:52	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	83.9		50 - 150				10/29/14 08:21	10/29/14 12:52	1.00
n-Triacontane-d62	97.4		50 - 150				10/29/14 08:21	10/29/14 12:52	1.00

Client Sample ID: 17678-B09-07

Lab Sample ID: 230-361-12

Date Collected: 10/23/14 18:15

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 92.6

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	1.06	J	2.92	0.0800	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:32	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	98.9		41.5 - 162				10/29/14 08:37	10/29/14 16:32	1.00
a.a.a - Trifluorotoluene	70.7		50 - 150				10/29/14 08:37	10/29/14 16:32	1.00

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B09-07

Lab Sample ID: 230-361-12

Date Collected: 10/23/14 18:15

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 92.6

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0117	0.00566	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:32	1.00
Toluene	ND		0.0584	0.00776	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:32	1.00
Ethylbenzene	ND		0.0584	0.00945	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:32	1.00
m,p-Xylene	ND		0.233	0.00992	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:32	1.00
o-Xylene	ND		0.117	0.00765	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:32	1.00
1,3,5-Trimethylbenzene	ND		0.0584	0.0109	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:32	1.00
1,2,4-Trimethylbenzene	ND		0.0584	0.00846	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:32	1.00
Xylenes (total)	ND		0.350	0.0176	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:32	1.00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane	99.3		80 - 120	10/29/14 08:37	10/29/14 16:32	1.00
Toluene-d8	105		78.5 - 125	10/29/14 08:37	10/29/14 16:32	1.00
4-bromofluorobenzene	98.9		69.8 - 140	10/29/14 08:37	10/29/14 16:32	1.00
a,a,a - Trifluorotoluene	70.7		50 - 150	10/29/14 08:37	10/29/14 16:32	1.00

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	12.1		10.6	1.77	mg/kg dry	☼	10/29/14 08:21	10/29/14 12:52	1.00
Heavy Oil Range Hydrocarbons	40.6		21.2	2.36	mg/kg dry	☼	10/29/14 08:21	10/29/14 12:52	1.00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	101		50 - 150	10/29/14 08:21	10/29/14 12:52	1.00
n-Triacontane-d62	90.3		50 - 150	10/29/14 08:21	10/29/14 12:52	1.00

Client Sample ID: 17678-B03-04

Lab Sample ID: 230-361-13

Date Collected: 10/23/14 09:15

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 88.9

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	6.65		3.16	0.0864	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:54	1.00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	106		41.5 - 162	10/29/14 08:37	10/29/14 16:54	1.00
a,a,a - Trifluorotoluene	83.3		50 - 150	10/29/14 08:37	10/29/14 16:54	1.00

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.0609		0.0126	0.00612	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:54	1.00
Toluene	ND		0.0631	0.00839	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:54	1.00
Ethylbenzene	0.114		0.0631	0.0102	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:54	1.00
m,p-Xylene	0.408		0.252	0.0107	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:54	1.00
o-Xylene	0.0514	J	0.126	0.00827	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:54	1.00
1,3,5-Trimethylbenzene	0.130		0.0631	0.0117	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:54	1.00
1,2,4-Trimethylbenzene	0.400		0.0631	0.00915	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:54	1.00
Xylenes (total)	0.460		0.379	0.0190	mg/kg dry	☼	10/29/14 08:37	10/29/14 16:54	1.00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane	101		80 - 120	10/29/14 08:37	10/29/14 16:54	1.00
Toluene-d8	104		78.5 - 125	10/29/14 08:37	10/29/14 16:54	1.00
4-bromofluorobenzene	106		69.8 - 140	10/29/14 08:37	10/29/14 16:54	1.00

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B03-04

Lab Sample ID: 230-361-13

Date Collected: 10/23/14 09:15

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 88.9

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
a,a,a - Trifluorotoluene	83.3		50 - 150	10/29/14 08:37	10/29/14 16:54	1.00

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	104		10.8	1.80	mg/kg dry	☼	10/29/14 08:21	10/29/14 13:17	1.00
Heavy Oil Range Hydrocarbons	64.0		21.5	2.40	mg/kg dry	☼	10/29/14 08:21	10/29/14 13:17	1.00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	95.0		50 - 150	10/29/14 08:21	10/29/14 13:17	1.00
n-Triacontane-d62	102		50 - 150	10/29/14 08:21	10/29/14 13:17	1.00

Client Sample ID: 17678-B04-04

Lab Sample ID: 230-361-14

Date Collected: 10/23/14 13:45

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 84.1

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	4.85		3.60	0.0986	mg/kg dry	☼	10/29/14 08:37	10/29/14 17:17	1.00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	107		41.5 - 162	10/29/14 08:37	10/29/14 17:17	1.00
a,a,a - Trifluorotoluene	87.2		50 - 150	10/29/14 08:37	10/29/14 17:17	1.00

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.0209		0.0144	0.00698	mg/kg dry	☼	10/29/14 08:37	10/29/14 17:17	1.00
Toluene	ND		0.0720	0.00957	mg/kg dry	☼	10/29/14 08:37	10/29/14 17:17	1.00
Ethylbenzene	ND		0.0720	0.0117	mg/kg dry	☼	10/29/14 08:37	10/29/14 17:17	1.00
m,p-Xylene	0.0410	J	0.288	0.0122	mg/kg dry	☼	10/29/14 08:37	10/29/14 17:17	1.00
o-Xylene	ND		0.144	0.00943	mg/kg dry	☼	10/29/14 08:37	10/29/14 17:17	1.00
1,3,5-Trimethylbenzene	0.0201	J	0.0720	0.0134	mg/kg dry	☼	10/29/14 08:37	10/29/14 17:17	1.00
1,2,4-Trimethylbenzene	0.0838		0.0720	0.0104	mg/kg dry	☼	10/29/14 08:37	10/29/14 17:17	1.00
Xylenes (total)	0.0471	J	0.432	0.0217	mg/kg dry	☼	10/29/14 08:37	10/29/14 17:17	1.00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane	99.4		80 - 120	10/29/14 08:37	10/29/14 17:17	1.00
Toluene-d8	101		78.5 - 125	10/29/14 08:37	10/29/14 17:17	1.00
4-bromofluorobenzene	107		69.8 - 140	10/29/14 08:37	10/29/14 17:17	1.00
a,a,a - Trifluorotoluene	87.2		50 - 150	10/29/14 08:37	10/29/14 17:17	1.00

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	93.0		11.0	1.84	mg/kg dry	☼	10/29/14 08:21	10/29/14 13:17	1.00
Heavy Oil Range Hydrocarbons	97.8		22.1	2.46	mg/kg dry	☼	10/29/14 08:21	10/29/14 13:17	1.00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	100		50 - 150	10/29/14 08:21	10/29/14 13:17	1.00
n-Triacontane-d62	99.6		50 - 150	10/29/14 08:21	10/29/14 13:17	1.00

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B04-06

Lab Sample ID: 230-361-15

Date Collected: 10/23/14 12:45

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 86.8

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	1.19	J	3.10	0.0850	mg/kg dry	☼	10/29/14 08:37	10/29/14 17:39	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	103		41.5 - 162				10/29/14 08:37	10/29/14 17:39	1.00
a,a,a - Trifluorotoluene	110		50 - 150				10/29/14 08:37	10/29/14 17:39	1.00

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.0874		0.0124	0.00602	mg/kg dry	☼	10/29/14 08:37	10/29/14 17:39	1.00
Toluene	ND		0.0620	0.00825	mg/kg dry	☼	10/29/14 08:37	10/29/14 17:39	1.00
Ethylbenzene	ND		0.0620	0.0100	mg/kg dry	☼	10/29/14 08:37	10/29/14 17:39	1.00
m,p-Xylene	0.0267	J	0.248	0.0105	mg/kg dry	☼	10/29/14 08:37	10/29/14 17:39	1.00
o-Xylene	ND		0.124	0.00812	mg/kg dry	☼	10/29/14 08:37	10/29/14 17:39	1.00
1,3,5-Trimethylbenzene	0.0146	J	0.0620	0.0115	mg/kg dry	☼	10/29/14 08:37	10/29/14 17:39	1.00
1,2,4-Trimethylbenzene	0.0744		0.0620	0.00899	mg/kg dry	☼	10/29/14 08:37	10/29/14 17:39	1.00
Xylenes (total)	0.0267	J	0.372	0.0187	mg/kg dry	☼	10/29/14 08:37	10/29/14 17:39	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dibromofluoromethane	98.5		80 - 120				10/29/14 08:37	10/29/14 17:39	1.00
Toluene-d8	105		78.5 - 125				10/29/14 08:37	10/29/14 17:39	1.00
4-bromofluorobenzene	103		69.8 - 140				10/29/14 08:37	10/29/14 17:39	1.00
a,a,a - Trifluorotoluene	110		50 - 150				10/29/14 08:37	10/29/14 17:39	1.00

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	7.05	J	11.0	1.84	mg/kg dry	☼	10/29/14 08:21	10/29/14 13:41	1.00
Heavy Oil Range Hydrocarbons	4.42	J	22.0	2.45	mg/kg dry	☼	10/29/14 08:21	10/29/14 13:41	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	93.9		50 - 150				10/29/14 08:21	10/29/14 13:41	1.00
n-Triacontane-d62	94.9		50 - 150				10/29/14 08:21	10/29/14 13:41	1.00

Client Sample ID: 17678-B10-05

Lab Sample ID: 230-361-16

Date Collected: 10/22/14 15:30

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 65.2

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	165		105	2.88	mg/kg dry	☼	10/29/14 08:37	10/29/14 18:01	10.0
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	109		41.5 - 162				10/29/14 08:37	10/29/14 18:01	10.0
a,a,a - Trifluorotoluene	121		50 - 150				10/29/14 08:37	10/29/14 18:01	10.0

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.420	0.204	mg/kg dry	☼	10/29/14 08:37	10/29/14 18:01	10.0
Toluene	ND		2.10	0.280	mg/kg dry	☼	10/29/14 08:37	10/29/14 18:01	10.0
Ethylbenzene	2.22		2.10	0.340	mg/kg dry	☼	10/29/14 08:37	10/29/14 18:01	10.0
m,p-Xylene	9.24		8.41	0.357	mg/kg dry	☼	10/29/14 08:37	10/29/14 18:01	10.0
o-Xylene	0.757	J	4.20	0.275	mg/kg dry	☼	10/29/14 08:37	10/29/14 18:01	10.0

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B10-05

Lab Sample ID: 230-361-16

Date Collected: 10/22/14 15:30

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 65.2

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,3,5-Trimethylbenzene	7.16		2.10	0.391	mg/kg dry	☆	10/29/14 08:37	10/29/14 18:01	10.0
1,2,4-Trimethylbenzene	23.0		2.10	0.305	mg/kg dry	☆	10/29/14 08:37	10/29/14 18:01	10.0
Xylenes (total)	9.99	J	12.6	0.633	mg/kg dry	☆	10/29/14 08:37	10/29/14 18:01	10.0
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dibromofluoromethane	99.5		80 - 120				10/29/14 08:37	10/29/14 18:01	10.0
Toluene-d8	103		78.5 - 125				10/29/14 08:37	10/29/14 18:01	10.0
4-bromofluorobenzene	109		69.8 - 140				10/29/14 08:37	10/29/14 18:01	10.0
a,a,a - Trifluorotoluene	121		50 - 150				10/29/14 08:37	10/29/14 18:01	10.0

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	2750		22.2	3.71	mg/kg dry	☆	10/29/14 08:21	10/29/14 13:41	1.00
Heavy Oil Range Hydrocarbons	346		44.5	4.96	mg/kg dry	☆	10/29/14 08:21	10/29/14 13:41	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	274	ZX	50 - 150				10/29/14 08:21	10/29/14 13:41	1.00
n-Triacontane-d62	91.9		50 - 150				10/29/14 08:21	10/29/14 13:41	1.00

Client Sample ID: 17678-B10-06

Lab Sample ID: 230-361-17

Date Collected: 10/22/14 15:45

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 80.1

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	3.18	J	4.19	0.115	mg/kg dry	☆	10/29/14 08:37	10/29/14 18:24	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	108		41.5 - 162				10/29/14 08:37	10/29/14 18:24	1.00
a,a,a - Trifluorotoluene	94.3		50 - 150				10/29/14 08:37	10/29/14 18:24	1.00

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.0176		0.0168	0.00813	mg/kg dry	☆	10/29/14 08:37	10/29/14 18:24	1.00
Toluene	ND		0.0838	0.0112	mg/kg dry	☆	10/29/14 08:37	10/29/14 18:24	1.00
Ethylbenzene	ND		0.0838	0.0136	mg/kg dry	☆	10/29/14 08:37	10/29/14 18:24	1.00
m,p-Xylene	0.0402	J	0.335	0.0143	mg/kg dry	☆	10/29/14 08:37	10/29/14 18:24	1.00
o-Xylene	ND		0.168	0.0110	mg/kg dry	☆	10/29/14 08:37	10/29/14 18:24	1.00
1,3,5-Trimethylbenzene	0.0402	J	0.0838	0.0156	mg/kg dry	☆	10/29/14 08:37	10/29/14 18:24	1.00
1,2,4-Trimethylbenzene	0.0968		0.0838	0.0122	mg/kg dry	☆	10/29/14 08:37	10/29/14 18:24	1.00
Xylenes (total)	0.0402	J	0.503	0.0252	mg/kg dry	☆	10/29/14 08:37	10/29/14 18:24	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dibromofluoromethane	99.1		80 - 120				10/29/14 08:37	10/29/14 18:24	1.00
Toluene-d8	104		78.5 - 125				10/29/14 08:37	10/29/14 18:24	1.00
4-bromofluorobenzene	108		69.8 - 140				10/29/14 08:37	10/29/14 18:24	1.00
a,a,a - Trifluorotoluene	94.3		50 - 150				10/29/14 08:37	10/29/14 18:24	1.00

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	16.8		11.7	1.95	mg/kg dry	☆	10/29/14 08:21	10/29/14 14:05	1.00

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B10-06

Lab Sample ID: 230-361-17

Date Collected: 10/22/14 15:45

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 80.1

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103 (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Heavy Oil Range Hydrocarbons	16.9	J	23.4	2.61	mg/kg dry	☼	10/29/14 08:21	10/29/14 14:05	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	85.8		50 - 150				10/29/14 08:21	10/29/14 14:05	1.00
<i>n</i> -Triacontane-d62	93.9		50 - 150				10/29/14 08:21	10/29/14 14:05	1.00

Client Sample ID: 17678-B06-06

Lab Sample ID: 230-361-18

Date Collected: 10/22/14 12:45

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 92.2

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	0.984	J	3.33	0.0914	mg/kg dry	☼	10/29/14 08:37	10/29/14 18:46	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	102		41.5 - 162				10/29/14 08:37	10/29/14 18:46	1.00
a,a,a - Trifluorotoluene	104		50 - 150				10/29/14 08:37	10/29/14 18:46	1.00

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.0237		0.0133	0.00647	mg/kg dry	☼	10/29/14 08:37	10/29/14 18:46	1.00
Toluene	ND		0.0667	0.00887	mg/kg dry	☼	10/29/14 08:37	10/29/14 18:46	1.00
Ethylbenzene	ND		0.0667	0.0108	mg/kg dry	☼	10/29/14 08:37	10/29/14 18:46	1.00
m,p-Xylene	ND		0.267	0.0113	mg/kg dry	☼	10/29/14 08:37	10/29/14 18:46	1.00
o-Xylene	ND		0.133	0.00874	mg/kg dry	☼	10/29/14 08:37	10/29/14 18:46	1.00
1,3,5-Trimethylbenzene	ND		0.0667	0.0124	mg/kg dry	☼	10/29/14 08:37	10/29/14 18:46	1.00
1,2,4-Trimethylbenzene	ND		0.0667	0.00967	mg/kg dry	☼	10/29/14 08:37	10/29/14 18:46	1.00
Xylenes (total)	ND		0.400	0.0201	mg/kg dry	☼	10/29/14 08:37	10/29/14 18:46	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dibromofluoromethane	97.1		80 - 120				10/29/14 08:37	10/29/14 18:46	1.00
Toluene-d8	103		78.5 - 125				10/29/14 08:37	10/29/14 18:46	1.00
4-bromofluorobenzene	102		69.8 - 140				10/29/14 08:37	10/29/14 18:46	1.00
a,a,a - Trifluorotoluene	104		50 - 150				10/29/14 08:37	10/29/14 18:46	1.00

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	9.10	J	10.4	1.73	mg/kg dry	☼	10/29/14 08:21	10/29/14 14:05	1.00
Heavy Oil Range Hydrocarbons	30.4		20.7	2.31	mg/kg dry	☼	10/29/14 08:21	10/29/14 14:05	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	106		50 - 150				10/29/14 08:21	10/29/14 14:05	1.00
<i>n</i> -Triacontane-d62	95.4		50 - 150				10/29/14 08:21	10/29/14 14:05	1.00

Client Sample ID: 17678-B06-04

Lab Sample ID: 230-361-19

Date Collected: 10/22/14 12:10

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 86.6

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	74.7		31.8	0.873	mg/kg dry	☼	10/29/14 08:37	10/30/14 07:58	10.0

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B06-04

Lab Sample ID: 230-361-19

Date Collected: 10/22/14 12:10

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 86.6

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	106		41.5 - 162	10/29/14 08:37	10/30/14 07:58	10.0
a,a,a - Trifluorotoluene	71.8		50 - 150	10/29/14 08:37	10/30/14 07:58	10.0

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.777		0.127	0.0618	mg/kg dry	☼	10/29/14 08:37	10/30/14 07:58	10.0
Toluene	ND		0.637	0.0847	mg/kg dry	☼	10/29/14 08:37	10/30/14 07:58	10.0
Ethylbenzene	2.46		0.637	0.103	mg/kg dry	☼	10/29/14 08:37	10/30/14 07:58	10.0
m,p-Xylene	10.9		2.55	0.108	mg/kg dry	☼	10/29/14 08:37	10/30/14 07:58	10.0
o-Xylene	0.111	J	1.27	0.0834	mg/kg dry	☼	10/29/14 08:37	10/30/14 07:58	10.0
1,3,5-Trimethylbenzene	3.70		0.637	0.118	mg/kg dry	☼	10/29/14 08:37	10/30/14 07:58	10.0
1,2,4-Trimethylbenzene	12.9		0.637	0.0924	mg/kg dry	☼	10/29/14 08:37	10/30/14 07:58	10.0
Xylenes (total)	11.0		3.82	0.192	mg/kg dry	☼	10/29/14 08:37	10/30/14 07:58	10.0

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane	103		80 - 120	10/29/14 08:37	10/30/14 07:58	10.0
Toluene-d8	102		78.5 - 125	10/29/14 08:37	10/30/14 07:58	10.0
4-bromofluorobenzene	106		69.8 - 140	10/29/14 08:37	10/30/14 07:58	10.0
a,a,a - Trifluorotoluene	71.8		50 - 150	10/29/14 08:37	10/30/14 07:58	10.0

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	2530		226	37.7	mg/kg dry	☼	10/29/14 08:21	10/29/14 16:32	20.0
Heavy Oil Range Hydrocarbons	235	J	452	50.4	mg/kg dry	☼	10/29/14 08:21	10/29/14 16:32	20.0

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	32.3	Z3	50 - 150	10/29/14 08:21	10/29/14 16:32	20.0
n-Triacontane-d62	117		50 - 150	10/29/14 08:21	10/29/14 16:32	20.0

Client Sample ID: 17678-B06-04D

Lab Sample ID: 230-361-20

Date Collected: 10/22/14 12:00

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 79.8

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	143		37.9	1.04	mg/kg dry	☼	10/29/14 08:37	10/30/14 08:20	10.0

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	110		41.5 - 162	10/29/14 08:37	10/30/14 08:20	10.0
a,a,a - Trifluorotoluene	108		50 - 150	10/29/14 08:37	10/30/14 08:20	10.0

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	1.36		0.152	0.0735	mg/kg dry	☼	10/29/14 08:37	10/30/14 08:20	10.0
Toluene	0.106	J	0.758	0.101	mg/kg dry	☼	10/29/14 08:37	10/30/14 08:20	10.0
Ethylbenzene	3.91		0.758	0.123	mg/kg dry	☼	10/29/14 08:37	10/30/14 08:20	10.0
m,p-Xylene	14.4		3.03	0.129	mg/kg dry	☼	10/29/14 08:37	10/30/14 08:20	10.0
o-Xylene	0.777	J	1.52	0.0992	mg/kg dry	☼	10/29/14 08:37	10/30/14 08:20	10.0
1,3,5-Trimethylbenzene	4.58		0.758	0.141	mg/kg dry	☼	10/29/14 08:37	10/30/14 08:20	10.0
1,2,4-Trimethylbenzene	17.0		0.758	0.110	mg/kg dry	☼	10/29/14 08:37	10/30/14 08:20	10.0
Xylenes (total)	15.2		4.55	0.228	mg/kg dry	☼	10/29/14 08:37	10/30/14 08:20	10.0

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B06-04D

Lab Sample ID: 230-361-20

Date Collected: 10/22/14 12:00

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 79.8

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane	100		80 - 120	10/29/14 08:37	10/30/14 08:20	10.0
Toluene-d8	101		78.5 - 125	10/29/14 08:37	10/30/14 08:20	10.0
4-bromofluorobenzene	110		69.8 - 140	10/29/14 08:37	10/30/14 08:20	10.0
a,a,a - Trifluorotoluene	108		50 - 150	10/29/14 08:37	10/30/14 08:20	10.0

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	2500		125	20.8	mg/kg dry	☼	10/29/14 08:21	10/29/14 14:30	10.0
Heavy Oil Range Hydrocarbons	254		249	27.8	mg/kg dry	☼	10/29/14 08:21	10/29/14 14:30	10.0

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	162	Z3	50 - 150	10/29/14 08:21	10/29/14 14:30	10.0
n-Triacontane-d62	98.5		50 - 150	10/29/14 08:21	10/29/14 14:30	10.0

Client Sample ID: 17678-B05-05

Lab Sample ID: 230-361-21

Date Collected: 10/22/14 09:20

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 82.4

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	3.05	J	3.07	0.0841	mg/kg dry	☼	10/29/14 08:37	10/29/14 19:53	1.00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	105		41.5 - 162	10/29/14 08:37	10/29/14 19:53	1.00
a,a,a - Trifluorotoluene	80.8		50 - 150	10/29/14 08:37	10/29/14 19:53	1.00

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.00921	J	0.0123	0.00595	mg/kg dry	☼	10/29/14 08:37	10/29/14 19:53	1.00
Toluene	ND		0.0614	0.00816	mg/kg dry	☼	10/29/14 08:37	10/29/14 19:53	1.00
Ethylbenzene	0.101		0.0614	0.00994	mg/kg dry	☼	10/29/14 08:37	10/29/14 19:53	1.00
m,p-Xylene	0.0644	J	0.245	0.0104	mg/kg dry	☼	10/29/14 08:37	10/29/14 19:53	1.00
o-Xylene	ND		0.123	0.00804	mg/kg dry	☼	10/29/14 08:37	10/29/14 19:53	1.00
1,3,5-Trimethylbenzene	0.0954		0.0614	0.0114	mg/kg dry	☼	10/29/14 08:37	10/29/14 19:53	1.00
1,2,4-Trimethylbenzene	0.0908		0.0614	0.00890	mg/kg dry	☼	10/29/14 08:37	10/29/14 19:53	1.00
Xylenes (total)	0.0681	J	0.368	0.0185	mg/kg dry	☼	10/29/14 08:37	10/29/14 19:53	1.00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane	100		80 - 120	10/29/14 08:37	10/29/14 19:53	1.00
Toluene-d8	102		78.5 - 125	10/29/14 08:37	10/29/14 19:53	1.00
4-bromofluorobenzene	105		69.8 - 140	10/29/14 08:37	10/29/14 19:53	1.00
a,a,a - Trifluorotoluene	80.8		50 - 150	10/29/14 08:37	10/29/14 19:53	1.00

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	1060		230	38.4	mg/kg dry	☼	10/29/14 08:21	10/29/14 16:32	20.0
Heavy Oil Range Hydrocarbons	1570		460	51.3	mg/kg dry	☼	10/29/14 08:21	10/29/14 16:32	20.0

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	112		50 - 150	10/29/14 08:21	10/29/14 16:32	20.0
n-Triacontane-d62	104		50 - 150	10/29/14 08:21	10/29/14 16:32	20.0

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B05-07

Lab Sample ID: 230-361-22

Date Collected: 10/22/14 09:45

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 90.7

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	0.957	J	3.42	0.0938	mg/kg dry	☼	10/29/14 08:37	10/29/14 20:15	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	101		41.5 - 162				10/29/14 08:37	10/29/14 20:15	1.00
a,a,a - Trifluorotoluene	93.8		50 - 150				10/29/14 08:37	10/29/14 20:15	1.00

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0137	0.00664	mg/kg dry	☼	10/29/14 08:37	10/29/14 20:15	1.00
Toluene	ND		0.0684	0.00910	mg/kg dry	☼	10/29/14 08:37	10/29/14 20:15	1.00
Ethylbenzene	ND		0.0684	0.0111	mg/kg dry	☼	10/29/14 08:37	10/29/14 20:15	1.00
m,p-Xylene	ND		0.274	0.0116	mg/kg dry	☼	10/29/14 08:37	10/29/14 20:15	1.00
o-Xylene	ND		0.137	0.00897	mg/kg dry	☼	10/29/14 08:37	10/29/14 20:15	1.00
1,3,5-Trimethylbenzene	ND		0.0684	0.0127	mg/kg dry	☼	10/29/14 08:37	10/29/14 20:15	1.00
1,2,4-Trimethylbenzene	ND		0.0684	0.00992	mg/kg dry	☼	10/29/14 08:37	10/29/14 20:15	1.00
Xylenes (total)	ND		0.411	0.0206	mg/kg dry	☼	10/29/14 08:37	10/29/14 20:15	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dibromofluoromethane	101		80 - 120				10/29/14 08:37	10/29/14 20:15	1.00
Toluene-d8	103		78.5 - 125				10/29/14 08:37	10/29/14 20:15	1.00
4-bromofluorobenzene	101		69.8 - 140				10/29/14 08:37	10/29/14 20:15	1.00
a,a,a - Trifluorotoluene	93.8		50 - 150				10/29/14 08:37	10/29/14 20:15	1.00

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	14.3		9.77	1.63	mg/kg dry	☼	10/29/14 08:21	10/29/14 15:43	1.00
Heavy Oil Range Hydrocarbons	40.0		19.5	2.18	mg/kg dry	☼	10/29/14 08:21	10/29/14 15:43	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	101		50 - 150				10/29/14 08:21	10/29/14 15:43	1.00
n-Triacontane-d62	87.6		50 - 150				10/29/14 08:21	10/29/14 15:43	1.00

Client Sample ID: 17678-TB1

Lab Sample ID: 230-361-24

Date Collected: 10/20/14 00:00

Matrix: Solid

Date Received: 10/27/14 15:22

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	2.91	J	5.00	0.137	mg/kg wet	—	10/30/14 06:27	10/30/14 10:45	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	102		41.5 - 162				10/30/14 06:27	10/30/14 10:45	1.00
a,a,a - Trifluorotoluene	104		50 - 150				10/30/14 06:27	10/30/14 10:45	1.00

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0200	0.00970	mg/kg wet	—	10/30/14 06:27	10/30/14 10:45	1.00
Toluene	ND		0.100	0.0133	mg/kg wet	—	10/30/14 06:27	10/30/14 10:45	1.00
Ethylbenzene	ND		0.100	0.0162	mg/kg wet	—	10/30/14 06:27	10/30/14 10:45	1.00
m,p-Xylene	ND		0.400	0.0170	mg/kg wet	—	10/30/14 06:27	10/30/14 10:45	1.00
o-Xylene	ND		0.200	0.0131	mg/kg wet	—	10/30/14 06:27	10/30/14 10:45	1.00

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-TB1

Lab Sample ID: 230-361-24

Date Collected: 10/20/14 00:00

Matrix: Solid

Date Received: 10/27/14 15:22

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,3,5-Trimethylbenzene	ND		0.100	0.0186	mg/kg wet		10/30/14 06:27	10/30/14 10:45	1.00
1,2,4-Trimethylbenzene	ND		0.100	0.0145	mg/kg wet		10/30/14 06:27	10/30/14 10:45	1.00
Xylenes (total)	ND		0.600	0.0301	mg/kg wet		10/30/14 06:27	10/30/14 10:45	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dibromofluoromethane	98.9		80 - 120				10/30/14 06:27	10/30/14 10:45	1.00
Toluene-d8	104		78.5 - 125				10/30/14 06:27	10/30/14 10:45	1.00
4-bromofluorobenzene	102		69.8 - 140				10/30/14 06:27	10/30/14 10:45	1.00
a,a,a - Trifluorotoluene	104		50 - 150				10/30/14 06:27	10/30/14 10:45	1.00

Client Sample ID: 17678-TB2

Lab Sample ID: 230-361-25

Date Collected: 10/20/14 00:00

Matrix: Solid

Date Received: 10/27/14 15:22

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	1.45	J	5.00	0.137	mg/kg wet		10/30/14 06:27	10/30/14 11:08	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	102		41.5 - 162				10/30/14 06:27	10/30/14 11:08	1.00
a,a,a - Trifluorotoluene	106		50 - 150				10/30/14 06:27	10/30/14 11:08	1.00

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0200	0.00970	mg/kg wet		10/30/14 06:27	10/30/14 11:08	1.00
Toluene	ND		0.100	0.0133	mg/kg wet		10/30/14 06:27	10/30/14 11:08	1.00
Ethylbenzene	ND		0.100	0.0162	mg/kg wet		10/30/14 06:27	10/30/14 11:08	1.00
m,p-Xylene	ND		0.400	0.0170	mg/kg wet		10/30/14 06:27	10/30/14 11:08	1.00
o-Xylene	ND		0.200	0.0131	mg/kg wet		10/30/14 06:27	10/30/14 11:08	1.00
1,3,5-Trimethylbenzene	ND		0.100	0.0186	mg/kg wet		10/30/14 06:27	10/30/14 11:08	1.00
1,2,4-Trimethylbenzene	ND		0.100	0.0145	mg/kg wet		10/30/14 06:27	10/30/14 11:08	1.00
Xylenes (total)	ND		0.600	0.0301	mg/kg wet		10/30/14 06:27	10/30/14 11:08	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dibromofluoromethane	98.1		80 - 120				10/30/14 06:27	10/30/14 11:08	1.00
Toluene-d8	104		78.5 - 125				10/30/14 06:27	10/30/14 11:08	1.00
4-bromofluorobenzene	102		69.8 - 140				10/30/14 06:27	10/30/14 11:08	1.00
a,a,a - Trifluorotoluene	106		50 - 150				10/30/14 06:27	10/30/14 11:08	1.00

Client Sample ID: 17678-TB3

Lab Sample ID: 230-361-26

Date Collected: 10/20/14 00:00

Matrix: Solid

Date Received: 10/27/14 15:22

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	1.78	J	5.00	0.137	mg/kg wet		10/30/14 06:27	10/30/14 11:30	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	101		41.5 - 162				10/30/14 06:27	10/30/14 11:30	1.00
a,a,a - Trifluorotoluene	102		50 - 150				10/30/14 06:27	10/30/14 11:30	1.00

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-TB3

Lab Sample ID: 230-361-26

Date Collected: 10/20/14 00:00

Matrix: Solid

Date Received: 10/27/14 15:22

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0200	0.00970	mg/kg wet		10/30/14 06:27	10/30/14 11:30	1.00
Toluene	ND		0.100	0.0133	mg/kg wet		10/30/14 06:27	10/30/14 11:30	1.00
Ethylbenzene	ND		0.100	0.0162	mg/kg wet		10/30/14 06:27	10/30/14 11:30	1.00
m,p-Xylene	ND		0.400	0.0170	mg/kg wet		10/30/14 06:27	10/30/14 11:30	1.00
o-Xylene	ND		0.200	0.0131	mg/kg wet		10/30/14 06:27	10/30/14 11:30	1.00
1,3,5-Trimethylbenzene	ND		0.100	0.0186	mg/kg wet		10/30/14 06:27	10/30/14 11:30	1.00
1,2,4-Trimethylbenzene	ND		0.100	0.0145	mg/kg wet		10/30/14 06:27	10/30/14 11:30	1.00
Xylenes (total)	ND		0.600	0.0301	mg/kg wet		10/30/14 06:27	10/30/14 11:30	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dibromofluoromethane	98.9		80 - 120				10/30/14 06:27	10/30/14 11:30	1.00
Toluene-d8	105		78.5 - 125				10/30/14 06:27	10/30/14 11:30	1.00
4-bromofluorobenzene	101		69.8 - 140				10/30/14 06:27	10/30/14 11:30	1.00
a,a,a - Trifluorotoluene	102		50 - 150				10/30/14 06:27	10/30/14 11:30	1.00

Client Sample ID: 17678-TB4

Lab Sample ID: 230-361-27

Date Collected: 10/20/14 00:00

Matrix: Water

Date Received: 10/27/14 15:22

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	ND		100	52.0	ug/L		10/31/14 14:45	10/31/14 19:17	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	100		68.7 - 141				10/31/14 14:45	10/31/14 19:17	1.00

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.200	0.0320	ug/L		10/31/14 14:45	10/31/14 19:17	1.00
Toluene	0.100	J	1.00	0.0380	ug/L		10/31/14 14:45	10/31/14 19:17	1.00
Ethylbenzene	ND		1.00	0.0860	ug/L		10/31/14 14:45	10/31/14 19:17	1.00
m,p-Xylene	ND		2.00	0.124	ug/L		10/31/14 14:45	10/31/14 19:17	1.00
o-Xylene	ND		1.00	0.0620	ug/L		10/31/14 14:45	10/31/14 19:17	1.00
1,3,5-Trimethylbenzene	ND		1.00	0.0740	ug/L		10/31/14 14:45	10/31/14 19:17	1.00
1,2,4-Trimethylbenzene	ND		1.00	0.0400	ug/L		10/31/14 14:45	10/31/14 19:17	1.00
Xylenes (total)	ND		3.00	0.0160	ug/L		10/31/14 14:45	10/31/14 19:17	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dibromofluoromethane	96.5		71.2 - 143				10/31/14 14:45	10/31/14 19:17	1.00
Toluene-d8	108		74.1 - 135				10/31/14 14:45	10/31/14 19:17	1.00
4-bromofluorobenzene	100		68.7 - 141				10/31/14 14:45	10/31/14 19:17	1.00

Client Sample ID: 17678-MW1

Lab Sample ID: 230-361-28

Date Collected: 10/25/14 17:18

Matrix: Water

Date Received: 10/27/14 15:22

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	ND		100	52.0	ug/L		10/31/14 14:45	10/31/14 19:40	1.00

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-MW1

Lab Sample ID: 230-361-28

Date Collected: 10/25/14 17:18

Matrix: Water

Date Received: 10/27/14 15:22

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	99.9		68.7 - 141	10/31/14 14:45	10/31/14 19:40	1.00

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.340		0.200	0.0320	ug/L		10/31/14 14:45	10/31/14 19:40	1.00
Toluene	ND		1.00	0.0380	ug/L		10/31/14 14:45	10/31/14 19:40	1.00
Ethylbenzene	ND		1.00	0.0860	ug/L		10/31/14 14:45	10/31/14 19:40	1.00
m,p-Xylene	0.170	J	2.00	0.124	ug/L		10/31/14 14:45	10/31/14 19:40	1.00
o-Xylene	ND		1.00	0.0620	ug/L		10/31/14 14:45	10/31/14 19:40	1.00
1,3,5-Trimethylbenzene	ND		1.00	0.0740	ug/L		10/31/14 14:45	10/31/14 19:40	1.00
1,2,4-Trimethylbenzene	0.240	J	1.00	0.0400	ug/L		10/31/14 14:45	10/31/14 19:40	1.00
Xylenes (total)	0.170	J	3.00	0.0160	ug/L		10/31/14 14:45	10/31/14 19:40	1.00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane	96.9		71.2 - 143	10/31/14 14:45	10/31/14 19:40	1.00
Toluene-d8	105		74.1 - 135	10/31/14 14:45	10/31/14 19:40	1.00
4-bromofluorobenzene	99.9		68.7 - 141	10/31/14 14:45	10/31/14 19:40	1.00

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	1.28	Y	0.101	0.0121	mg/L		10/31/14 11:06	11/03/14 13:27	1
RRO (nC25-nC36)	0.701	Y	0.101	0.0202	mg/L		10/31/14 11:06	11/03/14 13:27	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o-Terphenyl	82		50 - 150	10/31/14 11:06	11/03/14 13:27	1
n-Triacontane-d62	87		50 - 150	10/31/14 11:06	11/03/14 13:27	1

Client Sample ID: 17678-MW2

Lab Sample ID: 230-361-29

Date Collected: 10/25/14 13:54

Matrix: Water

Date Received: 10/27/14 15:22

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	98.1		68.7 - 141	10/31/14 14:45	10/31/14 20:02	1.00

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	1180		100	52.0	ug/L		10/31/14 14:45	10/31/14 20:02	1.00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	98.1		68.7 - 141	10/31/14 14:45	10/31/14 20:02	1.00

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	0.590	J	1.00	0.0380	ug/L		10/31/14 14:45	10/31/14 20:02	1.00
Ethylbenzene	2.03		1.00	0.0860	ug/L		10/31/14 14:45	10/31/14 20:02	1.00
m,p-Xylene	41.4		2.00	0.124	ug/L		10/31/14 14:45	10/31/14 20:02	1.00
o-Xylene	0.650	J	1.00	0.0620	ug/L		10/31/14 14:45	10/31/14 20:02	1.00
1,3,5-Trimethylbenzene	18.3		1.00	0.0740	ug/L		10/31/14 14:45	10/31/14 20:02	1.00
1,2,4-Trimethylbenzene	61.1		1.00	0.0400	ug/L		10/31/14 14:45	10/31/14 20:02	1.00
Xylenes (total)	42.1		3.00	0.0160	ug/L		10/31/14 14:45	10/31/14 20:02	1.00

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane	95.5		71.2 - 143	10/31/14 14:45	10/31/14 20:02	1.00
Toluene-d8	106		74.1 - 135	10/31/14 14:45	10/31/14 20:02	1.00
4-bromofluorobenzene	98.1		68.7 - 141	10/31/14 14:45	10/31/14 20:02	1.00

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-MW2

Lab Sample ID: 230-361-29

Date Collected: 10/25/14 13:54

Matrix: Water

Date Received: 10/27/14 15:22

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C - RE1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	325		2.00	0.320	ug/L		10/31/14 14:45	11/03/14 10:34	10.0
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dibromofluoromethane	95.7		71.2 - 143				10/31/14 14:45	11/03/14 10:34	10.0
Toluene-d8	108		74.1 - 135				10/31/14 14:45	11/03/14 10:34	10.0
4-bromofluorobenzene	102		68.7 - 141				10/31/14 14:45	11/03/14 10:34	10.0

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	2.10	Y	0.0978	0.0117	mg/L		10/31/14 11:06	11/03/14 13:45	1
RRO (nC25-nC36)	0.691	Y	0.0978	0.0196	mg/L		10/31/14 11:06	11/03/14 13:45	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	84		50 - 150				10/31/14 11:06	11/03/14 13:45	1
n-Triacontane-d62	92		50 - 150				10/31/14 11:06	11/03/14 13:45	1

Client Sample ID: 17678-MW12

Lab Sample ID: 230-361-30

Date Collected: 10/25/14 13:49

Matrix: Water

Date Received: 10/27/14 15:22

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	1200		100	52.0	ug/L		10/31/14 14:45	10/31/14 20:25	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	99.7		68.7 - 141				10/31/14 14:45	10/31/14 20:25	1.00

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toluene	0.620	J	1.00	0.0380	ug/L		10/31/14 14:45	10/31/14 20:25	1.00
Ethylbenzene	2.05		1.00	0.0860	ug/L		10/31/14 14:45	10/31/14 20:25	1.00
m,p-Xylene	41.5		2.00	0.124	ug/L		10/31/14 14:45	10/31/14 20:25	1.00
o-Xylene	0.660	J	1.00	0.0620	ug/L		10/31/14 14:45	10/31/14 20:25	1.00
1,3,5-Trimethylbenzene	18.8		1.00	0.0740	ug/L		10/31/14 14:45	10/31/14 20:25	1.00
1,2,4-Trimethylbenzene	63.2		1.00	0.0400	ug/L		10/31/14 14:45	10/31/14 20:25	1.00
Xylenes (total)	42.1		3.00	0.0160	ug/L		10/31/14 14:45	10/31/14 20:25	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dibromofluoromethane	96.9		71.2 - 143				10/31/14 14:45	10/31/14 20:25	1.00
Toluene-d8	105		74.1 - 135				10/31/14 14:45	10/31/14 20:25	1.00
4-bromofluorobenzene	99.7		68.7 - 141				10/31/14 14:45	10/31/14 20:25	1.00

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C - RE1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	325		2.00	0.320	ug/L		10/31/14 14:45	11/03/14 10:56	10.0
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dibromofluoromethane	95.3		71.2 - 143				10/31/14 14:45	11/03/14 10:56	10.0
Toluene-d8	108		74.1 - 135				10/31/14 14:45	11/03/14 10:56	10.0
4-bromofluorobenzene	98.6		68.7 - 141				10/31/14 14:45	11/03/14 10:56	10.0

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-MW12

Lab Sample ID: 230-361-30

Date Collected: 10/25/14 13:49

Matrix: Water

Date Received: 10/27/14 15:22

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	2.02	Y	0.100	0.0120	mg/L		10/31/14 11:06	11/03/14 14:03	1
RRO (nC25-nC36)	0.760	Y	0.100	0.0200	mg/L		10/31/14 11:06	11/03/14 14:03	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	81		50 - 150				10/31/14 11:06	11/03/14 14:03	1
n-Triacontane-d62	92		50 - 150				10/31/14 11:06	11/03/14 14:03	1

Surrogate Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Matrix: Soil

Prep Type: Total

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		BFB (41.5-162)	Trifluorotoluene (60-120)
14J0172-BS2	Lab Control Sample	98.2	107
14J0172-BSD2	Lab Control Sample Dup	100	105
14J0181-BS2	Lab Control Sample	97.1	92.3
14J0181-BSD2	Lab Control Sample Dup	100	91.5
14K0105-BS2	Lab Control Sample	105	95.7
14K0105-BSD2	Lab Control Sample Dup	98.4	94.6
Surrogate Legend			
BFB = 4-bromofluorobenzene			
a,a,a - Trifluorotoluene = a,a,a - Trifluorotoluene			

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Matrix: Soil

Prep Type: Total

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		BFB (41.5-162)	Trifluorotoluene (50-150)
14J0172-BLK1	Method Blank	99.8	103
14J0181-BLK1	Method Blank	101	113
14K0105-BLK1	Method Blank	102	82.2
Surrogate Legend			
BFB = 4-bromofluorobenzene			
a,a,a - Trifluorotoluene = a,a,a - Trifluorotoluene			

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Matrix: Solid

Prep Type: Total

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		BFB (41.5-162)	Trifluorotoluene (50-150)
230-361-1	17678-B01-04	101	101
230-361-2	17678-B08-03B	164 ZX	102
230-361-3	17678-B08-06	102	53.2
230-361-4	17678-B08-08	102 H1	93.6 H1
230-361-5	17678-B07-03B	104	87.6
230-361-6	17678-B07-06	99.7	102
230-361-7	17678-B07-08	101 H1	74.3 H1
230-361-8	17678-B02R-02	101	118
230-361-9	17678-B02R-05	101	79.8
230-361-10	17678-B02R-06	99.7 H1	78.3 H1
230-361-11	17678-B09-05	99.3	88.7
230-361-12	17678-B09-07	98.9	70.7
230-361-13	17678-B03-04	106	83.3
230-361-14	17678-B04-04	107	87.2
230-361-15	17678-B04-06	103	110
230-361-16	17678-B10-05	109	121
230-361-17	17678-B10-06	108	94.3
230-361-18	17678-B06-06	102	104
230-361-19	17678-B06-04	106	71.8

TestAmerica Anchorage

Surrogate Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101 (Continued)

Matrix: Solid

Prep Type: Total

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		BFB (41.5-162)	Trifluorotc (50-150)
230-361-20	17678-B06-04D	110	108
230-361-21	17678-B05-05	105	80.8
230-361-22	17678-B05-07	101	93.8
230-361-24	17678-TB1	102	104
230-361-25	17678-TB2	102	106
230-361-26	17678-TB3	101	102

Surrogate Legend
BFB = 4-bromofluorobenzene
a,a,a - Trifluorotoluene = a,a,a - Trifluorotoluene

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Matrix: Water

Prep Type: Total

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		BFB (68.7-141)	
14J0201-BLK1	Method Blank	97.1	
14J0201-BS2	Lab Control Sample	97.1	
14J0201-BSD2	Lab Control Sample Dup	97.8	
230-361-27	17678-TB4	100	
230-361-28	17678-MW1	99.9	
230-361-29	17678-MW2	98.1	
230-361-30	17678-MW12	99.7	

Surrogate Legend
BFB = 4-bromofluorobenzene

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Matrix: Soil

Prep Type: Total

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		DBFM (80-120)	Toluene-d8 (78.5-125)	BFB (69.8-140)	Trifluorotc (50-150)
14J0172-BLK1	Method Blank	99.9	102	99.8	103
14J0181-BLK1	Method Blank	98.0	105	101	113
14K0105-BLK1	Method Blank	100	97.0	102	82.2

Surrogate Legend
DBFM = Dibromofluoromethane
Toluene-d8 = Toluene-d8
BFB = 4-bromofluorobenzene
a,a,a - Trifluorotoluene = a,a,a - Trifluorotoluene

Surrogate Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Matrix: Soil

Prep Type: Total

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		DBFM (80-120)	Toluene-d8 (78.5-125)	BFB (69.8-140)	Trifluorotc (60-120)
14J0172-BS1	Lab Control Sample	102	101	97.7	98.1
14J0172-BSD1	Lab Control Sample Dup	104	99.8	98.6	95.9
14J0181-BS1	Lab Control Sample	98.7	102	99.7	103
14J0181-BSD1	Lab Control Sample Dup	100	102	101	113
14K0105-BS1	Lab Control Sample	101	98.3	102	110
14K0105-BSD1	Lab Control Sample Dup	97.2	95.9	100	85.8

Surrogate Legend

DBFM = Dibromofluoromethane

Toluene-d8 = Toluene-d8

BFB = 4-bromofluorobenzene

a,a,a - Trifluorotoluene = a,a,a - Trifluorotoluene

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Matrix: Solid

Prep Type: Total

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		DBFM (80-120)	Toluene-d8 (78.5-125)	BFB (69.8-140)	Trifluorotc (50-150)
230-361-1	17678-B01-04	100	104	101	101
230-361-2	17678-B08-03B	101	96.5	164 ZX	102
230-361-3	17678-B08-06	99.5	107	102	53.2
230-361-4	17678-B08-08	98.5 H1	103 H1	102 H1	93.6 H1
230-361-5	17678-B07-03B	99.5	105	104	87.6
230-361-6	17678-B07-06	96.9	105	99.7	102
230-361-7	17678-B07-08	99.5 H1	99.3 H1	101 H1	74.3 H1
230-361-8	17678-B02R-02	100	104	101	118
230-361-9	17678-B02R-05	98.7	104	101	79.8
230-361-10	17678-B02R-06	98.3 H1	99.5 H1	99.7 H1	78.3 H1
230-361-11	17678-B09-05	97.9	105	99.3	88.7
230-361-12	17678-B09-07	99.3	105	98.9	70.7
230-361-13	17678-B03-04	101	104	106	83.3
230-361-14	17678-B04-04	99.4	101	107	87.2
230-361-15	17678-B04-06	98.5	105	103	110
230-361-16	17678-B10-05	99.5	103	109	121
230-361-17	17678-B10-06	99.1	104	108	94.3
230-361-18	17678-B06-06	97.1	103	102	104
230-361-19	17678-B06-04	103	102	106	71.8
230-361-20	17678-B06-04D	100	101	110	108
230-361-21	17678-B05-05	100	102	105	80.8
230-361-22	17678-B05-07	101	103	101	93.8
230-361-24	17678-TB1	98.9	104	102	104
230-361-25	17678-TB2	98.1	104	102	106
230-361-26	17678-TB3	98.9	105	101	102

Surrogate Legend

DBFM = Dibromofluoromethane

Toluene-d8 = Toluene-d8

BFB = 4-bromofluorobenzene

a,a,a - Trifluorotoluene = a,a,a - Trifluorotoluene

TestAmerica Anchorage

Surrogate Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Matrix: Water

Prep Type: Total

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)		
		DBFM (71.2-143)	Toluene-d8 (74.1-135)	BFB (68.7-141)
14J0201-BLK1	Method Blank	95.7	108	97.1
14J0201-BS1	Lab Control Sample	97.9	105	96.5
14J0201-BSD1	Lab Control Sample Dup	96.8	103	97.2
230-361-27	17678-TB4	96.5	108	100
230-361-28	17678-MW1	96.9	105	99.9
230-361-29	17678-MW2	95.5	106	98.1
230-361-29 - RE1	17678-MW2	95.7	108	102
230-361-30	17678-MW12	96.9	105	99.7
230-361-30 - RE1	17678-MW12	95.3	108	98.6

Surrogate Legend
DBFM = Dibromofluoromethane
Toluene-d8 = Toluene-d8
BFB = 4-bromofluorobenzene

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Matrix: Soil

Prep Type: Total

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		o-Terphenyl (50-150)	nTCD62 (50-150)
14J0171-BLK1	Method Blank	93.2	95.5
14K0104-BLK1	Method Blank	102	105

Surrogate Legend
o-Terphenyl = o-Terphenyl
nTCD62 = n-Triacontane-d62

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Matrix: Soil

Prep Type: Total

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		o-Terphenyl (60-120)	nTCD62 (60-120)
14J0171-BS1	Lab Control Sample	105	107
14J0171-BSD1	Lab Control Sample Dup	90.5	96.8
14K0104-BS1	Lab Control Sample	108	117
14K0104-BSD1	Lab Control Sample Dup	112	113

Surrogate Legend
o-Terphenyl = o-Terphenyl
nTCD62 = n-Triacontane-d62

Surrogate Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103

Matrix: Solid

Prep Type: Total

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		o-Terphenyl (50-150)	nTCD62 (50-150)
230-361-1	17678-B01-04	101	75.2
230-361-2	17678-B08-03B	71.9	102
230-361-3	17678-B08-06	105	128
230-361-4	17678-B08-08	113 H1	145 H1
230-361-5	17678-B07-03B	188 Z3	102
230-361-6	17678-B07-06	103	88.9
230-361-7	17678-B07-08	106 H1	129 H1
230-361-8	17678-B02R-02	102	106
230-361-9	17678-B02R-05	102	86.7
230-361-10	17678-B02R-06	108 H1	133 H1
230-361-11	17678-B09-05	83.9	97.4
230-361-12	17678-B09-07	101	90.3
230-361-13	17678-B03-04	95.0	102
230-361-14	17678-B04-04	100	99.6
230-361-15	17678-B04-06	93.9	94.9
230-361-16	17678-B10-05	274 ZX	91.9
230-361-17	17678-B10-06	85.8	93.9
230-361-18	17678-B06-06	106	95.4
230-361-19	17678-B06-04	32.3 Z3	117
230-361-20	17678-B06-04D	162 Z3	98.5
230-361-21	17678-B05-05	112	104
230-361-22	17678-B05-07	101	87.6

Surrogate Legend
o-Terphenyl = o-Terphenyl
nTCD62 = n-Triacontane-d62

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		OTPH (50-150)	nTCD62 (50-150)
230-361-28	17678-MW1	82	87
230-361-29	17678-MW2	84	92
230-361-30	17678-MW12	81	92
LCS 580-174455/2-A	Lab Control Sample	94	97
LCSD 580-174455/3-A	Lab Control Sample Dup	100	100
MB 580-174455/1-A	Method Blank	94	99

Surrogate Legend
OTPH = o-Terphenyl
nTCD62 = n-Triacontane-d62

QC Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101

Lab Sample ID: 14J0172-BLK1

Matrix: Soil

Analysis Batch: 14J0172

Client Sample ID: Method Blank

Prep Type: Total

Prep Batch: 14J0172_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	0.517	J	5.00	0.137	mg/kg wet	-	10/29/14 08:37	10/29/14 10:57	1.00
Surrogate	Blank %Recovery	Blank Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	99.8		41.5 - 162				10/29/14 08:37	10/29/14 10:57	1.00
a,a,a - Trifluorotoluene	103		50 - 150				10/29/14 08:37	10/29/14 10:57	1.00

Lab Sample ID: 14J0172-BS2

Matrix: Soil

Analysis Batch: 14J0172

Client Sample ID: Lab Control Sample

Prep Type: Total

Prep Batch: 14J0172_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Gasoline Range Hydrocarbons	50.0	59.5		mg/kg wet	-	119	60 - 120
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
4-bromofluorobenzene	98.2		41.5 - 162				
a,a,a - Trifluorotoluene	107		60 - 120				

Lab Sample ID: 14J0172-BSD2

Matrix: Soil

Analysis Batch: 14J0172

Client Sample ID: Lab Control Sample Dup

Prep Type: Total

Prep Batch: 14J0172_P

Analyte	Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Gasoline Range Hydrocarbons	50.0	59.3		mg/kg wet	-	119	60 - 120	0.362	20
Surrogate	LCS Dup %Recovery	LCS Dup Qualifier	Limits						
4-bromofluorobenzene	100		41.5 - 162						
a,a,a - Trifluorotoluene	105		60 - 120						

Lab Sample ID: 14J0181-BLK1

Matrix: Soil

Analysis Batch: 14J0181

Client Sample ID: Method Blank

Prep Type: Total

Prep Batch: 14J0181_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	2.21	J	5.00	0.137	mg/kg wet	-	10/30/14 06:27	10/30/14 08:54	1.00
Surrogate	Blank %Recovery	Blank Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	101		41.5 - 162				10/30/14 06:27	10/30/14 08:54	1.00
a,a,a - Trifluorotoluene	113		50 - 150				10/30/14 06:27	10/30/14 08:54	1.00

Lab Sample ID: 14J0181-BS2

Matrix: Soil

Analysis Batch: 14J0181

Client Sample ID: Lab Control Sample

Prep Type: Total

Prep Batch: 14J0181_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Gasoline Range Hydrocarbons	50.0	47.3		mg/kg wet	-	94.7	60 - 120

TestAmerica Anchorage

QC Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101 (Continued)

Lab Sample ID: 14J0181-BS2

Matrix: Soil

Analysis Batch: 14J0181

Client Sample ID: Lab Control Sample

Prep Type: Total

Prep Batch: 14J0181_P

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-bromofluorobenzene	97.1		41.5 - 162
a,a,a - Trifluorotoluene	92.3		60 - 120

Lab Sample ID: 14J0181-BSD2

Matrix: Soil

Analysis Batch: 14J0181

Client Sample ID: Lab Control Sample Dup

Prep Type: Total

Prep Batch: 14J0181_P

Analyte	Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline Range Hydrocarbons	50.0	49.0		mg/kg wet		97.9	60 - 120	3.40	20

Surrogate	LCS Dup %Recovery	LCS Dup Qualifier	Limits
4-bromofluorobenzene	100		41.5 - 162
a,a,a - Trifluorotoluene	91.5		60 - 120

Lab Sample ID: 14J0201-BLK1

Matrix: Water

Analysis Batch: 14J0201

Client Sample ID: Method Blank

Prep Type: Total

Prep Batch: 14J0201_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	ND		100	52.0	ug/L		10/31/14 14:45	10/31/14 17:25	1.00

Surrogate	Blank %Recovery	Blank Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	97.1		68.7 - 141	10/31/14 14:45	10/31/14 17:25	1.00

Lab Sample ID: 14J0201-BS2

Matrix: Water

Analysis Batch: 14J0201

Client Sample ID: Lab Control Sample

Prep Type: Total

Prep Batch: 14J0201_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Gasoline Range Hydrocarbons	1000	1010		ug/L		101	60 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-bromofluorobenzene	97.1		68.7 - 141

Lab Sample ID: 14J0201-BSD2

Matrix: Water

Analysis Batch: 14J0201

Client Sample ID: Lab Control Sample Dup

Prep Type: Total

Prep Batch: 14J0201_P

Analyte	Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline Range Hydrocarbons	1000	990		ug/L		99.0	60 - 120	1.85	20

Surrogate	LCS Dup %Recovery	LCS Dup Qualifier	Limits
4-bromofluorobenzene	97.8		68.7 - 141

TestAmerica Anchorage

QC Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Method: EPA 8260C - Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101 (Continued)

Lab Sample ID: 14K0105-BLK1

Matrix: Soil

Analysis Batch: 14K0105

Client Sample ID: Method Blank

Prep Type: Total

Prep Batch: 14K0105_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Hydrocarbons	1.08	J	5.00	0.137	mg/kg wet	-	11/20/14 09:00	11/20/14 09:56	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-bromofluorobenzene	102		41.5 - 162				11/20/14 09:00	11/20/14 09:56	1.00
a,a,a - Trifluorotoluene	82.2		50 - 150				11/20/14 09:00	11/20/14 09:56	1.00

Lab Sample ID: 14K0105-BS2

Matrix: Soil

Analysis Batch: 14K0105

Client Sample ID: Lab Control Sample

Prep Type: Total

Prep Batch: 14K0105_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Gasoline Range Hydrocarbons	50.0	49.1		mg/kg wet	-	98.2	60 - 120
Surrogate	%Recovery	Qualifier	Limits				
4-bromofluorobenzene	105		41.5 - 162				
a,a,a - Trifluorotoluene	95.7		60 - 120				

Lab Sample ID: 14K0105-BSD2

Matrix: Soil

Analysis Batch: 14K0105

Client Sample ID: Lab Control Sample Dup

Prep Type: Total

Prep Batch: 14K0105_P

Analyte	Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Gasoline Range Hydrocarbons	50.0	50.0		mg/kg wet	-	100	60 - 120	1.82	20
Surrogate	%Recovery	Qualifier	Limits						
4-bromofluorobenzene	98.4		41.5 - 162						
a,a,a - Trifluorotoluene	94.6		60 - 120						

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C

Lab Sample ID: 14J0172-BLK1

Matrix: Soil

Analysis Batch: 14J0172

Client Sample ID: Method Blank

Prep Type: Total

Prep Batch: 14J0172_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0200	0.00970	mg/kg wet	-	10/29/14 08:37	10/29/14 10:57	1.00
Toluene	ND		0.100	0.0133	mg/kg wet	-	10/29/14 08:37	10/29/14 10:57	1.00
Ethylbenzene	ND		0.100	0.0162	mg/kg wet	-	10/29/14 08:37	10/29/14 10:57	1.00
m,p-Xylene	ND		0.400	0.0170	mg/kg wet	-	10/29/14 08:37	10/29/14 10:57	1.00
o-Xylene	ND		0.200	0.0131	mg/kg wet	-	10/29/14 08:37	10/29/14 10:57	1.00
1,3,5-Trimethylbenzene	ND		0.100	0.0186	mg/kg wet	-	10/29/14 08:37	10/29/14 10:57	1.00
1,2,4-Trimethylbenzene	ND		0.100	0.0145	mg/kg wet	-	10/29/14 08:37	10/29/14 10:57	1.00
Xylenes (total)	ND		0.600	0.0301	mg/kg wet	-	10/29/14 08:37	10/29/14 10:57	1.00
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Dibromofluoromethane	99.9		80 - 120				10/29/14 08:37	10/29/14 10:57	1.00

TestAmerica Anchorage

QC Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C (Continued)

Lab Sample ID: 14J0172-BLK1

Matrix: Soil

Analysis Batch: 14J0172

Client Sample ID: Method Blank

Prep Type: Total

Prep Batch: 14J0172_P

Surrogate	Blank %Recovery	Blank Qualifier	Limits	Prepared	Analyzed	Dil Fac
Toluene-d8	102		78.5 - 125	10/29/14 08:37	10/29/14 10:57	1.00
4-bromofluorobenzene	99.8		69.8 - 140	10/29/14 08:37	10/29/14 10:57	1.00
a,a,a - Trifluorotoluene	103		50 - 150	10/29/14 08:37	10/29/14 10:57	1.00

Lab Sample ID: 14J0172-BS1

Matrix: Soil

Analysis Batch: 14J0172

Client Sample ID: Lab Control Sample

Prep Type: Total

Prep Batch: 14J0172_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Benzene	0.500	0.494		mg/kg wet		98.7	75.8 - 123
Toluene	0.500	0.482		mg/kg wet		96.4	76.6 - 125
Ethylbenzene	0.500	0.498		mg/kg wet		99.6	77.3 - 121
m,p-Xylene	0.500	0.500		mg/kg wet		99.9	77.7 - 124
o-Xylene	0.500	0.504		mg/kg wet		101	76.7 - 129
1,3,5-Trimethylbenzene	0.500	0.468		mg/kg wet		93.6	80 - 121
1,2,4-Trimethylbenzene	0.500	0.486		mg/kg wet		97.2	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Dibromofluoromethane	102		80 - 120
Toluene-d8	101		78.5 - 125
4-bromofluorobenzene	97.7		69.8 - 140
a,a,a - Trifluorotoluene	98.1		60 - 120

Lab Sample ID: 14J0172-BSD1

Matrix: Soil

Analysis Batch: 14J0172

Client Sample ID: Lab Control Sample Dup

Prep Type: Total

Prep Batch: 14J0172_P

Analyte	Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Benzene	0.500	0.482		mg/kg wet		96.5	75.8 - 123	2.25	25
Toluene	0.500	0.460		mg/kg wet		91.9	76.6 - 125	4.78	25
Ethylbenzene	0.500	0.468		mg/kg wet		93.7	77.3 - 121	6.10	25
m,p-Xylene	0.500	0.466		mg/kg wet		93.1	77.7 - 124	7.05	25
o-Xylene	0.500	0.474		mg/kg wet		94.7	76.7 - 129	6.14	25
1,3,5-Trimethylbenzene	0.500	0.447		mg/kg wet		89.4	80 - 121	4.59	25
1,2,4-Trimethylbenzene	0.500	0.466		mg/kg wet		93.3	80 - 122	4.09	25

Surrogate	LCS Dup %Recovery	LCS Dup Qualifier	Limits
Dibromofluoromethane	104		80 - 120
Toluene-d8	99.8		78.5 - 125
4-bromofluorobenzene	98.6		69.8 - 140
a,a,a - Trifluorotoluene	95.9		60 - 120

TestAmerica Anchorage

QC Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C (Continued)

Lab Sample ID: 14J0181-BLK1

Matrix: Soil

Analysis Batch: 14J0181

Client Sample ID: Method Blank

Prep Type: Total

Prep Batch: 14J0181_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0200	0.00970	mg/kg wet		10/30/14 06:27	10/30/14 08:54	1.00
Toluene	ND		0.100	0.0133	mg/kg wet		10/30/14 06:27	10/30/14 08:54	1.00
Ethylbenzene	ND		0.100	0.0162	mg/kg wet		10/30/14 06:27	10/30/14 08:54	1.00
m,p-Xylene	ND		0.400	0.0170	mg/kg wet		10/30/14 06:27	10/30/14 08:54	1.00
o-Xylene	ND		0.200	0.0131	mg/kg wet		10/30/14 06:27	10/30/14 08:54	1.00
1,3,5-Trimethylbenzene	ND		0.100	0.0186	mg/kg wet		10/30/14 06:27	10/30/14 08:54	1.00
1,2,4-Trimethylbenzene	ND		0.100	0.0145	mg/kg wet		10/30/14 06:27	10/30/14 08:54	1.00
Xylenes (total)	ND		0.600	0.0301	mg/kg wet		10/30/14 06:27	10/30/14 08:54	1.00

Surrogate	Blank %Recovery	Blank Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane	98.0		80 - 120	10/30/14 06:27	10/30/14 08:54	1.00
Toluene-d8	105		78.5 - 125	10/30/14 06:27	10/30/14 08:54	1.00
4-bromofluorobenzene	101		69.8 - 140	10/30/14 06:27	10/30/14 08:54	1.00
a,a,a - Trifluorotoluene	113		50 - 150	10/30/14 06:27	10/30/14 08:54	1.00

Lab Sample ID: 14J0181-BS1

Matrix: Soil

Analysis Batch: 14J0181

Client Sample ID: Lab Control Sample

Prep Type: Total

Prep Batch: 14J0181_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Benzene	0.500	0.570		mg/kg wet		114	75.8 - 123
Toluene	0.500	0.544		mg/kg wet		109	76.6 - 125
Ethylbenzene	0.500	0.540		mg/kg wet		108	77.3 - 121
m,p-Xylene	0.500	0.548		mg/kg wet		110	77.7 - 124
o-Xylene	0.500	0.542		mg/kg wet		108	76.7 - 129
1,3,5-Trimethylbenzene	0.500	0.526		mg/kg wet		105	80 - 121
1,2,4-Trimethylbenzene	0.500	0.548		mg/kg wet		110	80 - 122

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Dibromofluoromethane	98.7		80 - 120
Toluene-d8	102		78.5 - 125
4-bromofluorobenzene	99.7		69.8 - 140
a,a,a - Trifluorotoluene	103		60 - 120

Lab Sample ID: 14J0181-BSD1

Matrix: Soil

Analysis Batch: 14J0181

Client Sample ID: Lab Control Sample Dup

Prep Type: Total

Prep Batch: 14J0181_P

Analyte	Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Benzene	0.500	0.482		mg/kg wet		96.5	75.8 - 123	16.5	25
Toluene	0.500	0.458		mg/kg wet		91.7	76.6 - 125	17.1	25
Ethylbenzene	0.500	0.456		mg/kg wet		91.3	77.3 - 121	16.7	25
m,p-Xylene	0.500	0.456		mg/kg wet		91.1	77.7 - 124	18.5	25
o-Xylene	0.500	0.455		mg/kg wet		91.0	76.7 - 129	17.5	25
1,3,5-Trimethylbenzene	0.500	0.446		mg/kg wet		89.2	80 - 121	16.4	25
1,2,4-Trimethylbenzene	0.500	0.454		mg/kg wet		90.8	80 - 122	18.8	25

TestAmerica Anchorage

QC Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C (Continued)

Lab Sample ID: 14J0181-BSD1

Matrix: Soil

Analysis Batch: 14J0181

Client Sample ID: Lab Control Sample Dup

Prep Type: Total

Prep Batch: 14J0181_P

Surrogate	LCS Dup %Recovery	LCS Dup Qualifier	Limits
Dibromofluoromethane	100		80 - 120
Toluene-d8	102		78.5 - 125
4-bromofluorobenzene	101		69.8 - 140
a,a,a - Trifluorotoluene	113		60 - 120

Lab Sample ID: 14J0201-BLK1

Matrix: Water

Analysis Batch: 14J0201

Client Sample ID: Method Blank

Prep Type: Total

Prep Batch: 14J0201_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.200	0.0320	ug/L		10/31/14 14:45	10/31/14 17:25	1.00
Toluene	ND		1.00	0.0380	ug/L		10/31/14 14:45	10/31/14 17:25	1.00
Ethylbenzene	ND		1.00	0.0860	ug/L		10/31/14 14:45	10/31/14 17:25	1.00
m,p-Xylene	ND		2.00	0.124	ug/L		10/31/14 14:45	10/31/14 17:25	1.00
o-Xylene	ND		1.00	0.0620	ug/L		10/31/14 14:45	10/31/14 17:25	1.00
1,3,5-Trimethylbenzene	ND		1.00	0.0740	ug/L		10/31/14 14:45	10/31/14 17:25	1.00
1,2,4-Trimethylbenzene	ND		1.00	0.0400	ug/L		10/31/14 14:45	10/31/14 17:25	1.00
Xylenes (total)	ND		3.00	0.0160	ug/L		10/31/14 14:45	10/31/14 17:25	1.00

Surrogate	Blank %Recovery	Blank Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane	95.7		71.2 - 143	10/31/14 14:45	10/31/14 17:25	1.00
Toluene-d8	108		74.1 - 135	10/31/14 14:45	10/31/14 17:25	1.00
4-bromofluorobenzene	97.1		68.7 - 141	10/31/14 14:45	10/31/14 17:25	1.00

Lab Sample ID: 14J0201-BS1

Matrix: Water

Analysis Batch: 14J0201

Client Sample ID: Lab Control Sample

Prep Type: Total

Prep Batch: 14J0201_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	10.0	10.1		ug/L		101	80 - 122
Toluene	10.0	10.1		ug/L		101	80 - 123
Ethylbenzene	10.0	9.74		ug/L		97.4	80 - 120
m,p-Xylene	10.0	9.83		ug/L		98.3	80 - 120
o-Xylene	10.0	9.87		ug/L		98.7	80 - 120
Xylenes (total)	20.0	19.7		ug/L		98.5	80 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Dibromofluoromethane	97.9		71.2 - 143
Toluene-d8	105		74.1 - 135
4-bromofluorobenzene	96.5		68.7 - 141

Lab Sample ID: 14J0201-BSD1

Matrix: Water

Analysis Batch: 14J0201

Client Sample ID: Lab Control Sample Dup

Prep Type: Total

Prep Batch: 14J0201_P

Analyte	Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	10.0	10.1		ug/L		101	80 - 122	0.098	25

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TestAmerica Anchorage

QC Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C (Continued)

Lab Sample ID: 14J0201-BSD1

Matrix: Water

Analysis Batch: 14J0201

Client Sample ID: Lab Control Sample Dup

Prep Type: Total

Prep Batch: 14J0201_P

Analyte	Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Toluene	10.0	10.0		ug/L		100	80 - 123	0.497	25
Ethylbenzene	10.0	9.88		ug/L		98.8	80 - 120	1.43	25
m,p-Xylene	10.0	9.79		ug/L		97.9	80 - 120	0.408	25
o-Xylene	10.0	9.90		ug/L		99.0	80 - 120	0.303	25
Xylenes (total)	20.0	19.7		ug/L		98.4	80 - 120	0.050	25
								8	

Surrogate	LCS Dup %Recovery	LCS Dup Qualifier	Limits
Dibromofluoromethane	96.8		71.2 - 143
Toluene-d8	103		74.1 - 135
4-bromofluorobenzene	97.2		68.7 - 141

Lab Sample ID: 14K0105-BLK1

Matrix: Soil

Analysis Batch: 14K0105

Client Sample ID: Method Blank

Prep Type: Total

Prep Batch: 14K0105_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dichlorodifluoromethane	ND		0.100	0.00930	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Chloromethane	ND		0.0300	0.00530	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Vinyl chloride	ND		0.00800	0.00620	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Bromomethane	ND		0.0600	0.0306	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Chloroethane	ND		0.100	0.0245	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Trichlorofluoromethane	ND		0.0300	0.00790	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
1,1-Dichloroethene	ND		0.0300	0.0127	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Carbon disulfide	ND		0.100	0.0107	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Methylene chloride	0.0890	J	0.200	0.00520	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Acetone	ND		1.00	0.0870	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
trans-1,2-Dichloroethene	ND		0.300	0.0103	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Methyl tert-butyl ether	ND		0.100	0.00320	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
1,1-Dichloroethane	ND		0.100	0.0113	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
cis-1,2-Dichloroethene	ND		0.200	0.00570	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
2,2-Dichloropropane	ND		0.100	0.0170	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Bromochloromethane	ND		0.100	0.00390	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Chloroform	ND		0.100	0.00770	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Carbon tetrachloride	ND		0.0300	0.0208	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
1,1,1-Trichloroethane	ND		0.100	0.0173	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
2-Butanone	ND		1.00	0.110	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
1,1-Dichloropropene	ND		0.100	0.0174	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Benzene	ND		0.0200	0.00970	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
1,2-Dichloroethane (EDC)	ND		0.0150	0.00490	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Trichloroethene	ND		0.0200	0.0128	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Dibromomethane	ND		0.100	0.00910	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
1,2-Dichloropropane	ND		0.0100	0.00600	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Bromodichloromethane	ND		0.0500	0.00700	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
cis-1,3-Dichloropropene	ND		0.0200	0.00620	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Toluene	ND		0.100	0.0133	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
4-Methyl-2-pentanone	ND		1.00	0.0204	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
trans-1,3-Dichloropropene	ND		0.0200	0.00660	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00

TestAmerica Anchorage

QC Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C (Continued)

Lab Sample ID: 14K0105-BLK1

Matrix: Soil

Analysis Batch: 14K0105

Client Sample ID: Method Blank

Prep Type: Total

Prep Batch: 14K0105_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tetrachloroethene	ND		0.0200	0.0176	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
1,1,2-Trichloroethane	ND		0.0100	0.00620	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Dibromochloromethane	ND		0.100	0.00600	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
1,3-Dichloropropane	ND		0.0200	0.00740	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
1,2-Dibromoethane	ND		0.00600	0.00580	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
2-Hexanone	ND		1.00	0.0465	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Ethylbenzene	ND		0.100	0.0162	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Chlorobenzene	ND		0.100	0.00760	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
1,1,1,2-Tetrachloroethane	ND		0.100	0.0102	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
m,p-Xylene	ND		0.400	0.0170	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
o-Xylene	ND		0.200	0.0131	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Styrene	ND		0.100	0.00930	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Bromoform	ND		0.100	0.0125	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Isopropylbenzene	ND		0.100	0.0190	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
n-Propylbenzene	ND		0.100	0.0207	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
1,1,2,2-Tetrachloroethane	ND		0.0100	0.00750	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Bromobenzene	ND		0.100	0.00940	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
1,3,5-Trimethylbenzene	ND		0.100	0.0186	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
2-Chlorotoluene	ND		0.100	0.0163	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
1,2,3-Trichloropropane	ND		0.0100	0.00840	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
4-Chlorotoluene	ND		0.100	0.0143	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
tert-Butylbenzene	ND		0.100	0.0216	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
1,2,4-Trimethylbenzene	ND		0.100	0.0145	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
sec-Butylbenzene	ND		0.100	0.0235	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
p-Isopropyltoluene	ND		0.100	0.0239	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
1,3-Dichlorobenzene	ND		0.100	0.0126	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
1,4-Dichlorobenzene	ND		0.100	0.0106	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
n-Butylbenzene	ND		0.100	0.0275	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
1,2-Dichlorobenzene	ND		0.100	0.00760	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
1,2-Dibromo-3-chloropropane	ND		0.500	0.0284	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Hexachlorobutadiene	ND		0.100	0.0570	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
1,2,4-Trichlorobenzene	ND		0.100	0.0199	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Naphthalene	ND		0.200	0.0136	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
1,2,3-Trichlorobenzene	ND		0.100	0.0355	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00
Xylenes (total)	ND		0.600	0.0301	mg/kg wet		11/20/14 09:00	11/20/14 09:56	1.00

Surrogate	Blank %Recovery	Blank Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane	100		80 - 120	11/20/14 09:00	11/20/14 09:56	1.00
Toluene-d8	97.0		78.5 - 125	11/20/14 09:00	11/20/14 09:56	1.00
4-bromofluorobenzene	102		69.8 - 140	11/20/14 09:00	11/20/14 09:56	1.00
a,a,a - Trifluorotoluene	82.2		50 - 150	11/20/14 09:00	11/20/14 09:56	1.00

Lab Sample ID: 14K0105-BS1

Matrix: Soil

Analysis Batch: 14K0105

Client Sample ID: Lab Control Sample

Prep Type: Total

Prep Batch: 14K0105_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dichlorodifluoromethane	0.500	0.478		mg/kg wet		95.5	60.5 - 130

TestAmerica Anchorage

QC Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C (Continued)

Lab Sample ID: 14K0105-BS1

Matrix: Soil

Analysis Batch: 14K0105

Client Sample ID: Lab Control Sample

Prep Type: Total

Prep Batch: 14K0105_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloromethane	0.500	0.528		mg/kg wet		106	68.9 - 130
Vinyl chloride	0.500	0.594		mg/kg wet		119	74 - 142
Bromomethane	0.500	0.637		mg/kg wet		127	70.5 - 146
Chloroethane	0.500	0.554		mg/kg wet		111	60 - 140
Trichlorofluoromethane	0.500	0.529		mg/kg wet		106	70.5 - 139
1,1-Dichloroethene	0.500	0.600		mg/kg wet		120	72.9 - 135
Carbon disulfide	0.500	0.580		mg/kg wet		116	66.8 - 146
Methylene chloride	0.500	0.620		mg/kg wet		124	60 - 140
Acetone	2.50	2.80		mg/kg wet		112	39.2 - 145
trans-1,2-Dichloroethene	0.500	0.552		mg/kg wet		110	60 - 140
Methyl tert-butyl ether	0.500	0.593		mg/kg wet		119	60 - 140
1,1-Dichloroethane	0.500	0.582		mg/kg wet		116	80 - 131
cis-1,2-Dichloroethene	0.500	0.611		mg/kg wet		122	80 - 126
2,2-Dichloropropane	0.500	0.590		mg/kg wet		118	71.5 - 132
Bromochloromethane	0.500	0.578		mg/kg wet		116	69.1 - 139
Chloroform	0.500	0.564		mg/kg wet		113	80 - 130
Carbon tetrachloride	0.500	0.589		mg/kg wet		118	73.6 - 148
1,1,1-Trichloroethane	0.500	0.592		mg/kg wet		118	74.3 - 138
2-Butanone	2.50	2.78		mg/kg wet		111	56.1 - 124
1,1-Dichloropropene	0.500	0.605		mg/kg wet		121	78.3 - 132
Benzene	0.500	0.563		mg/kg wet		113	75.8 - 123
1,2-Dichloroethane (EDC)	0.500	0.614		mg/kg wet		123	71.1 - 142
Trichloroethene	0.500	0.545		mg/kg wet		109	78.5 - 134
Dibromomethane	0.500	0.572		mg/kg wet		114	80 - 129
1,2-Dichloropropane	0.500	0.568		mg/kg wet		114	50.8 - 155
Bromodichloromethane	0.500	0.544		mg/kg wet		109	80 - 128
cis-1,3-Dichloropropene	0.500	0.606		mg/kg wet		121	80 - 126
Toluene	0.500	0.544		mg/kg wet		109	76.6 - 125
4-Methyl-2-pentanone	2.50	2.78		mg/kg wet		111	66.4 - 131
trans-1,3-Dichloropropene	0.500	0.594		mg/kg wet		119	79 - 124
Tetrachloroethene	0.500	0.578		mg/kg wet		116	80 - 127
1,1,2-Trichloroethane	0.500	0.548		mg/kg wet		110	78.4 - 125
Dibromochloromethane	0.500	0.562		mg/kg wet		112	78.4 - 127
1,3-Dichloropropane	0.500	0.574		mg/kg wet		115	80 - 125
1,2-Dibromoethane	0.500	0.564		mg/kg wet		113	77.1 - 129
2-Hexanone	2.50	2.88		mg/kg wet		115	64.6 - 127
Ethylbenzene	0.500	0.528		mg/kg wet		106	77.3 - 121
Chlorobenzene	0.500	0.537		mg/kg wet		107	80 - 120
1,1,1,2-Tetrachloroethane	0.500	0.564		mg/kg wet		113	80 - 120
m,p-Xylene	0.500	0.550		mg/kg wet		110	77.7 - 124
o-Xylene	0.500	0.552		mg/kg wet		110	76.7 - 129
Styrene	0.500	0.546		mg/kg wet		109	80 - 128
Bromoform	0.500	0.526		mg/kg wet		105	76 - 135
Isopropylbenzene	0.500	0.540		mg/kg wet		108	78.4 - 131
n-Propylbenzene	0.500	0.576		mg/kg wet		115	80 - 120
1,1,2,2-Tetrachloroethane	0.500	0.578		mg/kg wet		116	60.3 - 137
Bromobenzene	0.500	0.548		mg/kg wet		110	60 - 140
1,3,5-Trimethylbenzene	0.500	0.574		mg/kg wet		115	80 - 121

TestAmerica Anchorage

QC Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C (Continued)

Lab Sample ID: 14K0105-BS1

Matrix: Soil

Analysis Batch: 14K0105

Client Sample ID: Lab Control Sample

Prep Type: Total

Prep Batch: 14K0105_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2-Chlorotoluene	0.500	0.582		mg/kg wet		116	80 - 123
1,2,3-Trichloropropane	0.500	0.628		mg/kg wet		126	59.9 - 131
4-Chlorotoluene	0.500	0.575		mg/kg wet		115	80 - 124
tert-Butylbenzene	0.500	0.542		mg/kg wet		108	78.8 - 130
1,2,4-Trimethylbenzene	0.500	0.562		mg/kg wet		112	80 - 122
sec-Butylbenzene	0.500	0.557		mg/kg wet		111	80 - 120
p-Isopropyltoluene	0.500	0.556		mg/kg wet		111	67.2 - 147
1,3-Dichlorobenzene	0.500	0.571		mg/kg wet		114	80 - 122
1,4-Dichlorobenzene	0.500	0.564		mg/kg wet		113	80 - 125
n-Butylbenzene	0.500	0.572		mg/kg wet		114	80 - 120
1,2-Dichlorobenzene	0.500	0.569		mg/kg wet		114	80 - 124
1,2-Dibromo-3-chloropropane	0.500	0.518		mg/kg wet		104	60 - 140
Hexachlorobutadiene	0.500	0.566		mg/kg wet		113	71.8 - 138
1,2,4-Trichlorobenzene	0.500	0.520		mg/kg wet		104	75.3 - 126
Naphthalene	0.500	0.534		mg/kg wet		107	55.1 - 142
1,2,3-Trichlorobenzene	0.500	0.502		mg/kg wet		100	69.6 - 127

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Dibromofluoromethane	101		80 - 120
Toluene-d8	98.3		78.5 - 125
4-bromofluorobenzene	102		69.8 - 140
a,a,a - Trifluorotoluene	110		60 - 120

Lab Sample ID: 14K0105-BSD1

Matrix: Soil

Analysis Batch: 14K0105

Client Sample ID: Lab Control Sample Dup

Prep Type: Total

Prep Batch: 14K0105_P

Analyte	Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Dichlorodifluoromethane	0.500	0.436		mg/kg wet		87.3	60.5 - 130	8.97	25
Chloromethane	0.500	0.459		mg/kg wet		91.8	68.9 - 130	13.9	25
Vinyl chloride	0.500	0.503		mg/kg wet		101	74 - 142	16.6	25
Bromomethane	0.500	0.542		mg/kg wet		108	70.5 - 146	16.1	25
Chloroethane	0.500	0.565		mg/kg wet		113	60 - 140	1.88	25
Trichlorofluoromethane	0.500	0.524		mg/kg wet		105	70.5 - 139	0.950	25
1,1-Dichloroethene	0.500	0.507		mg/kg wet		101	72.9 - 135	16.8	25
Carbon disulfide	0.500	0.486		mg/kg wet		97.3	66.8 - 146	17.5	25
Methylene chloride	0.500	0.556		mg/kg wet		111	60 - 140	11.1	25
Acetone	2.50	2.52		mg/kg wet		101	39.2 - 145	10.6	25
trans-1,2-Dichloroethene	0.500	0.476		mg/kg wet		95.2	60 - 140	14.9	25
Methyl tert-butyl ether	0.500	0.518		mg/kg wet		104	60 - 140	13.6	25
1,1-Dichloroethane	0.500	0.502		mg/kg wet		100	80 - 131	14.8	25
cis-1,2-Dichloroethene	0.500	0.538		mg/kg wet		108	80 - 126	12.7	25
2,2-Dichloropropane	0.500	0.483		mg/kg wet		96.6	71.5 - 132	19.9	25
Bromochloromethane	0.500	0.493		mg/kg wet		98.6	69.1 - 139	15.9	25
Chloroform	0.500	0.478		mg/kg wet		95.7	80 - 130	16.4	25
Carbon tetrachloride	0.500	0.496		mg/kg wet		99.3	73.6 - 148	17.0	25
1,1,1-Trichloroethane	0.500	0.510		mg/kg wet		102	74.3 - 138	15.1	25
2-Butanone	2.50	2.46		mg/kg wet		98.3	56.1 - 124	12.4	25

TestAmerica Anchorage

QC Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C (Continued)

Lab Sample ID: 14K0105-BSD1

Matrix: Soil

Analysis Batch: 14K0105

Client Sample ID: Lab Control Sample Dup

Prep Type: Total

Prep Batch: 14K0105_P

Analyte	Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
1,1-Dichloropropene	0.500	0.512		mg/kg wet		102	78.3 - 132	16.7	25
Benzene	0.500	0.486		mg/kg wet		97.2	75.8 - 123	14.7	25
1,2-Dichloroethane (EDC)	0.500	0.544		mg/kg wet		109	71.1 - 142	12.2	25
Trichloroethene	0.500	0.465		mg/kg wet		93.0	78.5 - 134	15.8	25
Dibromomethane	0.500	0.490		mg/kg wet		98.0	80 - 129	15.4	25
1,2-Dichloropropane	0.500	0.483		mg/kg wet		96.6	50.8 - 155	16.1	25
Bromodichloromethane	0.500	0.466		mg/kg wet		93.2	80 - 128	15.5	25
cis-1,3-Dichloropropene	0.500	0.517		mg/kg wet		103	80 - 126	15.9	25
Toluene	0.500	0.458		mg/kg wet		91.6	76.6 - 125	17.2	25
4-Methyl-2-pentanone	2.50	2.45		mg/kg wet		98.1	66.4 - 131	12.4	25
trans-1,3-Dichloropropene	0.500	0.502		mg/kg wet		100	79 - 124	16.7	25
Tetrachloroethene	0.500	0.484		mg/kg wet		96.7	80 - 127	17.7	25
1,1,2-Trichloroethane	0.500	0.468		mg/kg wet		93.7	78.4 - 125	15.6	25
Dibromochloromethane	0.500	0.470		mg/kg wet		93.9	78.4 - 127	17.8	25
1,3-Dichloropropane	0.500	0.498		mg/kg wet		99.7	80 - 125	14.2	25
1,2-Dibromoethane	0.500	0.486		mg/kg wet		97.1	77.1 - 129	15.0	25
2-Hexanone	2.50	2.57		mg/kg wet		103	64.6 - 127	11.3	25
Ethylbenzene	0.500	0.454		mg/kg wet		90.9	77.3 - 121	14.9	25
Chlorobenzene	0.500	0.461		mg/kg wet		92.2	80 - 120	15.2	25
1,1,1,2-Tetrachloroethane	0.500	0.476		mg/kg wet		95.3	80 - 120	16.9	25
m,p-Xylene	0.500	0.470		mg/kg wet		93.9	77.7 - 124	15.9	25
o-Xylene	0.500	0.474		mg/kg wet		94.8	76.7 - 129	15.2	25
Styrene	0.500	0.464		mg/kg wet		92.7	80 - 128	16.3	25
Bromoform	0.500	0.466		mg/kg wet		93.3	76 - 135	11.9	25
Isopropylbenzene	0.500	0.470		mg/kg wet		93.9	78.4 - 131	13.9	25
n-Propylbenzene	0.500	0.483		mg/kg wet		96.6	80 - 120	17.6	25
1,1,2,2-Tetrachloroethane	0.500	0.497		mg/kg wet		99.4	60.3 - 137	15.0	25
Bromobenzene	0.500	0.463		mg/kg wet		92.6	60 - 140	16.8	25
1,3,5-Trimethylbenzene	0.500	0.492		mg/kg wet		98.5	80 - 121	15.4	25
2-Chlorotoluene	0.500	0.495		mg/kg wet		99.0	80 - 123	16.2	25
1,2,3-Trichloropropane	0.500	0.494		mg/kg wet		98.7	59.9 - 131	24.1	25
4-Chlorotoluene	0.500	0.477		mg/kg wet		95.4	80 - 124	18.6	25
tert-Butylbenzene	0.500	0.466		mg/kg wet		93.3	78.8 - 130	15.0	25
1,2,4-Trimethylbenzene	0.500	0.482		mg/kg wet		96.4	80 - 122	15.4	25
sec-Butylbenzene	0.500	0.476		mg/kg wet		95.2	80 - 120	15.7	25
p-Isopropyltoluene	0.500	0.476		mg/kg wet		95.2	67.2 - 147	15.6	25
1,3-Dichlorobenzene	0.500	0.480		mg/kg wet		96.0	80 - 122	17.3	25
1,4-Dichlorobenzene	0.500	0.488		mg/kg wet		97.6	80 - 125	14.4	25
n-Butylbenzene	0.500	0.477		mg/kg wet		95.4	80 - 120	18.0	25
1,2-Dichlorobenzene	0.500	0.496		mg/kg wet		99.3	80 - 124	13.6	25
1,2-Dibromo-3-chloropropane	0.500	0.450	J	mg/kg wet		90.0	60 - 140	14.0	25
Hexachlorobutadiene	0.500	0.496		mg/kg wet		99.3	71.8 - 138	13.0	25
1,2,4-Trichlorobenzene	0.500	0.492		mg/kg wet		98.5	75.3 - 126	5.53	25
Naphthalene	0.500	0.498		mg/kg wet		99.5	55.1 - 142	6.98	25
1,2,3-Trichlorobenzene	0.500	0.496		mg/kg wet		99.1	69.6 - 127	1.30	25

Surrogate	LCS Dup %Recovery	LCS Dup Qualifier	Limits
Dibromofluoromethane	97.2		80 - 120

TestAmerica Anchorage

QC Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Method: EPA 8260C - Volatile Organic Compounds by EPA Method 8260C (Continued)

Lab Sample ID: 14K0105-BSD1

Matrix: Soil

Analysis Batch: 14K0105

Client Sample ID: Lab Control Sample Dup

Prep Type: Total

Prep Batch: 14K0105_P

Surrogate	LCS Dup %Recovery	LCS Dup Qualifier	Limits
Toluene-d8	95.9		78.5 - 125
4-bromofluorobenzene	100		69.8 - 140
a,a,a - Trifluorotoluene	85.8		60 - 120

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and

AK103

Lab Sample ID: 14J0171-BLK1

Matrix: Soil

Analysis Batch: 14J0171

Client Sample ID: Method Blank

Prep Type: Total

Prep Batch: 14J0171_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	ND		10.0	1.67	mg/kg wet		10/29/14 08:21	10/29/14 10:22	1.00
Heavy Oil Range Hydrocarbons	ND		20.0	2.23	mg/kg wet		10/29/14 08:21	10/29/14 10:22	1.00
Surrogate	Blank %Recovery	Blank Qualifier	Limits				Prepared	Analyzed	Dil Fac
o-Terphenyl	93.2		50 - 150				10/29/14 08:21	10/29/14 10:22	1.00
n-Triacontane-d62	95.5		50 - 150				10/29/14 08:21	10/29/14 10:22	1.00

Lab Sample ID: 14J0171-BS1

Matrix: Soil

Analysis Batch: 14J0171

Client Sample ID: Lab Control Sample

Prep Type: Total

Prep Batch: 14J0171_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Diesel Range Hydrocarbons	66.7	67.5		mg/kg wet		101	75 - 125
Heavy Oil Range Hydrocarbons	66.7	62.8		mg/kg wet		94.3	60 - 120
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
o-Terphenyl	105		60 - 120				
n-Triacontane-d62	107		60 - 120				

Lab Sample ID: 14J0171-BSD1

Matrix: Soil

Analysis Batch: 14J0171

Client Sample ID: Lab Control Sample Dup

Prep Type: Total

Prep Batch: 14J0171_P

Analyte	Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Diesel Range Hydrocarbons	66.7	65.8		mg/kg wet		98.7	75 - 125	2.55	20
Heavy Oil Range Hydrocarbons	66.7	65.3		mg/kg wet		97.9	60 - 120	3.79	20
Surrogate	LCS Dup %Recovery	LCS Dup Qualifier	Limits						
o-Terphenyl	90.5		60 - 120						
n-Triacontane-d62	96.8		60 - 120						

TestAmerica Anchorage

QC Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Method: AK102/103 - Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103 (Continued)

Lab Sample ID: 14K0104-BLK1

Matrix: Soil

Analysis Batch: 14K0104

Client Sample ID: Method Blank

Prep Type: Total

Prep Batch: 14K0104_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Hydrocarbons	ND		10.0	1.67	mg/kg wet		11/21/14 09:10	11/21/14 12:59	1.00
Heavy Oil Range Hydrocarbons	ND		20.0	2.23	mg/kg wet		11/21/14 09:10	11/21/14 12:59	1.00
Surrogate	Blank %Recovery	Blank Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	102		50 - 150				11/21/14 09:10	11/21/14 12:59	1.00
<i>n</i> -Triacontane-d62	105		50 - 150				11/21/14 09:10	11/21/14 12:59	1.00

Lab Sample ID: 14K0104-BS1

Matrix: Soil

Analysis Batch: 14K0104

Client Sample ID: Lab Control Sample

Prep Type: Total

Prep Batch: 14K0104_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits	
Diesel Range Hydrocarbons	66.7	68.8		mg/kg wet		103	75 - 125	
Heavy Oil Range Hydrocarbons	66.7	64.8		mg/kg wet		97.1	60 - 120	
Surrogate	LCS %Recovery	LCS Qualifier	Limits					
<i>o</i> -Terphenyl	108		60 - 120					
<i>n</i> -Triacontane-d62	117		60 - 120					

Lab Sample ID: 14K0104-BSD1

Matrix: Soil

Analysis Batch: 14K0104

Client Sample ID: Lab Control Sample Dup

Prep Type: Total

Prep Batch: 14K0104_P

Analyte	Spike Added	LCS Dup Result	LCS Dup Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Diesel Range Hydrocarbons	66.7	70.1		mg/kg wet		105	75 - 125	1.77	20
Heavy Oil Range Hydrocarbons	66.7	64.1		mg/kg wet		96.2	60 - 120	0.949	20
Surrogate	LCS Dup %Recovery	LCS Dup Qualifier	Limits						
<i>o</i> -Terphenyl	112		60 - 120						
<i>n</i> -Triacontane-d62	113		60 - 120						

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Lab Sample ID: MB 580-174455/1-A

Matrix: Water

Analysis Batch: 174580

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 174455

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DRO (nC10-<nC25)	<0.100		0.100	0.0120	mg/L		10/31/14 09:51	11/03/14 09:30	1
RRO (nC25-nC36)	<0.100		0.100	0.0200	mg/L		10/31/14 09:51	11/03/14 09:30	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>o</i> -Terphenyl	94		50 - 150				10/31/14 09:51	11/03/14 09:30	1
<i>n</i> -Triacontane-d62	99		50 - 150				10/31/14 09:51	11/03/14 09:30	1

TestAmerica Anchorage

QC Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

(Continued)

Lab Sample ID: LCS 580-174455/2-A

Matrix: Water

Analysis Batch: 174580

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 174455

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
DRO (nC10-<nC25)	4.00	3.663		mg/L		92	75 - 125
RRO (nC25-nC36)	4.02	3.941		mg/L		98	60 - 120

Surrogate	LCS %Recovery	LCS Qualifier	Limits
<i>o</i> -Terphenyl	94		50 - 150
<i>n</i> -Triacontane-d62	97		50 - 150

Lab Sample ID: LCSD 580-174455/3-A

Matrix: Water

Analysis Batch: 174580

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 174455

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
DRO (nC10-<nC25)	4.00	3.829		mg/L		96	75 - 125	4	20
RRO (nC25-nC36)	4.02	4.171		mg/L		104	60 - 120	6	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
<i>o</i> -Terphenyl	100		50 - 150
<i>n</i> -Triacontane-d62	100		50 - 150

QC Association Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

GCMS Volatiles

Analysis Batch: 14J0172

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
14J0172-BLK1	Method Blank	Total	Soil	EPA 8260C	14J0172_P
14J0172-BS1	Lab Control Sample	Total	Soil	EPA 8260C	14J0172_P
14J0172-BS2	Lab Control Sample	Total	Soil	EPA 8260C	14J0172_P
14J0172-BSD1	Lab Control Sample Dup	Total	Soil	EPA 8260C	14J0172_P
14J0172-BSD2	Lab Control Sample Dup	Total	Soil	EPA 8260C	14J0172_P
230-361-1	17678-B01-04	Total	Solid	EPA 8260C	14J0172_P
230-361-2	17678-B08-03B	Total	Solid	EPA 8260C	14J0172_P
230-361-3	17678-B08-06	Total	Solid	EPA 8260C	14J0172_P
230-361-5	17678-B07-03B	Total	Solid	EPA 8260C	14J0172_P
230-361-6	17678-B07-06	Total	Solid	EPA 8260C	14J0172_P
230-361-8	17678-B02R-02	Total	Solid	EPA 8260C	14J0172_P
230-361-9	17678-B02R-05	Total	Solid	EPA 8260C	14J0172_P
230-361-11	17678-B09-05	Total	Solid	EPA 8260C	14J0172_P
230-361-12	17678-B09-07	Total	Solid	EPA 8260C	14J0172_P
230-361-13	17678-B03-04	Total	Solid	EPA 8260C	14J0172_P
230-361-14	17678-B04-04	Total	Solid	EPA 8260C	14J0172_P
230-361-15	17678-B04-06	Total	Solid	EPA 8260C	14J0172_P
230-361-16	17678-B10-05	Total	Solid	EPA 8260C	14J0172_P
230-361-17	17678-B10-06	Total	Solid	EPA 8260C	14J0172_P
230-361-18	17678-B06-06	Total	Solid	EPA 8260C	14J0172_P
230-361-19	17678-B06-04	Total	Solid	EPA 8260C	14J0172_P
230-361-20	17678-B06-04D	Total	Solid	EPA 8260C	14J0172_P
230-361-21	17678-B05-05	Total	Solid	EPA 8260C	14J0172_P
230-361-22	17678-B05-07	Total	Solid	EPA 8260C	14J0172_P

Analysis Batch: 14J0181

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
14J0181-BLK1	Method Blank	Total	Soil	EPA 8260C	14J0181_P
14J0181-BS1	Lab Control Sample	Total	Soil	EPA 8260C	14J0181_P
14J0181-BS2	Lab Control Sample	Total	Soil	EPA 8260C	14J0181_P
14J0181-BSD1	Lab Control Sample Dup	Total	Soil	EPA 8260C	14J0181_P
14J0181-BSD2	Lab Control Sample Dup	Total	Soil	EPA 8260C	14J0181_P
230-361-24	17678-TB1	Total	Solid	EPA 8260C	14J0181_P
230-361-25	17678-TB2	Total	Solid	EPA 8260C	14J0181_P
230-361-26	17678-TB3	Total	Solid	EPA 8260C	14J0181_P

Analysis Batch: 14J0201

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
14J0201-BLK1	Method Blank	Total	Water	EPA 8260C	14J0201_P
14J0201-BS1	Lab Control Sample	Total	Water	EPA 8260C	14J0201_P
14J0201-BS2	Lab Control Sample	Total	Water	EPA 8260C	14J0201_P
14J0201-BSD1	Lab Control Sample Dup	Total	Water	EPA 8260C	14J0201_P
14J0201-BSD2	Lab Control Sample Dup	Total	Water	EPA 8260C	14J0201_P
230-361-27	17678-TB4	Total	Water	EPA 8260C	14J0201_P
230-361-28	17678-MW1	Total	Water	EPA 8260C	14J0201_P
230-361-29	17678-MW2	Total	Water	EPA 8260C	14J0201_P
230-361-29 - RE1	17678-MW2	Total	Water	EPA 8260C	14J0201_P
230-361-30	17678-MW12	Total	Water	EPA 8260C	14J0201_P
230-361-30 - RE1	17678-MW12	Total	Water	EPA 8260C	14J0201_P

TestAmerica Anchorage

QC Association Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

GCMS Volatiles (Continued)

Analysis Batch: 14K0105

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
14K0105-BLK1	Method Blank	Total	Soil	EPA 8260C	14K0105_P
14K0105-BS1	Lab Control Sample	Total	Soil	EPA 8260C	14K0105_P
14K0105-BS2	Lab Control Sample	Total	Soil	EPA 8260C	14K0105_P
14K0105-BSD1	Lab Control Sample Dup	Total	Soil	EPA 8260C	14K0105_P
14K0105-BSD2	Lab Control Sample Dup	Total	Soil	EPA 8260C	14K0105_P
230-361-4	17678-B08-08	Total	Solid	EPA 8260C	14K0105_P
230-361-7	17678-B07-08	Total	Solid	EPA 8260C	14K0105_P
230-361-10	17678-B02R-06	Total	Solid	EPA 8260C	14K0105_P

Prep Batch: 14J0172_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
14J0172-BLK1	Method Blank	Total	Soil	GC/MS Volatiles	
14J0172-BS1	Lab Control Sample	Total	Soil	GC/MS Volatiles	
14J0172-BS2	Lab Control Sample	Total	Soil	GC/MS Volatiles	
14J0172-BSD1	Lab Control Sample Dup	Total	Soil	GC/MS Volatiles	
14J0172-BSD2	Lab Control Sample Dup	Total	Soil	GC/MS Volatiles	
230-361-1	17678-B01-04	Total	Solid	GC/MS Volatiles	
230-361-2	17678-B08-03B	Total	Solid	GC/MS Volatiles	
230-361-3	17678-B08-06	Total	Solid	GC/MS Volatiles	
230-361-5	17678-B07-03B	Total	Solid	GC/MS Volatiles	
230-361-6	17678-B07-06	Total	Solid	GC/MS Volatiles	
230-361-8	17678-B02R-02	Total	Solid	GC/MS Volatiles	
230-361-9	17678-B02R-05	Total	Solid	GC/MS Volatiles	
230-361-11	17678-B09-05	Total	Solid	GC/MS Volatiles	
230-361-12	17678-B09-07	Total	Solid	GC/MS Volatiles	
230-361-13	17678-B03-04	Total	Solid	GC/MS Volatiles	
230-361-14	17678-B04-04	Total	Solid	GC/MS Volatiles	
230-361-15	17678-B04-06	Total	Solid	GC/MS Volatiles	
230-361-16	17678-B10-05	Total	Solid	GC/MS Volatiles	
230-361-17	17678-B10-06	Total	Solid	GC/MS Volatiles	
230-361-18	17678-B06-06	Total	Solid	GC/MS Volatiles	
230-361-19	17678-B06-04	Total	Solid	GC/MS Volatiles	
230-361-20	17678-B06-04D	Total	Solid	GC/MS Volatiles	
230-361-21	17678-B05-05	Total	Solid	GC/MS Volatiles	
230-361-22	17678-B05-07	Total	Solid	GC/MS Volatiles	

Prep Batch: 14J0181_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
14J0181-BLK1	Method Blank	Total	Soil	GC/MS Volatiles	
14J0181-BS1	Lab Control Sample	Total	Soil	GC/MS Volatiles	
14J0181-BS2	Lab Control Sample	Total	Soil	GC/MS Volatiles	
14J0181-BSD1	Lab Control Sample Dup	Total	Soil	GC/MS Volatiles	
14J0181-BSD2	Lab Control Sample Dup	Total	Soil	GC/MS Volatiles	
230-361-24	17678-TB1	Total	Solid	GC/MS Volatiles	
230-361-25	17678-TB2	Total	Solid	GC/MS Volatiles	
230-361-26	17678-TB3	Total	Solid	GC/MS Volatiles	

Prep Batch: 14J0201_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
14J0201-BLK1	Method Blank	Total	Water	GC/MS Volatiles	
14J0201-BS1	Lab Control Sample	Total	Water	GC/MS Volatiles	

TestAmerica Anchorage

QC Association Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

GCMS Volatiles (Continued)

Prep Batch: 14J0201_P (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
14J0201-BS2	Lab Control Sample	Total	Water	GC/MS Volatiles	
14J0201-BSD1	Lab Control Sample Dup	Total	Water	GC/MS Volatiles	
14J0201-BSD2	Lab Control Sample Dup	Total	Water	GC/MS Volatiles	
230-361-27	17678-TB4	Total	Water	GC/MS Volatiles	
230-361-28	17678-MW1	Total	Water	GC/MS Volatiles	
230-361-29	17678-MW2	Total	Water	GC/MS Volatiles	
230-361-29 - RE1	17678-MW2	Total	Water	GC/MS Volatiles	
230-361-30 - RE1	17678-MW12	Total	Water	GC/MS Volatiles	
230-361-30	17678-MW12	Total	Water	GC/MS Volatiles	

Prep Batch: 14K0105_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
14K0105-BLK1	Method Blank	Total	Soil	GC/MS Volatiles	
14K0105-BS1	Lab Control Sample	Total	Soil	GC/MS Volatiles	
14K0105-BS2	Lab Control Sample	Total	Soil	GC/MS Volatiles	
14K0105-BSD1	Lab Control Sample Dup	Total	Soil	GC/MS Volatiles	
14K0105-BSD2	Lab Control Sample Dup	Total	Soil	GC/MS Volatiles	
230-361-4	17678-B08-08	Total	Solid	GC/MS Volatiles	
230-361-7	17678-B07-08	Total	Solid	GC/MS Volatiles	
230-361-10	17678-B02R-06	Total	Solid	GC/MS Volatiles	

Fuels

Analysis Batch: 14J0171

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
14J0171-BLK1	Method Blank	Total	Soil	AK102/103	14J0171_P
14J0171-BS1	Lab Control Sample	Total	Soil	AK102/103	14J0171_P
14J0171-BSD1	Lab Control Sample Dup	Total	Soil	AK102/103	14J0171_P
230-361-1	17678-B01-04	Total	Solid	AK102/103	14J0171_P
230-361-2	17678-B08-03B	Total	Solid	AK102/103	14J0171_P
230-361-3	17678-B08-06	Total	Solid	AK102/103	14J0171_P
230-361-5	17678-B07-03B	Total	Solid	AK102/103	14J0171_P
230-361-6	17678-B07-06	Total	Solid	AK102/103	14J0171_P
230-361-8	17678-B02R-02	Total	Solid	AK102/103	14J0171_P
230-361-9	17678-B02R-05	Total	Solid	AK102/103	14J0171_P
230-361-11	17678-B09-05	Total	Solid	AK102/103	14J0171_P
230-361-12	17678-B09-07	Total	Solid	AK102/103	14J0171_P
230-361-13	17678-B03-04	Total	Solid	AK102/103	14J0171_P
230-361-14	17678-B04-04	Total	Solid	AK102/103	14J0171_P
230-361-15	17678-B04-06	Total	Solid	AK102/103	14J0171_P
230-361-16	17678-B10-05	Total	Solid	AK102/103	14J0171_P
230-361-17	17678-B10-06	Total	Solid	AK102/103	14J0171_P
230-361-18	17678-B06-06	Total	Solid	AK102/103	14J0171_P
230-361-19	17678-B06-04	Total	Solid	AK102/103	14J0171_P
230-361-20	17678-B06-04D	Total	Solid	AK102/103	14J0171_P
230-361-21	17678-B05-05	Total	Solid	AK102/103	14J0171_P
230-361-22	17678-B05-07	Total	Solid	AK102/103	14J0171_P

TestAmerica Anchorage

QC Association Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Fuels (Continued)

Analysis Batch: 14K0104

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
14K0104-BLK1	Method Blank	Total	Soil	AK102/103	14K0104_P
14K0104-BS1	Lab Control Sample	Total	Soil	AK102/103	14K0104_P
14K0104-BSD1	Lab Control Sample Dup	Total	Soil	AK102/103	14K0104_P
230-361-4	17678-B08-08	Total	Solid	AK102/103	14K0104_P
230-361-7	17678-B07-08	Total	Solid	AK102/103	14K0104_P
230-361-10	17678-B02R-06	Total	Solid	AK102/103	14K0104_P

Prep Batch: 14J0171_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
14J0171-BLK1	Method Blank	Total	Soil	EPA 3550B	
14J0171-BS1	Lab Control Sample	Total	Soil	EPA 3550B	
14J0171-BSD1	Lab Control Sample Dup	Total	Soil	EPA 3550B	
230-361-1	17678-B01-04	Total	Solid	EPA 3550B	
230-361-2	17678-B08-03B	Total	Solid	EPA 3550B	
230-361-3	17678-B08-06	Total	Solid	EPA 3550B	
230-361-5	17678-B07-03B	Total	Solid	EPA 3550B	
230-361-6	17678-B07-06	Total	Solid	EPA 3550B	
230-361-8	17678-B02R-02	Total	Solid	EPA 3550B	
230-361-9	17678-B02R-05	Total	Solid	EPA 3550B	
230-361-11	17678-B09-05	Total	Solid	EPA 3550B	
230-361-12	17678-B09-07	Total	Solid	EPA 3550B	
230-361-13	17678-B03-04	Total	Solid	EPA 3550B	
230-361-14	17678-B04-04	Total	Solid	EPA 3550B	
230-361-15	17678-B04-06	Total	Solid	EPA 3550B	
230-361-16	17678-B10-05	Total	Solid	EPA 3550B	
230-361-17	17678-B10-06	Total	Solid	EPA 3550B	
230-361-18	17678-B06-06	Total	Solid	EPA 3550B	
230-361-19	17678-B06-04	Total	Solid	EPA 3550B	
230-361-20	17678-B06-04D	Total	Solid	EPA 3550B	
230-361-21	17678-B05-05	Total	Solid	EPA 3550B	
230-361-22	17678-B05-07	Total	Solid	EPA 3550B	

Prep Batch: 14K0104_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
14K0104-BLK1	Method Blank	Total	Soil	EPA 3550B	
14K0104-BS1	Lab Control Sample	Total	Soil	EPA 3550B	
14K0104-BSD1	Lab Control Sample Dup	Total	Soil	EPA 3550B	
230-361-4	17678-B08-08	Total	Solid	EPA 3550B	
230-361-7	17678-B07-08	Total	Solid	EPA 3550B	
230-361-10	17678-B02R-06	Total	Solid	EPA 3550B	

GC Semi VOA

Prep Batch: 174455

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
230-361-28	17678-MW1	Total/NA	Water	3510C	
230-361-29	17678-MW2	Total/NA	Water	3510C	
230-361-30	17678-MW12	Total/NA	Water	3510C	
LCS 580-174455/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 580-174455/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

TestAmerica Anchorage

QC Association Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

GC Semi VOA (Continued)

Prep Batch: 174455 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 580-174455/1-A	Method Blank	Total/NA	Water	3510C	

Analysis Batch: 174580

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
230-361-28	17678-MW1	Total/NA	Water	AK102 & 103	174455
230-361-29	17678-MW2	Total/NA	Water	AK102 & 103	174455
230-361-30	17678-MW12	Total/NA	Water	AK102 & 103	174455
LCS 580-174455/2-A	Lab Control Sample	Total/NA	Water	AK102 & 103	174455
LCSD 580-174455/3-A	Lab Control Sample Dup	Total/NA	Water	AK102 & 103	174455
MB 580-174455/1-A	Method Blank	Total/NA	Water	AK102 & 103	174455

Wet Chem

Analysis Batch: 14J0184

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
14J0184-DUP1	17678-B06-04D (230-361-20)	Total	Soil	TA SOP	14J0184_P
14J0184-DUP2	17678-B05-07 (230-361-22)	Total	Soil	TA SOP	14J0184_P
230-361-1	17678-B01-04	Total	Solid	TA SOP	14J0184_P
230-361-2	17678-B08-03B	Total	Solid	TA SOP	14J0184_P
230-361-3	17678-B08-06	Total	Solid	TA SOP	14J0184_P
230-361-4	17678-B08-08	Total	Solid	TA SOP	14J0184_P
230-361-5	17678-B07-03B	Total	Solid	TA SOP	14J0184_P
230-361-6	17678-B07-06	Total	Solid	TA SOP	14J0184_P
230-361-7	17678-B07-08	Total	Solid	TA SOP	14J0184_P
230-361-8	17678-B02R-02	Total	Solid	TA SOP	14J0184_P
230-361-9	17678-B02R-05	Total	Solid	TA SOP	14J0184_P
230-361-10	17678-B02R-06	Total	Solid	TA SOP	14J0184_P
230-361-11	17678-B09-05	Total	Solid	TA SOP	14J0184_P
230-361-12	17678-B09-07	Total	Solid	TA SOP	14J0184_P
230-361-13	17678-B03-04	Total	Solid	TA SOP	14J0184_P
230-361-14	17678-B04-04	Total	Solid	TA SOP	14J0184_P
230-361-15	17678-B04-06	Total	Solid	TA SOP	14J0184_P
230-361-16	17678-B10-05	Total	Solid	TA SOP	14J0184_P
230-361-17	17678-B10-06	Total	Solid	TA SOP	14J0184_P
230-361-18	17678-B06-06	Total	Solid	TA SOP	14J0184_P
230-361-19	17678-B06-04	Total	Solid	TA SOP	14J0184_P
230-361-20	17678-B06-04D	Total	Solid	TA SOP	14J0184_P
230-361-21	17678-B05-05	Total	Solid	TA SOP	14J0184_P
230-361-22	17678-B05-07	Total	Solid	TA SOP	14J0184_P

Prep Batch: 14J0184_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
14J0184-DUP1	17678-B06-04D (230-361-20)	Total	Soil	Wet Chem	
14J0184-DUP2	17678-B05-07 (230-361-22)	Total	Soil	Wet Chem	
230-361-1	17678-B01-04	Total	Solid	Wet Chem	
230-361-2	17678-B08-03B	Total	Solid	Wet Chem	
230-361-3	17678-B08-06	Total	Solid	Wet Chem	
230-361-4	17678-B08-08	Total	Solid	Wet Chem	
230-361-5	17678-B07-03B	Total	Solid	Wet Chem	
230-361-6	17678-B07-06	Total	Solid	Wet Chem	

TestAmerica Anchorage

QC Association Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Wet Chem (Continued)

Prep Batch: 14J0184_P (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
230-361-7	17678-B07-08	Total	Solid	Wet Chem	
230-361-8	17678-B02R-02	Total	Solid	Wet Chem	
230-361-9	17678-B02R-05	Total	Solid	Wet Chem	
230-361-10	17678-B02R-06	Total	Solid	Wet Chem	
230-361-11	17678-B09-05	Total	Solid	Wet Chem	
230-361-12	17678-B09-07	Total	Solid	Wet Chem	
230-361-13	17678-B03-04	Total	Solid	Wet Chem	
230-361-14	17678-B04-04	Total	Solid	Wet Chem	
230-361-15	17678-B04-06	Total	Solid	Wet Chem	
230-361-16	17678-B10-05	Total	Solid	Wet Chem	
230-361-17	17678-B10-06	Total	Solid	Wet Chem	
230-361-18	17678-B06-06	Total	Solid	Wet Chem	
230-361-19	17678-B06-04	Total	Solid	Wet Chem	
230-361-20	17678-B06-04D	Total	Solid	Wet Chem	
230-361-21	17678-B05-05	Total	Solid	Wet Chem	
230-361-22	17678-B05-07	Total	Solid	Wet Chem	

Lab Chronicle

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B01-04

Date Collected: 10/20/14 14:00

Date Received: 10/27/14 15:22

Lab Sample ID: 230-361-1

Matrix: Solid

Percent Solids: 82.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		0.772	14J0172_P	10/29/14 08:37	CBW	TAL SPK
Total	Analysis	EPA 8260C		1.00	14J0172	10/29/14 13:11	CBW	TAL SPK
Total	Prep	EPA 3550B		0.926	14J0171_P	10/29/14 08:21	MS	TAL SPK
Total	Analysis	AK102/103		1.00	14J0171	10/29/14 10:46	NMI	TAL SPK
Total	Prep	Wet Chem		1.00	14J0184_P	10/29/14 11:07	MS	TAL SPK
Total	Analysis	TA SOP		1.00	14J0184	10/30/14 08:45	MS	TAL SPK

Client Sample ID: 17678-B08-03B

Date Collected: 10/21/14 17:50

Date Received: 10/27/14 15:22

Lab Sample ID: 230-361-2

Matrix: Solid

Percent Solids: 92.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		0.478	14J0172_P	10/29/14 08:37	CBW	TAL SPK
Total	Analysis	EPA 8260C		10.0	14J0172	10/29/14 13:33	CBW	TAL SPK

Client Sample ID: 17678-B08-06

Date Collected: 10/21/14 18:17

Date Received: 10/27/14 15:22

Lab Sample ID: 230-361-3

Matrix: Solid

Percent Solids: 83.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		0.403	14J0172_P	10/29/14 08:37	CBW	TAL SPK
Total	Analysis	EPA 8260C		1.00	14J0172	10/29/14 13:55	CBW	TAL SPK
Total	Prep	EPA 3550B		0.842	14J0171_P	10/29/14 08:21	MS	TAL SPK
Total	Analysis	AK102/103		1.00	14J0171	10/29/14 11:40	NMI	TAL SPK

Client Sample ID: 17678-B08-08

Date Collected: 10/21/14 18:35

Date Received: 10/27/14 15:22

Lab Sample ID: 230-361-4

Matrix: Solid

Percent Solids: 94.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		0.391	14K0105_P	11/20/14 10:25	MS	TAL SPK
Total	Analysis	EPA 8260C		1.00	14K0105	11/20/14 12:59	CBW	TAL SPK
Total	Prep	EPA 3550B		0.980	14K0104_P	11/21/14 09:10	NI	TAL SPK
Total	Analysis	AK102/103		1.00	14K0104	11/21/14 14:08	NMI	TAL SPK

Client Sample ID: 17678-B07-03B

Date Collected: 10/21/14 15:00

Date Received: 10/27/14 15:22

Lab Sample ID: 230-361-5

Matrix: Solid

Percent Solids: 87.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		0.634	14J0172_P	10/29/14 08:37	CBW	TAL SPK
Total	Analysis	EPA 8260C		100	14J0172	10/29/14 14:17	CBW	TAL SPK
Total	Prep	EPA 3550B		0.996	14J0171_P	10/29/14 08:21	MS	TAL SPK

TestAmerica Anchorage

Lab Chronicle

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B07-03B

Lab Sample ID: 230-361-5

Date Collected: 10/21/14 15:00

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 87.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Analysis	AK102/103		50.0	14J0171	10/29/14 16:07	NMI	TAL SPK

Client Sample ID: 17678-B07-06

Lab Sample ID: 230-361-6

Date Collected: 10/21/14 15:50

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 91.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		0.385	14J0172_P	10/29/14 08:37	CBW	TAL SPK
Total	Analysis	EPA 8260C		1.00	14J0172	10/29/14 14:40	CBW	TAL SPK
Total	Prep	EPA 3550B		0.969	14J0171_P	10/29/14 08:21	MS	TAL SPK
Total	Analysis	AK102/103		1.00	14J0171	10/29/14 12:04	NMI	TAL SPK

Client Sample ID: 17678-B07-08

Lab Sample ID: 230-361-7

Date Collected: 10/21/14 16:27

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 90.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		0.454	14K0105_P	11/20/14 10:25	MS	TAL SPK
Total	Analysis	EPA 8260C		1.00	14K0105	11/20/14 13:21	CBW	TAL SPK
Total	Prep	EPA 3550B		0.952	14K0104_P	11/21/14 09:10	NI	TAL SPK
Total	Analysis	AK102/103		1.00	14K0104	11/21/14 14:32	NMI	TAL SPK

Client Sample ID: 17678-B02R-02

Lab Sample ID: 230-361-8

Date Collected: 10/21/14 10:15

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 80.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		0.406	14J0172_P	10/29/14 08:37	CBW	TAL SPK
Total	Analysis	EPA 8260C		100	14J0172	10/29/14 15:02	CBW	TAL SPK
Total	Prep	EPA 3550B		0.956	14J0171_P	10/29/14 08:21	MS	TAL SPK
Total	Analysis	AK102/103		1.00	14J0171	10/29/14 12:28	NMI	TAL SPK

Client Sample ID: 17678-B02R-05

Lab Sample ID: 230-361-9

Date Collected: 10/21/14 13:05

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 92.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		0.562	14J0172_P	10/29/14 08:37	CBW	TAL SPK
Total	Analysis	EPA 8260C		1.00	14J0172	10/29/14 15:47	CBW	TAL SPK

TestAmerica Anchorage

Lab Chronicle

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B02R-06

Lab Sample ID: 230-361-10

Date Collected: 10/21/14 13:15

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 90.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		0.560	14K0105_P	11/20/14 10:25	MS	TAL SPK
Total	Analysis	EPA 8260C		1.00	14K0105	11/20/14 13:44	CBW	TAL SPK
Total	Prep	EPA 3550B		0.998	14K0104_P	11/21/14 09:10	NI	TAL SPK
Total	Analysis	AK102/103		1.00	14K0104	11/21/14 14:56	NMI	TAL SPK
Total	Prep	Wet Chem		1.00	14J0184_P	10/29/14 11:07	NI	TAL SPK
Total	Analysis	TA SOP		1.00	14J0184	11/25/14 16:39	NI	TAL SPK

Client Sample ID: 17678-B09-05

Lab Sample ID: 230-361-11

Date Collected: 10/23/14 17:55

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 83

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		0.627	14J0172_P	10/29/14 08:37	CBW	TAL SPK
Total	Analysis	EPA 8260C		1.00	14J0172	10/29/14 16:09	CBW	TAL SPK
Total	Prep	EPA 3550B		0.954	14J0171_P	10/29/14 08:21	MS	TAL SPK
Total	Analysis	AK102/103		1.00	14J0171	10/29/14 12:52	NMI	TAL SPK

Client Sample ID: 17678-B09-07

Lab Sample ID: 230-361-12

Date Collected: 10/23/14 18:15

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 92.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		0.466	14J0172_P	10/29/14 08:37	CBW	TAL SPK
Total	Analysis	EPA 8260C		1.00	14J0172	10/29/14 16:32	CBW	TAL SPK

Client Sample ID: 17678-B03-04

Lab Sample ID: 230-361-13

Date Collected: 10/23/14 09:15

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 88.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		0.450	14J0172_P	10/29/14 08:37	CBW	TAL SPK
Total	Analysis	EPA 8260C		1.00	14J0172	10/29/14 16:54	CBW	TAL SPK
Total	Prep	EPA 3550B		0.956	14J0171_P	10/29/14 08:21	MS	TAL SPK
Total	Analysis	AK102/103		1.00	14J0171	10/29/14 13:17	NMI	TAL SPK

Client Sample ID: 17678-B04-04

Lab Sample ID: 230-361-14

Date Collected: 10/23/14 13:45

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 84.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		0.446	14J0172_P	10/29/14 08:37	CBW	TAL SPK
Total	Analysis	EPA 8260C		1.00	14J0172	10/29/14 17:17	CBW	TAL SPK

TestAmerica Anchorage

Lab Chronicle

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B04-06

Lab Sample ID: 230-361-15

Date Collected: 10/23/14 12:45

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 86.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		0.406	14J0172_P	10/29/14 08:37	CBW	TAL SPK
Total	Analysis	EPA 8260C		1.00	14J0172	10/29/14 17:39	CBW	TAL SPK
Total	Prep	EPA 3550B		0.955	14J0171_P	10/29/14 08:21	MS	TAL SPK
Total	Analysis	AK102/103		1.00	14J0171	10/29/14 13:41	NMI	TAL SPK

Client Sample ID: 17678-B10-05

Lab Sample ID: 230-361-16

Date Collected: 10/22/14 15:30

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 65.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		1.02	14J0172_P	10/29/14 08:37	CBW	TAL SPK
Total	Analysis	EPA 8260C		10.0	14J0172	10/29/14 18:01	CBW	TAL SPK

Client Sample ID: 17678-B10-06

Lab Sample ID: 230-361-17

Date Collected: 10/22/14 15:45

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 80.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		0.473	14J0172_P	10/29/14 08:37	CBW	TAL SPK
Total	Analysis	EPA 8260C		1.00	14J0172	10/29/14 18:24	CBW	TAL SPK

Client Sample ID: 17678-B06-06

Lab Sample ID: 230-361-18

Date Collected: 10/22/14 12:45

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 92.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		0.537	14J0172_P	10/29/14 08:37	CBW	TAL SPK
Total	Analysis	EPA 8260C		1.00	14J0172	10/29/14 18:46	CBW	TAL SPK
Total	Prep	EPA 3550B		0.955	14J0171_P	10/29/14 08:21	MS	TAL SPK
Total	Analysis	AK102/103		1.00	14J0171	10/29/14 14:05	NMI	TAL SPK

Client Sample ID: 17678-B06-04

Lab Sample ID: 230-361-19

Date Collected: 10/22/14 12:10

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 86.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		0.418	14J0172_P	10/29/14 08:37	CBW	TAL SPK
Total	Analysis	EPA 8260C		10.0	14J0172	10/30/14 07:58	CBW	TAL SPK

TestAmerica Anchorage

Lab Chronicle

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-B06-04D

Lab Sample ID: 230-361-20

Date Collected: 10/22/14 12:00

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 79.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		0.403	14J0172_P	10/29/14 08:37	CBW	TAL SPK
Total	Analysis	EPA 8260C		10.0	14J0172	10/30/14 08:20	CBW	TAL SPK
Total	Prep	EPA 3550B		0.995	14J0171_P	10/29/14 08:21	MS	TAL SPK
Total	Analysis	AK102/103		10.0	14J0171	10/29/14 14:30	NMI	TAL SPK

Client Sample ID: 17678-B05-05

Lab Sample ID: 230-361-21

Date Collected: 10/22/14 09:20

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 82.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		0.330	14J0172_P	10/29/14 08:37	CBW	TAL SPK
Total	Analysis	EPA 8260C		1.00	14J0172	10/29/14 19:53	CBW	TAL SPK
Total	Prep	EPA 3550B		0.947	14J0171_P	10/29/14 08:21	MS	TAL SPK
Total	Analysis	AK102/103		20.0	14J0171	10/29/14 16:32	NMI	TAL SPK

Client Sample ID: 17678-B05-07

Lab Sample ID: 230-361-22

Date Collected: 10/22/14 09:45

Matrix: Solid

Date Received: 10/27/14 15:22

Percent Solids: 90.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		0.528	14J0172_P	10/29/14 08:37	CBW	TAL SPK
Total	Analysis	EPA 8260C		1.00	14J0172	10/29/14 20:15	CBW	TAL SPK
Total	Prep	EPA 3550B		0.886	14J0171_P	10/29/14 08:21	MS	TAL SPK
Total	Analysis	AK102/103		1.00	14J0171	10/29/14 15:43	NMI	TAL SPK

Client Sample ID: 17678-TB1

Lab Sample ID: 230-361-24

Date Collected: 10/20/14 00:00

Matrix: Solid

Date Received: 10/27/14 15:22

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		1.00	14J0181_P	10/30/14 06:27	CBW	TAL SPK
Total	Analysis	EPA 8260C		1.00	14J0181	10/30/14 10:45	CBW	TAL SPK

Client Sample ID: 17678-TB2

Lab Sample ID: 230-361-25

Date Collected: 10/20/14 00:00

Matrix: Solid

Date Received: 10/27/14 15:22

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		1.00	14J0181_P	10/30/14 06:27	CBW	TAL SPK
Total	Analysis	EPA 8260C		1.00	14J0181	10/30/14 11:08	CBW	TAL SPK

TestAmerica Anchorage

Lab Chronicle

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-TB3

Date Collected: 10/20/14 00:00

Date Received: 10/27/14 15:22

Lab Sample ID: 230-361-26

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		1.00	14J0181_P	10/30/14 06:27	CBW	TAL SPK
Total	Analysis	EPA 8260C		1.00	14J0181	10/30/14 11:30	CBW	TAL SPK

Client Sample ID: 17678-TB4

Date Collected: 10/20/14 00:00

Date Received: 10/27/14 15:22

Lab Sample ID: 230-361-27

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		1.00	14J0201_P	10/31/14 14:45	CBW	TAL SPK
Total	Analysis	EPA 8260C		1.00	14J0201	10/31/14 19:17	CBW	TAL SPK

Client Sample ID: 17678-MW1

Date Collected: 10/25/14 17:18

Date Received: 10/27/14 15:22

Lab Sample ID: 230-361-28

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		1.00	14J0201_P	10/31/14 14:45	CBW	TAL SPK
Total	Analysis	EPA 8260C		1.00	14J0201	10/31/14 19:40	CBW	TAL SPK
Total/NA	Prep	3510C			174455	10/31/14 11:06	WJR	TAL SEA
Total/NA	Analysis	AK102 & 103		1	174580	11/03/14 13:27	JJP	TAL SEA

Client Sample ID: 17678-MW2

Date Collected: 10/25/14 13:54

Date Received: 10/27/14 15:22

Lab Sample ID: 230-361-29

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		1.00	14J0201_P	10/31/14 14:45	CBW	TAL SPK
Total	Analysis	EPA 8260C		1.00	14J0201	10/31/14 20:02	CBW	TAL SPK
Total	Prep	GC/MS Volatiles	RE1	1.00	14J0201_P	10/31/14 14:45	CBW	TAL SPK
Total	Analysis	EPA 8260C	RE1	10.0	14J0201	11/03/14 10:34	CBW	TAL SPK
Total/NA	Prep	3510C			174455	10/31/14 11:06	WJR	TAL SEA
Total/NA	Analysis	AK102 & 103		1	174580	11/03/14 13:45	JJP	TAL SEA

Client Sample ID: 17678-MW12

Date Collected: 10/25/14 13:49

Date Received: 10/27/14 15:22

Lab Sample ID: 230-361-30

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total	Prep	GC/MS Volatiles		1.00	14J0201_P	10/31/14 14:45	CBW	TAL SPK
Total	Analysis	EPA 8260C		1.00	14J0201	10/31/14 20:25	CBW	TAL SPK
Total	Prep	GC/MS Volatiles	RE1	1.00	14J0201_P	10/31/14 14:45	CBW	TAL SPK
Total	Analysis	EPA 8260C	RE1	10.0	14J0201	11/03/14 10:56	CBW	TAL SPK
Total/NA	Prep	3510C			174455	10/31/14 11:06	WJR	TAL SEA

TestAmerica Anchorage

Lab Chronicle

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Client Sample ID: 17678-MW12

Date Collected: 10/25/14 13:49

Date Received: 10/27/14 15:22

Lab Sample ID: 230-361-30

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	AK102 & 103		1	174580	11/03/14 14:03	JJP	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

TAL SPK = TestAmerica Spokane, 11922 East 1st. Avenue, Spokane, WA 99206, TEL (509)924-9200

Certification Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Laboratory: TestAmerica Anchorage

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

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska	State Program	10	AK00975	06-30-15
Alaska (UST)	State Program	10	UST-067	06-16-15

Laboratory: TestAmerica Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska (UST)	State Program	10	UST-022	03-04-15

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
AK102 & 103	3510C	Water	RRO (nC25-nC36)

Laboratory: TestAmerica Spokane

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

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska (UST)	State Program	10	UST-071	12-07-14
Washington	State Program	10	C569	01-06-15

Method Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Method	Method Description	Protocol	Laboratory
EPA 8260C	Volatile Organic Compounds by EPA Method 8260C		TAL SPK
EPA 8260C	Gasoline Hydrocarbons (n-Hexane to <n-Decane) by AK101		TAL SPK
AK102/103	Diesel Hydrocarbons (C10-C25) and Heavy Oil (C25-C36) by AK102 and AK103		TAL SPK
AK102 & 103	Alaska - Diesel Range Organics & Residual Range Organics (GC)	ADEC	TAL SEA
TA SOP	Conventional Chemistry Parameters by APHA/EPA Methods		TAL SPK

Protocol References:

ADEC = Alaska Department of Environmental Conservation

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

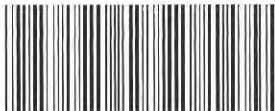
TAL SPK = TestAmerica Spokane, 11922 East 1st. Avenue, Spokane, WA 99206, TEL (509)924-9200

Sample Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678 Southcentral Tesoro

TestAmerica Job ID: 230-361-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
230-361-1	17678-B01-04	Solid	10/20/14 14:00	10/27/14 15:22
230-361-2	17678-B08-03B	Solid	10/21/14 17:50	10/27/14 15:22
230-361-3	17678-B08-06	Solid	10/21/14 18:17	10/27/14 15:22
230-361-4	17678-B08-08	Solid	10/21/14 18:35	10/27/14 15:22
230-361-5	17678-B07-03B	Solid	10/21/14 15:00	10/27/14 15:22
230-361-6	17678-B07-06	Solid	10/21/14 15:50	10/27/14 15:22
230-361-7	17678-B07-08	Solid	10/21/14 16:27	10/27/14 15:22
230-361-8	17678-B02R-02	Solid	10/21/14 10:15	10/27/14 15:22
230-361-9	17678-B02R-05	Solid	10/21/14 13:05	10/27/14 15:22
230-361-10	17678-B02R-06	Solid	10/21/14 13:15	10/27/14 15:22
230-361-11	17678-B09-05	Solid	10/23/14 17:55	10/27/14 15:22
230-361-12	17678-B09-07	Solid	10/23/14 18:15	10/27/14 15:22
230-361-13	17678-B03-04	Solid	10/23/14 09:15	10/27/14 15:22
230-361-14	17678-B04-04	Solid	10/23/14 13:45	10/27/14 15:22
230-361-15	17678-B04-06	Solid	10/23/14 12:45	10/27/14 15:22
230-361-16	17678-B10-05	Solid	10/22/14 15:30	10/27/14 15:22
230-361-17	17678-B10-06	Solid	10/22/14 15:45	10/27/14 15:22
230-361-18	17678-B06-06	Solid	10/22/14 12:45	10/27/14 15:22
230-361-19	17678-B06-04	Solid	10/22/14 12:10	10/27/14 15:22
230-361-20	17678-B06-04D	Solid	10/22/14 12:00	10/27/14 15:22
230-361-21	17678-B05-05	Solid	10/22/14 09:20	10/27/14 15:22
230-361-22	17678-B05-07	Solid	10/22/14 09:45	10/27/14 15:22
230-361-23	17678-B05-06	Solid	10/22/14 09:30	10/27/14 15:22
230-361-24	17678-TB1	Solid	10/20/14 00:00	10/27/14 15:22
230-361-25	17678-TB2	Solid	10/20/14 00:00	10/27/14 15:22
230-361-26	17678-TB3	Solid	10/20/14 00:00	10/27/14 15:22
230-361-27	17678-TB4	Water	10/20/14 00:00	10/27/14 15:22
230-361-28	17678-MW1	Water	10/25/14 17:18	10/27/14 15:22
230-361-29	17678-MW2	Water	10/25/14 13:54	10/27/14 15:22
230-361-30	17678-MW12	Water	10/25/14 13:49	10/27/14 15:22



230-361 Chain of Custody

230-361

SHANNON & WILSON, INC.

Geotechnical and Environmental Consultants

CHAIN-OF-CU

400 N. 34th Street, Suite 100
Seattle, WA 98103
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St. Louis, MO 63146-3564
(314) 699-9660

303 Wellsian Way
Richland, WA 99352
(509) 946-6309

2355 Hill Road
Fairbanks, AK 99709
(907) 479-0600

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

2255 S.W. Canyon Road
Portland, OR 97201-2498
(503) 223-6147

1200 17th Street, Suite 1024
Denver, Co 80202
(303) 825-3800

Page 1 of 3
Laboratory Test America
Attn: Steve

Analysis Parameters/Sample Container Description

(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	DRD/RRO	AK 102/1103	GRD/Limited	AK 104/621008	associated w/ TBI	Old NeOH	Hold	double NeOH	Total Number of Containers	Remarks/Matrix
17678-B01-04		1400	10/20/14	X	X	X	X	X				X	2		Soil
-B08-03B		1750	10/21/14												
-B08-00		1817													
-B08-08		1835													
-B07-03B		1500													
-B07-06		1550													
-B07-08		1627													
-B02R-02		1015													
-B02R-05		1305													
-B02R-06		1315													Limited DRD/RRO volume
															Soil

Project Information	Sample Receipt
Project Number: <u>32-1-17678</u>	Total Number of Containers
Project Name: <u>Sacramento Feas</u>	COC Seals/Intact? Y/N/NA
Contact: <u>SIM/TAL</u>	Received Good Cond./Cold
Ongoing Project? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Delivery Method:
Sampler: <u>TAL</u>	(attach shipping bill, if any)

Instructions
Requested Turnaround Time: <u>Standard</u>
Special Instructions: <u>* Limited VOCs = BTEX, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene</u>

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

Relinquished By: 1.	Relinquished By: 2.	Relinquished By: 3.
Signature: <u>TAL</u> Time: <u>1522</u>	Signature: _____ Time: _____	Signature: _____ Time: _____
Printed Name: <u>Trevelyn Lash</u> Date: <u>10/27/14</u>	Printed Name: _____ Date: _____	Printed Name: _____ Date: _____
Company: <u>SWI</u>	Company: _____	Company: _____
Received By: 1.	Received By: 2.	Received By: 3.
Signature: <u>ATKINS</u> Time: <u>1522</u>	Signature: _____ Time: _____	Signature: _____ Time: _____
Printed Name: <u>ALY HOO</u> Date: <u>10/27/14</u>	Printed Name: _____ Date: _____	Printed Name: _____ Date: _____
Company: <u>TA-AK</u>	Company: _____	Company: _____

0.6

No. 30451



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2255 S.W. Canyon Road
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2043 Westport Center Drive
St. Louis, MO 63146-3564
(314) 699-9660

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Anchorage, AK 99518
(907) 561-2120

1200 17th Street, Suite 1024
Denver, Co 80202
(303) 825-3800

303 Wellsian Way
Richland, WA 99352
(509) 946-6309

CHAIN-OF-CUSTODY RECORD

Laboratory Test Page 2 of 3
Attn: Steve America

Analysis Parameters/Sample Container Description
(include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	DRG / RPO	GRG / LRG	GRG / LRG	associated w/ TB2	associated w/ TB3	old MeOH	new MeOH	Total Number of Containers	Remarks/Matrix	
17078-B09-05		1755	10/23/14	X	X	X	X				X		2	Soil	11
- B09-07		1815	↓				X								12
- B03-04		1815	↓				X								13
- B04-04		1815	↓				X								14
- B04-06		1245	↓				X								15
- B10-05		1530	10/22/14						X	X	X				16
- B10-06		1545	↓						X	↓					17
- B06-06		1245	↓						X	↓					18
- B06-04		1210	↓						X	↓					19
✓ - B06-040		1200	↓	↓	↓	↓			X	↓			↓		20

Project Information		Sample Receipt	
Project Number: <u>32-1-17678</u>	Total Number of Containers		
Project Name: <u>Southcentral Texas</u>	COC Seals/Intact? Y/N/NA		
Contact: <u>Stacy KRAL</u>	Received Good Cond./Cold		
Ongoing Project? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Delivery Method:		
Sampler: <u>TAL</u>	(attach shipping bill, if any)		

Instructions	
Requested Turnaround Time: <u>Standard</u>	
Special Instructions: <u>* Limited VOCs: BTEX, 1,2,4-trimethyl-benzene, 1,3,5-trimethylbenzene</u>	
Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report Yellow - w/shipment - for consignee files Pink - Shannon & Wilson - Job File	

Relinquished By: 1.		Relinquished By: 2.		Relinquished By: 3.	
Signature: <u>[Signature]</u>	Time: <u>1522</u>	Signature: _____	Time: _____	Signature: _____	Time: _____
Printed Name: <u>Travelin Lash</u>	Date: <u>10/27/14</u>	Printed Name: _____	Date: _____	Printed Name: _____	Date: _____
Company: <u>SLT</u>		Company: _____		Company: _____	

Received By: 1.		Received By: 2.		Received By: 3.	
Signature: <u>[Signature]</u>	Time: <u>1522</u>	Signature: _____	Time: _____	Signature: _____	Time: _____
Printed Name: <u>Aly Piny</u>	Date: <u>10/27/14</u>	Printed Name: _____	Date: _____	Printed Name: _____	Date: _____
Company: <u>TA-AK</u>		Company: _____		Company: _____	



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CHAIN-OF-CUSTODY RECORD

Page 3 of 3

Laboratory Test America
Attn: Steve

Analysis Parameters/Sample Container Description (include preservative if used)

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	DR0/PR0	AN02/103	GR0/UN03	AK02/UN03	associated w/ TB3	associated w/ TB4	old MW4	Hold	Total Number of Containers	Remarks/Matrix
17678-BOS-05		920	10/22/14		X	X	X	X	X	X	X			2	Soil 21
-BOS-07		945	↓			X	X	X	X	X	X			2	Soil 22
-BOS-06		930	↓			X	X	X	X	X	X	X		2	Soil, DBI MeOH 23
-TB1		-	-											1	Soil TB 24
-TB2		-	-											1	↓ 25
-TB3		-	-											1	↓ 26
-TB4		-	-											3	Water TB 27
-MW1		1718	10/25/14			X				X				8	Water 28
-MW2		1354	↓			X								8	↓ 29
↓ -MW2		1349	↓			X								8	↓ 30

Project Information		Sample Receipt		Relinquished By: 1.		Relinquished By: 2.		Relinquished By: 3.	
Project Number: <u>32-1-17678</u>		Total Number of Containers		Signature: <u>Thi</u> Time: <u>1522</u>		Signature: _____ Time: _____		Signature: _____ Time: _____	
Project Name: <u>Soil Remediation</u>		COC Seals/Intact? Y/N/NA		Printed Name: <u>Trevelyn Lough</u> Date: <u>10/27/14</u>		Printed Name: _____ Date: _____		Printed Name: _____ Date: _____	
Contact: <u>TAL/SIM</u>		Received Good Cond./Cold		Company: <u>SWC</u>		Company: _____		Company: _____	
Ongoing Project? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		Delivery Method:							
Sampler: <u>TAL</u>		(attach shipping bill, if any)							
Instructions				Received By: 1.		Received By: 2.		Received By: 3.	
Requested Turnaround Time: <u>Standard</u>				Signature: <u>Ady</u> Time: <u>1522</u>		Signature: _____ Time: _____		Signature: _____ Time: _____	
Special Instructions: <u>Limited Vols: BTEX, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene</u>				Printed Name: <u>Ady</u> Date: <u>10/27/14</u>		Printed Name: _____ Date: _____		Printed Name: _____ Date: _____	
Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report Yellow - w/shipment - for consignee files Pink - Shannon & Wilson - Job File				Company: <u>TA-AK</u>		Company: _____		Company: _____	

Login Sample Receipt Checklist

Client: Shannon & Wilson

Job Number: 230-361-1

Login Number: 361

List Source: TestAmerica Anchorage

List Number: 1

Creator: Pilch, Andrew C

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.6 C and 1.2 C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Shannon & Wilson

Job Number: 230-361-1

Login Number: 361

List Source: TestAmerica Seattle

List Number: 2

List Creation: 10/30/14 06:20 PM

Creator: Abello, Andrea N

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	IR#1 = 2.7 / 4.3
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	False	COC not relinquished.
Is the Field Sampler's name present on COC?	N/A	Received project as a subcontract.
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

LABORATORY DATA REVIEW CHECKLIST

CS Report Name: **Date:** November 2014

Laboratory Report Date: November 10, 2014

Consultant Firm: Shannon & Wilson, Inc.

Completed by: Trevelyn Lough

Title: Geologist

Laboratory Name: Test America Laboratories, Inc.

Work Order Number: 230-361-1

ADEC File Number: 2314.26.031

(NOTE: NA = not applicable; Text in *italics* added by Shannon & Wilson, Inc.)

1. Laboratory

- a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses? **Yes** / No / NA (Please explain.)
Comments: *TestAmerica Spokane performed all submitted sample analyses, except DRO and RRO. TestAmerica Seattle performed DRO analyses by Alaska Method AK102 and RRO analyses by Alaska Method AK103.*
- b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS-approved?
Yes / No **NA**
Comments: *Samples were not transferred to another laboratory.*

2. Chain of Custody (COC)

- a. COC information completed, signed, and dated (including released/received by)?
Yes / No / NA (Please explain.)
Comments:
- b. Correct analyses requested? **Yes** / No / NA (Please explain.)
Comments:

3. Laboratory Sample Receipt Documentation

- a. Sample/cooler temperature documented and within range at receipt ($4^{\circ} \pm 2^{\circ}$ C)?
Yes / No / NA (Please explain.)
Comments: *The temperature blanks measured 0.6° and 1.2° Celsius upon submittal to the TestAmerica sample-receiving facility in Anchorage and 2.7° and 4.3° Celsius upon receipt at the TestAmerica laboratory in Seattle. The temperature blank measured 4.3° Celsius upon receipt at the TestAmerica laboratory in Spokane.*

- b. Sample preservation acceptable - acidified waters, Methanol-preserved VOC soil (GRO, BTEX, VOCs, etc.)? **Yes** / No / NA (Please explain.)

Comments: *TestAmerica specifies on their case narrative that samples were properly preserved on their sample-receipt checklists.*

- c. Sample condition documented - broken, leaking (soil MeOH), zero headspace (VOC vials)? **Yes** / No / NA (Please explain.)

Comments: *TestAmerica specifies on their case narrative that samples were received in good condition on their sample-receipt checklists.*

- d. If there were any discrepancies, were they documented (e.g., incorrect sample containers/preservation, sample temperatures outside range, insufficient sample size, missing samples)? Yes / No **NA** (Please explain.)

Comments: *No discrepancies documented.*

- e. Data quality or usability affected? Yes / No **NA** (Please Explain.)

Comments: *In the absence of ice, a temperature less than $\leq 6^{\circ}$ is acceptable, as specified in chapter 4 of the USEPA 2007 SW-846 document. TestAmerica did not note the presence of ice in sample jars.*

4. Case Narrative

- a. Present and understandable? **Yes** / No / NA (Please explain.)

Comments:

- b. Discrepancies, errors or QC failures noted by the lab? **Yes** / No / NA (Please explain.)

Comments: *TestAmerica noted the following discrepancies or QC failures:*

- *No additional analytical or quality issues were noted, other than those described in the Definitions/Glossary on page 3 of the report.*

- c. Were corrective actions documented? Yes / **No** / NA (Please explain.)

Comments: *No corrective actions were documented.*

- d. What is the effect on data quality/usability, according to the case narrative?

Comments: *The case narrative does not comment on the data quality/usability.*

5. Sample Results

- a. Correct analyses performed/reported as requested on COC? **Yes** / No / NA (Please explain.)

Comments:

- b. All applicable holding times met? Yes **No** / NA (Please explain.)

Comments: *Samples 17686-B07-08, 17686-B08-08, and 17686-B02R-06 were submitted on hold pending results of other samples collected from their respective borings. After*

initial results were received, the three samples were run outside of hold time. These samples are considered biased low estimates and are flagged “J-” in Table 3.

- c. All soils reported on a dry-weight basis? **Yes** / No / NA (Please explain.)

Comments:

- d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project? Yes **No** NA (Please explain.)

Comments: *Benzene reporting limits and reporting limits exceed the applicable cleanup level for non-detect results in Samples 17678-B07-03B and 17678-B10-05; therefore, it is not possible to assess whether benzene exists above the ADEC cleanup level, but below the limit of detection in these samples or not. Other reporting limits are less than corresponding cleanup levels where applicable (for non detect results).*

- e. Data quality or usability affected? (Please explain.) **Yes** / No / NA (Please explain.)

Comments: *See above.*

6. QC Samples

a. Method Blank

- i. One method blank reported per matrix, analysis, and 20 samples?

Yes / No / NA (Please explain.)

Comments:

- ii. All method blank results less than LOQ? **Yes** / No / NA (Please explain.)

Comments: *However, GRO was detected at concentrations below the reporting limit in three method blanks.*

- iii. If above LOQ, what samples are affected?

Comments: *Soil Trip Blanks 17678-TB1, 17678-TB2, and 17678-TB3 are associated with the method blank detection of 2.21 J milligrams per kilogram (mg/kg). Other project samples are associated with the method blank detection of 0.517 J mg/kg, except Samples 17686-B07-08, 17686-B08-08, and 17686-B02R-06. These three samples are associated with the method blank detection of 1.08J mg/kg.*

The samples associated with the method blank detection are “B” flagged when the reported sample concentration is within 10x the reported method blank concentration. If the sample is reported at levels less than the reporting limit, the sample concentration is reported as non-detect at the reporting limit. If the reported sample concentration is greater than the reporting limit and less than 5x the method blank concentration, the sample concentration is reported as non-detect at the detected sample concentration. If the sample concentration is greater than 5x the method blank concentration and less than or equal to 10x the method blank concentration, the sample concentration is reported at the detected sample concentration.

- iv. Do the affected sample(s) have data flags? **Yes** / No / NA
Comments: *The affected samples are "B" flagged on Table 3.*

If so, are the data flags clearly defined? **Yes** / No / NA
Comments: *See above.*

- v. Data quality or usability affected? (Please explain.) **Yes** / No / NA
Comments: *See above.*

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

- i. Organics - One LCS/LCSD reported per matrix, analysis, and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846) **Yes** / No / NA (Please explain.)
Comments: *One LCS/LCSD pair reported per analysis and 20 samples for each analyte.*

- ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples? Yes / No / **NA** (Please explain.)
Comments: *Metals/inorganic analyses not requested.*

- iii. Accuracy – All percent recoveries (%R) reported *and* within method or laboratory limits? And project specified DQOs, if applicable. (AK petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages) **Yes** / No / NA (Please explain.)
Comments:

Precision – All relative percent differences (RPDs) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages) **Yes** / No / NA (Please explain.)
Comments:

- iv. If %R or RPD is outside of acceptable limits, what samples are affected? **NA**
Comments: *See above.*

- v. Do the affected samples(s) have data flags? Yes / No / **NA**
Comments: *See above.*

If so, are the data flags clearly defined? Yes / No / **NA**
Comments: *See above.*

- vi. Data quality or usability affected? Explain. **NA**
Comments: *See above.*

Surrogates - Organics Only

- i. Are surrogate recoveries reported for organic analyses, field, QC, and laboratory samples? **Yes** / No / NA (Please explain.)

Comments:

- ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages) Yes / **No** / NA (Please explain.)

Comments: *Recovery of GRO by AK101 surrogate BFB and 1,2,4-trimethylbenzene & 1,3,5-trimethylbenzene by EPA 8260B surrogate BFB in Project Sample 17678-B08-03B exceed acceptable QC criteria due to matrix interference. Recovery of DRO by AK 102 surrogate o-terphenyl in Project Sample 17678-B10-05 exceeds acceptable QC criteria due to matrix interference. Recovery of DRO by AK 102 surrogate o-terphenyl in Project Samples 17678-B07-03B, 17678-B06-04 and 17678-B06-04D do not meet QC criteria due to sample dilution.*

- iii. Do the sample results with failed surrogate recoveries have data flags? **Yes** / No / NA (Please explain.)

Comments: *Results associated with the elevated surrogate recoveries due to matrix interference or sample dilution are considered bias-high estimates, flagged “J+” in Table 2 of the Report. O-terphenyl recovery in blanks and LCS/LCSDs associated with the project samples with low o-terphenyl recovery failures due to dilution meet QC criteria; therefore, data quality and usability are unaffected and data flags are not required.*

If so, are the data flags clearly defined? **Yes** / No / NA

Comments: *See above.*

- iv. Data quality or usability affected? Explain. **Yes** / No / NA

Comments: *See above.*

c. Trip Blank - Volatile analyses only (GRO, BTEX, VOCs, etc.) Water

- i. One trip blank reported per matrix, analysis and cooler? **Yes** / No / NA (Please explain.)

Comments:

- ii. Is the cooler used to transport the trip blank and volatile samples clearly indicated on the COC? **Yes** / No / NA (Please explain if NA or no.)

Comments:

- iii. All results less than LOQ? **Yes** / No / NA (Please explain.)

Comments: *However, the lab reports concentrations of GRO in soil trip blanks 17678-TB1, 17678-TB2, and 17678-TB3. These detections are within 10 times the*

amount found in an associated method blank and are considered non-detect at the reporting limit. See Section 6.a. for details. Project samples are unaffected.

Toluene was also detected below the reporting limit in the water trip blank. All water samples are associated with this trip blank.

iv. If above LOQ, what samples are affected?

Comments: The samples associated with the water trip blank are "B" flagged when the reported sample concentration detected within 10x the reported trip blank concentration. If the sample is reported at levels less than the reporting limit, the sample concentration is reported as non-detect at the reporting limit. If the reported sample concentration is greater than the reporting limit and less than 5x the trip blank concentration, the sample concentration is reported as non-detect at the detected sample concentration. If the sample concentration is greater than 5x the trip blank concentration and less than or equal to 10x the trip blank concentration, the sample concentration is reported at the detected sample concentration.

v. Data quality or usability affected? Yes / No / NA (Please explain.)

Comments: The affected samples are "B" flagged on Table 4.

d. Field Duplicate

i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes No / NA (Please explain.)

Comments: One soil field duplicate (sample set 17678-B06-04/17678-B06-04D) and one water field duplicate (sample set 17678-MW2/17678-MW12) were submitted with this work order. This results in a field duplicate collection frequency of 1 per 18 soil samples and 1 per two water samples. Collection of additional soil field duplicates was outside the scope of this project.

ii. Were the field duplicates submitted blind to the lab? Yes / No / NA (Please explain.)

Comments:

iii. Precision – All relative percent differences (RPDs) less than specified DQOs?

(Recommended: 30% for water, 50% for soil) Yes No / NA (Please explain.)

Comments: The RPD for GRO was 63% and the RPD for benzene was 55% in the soil duplicate set. Other RPDs, where calculable (results detected above the reporting limit), were less than the recommended DQO of 50% for soil and 30% for water.

iv. Data quality or usability affected? Explain. Yes / No / NA (Please explain.)

Comments: GRO and benzene results in the soil field-duplicate pair are within a factor of 2, and both results are either above or below clean up levels; therefore, data usability is unaffected.

- e. **Decontamination or Equipment Blank** (if not applicable, a comment stating why must be entered below)

Yes / **No** / NA (Please explain.) *Collecting and submitting a decontamination or equipment blank was not included in the ADEC's project scope.*

- i. All results less than LOQ? Yes / No / **NA** (Please explain.)
Comments: *See above.*

- ii. If results are above LOQ, what samples are affected? **NA**
Comments: *See above.*

- iii. Data quality or usability affected? Explain. **NA**
Comments: *See above.*

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab-specific, etc.)

- a. Are they defined and appropriate? **Yes** / No / NA
Comments: *Laboratory-applied data flags are defined on page 3 of the laboratory report.*

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Anchorage

2000 West International Airport Road

Suite A10

Anchorage, AK 99502-1119

Tel: (907)563-9200

TestAmerica Job ID: 230-420-1

TestAmerica Sample Delivery Group: Homer Tesoro

Client Project/Site: 32-1-17678

Revision: 1

For:

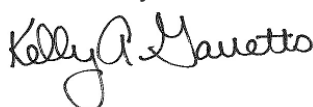
Shannon & Wilson

5430 Fairbanks Street

Suite 3

Anchorage, Alaska 99518-1263

Attn: Shayla Marshall



Authorized for release by:

2/9/2015 11:48:28 AM

Kelly Garretts, Project Manager II

(253)248-4961

kelly.garretts@testamericainc.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.



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Definitions/Glossary

Client: Shannon & Wilson
Project/Site: 32-1-17678

TestAmerica Job ID: 230-420-1
SDG: Homer Tesoro

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
B	Compound was found in the blank and sample.

GC Semi VOA

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

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

Case Narrative

Client: Shannon & Wilson
Project/Site: 32-1-17678

TestAmerica Job ID: 230-420-1
SDG: Homer Tesoro

Job ID: 230-420-1

Laboratory: TestAmerica Anchorage

Narrative

Job Narrative 230-420-1

Comments

No additional comments.

Receipt

The samples were received on 1/19/2015 1:45 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.8° C.

Except:

TB sample had no time on COC logged in at 00:00 on day sampled by default.

GC/MS VOA

Method AK101: Surrogate 4-Bromofluorobenzene recovery for the following samples was outside the upper control limit: (LCS 230-1602/1005), (LCSD 230-1602/6), (MB 230-1602/7). The method blank was non-detect and the data not impacted. The LCS and LCSD were run by MS and have 3 surrogates, two of which were within QC limits. Both the LCS and LCSD recovered at 125% for 4-BFB, the upper control limit being 120%.

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

GC Semi VOA

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

Organic Prep

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

Detection Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678

TestAmerica Job ID: 230-420-1
SDG: Homer Tesoro

Client Sample ID: 17678-MW1

Lab Sample ID: 230-420-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	0.24	J	0.50	0.064	ug/L	1		8260B	Total/NA
Diesel Range Organics (DRO) (C10-C25)	1.0	B	0.38	0.12	mg/L	1		AK102 & 103	Total/NA
Residual Range Organics (RRO) (C25-C36)	1.2	B	0.38	0.077	mg/L	1		AK102 & 103	Total/NA

Client Sample ID: 17678-MW2

Lab Sample ID: 230-420-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	370		5.0	0.64	ug/L	10		8260B	Total/NA
Ethylbenzene	4.1	J B	10	0.50	ug/L	10		8260B	Total/NA
Xylenes, Total	55		10	2.5	ug/L	10		8260B	Total/NA
m,p-Xylene	55		20	0.85	ug/L	10		8260B	Total/NA
1,2,4-Trimethylbenzene	92		10	0.57	ug/L	10		8260B	Total/NA
1,3,5-Trimethylbenzene	27		10	4.0	ug/L	10		8260B	Total/NA
Gasoline Range Organics (GRO) -C6-C10	780		500	85	ug/L	10		AK101	Total/NA
Diesel Range Organics (DRO) (C10-C25)	2.6	B	0.38	0.12	mg/L	1		AK102 & 103	Total/NA
Residual Range Organics (RRO) (C25-C36)	1.1	B	0.38	0.077	mg/L	1		AK102 & 103	Total/NA

Client Sample ID: 17678-MW11

Lab Sample ID: 230-420-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	0.32	J	0.50	0.064	ug/L	1		8260B	Total/NA
Diesel Range Organics (DRO) (C10-C25)	1.2	B	0.38	0.12	mg/L	1		AK102 & 103	Total/NA
Residual Range Organics (RRO) (C25-C36)	1.1	B	0.38	0.077	mg/L	1		AK102 & 103	Total/NA

Client Sample ID: 17678-MW12

Lab Sample ID: 230-420-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Ethylbenzene	3.7	B	1.0	0.050	ug/L	1		8260B	Total/NA
Toluene	0.72	J	1.0	0.057	ug/L	1		8260B	Total/NA
Xylenes, Total	52		1.0	0.25	ug/L	1		8260B	Total/NA
m,p-Xylene	52		2.0	0.085	ug/L	1		8260B	Total/NA
1,2,4-Trimethylbenzene	90		1.0	0.057	ug/L	1		8260B	Total/NA
1,3,5-Trimethylbenzene	27		1.0	0.40	ug/L	1		8260B	Total/NA
Benzene - DL	350		5.0	0.64	ug/L	10		8260B	Total/NA
Gasoline Range Organics (GRO) -C6-C10	1300		50	8.5	ug/L	1		AK101	Total/NA
Diesel Range Organics (DRO) (C10-C25)	2.7	B	0.38	0.12	mg/L	1		AK102 & 103	Total/NA
Residual Range Organics (RRO) (C25-C36)	1.2	B	0.38	0.077	mg/L	1		AK102 & 103	Total/NA

Client Sample ID: 17678-TB

Lab Sample ID: 230-420-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Benzene	0.19	J	0.50	0.064	ug/L	1		8260B	Total/NA
Ethylbenzene	0.11	J B	1.0	0.050	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678

TestAmerica Job ID: 230-420-1
SDG: Homer Tesoro

Client Sample ID: 17678-MW1

Lab Sample ID: 230-420-1

Date Collected: 01/16/15 13:30

Matrix: Water

Date Received: 01/19/15 13:45

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.24	J	0.50	0.064	ug/L			01/30/15 00:56	1
Ethylbenzene	ND		1.0	0.050	ug/L			01/30/15 00:56	1
Toluene	ND		1.0	0.057	ug/L			01/30/15 00:56	1
Xylenes, Total	ND		1.0	0.25	ug/L			01/30/15 00:56	1
o-Xylene	ND		1.0	0.051	ug/L			01/30/15 00:56	1
m,p-Xylene	ND		2.0	0.085	ug/L			01/30/15 00:56	1
1,2,4-Trimethylbenzene	ND		1.0	0.057	ug/L			01/30/15 00:56	1
1,3,5-Trimethylbenzene	ND		1.0	0.40	ug/L			01/30/15 00:56	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	129		57.8 - 139		01/30/15 00:56	1
Dibromofluoromethane (Surr)	89		35.8 - 145		01/30/15 00:56	1
Toluene-d8 (Surr)	107		38.6 - 147		01/30/15 00:56	1
Trifluorotoluene (Surr)	0.3				01/30/15 00:56	1

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO)	ND		50	8.5	ug/L			01/30/15 00:56	1
-C6-C10									

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	129		50 - 150		01/30/15 00:56	1
Dibromofluoromethane (Surr)	89		72.7 - 135		01/30/15 00:56	1
Toluene-d8 (Surr)	107		72.4 - 121		01/30/15 00:56	1
Trifluorotoluene (Surr)	0.3				01/30/15 00:56	1

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO)	1.0	B	0.38	0.12	mg/L		01/28/15 13:11	02/05/15 19:58	1
(C10-C25)									
Residual Range Organics (RRO)	1.2	B	0.38	0.077	mg/L		01/28/15 13:11	01/28/15 18:29	1
(C25-C36)									
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1-Chlorooctadecane	71		50 - 150				01/28/15 13:11	02/05/15 19:58	1
n-Triacontane (Surr)	77		50 - 150				01/28/15 13:11	01/28/15 18:29	1

Client Sample ID: 17678-MW2

Lab Sample ID: 230-420-2

Date Collected: 01/16/15 12:20

Matrix: Water

Date Received: 01/19/15 13:45

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	370		5.0	0.64	ug/L			01/30/15 01:59	10
Ethylbenzene	4.1	J B	10	0.50	ug/L			01/30/15 01:59	10
Toluene	ND		10	0.57	ug/L			01/30/15 01:59	10
Xylenes, Total	55		10	2.5	ug/L			01/30/15 01:59	10
o-Xylene	ND		10	0.51	ug/L			01/30/15 01:59	10
m,p-Xylene	55		20	0.85	ug/L			01/30/15 01:59	10
1,2,4-Trimethylbenzene	92		10	0.57	ug/L			01/30/15 01:59	10
1,3,5-Trimethylbenzene	27		10	4.0	ug/L			01/30/15 01:59	10

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678

TestAmerica Job ID: 230-420-1
SDG: Homer Tesoro

Client Sample ID: 17678-MW2

Lab Sample ID: 230-420-2

Date Collected: 01/16/15 12:20

Matrix: Water

Date Received: 01/19/15 13:45

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	129		57.8 - 139		01/30/15 01:59	10
Dibromofluoromethane (Surr)	88		35.8 - 145		01/30/15 01:59	10
Toluene-d8 (Surr)	108		38.6 - 147		01/30/15 01:59	10
Trifluorotoluene (Surr)	0				01/30/15 01:59	10

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO)	780		500	85	ug/L			01/30/15 01:59	10

-C6-C10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	129		50 - 150		01/30/15 01:59	10
Dibromofluoromethane (Surr)	88		72.7 - 135		01/30/15 01:59	10
Toluene-d8 (Surr)	108		72.4 - 121		01/30/15 01:59	10
Trifluorotoluene (Surr)	0				01/30/15 01:59	10

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO)	2.6	B	0.38	0.12	mg/L		01/28/15 13:11	02/05/15 21:00	1

Residual Range Organics (RRO)	1.1	B	0.38	0.077	mg/L		01/28/15 13:11	01/28/15 19:32	1
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(C25-C36)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1-Chlorooctadecane	74		50 - 150	01/28/15 13:11	02/05/15 21:00	1
n-Triacontane (Surr)	83		50 - 150	01/28/15 13:11	01/28/15 19:32	1

Client Sample ID: 17678-MW11

Lab Sample ID: 230-420-3

Date Collected: 01/16/15 13:45

Matrix: Water

Date Received: 01/19/15 13:45

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.32	J	0.50	0.064	ug/L			01/30/15 02:30	1

Ethylbenzene	ND		1.0	0.050	ug/L			01/30/15 02:30	1
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Toluene	ND		1.0	0.057	ug/L			01/30/15 02:30	1
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Xylenes, Total	ND		1.0	0.25	ug/L			01/30/15 02:30	1
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o-Xylene	ND		1.0	0.051	ug/L			01/30/15 02:30	1
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m,p-Xylene	ND		2.0	0.085	ug/L			01/30/15 02:30	1
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1,2,4-Trimethylbenzene	ND		1.0	0.057	ug/L			01/30/15 02:30	1
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1,3,5-Trimethylbenzene	ND		1.0	0.40	ug/L			01/30/15 02:30	1
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Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	124		57.8 - 139		01/30/15 02:30	1
Dibromofluoromethane (Surr)	86		35.8 - 145		01/30/15 02:30	1
Toluene-d8 (Surr)	102		38.6 - 147		01/30/15 02:30	1
Trifluorotoluene (Surr)	0				01/30/15 02:30	1

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO)	ND		50	8.5	ug/L			01/30/15 02:30	1

-C6-C10

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678

TestAmerica Job ID: 230-420-1
SDG: Homer Tesoro

Client Sample ID: 17678-MW11

Lab Sample ID: 230-420-3

Date Collected: 01/16/15 13:45

Matrix: Water

Date Received: 01/19/15 13:45

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	124		50 - 150		01/30/15 02:30	1
Dibromofluoromethane (Surr)	86		72.7 - 135		01/30/15 02:30	1
Toluene-d8 (Surr)	102		72.4 - 121		01/30/15 02:30	1
Trifluorotoluene (Surr)	0				01/30/15 02:30	1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)									
Diesel Range Organics (DRO)	1.2	B	0.38	0.12	mg/L		01/28/15 13:11	02/05/15 21:31	1
(C10-C25)									
Residual Range Organics (RRO)	1.1	B	0.38	0.077	mg/L		01/28/15 13:11	01/28/15 20:03	1
(C25-C36)									

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1-Chlorooctadecane	74		50 - 150	01/28/15 13:11	02/05/15 21:31	1
n-Triacontane (Surr)	81		50 - 150	01/28/15 13:11	01/28/15 20:03	1

Client Sample ID: 17678-MW12

Lab Sample ID: 230-420-4

Date Collected: 01/16/15 12:40

Matrix: Water

Date Received: 01/19/15 13:45

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	126		57.8 - 139		01/30/15 03:02	1
Dibromofluoromethane (Surr)	91		35.8 - 145		01/30/15 03:02	1
Toluene-d8 (Surr)	104		38.6 - 147		01/30/15 03:02	1
Trifluorotoluene (Surr)	0				01/30/15 03:02	1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Method: 8260B - Volatile Organic Compounds (GC/MS)									
Ethylbenzene	3.7	B	1.0	0.050	ug/L			01/30/15 03:02	1
Toluene	0.72	J	1.0	0.057	ug/L			01/30/15 03:02	1
Xylenes, Total	52		1.0	0.25	ug/L			01/30/15 03:02	1
o-Xylene	ND		1.0	0.051	ug/L			01/30/15 03:02	1
m,p-Xylene	52		2.0	0.085	ug/L			01/30/15 03:02	1
1,2,4-Trimethylbenzene	90		1.0	0.057	ug/L			01/30/15 03:02	1
1,3,5-Trimethylbenzene	27		1.0	0.40	ug/L			01/30/15 03:02	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	126		57.8 - 139		01/30/15 03:02	1
Dibromofluoromethane (Surr)	91		35.8 - 145		01/30/15 03:02	1
Toluene-d8 (Surr)	104		38.6 - 147		01/30/15 03:02	1
Trifluorotoluene (Surr)	0				01/30/15 03:02	1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Method: 8260B - Volatile Organic Compounds (GC/MS) - DL									
Benzene	350		5.0	0.64	ug/L			01/30/15 11:40	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	126		57.8 - 139		01/30/15 11:40	10
Dibromofluoromethane (Surr)	83		35.8 - 145		01/30/15 11:40	10
Toluene-d8 (Surr)	104		38.6 - 147		01/30/15 11:40	10
Trifluorotoluene (Surr)	0.7				01/30/15 11:40	10

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)									
Gasoline Range Organics (GRO)	1300		50	8.5	ug/L			01/30/15 03:02	1
-C6-C10									

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	126		50 - 150		01/30/15 03:02	1

TestAmerica Anchorage

Client Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678

TestAmerica Job ID: 230-420-1
SDG: Homer Tesoro

Client Sample ID: 17678-MW12

Lab Sample ID: 230-420-4

Date Collected: 01/16/15 12:40

Matrix: Water

Date Received: 01/19/15 13:45

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS) (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Dibromofluoromethane (Surr)	91		72.7 - 135		01/30/15 03:02	1
Toluene-d8 (Surr)	104		72.4 - 121		01/30/15 03:02	1
Trifluorotoluene (Surr)	0				01/30/15 03:02	1

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO)	2.7	B	0.38	0.12	mg/L		01/28/15 13:11	02/05/15 22:03	1
(C10-C25)									
Residual Range Organics (RRO)	1.2	B	0.38	0.077	mg/L		01/28/15 13:11	01/28/15 20:34	1
(C25-C36)									
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1-Chlorooctadecane	74		50 - 150				01/28/15 13:11	02/05/15 22:03	1
n-Triacontane (Surr)	83		50 - 150				01/28/15 13:11	01/28/15 20:34	1

Client Sample ID: 17678-TB

Lab Sample ID: 230-420-5

Date Collected: 01/16/15 00:00

Matrix: Water

Date Received: 01/19/15 13:45

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.19	J	0.50	0.064	ug/L			01/30/15 03:33	1
Ethylbenzene	0.11	J B	1.0	0.050	ug/L			01/30/15 03:33	1
Toluene	ND		1.0	0.057	ug/L			01/30/15 03:33	1
Xylenes, Total	ND		1.0	0.25	ug/L			01/30/15 03:33	1
o-Xylene	ND		1.0	0.051	ug/L			01/30/15 03:33	1
m,p-Xylene	ND		2.0	0.085	ug/L			01/30/15 03:33	1
1,2,4-Trimethylbenzene	ND		1.0	0.057	ug/L			01/30/15 03:33	1
1,3,5-Trimethylbenzene	ND		1.0	0.40	ug/L			01/30/15 03:33	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	125		57.8 - 139					01/30/15 03:33	1
Dibromofluoromethane (Surr)	90		35.8 - 145					01/30/15 03:33	1
Toluene-d8 (Surr)	105		38.6 - 147					01/30/15 03:33	1
Trifluorotoluene (Surr)	0							01/30/15 03:33	1

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO)	ND		50	8.5	ug/L			01/30/15 03:33	1
-C6-C10									
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	125		50 - 150					01/30/15 03:33	1
Dibromofluoromethane (Surr)	90		72.7 - 135					01/30/15 03:33	1
Toluene-d8 (Surr)	105		72.4 - 121					01/30/15 03:33	1
Trifluorotoluene (Surr)	0							01/30/15 03:33	1

TestAmerica Anchorage

Surrogate Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678

TestAmerica Job ID: 230-420-1
SDG: Homer Tesoro

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		BFB (57.8-139)	DBFM (35.8-145)	TOL (38.6-147)	TFT
230-420-1	17678-MW1	129	89	107	0.3
230-420-1 DU	17678-MW1	128	88	106	0.1
230-420-2	17678-MW2	129	88	108	0
230-420-3	17678-MW11	124	86	102	0
230-420-4	17678-MW12	126	91	104	0
230-420-4 - DL	17678-MW12	126	83	104	0.7
230-420-4 DU - DL	17678-MW12	128	86	106	0.2
230-420-5	17678-TB	125	90	105	0
LCS 230-1603/1003	Lab Control Sample	130	86	104	110
LCS 230-1605/1003	Lab Control Sample	130	78	104	107
LCSD 230-1603/4	Lab Control Sample Dup	131	86	107	109
LCSD 230-1605/4	Lab Control Sample Dup	135	83	108	109
MB 230-1603/7	Method Blank	127	88	106	0.7
MB 230-1605/5	Method Blank	125	86	106	0

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)
TFT = Trifluorotoluene (Surr)

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		BFB (50-150)	DBFM (72.7-135)	TOL (72.4-121)	TFT
230-420-1	17678-MW1	129	89	107	0.3
230-420-1 DU	17678-MW1	128	88	106	0.1
230-420-2	17678-MW2	129	88	108	0
230-420-3	17678-MW11	124	86	102	0
230-420-4	17678-MW12	126	91	104	0
230-420-5	17678-TB	125	90	105	0
LCS 230-1602/1005	Lab Control Sample	125	89	105	104
LCSD 230-1602/6	Lab Control Sample Dup	125	87	104	108
MB 230-1602/7	Method Blank	127	88	106	0.7

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)
TFT = Trifluorotoluene (Surr)

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		acontane (†) (50-150)			
230-420-1	17678-MW1	77			

TestAmerica Anchorage

Surrogate Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678

TestAmerica Job ID: 230-420-1
SDG: Homer Tesoro

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

(Continued)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)					
Lab Sample ID	Client Sample ID	n-Triacontane (%) (50-150)					
230-420-1 DU	17678-MW1	81					
230-420-2	17678-MW2	83					
230-420-3	17678-MW11	81					
230-420-4	17678-MW12	83					
LCS 230-1599/2-A	Lab Control Sample	84					
LCSD 230-1599/3-A	Lab Control Sample Dup	87					
MB 230-1599/1-A	Method Blank	93					
Surrogate Legend							
n-Triacontane (Surr) = n-Triacontane (Surr)							

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)					
Lab Sample ID	Client Sample ID	1-Chlorooctadecane (%) (50-150)					
230-420-1	17678-MW1	71					
230-420-1 DU	17678-MW1	74					
230-420-2	17678-MW2	74					
230-420-3	17678-MW11	74					
230-420-4	17678-MW12	74					
LCS 230-1599/2-A	Lab Control Sample	83					
LCSD 230-1599/3-A	Lab Control Sample Dup	79					
MB 230-1599/1-A	Method Blank	88					
Surrogate Legend							
1COD = 1-Chlorooctadecane							

QC Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678

TestAmerica Job ID: 230-420-1
SDG: Homer Tesoro

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 230-1603/7

Matrix: Water

Analysis Batch: 1603

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.50	0.064	ug/L			01/30/15 00:25	1
Ethylbenzene	0.0871	J	1.0	0.050	ug/L			01/30/15 00:25	1
Toluene	ND		1.0	0.057	ug/L			01/30/15 00:25	1
Xylenes, Total	ND		1.0	0.25	ug/L			01/30/15 00:25	1
o-Xylene	ND		1.0	0.051	ug/L			01/30/15 00:25	1
m,p-Xylene	ND		2.0	0.085	ug/L			01/30/15 00:25	1
1,2,4-Trimethylbenzene	ND		1.0	0.057	ug/L			01/30/15 00:25	1
1,3,5-Trimethylbenzene	ND		1.0	0.40	ug/L			01/30/15 00:25	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	127		57.8 - 139		01/30/15 00:25	1
Dibromofluoromethane (Surr)	88		35.8 - 145		01/30/15 00:25	1
Toluene-d8 (Surr)	106		38.6 - 147		01/30/15 00:25	1
Trifluorotoluene (Surr)	0.7				01/30/15 00:25	1

Lab Sample ID: LCS 230-1603/1003

Matrix: Water

Analysis Batch: 1603

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	20.0	17.7		ug/L		89	73.8 - 128
Ethylbenzene	20.0	22.3		ug/L		111	78 - 130
Toluene	20.0	21.1		ug/L		105	75.6 - 124
Xylenes, Total	60.0	65.3		ug/L		109	70 - 130
o-Xylene	20.0	22.1		ug/L		110	75.1 - 137
m,p-Xylene	40.0	43.2		ug/L		108	76 - 137
1,2,4-Trimethylbenzene	20.0	23.8		ug/L		119	71.1 - 141
1,3,5-Trimethylbenzene	20.0	23.3		ug/L		116	74.6 - 143

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	130		57.8 - 139
Dibromofluoromethane (Surr)	86		35.8 - 145
Toluene-d8 (Surr)	104		38.6 - 147
Trifluorotoluene (Surr)	110		

Lab Sample ID: LCSD 230-1603/4

Matrix: Water

Analysis Batch: 1603

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	20.0	17.4		ug/L		87	73.8 - 128	2	20
Ethylbenzene	20.0	22.1		ug/L		110	78 - 130	1	20
Toluene	20.0	21.2		ug/L		106	75.6 - 124	1	20
Xylenes, Total	60.0	65.3		ug/L		109	70 - 130	0	20
o-Xylene	20.0	21.9		ug/L		109	75.1 - 137	1	20
m,p-Xylene	40.0	43.4		ug/L		108	76 - 137	0	20
1,2,4-Trimethylbenzene	20.0	23.8		ug/L		119	71.1 - 141	0	20

TestAmerica Anchorage

QC Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678

TestAmerica Job ID: 230-420-1
SDG: Homer Tesoro

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

Lab Sample ID: LCSD 230-1603/4

Matrix: Water

Analysis Batch: 1603

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,3,5-Trimethylbenzene	20.0	23.0		ug/L		115	74.6 - 143	1	20
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
4-Bromofluorobenzene (Surr)	131		57.8 - 139						
Dibromofluoromethane (Surr)	86		35.8 - 145						
Toluene-d8 (Surr)	107		38.6 - 147						
Trifluorotoluene (Surr)	109								

Lab Sample ID: 230-420-1 DU

Matrix: Water

Analysis Batch: 1603

Client Sample ID: 17678-MW1

Prep Type: Total/NA

Analyte	Sample	Sample	DU		DU	Unit	D	RPD	Limit
	Result	Qualifier	Result	Qualifier					
Benzene	0.24	J	0.281	J		ug/L		16	20
Ethylbenzene	ND		0.186	J		ug/L		NC	20
Toluene	ND		ND			ug/L		NC	20
Xylenes, Total	ND		ND			ug/L		NC	20
o-Xylene	ND		ND			ug/L		NC	20
m,p-Xylene	ND		ND			ug/L		NC	20
1,2,4-Trimethylbenzene	ND		0.452	J		ug/L		NC	20
1,3,5-Trimethylbenzene	ND		ND			ug/L		NC	20
									</

Lab Sample ID: MB 230-1605/5

Matrix: Water

Analysis Batch: 1605

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.50	0.064	ug/L			01/30/15 12:43	1
Ethylbenzene	ND		1.0	0.050	ug/L			01/30/15 12:43	1
Toluene	ND		1.0	0.057	ug/L			01/30/15 12:43	1
Xylenes, Total	ND		1.0	0.25	ug/L			01/30/15 12:43	1
o-Xylene	ND		1.0	0.051	ug/L			01/30/15 12:43	1
m,p-Xylene	ND		2.0	0.085	ug/L			01/30/15 12:43	1
1,2,4-Trimethylbenzene	ND		1.0	0.057	ug/L			01/30/15 12:43	1
1,3,5-Trimethylbenzene	ND		1.0	0.40	ug/L			01/30/15 12:43	1
Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac			
4-Bromofluorobenzene (Surr)	125		57.8 - 139		01/30/15 12:43	1			
Dibromofluoromethane (Surr)	86		35.8 - 145		01/30/15 12:43	1			
Toluene-d8 (Surr)	106		38.6 - 147		01/30/15 12:43	1			
Trifluorotoluene (Surr)	0				01/30/15 12:43	1			

TestAmerica Anchorage

QC Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678

TestAmerica Job ID: 230-420-1
SDG: Homer Tesoro

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

Lab Sample ID: LCS 230-1605/1003

Matrix: Water

Analysis Batch: 1605

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	20.0	16.3		ug/L		81	73.8 - 128
Ethylbenzene	20.0	20.9		ug/L		104	78 - 130
Toluene	20.0	20.3		ug/L		101	75.6 - 124
Xylenes, Total	60.0	60.2		ug/L		100	70 - 130
o-Xylene	20.0	20.2		ug/L		101	75.1 - 137
m,p-Xylene	40.0	40.0		ug/L		100	76 - 137
1,2,4-Trimethylbenzene	20.0	22.3		ug/L		111	71.1 - 141
1,3,5-Trimethylbenzene	20.0	21.9		ug/L		109	74.6 - 143

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	130		57.8 - 139
Dibromofluoromethane (Surr)	78		35.8 - 145
Toluene-d8 (Surr)	104		38.6 - 147
Trifluorotoluene (Surr)	107		

Lab Sample ID: LCSD 230-1605/4

Matrix: Water

Analysis Batch: 1605

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	20.0	16.9		ug/L		85	73.8 - 128	4	20
Ethylbenzene	20.0	21.7		ug/L		108	78 - 130	4	20
Toluene	20.0	21.1		ug/L		106	75.6 - 124	4	20
Xylenes, Total	60.0	64.2		ug/L		107	70 - 130	6	20
o-Xylene	20.0	21.2		ug/L		106	75.1 - 137	5	20
m,p-Xylene	40.0	43.0		ug/L		107	76 - 137	7	20
1,2,4-Trimethylbenzene	20.0	23.6		ug/L		118	71.1 - 141	6	20
1,3,5-Trimethylbenzene	20.0	23.0		ug/L		115	74.6 - 143	5	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	135		57.8 - 139
Dibromofluoromethane (Surr)	83		35.8 - 145
Toluene-d8 (Surr)	108		38.6 - 147
Trifluorotoluene (Surr)	109		

Method: 8260B - Volatile Organic Compounds (GC/MS) - DL

Lab Sample ID: 230-420-4 DU

Matrix: Water

Analysis Batch: 1605

Client Sample ID: 17678-MW12

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Benzene - DL	350		358		ug/L		3	20
Ethylbenzene - DL	4.1	J	3.63	J	ug/L		13	20
Toluene - DL	ND		ND		ug/L		NC	20
Xylenes, Total - DL	50		52.3		ug/L		4	20
o-Xylene - DL	ND		ND		ug/L		NC	20

TestAmerica Anchorage

QC Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678

TestAmerica Job ID: 230-420-1
SDG: Homer Tesoro

Method: 8260B - Volatile Organic Compounds (GC/MS) - DL (Continued)

Lab Sample ID: 230-420-4 DU

Matrix: Water

Analysis Batch: 1605

Client Sample ID: 17678-MW12

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
m,p-Xylene - DL	50		52.3		ug/L		4	20
1,2,4-Trimethylbenzene - DL	83		85.9		ug/L		4	20
1,3,5-Trimethylbenzene - DL	26		25.4		ug/L		2	20
Surrogate	%Recovery	DU Qualifier	Limits					
4-Bromofluorobenzene (Surr) - DL	128		57.8 - 139					
Dibromofluoromethane (Surr) - DL	86		35.8 - 145					
Toluene-d8 (Surr) - DL	106		38.6 - 147					
Trifluorotoluene (Surr) - DL	0.2							

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS)

Lab Sample ID: MB 230-1602/7

Matrix: Water

Analysis Batch: 1602

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (GRO) -C6-C10	ND		50	8.5	ug/L			01/30/15 00:25	1
Surrogate	%Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	127		50 - 150					01/30/15 00:25	1
Dibromofluoromethane (Surr)	88		72.7 - 135					01/30/15 00:25	1
Toluene-d8 (Surr)	106		72.4 - 121					01/30/15 00:25	1
Trifluorotoluene (Surr)	0.7							01/30/15 00:25	1

Lab Sample ID: LCS 230-1602/1005

Matrix: Water

Analysis Batch: 1602

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Gasoline Range Organics (GRO) -C6-C10	500	455		ug/L		91	60 - 120
Surrogate	%Recovery	LCS Qualifier	Limits				
4-Bromofluorobenzene (Surr)	125		50 - 150				
Dibromofluoromethane (Surr)	89		72.7 - 135				
Toluene-d8 (Surr)	105		72.4 - 121				
Trifluorotoluene (Surr)	104						

QC Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678

TestAmerica Job ID: 230-420-1
SDG: Homer Tesoro

Method: AK101 - Alaska - Gasoline Range Organics (GC/MS) (Continued)

Lab Sample ID: LCSD 230-1602/6

Matrix: Water

Analysis Batch: 1602

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline Range Organics (GRO) -C6-C10	500	462		ug/L		92	60 - 120	2	20
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
4-Bromofluorobenzene (Surr)	125		50 - 150						
Dibromofluoromethane (Surr)	87		72.7 - 135						
Toluene-d8 (Surr)	104		72.4 - 121						
Trifluorotoluene (Surr)	108								

Lab Sample ID: 230-420-1 DU

Matrix: Water

Analysis Batch: 1602

Client Sample ID: 17678-MW1

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Gasoline Range Organics (GRO) -C6-C10	ND		ND		ug/L		NC	
Surrogate	DU %Recovery	DU Qualifier	Limits					
4-Bromofluorobenzene (Surr)	128		50 - 150					
Dibromofluoromethane (Surr)	88		72.7 - 135					
Toluene-d8 (Surr)	106		72.4 - 121					
Trifluorotoluene (Surr)	0.1							

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

Lab Sample ID: MB 230-1599/1-A

Matrix: Water

Analysis Batch: 1600

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 1599

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Residual Range Organics (RRO) (C25-C36)	0.102	J	0.50	0.10	mg/L		01/28/15 13:11	01/28/15 16:55	1
Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac			
n-Triacontane (Surr)	93		50 - 150	01/28/15 13:11	01/28/15 16:55	1			

Lab Sample ID: MB 230-1599/1-A

Matrix: Water

Analysis Batch: 1631

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 1599

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Diesel Range Organics (DRO) (C10-C25)	0.243	J	0.50	0.15	mg/L		01/28/15 13:11	02/05/15 18:24	1
Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac			
1-Chlorooctadecane	88		50 - 150	01/28/15 13:11	02/05/15 18:24	1			

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QC Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678

TestAmerica Job ID: 230-420-1
SDG: Homer Tesoro

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC)

(Continued)

Lab Sample ID: LCS 230-1599/2-A

Matrix: Water

Analysis Batch: 1600

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 1599

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Residual Range Organics (RRO) (C25-C36)	10.0	9.04		mg/L		90	60 - 120
Surrogate	%Recovery	LCS Qualifier	LCS	Limits			
n-Triacontane (Surr)	84			50 - 150			

Lab Sample ID: LCS 230-1599/2-A

Matrix: Water

Analysis Batch: 1631

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 1599

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Diesel Range Organics (DRO) (C10-C25)	10.0	10.6		mg/L		106	75 - 125
Surrogate	%Recovery	LCS Qualifier	LCS	Limits			
1-Chlorooctadecane	83			50 - 150			

Lab Sample ID: LCSD 230-1599/3-A

Matrix: Water

Analysis Batch: 1600

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 1599

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Residual Range Organics (RRO) (C25-C36)	10.0	9.44		mg/L		94	60 - 120	4	20
Surrogate	%Recovery	LCSD Qualifier	LCSD	Limits					
n-Triacontane (Surr)	87			50 - 150					

Lab Sample ID: LCSD 230-1599/3-A

Matrix: Water

Analysis Batch: 1631

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 1599

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Diesel Range Organics (DRO) (C10-C25)	10.0	9.64		mg/L		96	75 - 125	10	20
Surrogate	%Recovery	LCSD Qualifier	LCSD	Limits					
1-Chlorooctadecane	79			50 - 150					

Lab Sample ID: 230-420-1 DU

Matrix: Water

Analysis Batch: 1600

Client Sample ID: 17678-MW1

Prep Type: Total/NA

Prep Batch: 1599

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Residual Range Organics (RRO) (C25-C36)	1.2	B	1.25		mg/L		3	20

TestAmerica Anchorage

QC Sample Results

Client: Shannon & Wilson
Project/Site: 32-1-17678

TestAmerica Job ID: 230-420-1
SDG: Homer Tesoro

Method: AK102 & 103 - Alaska - Diesel Range Organics & Residual Range Organics (GC) (Continued)

Lab Sample ID: 230-420-1 DU
Matrix: Water
Analysis Batch: 1600

Client Sample ID: 17678-MW1
Prep Type: Total/NA
Prep Batch: 1599

	DU	DU	
Surrogate	%Recovery	Qualifier	Limits
n-Triacontane (Surr)	81		50 - 150

Lab Sample ID: 230-420-1 DU
Matrix: Water
Analysis Batch: 1631

Client Sample ID: 17678-MW1
Prep Type: Total/NA
Prep Batch: 1599

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Diesel Range Organics (DRO) (C10-C25)	1.0	B	1.21		mg/L		16	20

	DU	DU	
Surrogate	%Recovery	Qualifier	Limits
1-Chlorooctadecane	74		50 - 150

QC Association Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678

TestAmerica Job ID: 230-420-1
SDG: Homer Tesoro

GC/MS VOA

Analysis Batch: 1602

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
230-420-1	17678-MW1	Total/NA	Water	AK101	
230-420-1 DU	17678-MW1	Total/NA	Water	AK101	
230-420-2	17678-MW2	Total/NA	Water	AK101	
230-420-3	17678-MW11	Total/NA	Water	AK101	
230-420-4	17678-MW12	Total/NA	Water	AK101	
230-420-5	17678-TB	Total/NA	Water	AK101	
LCS 230-1602/1005	Lab Control Sample	Total/NA	Water	AK101	
LCSD 230-1602/6	Lab Control Sample Dup	Total/NA	Water	AK101	
MB 230-1602/7	Method Blank	Total/NA	Water	AK101	

Analysis Batch: 1603

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
230-420-1	17678-MW1	Total/NA	Water	8260B	
230-420-1 DU	17678-MW1	Total/NA	Water	8260B	
230-420-2	17678-MW2	Total/NA	Water	8260B	
230-420-3	17678-MW11	Total/NA	Water	8260B	
230-420-4	17678-MW12	Total/NA	Water	8260B	
230-420-5	17678-TB	Total/NA	Water	8260B	
LCS 230-1603/1003	Lab Control Sample	Total/NA	Water	8260B	
LCSD 230-1603/4	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 230-1603/7	Method Blank	Total/NA	Water	8260B	

Analysis Batch: 1605

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
230-420-4 - DL	17678-MW12	Total/NA	Water	8260B	
230-420-4 DU - DL	17678-MW12	Total/NA	Water	8260B	
LCS 230-1605/1003	Lab Control Sample	Total/NA	Water	8260B	
LCSD 230-1605/4	Lab Control Sample Dup	Total/NA	Water	8260B	
MB 230-1605/5	Method Blank	Total/NA	Water	8260B	

GC Semi VOA

Prep Batch: 1599

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
230-420-1	17678-MW1	Total/NA	Water	3510C	
230-420-1 DU	17678-MW1	Total/NA	Water	3510C	
230-420-2	17678-MW2	Total/NA	Water	3510C	
230-420-3	17678-MW11	Total/NA	Water	3510C	
230-420-4	17678-MW12	Total/NA	Water	3510C	
LCS 230-1599/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 230-1599/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	
MB 230-1599/1-A	Method Blank	Total/NA	Water	3510C	

Analysis Batch: 1600

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
230-420-1	17678-MW1	Total/NA	Water	AK102 & 103	1599
230-420-1 DU	17678-MW1	Total/NA	Water	AK102 & 103	1599
230-420-2	17678-MW2	Total/NA	Water	AK102 & 103	1599
230-420-3	17678-MW11	Total/NA	Water	AK102 & 103	1599
230-420-4	17678-MW12	Total/NA	Water	AK102 & 103	1599

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QC Association Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678

TestAmerica Job ID: 230-420-1
SDG: Homer Tesoro

GC Semi VOA (Continued)

Analysis Batch: 1600 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 230-1599/2-A	Lab Control Sample	Total/NA	Water	AK102 & 103	1599
LCSD 230-1599/3-A	Lab Control Sample Dup	Total/NA	Water	AK102 & 103	1599
MB 230-1599/1-A	Method Blank	Total/NA	Water	AK102 & 103	1599

Analysis Batch: 1631

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
230-420-1	17678-MW1	Total/NA	Water	AK102 & 103	1599
230-420-1 DU	17678-MW1	Total/NA	Water	AK102 & 103	1599
230-420-2	17678-MW2	Total/NA	Water	AK102 & 103	1599
230-420-3	17678-MW11	Total/NA	Water	AK102 & 103	1599
230-420-4	17678-MW12	Total/NA	Water	AK102 & 103	1599
LCS 230-1599/2-A	Lab Control Sample	Total/NA	Water	AK102 & 103	1599
LCSD 230-1599/3-A	Lab Control Sample Dup	Total/NA	Water	AK102 & 103	1599
MB 230-1599/1-A	Method Blank	Total/NA	Water	AK102 & 103	1599

Lab Chronicle

Client: Shannon & Wilson
Project/Site: 32-1-17678

TestAmerica Job ID: 230-420-1
SDG: Homer Tesoro

Client Sample ID: 17678-MW1

Date Collected: 01/16/15 13:30

Date Received: 01/19/15 13:45

Lab Sample ID: 230-420-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	1603	01/30/15 00:56	ASD	TAL ANC
Total/NA	Analysis	AK101		1	1602	01/30/15 00:56	ASD	TAL ANC
Total/NA	Prep	3510C			1599	01/28/15 13:11	ASD	TAL ANC
Total/NA	Analysis	AK102 & 103		1	1600	01/28/15 18:29	ASD	TAL ANC
Total/NA	Prep	3510C			1599	01/28/15 13:11	ASD	TAL ANC
Total/NA	Analysis	AK102 & 103		1	1631	02/05/15 19:58	ASD	TAL ANC

Client Sample ID: 17678-MW2

Date Collected: 01/16/15 12:20

Date Received: 01/19/15 13:45

Lab Sample ID: 230-420-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		10	1603	01/30/15 01:59	ASD	TAL ANC
Total/NA	Analysis	AK101		10	1602	01/30/15 01:59	ASD	TAL ANC
Total/NA	Prep	3510C			1599	01/28/15 13:11	ASD	TAL ANC
Total/NA	Analysis	AK102 & 103		1	1600	01/28/15 19:32	ASD	TAL ANC
Total/NA	Prep	3510C			1599	01/28/15 13:11	ASD	TAL ANC
Total/NA	Analysis	AK102 & 103		1	1631	02/05/15 21:00	ASD	TAL ANC

Client Sample ID: 17678-MW11

Date Collected: 01/16/15 13:45

Date Received: 01/19/15 13:45

Lab Sample ID: 230-420-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	1603	01/30/15 02:30	ASD	TAL ANC
Total/NA	Analysis	AK101		1	1602	01/30/15 02:30	ASD	TAL ANC
Total/NA	Prep	3510C			1599	01/28/15 13:11	ASD	TAL ANC
Total/NA	Analysis	AK102 & 103		1	1600	01/28/15 20:03	ASD	TAL ANC
Total/NA	Prep	3510C			1599	01/28/15 13:11	ASD	TAL ANC
Total/NA	Analysis	AK102 & 103		1	1631	02/05/15 21:31	ASD	TAL ANC

Client Sample ID: 17678-MW12

Date Collected: 01/16/15 12:40

Date Received: 01/19/15 13:45

Lab Sample ID: 230-420-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	1603	01/30/15 03:02	ASD	TAL ANC
Total/NA	Analysis	8260B	DL	10	1605	01/30/15 11:40	ASD	TAL ANC
Total/NA	Analysis	AK101		1	1602	01/30/15 03:02	ASD	TAL ANC
Total/NA	Prep	3510C			1599	01/28/15 13:11	ASD	TAL ANC
Total/NA	Analysis	AK102 & 103		1	1600	01/28/15 20:34	ASD	TAL ANC
Total/NA	Prep	3510C			1599	01/28/15 13:11	ASD	TAL ANC

TestAmerica Anchorage

Lab Chronicle

Client: Shannon & Wilson
Project/Site: 32-1-17678

TestAmerica Job ID: 230-420-1
SDG: Homer Tesoro

Client Sample ID: 17678-MW12

Date Collected: 01/16/15 12:40

Date Received: 01/19/15 13:45

Lab Sample ID: 230-420-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	AK102 & 103		1	1631	02/05/15 22:03	ASD	TAL ANC

Client Sample ID: 17678-TB

Date Collected: 01/16/15 00:00

Date Received: 01/19/15 13:45

Lab Sample ID: 230-420-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	1603	01/30/15 03:33	ASD	TAL ANC
Total/NA	Analysis	AK101		1	1602	01/30/15 03:33	ASD	TAL ANC

Laboratory References:

TAL ANC = TestAmerica Anchorage, 2000 West International Airport Road, Suite A10, Anchorage, AK 99502-1119, TEL (907)563-9200

Certification Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678

TestAmerica Job ID: 230-420-1
SDG: Homer Tesoro

Laboratory: TestAmerica Anchorage

Unless otherwise noted, all analytes for this laboratory were covered under each certification below.

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska (UST)	State Program	10	UST-067	06-16-15

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
8260B		Water	1,2,4-Trimethylbenzene
8260B		Water	1,3,5-Trimethylbenzene
8260B		Water	Benzene
8260B		Water	Ethylbenzene
8260B		Water	m,p-Xylene
8260B		Water	o-Xylene
8260B		Water	Toluene
8260B		Water	Xylenes, Total
AK102 & 103	3510C	Water	Residual Range Organics (RRO) (C25-C36)

Method Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678

TestAmerica Job ID: 230-420-1
SDG: Homer Tesoro

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL ANC
AK101	Alaska - Gasoline Range Organics (GC/MS)	ADEC	TAL ANC
AK102 & 103	Alaska - Diesel Range Organics & Residual Range Organics (GC)	ADEC	TAL ANC

Protocol References:

ADEC = Alaska Department of Environmental Conservation

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

Laboratory References:

TAL ANC = TestAmerica Anchorage, 2000 West International Airport Road, Suite A10, Anchorage, AK 99502-1119, TEL (907)563-9200

Sample Summary

Client: Shannon & Wilson
Project/Site: 32-1-17678

TestAmerica Job ID: 230-420-1
SDG: Homer Tesoro

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
230-420-1	17678-MW1	Water	01/16/15 13:30	01/19/15 13:45
230-420-2	17678-MW2	Water	01/16/15 12:20	01/19/15 13:45
230-420-3	17678-MW11	Water	01/16/15 13:45	01/19/15 13:45
230-420-4	17678-MW12	Water	01/16/15 12:40	01/19/15 13:45
230-420-5	17678-TB	Water	01/16/15 00:00	01/19/15 13:45

SHANNON & WILSON, INC.

Geotechnical and Environmental Consultants

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Fairbanks, AK 99709
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2043 Westport Center Drive
St. Louis, MO 63146-3564
(314) 699-9660

5430 Fairbanks Street, Suite 3
Anchorage, AK 99518
(907) 561-2120

1321 Bannock Street, Suite 200
Denver, CO 80204
(303) 825-3800

2705 Saint Andrews Loop, Suite A
Pasco, WA 99301-3378
(509) 946-6309

CHAIN-OF-CUSTODY RECORD

Laboratory
Attn: Steve

Test Area: Energy Page 1 of 1
Anchorage

Analysis Parameters/Sample Container Description
(include preservative if used)

230-420

Cooler lot 1

Sample Identity	Lab No.	Time	Date Sampled	Comp.	Grab	GRO-AK101	HCI	DRO/RO	AK102/103: HCI	Short list VOCs	HCI: EPA 8260	Total Number of Containers	Remarks/Matrix
17678-MW1		13:30	1/16/15	X	X	X	X	X	X	X	X	8	ground water
↓ - MW2		12:20	↓	↓	↓	X	X	X	X	X	X	8	↓
↓ - MW11		13:45	↓	↓	↓	X	X	X	X	X	X	8	only 1
↓ - MW12		12:40	↓	↓	↓	X	X	X	X	X	X	8	DRO/RO
-TB			↓	↓	↓	X	X	X	X	X	X	3	1/19/15 bottle for MW11 + MW12 only 3 ports for MW11 + MW12

Project Information Project Number: <u>32-1-17678</u> Project Name: <u>Homer Tesoro</u> Contact: <u>Judy Hepner</u> Ongoing Project? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Sampler: <u>JKH</u>	Sample Receipt Total Number of Containers: <u> </u> COC Seals/Intact? Y/N/NA: <u> </u> Received Good Cond./Cold: <u> </u> Delivery Method: <u> </u> (attach shipping bill, if any)	Relinquished By: 1. Signature: <u>Judy Hepner</u> Time: <u>17:20</u> Printed Name: <u>Judy Hepner</u> Date: <u>1/16/15</u> Company: <u>SWI</u>	Relinquished By: 2. Signature: <u>Randy Hessong</u> Time: <u>11:48</u> Printed Name: <u>Randy Hessong</u> Date: <u>1/19/15</u> Company: <u>SWI</u>	Relinquished By: 3. Signature: <u>Shayla Marshall</u> Time: <u>13:45</u> Printed Name: <u>Shayla Marshall</u> Date: <u>1/19/15</u> Company: <u>SWI</u>
Instructions Requested Turnaround Time: <u>Standard</u> Special Instructions: <u>Level II Deliverable Shortlist VOCs - BTEX, 1,2,4-Trimethylbenzene + 1,3,5-Trimethylbenzene</u>		Received By: 1. Signature: <u>Randy Hessong</u> Time: <u>17:20</u> Printed Name: <u>Randy Hessong</u> Date: <u>1/17/15</u> Company: <u>SWI</u>	Received By: 2. Signature: <u>Shayla Marshall</u> Time: <u>11:48</u> Printed Name: <u>Shayla Marshall</u> Date: <u>1/19/15</u> Company: <u>SWI</u>	Received By: 3. Signature: <u>Kelly Garrett</u> Time: <u>13:45</u> Printed Name: <u>Kelly Garrett</u> Date: <u>1/19/15</u> Company: <u>SWI</u>

Distribution: White - w/shipment - returned to Shannon & Wilson w/ laboratory report
Yellow - w/shipment - for consignee files
Pink - Shannon & Wilson - Job File

Login Sample Receipt Checklist

Client: Shannon & Wilson

Job Number: 230-420-1

SDG Number: Homer Tesoro

Login Number: 420

List Number: 1

Creator: Garretts, Kelly A

List Source: TestAmerica Anchorage

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	1.8
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	N/A	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	VOAs
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	N/A	
Residual Chlorine Checked.	N/A	

LABORATORY DATA REVIEW CHECKLIST

CS Report Name: **Date:** February 2015

Laboratory Report Date: February 6, 2015

Consultant Firm: Shannon & Wilson, Inc.

Completed by: Trevelyn Lough

Title: Geologist

Laboratory Name: TestAmerica Laboratories, Inc.

Work Order Number: 230-420-1

ADEC File Number: 2314.26.031

(NOTE: NA = not applicable; Text in *italics* added by Shannon & Wilson, Inc.)

1. Laboratory

- a. Did an ADEC CS approved laboratory receive and perform all of the submitted sample analyses? **Yes** / No / NA (Please explain.)

Comments: *TestAmerica Anchorage performed all submitted sample analyses.*

- b. If the samples were transferred to another "network" laboratory or sub-contracted to an alternate laboratory, was the laboratory performing the analyses ADEC CS-approved?

Yes / No / **NA**

Comments: *Samples were not transferred to another laboratory.*

2. Chain of Custody (COC)

- a. COC information completed, signed, and dated (including released/received by)?

Yes / No / NA (Please explain.)

Comments:

- b. Correct analyses requested? **Yes** / No / NA (Please explain.)

Comments:

3. Laboratory Sample Receipt Documentation

- a. Sample/cooler temperature documented and within range at receipt ($4^{\circ} \pm 2^{\circ}$ C)?

Yes / No / NA (Please explain.)

Comments: *The temperature blanks measured 1.8° Celsius upon submittal to the TestAmerica sample-receiving facility in Anchorage.*

- b. Sample preservation acceptable - acidified waters, Methanol-preserved VOC soil (GRO, BTEX, VOCs, etc.)? **Yes** / No / NA (Please explain.)

Comments: *TestAmerica specifies on their case narrative that samples were properly*

preserved on their sample-receipt checklists.

- c. Sample condition documented - broken, leaking (soil MeOH), zero headspace (VOC vials)? **Yes** / No / NA (Please explain.)

Comments: *TestAmerica specifies on their case narrative that samples were received in good condition on their sample-receipt checklists.*

- d. If there were any discrepancies, were they documented (e.g., incorrect sample containers/preservation, sample temperatures outside range, insufficient sample size, missing samples)? **Yes** / No / NA (Please explain.)

Comments: *The case narrative notes the TB sample did not have a time on the COC and was logged at 00:00 on day project samples were collected by default.*

- e. Data quality or usability affected? Yes / **No** / NA (Please Explain.)

Comments:

- *In the absence of ice, a temperature less than $\leq 6^{\circ}$ is acceptable, as specified in chapter 4 of the USEPA 2007 SW-846 document. TestAmerica does not note the presence of ice in sample jars.*
- *The laboratory prepared the trip blank with the sample jars. Providing a sample time on the COC is not applicable. In*

4. Case Narrative

- a. Present and understandable? **Yes** / No / NA (Please explain.)

Comments:

- b. Discrepancies, errors or QC failures noted by the lab? **Yes** / No / NA (Please explain.)

Comments: *TestAmerica noted the following discrepancies, errors or QC failures:*

- *Method AK101 surrogate BFB recovery for the LCS, LCSD, and MB was outside the upper control limit; the method blank was non-detect and the data are not impacted. The LCS and LCSD were run by MS and have 3 surrogates, two of which were within QC limits. Both the LCS and LCSD were recovered at 125%, the upper control limit being 120%.*
- *No additional analytical or quality issues were noted, other than those described above of in the Definitions/Glossary on page 3 of the laboratory report.*

- c. Were corrective actions documented? Yes / **No** / NA (Please explain.)

Comments: *No corrective actions were documented.*

- d. What is the effect on data quality/usability, according to the case narrative?

Comments: *The case narrative notes the data quality and usability are unaffected by the surrogate recovery failure.*

5. Sample Results

- a. Correct analyses performed/reported as requested on COC? **Yes** / No / NA (Please

explain.)

Comments:

- b. All applicable holding times met? **Yes** / No / NA (Please explain.)

Comments:

- c. All soils reported on a dry-weight basis? Yes / No / **NA** (Please explain.)

Comments: *Soil samples not submitted with this work order.*

- d. Are the reported LOQs less than the Cleanup Level or the minimum required detection level for the project? **Yes** / No / NA (Please explain.)

Comments: *Reporting limits are less than corresponding cleanup levels where applicable (for non detect results).*

- e. Data quality or usability affected? (Please explain.) **Yes** / No / NA (Please explain.)

Comments: *See above.*

6. QC Samples

a. Method Blank

- i. One method blank reported per matrix, analysis, and 20 samples?

Yes / No / NA (Please explain.)

Comments:

- ii. All method blank results less than LOQ? **Yes** / No / NA (Please explain.)

Comments: *However, DRO, RRO, and ethylbenzene were detected below the reporting limit in the method blanks associated with all project samples and the trip blank.*

- iii. If above LOQ, what samples are affected?

Comments: *All project samples and the soil trip blank are affected by the method blank detections.*

- iv. Do the affected sample(s) have data flags? **Yes** / No / NA

Comments: *The samples associated with the method blank detection are "B" flagged when the reported sample concentration is within 10x the reported method blank concentration. If the sample is reported at levels less than the LOQ, the sample concentration is reported as non-detect at the reporting limit. If the reported sample concentration is greater than the reporting limit and less than 5x the method blank concentration, the sample concentration is reported as non-detect at the detected sample concentration. If the sample concentration is greater than 5x the method blank concentration and less than or equal to 10x the method blank concentration, the sample concentration is reported at the detected sample concentration.*

If so, are the data flags clearly defined? **Yes** / No / NA

Comments: *Affected sample results are "B" flagged on Table 4.*

- v. Data quality or usability affected? (Please explain.) **Yes** / No / NA

Comments: *Data quality is affected as described above. Results within 10 times the method blank detections are less than applicable cleanup levels, and data is considered usable for the purposes of this report.*

b. Laboratory Control Sample/Duplicate (LCS/LCSD)

- i. Organics - One LCS/LCSD reported per matrix, analysis, and 20 samples? (LCS/LCSD required per AK methods, LCS required per SW846) **Yes** / No / NA (Please explain.)

Comments: *One LCS/LCSD pair reported per analysis and 20 samples for each analyte.*

- ii. Metals/Inorganics - One LCS and one sample duplicate reported per matrix, analysis and 20 samples? **Yes** / No / **NA** (Please explain.)

Comments: *Metals/inorganic analyses not requested.*

- iii. Accuracy – All percent recoveries (%R) reported *and* within method or laboratory limits? And project specified DQOs, if applicable. (AK petroleum methods: AK101 60%-120%, AK102 75%-125%, AK103 60%-120%; all other analyses see the laboratory QC pages) **Yes** / No / NA (Please explain.)

Comments:

Precision – All relative percent differences (RPDs) reported and less than method or laboratory limits? And project specified DQOs, if applicable. RPD reported from LCS/LCSD, MS/MSD, and or sample/sample duplicate. (AK Petroleum methods 20%; all other analyses see the laboratory QC pages) **Yes** / No / NA (Please explain.)

Comments:

- iv. If %R or RPD is outside of acceptable limits, what samples are affected? **NA**

Comments: *See above.*

- v. Do the affected samples(s) have data flags? **Yes** / No / **NA**

Comments: *See above.*

If so, are the data flags clearly defined? **Yes** / No / **NA**

Comments: *See above.*

- vi. Data quality or usability affected? Explain. **NA**

Comments: *See above.*

c. Surrogates - Organics Only

- i. Are surrogate recoveries reported for organic analyses, field, QC, and laboratory samples? **Yes** / No / NA (Please explain.)

Comments:

- ii. Accuracy – All percent recoveries (%R) reported and within method or laboratory limits? And project specified DQOs if applicable. (AK Petroleum methods 50-150 %R; all other analyses see the laboratory report pages) Yes / **No** / NA (Please explain.)

Comments: *Recovery of GRO by AK101 surrogate BFB exceeds upper control limits by 5% in the LCS, LCSD and method blank.*

- iii. Do the sample results with failed surrogate recoveries have data flags? Yes / **No** / NA (Please explain.)

Comments: *The case narrative notes these three QC samples were run with three other surrogates, all of which were recovered within control limits. Data quality and usability are considered unaffected.*

If so, are the data flags clearly defined? Yes / No / **NA**

Comments: *See above.*

- iv. Data quality or usability affected? Explain. Yes / No / **NA**

Comments: *See above.*

d. Trip Blank - Volatile analyses only (GRO, BTEX, VOCs, etc.) Water

- i. One trip blank reported per matrix, analysis and cooler? **Yes** / No / NA (Please explain.)

Comments:

- ii. Is the cooler used to transport the trip blank and volatile samples clearly indicated on the COC? **Yes** / No / NA (Please explain if NA or no.)

Comments: *Samples were submitted in a single cooler.*

- iii. All results less than LOQ? **Yes** / No / NA (Please explain.)

Comments: *However, the lab reports concentrations of benzene and ethylbenzene in the water trip blank. The ethylbenzene detection is within 10 times the amount found in an associated method blank and is considered non-detect at the reporting limit. See Section 6.a. for details.*

- iv. If above LOQ, what samples are affected?

Comments: *The samples associated with the water trip blank are "B" flagged when the reported sample concentration detected within 10x the reported trip blank concentration. If the sample is reported at levels less than the reporting limit, the sample concentration is reported as non-detect at the reporting limit. If the reported sample concentration is greater than the reporting limit and less than 5x the trip blank concentration, the sample concentration is reported as non-detect at the*

detected sample concentration. If the sample concentration is greater than 5x the trip blank concentration and less than or equal to 10x the trip blank concentration, the sample concentration is reported at the detected sample concentration.

- v. Data quality or usability affected? **Yes** / No / NA (Please explain.)

Comments: *The affected samples are "B" flagged on Table 4.*

e. Field Duplicate

- i. One field duplicate submitted per matrix, analysis and 10 project samples?

Yes / No / NA (Please explain.)

Comments: *Two field duplicates (sample set 17678-MW1/17678-MW11 and 17678-MW2/17678-MW12) were submitted with this work order.*

- ii. Were the field duplicates submitted blind to the lab? **Yes** / No / NA (Please explain.)

Comments:

- iii. Precision – All relative percent differences (RPDs) less than specified DQOs?

(Recommended: 30% for water, 50% for soil) **Yes** / **No** / NA (Please explain.)

Comments: *The RPD for GRO was 46% in the Sample 17678-MW2/17678-MW12 duplicate set. Other RPDs, where calculable (results detected above the LOQ), were less than the recommended DQO of 30%.*

- iv. Data quality or usability affected? Explain. **Yes** / No / NA (Please explain.)

Comments: *The DRO results in the Sample 17678-MW2/17678-MW12 field-duplicate pair are considered usable for the purposes of this report because the results are within a factor of 2 of one another. In addition, both results are less than applicable cleanup levels.*

- f. Decontamination or Equipment Blank** (if not applicable, a comment stating why must be entered below)

Yes / **No** / NA (Please explain.) *Collecting and submitting a decontamination or equipment blank is outside the scope of this project.*

- i. All results less than LOQ? **Yes** / No / **NA** (Please explain.)

Comments: *See above.*

- ii. If results are above LOQ, what samples are affected? **NA**

Comments: *See above.*

- iii. Data quality or usability affected? Explain. **NA**

Comments: *See above.*

7. Other Data Flags/Qualifiers (ACOE, AFCEE, Lab-specific, etc.)

- a. Are they defined and appropriate? **Yes** / No / NA

Comments: *Laboratory-applied data flags are defined on page 3 of the lab report.*

APPENDIX E
CONCEPTUAL SITE MODEL

HUMAN HEALTH CONCEPTUAL SITE MODEL GRAPHIC FORM

Site: Southcentral Tesoro-Homer
File ID 2314.26.031

Completed By: Shannon & Wilson, Inc.
Date Completed: 12/10/2014

Instructions: Follow the numbered directions below. Do not consider contaminant concentrations or engineering/land use controls when describing pathways.

(1) Check the media that could be directly affected by the release.	(2) For each medium identified in (1), follow the top arrow and check possible transport mechanisms. Check additional media under (1) if the media acts as a secondary source.
Media	Transport Mechanisms
<input type="checkbox"/> Surface Soil (0-2 ft bgs)	<input checked="" type="checkbox"/> Direct release to surface soil <i>check soil</i> <input type="checkbox"/> Migration to subsurface <i>check soil</i> <input type="checkbox"/> Migration to groundwater <i>check groundwater</i> <input type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Runoff or erosion <i>check surface water</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input checked="" type="checkbox"/> Subsurface Soil (2-15 ft bgs)	<input checked="" type="checkbox"/> Direct release to subsurface soil <i>check soil</i> <input checked="" type="checkbox"/> Migration to groundwater <i>check groundwater</i> <input checked="" type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input checked="" type="checkbox"/> Ground-water	<input checked="" type="checkbox"/> Direct release to groundwater <i>check groundwater</i> <input checked="" type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Flow to surface water body <i>check surface water</i> <input type="checkbox"/> Flow to sediment <i>check sediment</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input type="checkbox"/> Surface Water	<input type="checkbox"/> Direct release to surface water <i>check surface water</i> <input type="checkbox"/> Volatilization <i>check air</i> <input type="checkbox"/> Sedimentation <i>check sediment</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____
<input type="checkbox"/> Sediment	<input type="checkbox"/> Direct release to sediment <i>check sediment</i> <input type="checkbox"/> Resuspension, runoff, or erosion <i>check surface water</i> <input type="checkbox"/> Uptake by plants or animals <i>check biota</i> <input type="checkbox"/> Other (list): _____

(3) Check all exposure media identified in (2).	(4) Check all pathways that could be complete. The pathways identified in this column must agree with Sections 2 and 3 of the Human Health CSM Scoping Form.	(5) Identify the receptors potentially affected by each exposure pathway: Enter "C" for current receptors, "F" for future receptors, "C/F" for both current and future receptors, or "I" for insignificant exposure.						
Exposure Media	Exposure Pathway/Route	Current & Future Receptors						
		Residents (adults or children)	Commercial or Industrial workers	Site visitors, trespassers, or recreational users	Construction workers	Farmers or subsistence harvesters	Subsistence consumers	Other
<input checked="" type="checkbox"/> soil	<input checked="" type="checkbox"/> Incidental Soil Ingestion <input type="checkbox"/> Dermal Absorption of Contaminants from Soil <input type="checkbox"/> Inhalation of Fugitive Dust	C/F	C/F	C/F	C/F			
<input checked="" type="checkbox"/> groundwater	<input checked="" type="checkbox"/> Ingestion of Groundwater <input type="checkbox"/> Dermal Absorption of Contaminants in Groundwater <input checked="" type="checkbox"/> Inhalation of Volatile Compounds in Tap Water	F	F	F	F			
<input checked="" type="checkbox"/> air	<input checked="" type="checkbox"/> Inhalation of Outdoor Air <input checked="" type="checkbox"/> Inhalation of Indoor Air <input type="checkbox"/> Inhalation of Fugitive Dust	C/F	C/F	C/F	C/F			
<input type="checkbox"/> surface water	<input type="checkbox"/> Ingestion of Surface Water <input type="checkbox"/> Dermal Absorption of Contaminants in Surface Water <input type="checkbox"/> Inhalation of Volatile Compounds in Tap Water							
<input type="checkbox"/> sediment	<input type="checkbox"/> Direct Contact with Sediment							
<input type="checkbox"/> biota	<input type="checkbox"/> Ingestion of Wild or Farmed Foods							

Human Health Conceptual Site Model Scoping Form

Site Name:	Southcentral Tesoro-Homer
File Number:	2314.26.031
Completed by:	Shannon & Willson, Inc.

Introduction

The form should be used to reach agreement with the Alaska Department of Environmental Conservation (DEC) about which exposure pathways should be further investigated during site characterization. From this information, summary text about the CSM and a graphic depicting exposure pathways should be submitted with the site characterization work plan and updated as needed in later reports.

General Instructions: *Follow the italicized instructions in each section below.*

1. General Information:

Sources *(check potential sources at the site)*

<input checked="" type="checkbox"/> USTs	<input type="checkbox"/> Vehicles
<input type="checkbox"/> ASTs	<input type="checkbox"/> Landfills
<input checked="" type="checkbox"/> Dispensers/fuel loading racks	<input type="checkbox"/> Transformers
<input type="checkbox"/> Drums	<input type="checkbox"/> Other: <input style="width: 150px;" type="text"/>

Release Mechanisms *(check potential release mechanisms at the site)*

<input checked="" type="checkbox"/> Spills	<input type="checkbox"/> Direct discharge
<input checked="" type="checkbox"/> Leaks	<input type="checkbox"/> Burning
	<input type="checkbox"/> Other: <input style="width: 150px;" type="text"/>

Impacted Media *(check potentially-impacted media at the site)*

<input type="checkbox"/> Surface soil (0-2 feet bgs*)	<input checked="" type="checkbox"/> Groundwater
<input checked="" type="checkbox"/> Subsurface soil (>2 feet bgs)	<input type="checkbox"/> Surface water
<input checked="" type="checkbox"/> Air	<input type="checkbox"/> Biota
<input type="checkbox"/> Sediment	<input type="checkbox"/> Other: <input style="width: 150px;" type="text"/>

Receptors *(check receptors that could be affected by contamination at the site)*

<input checked="" type="checkbox"/> Residents (adult or child)	<input checked="" type="checkbox"/> Site visitor
<input checked="" type="checkbox"/> Commercial or industrial worker	<input checked="" type="checkbox"/> Trespasser
<input checked="" type="checkbox"/> Construction worker	<input type="checkbox"/> Recreational user
<input type="checkbox"/> Subsistence harvester (i.e. gathers wild foods)	<input type="checkbox"/> Farmer
<input type="checkbox"/> Subsistence consumer (i.e. eats wild foods)	<input type="checkbox"/> Other: <input style="width: 150px;" type="text"/>

2. Exposure Pathways: *(The answers to the following questions will identify complete exposure pathways at the site. Check each box where the answer to the question is "yes".)*

a) Direct Contact -

1. Incidental Soil Ingestion

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface?
(Contamination at deeper depths may require evaluation on a site-specific basis.) ☒

If the box is checked, label this pathway complete:

Complete

Comments:

2. Dermal Absorption of Contaminants from Soil

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface?
(Contamination at deeper depths may require evaluation on a site specific basis.) ☒

Can the soil contaminants permeate the skin (see Appendix B in the guidance document)? ☐

If both boxes are checked, label this pathway complete:

Incomplete

Comments:

b) Ingestion -

1. Ingestion of Groundwater

Have contaminants been detected or are they expected to be detected in the groundwater,
or are contaminants expected to migrate to groundwater in the future? ☒

Could the potentially affected groundwater be used as a current or future drinking water
source? Please note, only leave the box unchecked if DEC has determined the ground-
water is not a currently or reasonably expected future source of drinking water according
to 18 AAC 75.350. ☒

If both boxes are checked, label this pathway complete:

Complete

Comments:

2. Ingestion of Surface Water

Have contaminants been detected or are they expected to be detected in surface water, or are contaminants expected to migrate to surface water in the future?

☐

Could potentially affected surface water bodies be used, currently or in the future, as a drinking water source? Consider both public water systems and private use (i.e., during residential, recreational or subsistence activities).

☐

If both boxes are checked, label this pathway complete:

Incomplete

Comments:

3. Ingestion of Wild and Farmed Foods

Is the site in an area that is used or reasonably could be used for hunting, fishing, or harvesting of wild or farmed foods?

☐

Do the site contaminants have the potential to bioaccumulate (see Appendix C in the guidance document)?

☐

Are site contaminants located where they would have the potential to be taken up into biota? (i.e. soil within the root zone for plants or burrowing depth for animals, in groundwater that could be connected to surface water, etc.)

☐

If all of the boxes are checked, label this pathway complete:

Incomplete

Comments:

c) Inhalation-

1. Inhalation of Outdoor Air

Are contaminants present or potentially present in surface soil between 0 and 15 feet below the ground surface? (Contamination at deeper depths may require evaluation on a site specific basis.)

☒

Are the contaminants in soil volatile (see Appendix D in the guidance document)?

☒

If both boxes are checked, label this pathway complete:

Complete

Comments:

2. Inhalation of Indoor Air

Are occupied buildings on the site or reasonably expected to be occupied or placed on the site in an area that could be affected by contaminant vapors? (within 30 horizontal or vertical feet of petroleum contaminated soil or groundwater; within 100 feet of non-petroleum contaminated soil or groundwater; or subject to "preferential pathways," which promote easy airflow like utility conduits or rock fractures)



Are volatile compounds present in soil or groundwater (see Appendix D in the guidance document)?



If both boxes are checked, label this pathway complete:

Complete

Comments:

3. Additional Exposure Pathways: *(Although there are no definitive questions provided in this section, these exposure pathways should also be considered at each site. Use the guidelines provided below to determine if further evaluation of each pathway is warranted.)*

Dermal Exposure to Contaminants in Groundwater and Surface Water

Dermal exposure to contaminants in groundwater and surface water may be a complete pathway if:

- Climate permits recreational use of waters for swimming.
- Climate permits exposure to groundwater during activities, such as construction.
- Groundwater or surface water is used for household purposes, such as bathing or cleaning.

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

Check the box if further evaluation of this pathway is needed:

☐

Comments:

Inhalation of Volatile Compounds in Tap Water

Inhalation of volatile compounds in tap water may be a complete pathway if:

- The contaminated water is used for indoor household purposes such as showering, laundering, and dish washing.
- The contaminants of concern are volatile (common volatile contaminants are listed in Appendix D in the guidance document.)

Generally, DEC groundwater cleanup levels in 18 AAC 75, Table C, are assumed to be protective of this pathway.

Check the box if further evaluation of this pathway is needed:

☐

Comments:

Inhalation of Fugitive Dust

Inhalation of fugitive dust may be a complete pathway if:

- Nonvolatile compounds are found in the top 2 centimeters of soil. The top 2 centimeters of soil are likely to be dispersed in the wind as dust particles.
- Dust particles are less than 10 micrometers (Particulate Matter - PM₁₀). Particles of this size are called respirable particles and can reach the pulmonary parts of the lungs when inhaled.
- Chromium is present in soil that can be dispersed as dust particles of any size.

Generally, DEC direct contact soil cleanup levels in Table B1 of 18 AAC 75 are protective of this pathway because it is assumed most dust particles are incidentally ingested instead of inhaled to the lower lungs. The inhalation pathway only needs to be evaluated when very small dust particles are present (e.g., along a dirt roadway or where dusts are a nuisance). This is not true in the case of chromium. Site specific cleanup levels will need to be calculated in the event that inhalation of dust containing chromium is a complete pathway at a site.

Check the box if further evaluation of this pathway is needed:

☐

Comments:

Direct Contact with Sediment

This pathway involves people's hands being exposed to sediment, such as during some recreational, subsistence, or industrial activity. People then incidentally ingest sediment from normal hand-to-mouth activities. In addition, dermal absorption of contaminants may be of concern if the the contaminants are able to permeate the skin (see Appendix B in the guidance document). This type of exposure should be investigated if:

- Climate permits recreational activities around sediment.
- The community has identified subsistence or recreational activities that would result in exposure to the sediment, such as clam digging.

Generally, DEC direct contact soil cleanup levels in 18 AAC 75, Table B1, are assumed to be protective of direct contact with sediment.

Check the box if further evaluation of this pathway is needed:

☒

Comments:

4. Other Comments *(Provide other comments as necessary to support the information provided in this form.)*

APPENDIX F

**IMPORTANT INFORMATION ABOUT YOUR GEOTECHNICAL/ENVIRONMENTAL
REPORT**



Date:	April 2015
To:	ADEC
Re:	Southcentral Tesoro, Homer, Alaska

Important Information About Your Geotechnical/Environmental Report

CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include: the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used: (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors, which were considered in the development of the report, have changed.

SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events, and should be consulted to determine if additional tests are necessary.

MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the
ASFE/Association of Engineering Firms Practicing in the Geosciences, Silver Spring, Maryland