Atlantic Richfield Company

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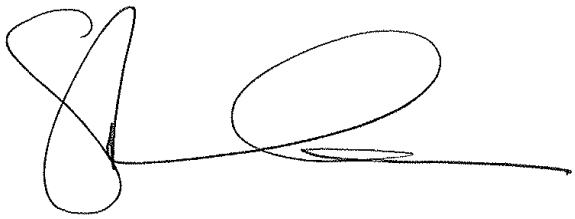
May 3, 2013

RECEIVED
By Alameda County Environmental Health at 8:39 am, May 09, 2013

Re: Soil and Groundwater Investigation Report
Atlantic Richfield Company Station #498
286 South Livermore Avenue, Livermore, California
ACEH Case No. RO0002873

"I declare, that to the best of my knowledge at the present time, that the information and/or recommendations contained in the attached document are true and correct."

Submitted by,



Shannon Couch
Project Manager

Attachment

SOIL AND GROUNDWATER INVESTIGATION REPORT
Atlantic Richfield Company Station #498
286 South Livermore Ave.
Livermore, Alameda County, California

Prepared for:

Ms. Shannon Couch
Atlantic Richfield Company
P.O. Box 1257
San Ramon, CA 94583

Prepared by:

Broadbent & Associates, Inc.
1324 Mangrove Avenue, Suite 212
Chico, California 95926
(530) 566-1400

May 3, 2013

No. 08-82-603

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CREATING SOLUTIONS. BUILDING TRUST.

May 3, 2013

Project No. 08-82-603

Atlantic Richfield Company
P.O. Box 1257
San Ramon, California 94583
Submitted via ENFOS

Attn.: Ms. Shannon Couch

Re: Soil and Groundwater Investigation Report, Atlantic Richfield Company (a BP affiliated company) Station #498, 286 South Livermore Avenue, Livermore, California;
ACEH Case #RO0002873

Dear Ms. Couch:

Broadbent & Associates, Inc. (Broadbent) is pleased to submit this report summarizing activities associated with conduct of a soil and groundwater investigation at Atlantic Richfield Company Station #498 (herein referred to as Station #498) located at 286 South Livermore Avenue, Livermore, California (Property). The scope of work was conducted in accordance with the December 7, 2012 *Soil and Groundwater Investigation Work Plan* prepared by Broadbent and the Alameda County Environmental Health (ACEH) directive letter dated December 24, 2012.

Should you have any questions concerning this report, please do not hesitate to contact us at (530) 566-1400.

Sincerely,
BROADBENT & ASSOCIATES, INC.

Jason R. Duda
Project Scientist

Matthew G. Herrick, P.G., C.HG.
Senior Hydrogeologist

PROFESSIONAL GEOLOGIST
MATTHEW G. HERRICK
No. 8010
Exp 4/30/15
STATE OF CALIFORNIA

cc: Mr. Jerry Wickham, ACEH (Submitted via ACEH ftp Site)
GeoTracker

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1.0 INTRODUCTION

In order to further characterize petroleum hydrocarbon impact to soil and groundwater associated with Station #498 and accurately assess subsurface hydro-geologic conditions, Broadbent oversaw Gregg Drilling (Martinez, California) conduct the advancement of eight soil borings (SB-9 through SB-16) onsite using CPT drilling technology. The borings were terminated between approximate depths of 57 and 58 feet below ground surface (bgs). Select soil samples were collected from each boring as well as one grab groundwater sample. A Ultra-Violet Optical Screening Tool (UVOST) was coupled with the CPT attachment on the drill rig in order to assist with recognition of subsurface soils impacted by petroleum hydrocarbons and determination of appropriate depths for soil sample collection.

Borings SB-9 through SB-11 were located along the northwestern property boundary to further assess potential impact to soil and groundwater in the down-gradient direction. Boring SB-12 was situated adjacent to existing well MW-1 in order to evaluate the potential presence of a localized perched water zone within its vicinity, as anomalous water levels have consistently been observed during gauging and sampling events conducted at MW-1. Borings SB-13 through SB-16 were advanced within close proximity to previous borings installed in 2005 by URS. The purpose of these borings was to re-evaluate subsurface conditions at the proposed locations and obtain grab groundwater samples, as groundwater was not encountered during the 2005 investigation. The boring locations are depicted on Drawing 2.

2.0 SITE DESCRIPTION

The Property is currently an operational gas station located in an area of mixed commercial and residential use. The property consists of a convenience store and one gasoline dispensing island with associated underground storage tanks (USTs) and product piping. A site location map is provided as Drawing 1.

3.0 BACKGROUND

During product line and dispenser upgrade activities completed in June 2001, Delta Environmental Consultants, Inc. (Delta) collected soil samples beneath the product lines and dispenser islands. Total purgeable hydrocarbons as gasoline (TPHg) were detected in two of the four dispenser island samples at 1.8 milligrams per kilogram (mg/kg) in sample DP-1 and 87 mg/kg in sample DP-3. Benzene, toluene, ethylbenzene, and total xylenes (BTEX), and methyl tertiary butyl ether (MTBE) were also detected in dispenser island sample DP-3. Toluene and total xylenes were detected in product line sample PL-2 at relatively low concentrations. Historic soil analytical data are provided in Appendix A. Historic soil sample locations are depicted in Drawing 2. Product line and dispenser island sampling activities are summarized in the Delta September 19, 2001 *Product Line and Dispenser Island Sampling Results* report.

In January 2005, URS completed a site assessment to fulfill a due diligence audit as part of the sale of the Property. Field activities were conducted to assess whether subsurface soils in the vicinity of

the USTs and fuel dispensers had been impacted by petroleum hydrocarbons. The work was not required as part of a regulatory agency directive. Eight soil borings were advanced using a direct push Geoprobe® 6600 drill rig. URS stated in the February 15, 2005 *Site Assessment Report* that the proposed total depth of all borings was 30 feet below ground surface (bgs); however, due to difficult drilling conditions encountered, the borings were only advanced to depths ranging from 15 to 25 feet bgs. Groundwater was not encountered in the borings advanced. MTBE and tert-butyl alcohol (TBA) were detected in four of the collected soil samples (SB-1-22', SB-1-24', SB-3-25', and SB-8-25') at maximum concentrations of 0.022 mg/kg (SB-8-25') and 0.031 mg/kg (SB-1-22'), respectively. Historic soil analytical data are provided in Appendix A and sample locations are depicted on Drawing 2.

In November 2008, a soil and groundwater investigation was completed, which included installation of monitor wells MW-1 through MW-4. Field activities were conducted to further define the vertical and lateral extent of impacted soil and complete an initial groundwater investigation. Soil sample analytical results showed the presence of petroleum hydrocarbon impacted soil at all four sample locations (MW-1 through MW-4) at depths ranging from 15 to 35 feet bgs. Historic soil analytical data are provided in Appendix A. Elevated groundwater concentrations were detected in well MW-3 and moderately elevated concentrations were detected in wells MW-1 and MW-2. Well MW-4 was found to be dry. The February 6, 2009 *Soil and Ground-Water Investigation and Fourth Quarter, 2008 Quarterly Monitoring Report* recommended that two additional quarters (First and Second Quarter, 2009) of groundwater monitoring/sampling be completed to better understand the hydrogeology before additional investigative work activities were proposed.

Broadbent prepared the *Soil and Groundwater Investigation Work Plan* on August 28, 2009, which proposed installation of three additional groundwater monitoring wells (MW-5, MW-6, and MW-7). The purpose of locating proposed well MW-5 adjacent to MW-1 was to determine if anomalous water levels observed in MW-1 were potentially due to a localized perched water-bearing zone. Proposed wells MW-6 and MW-7 were located off-Site and to the northwest of the station in order to further delineate the down-gradient extent of groundwater contamination. In a letter dated February 10, 2010, ACEH requested a Work Plan Addendum to address concerns regarding the proposed locations of wells MW-6 and MW-7, which may not have adequately characterized the extent of impacted groundwater due to the calculated groundwater flow direction on November 9, 2009, which was south-southwest instead of northwest as was calculated on March 20, 2009. On April 12, 2010, Broadbent submitted the *Soil and Groundwater Investigation Work Plan Addendum,* which stated that the locations of MW-6 and MW-7 were based on the flow directions calculated at the Shell Station located across 3rd Street and data collected from the Site during the First Quarter 2009 groundwater monitoring event. In a letter dated August 12, 2010, ACEH approved the proposed scope of work.

Numerous attempts to obtain off-Site property access in order to complete the installation of off-Site wells have been made. However, off-Site property owners have been unresponsive and/or uncooperative in allowing access, which has delayed commencement of the proposed scope of work. On August 29, 2012, ACEH, Atlantic Richfield Company, and Broadbent met to discuss the possibility of advancing borings along the northwestern property boundary in lieu of the off-Site borings. In a letter dated September 18, 2012, ACEH accepted advancing borings along the

northwestern property boundary to define the site stratigraphy and vertical and lateral distribution of contamination and requested submittal of a Work Plan. ACEH also recommended use of Cone Penetration Testing (CPT) drilling procedures to adequately characterize subsurface hydro-geologic features. The *Soil and Groundwater Investigation Work Plan* dated December 7, 2012 detailed proposed CPT drilling activities and was approved by ACEH in their letter dated December 24, 2012.

Quarterly groundwater monitoring and sampling has been conducted on wells MW-1, MW-2, MW-3, and MW-4 at the Site since November 2008. The monitoring and sampling schedule was modified to be conducted semi-annually during the second and fourth quarters of each calendar year in June 2009. Historic groundwater monitoring and analytical data are provided in Appendix B.

4.0 REGIONAL HYDROGEOLOGY

The Site is located in the north-central portion of the Livermore Valley, an east-west trending structural trough surrounded by north-south trending faults and hills of the Diablo Range. The valley extends approximately 14 miles in an east-west direction and varies from three to six miles in width. The valley floor slopes gently west and southwest and is a part of the Livermore Valley ground-water basin. The groundwater basin is bounded by and crossed by several faults. These faults act as barriers to the lateral movement of groundwater and divide the groundwater basin into several subbasins. The water-bearing materials in the groundwater basin include Holocene age surficial valley-fill alluvial sediments overlying the Plio-Pleistocene Livermore Formation. The Livermore Formation consists of unconsolidated to semi-consolidated beds of gravel, sand, silt, and clay of varying permeabilities (California Department of Water Resources, 2003).

Natural recharge occurs primarily along the uplands and edges of the Livermore Valley groundwater basin, through the arroyos during periods of precipitation and winter flow, by underground flow, and by applied irrigation water seeping into the ground. The basin is also recharged by controlled releases from the South Bay Aqueduct along with local surface water stored at Del Valle reservoir into Arroyo Valle and Arroyo Mocho. Sections of these arroyos contain creek bottoms that are very porous, allowing the water to quickly seep into the ground. As of 2005, mine quarrying pits on the west side of the Livermore Valley were being used for storm water collection to assist in recharge of groundwater in the basin (Zone 7 Water Agency, 2005).

The basins' groundwater system is a multi-layered system with an unconfined upper aquifer overlying deeper semi-confined to confined aquifers separated by clay aquitards. These clay aquitards impede the vertical movement of groundwater between the upper and deeper aquifers. Most of the water for municipal and agricultural use is pumped from the deeper aquifers. Groundwater flow in the basin generally flows toward the west central portions of the valley and generally moves east to west within Livermore Valley. Groundwater near the center of Livermore Valley flows toward a cone of depression located west of the city of Livermore near gravel mining areas. The groundwater depression is thought to have been created by extraction of groundwater for municipal and agricultural use and dewatering for gravel quarrying (Zone 7 Water Agency, 2005). The extraction of groundwater is ongoing but has lessened over the years due to usage of water from the State Water Project.

Surface drainage features include four major seasonal streams (Arroyo Valle, Arroyo Mocho, Arroyo las Positas, and Arroyo de la Laguna) and several quarry ponds (mining area). The four major streams converge on the southwest side of the basin to form the main basin outlet, Arroyo de la Laguna, which flows south and joins Alameda Creek in Sunol Valley.

5.0 FIELD ACTIVITIES PERFORMED

5.1 Preliminary Field Activities

Prior to initiating field activities, Broadbent obtained the necessary well drilling permit from the Zone 7 Water Agency (Appendix C), prepared a Site health and safety plan specific to the scope of work, and cleared the Site for subsurface utilities. The utility clearance included notifying Underground Service Alert of the work a minimum of 48 hours prior to initiating the field investigation, and additionally securing the services of a private underground utility locating company, NorCal Geophysical Consultants, Inc. (Cotati, California), to confirm the absence of underground utilities at each boring location. Borehole locations were also cleared to a depth of 6.5 feet bgs using an air knife rig by Gregg Drilling between March 8 and 10, 2013 prior to borehole advancement.

5.2 CPT and UVOST Module Activities

Between March 18 and 22, 2013, Broadbent field personnel observed Gregg Drilling advance eight soil borings onsite (SB-9 through SB-16). Gregg Drilling utilized a truck-mounted hollow stem auger to drill from approximately 6.5 feet bgs to 10 feet bgs due to the presence of large gravels and a CPT drill rig to advance the soil borings from approximately 10 feet bgs to a maximum depth of approximately 58 feet bgs. A log based on CPT measurements was created for each boring. Metal rods equipped with a cone penetrometer (cone) were advanced into the subsurface at each boring location. The cone measured parameters in the subsurface including tip friction, sleeve friction, and pore pressure. The CPT measured these parameters in real time with depth, allowing for a vertical soil profile to be created based on these measurements (See Appendix D). Numerous pore pressure dissipation tests (PPDTs) were conducted during drilling activities in order to assist with determining whether or not a secondary, potentially perched water-bearing zone exists at the Site. A PPDT was conducted when the cone was halted at specific intervals. The variation in the penetration pore pressure with time was measured behind the tip of the cone. PPDT logs generated by Gregg Drilling are provided in Appendix D. Additional discussion of the PDT results is provided in Section 6.3.

In addition to the CPT technology, laser induced fluorescence utilizing an Ultra-Violet Optical Screening Tool (UVOST) was used for in-situ measurement of petroleum hydrocarbons during drilling activities. The laser induced fluorescence cone works on the principle that hydrocarbons, mixed with soil and/or groundwater, fluoresce when irradiated by ultra violet light. The soil is irradiated with ultra violet light, which is produced by a laser and transmitted to the cone through fiber optic cables. The light then passes through a small window in the side of the cone into the soil.

Hydrocarbon molecules present in the soil absorb the light energy during radiation and immediately re-emit the light at a longer wavelength. This re-emission is termed fluorescence and the amount of fluorescence measured by the UVOST module can be used to estimate hydrocarbon concentrations. Due to rough drilling conditions, the UVOST window broke while advancing borings SB-9 (at 58 feet bgs), SB-10 (at 42 feet bgs), SB-12 (at 58 feet bgs), SB-14 (at 58 feet bgs) and SB-16 (at 57.5 feet bgs). UVOST logs created by Gregg Drilling are provided in Appendix D and the UVOST data are also depicted on the boring logs within Appendix E.

5.3 Soil Boring Advancement and Sampling Activities

Following completion of the CPT/UVOST borings, a second borehole immediately adjacent to the first was installed in order to collect soil and groundwater samples. An attempt was made to collect soil samples from depths correlating to the highest observed concentrations as determined by the UVOST readings. However, due to difficult drilling conditions observed at various depths across the Site and minimal UVOST readings, two soil samples were generally collected from depths of approximately 14 to 24 feet bgs and 26 to 38 feet bgs. A second, deeper soil sample could not be collected from borings SB-10 and SB-11 due to very dense soil conditions.

One groundwater sample was collected from each boring. Groundwater samples were collected using a Hydropunch-type sampler equipped with a retrievable stainless steel screen with an expendable tip. The groundwater sampler operated by advancing 1 ¾ - inch hollow-push rods with the filter tip in a closed configuration to the base of the desired sampling interval. Once at the desired depth, the push rods were retracted, exposing the encased filter screen and allowing groundwater to infiltrate hydrostatically from the formation to the inlet screen. A small diameter bailer was then lowered through the push rod into the screened interval for sample collection. Upon completion of borehole advancement and sampling activities at each location, each boring was abandoned using neat cement grout and completed at the surface to match the surrounding area.

5.4 Investigation-Derived Residuals Management

Residual solids and liquids generated during the Site investigation activities are stored temporarily onsite in Department of Transportation-approved 55-gallon drums pending analytical results and profiling. Following characterization and profiling, Belshire Environmental Services will be scheduled to transport the investigation-derived residuals to an Atlantic Richfield Company-approved facility for treatment or disposal.

6.0 RESULTS OF INVESTIGATION

Fourteen soil samples and 8 groundwater samples were submitted to TestAmerica of Irvine, California, a California State-certified laboratory, under chain-of-custody protocol. Each soil and groundwater sample was analyzed for Gasoline range organics (GRO, C6-C12) via EPA Method 8015B and BTEX, MTBE, TBA, ethyl tert-butyl ether (ETBE), tert-amyl methyl ether (TAME), di-isopropyl ether (DIPE), 1,2-dichloroethane (1,2-DCA), 1,2-dibromoethane (EDB), and ethanol via

EPA Method 8260B. Select soil samples were also analyzed for bulk and grain density, total porosity, moisture content, volumetric moisture and air, total organic carbon, fractional organic carbon, and grain size distribution. These parameters were collected for potential use during future additional Site evaluation activities. No significant irregularities were reported during laboratory analysis of the samples. Copies of the laboratory analytical reports with chain-of-custody documentation are provided in Appendix F. Laboratory analytical results (EDF) were uploaded to the GeoTracker AB2886 database. Upload confirmation pages are provided in Appendix G.

6.1 Soil Sample Analytical and UVOST Results

Laboratory analytical results for GRO, BTEX, and MTBE are summarized in Table 1. Review of Table 2 indicates that analytical results were below laboratory detection limits in each of the soil samples collected from borings SB-9 through SB-14 and SB-16. GRO and BTEX concentrations were detected above laboratory detection limits in soil sample SB-15-38' at concentrations of 1,500 milligrams per kilogram (mg/kg), 4.8 mg/kg, 53 mg/kg, 35 mg/kg, and 230 mg/kg, respectively. Tabulated soil sample laboratory analytical results are compared against the revised residential Environmental Screening Levels (ESLs) established by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB, 2013) under a potential drinking water resource scenario.

Plots of the UVOST signal as a function of depth are included on the boring logs provided in Appendix E and individual plots are included in Appendix D. As indicated on the plots, very weak UVOST signals were measured in all borings.

6.2 Groundwater Sample Analytical Results

Laboratory analytical results for GRO, BTXE, MTBE, TBA and TAME in the eight submitted groundwater samples are summarized in Table 2. Review of Table 2 indicates that each groundwater sample, with the exception of the sample collected from SB-14, had at least one hydrocarbon constituent reported above laboratory detection limits. Analytical results for GRO, Benzene, and MTBE, from the CPT investigation are depicted on ISO concentration contour maps provided as Drawing 3 through Drawing 5, respectively. Tabulated groundwater sample laboratory analytical results are compared against the revised residential Environmental Screening Levels (ESLs) established by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB, 2013) under a potential drinking water resource scenario. Additional discussion regarding groundwater analytical results of this investigation is summarized below:

- GRO were detected above the laboratory reporting limits in three groundwater samples at concentrations ranging from 73 micrograms per liter (µg/L) in SB-11 to 26,000 µg/L in SB-16;
- BTEX concentrations above laboratory detection limits were only observed in the groundwater samples collected from borings SB-15 and SB-16, with the highest concentrations reported within SB-16;
- MTBE was detected above laboratory reporting limits in five of the groundwater samples ranging from 1.9 µg/L in SB-9 to 1,700 µg/L in SB-16;

- TBA was detected in three samples at concentrations ranging from 21 µg/L in SB-12 to 570 µg/L in SB-11; and
- TAME was reported in two samples at concentrations of 4.0 µg/L in SB-12 and 7.5 µg/L in SB-11.

6.3 Subsurface Lithology

Vertical profiles for soil behavior type (SBT) from each CPT boring were used to generate geologic cross sections which are shown in Drawing 6 through Drawing 8. As discussed above, each boring was cleared to 6.5 feet bgs using an air knife rig followed by hollow stem auger to 10 feet bgs due to the presence of large gravels. Accordingly, generated cross sections depict lithology from 10 feet bgs to total depth explored during the investigation. As depicted on the cross sections, the soil underlying the site primarily consists of a layer of sand and silt that extends to approximately 33 to 36 feet bgs resting on top of a layer of clay with some silty clay which extends to the total depth explored during the investigation. The sand and silt layer also consists of occasional finer grained clay and silty clay layers. The deeper clay and silt layer consists of intermittent beds of silty sand and sandy silt.

6.4 Pore Pressure Dissipation Test Results

PPDTs were completed at various depths to measure the equilibrium water pressure and calculate the piezometric surface. Complete PPDT data are provided in Appendix D and results are summarized in Table 3. A review of table 3 shows saturated conditions were confirmed in most borings at depths ranging from 35 feet to 45 feet bgs. Saturated conditions are based on equilibrium pore pressure readings at the end of the dissipation test that are positive values. The one exception is boring SB-9 where negative equilibrium pore pressure readings were noted for all four tests completed, which typically suggests dry soil conditions.

From each PPDT, the piezometric surface or potential energy at that depth is calculated. The piezometric surface from the PPDTs are depicted in the geologic cross sections presented as Drawing 6 through Drawing 8. In general, data from the site shows the piezometric surface in feet bgs increasing with depth, indicating a downward vertical groundwater gradient. The one exception is SB-10, which exhibited an upward vertical gradient based on the PPDTs performed.

7.0 CONCLUSIONS

On behalf of Atlantic Richfield Company, Broadbent has prepared this *Soil and Groundwater Investigation Report* for Station 498 located at 286 South Livermore Avenue, Livermore, CA. Based on the findings of this investigation, Broadbent concludes the following:

- Analytical results from soil samples were all below laboratory detection limits with the exception of the sample collected from SB-15 at 38 ft bgs, which showed moderate concentrations of GRO and BTEX above ESLs. It is suspected that this soil sample was likely saturated and therefore influenced by impacted groundwater. The UVOST data, which

supplements the laboratory analytical data, measured very weak signals which could either be due to the fact that the hydrocarbons present within the soil are highly weathered or the soil is relatively free of hydrocarbons.

- Analytical results from groundwater samples showed moderate concentrations of GRO and BTEX at locations SB-15 and SB-16 on the southeastern portion of the Site. MTBE and TBA concentrations were noted on the northwestern and downgradient portion of the property at SB-10, SB-11, and SB-12. This data suggests that the GRO and BTEX plume is limited and stable, although the location of the plume (centered generally upgradient from the UST system and suspected release location) is not indicative of the generally observed groundwater flow direction toward the west-northwest. The MTBE and TBA plume does not appear to be fully defined in the downgradient, northwesterly direction.

- The cross sections generated generally show a sand and silt layer overlaying a less permeable finer grained clay and silty clay layer that includes intermittent beds of courser material. Saturated conditions were encountered at about the same depth of the interface between these two layers. PPDT results indicate a downwards vertical gradient through the clay and silty clay layer. It is likely that a deeper courser grained and more permeable layer is present below the depths explored in this investigation, which would help explain the prolonged downward vertical gradient. Several borings also showed the presence of a more permeable sand and silt layer beginning at approximately 56 feet bgs. It is possible that the dewatering that has occurred in deeper water-bearing zones across the Livermore Valley (discussed above in Section 4.0) is contributing to the downwards vertical gradient that is observed at Station 498.

- Anomalous water levels have previously been observed in well MW-1 and attributed to a potential localized perched water-bearing zone. Based on the data collected during this investigation, it does not appear that a perched zone is present. Alternatively, it is believed that the anomalous shallow water levels in MW-1 are a result of the screen interval of the well and corresponding variations in the piezometric surface observed with depth in the clay and silty clay layer.

8.0 SUMMARY AND RECOMMENDATIONS

Shallow impacted soil has been adequately characterized at the site. The data suggest that the GRO and BTEX plume is stable and limited to the southeastern portion of the property in the vicinity of borings SB-15 and SB-16. However, the location of the GRO and BTEX plume, centered generally upgradient from the UST system and suspected release location, is not indicative of the generally observed groundwater flow direction toward the west-northwest. It is important to note that a former Shell Station with a previously documented release is located across Third Street in the general upgradient direction. It is recommended that a review of this case be completed.

The MTBE and TBA plume appear to be centered on the northwestern portion of the property and likely extend off-Site in the downgradient direction. It is recommended that further characterization,

including installation of off-Site borings and/or wells to fully delineate the extent of the MTBE and TBA plume, be conducted. It is important to note that past attempts to gain off-Site property access have been unsuccessful. It is requested that ACEH assist with efforts to gain access to off-Site properties. It is also recommended that a Sensitive Receptor Survey be completed in an effort to identify potential receptors within the vicinity.

The downward vertical gradient observed from the PPDTs suggest that full vertical delineation of the plume may not presently be complete. The CPT lithology data also suggests that a more permeable sand and silt layer possibly representing a second shallow water-bearing zone is present beginning at depths of 55 to 56 feet bgs. It is recommended that additional vertical characterization activities extending into this possible second water-bearing zone be completed on-Site. Based on data collected, it is recommended that depth-discrete monitor wells be installed on-Site.

The site does not appear to currently meet the requirement of the Low-Threat Closure Policy. Upon concurrence from ACEH regarding the identified data gaps above, a work plan will be prepared detailing the scope of work.

9.0 LIMITATIONS

This document has been prepared for the exclusive use of Atlantic Richfield Company (a BP affiliated company). The findings presented in this report are based upon the observations of Broadbent field personnel, points of investigation and results of laboratory tests performed by TestAmerica (Irvine, California). Services were performed in accordance with the generally accepted standard of practice at the time this report was written. No warranty, expressed or implied, is intended. It is possible that variations in the soil or groundwater conditions could exist beyond the points explored in this investigation. Also, changes in site conditions could occur at some time in the future due to variations in rainfall, temperature, regional water usage or other factors.

10.0 REFERENCES

Alameda County Environmental Health, February 10, 2010. Case No. RO0002873, ARCO #0498, 286 South Livermore Avenue, Livermore, CA. Letter from Mr. Paresh Khatri (ACEH) to Mr. Chuck Carmel (Atlantic Richfield Company).

Alameda County Environmental Health, August 12, 2010. Case No. RO0002873, ARCO #0498, 286 South Livermore Avenue, Livermore, CA. Letter from Mr. Paresh Khatri (ACEH) to Mr. Chuck Carmel (Atlantic Richfield Company).

Alameda County Environmental Health, September 18, 2012. Case No. RO0002873, ARCO #0498, 286 South Livermore Avenue, Livermore, CA. Letter from Mr. Jerry Wickham (ACEH) to Ms. Shannon Couch (Atlantic Richfield Company).

Alameda County Environmental Health, December 24, 2012. Case No. RO0002873, ARCO #0498, 286 South Livermore Avenue, Livermore, CA. Letter from Mr. Jerry Wickham (ACEH) to Ms. Shannon Couch (Atlantic Richfield Company).

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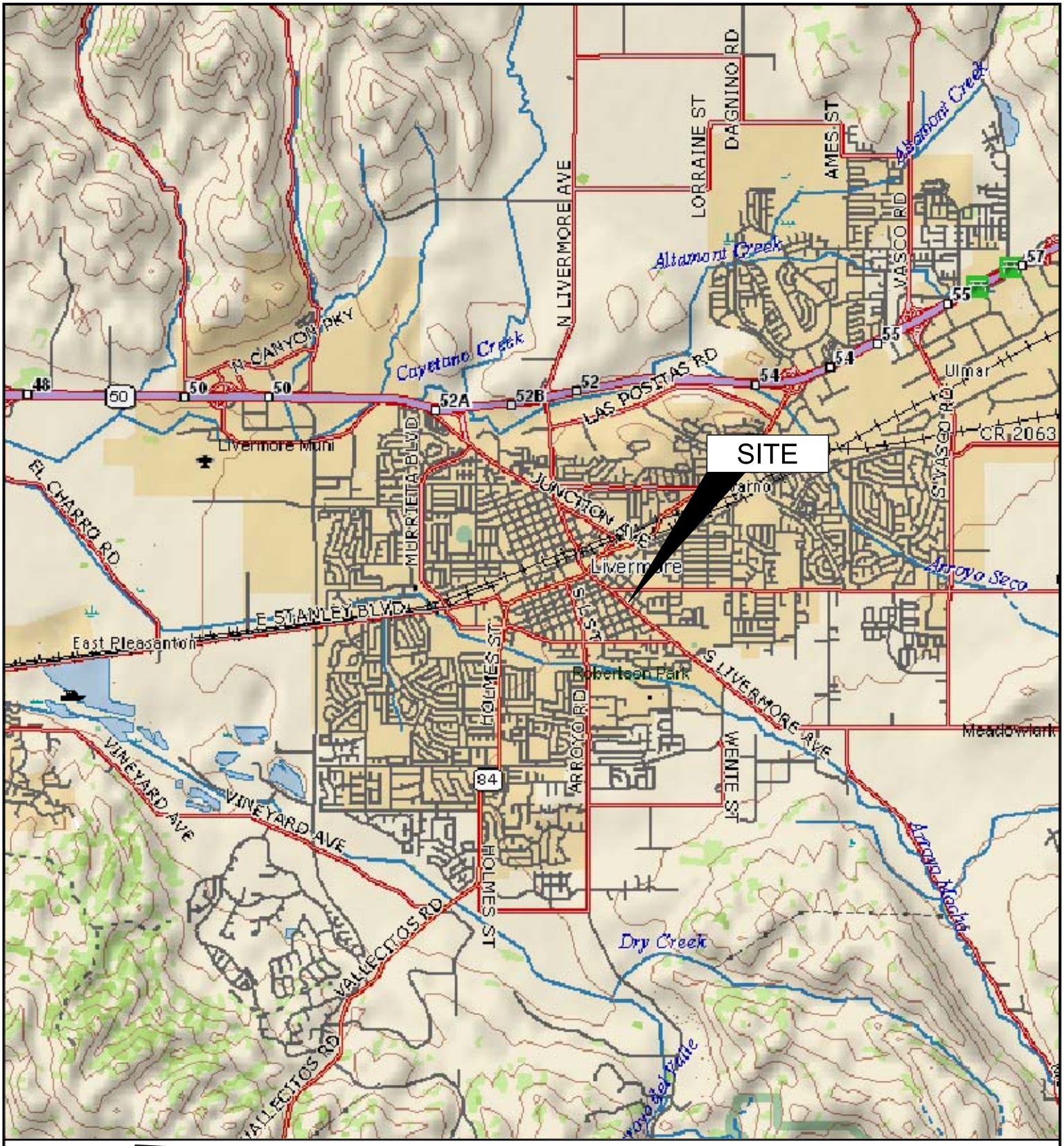
DRAWINGS



N

0 1 2

APPROXIMATE SCALE (mi)

IMAGE SOURCE: DELORME

BROADBENT & ASSOCIATES, INC.

ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
1324 Mangrove Ave. Suite 212, Chico, California 95926

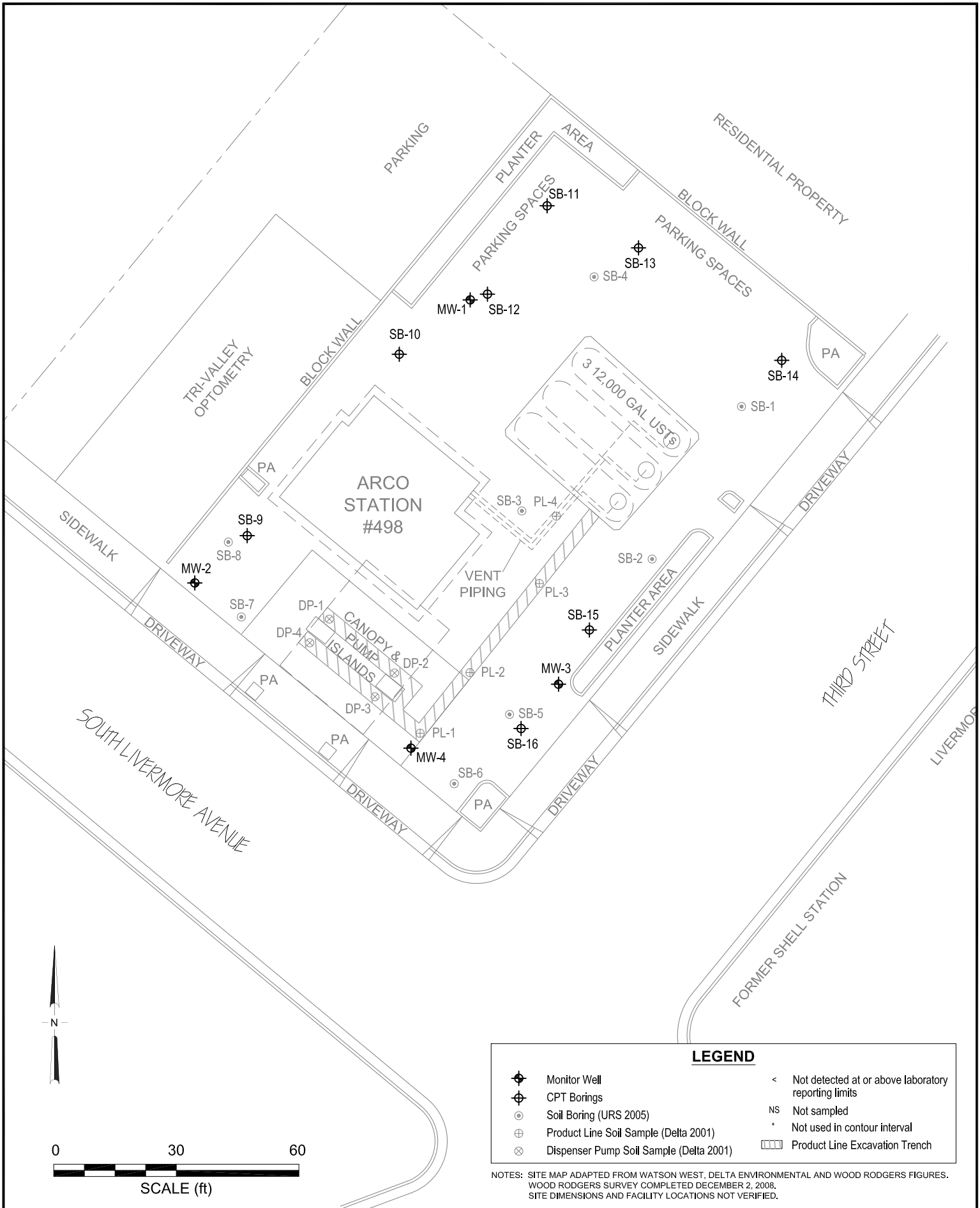
Project No.: 08-82-603 Date: 6/22/2010

Station #498
286 South Livermore Avenue
Livermore, California

Site Location Map

Drawing

1



LEGEND

- Monitor Well
- CPT Borings
- Soil Boring (URS 2005)
- Product Line Soil Sample (Delta 2001)
- Dispenser Pump Soil Sample (Delta 2001)
- < Not detected at or above laboratory reporting limits
- NS Not sampled
- * Not used in contour interval
- Product Line Excavation Trench

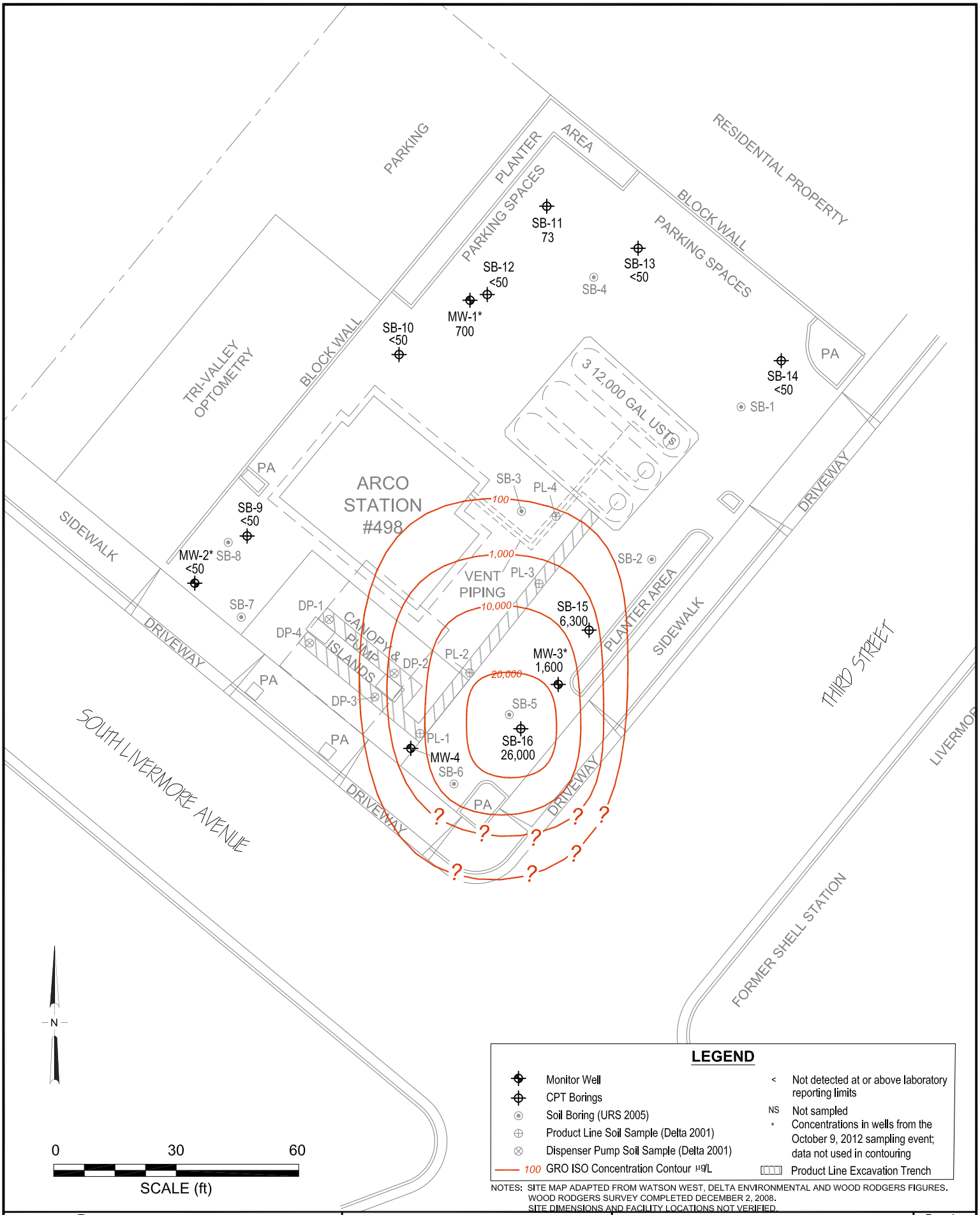
NOTES: SITE MAP ADAPTED FROM WATSON WEST, DELTA ENVIRONMENTAL AND WOOD RODGERS FIGURES.
WOOD RODGERS SURVEY COMPLETED DECEMBER 2, 2008.
SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
1324 Mangrove Ave. Suite 212
Chico, CA

Station #498
286 South Livermore Avenue
Livermore, California

Site Map with Historic Sample and CPT Boring Locations
Project No.: 08-82-603 Date: 4/19/13

Drawing 2



LEGEND

- Monitor Well
- CPT Borings
- Soil Boring (URS 2005)
- Product Line Soil Sample (Delta 2001)
- Dispenser Pump Soil Sample (Delta 2001)
- 100 GRO ISO Concentration Contour µg/L
- < Not detected at or above laboratory reporting limits
- NS Not sampled
- * Concentrations in wells from the October 9, 2012 sampling event; data not used in contouring
- Product Line Excavation Trench

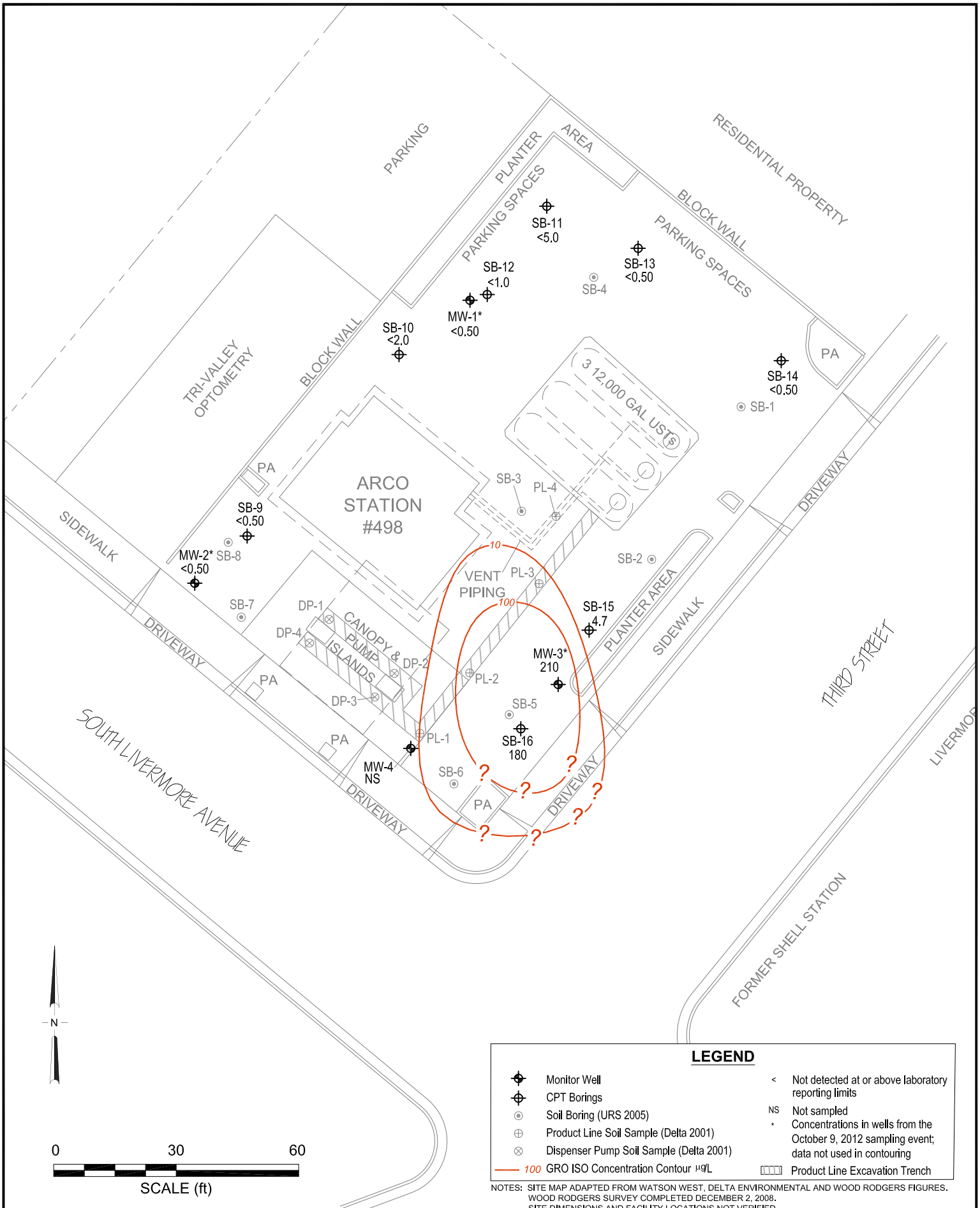
NOTES: SITE MAP ADAPTED FROM WATSON WEST, DELTA ENVIRONMENTAL AND WOOD RODGERS FIGURES.
WOOD RODGERS SURVEY COMPLETED DECEMBER 2, 2008.
SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

BROADBENT
1370 Ridgewood Dr., Suite 5
Chico, California 95973
Project No.: 08-82-603 Date: 04/28/2013

Station #498
286 South Livermore Avenue
Livermore, California

GRO ISO Concentration Contour Map from Hydropunch Groundwater Samples - March 2013

Drawing
3



LEGEND

- Monitor Well
- CPT Borings
- Soil Boring (URS 2005)
- Product Line Soil Sample (Delta 2001)
- Dispenser Pump Soil Sample (Delta 2001)
- 100 GRO ISO Concentration Contour µg/L
- < Not detected at or above laboratory reporting limits
- NS Not sampled
- * Concentrations in wells from the October 9, 2012 sampling event; data not used in contouring
- Product Line Excavation Trench

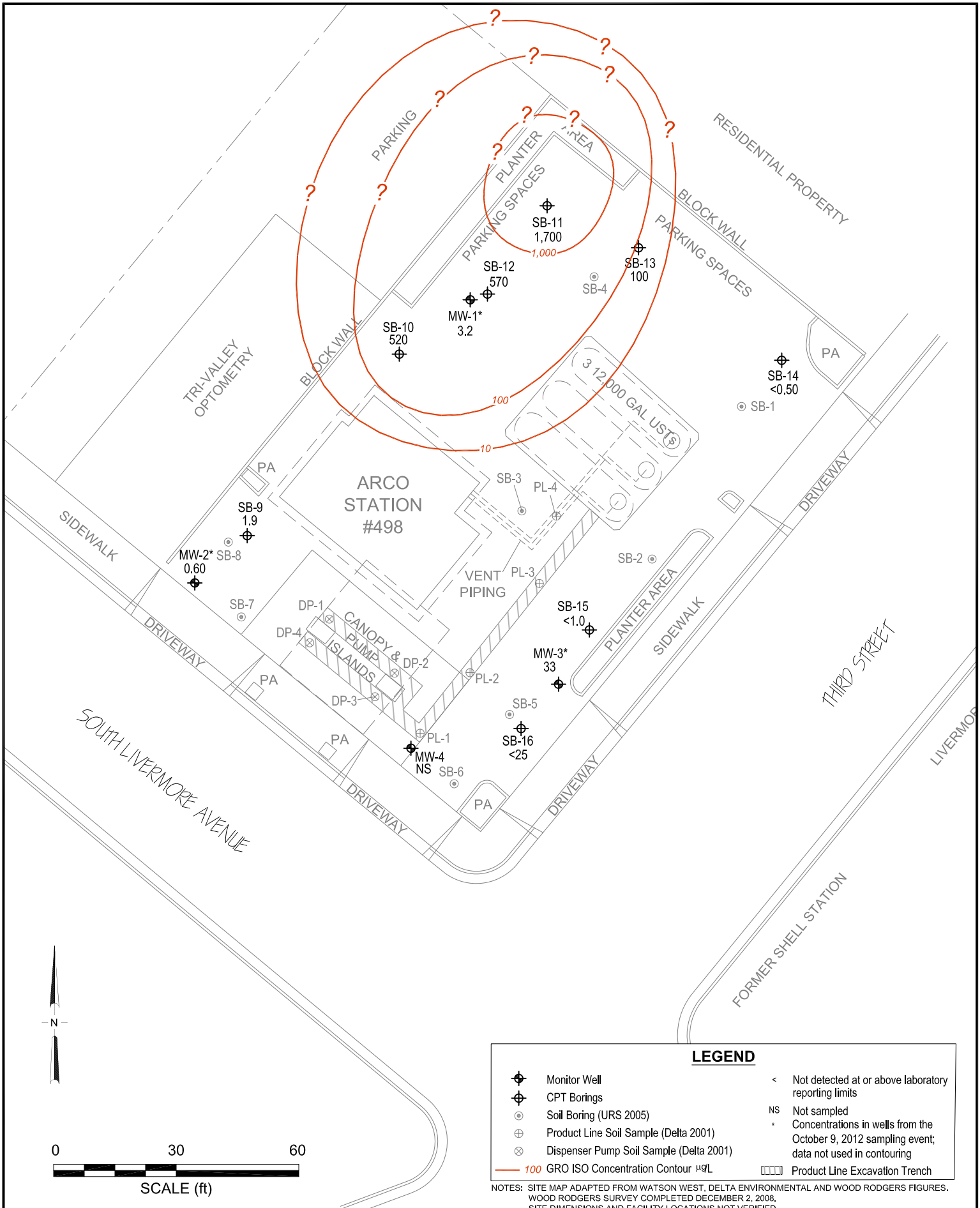
NOTES: SITE MAP ADAPTED FROM WATSON WEST, DELTA ENVIRONMENTAL AND WOOD RODGERS FIGURES.
WOOD RODGERS SURVEY COMPLETED DECEMBER 2, 2008.
SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

BROADBENT
1370 Ridgewood Dr., Suite 5
Chico, California 95973
Project No.: 08-82-603 Date: 04/28/2013

Station #498
286 South Livermore Avenue
Livermore, California

Benzene ISO Concentration Contour Map from Hydropunch Groundwater Samples - March 2013

Drawing
4



LEGEND

- Monitor Well
- CPT Borings
- Soil Boring (URS 2005)
- Product Line Soil Sample (Delta 2001)
- Dispenser Pump Soil Sample (Delta 2001)
- 100 GRO ISO Concentration Contour µg/L
- < Not detected at or above laboratory reporting limits
- NS Not sampled
- * Concentrations in wells from the October 9, 2012 sampling event; data not used in contouring
- Product Line Excavation Trench

NOTES: SITE MAP ADAPTED FROM WATSON WEST, DELTA ENVIRONMENTAL AND WOOD RODGERS FIGURES. WOOD RODGERS SURVEY COMPLETED DECEMBER 2, 2008. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

BROADBENT
1370 Ridgewood Dr., Suite 5
Chico, California 95973
Project No.: 08-82-603 Date: 04/28/2013

Station #498
286 South Livermore Avenue
Livermore, California

MTBE ISO Concentration Contour Map from Hydropunch Groundwater Samples - March 2013

Drawing 5

A

A'

MW-2

SB-9 (5' SE)

STATION BUILDING

SB-10 (3' SE)

MW-1 (5' SE)

SB-12 (7' SE)

SB-11

0'

10'

20'

30'

40'

50'

60'

SB-10-15'

SB-12-15'

SB-11-15'

SB-9-20'

SB-12-30'

SB-9-37'

TD 40'

TD 57'

TD 58'

TD 58'

TD 58'

TD 58'

Unknown - Air Knife from 0' to 6.5', Auger from 6.5' to 10'

SW - Sand

SM - Sand and Silty Sand

SM - Silty Sand and Sandy Silt

CL - Clay and Silty Clay

CL - Clay

Boring ID with Projected Distance and Direction (feet)

Extent of Boring

Extent of Well Screen (Where Applicable)

TD = Total Depth (feet)

Piezometric Surface Calculated from Pore Pressure Dissipation Tests (March 18-22, 2013)

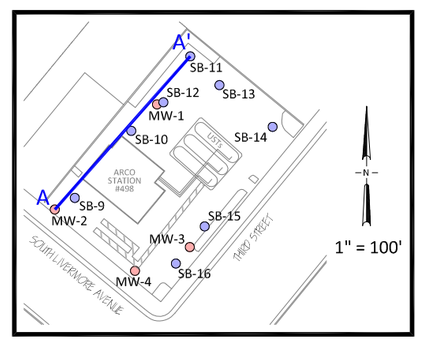
Static Groundwater Elevation (April 24, 2013)

Soil Sample Location

0 10 20

SCALE (ft)

NO VERTICAL EXAGGERATION



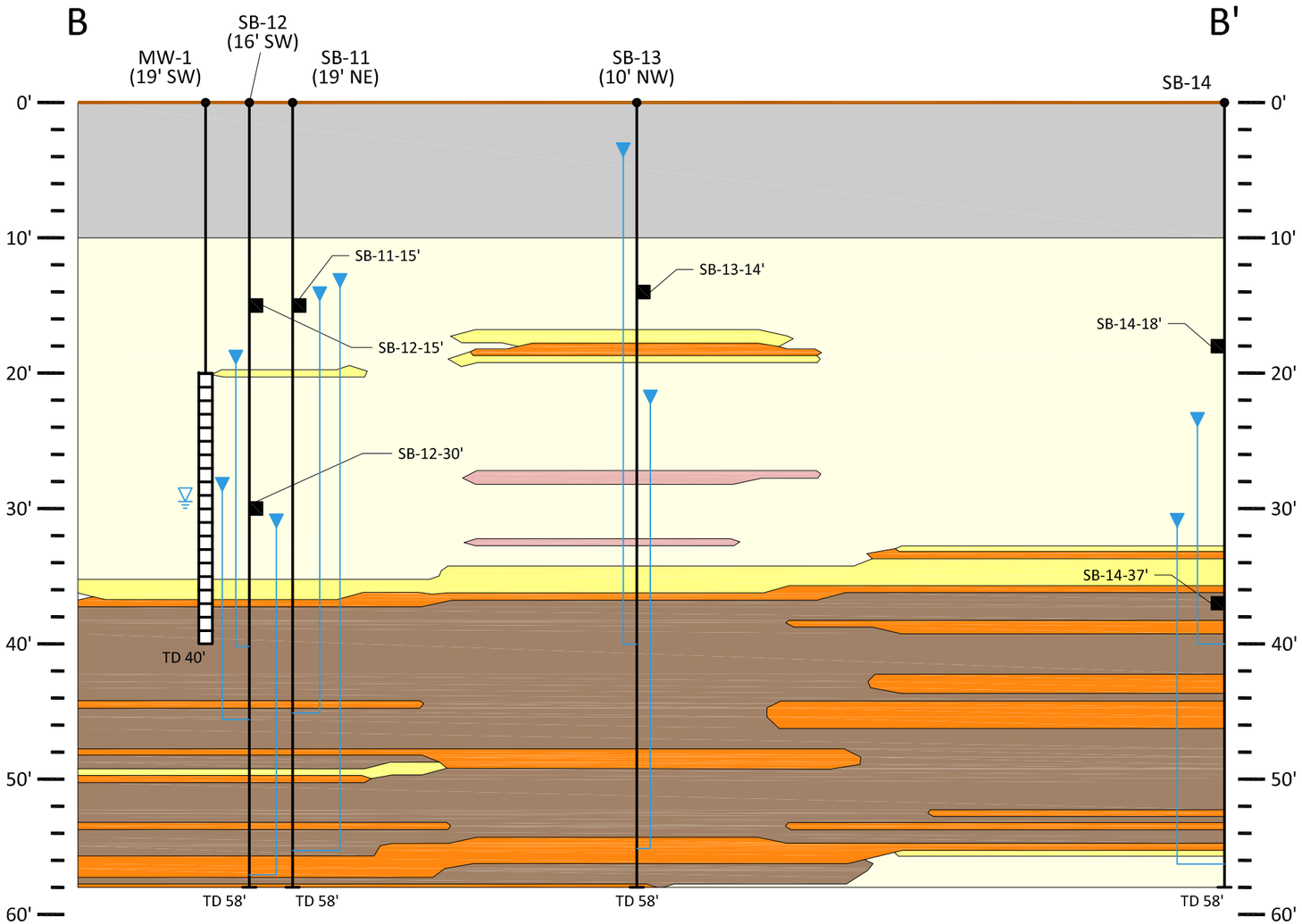
Note:
MW-1, MW-2, MW-3, and MW-4 lithology not used
Vertical scale is feet below ground surface

Drawing 6

Geologic Cross Section A - A'

Station #498
286 South Livermore Avenue
Livermore, California

BROADBENT
1370 Ridgewood Dr., Suite 5
Chico, California 95973
Project No.: 08-82-603 Date: 4/26/2013



Unknown - Air Knife from 0' to 6.5', Auger from 6.5' to 10'

SW - Sand

SM - Sand and Silty Sand

SM - Silty Sand and Sandy Silt

CL - Clay and Silty Clay

CL - Clay

Boring ID with Projected Distance and Direction (feet)

Extent of Boring

Extent of Well Screen (Where Applicable)

TD = Total Depth (feet)

Piezometric Surface Calculated from Pore Pressure Dissipation Tests (March 18-22, 2013)

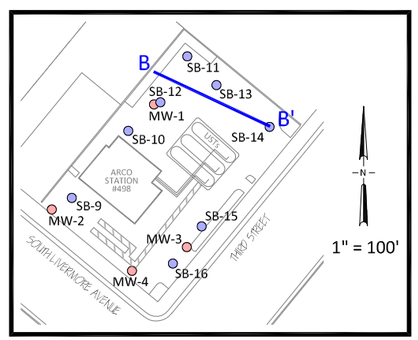
Static Groundwater Elevation (April 24, 2013)

Soil Sample Location

0 10 20

SCALE (ft)

NO VERTICAL EXAGGERATION



Note:
MW-1, MW-2, MW-3, and MW-4 lithology not used
Vertical scale is feet below ground surface

Drawing 7

Geologic Cross Section B - B'

Station #498
286 South Livermore Avenue
Livermore, California

BROADBENT
1370 Ridgewood Dr., Suite 5
Chico, California 95973
Project No.: 08-82-603 Date: 4/25/2013

C

C'

MW-4

SB-16 (16' SE)

MW-3 (15' SE)

SB-15 (13' SE)

SB-14

0'

10'

20'

30'

40'

50'

60'

SB-16-13'

SB-16-26'

SB-15-24'

SB-15-38'

SB-14-18'

SB-14-37'

TD 40'

TD 57'

TD 58'

TD 58'

TD 58'

Unknown - Air Knife from 0' to 6.5', Auger from 6.5' to 10'

SM - Sand and Silty Sand

SM - Silty Sand and Sandy Silt

CL - Clay and Silty Clay

CL - Clay

Boring ID with Projected Distance and Direction (feet)

Extent of Boring

Extent of Well Screen (Where Applicable)

TD = Total Depth (feet)

Piezometric Surface Calculated from Pore Pressure Dissipation Tests (March 18-22, 2013)

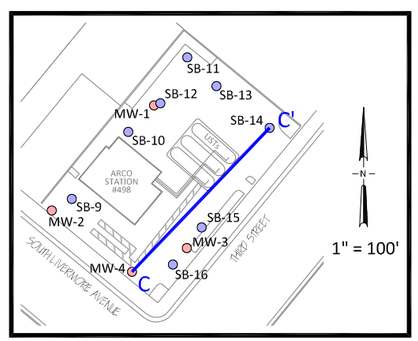
Static Groundwater Elevation (April 24, 2013)

Soil Sample Location

0 10 20

SCALE (ft)

NO VERTICAL EXAGGERATION



Note:
MW-1, MW-2, MW-3, and MW-4 lithology not used
Vertical scale is feet below ground surface

Drawing 8

Geologic Cross Section C - C'

Station #498
286 South Livermore Avenue
Livermore, California

BROADBENT
1370 Ridgewood Dr., Suite 5
Chico, California 95973
Project No.: 08-82-603 Date: 4/25/2013

TABLES

Table 1. Summary of Soil Sample Analytical Data
Station #498, 286 South Livermore Avenue, Livermore, California

Soil Boring Identification*	Sample ID	Date Collected	GRO mg/kg	Benzene mg/kg	Toluene mg/kg	Ethylbenzene mg/kg	Xylenes mg/kg	MTBE mg/kg	Comments
SB-9	SB-9-20'	3/22/2013	<0.380	<0.0020	<0.0020	<0.0020	<0.0040	<0.0049	
	SB-9-37'	3/22/2013	<0.390	<0.0020	<0.0020	<0.0020	<0.0040	<0.0049	
SB-10	SB-10-15'	3/18/2013	<0.400	<0.0020	<0.0020	<0.0020	<0.0040	<0.0049	
SB-11	SB-11-15'	3/20/2013	<0.390	<0.0020	<0.0020	<0.0020	<0.0040	<0.0049	
SB-12	SB-12-15'	3/20/2013	<0.400	<0.0020	<0.0020	<0.0020	<0.0040	<0.0050	
	SB-12-30'	3/20/2013	<0.350	<0.0020	<0.0020	<0.0020	<0.0040	<0.0050	
SB-13	SB-13-14'	3/21/2013	<0.390	<0.0020	<0.0020	<0.0020	<0.0040	<0.0050	
	SB-13-27'	3/21/2013	<0.370	<0.0020	<0.0020	<0.0020	<0.0040	<0.0050	
SB-14	SB-14-18'	3/22/2013	<0.38	<0.0020	<0.0020	<0.0020	<0.0040	<0.0050	
	SB-14-37'	3/22/2013	<0.38	<0.0020	<0.0020	<0.0020	<0.0039	<0.0049	
SB-15	SB-15-24'	3/21/2013	<0.38	<0.0020	<0.0020	<0.0020	<0.0040	<0.0050	
	SB-15-38'	3/21/2013	**1,500**	**4.8**	**53**	**35**	**230**	<2.5	
SB-16	SB-16-13'	3/21/2013	<0.40	<0.0020	<0.0020	<0.0020	<0.0040	<0.0049	
	SB-16-26'	3/21/2013	<0.36	<0.0020	<0.0020	<0.0020	<0.0040	<0.0050	
ESLs	--	--	83	0.044	2.9	2.9	2.3	0.023	

Abbreviations & Symbols:

Bolded concentrations exceed their respective ESL.

* = See Drawing 2 for soil boring locations.

GRO: Gasoline range organics.

TestAmerica: GRO (C6-C12)

GRO analyzed using EPA method 8015B

Benzene, Toluene, Ethylbenzene, Total Xylenes, and MTBE analyzed using EPA method 8260B.

mg/kg = Milligrams per kilogram.

ESLs = Environmental Screening Levels for deep soil (>3 meters bgs) where groundwater is a current or potential source of drinking water (San Francisco Bay Regional Water Quality Control Board, 2013).

bgs = Below ground surface

Notes:

1,2-dibromoethane (EDB), 1,2-dichloroethane (1,2 DCA), tert-butyl alcohol (TBA), Di-isopropyl ether (DIPE), ethyl tert-butyl ether (ETBE), ter-amyl methyl ether (TAME), and ethanol were not detected at or above their respective laboratory reporting limit.

The last number in each Sample ID denotes the depth at which the sample was collected in feet bgs (i.e., SB-9-20' was collected at a depth of 20 feet bgs)

Table 2. Summary of Groundwater Sample Analytical Data
Station #498, 286 South Livermore Avenue, Livermore, California

Sample ID*	Sample Depth (ft. bgs)	Date Collected	GRO µg/L	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Xylenes µg/L	MTBE µg/L	TBA µg/L	TAME µg/L	Comments
SB-9	55-60	3/22/2013	<50	<0.50	<0.50	<0.50	<1.0	1.9	<10	<0.50	
SB-10	45-50	3/18/2013	<50	<2.0	<2.0	<2.0	<4.0	**520**	**67**	<2.0	
SB-11	45-50	3/20/2013	73	<5.0	<5.0	<5.0	<10	**1,700**	**570**	7.5	
SB-12	45-50	3/20/2013	<50	<1.0	<1.0	<1.0	<2.0	**570**	**21**	4	
SB-13	51-56	3/21/2013	<50	<0.50	<0.50	<0.50	<1.0	**100**	<10	<0.50	
SB-14	55-60	3/22/2013	<50	<0.50	<0.50	<0.50	<1.0	<0.50	<10	<0.50	
SB-15	50-55	3/21/2013	**6,300**	**4.7**	8.2	**110**	**52**	<1.0	<20	<1.0	
SB-16	55-60	3/21/2013	**26,000**	**180**	**360**	**1,500**	**9,300**	<25	<500	<25	
ESLs	--	--	100	1.0	40	30	20	5.0	12	--	

Abbreviations & Symbols:

Bolded concentrations exceed their respective ESL.

* = See Drawing 2 for soil boring locations.

-- = Not applicable or available

GRO: Gasoline range organics.

TestAmerica.: GRO (C6-C12)

GRO analyzed using EPA method 8015B

TBA = Tert-butyl alcohol

TAME = Tert-amyl methyl ether

Benzene, Toluene, Ethylbenzene, Total Xylenes, MTBE, TBA and TAME analyzed using EPA method 8260B.

µg/L = Micrograms per liter.

ESLs = Environmental Screening Levels where groundwater is a current or potential source of drinking water (San Francisco Bay Regional Water Quality Control Board, 2013).

bgs = Below ground surface

Notes:

1,2-dibromoethane (EDB), 1,2-dichloroethane (1,2 DCA), Di-isopropyl ether (DIPE), ethyl tert-butyl ether (ETBE), and ethanol were not detected at or above their respective laboratory reporting limit.

Table 3. Summary of Pore Pressure Dissipation Tests and Corresponding Piezometric Surface
Station #498, 286 South Livermore Avenue, Livermore, California

CPT Boring ID	Test Depth (ft bgs)	u_0 (psi)	u_0 (ft H_2O)	Piezometric Surface (ft bgs)
SB-9	32.80	Not Applicable - Readings did not reach equilibrium		
SB-9	45.11	Negative readings indicative of dry soil conditions		
SB-9	52.00	Negative readings indicative of dry soil conditions		
SB-9	57.07	Negative readings indicative of dry soil conditions		
SB-10	29.50	Negative readings indicative of dry soil conditions		
SB-10	39.50	Not Applicable - Test terminated early		
SB-10	42.98	3.46	7.99	34.99
SB-10	49.21	Not Applicable - Readings did not reach equilibrium		
SB-10	57.74	6.62	15.29	42.45
SB-11	25.09	Negative readings indicative of dry soil conditions		
SB-11	36.42	Negative readings indicative of dry soil conditions		
SB-11	45.11	13.19	30.47	14.64
SB-11	55.28	18.02	41.63	13.65
SB-12	15.09	Negative readings indicative of dry soil conditions		
SB-12	20.01	Negative readings indicative of dry soil conditions		
SB-12	25.26	Negative readings indicative of dry soil conditions		
SB-12	30.02	Negative readings indicative of dry soil conditions		
SB-12	35.10	Negative readings indicative of dry soil conditions		
SB-12	40.19	9.04	20.88	19.31
SB-12	45.60	7.31	16.89	28.71
SB-12	57.07	11.11	25.66	31.41
SB-13	40.03	15.60	36.04	3.99
SB-13	55.12	14.22	32.85	22.27
SB-14	40.02	6.97	16.10	23.92
SB-14	56.27	10.77	24.88	31.39
SB-15	40.35	8.00	18.48	21.87
SB-15	58.07	11.11	25.66	32.41
SB-16	35.10	2.82	6.51	28.59
SB-16	55.12	6.62	15.29	39.83
SB-16	57.91	6.62	15.29	42.62

Abbreviations and Notes:

ft = feet

bgs = below ground surface

psi = pounds per square inch

H_2O = Water

u_0 = Equilibrium pore pressure at end of dissipation test

Conversion: 1 psi = 2.31 ft H_2O

Piezometric Surface (ft bgs) = Test Depth (ft bgs) – u0 (feet H_2O)

Appendix A

Historic Soil Analytical Data

Table 1 - Soil Analytical Data
ARCO Service Station #0498
286 South Livermore Avenue, Livermore California

Sample Name	Sample Depth (ft)	Date Sampled	TPH-GRO (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (mg/kg)
SB-1-7'	7.0	01/20/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-1-12'	12.0	01/20/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-1-17'	17.0	01/20/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-1-22'	22.0	01/20/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-1-24'	24.0	01/20/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-2-10'	10.0	01/19/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-2-15'	15.0	01/19/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-2-18.5'	18.5	01/19/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-3-10'	10.0	01/19/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-3-15'	15.0	01/19/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-3-20'	20.0	01/19/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-3-25'	25.0	01/19/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-4-7'	7.0	01/19/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-4-12'	12.0	01/19/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-4-17'	17.0	01/19/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-4-22'	22.0	01/19/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-5-10'	10.0	01/20/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-5-15'	15.0	01/20/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-6-10'	10.0	01/20/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-6-15'	15.0	01/20/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-6-22'	22.0	01/20/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-7-10'	10.0	01/20/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-7-14.5'	14.5	01/20/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-7-20'	20.0	01/20/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-8-10'	10.0	01/20/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-8-15'	15.0	01/20/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-8-20'	20.0	01/20/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-8-25'	25	01/20/05	ND <1.0	ND <0.005	ND <0.005	ND <0.005	ND <0.005

Notes:
ND = Not Detected at or above the laboratory reporting limit
mg/kg = milligrams per kilogram
TPH-GRO = Total Petroleum Hydrocarbons gasoline range organics
BTEX = Benzene, toluene, ethylbenzene, and xylenes

Table 2 Soil Analytical Data-Oxygenates
ARCO Service Station #0498
286 South Livermore Avenue, Livermore California

Sample Name	Sample Depth (ft)	Date Sampled	Ethanol (mg/kg)	TBA (mg/kg)	MTBE (mg/kg)	DIPE (mg/kg)	ETBE (mg/kg)	TAME (mg/kg)	1,2-DCA (mg/kg)	EDB (mg/kg)
SB-1-7'	7.0	01/20/05	ND <0.1	ND <0.01	ND <0.005	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-1-12'	12.0	01/20/05	ND <0.1	ND <0.01	ND <0.005	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-1-17'	17.0	01/20/05	ND <0.1	ND <0.01	ND <0.005	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-1-22'	22.0	01/20/05	ND <0.1	**0.031**	**0.015**	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-1-24'	24.0	01/20/05	ND <0.1	**0.025**	**0.006**	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-2-10'	10.0	01/19/05	ND <0.1	ND <0.01	ND <0.005	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-2-15'	15.0	01/19/05	ND <0.1	ND <0.01	ND <0.005	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-2-18.5'	18.5	01/19/05	ND <0.1	ND <0.01	ND <0.005	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-3-10'	10.0	01/19/05	ND <0.1	ND <0.01	ND <0.005	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-3-15'	15.0	01/19/05	ND <0.1	ND <0.01	ND <0.005	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-3-20'	20.0	01/19/05	ND <0.1	ND <0.01	ND <0.005	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-3-25'	25.0	01/19/05	ND <0.1	**0.021**	**0.011**	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-4-7'	7.0	01/19/05	ND <0.1	ND <0.01	ND <0.005	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-4-12'	12.0	01/19/05	ND <0.1	ND <0.01	ND <0.005	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-4-17'	17.0	01/19/05	ND <0.1	ND <0.01	ND <0.005	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-4-22'	22.0	01/19/05	ND <0.1	ND <0.01	ND <0.005	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-5-10'	10.0	01/20/05	ND <0.1	ND <0.01	ND <0.005	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-5-15'	15.0	01/20/05	ND <0.1	ND <0.01	ND <0.005	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-6-10'	10.0	01/20/05	ND <0.1	ND <0.01	ND <0.005	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-6-15'	15.0	01/20/05	ND <0.1	ND <0.01	ND <0.005	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-6-22'	22.0	01/20/05	ND <0.1	ND <0.01	ND <0.005	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-7-10'	10.0	01/20/05	ND <0.1	ND <0.01	ND <0.005	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-7-14.5'	14.5	01/20/05	ND <0.1	ND <0.01	ND <0.005	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-7-20'	20.0	01/20/05	ND <0.1	ND <0.01	ND <0.005	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-8-10'	10.0	01/20/05	ND <0.1	ND <0.01	ND <0.005	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-8-15'	15.0	01/20/05	ND <0.1	ND <0.01	ND <0.005	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-8-20'	20.0	01/20/05	ND <0.1	ND <0.01	ND <0.005	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005
SB-8-25'	25	01/20/05	ND <0.1	**0.012**	**0.022**	ND <0.01	ND <0.005	ND <0.005	ND <0.005	ND <0.005

Notes:

ND = Not Detected at or above the laboratory reporting limit
mg/kg = milligrams per kilogram
TBA = Tert-butyl alcohol
MTBE = Methyl tertiary butyl ether
DIPE = Di-isopropyl ether
ETBE = Ethyl tertiary butyl ether
TAME = Tert-amyl methyl ether
1,2-DCA = 1,2-Dichloroethane
EDB = 1,2-Dibromoethane

Table 1. Summary of Soil Sample Analytical Data

Station #498, 286 South Livermore Avenue, Livermore, CA

Boring and Sample Date	Sample ID	Concentrations in (mg/kg)								Comments
		GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE	Ethanol	TBA	
MW-1										
11/24/2008	MW-1 25'	**45**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.10	<0.010	
11/24/2008	MW-1 30'	**0.86**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.10	<0.010	
11/24/2008	MW-1 40'	<0.50	<0.0010	<0.0010	<0.0010	<0.0010	**0.16**	**0.23**	**0.036**	
MW-2										
11/24/2008	MW-2 40'	<0.50	<0.0010	<0.0010	<0.0010	<0.0010	**0.010**	<0.10	**0.022**	
11/24/2008	MW-2 45'	**18**	<0.0010	<0.0010	<0.0010	<0.0010	**0.0019**	**0.44**	**0.022**	
11/24/2008	MW-2 50'	<0.50	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.10	<0.010	
MW-3										
11/26/2008	MW-3 15'	**6.7**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.10	**0.14**	
11/26/2008	MW-3 20'	**210**	<0.0010	<0.0010	**0.88**	<0.0010	<0.0010	<0.10	<0.010	
11/26/2008	MW-3 25'	**530**	<0.10	<0.10	**1.5**	**0.17**	<0.10	<10	<1.0	
11/26/2008	MW-3 30'	**0.84**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.10	<0.010	
11/26/2008	MW-3 35'	<0.50	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.10	**0.028**	
11/26/2008	MW-3 40'	<0.50	<0.0010	<0.0010	<0.0010	<0.0010	**0.013**	<0.10	**0.014**	
MW-4										
11/25/2008	MW-4 30'	**2.0**	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.35**	**0.054**	
11/25/2008	MW-4 35'	**75**	<0.0010	<0.0010	<0.0010	<0.0010	**0.0030**	<0.10	**0.65**	
11/25/2008	MW-4 40'	<0.50	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.10	**0.14**	

SYMBOLS AND ABBREVIATIONS:

< = Not detected at or above specified laboratory reporting limit
GRO = Gasoline range organics
MTBE = Methyl tert-butyl ether
TBA = Tert-Butyl Alcohol
mg/kg = Milligrams per Kilogram

NOTES:

1,2-dibromoethane (EDB), 1,2-dichloroethane (1,2 DCA), Di-isopropyl ether (DIPE), ethyl tert-butyl ether (ETBE) and ter-amyl methyl ether (TAME) were not detected at or above their respective laboratory reporting limits.

GRO (C6-C12) analyzed using EPA method 8015B.

Benzene, toluene, ethylbenzene, total xylenes, MTBE, ethanol and TBA analyzed using EPA method 8260B.

The number after space in Sample ID denotes the depth at which the sample was collected in feet bls.

Appendix B

Historic Groundwater Monitoring and Analytical Data

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #498, 286 South Livermore Avenue, Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Product Thickness (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
								GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-1																
12/29/2008	P	496.72	20.00	40.00	28.81	0.00	467.91	1,100	38	1.2	4.0	3.3	17	2.72	6.83	
3/20/2009	P		20.00	40.00	28.95	0.00	467.77	640	9.1	<0.50	4.1	<0.50	21	0.35	7.28	
6/2/2009	P		20.00	40.00	30.90	0.00	465.82	600	1.6	<0.50	<0.50	<0.50	32	0.59	7.17	
9/2/2009	P		20.00	40.00	32.00	0.00	464.72	570	<0.50	<0.50	<0.50	<0.50	5.3	1.02	7.38	
11/9/2009	P		20.00	40.00	31.82	0.00	464.90	1,000	130	12	35	39	140	1.39	7.02	
5/20/2010	P		20.00	40.00	28.94	0.00	467.78	1,000	4.4	<0.50	0.76	0.73	22	0.59	6.6	
11/2/2010	P		20.00	40.00	32.03	0.00	464.69	1,300	83	20	40	61	39	0.72	6.0	b (GRO), c
5/25/2011	P		20.00	40.00	26.69	0.00	470.03	2,900	32	3.1	20	2.9	<0.50	0.68	7.0	lw (GRO)
10/25/2011	P		20.00	40.00	30.11	0.00	466.61	1,100	20	3.7	<0.50	5.4	21	0.78	7.4	lw (GRO)
4/10/2012	P		20.00	40.00	30.35	0.00	466.37	1,300	13	2.0	7.0	7.1	5.0	0.20	6.71	lw (GRO)
10/9/2012	**NP**		**20.00**	**40.00**	**37.61**	**0.00**	**459.11**	**700**	**<0.50**	**<0.50**	**<0.50**	**<1.0**	**3.2**	**2.79**	**7.93**	
MW-2																
12/29/2008	P	495.35	37.00	57.00	48.76	0.00	446.59	110	7.1	<0.50	<0.50	0.76	16	1.04	7.67	
3/20/2009	P		37.00	57.00	38.78	0.00	456.57	200	3.9	<1.0	<1.0	<1.0	56	0.41	7.51	
6/2/2009	P		37.00	57.00	43.98	0.00	451.37	110	5.1	<1.0	<1.0	<1.0	44	1.87	7.42	
9/2/2009	P		37.00	57.00	50.25	0.00	445.10	88	0.79	<0.50	<0.50	<0.50	12	1.55	6.91	
11/9/2009	P		37.00	57.00	43.79	0.00	451.56	58	2.0	<0.50	<0.50	<0.50	13	0.86	7.14	
5/20/2010	P		37.00	57.00	32.07	0.00	463.28	<50	<0.50	<0.50	<0.50	<0.50	27	0.61	6.8	
11/2/2010	P		37.00	57.00	39.23	0.00	456.12	<50	<0.50	<0.50	<0.50	<0.50	57	1.34	6.8	
5/25/2011	P		37.00	57.00	28.19	0.00	467.16	<50	<0.50	<0.50	<0.50	<0.50	15	3.74	7.1	
10/25/2011	P		37.00	57.00	33.33	0.00	462.02	<50	<0.50	<0.50	<0.50	<0.50	5.7	1.28	7.8	
4/10/2012	P		37.00	57.00	39.25	0.00	456.10	<50	<0.50	<0.50	<0.50	<0.50	1.1	1.04	7.13	
10/9/2012	**P**		**37.00**	**57.00**	**41.84**	**0.00**	**453.51**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<1.0**	**0.60**	**2.76**	**7.71**	
MW-3																
12/29/2008	P	496.32	37.00	57.00	48.21	0.00	448.11	28,000	310	200	840	6,200	71	1.95	7.39	
3/20/2009	P		37.00	57.00	38.48	0.00	457.84	11,000	360	84	600	1,500	71	0.56	7.25	
6/2/2009	P		37.00	57.00	43.33	0.00	452.99	5,100	310	14	180	310	66	2.06	7.18	a
9/2/2009	P		37.00	57.00	49.60	0.00	446.72	25,000	380	150	930	2,900	75	1.35	6.93	
11/9/2009	P		37.00	57.00	43.25	0.00	453.07	6,900	390	27	480	680	69	0.54	6.9	

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #498, 286 South Livermore Avenue, Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Product Thickness (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
								GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-3 Cont.																
5/20/2010	P	496.32	37.00	57.00	31.56	0.00	464.76	9,400	690	<10	300	83	77	0.36	6.8	
11/2/2010	P		37.00	57.00	38.68	0.00	457.64	4,400	420	<10	110	33	70	0.59	6.8	b (GRO)
5/25/2011	P		37.00	57.00	27.56	0.00	468.76	4,500	560	<10	210	22	74	0.70	9.8	lw (GRO)
10/25/2011	P		37.00	57.00	32.77	0.00	463.55	2,700	190	<4.0	82	51	33	0.69	7.6	
4/10/2012	P		37.00	57.00	38.69	0.00	457.63	3,000	440	<4.0	69	10	46	0.28	6.57	lw (GRO)
10/9/2012	**P**		**37.00**	**57.00**	**41.19**	**0.00**	**455.13**	**1,600**	**210**	**<2.0**	**28**	**7.4**	**33**	**1.23**	**7.39**	
MW-4																
12/29/2008	--	496.01	20.00	40.00	--	--	--	--	--	--	--	--	--	--	--	Dry
3/20/2009	P		20.00	40.00	37.82	0.00	458.19	410	0.78	<0.50	<0.50	0.64	16	0.52	7.16	
6/2/2009	--		20.00	40.00	--	--	--	--	--	--	--	--	--	--	--	Dry
9/2/2009	--		20.00	40.00	--	--	--	--	--	--	--	--	--	--	--	Dry
11/9/2009	--		20.00	40.00	--	--	--	--	--	--	--	--	--	--	--	Dry
5/20/2010	P		20.00	40.00	31.29	0.00	464.72	290	<2.0	<2.0	<2.0	<2.0	10	0.82	6.6	
11/2/2010	NP		20.00	40.00	38.42	0.00	457.59	51	<2.0	<2.0	<2.0	<2.0	5.1	1.12	6.4	b (GRO), c
5/25/2011	P		20.00	40.00	27.58	0.00	468.43	94	<1.0	<1.0	<1.0	<1.0	6.2	0.86	6.9	lw (GRO)
10/25/2011	P		20.00	40.00	32.51	0.00	463.50	73	<0.50	<0.50	<0.50	<0.50	4.3	0.49	7.4	lw (GRO)
4/10/2012	--		20.00	40.00	38.47	0.00	457.54	<50	<0.50	<0.50	<0.50	<0.50	0.85	--	7.06	
10/9/2012	**--**		**20.00**	**40.00**	**39.86**	**0.00**	**456.15**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**d**

Symbols & Abbreviations:
-- = Not sampled/analyzed/applicable/measured/ available
< = Not detected at or above specified laboratory reporting limit
DO = Dissolved oxygen
DTW = Depth to water in ft bgs
ft bgs= feet below ground surface
ft MSL= feet above mean sea level
GRO = Gasoline range organics
GWE = Groundwater elevation measured in ft MSL
mg/L = Milligrams per liter
MTBE = Methyl tert-butyl ether
NP = Not purged before sampling
P = Purged before sampling
TOC = Top of casing measured in ft MSL
µg/L = Micrograms per liter

Footnotes:
a = Sample preserved improperly
b = Quantitation of unknown hydrocarbon(s) in sample based on gasoline
c = Hydrocarbon odor
d = Insufficient water within well casing to collect sample
lw = Quantitated against gasoline

Table 2. Summary of Fuel Additives Analytical Data

ARCO Service Station #498, 286 South Livermore Avenue, Livermore, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-1									
12/29/2008	<300	<10	17	<0.50	<0.50	<0.50	<0.50	<0.50	
3/20/2009	<300	25	21	<0.50	<0.50	<0.50	<0.50	<0.50	
6/2/2009	<300	28	32	<0.50	<0.50	<0.50	<0.50	<0.50	
9/2/2009	<300	17	5.3	<0.50	<0.50	<0.50	<0.50	<0.50	
11/9/2009	<300	47	140	<0.50	<0.50	3.1	<0.50	<0.50	
5/20/2010	<300	75	22	<0.50	<0.50	<0.50	<0.50	<0.50	
11/2/2010	<300	50	39	<0.50	<0.50	<0.50	<0.50	<0.50	
5/25/2011	<300	32	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
10/25/2011	<300	78	21	<0.50	<0.50	0.72	<0.50	<0.50	
4/10/2012	<300	49	5.0	<0.50	<0.50	<0.50	<0.50	<0.50	
10/9/2012	**<150**	**47**	**3.2**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
MW-2									
12/29/2008	<300	22	16	<0.50	<0.50	<0.50	<0.50	<0.50	
3/20/2009	<600	62	56	<1.0	<1.0	<1.0	<1.0	<1.0	
6/2/2009	<600	83	44	<1.0	<1.0	<1.0	<1.0	<1.0	
9/2/2009	<300	37	12	<0.50	<0.50	<0.50	<0.50	<0.50	
11/9/2009	<300	41	13	<0.50	<0.50	<0.50	<0.50	<0.50	
5/20/2010	<300	22	27	<0.50	<0.50	<0.50	<0.50	<0.50	
11/2/2010	<300	26	57	<0.50	<0.50	<0.50	<0.50	<0.50	
5/25/2011	<300	<10	15	<0.50	<0.50	<0.50	<0.50	<0.50	
10/25/2011	<300	<10	5.7	<0.50	<0.50	<0.50	<0.50	<0.50	
4/10/2012	<300	<10	1.1	<0.50	<0.50	<0.50	<0.50	<0.50	
10/9/2012	**<150**	**<10**	**0.60**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
MW-3									
12/29/2008	<30,000	<1,000	71	<50	<50	<50	<50	<50	
3/20/2009	<7,500	<250	71	<12	<12	<12	<12	<12	
6/2/2009	<3,000	100	66	<5.0	<5.0	<5.0	<5.0	<5.0	
9/2/2009	<7,500	<250	75	<12	<12	<12	<12	<12	
11/9/2009	<3,000	<100	69	<5.0	<5.0	<5.0	<5.0	<5.0	
5/20/2010	<6,000	<200	77	<10	<10	<10	<10	<10	

Table 2. Summary of Fuel Additives Analytical Data

ARCO Service Station #498, 286 South Livermore Avenue, Livermore, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-3 Cont.									
11/2/2010	<6,000	<200	70	<10	<10	<10	<10	<10	
5/25/2011	<6000	<200	74	<10	<10	<10	<10	<10	
10/25/2011	<2,400	<80	33	<4.0	<4.0	<4.0	<4.0	<4.0	
4/10/2012	<2,400	<80	46	<4.0	<4.0	<4.0	<4.0	<4.0	
10/9/2012	**<600**	**56**	**33**	**<2.0**	**<2.0**	**<2.0**	**<2.0**	**<2.0**	
MW-4									
3/20/2009	<300	2,000	16	<0.50	<0.50	<0.50	<0.50	<0.50	
5/20/2010	<1,200	1,000	10	<2.0	<2.0	<2.0	<2.0	<2.0	
11/2/2010	<1,200	500	5.1	<2.0	<2.0	<2.0	<2.0	<2.0	
5/25/2011	<600	230	6.2	<1.0	<1.0	<1.0	<1.0	<1.0	
10/25/2011	<300	150	4.3	<0.50	<0.50	<0.50	<0.50	<0.50	
4/10/2012	<300	<10	0.85	<0.50	<0.50	<0.50	<0.50	<0.50	

Symbols & Abbreviations:
--/--- = Not sampled/analyzed/applicable/measured/avaliable
< = Not detected at or above specified laboratory reporting limit
1,2-DCA = 1,2-Dichloroethane
DIPE = Diisopropyl ether
EDB= 1,2-Dibromoethane
ETBE = Ethyl tert-butyl ether
MTBE = Methyl tert-butyl ether
TAME = tert-Amyl methyl ether
TBA = tert-Butyl alcohol
µg/L = Micrograms per liter

Table 3. Historical Groundwater Gradient - Direction and Magnitude

ARCO Service Station #498, 286 South Livermore Avenue, Livermore, CA

Date Measured	Approximate Gradient Direction	Approximate Gradient Magnitude (ft/ft)
12/29/2008	NA	NA
3/20/2009	North-Northwest	0.02
6/2/2009	NA	NA
9/2/2009	NA	NA
11/9/2009	NA	NA
5/20/2010	West-Northwest	0.02
11/2/2010	West-Northwest	0.02
5/25/2011	West-Northwest	0.02
10/25/2011	West-Northwest	0.02
4/10/2012	West-Northwest	0.01
10/9/2012	**West-Northwest**	**0.02**

Symbols & Abbreviations:
NA = Not Available

Appendix C

Zone 7 Water Agency Permit

ZONE 7 WATER AGENCY

100 NORTH CANYONS PARKWAY, LIVERMORE, CALIFORNIA 94551 VOICE (925) 454-5000 FAX (925) 245-9306
E-MAIL whong@zone7water.com

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT 76 Station #498
286 South Livermore Ave., Livermore, CA

Coordinates Source _____ ft. Accuracy _____ ft.
LAT: _____ ft. LONG: _____ ft.
APN 97-109-6

CLIENT
Name Atlantic Richfield Company
Address P.O. Box 1257 Phone (925) 275-3803
City San Ramon Zip 94583

APPLICANT
Name Jason Duda
Email jduda@broadbenthac.com Fax (530) 566-1401
Address 1324 Mangrove Ave, Ste. 212 Phone (530) 566-1400
City Chico Zip 95926

TYPE OF PROJECT:

Well Construction	__	Geotechnical Investigation	
Well Destruction	__	Contamination Investigation	X
Cathodic Protection	__	Other _____	__

PROPOSED WELL USE:

Domestic	__	Irrigation	__
Municipal	__	Remediation	__
Industrial	__	Groundwater Monitoring	__
Dewatering	__	Other _____	__

DRILLING METHOD:

Mud Rotary	__	Air Rotary	__	Hollow Stem Auger	__
Cable Tool	__	Direct Push (CPT)	X	Other _____	__

DRILLING COMPANY Gregg Drilling
DRILLER'S LICENSE NO. 485765

WELL SPECIFICATIONS:
Drill Hole Diameter _____ in. Maximum
Casing Diameter _____ in. Depth _____ ft.
Surface Seal Depth _____ ft. Number _____

SOIL BORINGS:
Number of Borings 8 Maximum
Hole Diameter 2 in. Depth 60 ft.

ESTIMATED STARTING DATE 2-18-13
ESTIMATED COMPLETION DATE 2-22-13

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE _____ Date 1-14-13

ATTACH SITE PLAN OR SKETCH

PERMIT NUMBER 2013003
WELL NUMBER _____
APN 097-0109-006-00

PERMIT CONDITIONS
(Circled Permit Requirements Apply)

(A.) GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to your proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report (DWR Form 188), signed by the driller.
3. Permit is void if project not begun within 90 days of approval date.
4. Notify Zone 7 at least 24 hours before the start of work.

B. WATER SUPPLY WELLS
1. Minimum surface seal diameter is four inches greater than the well casing diameter.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved.
3. Grout placed by tremie.
4. An access port at least 0.5 inches in diameter is required on the wellhead for water level measurements.
5. A sample port is required on the discharge pipe near the wellhead.

C. GROUNDWATER MONITORING WELLS INCLUDING PIEZOMETERS
1. Minimum surface seal diameter is four inches greater than the well or piezometer casing diameter.
2. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.
3. Grout placed by tremie.

(D.) GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

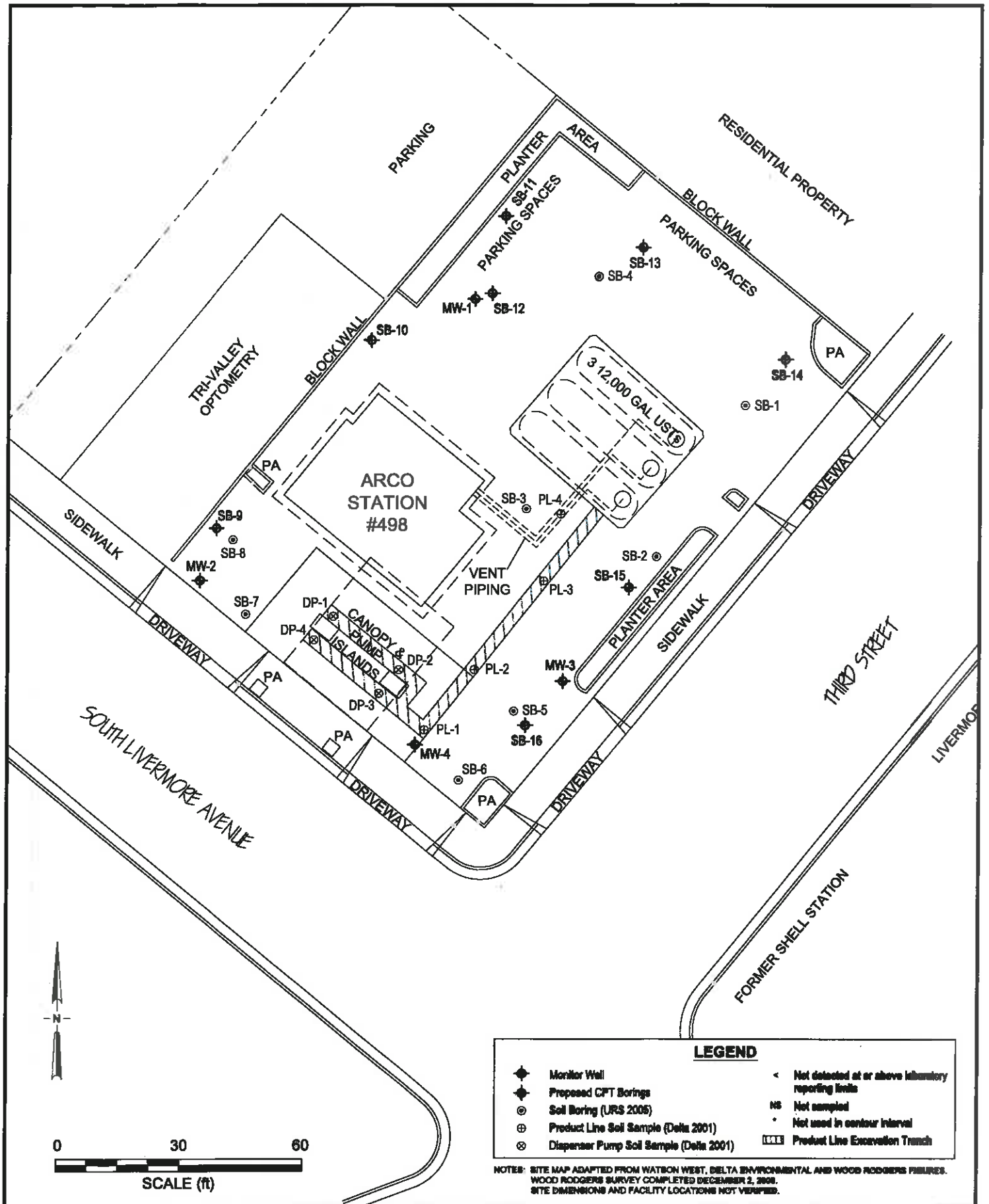
E. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

F. WELL DESTRUCTION. See attached.

(G.) SPECIAL CONDITIONS. Submit to Zone 7 within 60 days after completion of permitted work the well installation report including all soil and water laboratory analysis results.

Approved Wyman Hong Date 1/14/13
Wyman Hong

Revised: January 4, 2010



NOTES: SITE MAP ADAPTED FROM WATSON WEST, DELTA ENVIRONMENTAL AND WOOD RODGERS FIGURES.
WOOD RODGERS SURVEY COMPLETED DECEMBER 2, 2008.
SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
1324 Mangrove Ave. Suite 212
Chico, CA

Station #498
286 South Livermore Avenue
Livermore, California

Site Map with Historic Sample and Proposed Boring Locations
Project No.: 08-82-603 Date: 11/29/12

Drawing
2

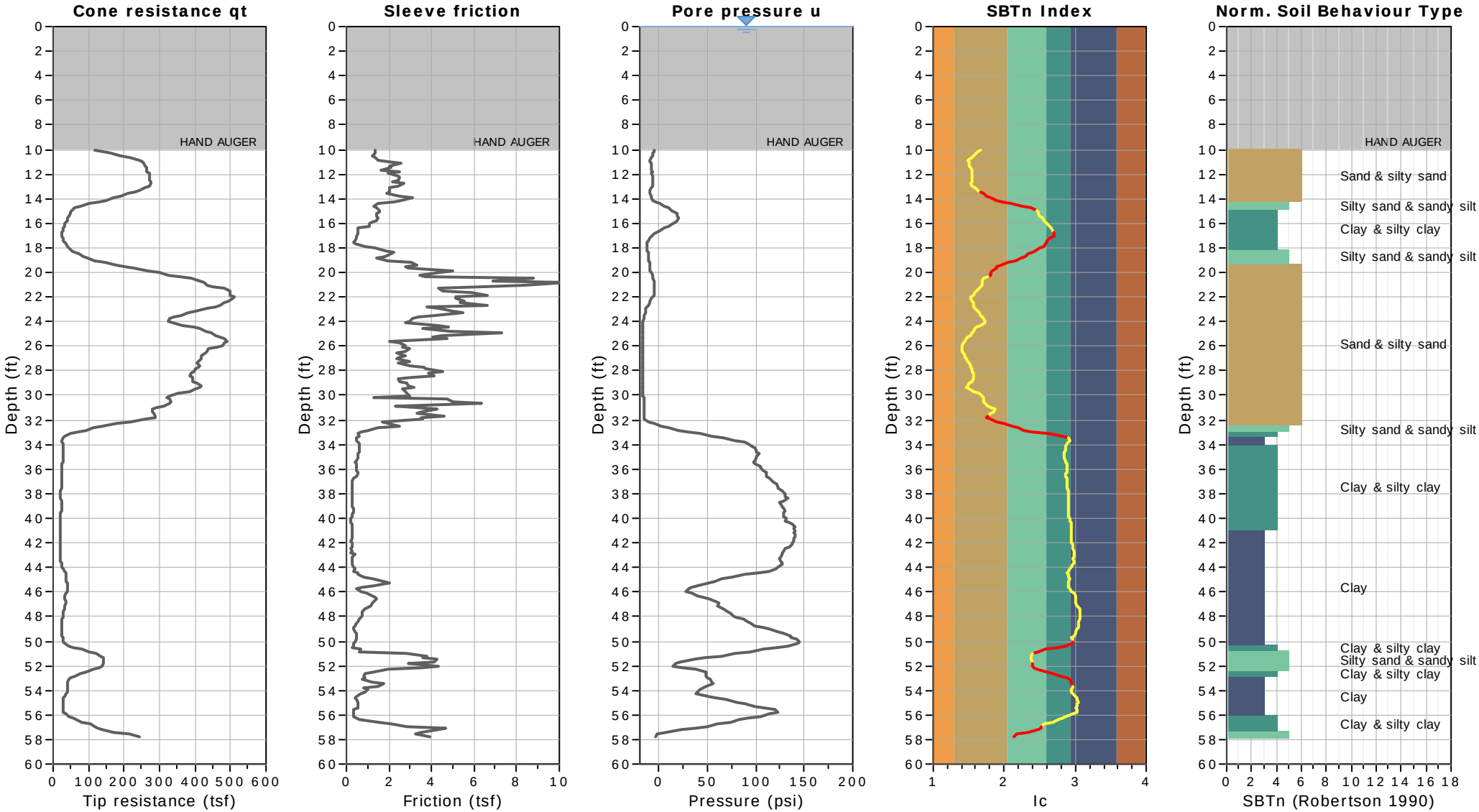
Appendix D

CPT Data Package

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: 050USB-9
Total depth: 57.74 ft, Date: 4/12/2013
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type: Uknown
Cone Operator: Uknown

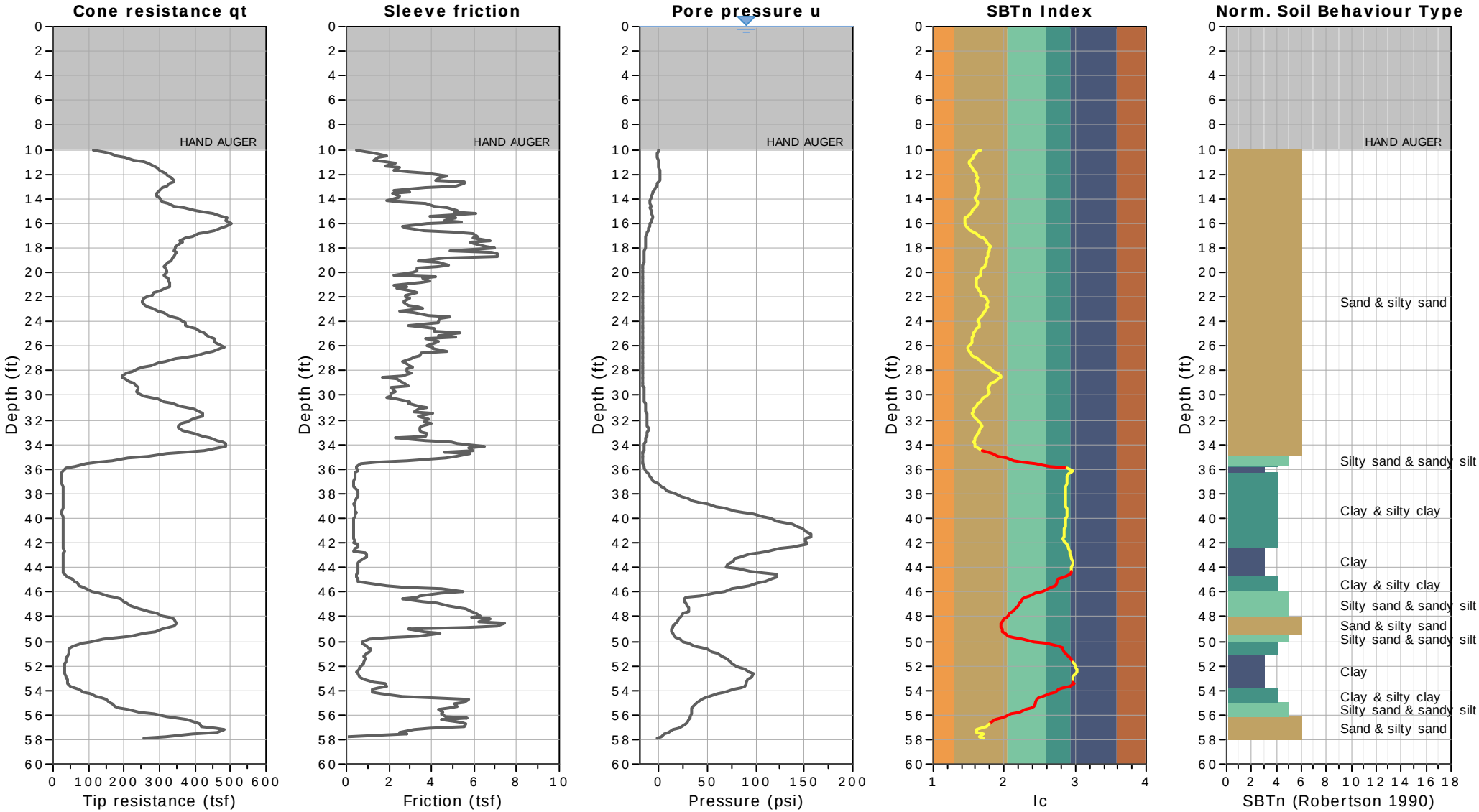
Project: BP 498
Location: 286 South Livermore Ave., Livermore, CA



GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: 050USB-10
Total depth: 57.91 ft, Date: 4/12/2013
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type: Uknown
Cone Operator: Uknown

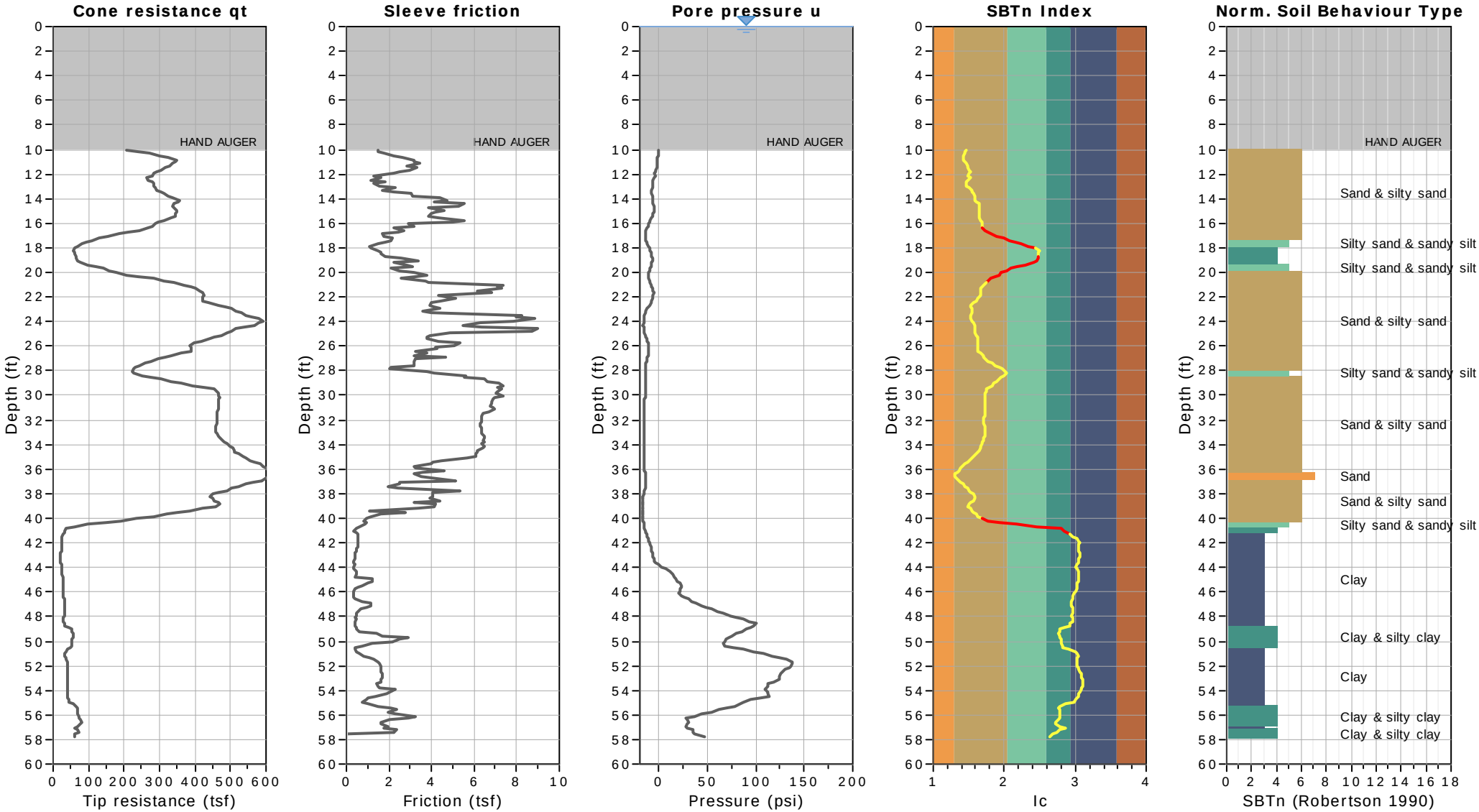
Project: BP 498
Location: 286 South Livermore Ave., Livermore, CA



GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: 050USB-11
Total depth: 57.74 ft, Date: 4/12/2013
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type: Uknown
Cone Operator: Uknown

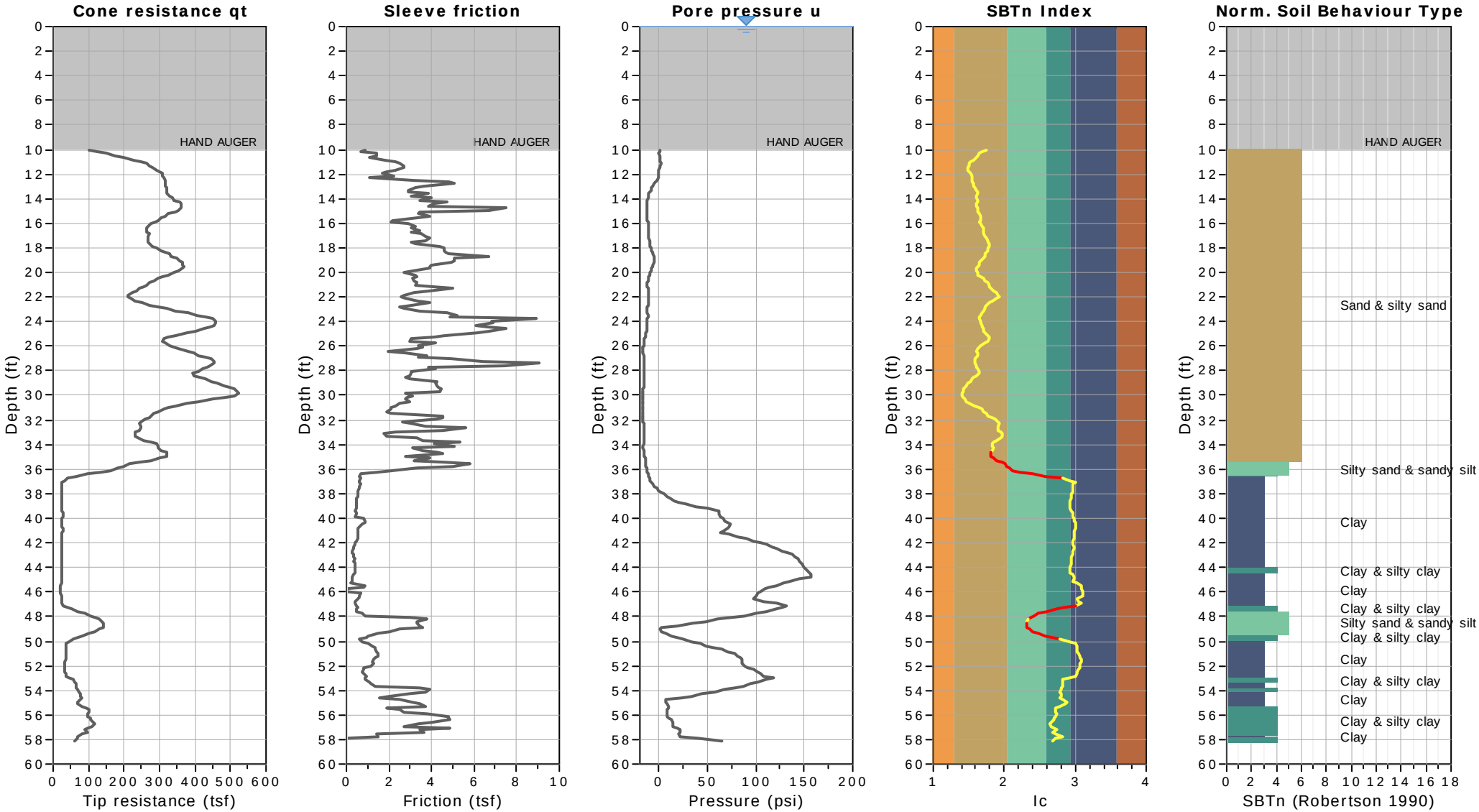
Project: **BP 498**
Location: **286 South Livermore Ave., Livermore, CA**



GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: 050USB-12
Total depth: 58.07 ft, Date: 4/12/2013
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type: Uknown
Cone Operator: Uknown

Project: **BP 498**
Location: **286 South Livermore Ave., Livermore, CA**



GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: 050USB-13
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Surface Elevation: 0.00 ft
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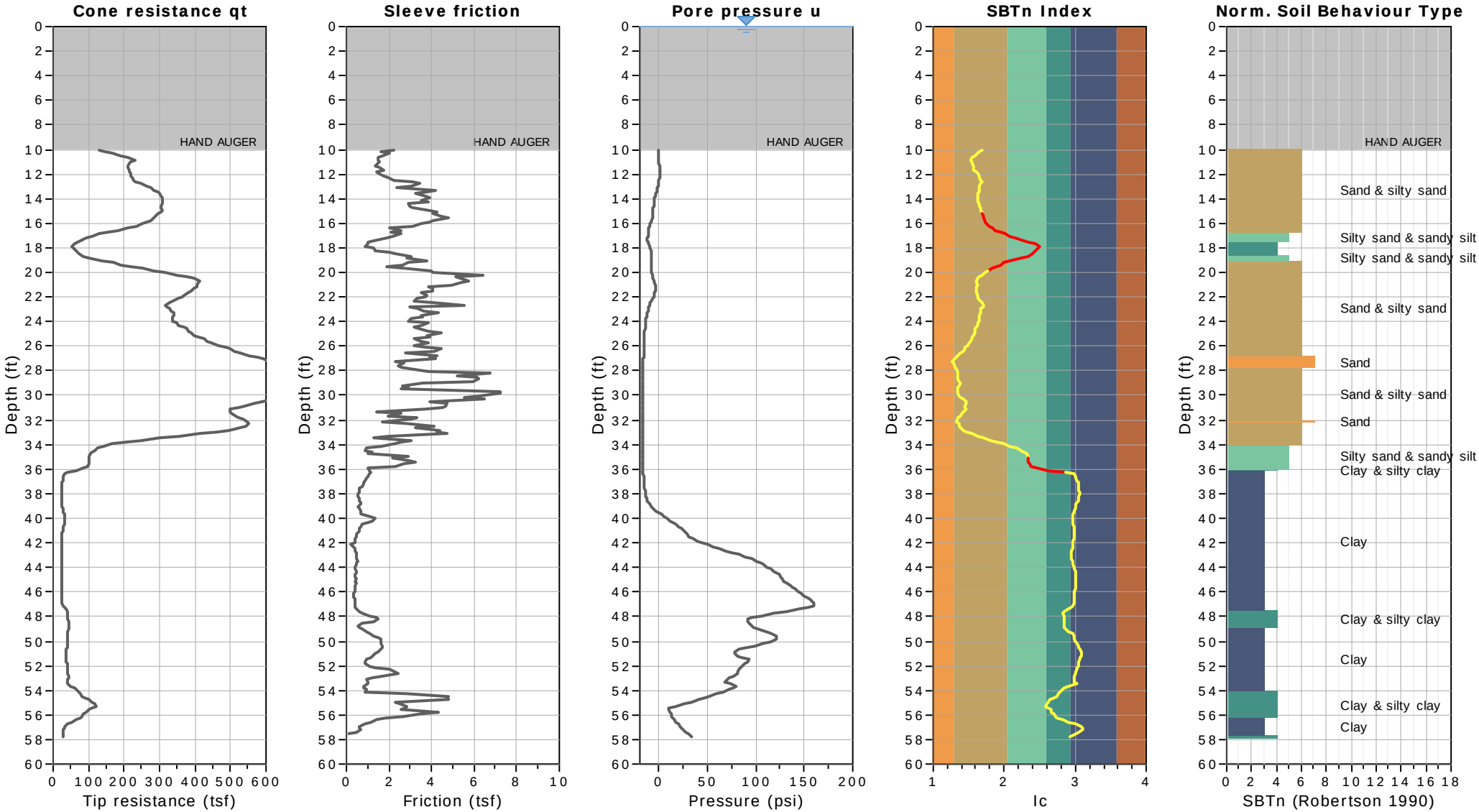
Cone Type: Uknown
Cone Operator: Uknown

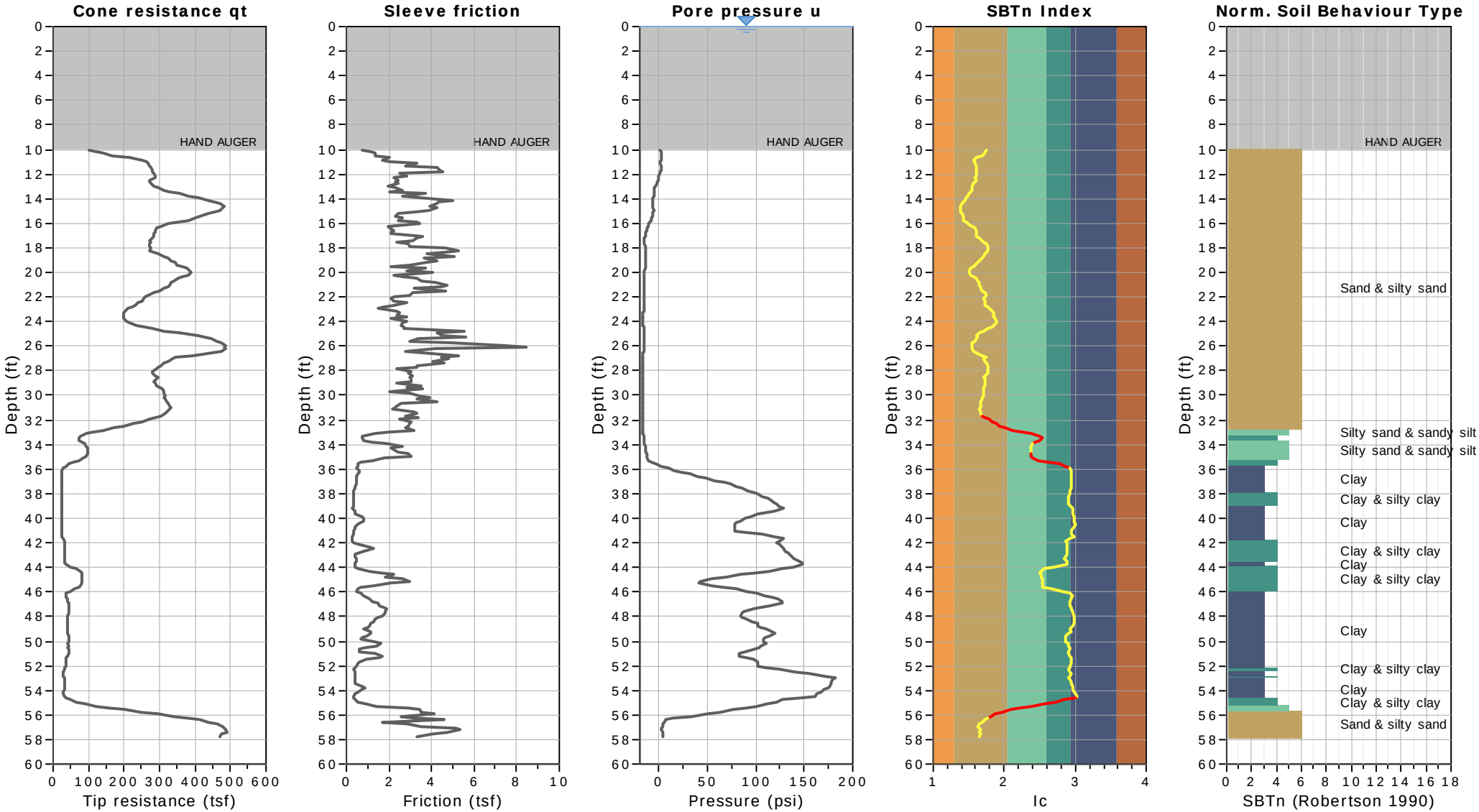
Project: **BP 498**
Location: **286 South Livermore Ave., Livermore, CA**



GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: 050USB-14
Total depth: 57.74 ft, Date: 4/12/2013
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type: Uknown
Cone Operator: Uknown

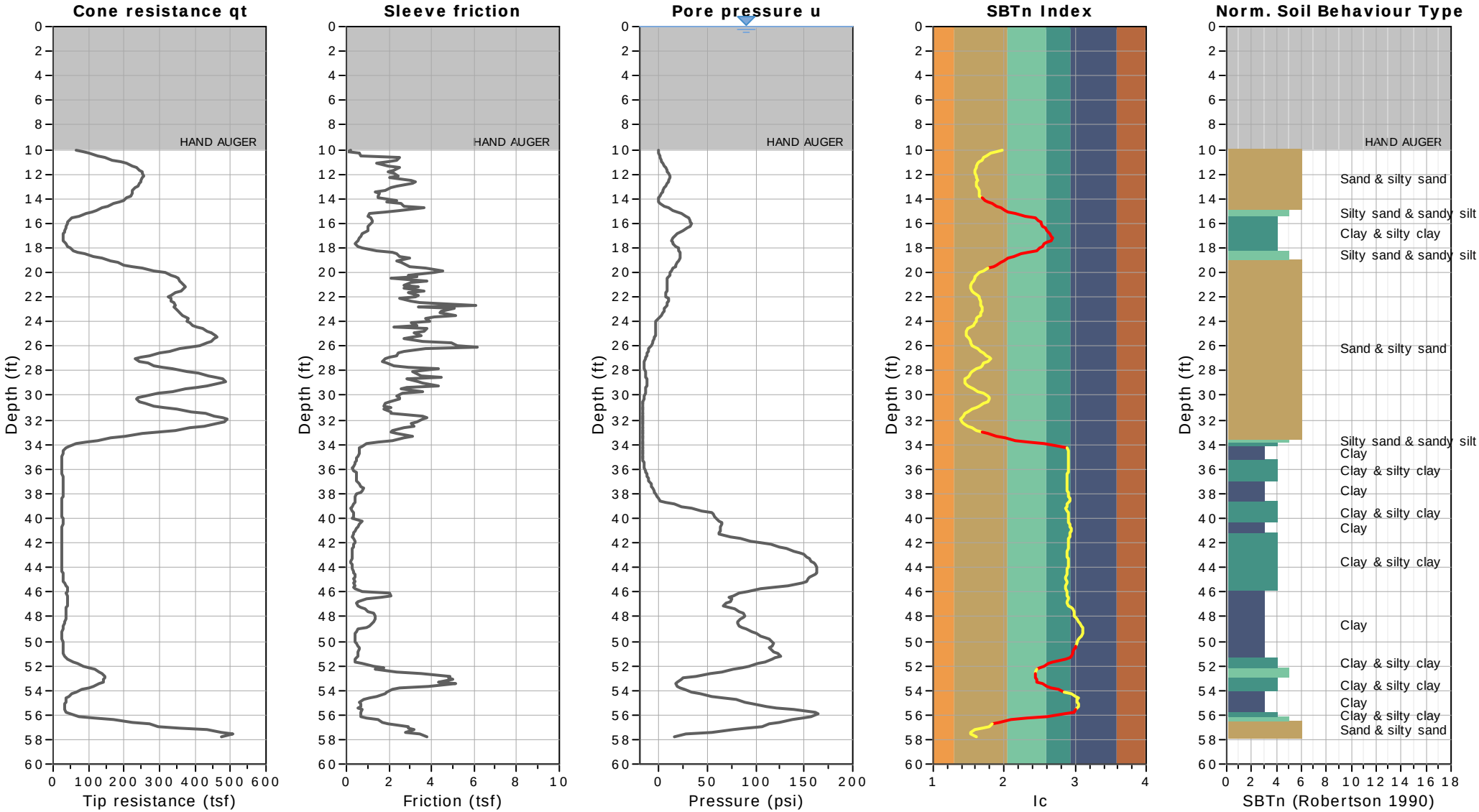
Project: **BP 498**
Location: **286 South Livermore Ave., Livermore, CA**



GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: 050USB-15
Total depth: 57.74 ft, Date: 4/12/2013
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type: Uknown
Cone Operator: Uknown

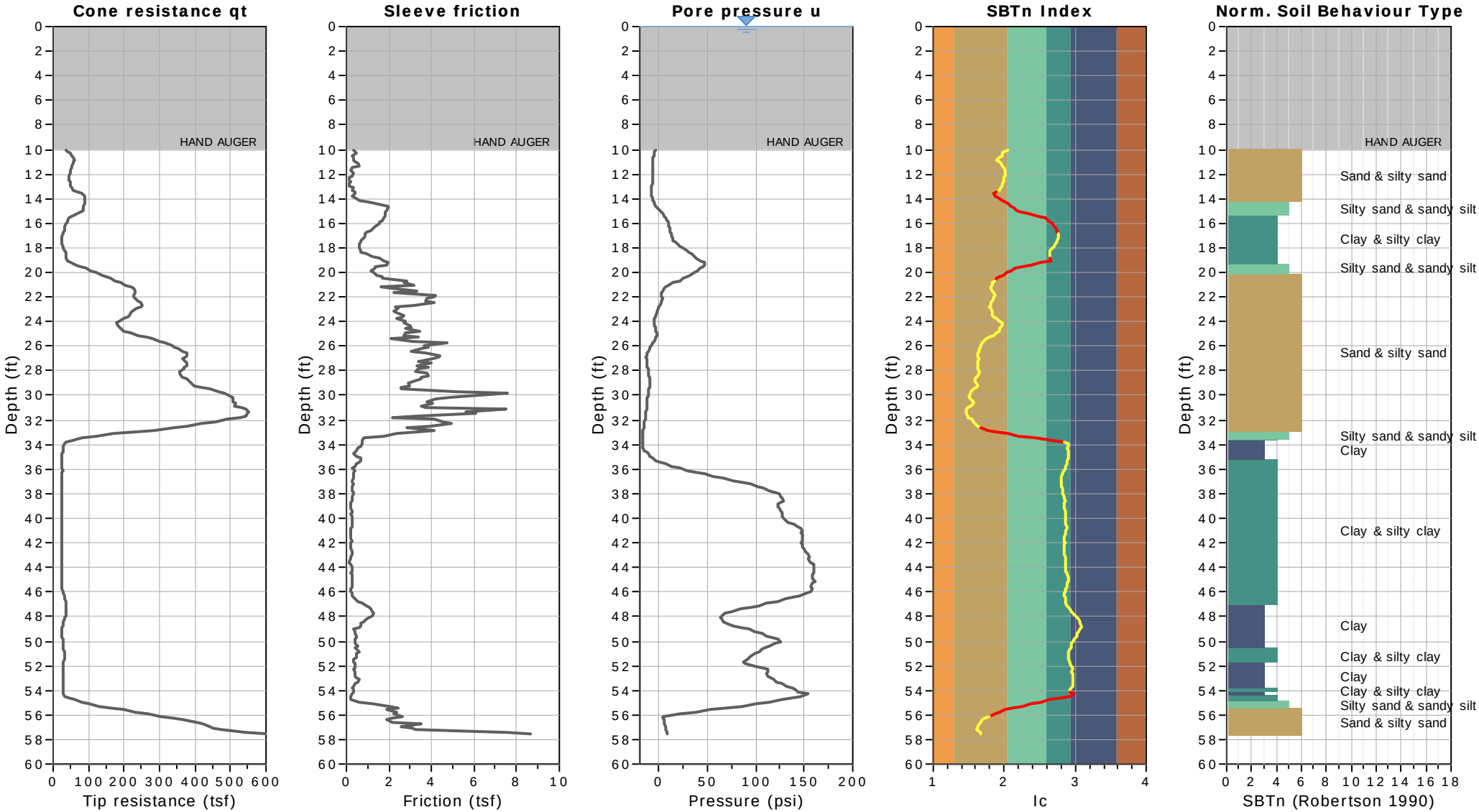
Project: **BP 498**
Location: **286 South Livermore Ave., Livermore, CA**



GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

CPT: 050USB-16
Total depth: 57.58 ft, Date: 4/12/2013
Surface Elevation: 0.00 ft
Coords: X:0.00, Y:0.00
Cone Type: Uknown
Cone Operator: Uknown

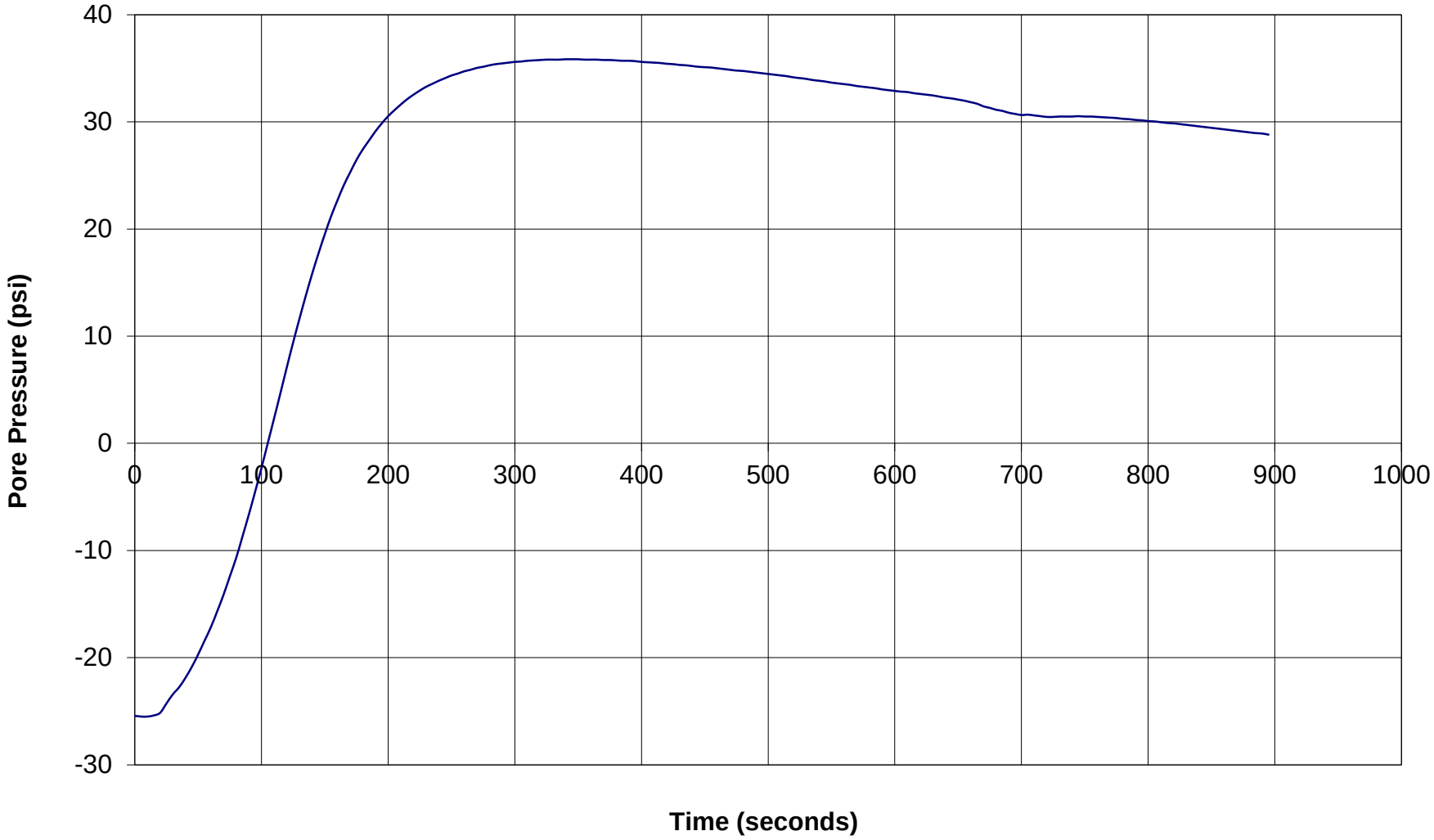
Project: **BP 498**
Location: **286 South Livermore Ave., Livermore, CA**



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

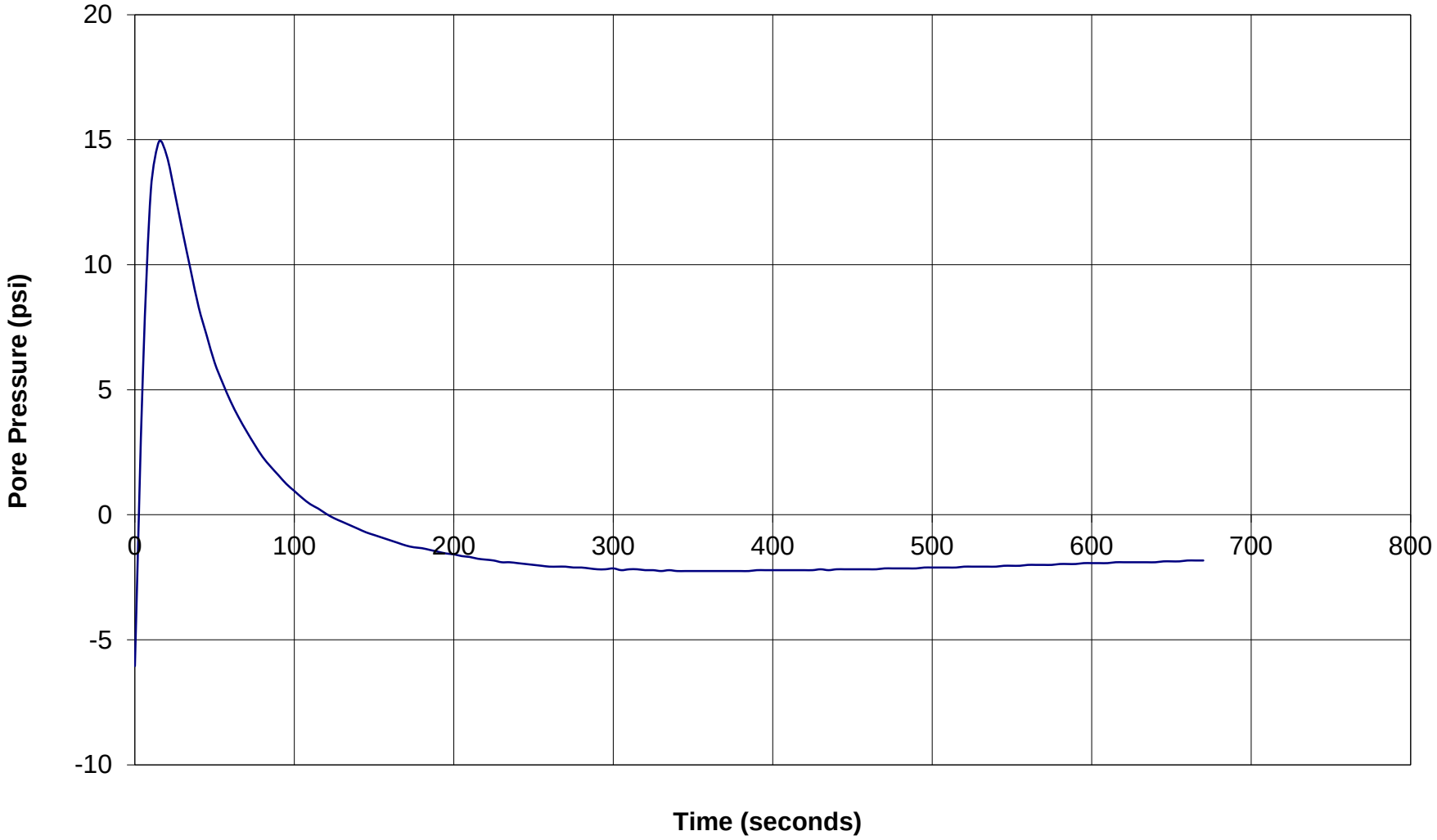
Sounding: USB-9
Depth: 32.8083
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

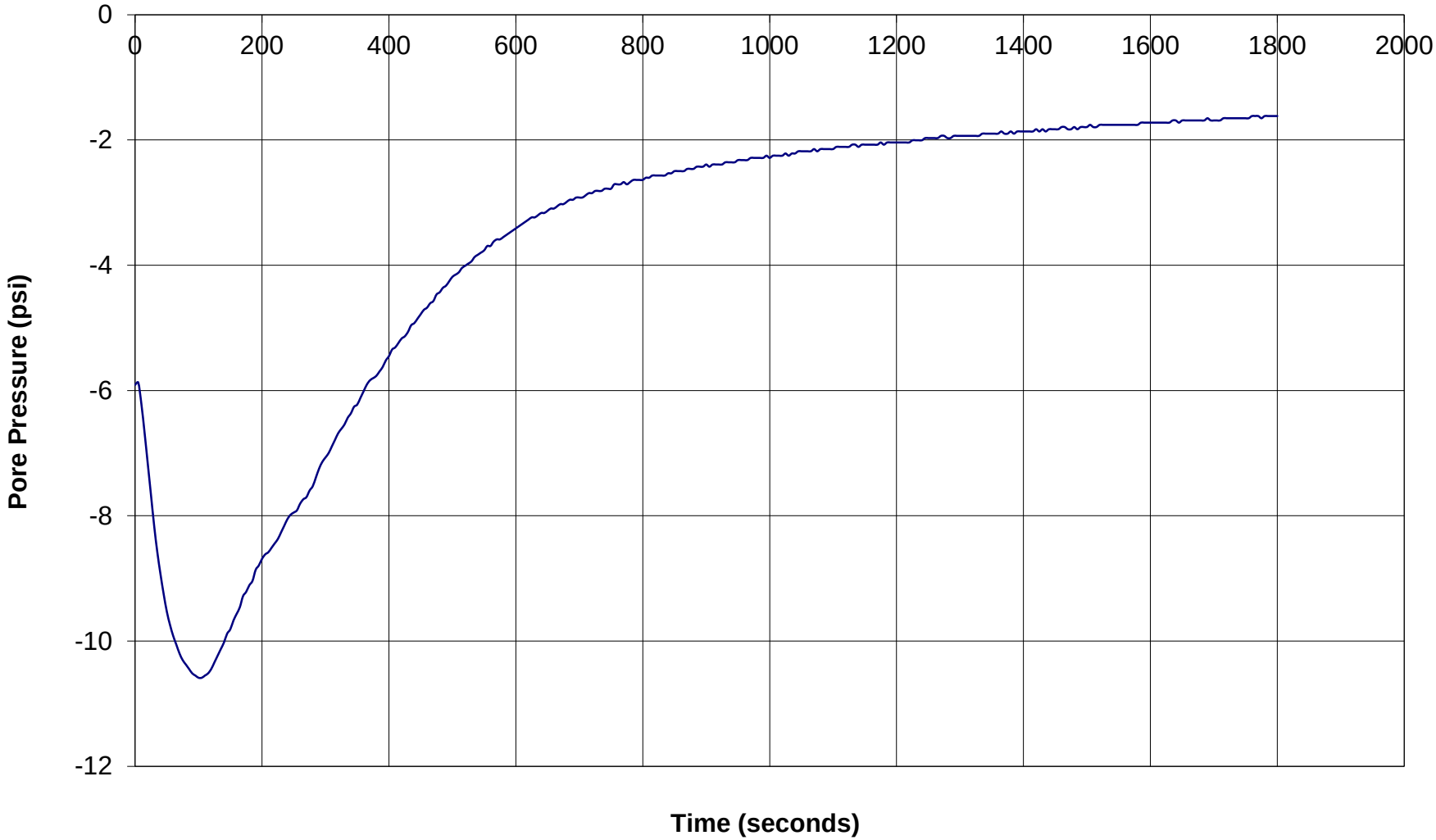
Sounding: USB-9
Depth: 45.1114125
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

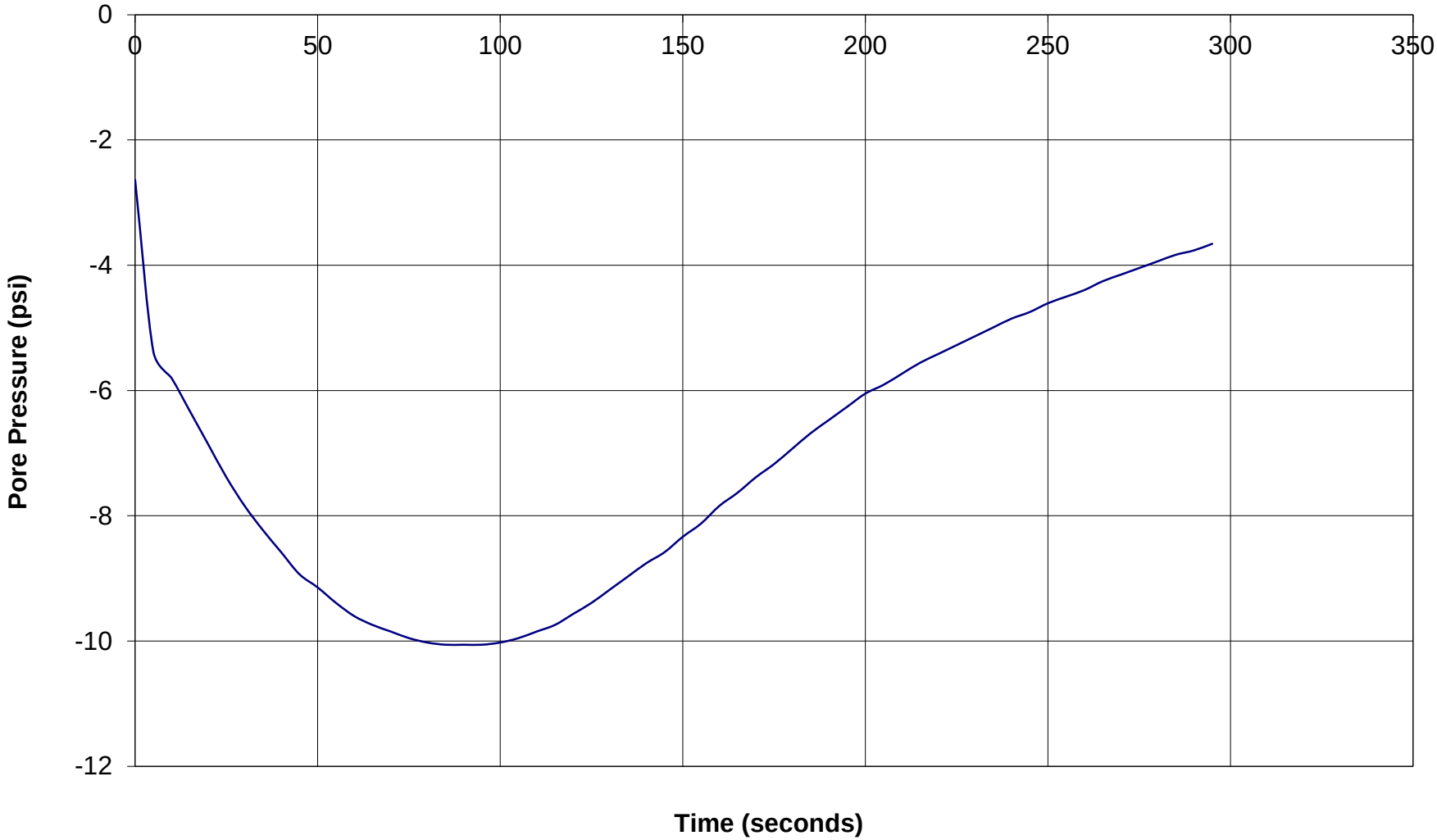
Sounding: USB-9
Depth: 52.0011555
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

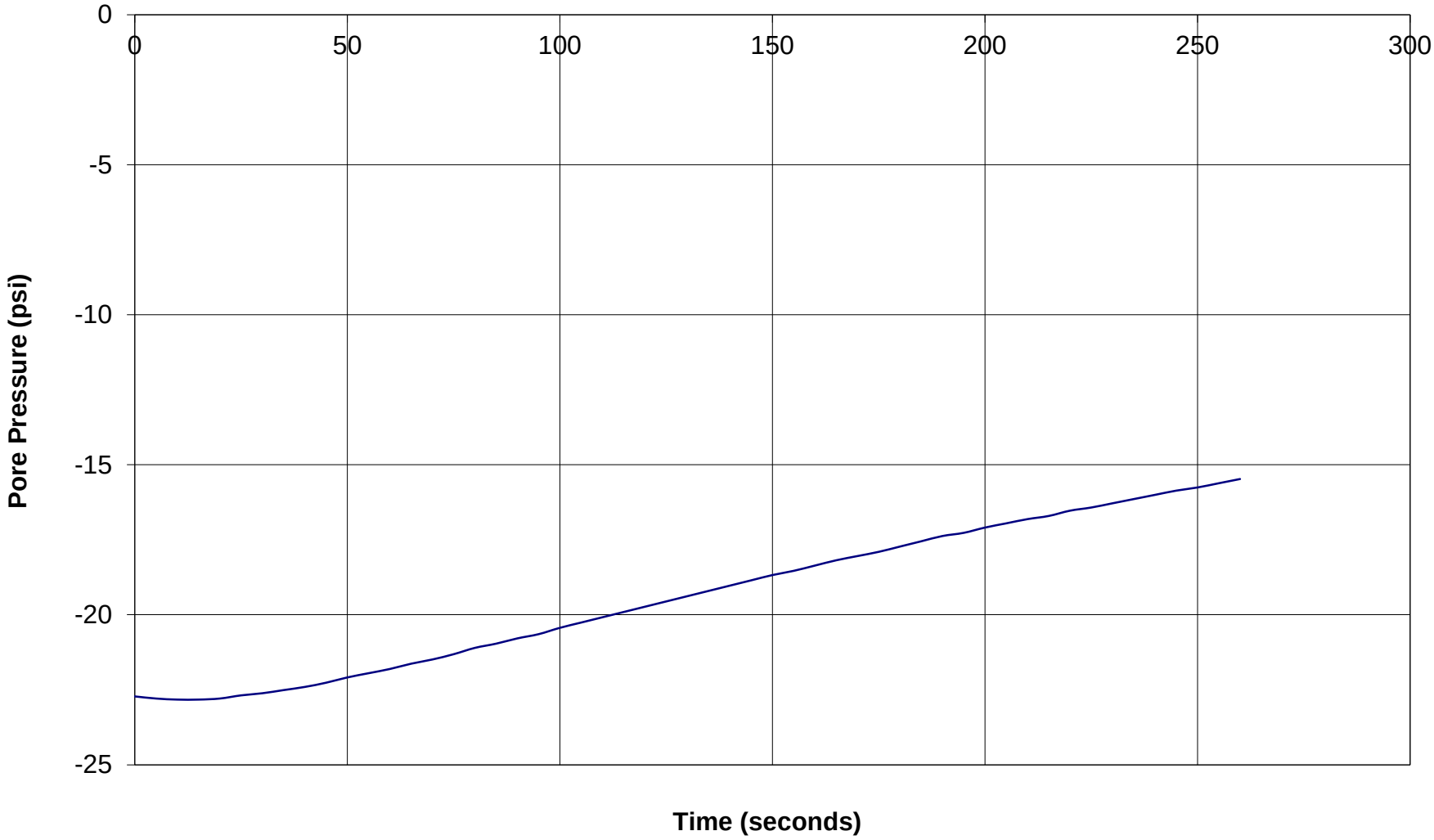
Sounding: USB-9
Depth: 58.070691
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

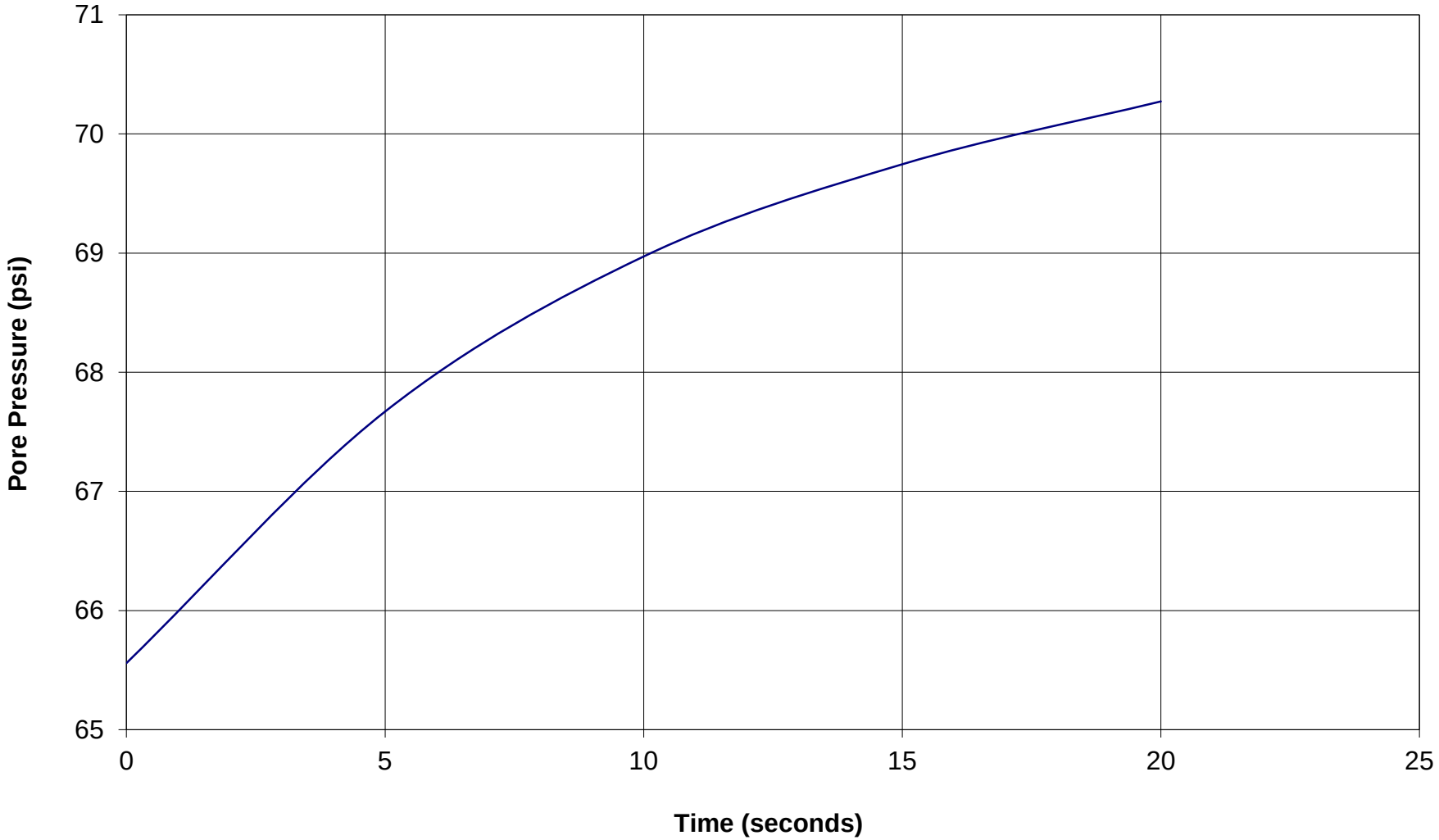
Sounding: USB-10
Depth: 29.52747
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

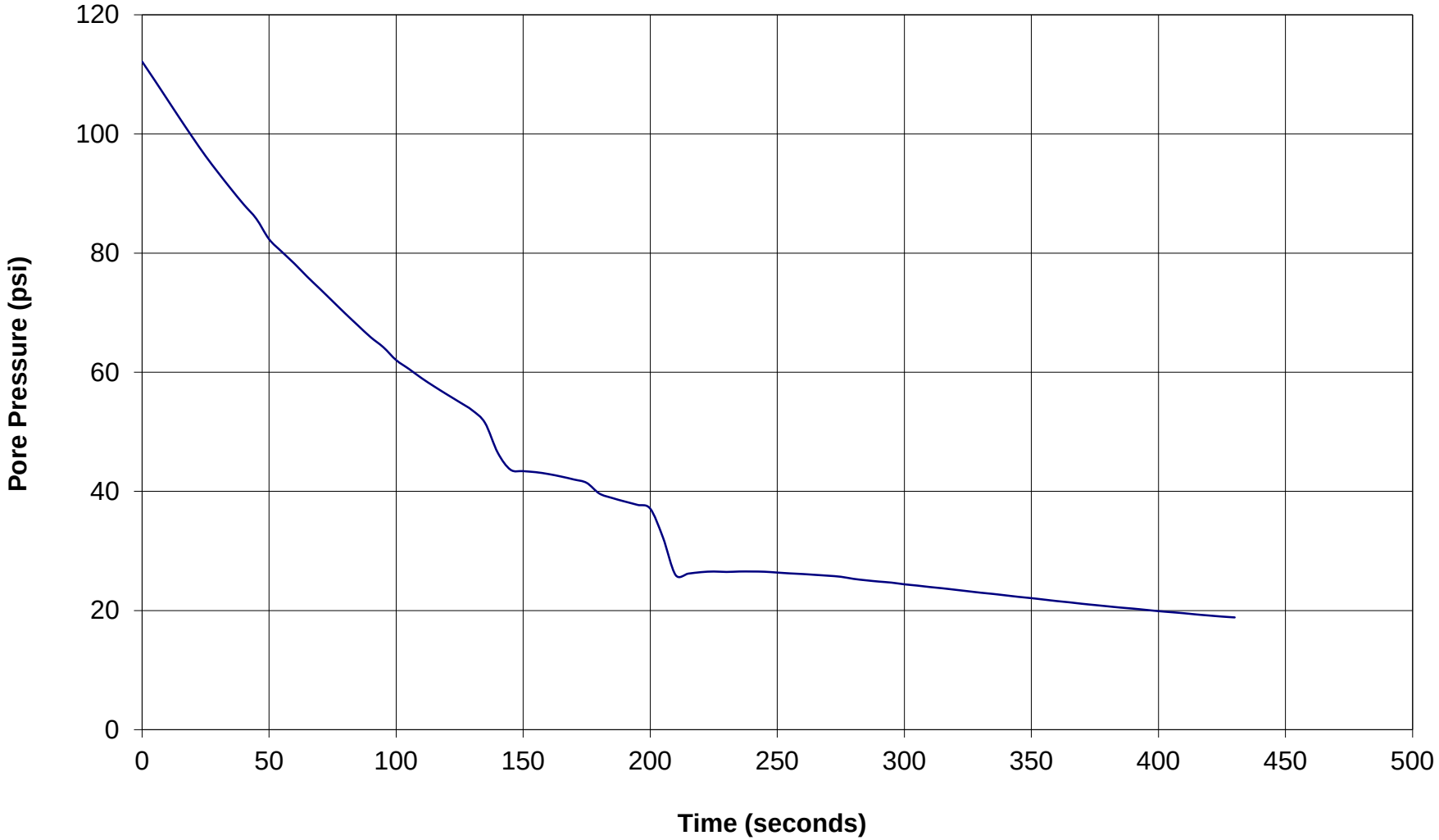
Sounding: USB-10
Depth: 39.5340015
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

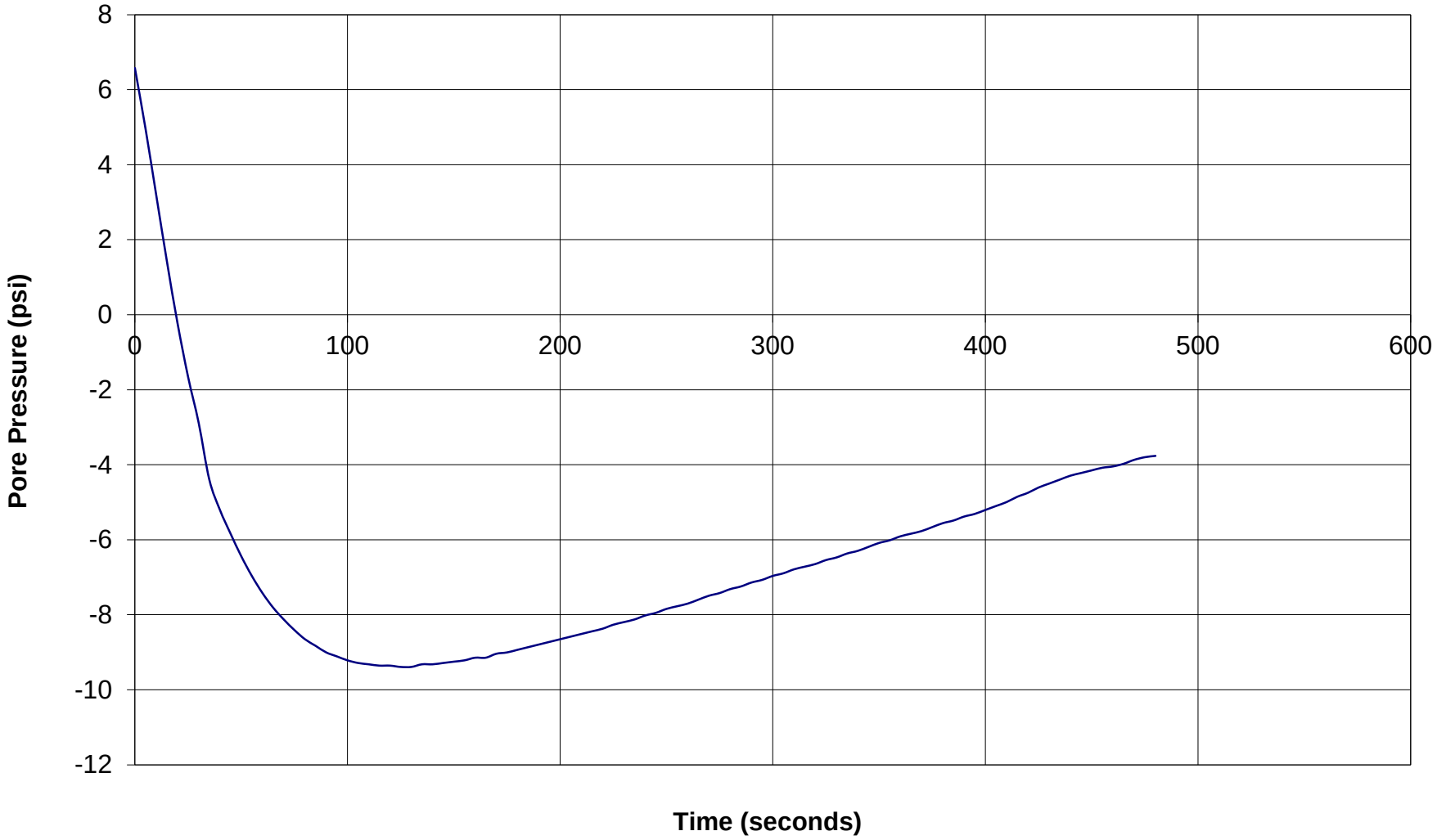
Sounding: USB-10
Depth: 42.978873
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

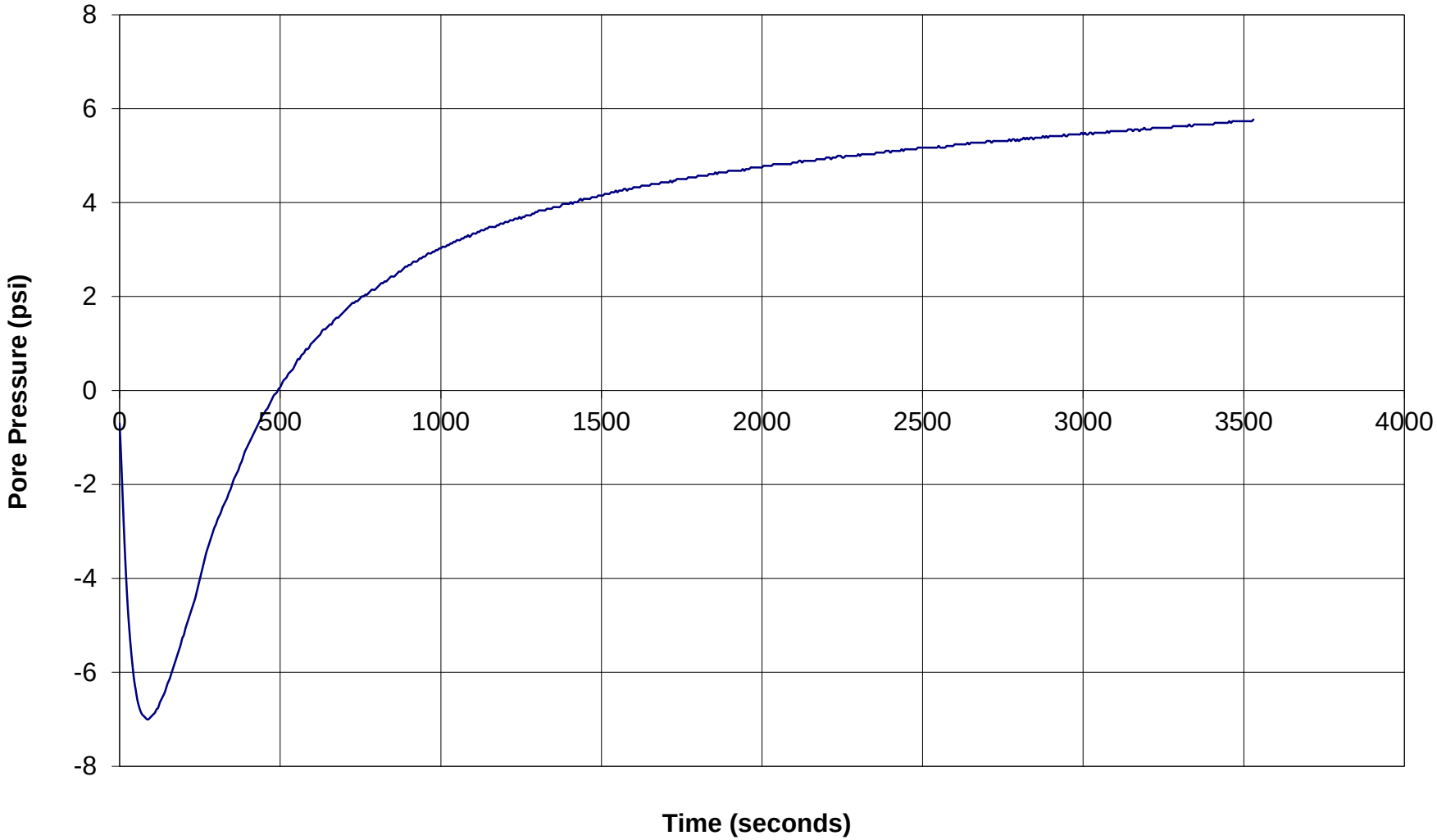
Sounding: USB-10
Depth: 49.21245
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

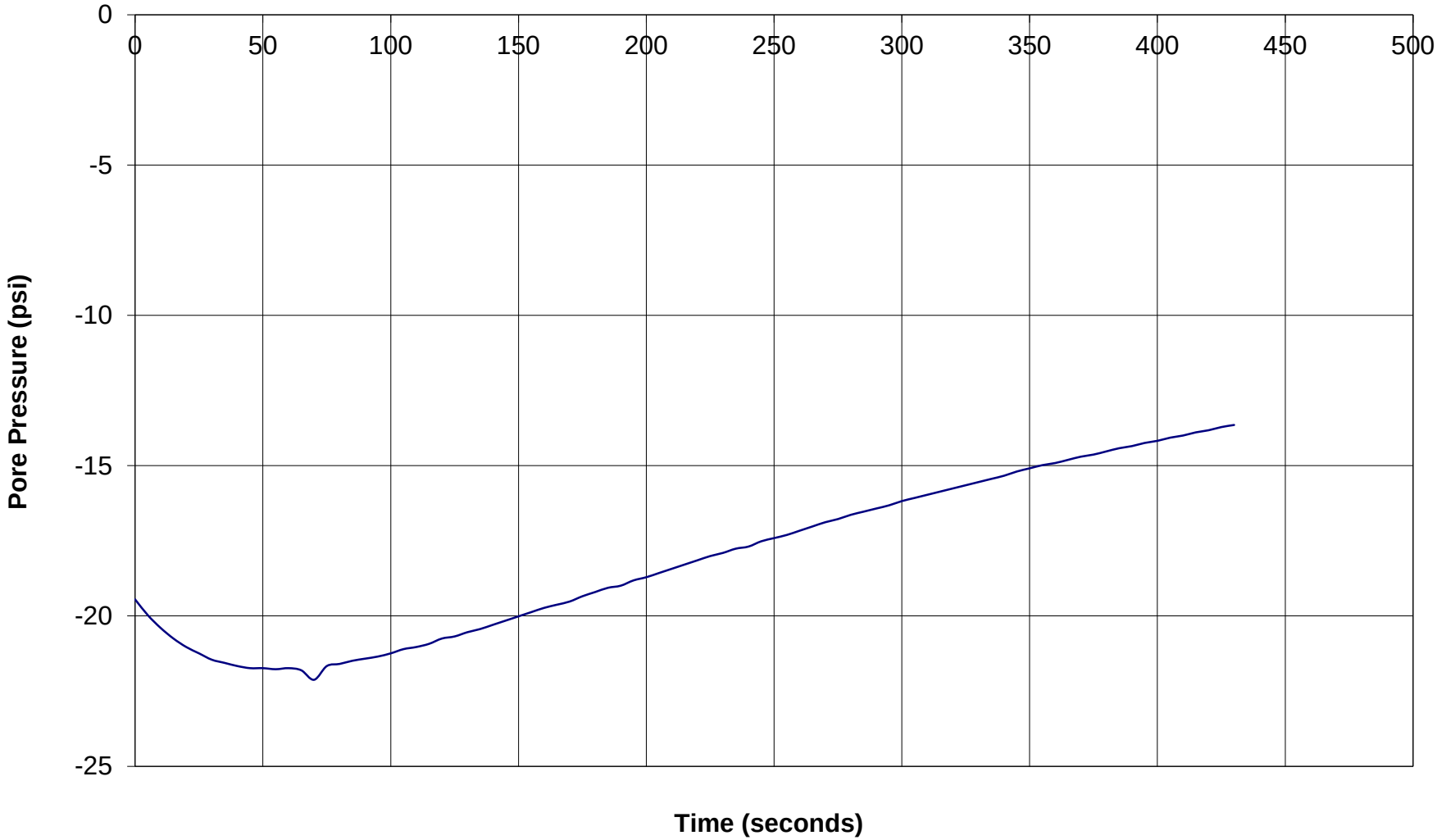
Sounding: USB-10
Depth: 57.742608
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

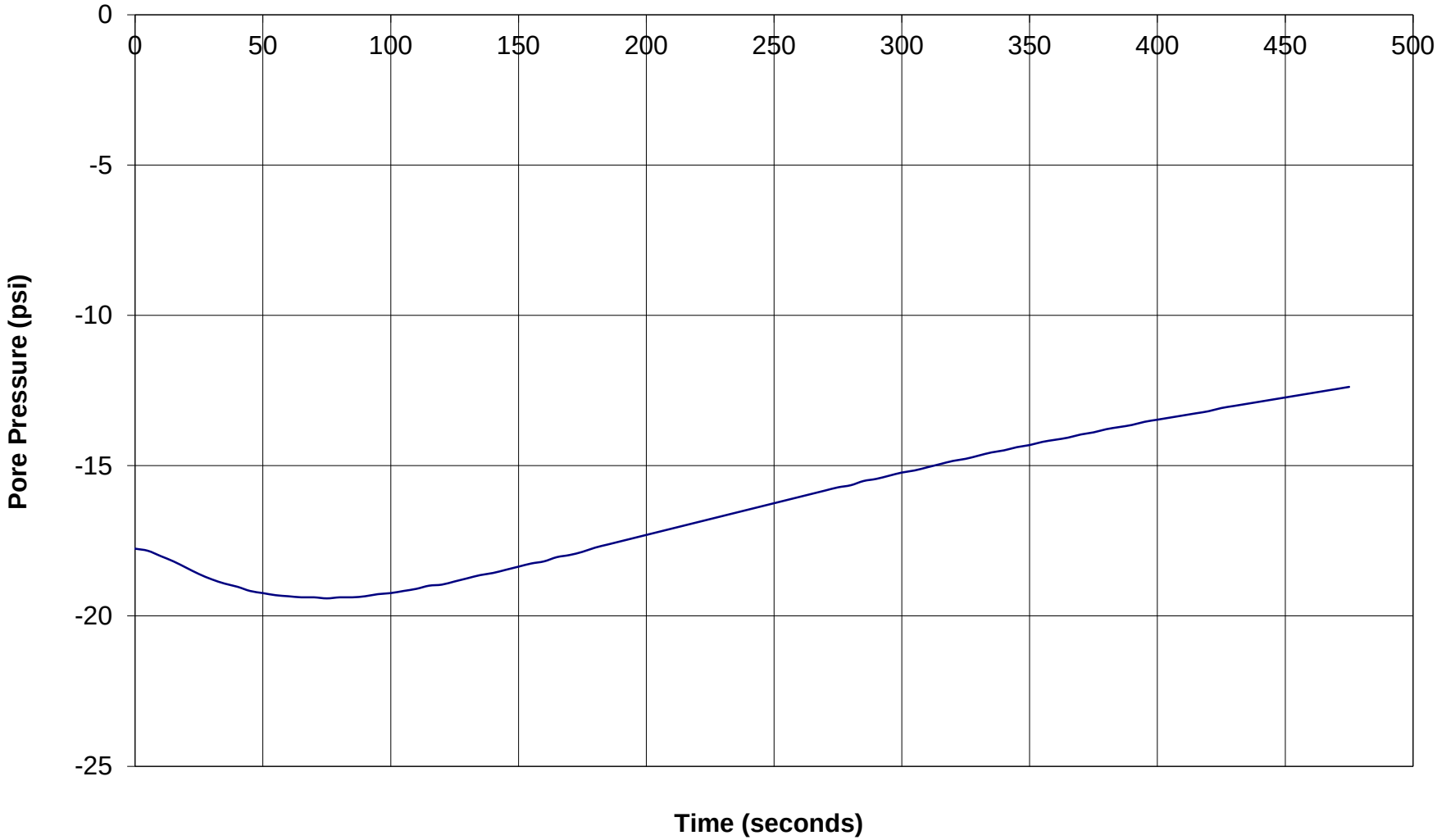
Sounding: USB-11
Depth: 25.0983495
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

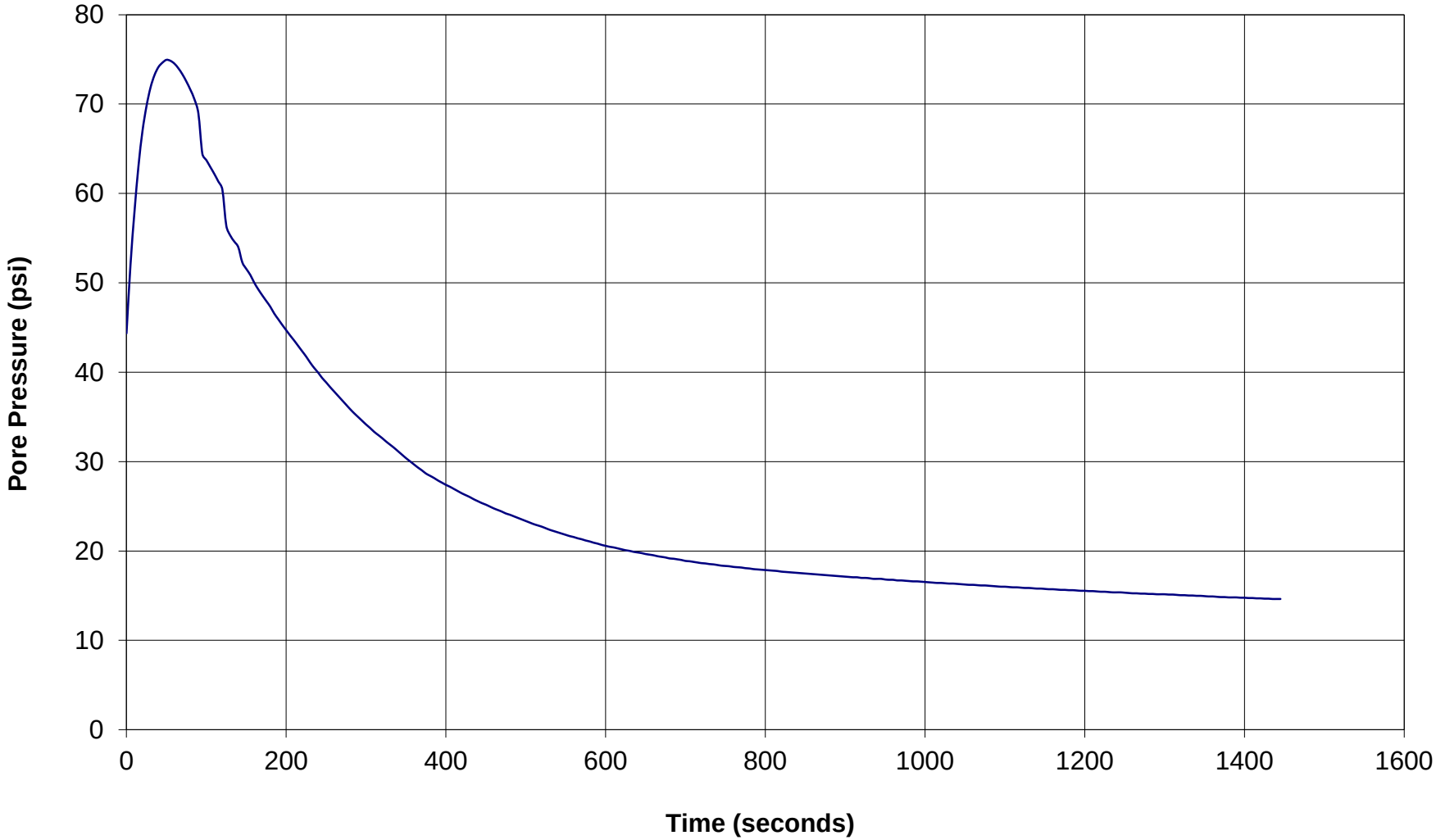
Sounding: USB-11
Depth: 36.417213
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

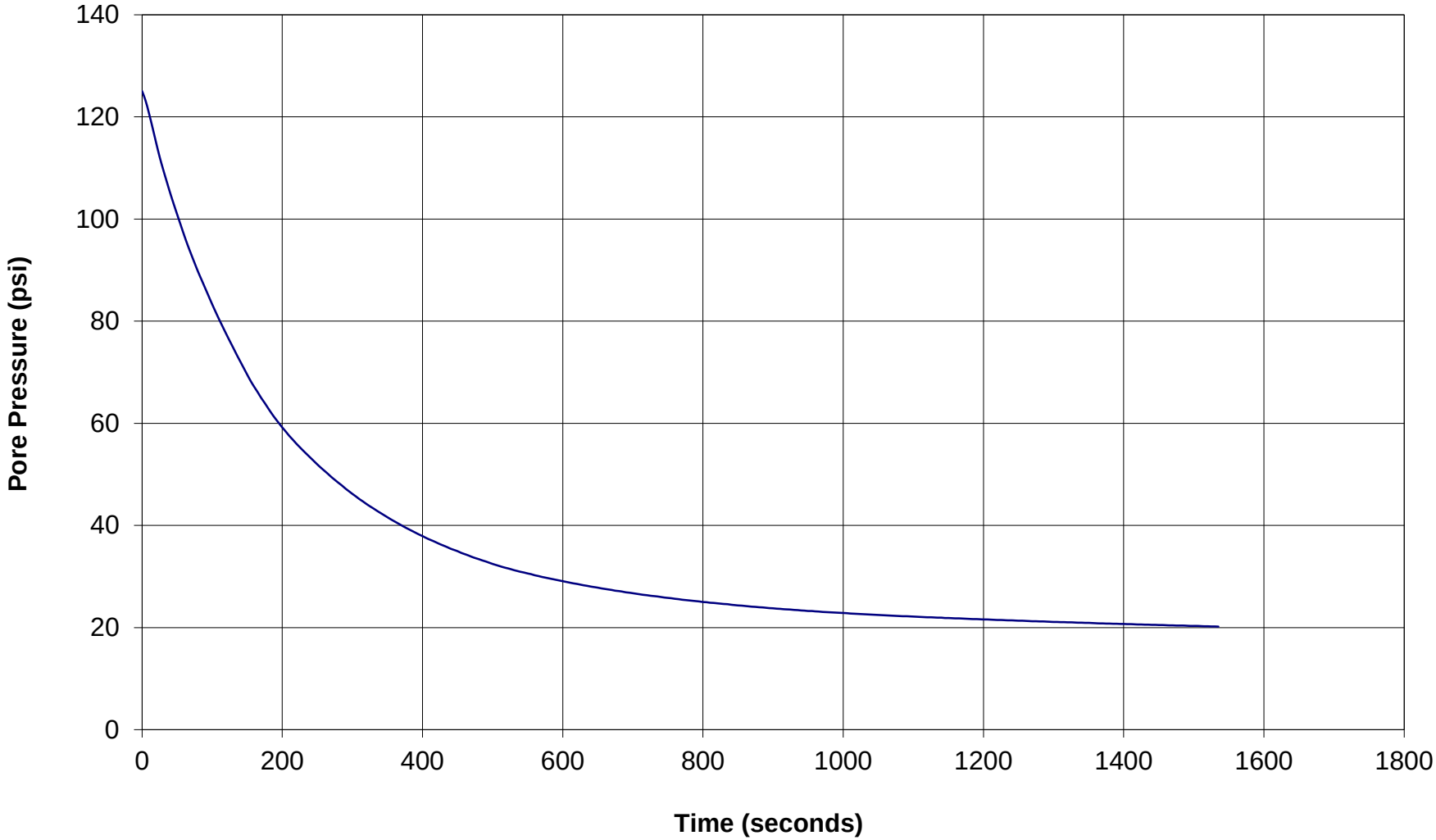
Sounding: USB-11
Depth: 45.1114125
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

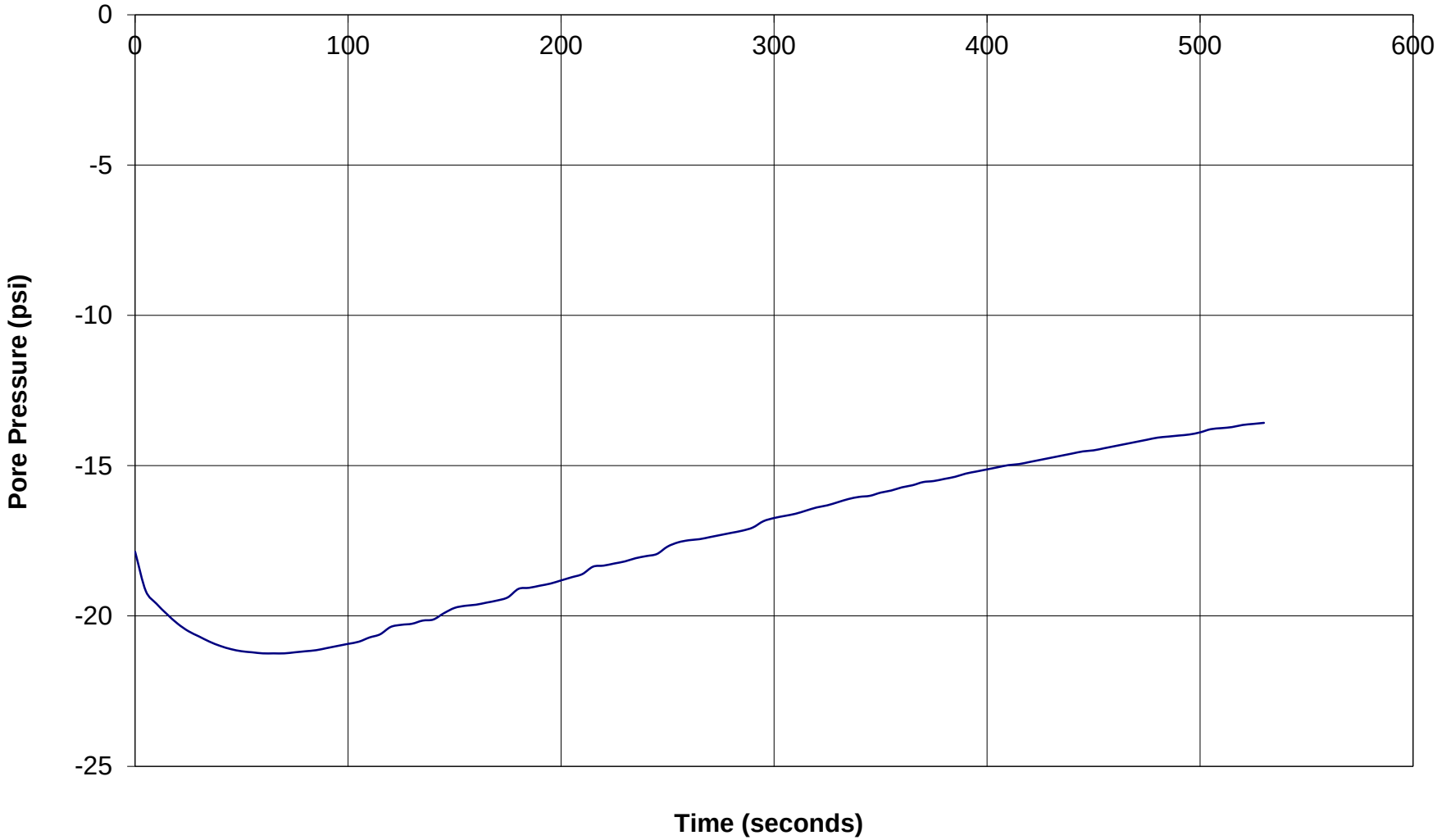
Sounding: USB-11
Depth: 55.2819855
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

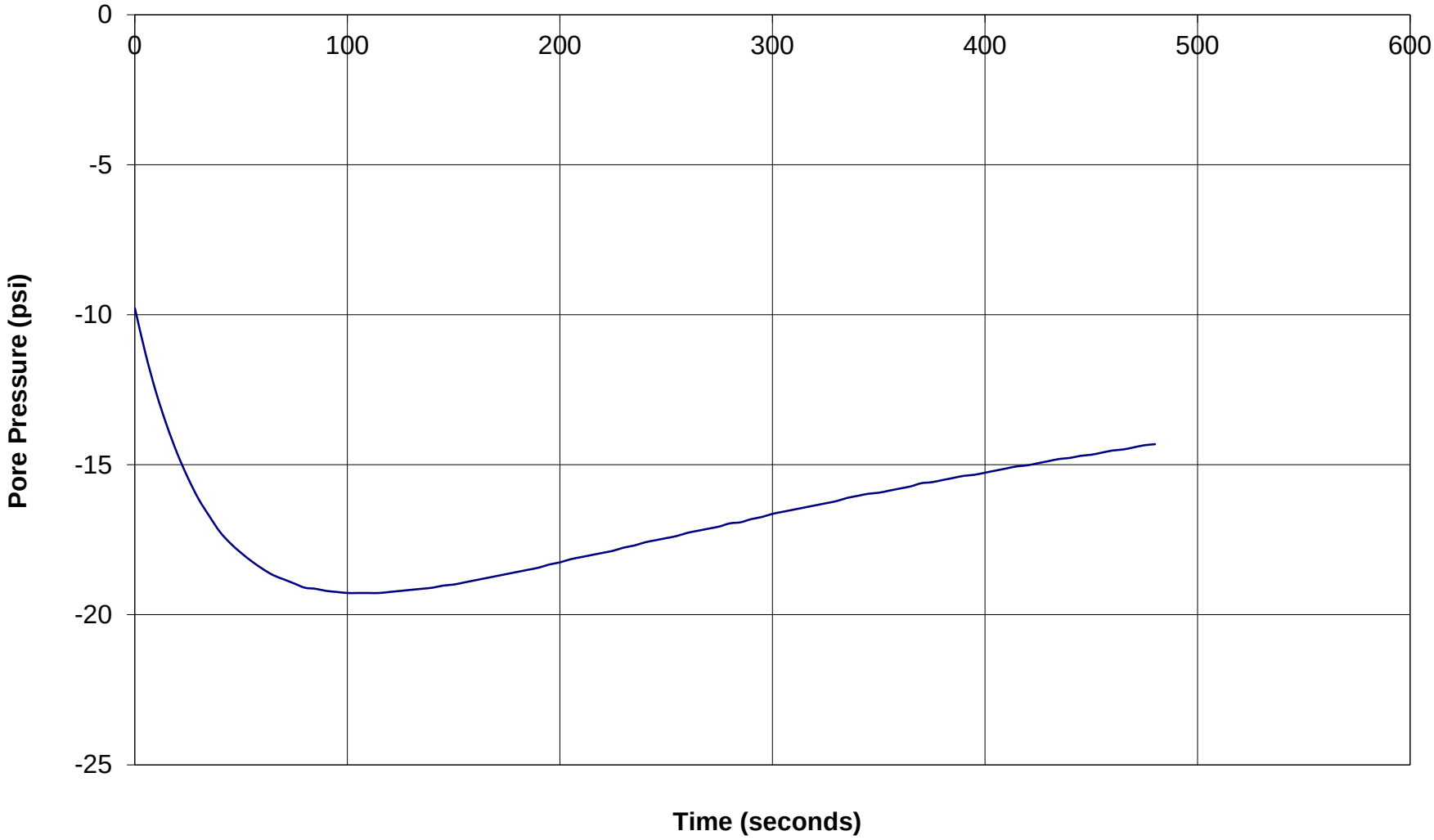
Sounding: USB-12
Depth: 15.091818
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

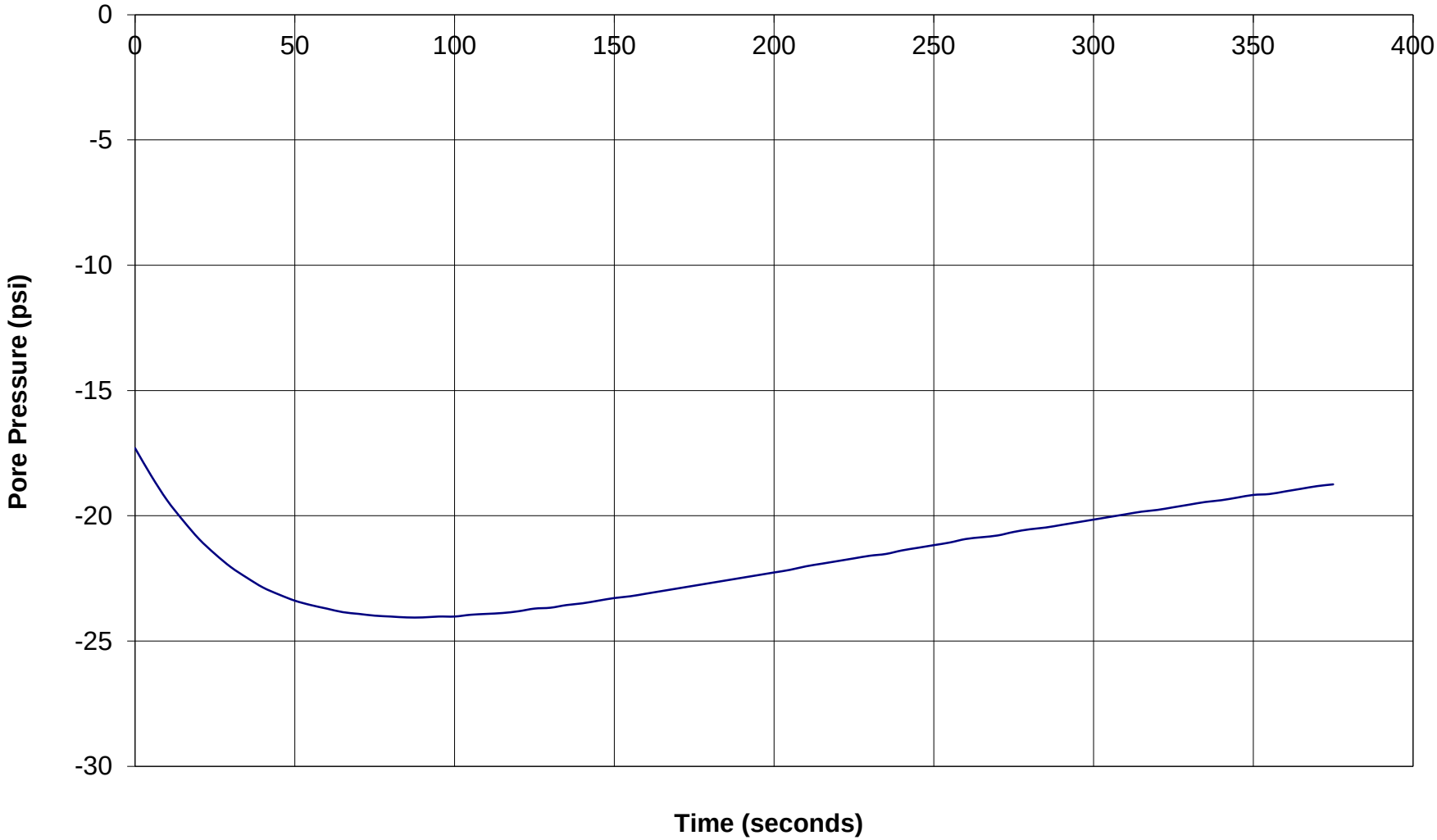
Sounding: USB-12
Depth: 20.013063
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

Sounding: USB-12
Depth: 25.262391
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

Sounding: USB-12
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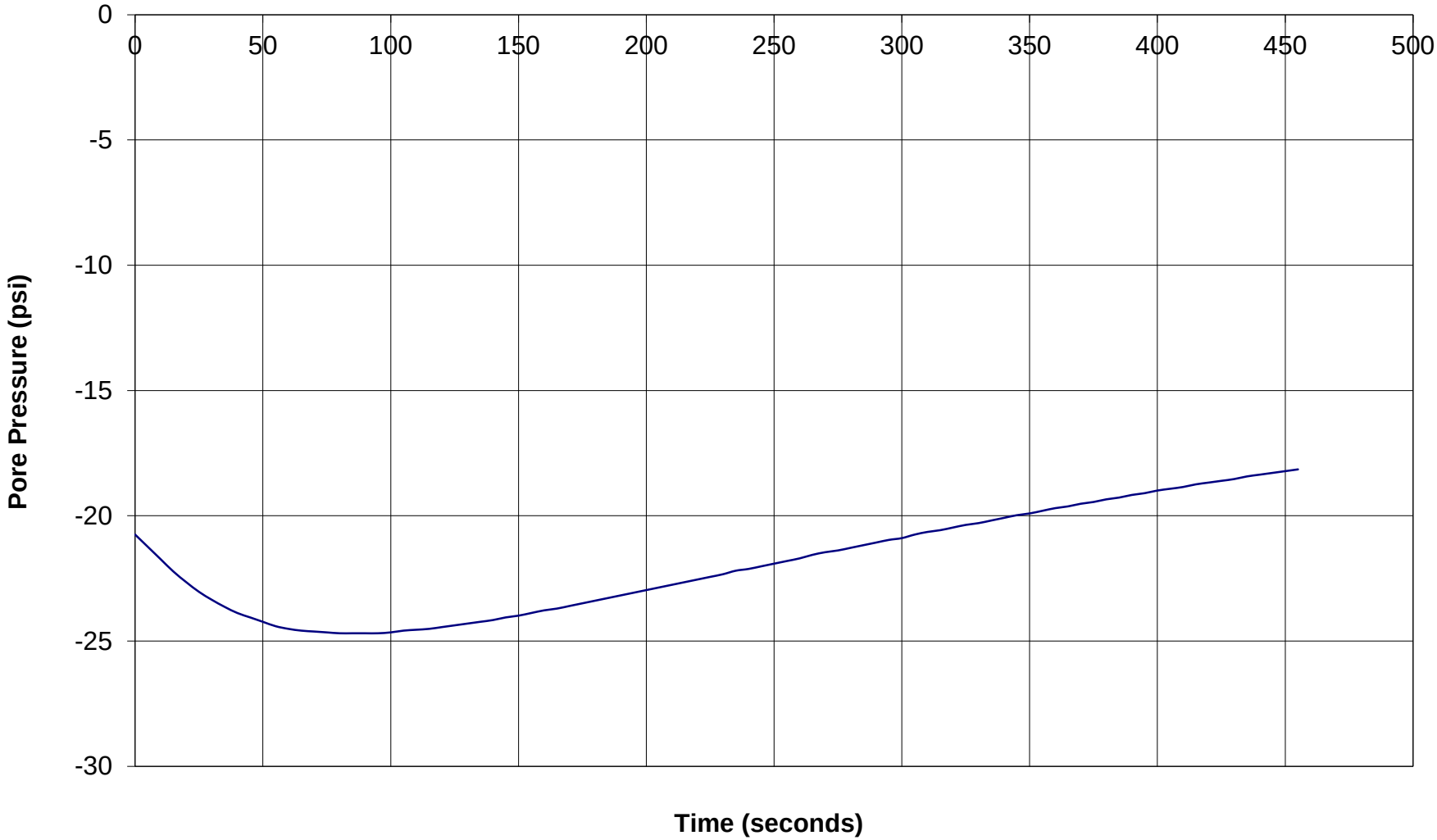
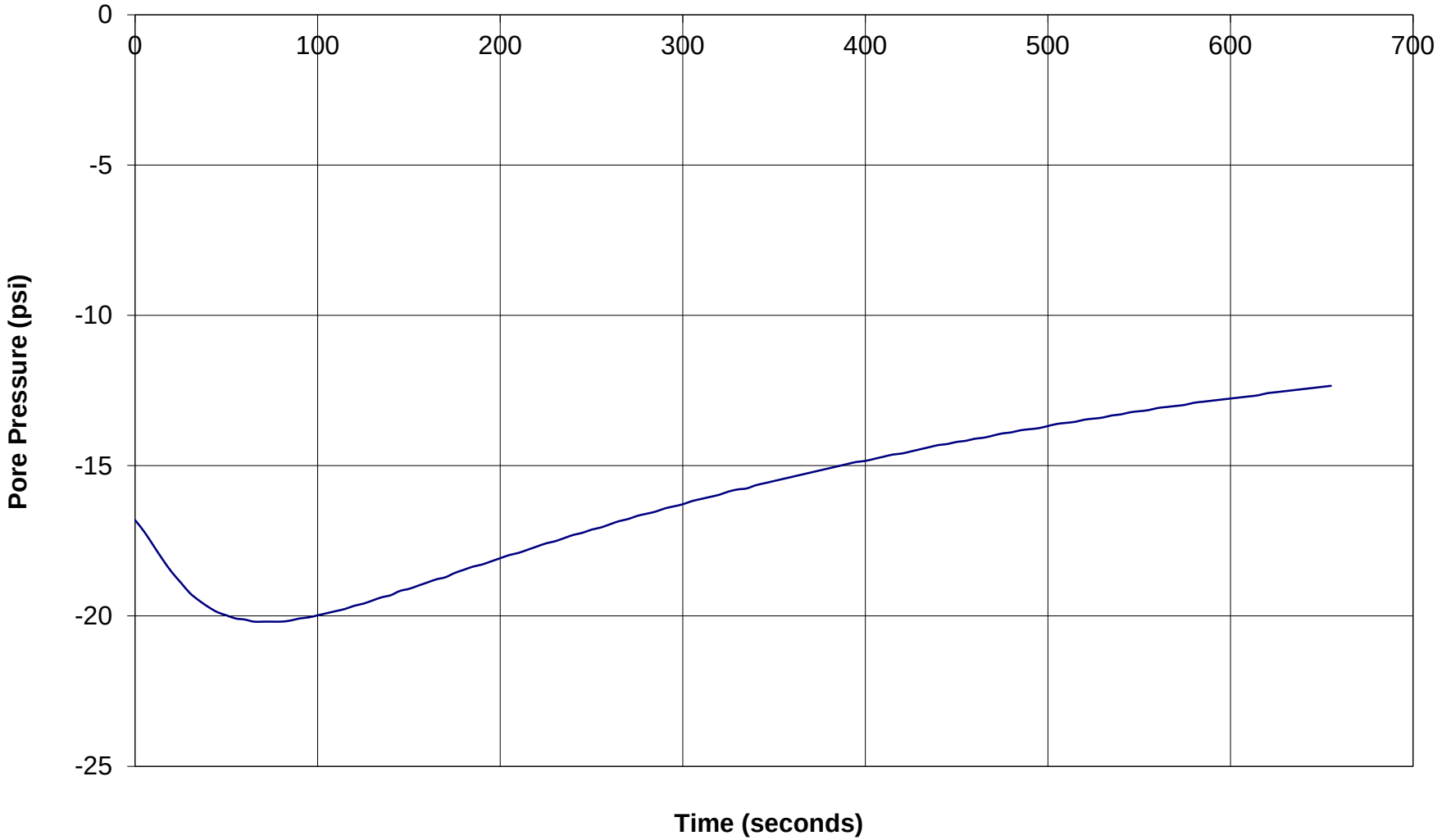
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

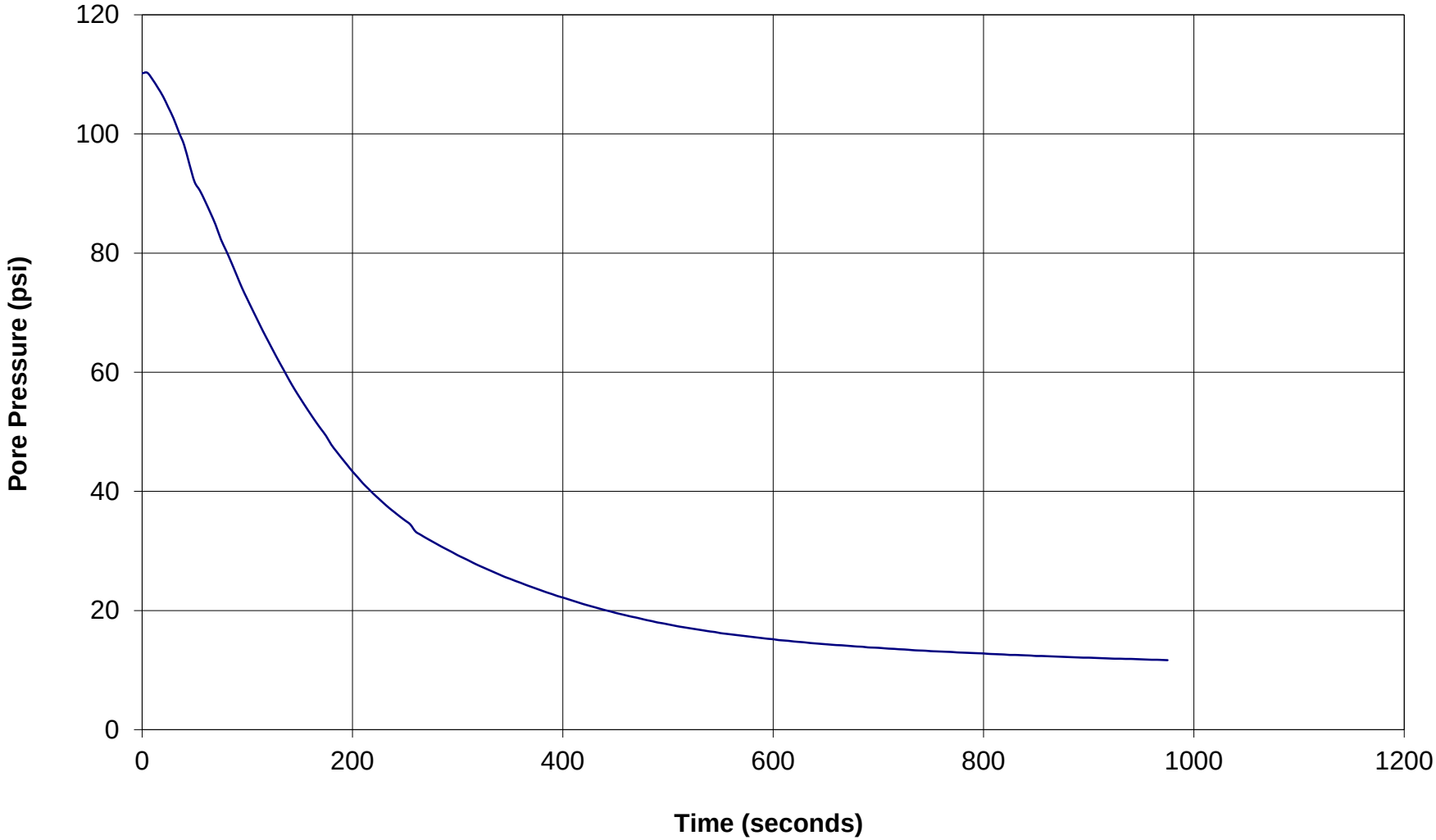
Sounding: USB-12
Depth: 35.104881
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

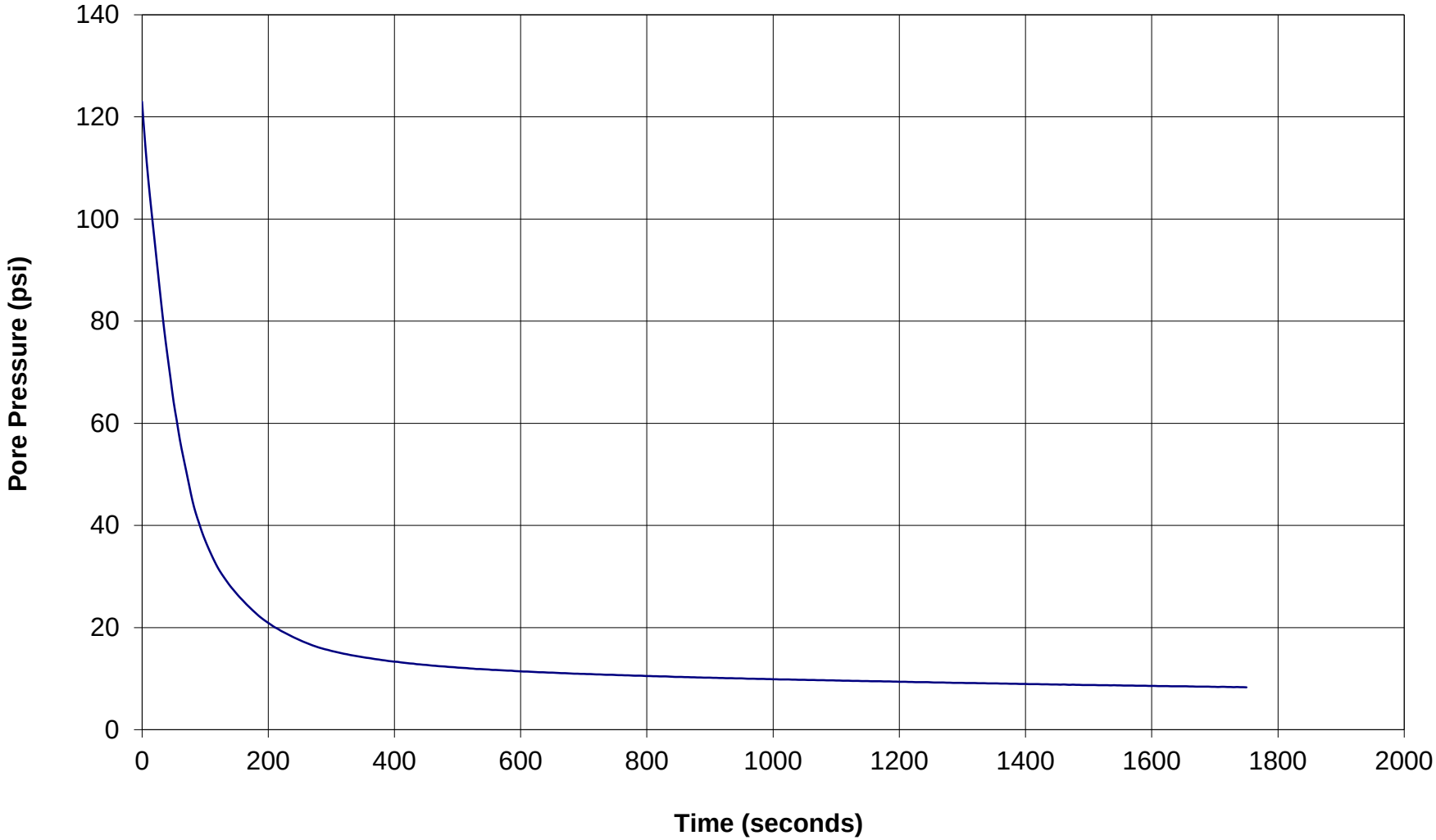
Sounding: USB-12
Depth: 40.1901675
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

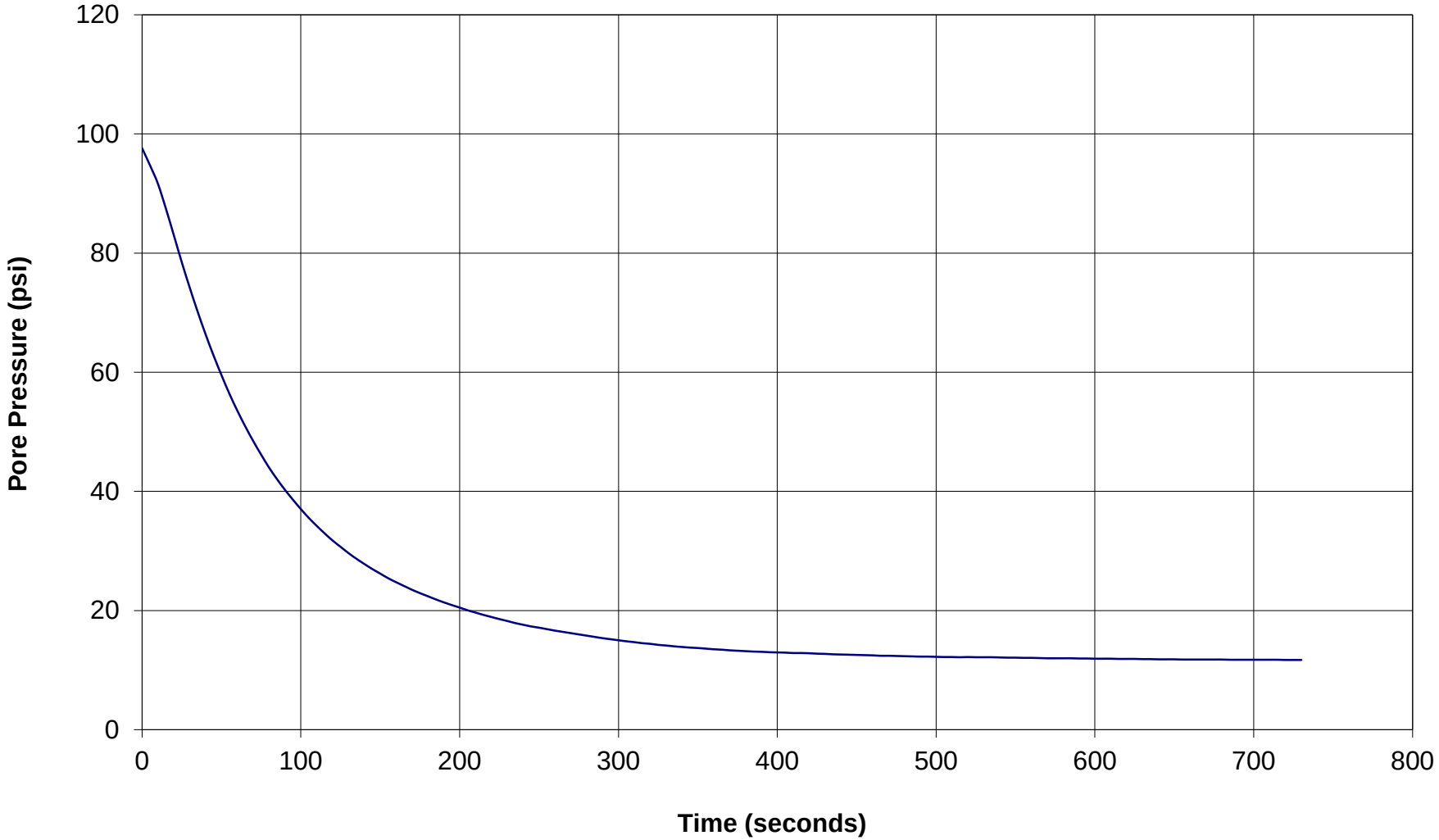
Sounding: USB-12
Depth: 45.603537
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

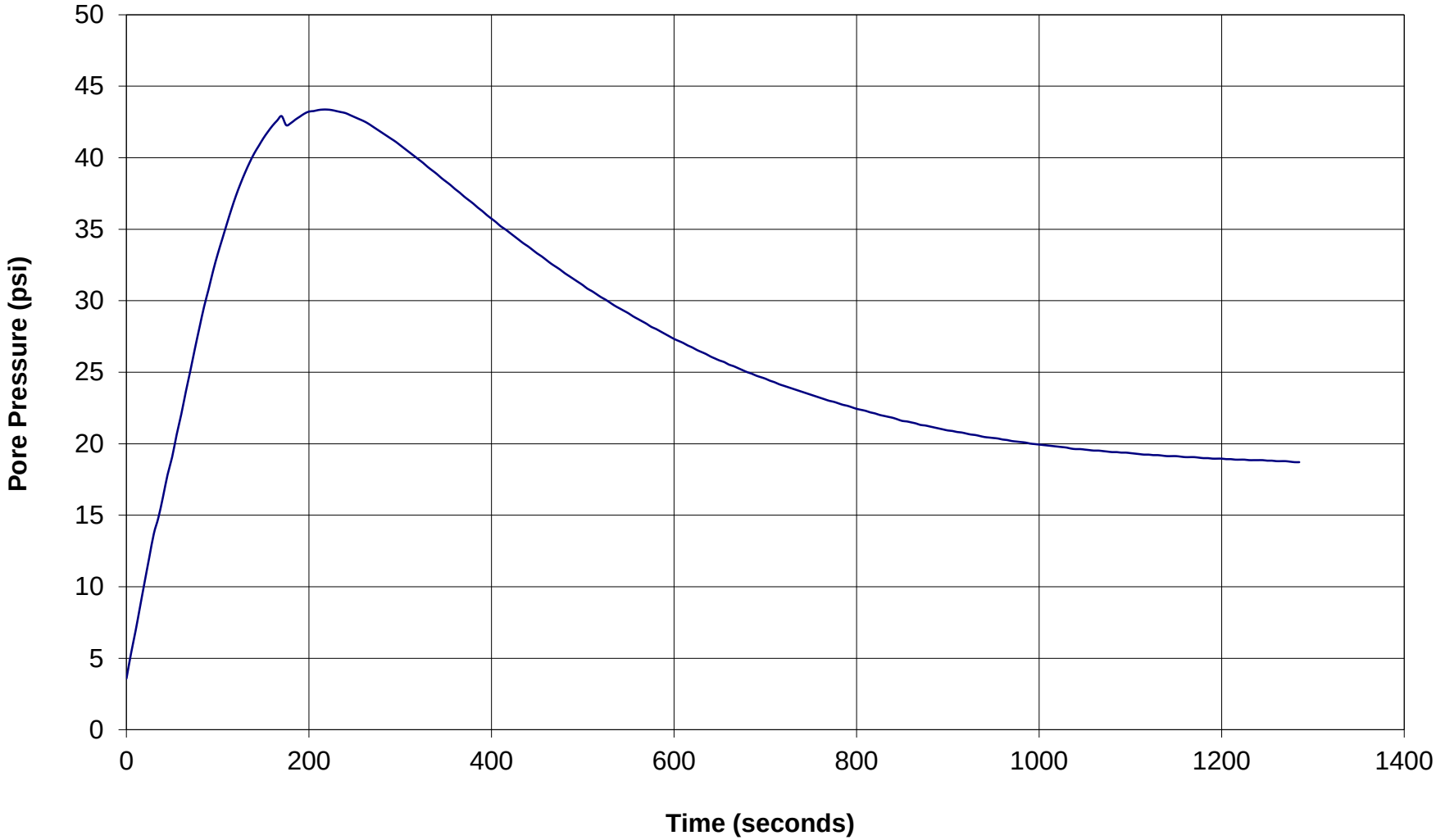
Sounding: USB-12
Depth: 58.070691
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

Sounding: USB-13
Depth: 40.026126
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

Sounding: USB-13
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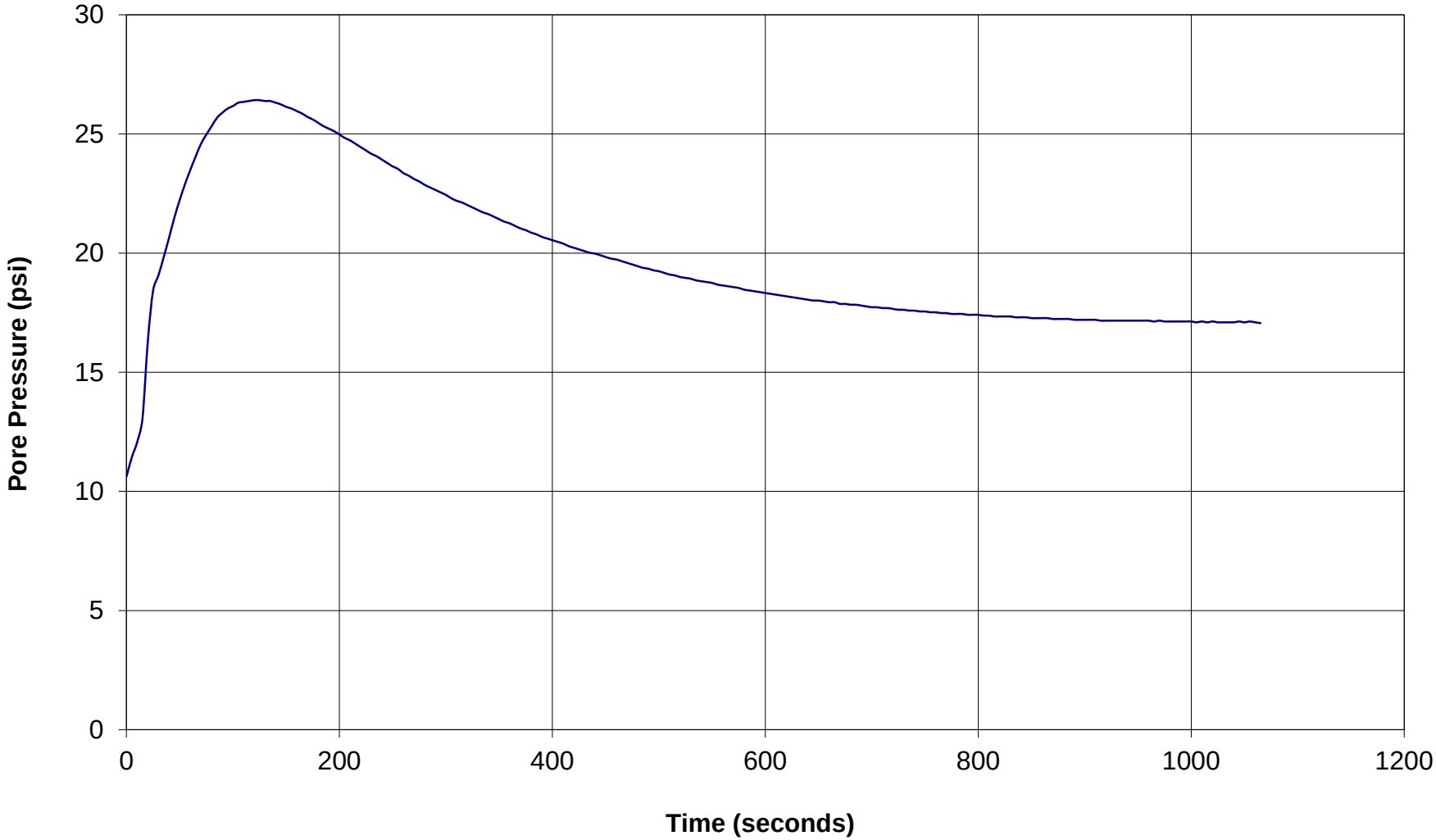
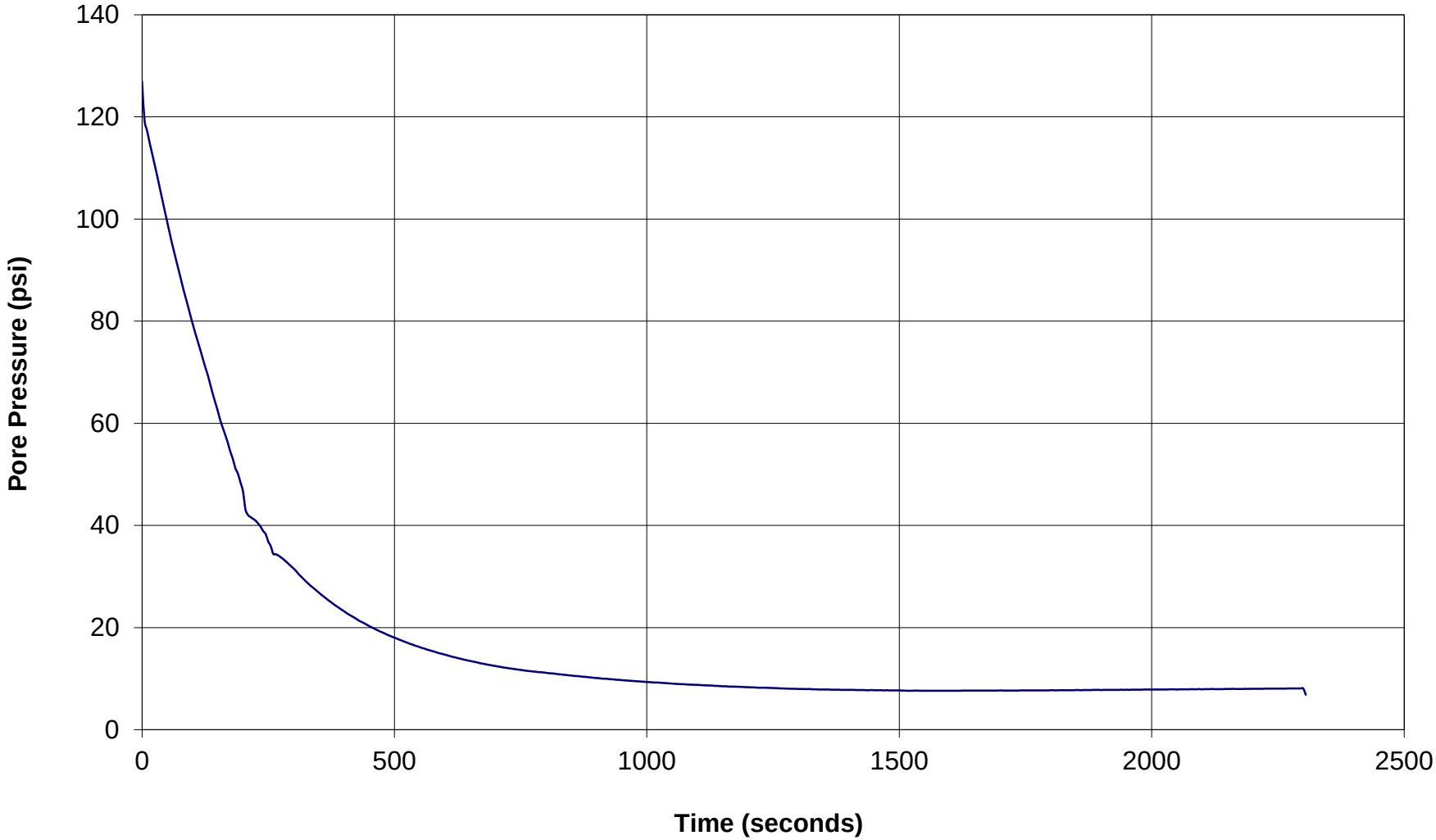
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

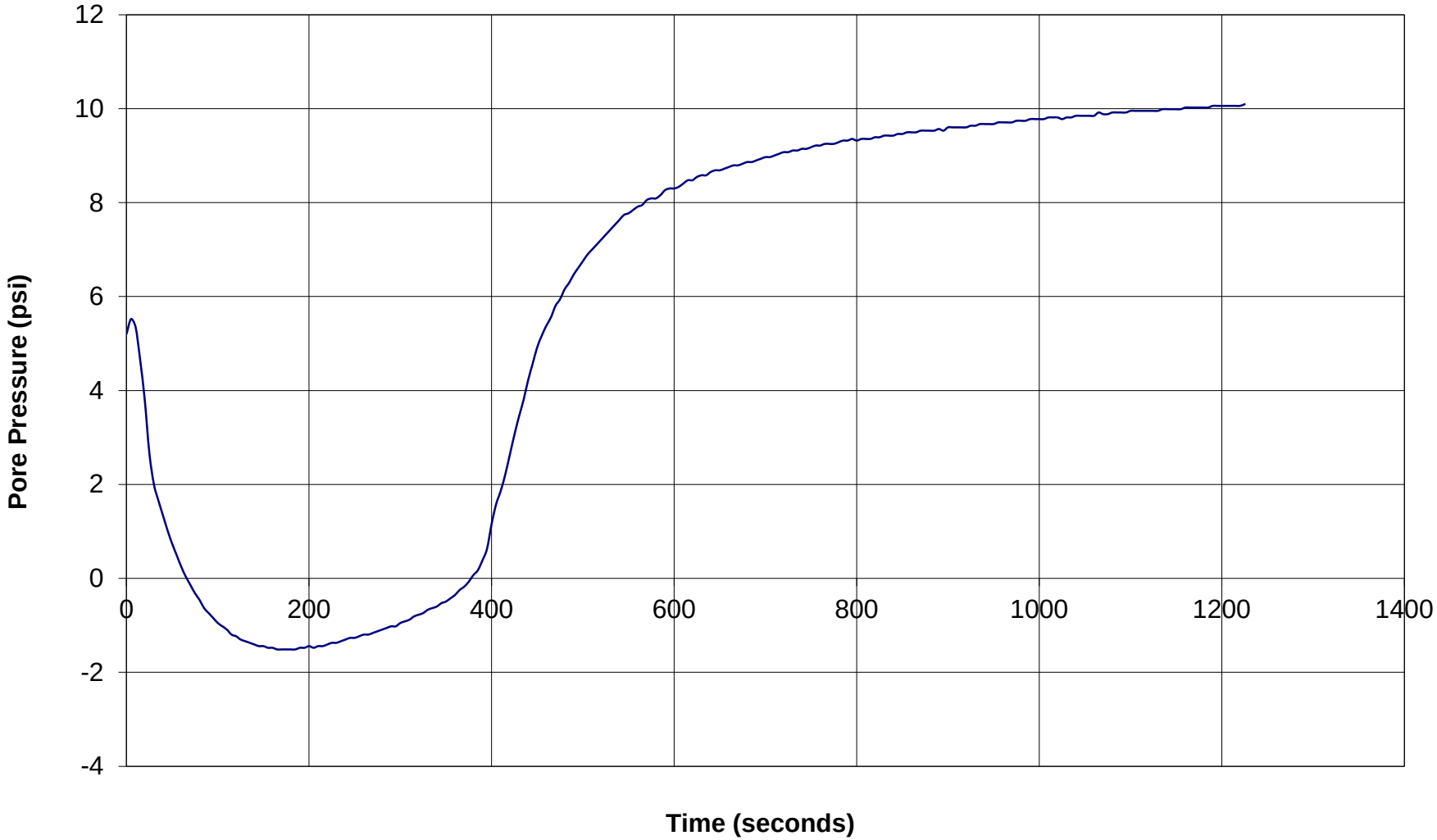
Sounding: USB-14
Depth: 40.026126
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

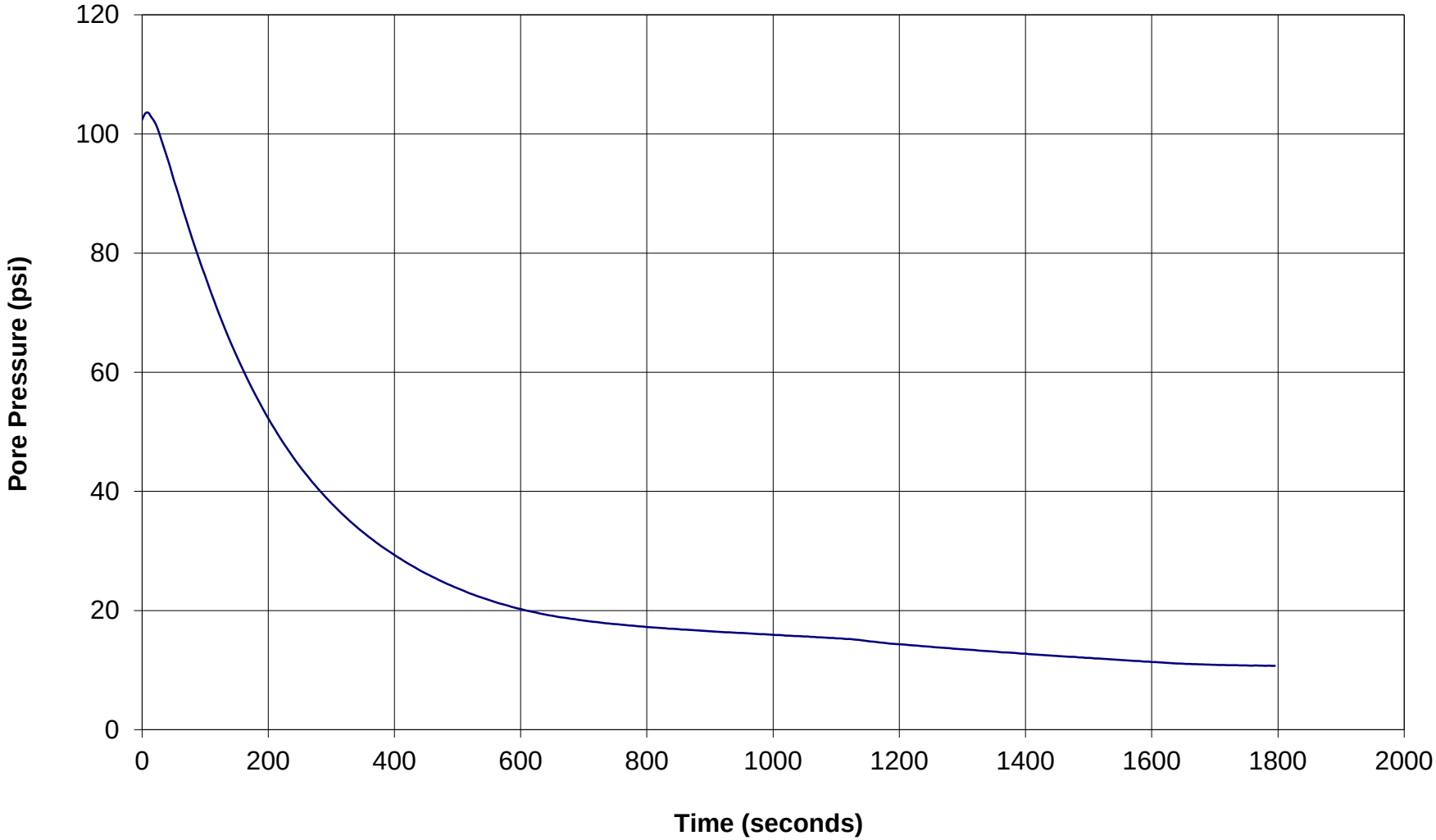
Sounding: USB-14
Depth: 56.2662345
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

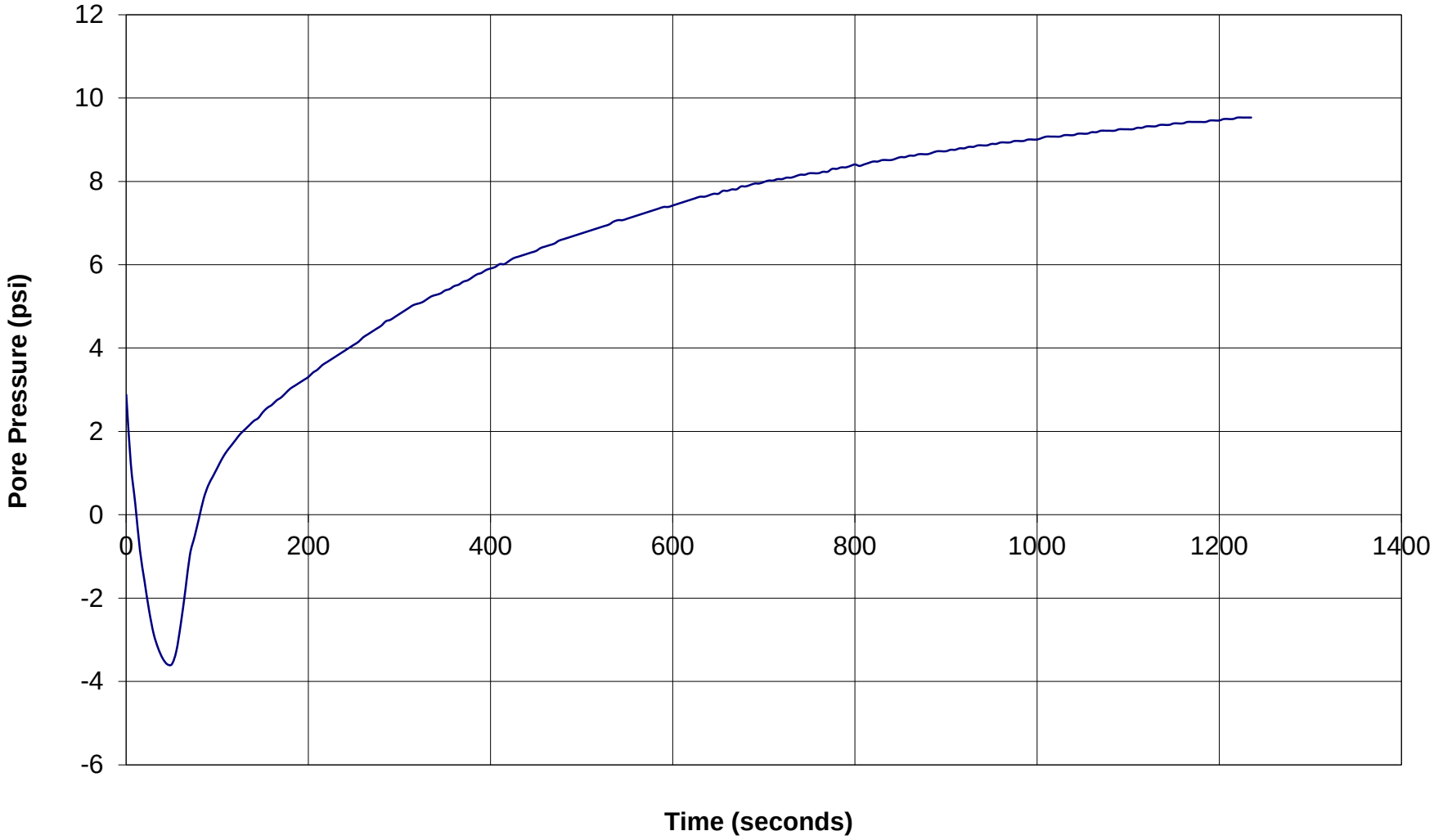
Sounding: USB-15
Depth: 40.354209
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

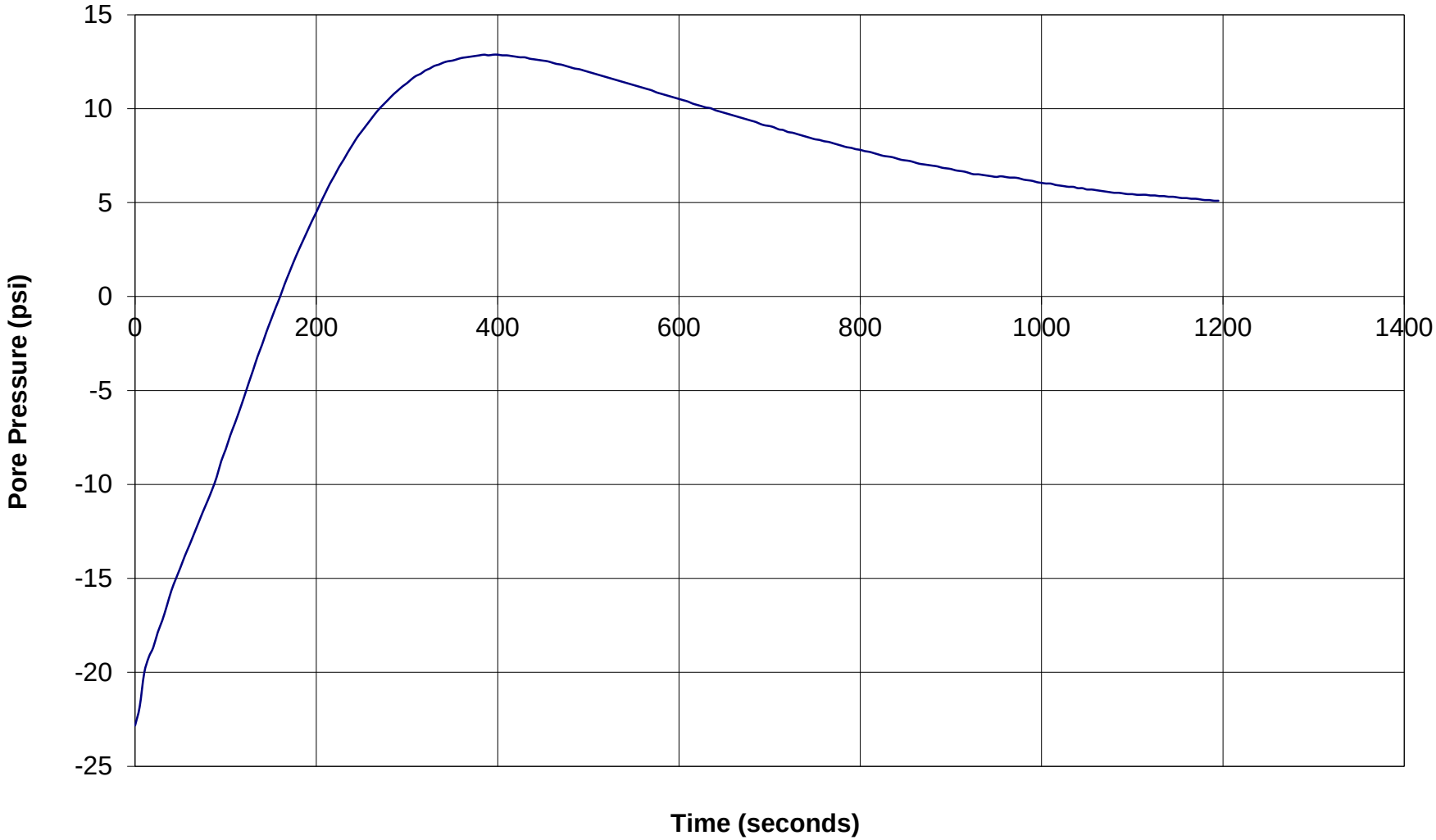
Sounding:	USB-15
Depth:	58.070691
Site:	BP 498
Engineer:	J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

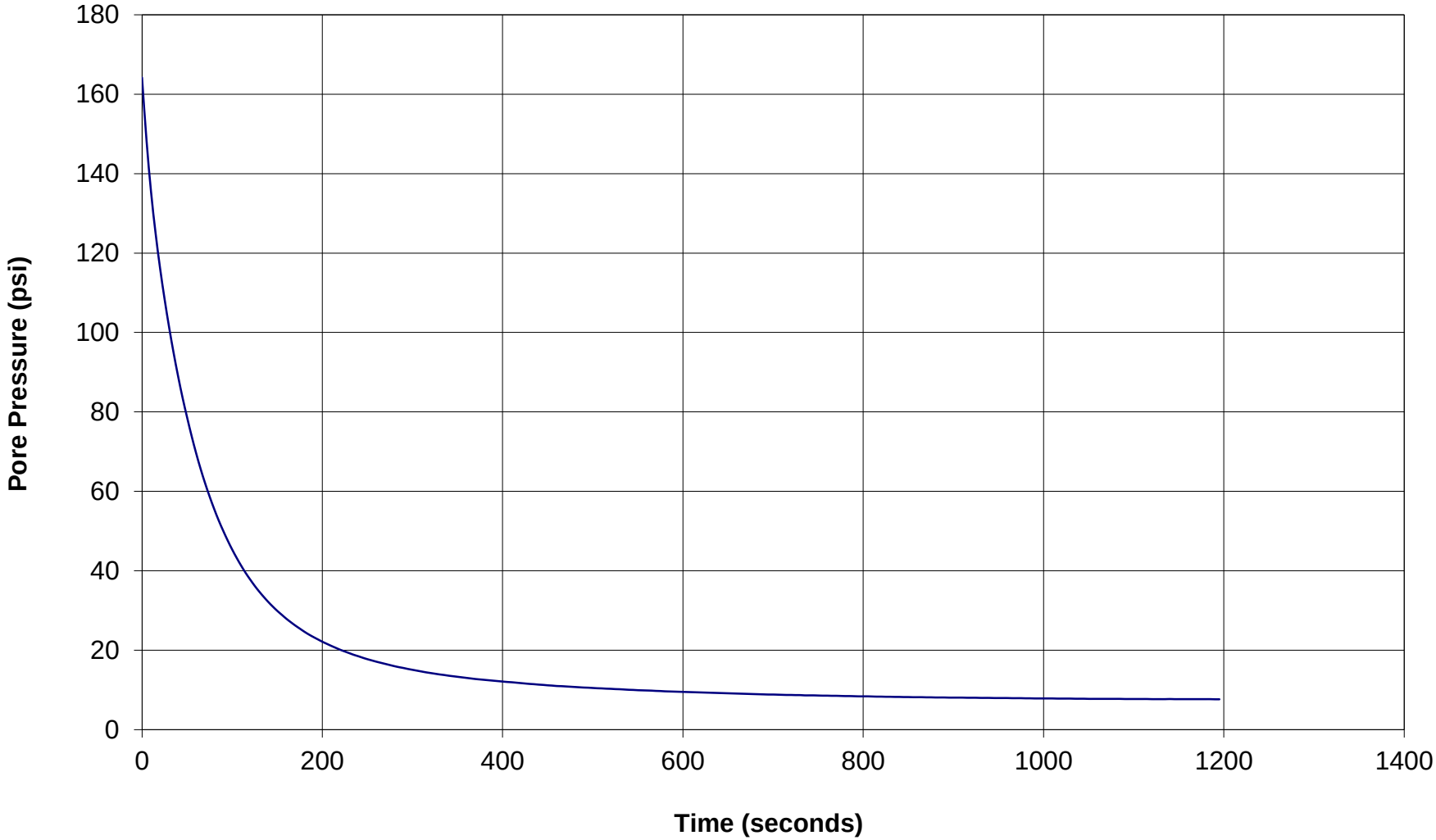
Sounding: USB-16
Depth: 35.104881
Site: BP 498
Engineer: J.DUDA



GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

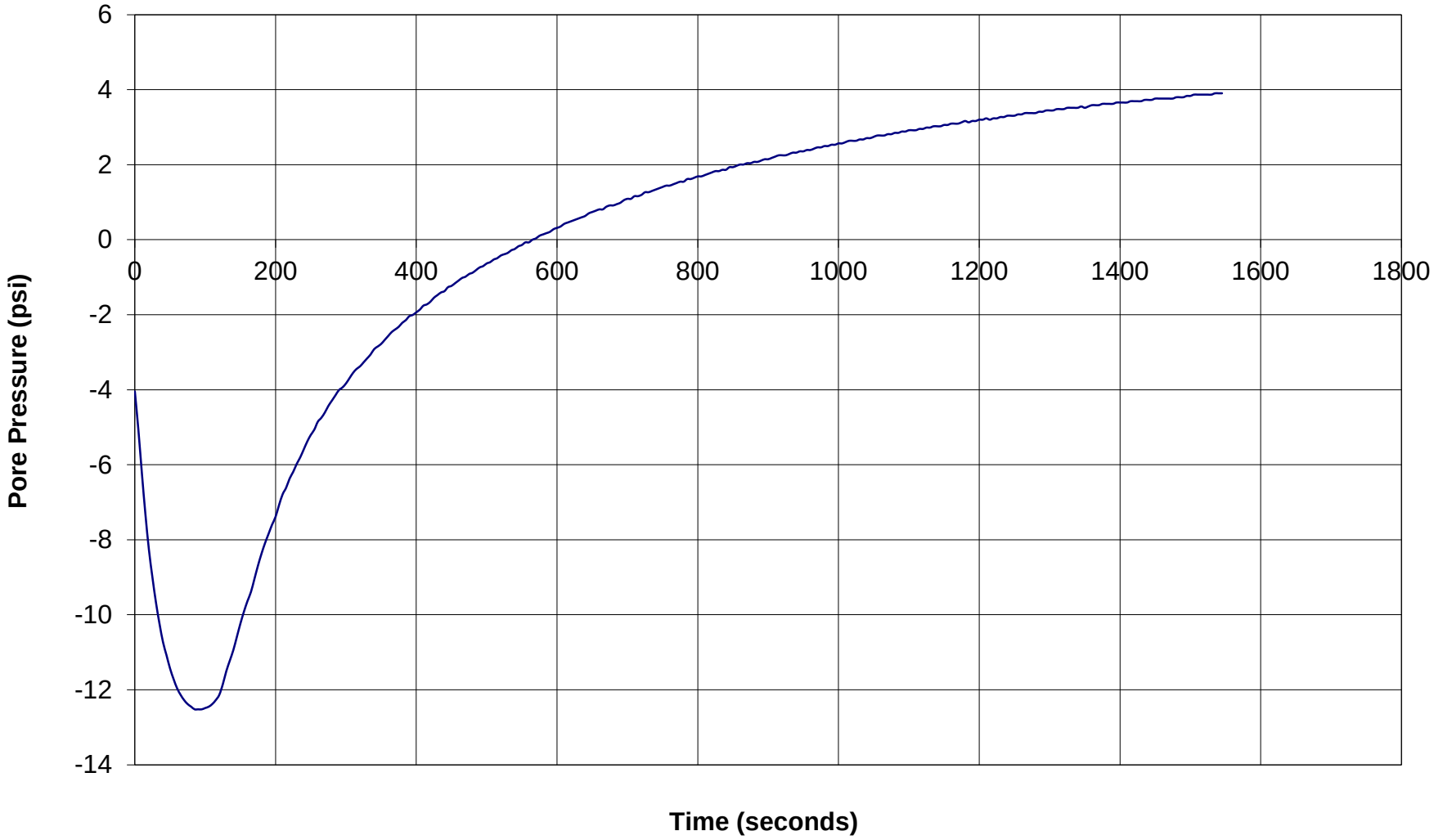
Sounding: USB-16
Depth: 55.117944
Site: BP 498
Engineer: J.DUDA

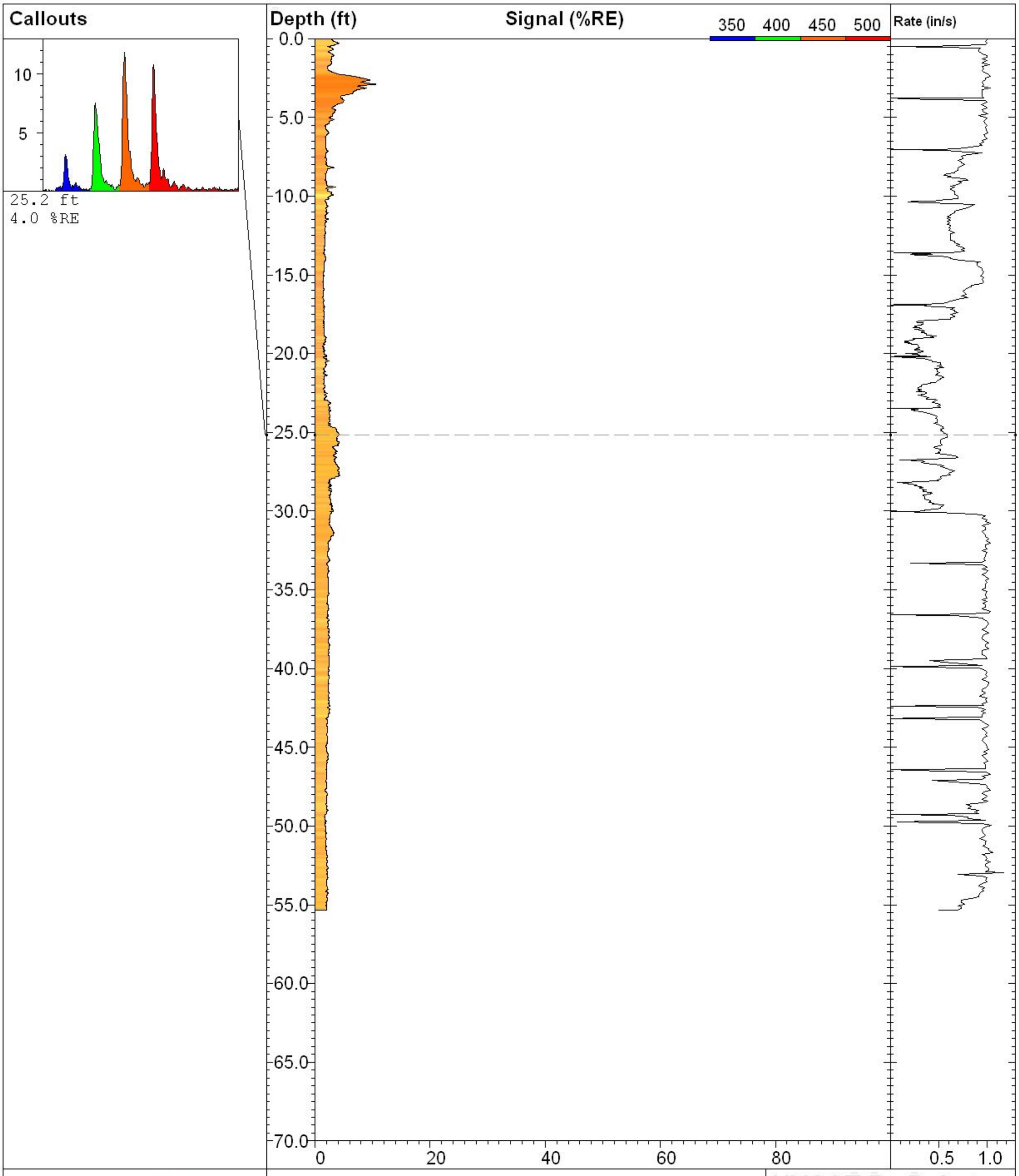


GREGG DRILLING & TESTING

Pore Pressure Dissipation Test

Sounding: USB-16
Depth: 57.9066495
Site: BP 498
Engineer: J.DUDA





GREGG

www.greggdrilling.com

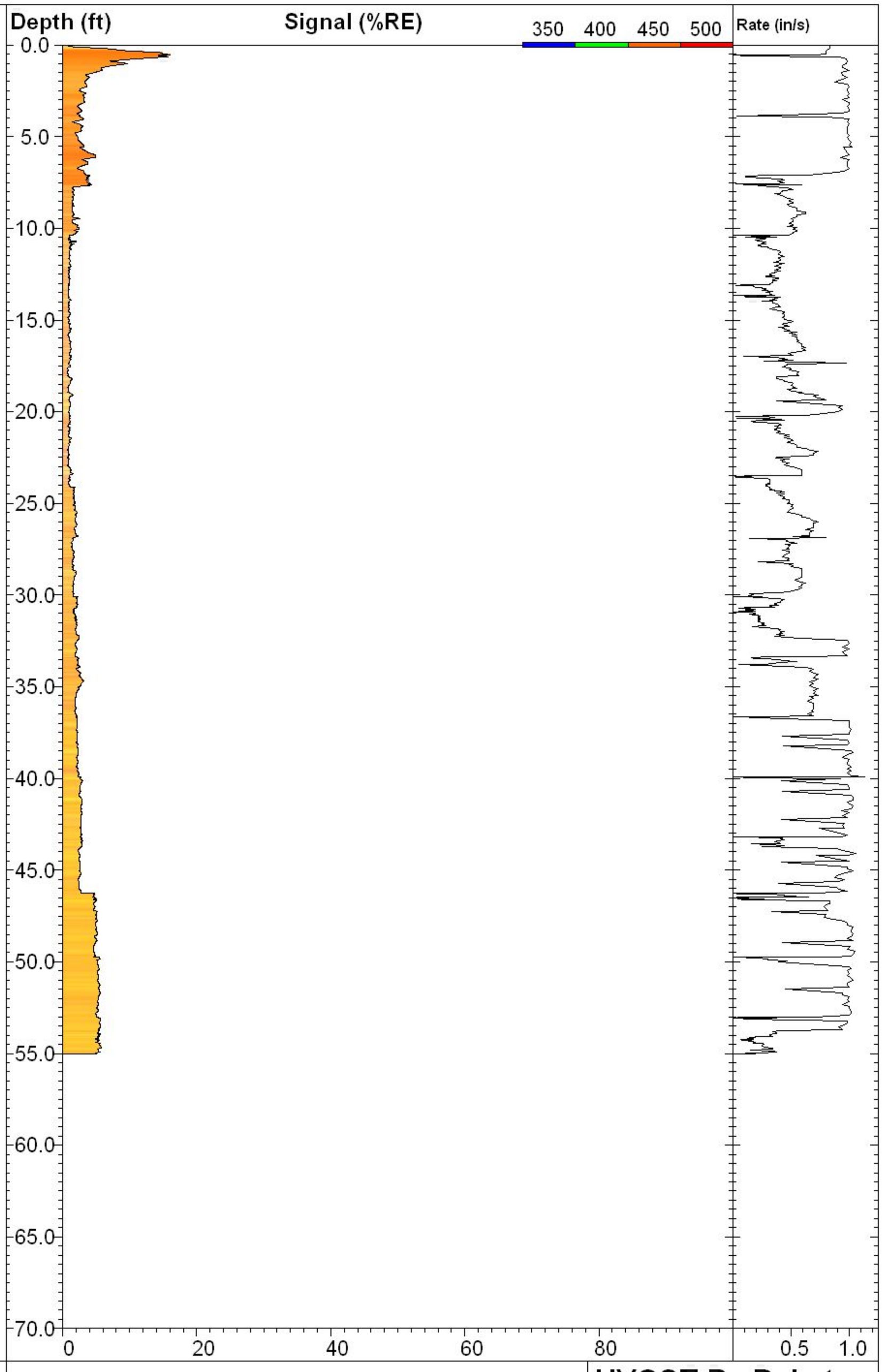
USB-9

UVOST By Dakota

www.DakotaTechnologies.com

Site: **BP-498-Livermore**	*Latitude / Datum:* **Unavailable / NA**	*Final depth:* **55.35 ft**
Client: **Broadbent**	*Longitude / Fix:* **Unavailable / NA**	*Max signal:* **10.6 % @ 2.90 ft**
Job: **08-82-603**	*Operator/Unit:* **Dustin T./UVOST1009**	*Date & Time:* **2013-03-22 07:38 PDT**

Callouts



GREGG

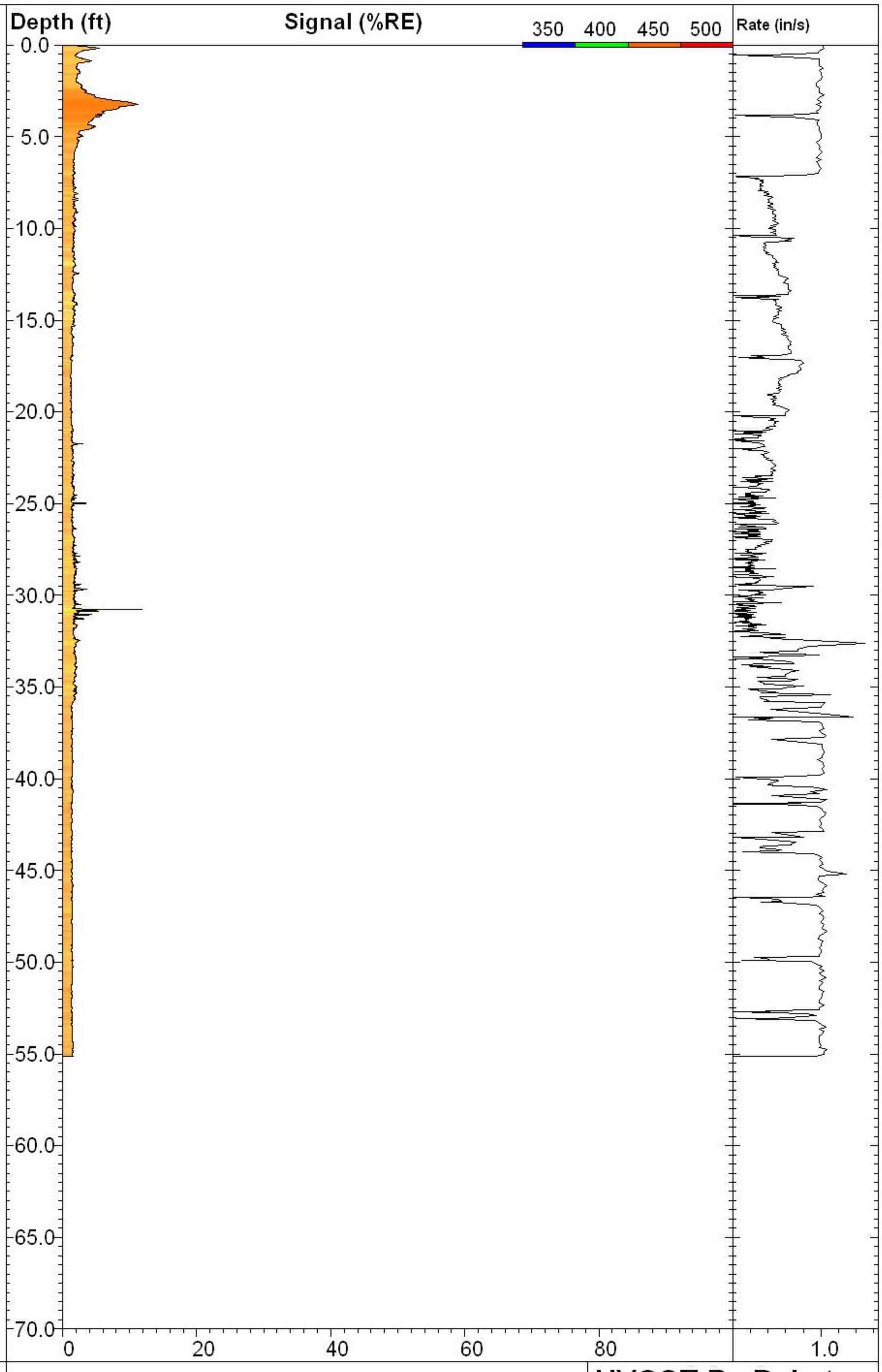
www.greggdrilling.com

USB-10

UVOST By Dakota
www.DakotaTechnologies.com

Site: **BP 498-Livermore**	*Latitude / Datum:* **Unavailable / NA**	*Final depth:* **55.02 ft**
Client: **Broadbent**	*Longitude / Fix:* **Unavailable / NA**	*Max signal:* **16.6 % @ 0.54 ft**
Job: **08-82-603**	*Operator/Unit:* **John H./UVOST1009**	*Date & Time:* **2013-03-18 11:53 PDT**

Callouts



GREGG

www.greggdrilling.com

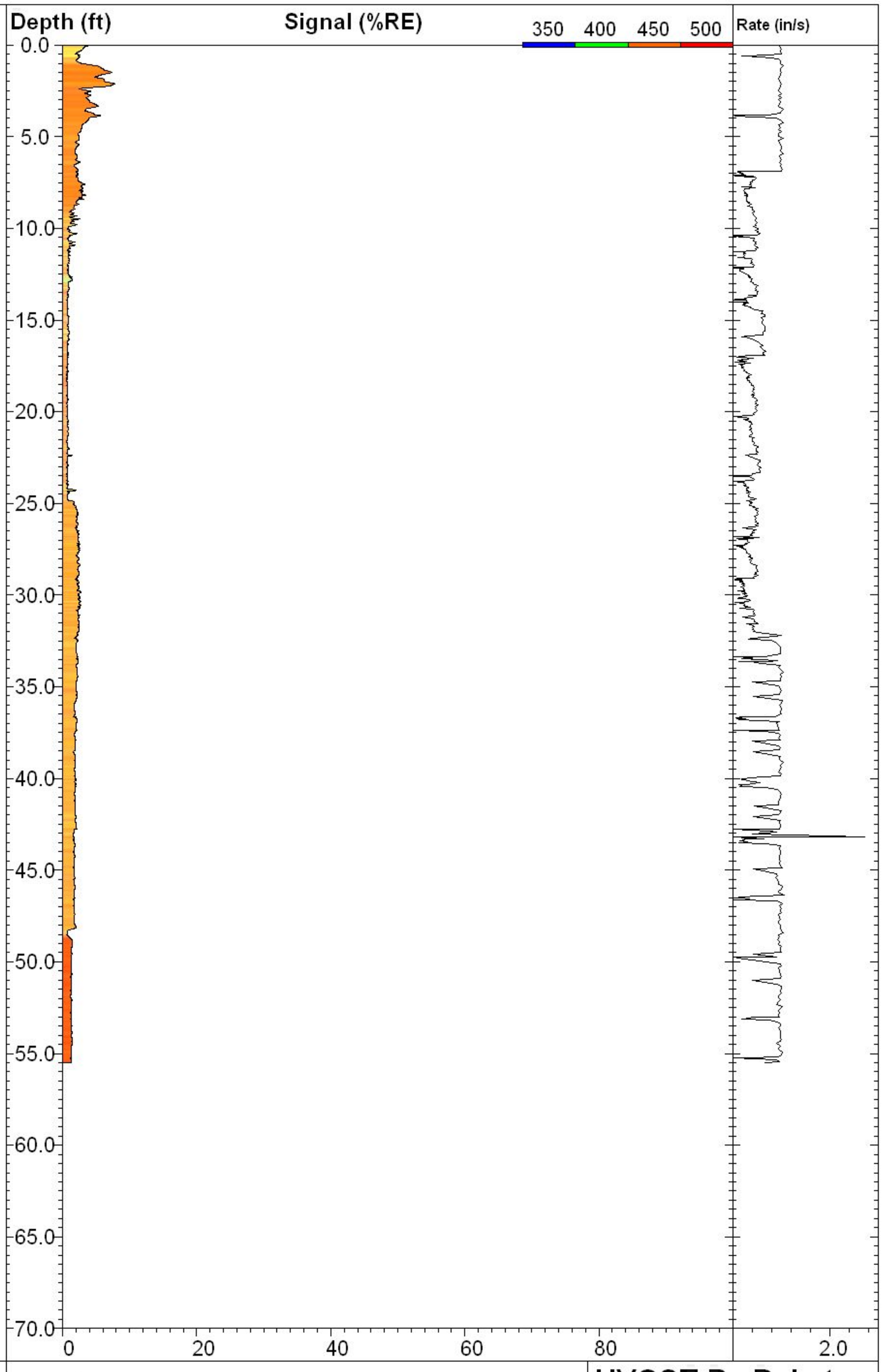
USB-11

UVOST By Dakota

www.DakotaTechnologies.com

Site: **BP 498-Livermoe**	*Latitude / Datum:* **Unavailable / NA**	*Final depth:* **55.15 ft**
Client: **Broadbent**	*Longitude / Fix:* **Unavailable / NA**	*Max signal:* **12.0 % @ 30.77 ft**
Job: **08-82-603**	*Operator/Unit:* **John H./UVOST1009**	*Date & Time:* **2013-03-20 10:32 PDT**

Callouts



GREGG

www.greggdrilling.com

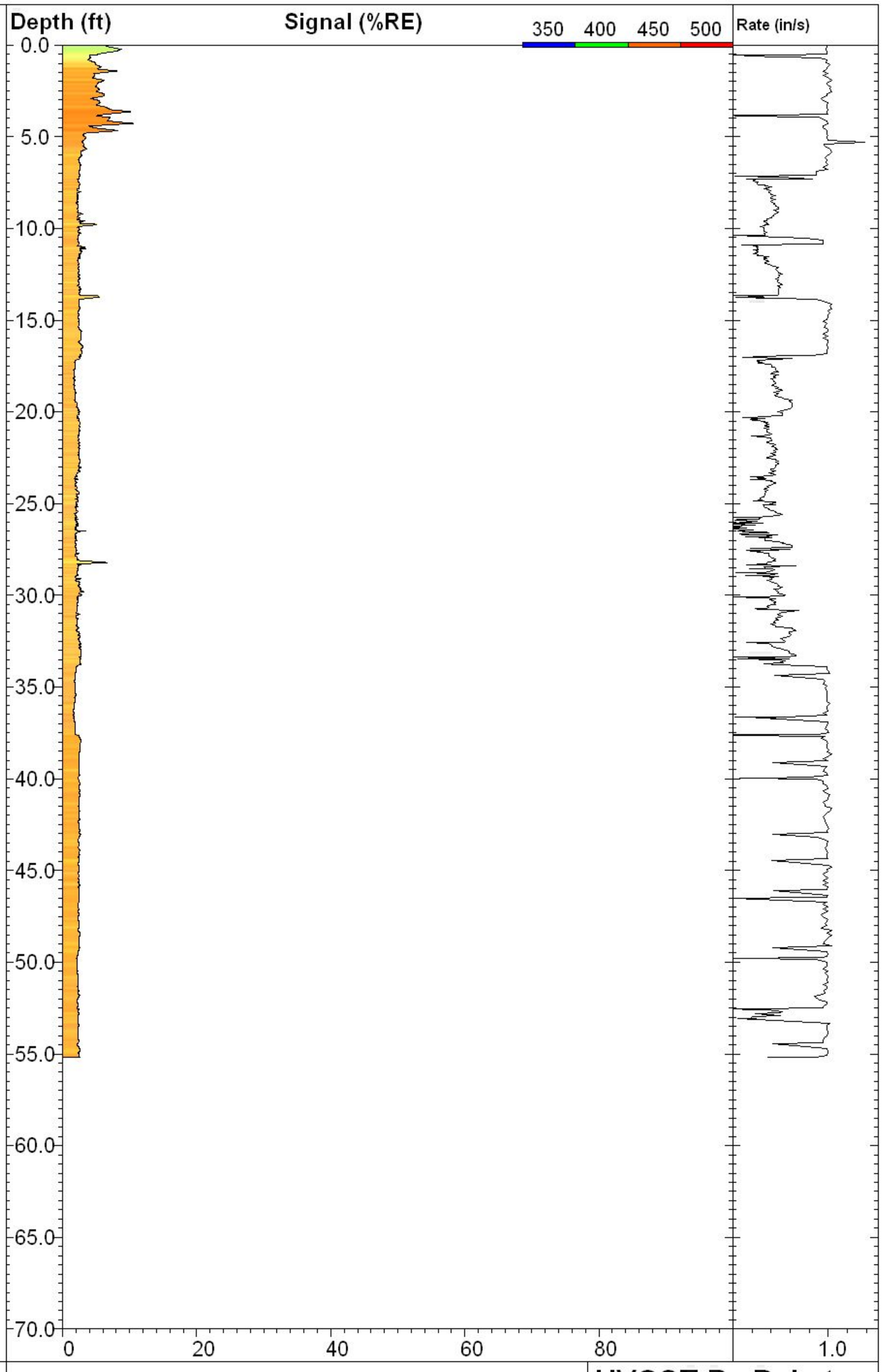
USB-12

UVOST By Dakota

www.DakotaTechnologies.com

Site: **BP 498-Livermore**	*Latitude / Datum:* **Unavailable / NA**	*Final depth:* **55.49 ft**
Client: **Broadbent**	*Longitude / Fix:* **Unavailable / NA**	*Max signal:* **7.8 % @ 2.11 ft**
Job: **08-82-603**	*Operator/Unit:* **John H./UVOST1009**	*Date & Time:* **2013-03-19 08:14 PDT**

Callouts



GREGG

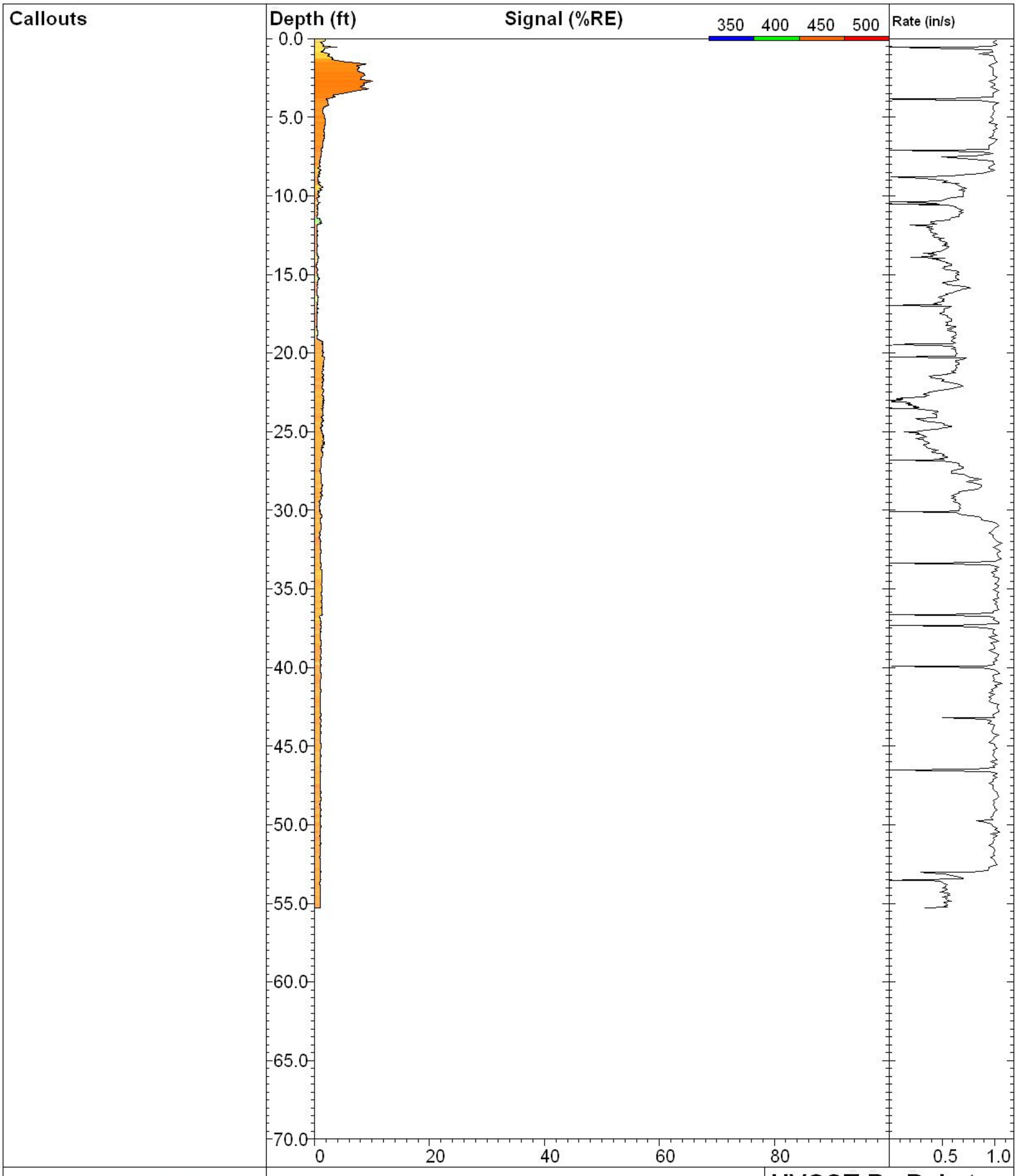
www.greggdrilling.com

USB-13

UVOST By Dakota

www.DakotaTechnologies.com

Site: **BP 498-Livermoe**	*Latitude / Datum:* **Unavailable / NA**	*Final depth:* **55.18 ft**
Client: **Broadbent**	*Longitude / Fix:* **Unavailable / NA**	*Max signal:* **10.6 % @ 4.29 ft**
Job: **08-82-603**	*Operator/Unit:* **John H./UVOST1009**	*Date & Time:* **2013-03-20 16:45 PDT**



GREGG

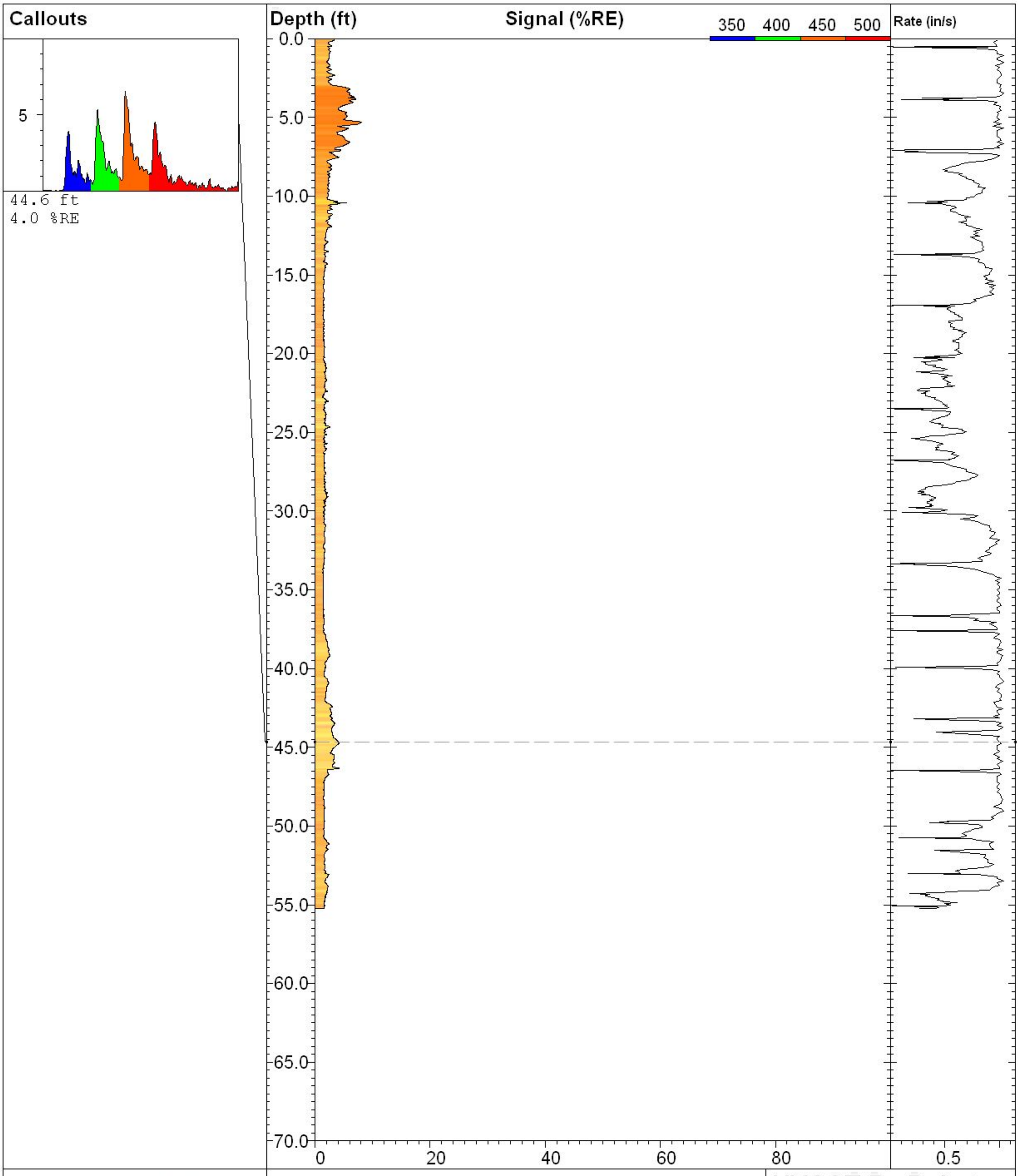
www.greggdrilling.com

USB-14

UVOST By Dakota

www.DakotaTechnologies.com

Site: **BP-498-Livermore**	*Latitude / Datum:* **Unavailable / NA**	*Final depth:* **55.30 ft**
Client: **Broadbent**	*Longitude / Fix:* **Unavailable / NA**	*Max signal:* **10.1 % @ 2.71 ft**
Job: **08-82-603**	*Operator/Unit:* **Dustin T./UVOST1009**	*Date & Time:* **2013-03-22 12:06 PDT**



GREGG

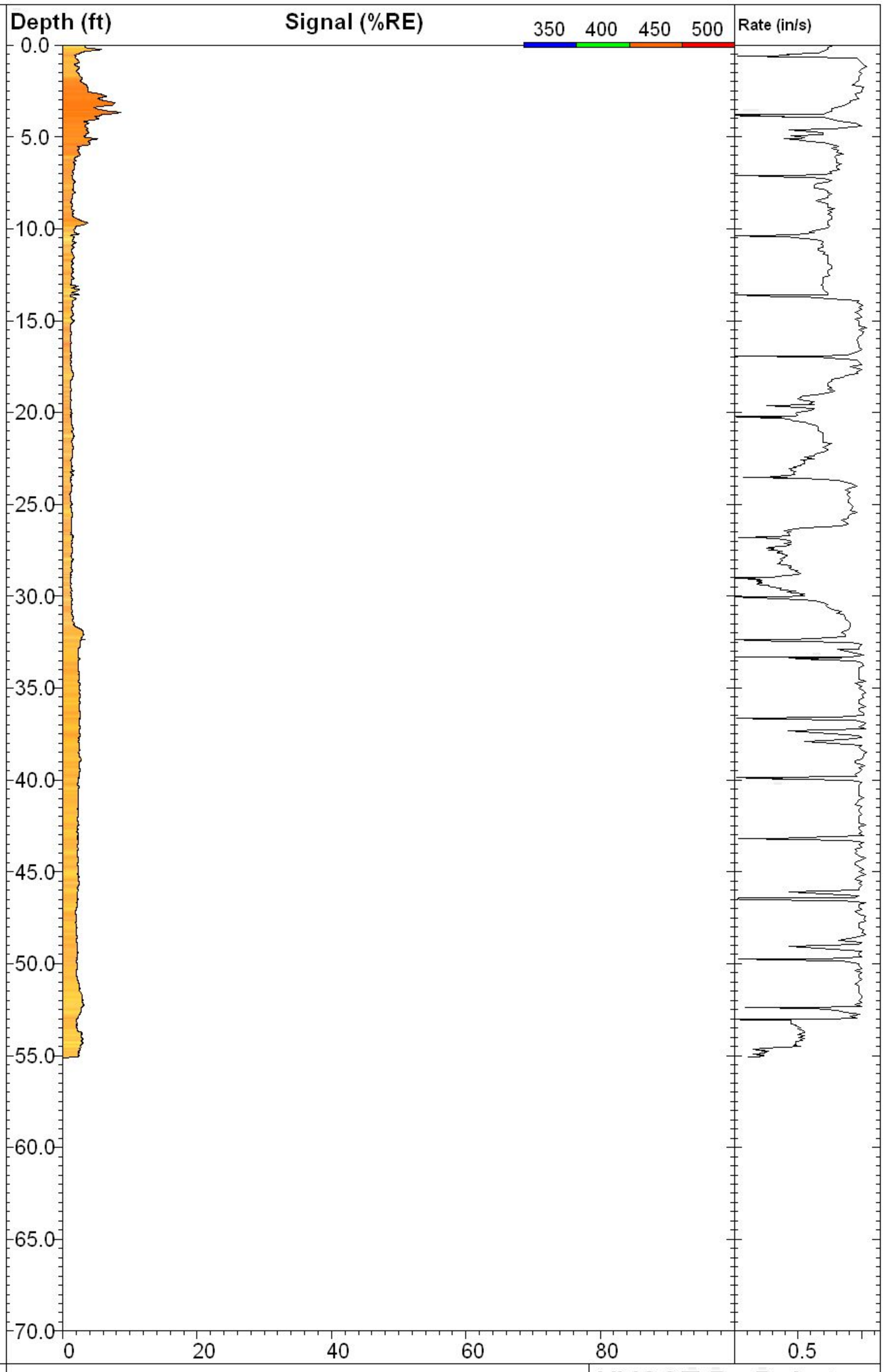
www.greggdrilling.com

USB-15

UVOST By Dakota
www.DakotaTechnologies.com

Site: **BP-498-Livermore**	*Latitude / Datum:* **Unavailable / NA**	*Final depth:* **55.26 ft**
Client: **Broadbent**	*Longitude / Fix:* **Unavailable / NA**	*Max signal:* **8.1 % @ 5.30 ft**
Job: **08-82-603**	*Operator/Unit:* **Dustin T./UVOST1009**	*Date & Time:* **2013-03-21 15:18 PDT**

Callouts



GREGG

www.greggdrilling.com

USB-16

UVOST By Dakota

www.DakotaTechnologies.com

Site: **BP-498-Livermore**	*Latitude / Datum:* **Unavailable / NA**	*Final depth:* **55.10 ft**
Client: **Broadbent**	*Longitude / Fix:* **Unavailable / NA**	*Max signal:* **8.7 % @ 3.67 ft**
Job: **08-82-603**	*Operator/Unit:* **Dustin T./UVOST1009**	*Date & Time:* **2013-03-21 10:35 PDT**

Appendix E

CPT Boring Logs

LITHOLOGIC LOG

PROJECT NAME: BP 498

PROJECT NUMBER: 08-82-498

DATE: 3/22/2013

SITE ADDRESS: 286 South Livermore Ave., Livermore, CA

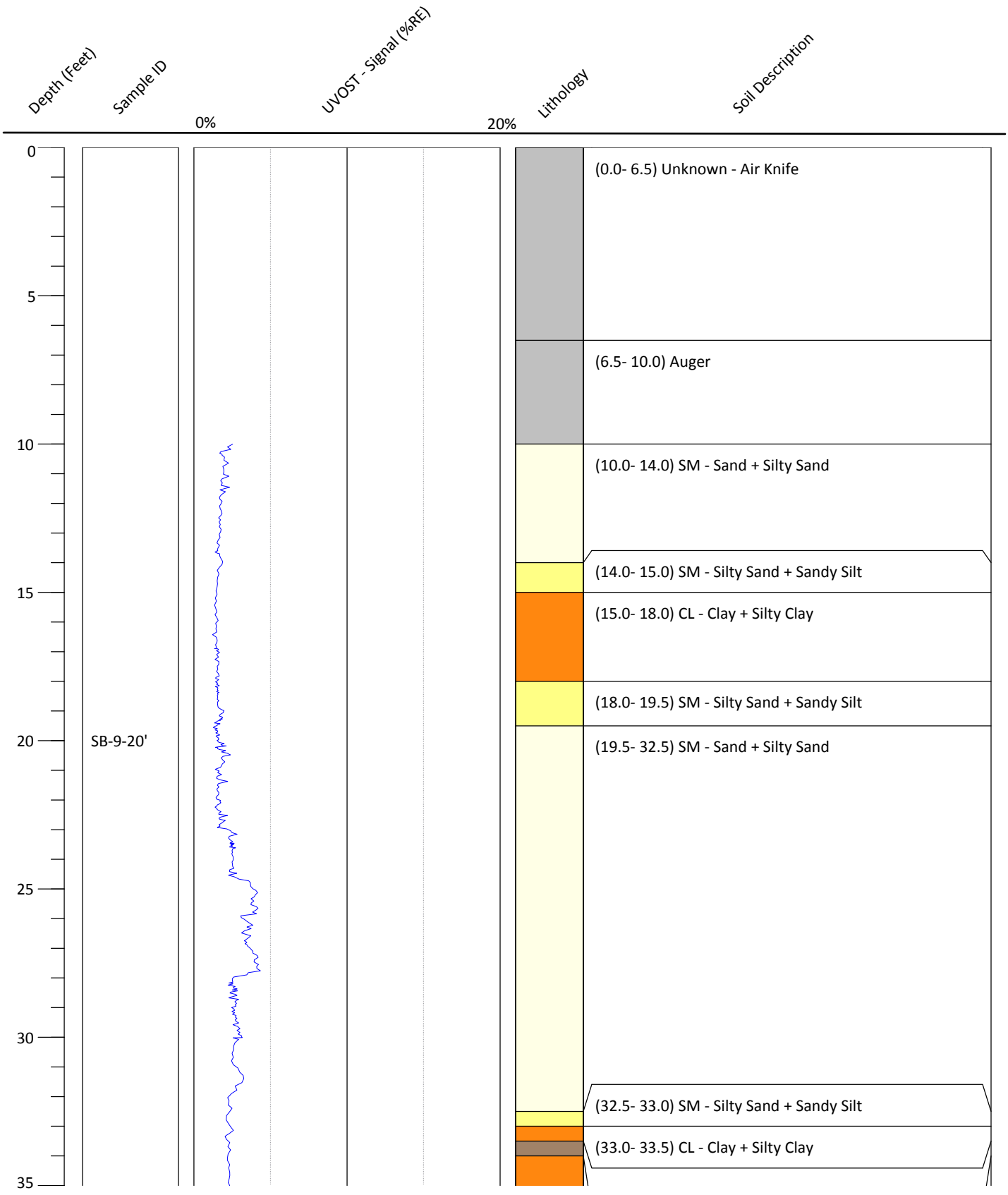
BORING ID: SB-9

DRILLING COMPANY: Gregg Drilling

SAMPLE METHOD: Direct Push

BORE HOLE DIAMETER: 1.78"

DRILLING METHOD: CPT



TOTAL BORING DEPTH: 58'

LITHOLOGIC LOG

PROJECT NAME: BP 498

PROJECT NUMBER: 08-82-498

DATE: 3/22/2013

SITE ADDRESS: 286 South Livermore Ave., Livermore, CA

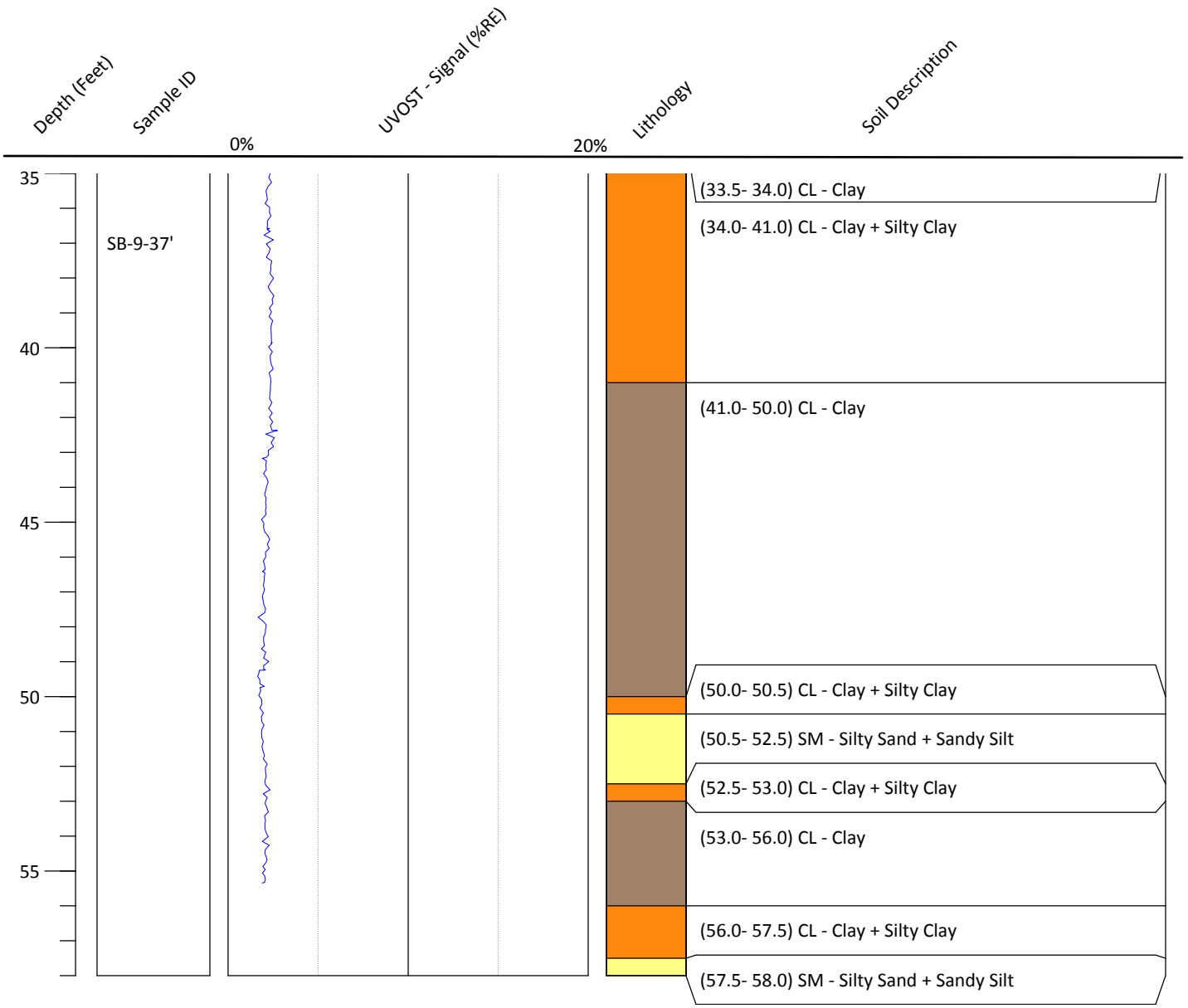
BORING ID: SB-9

DRILLING COMPANY: Gregg Drilling

SAMPLE METHOD: Direct Push

BORE HOLE DIAMETER: 1.78"

DRILLING METHOD: CPT



TOTAL BORING DEPTH: 58'

LITHOLOGIC LOG

PROJECT NAME: BP 498

PROJECT NUMBER: 08-82-603

DATE: 3/18/2013

SITE ADDRESS: 286 South Livermore Ave., Livermore, CA

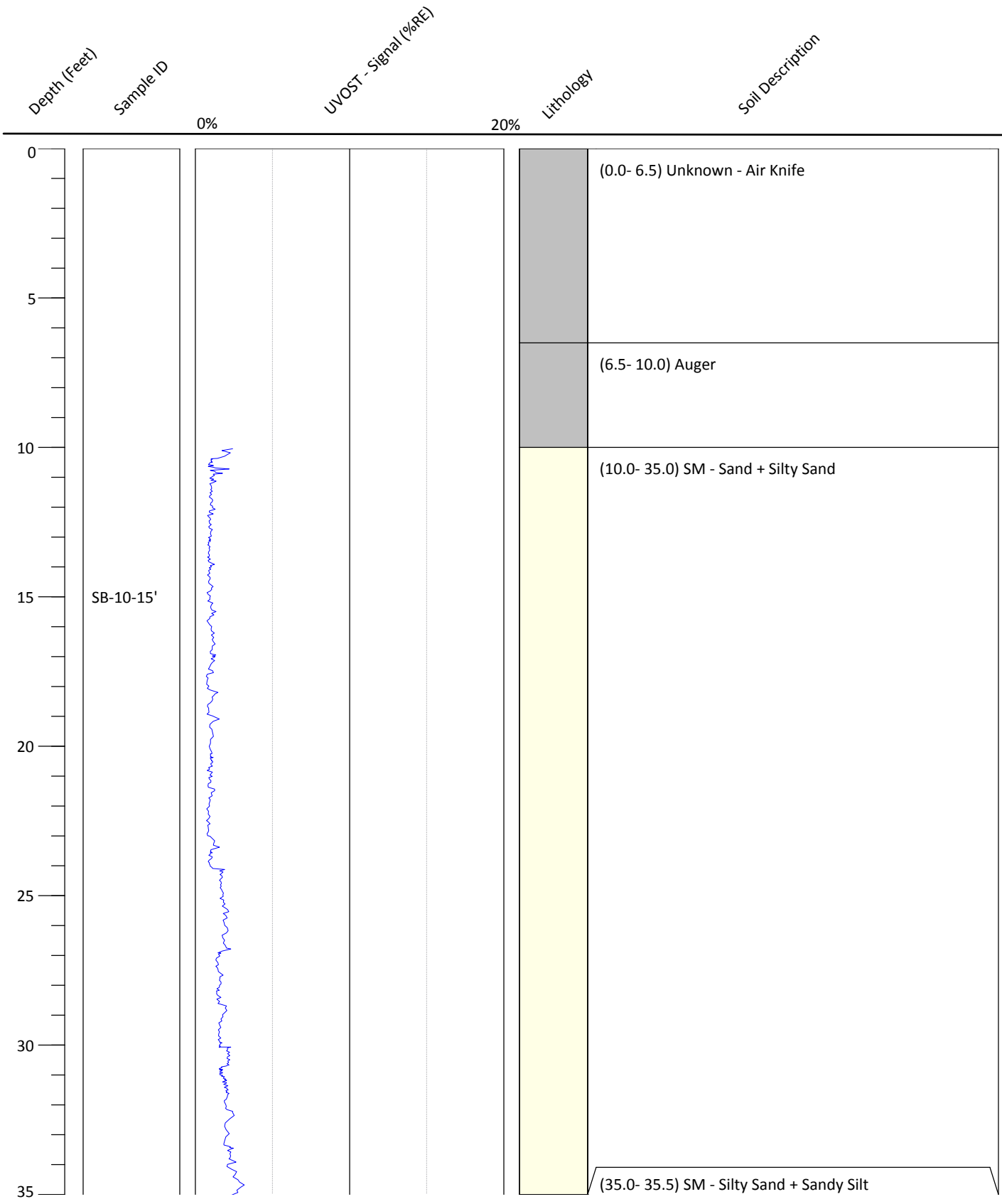
BORING ID: SB-10

DRILLING COMPANY: Gregg Drilling

SAMPLE METHOD: Direct Push

BORE HOLE DIAMETER: 1.78"

DRILLING METHOD: CPT



TOTAL BORING DEPTH: 58'

LITHOLOGIC LOG

PROJECT NAME: BP 498

PROJECT NUMBER: 08-82-603

DATE: 3/18/2013

SITE ADDRESS: 286 South Livermore Ave., Livermore, CA

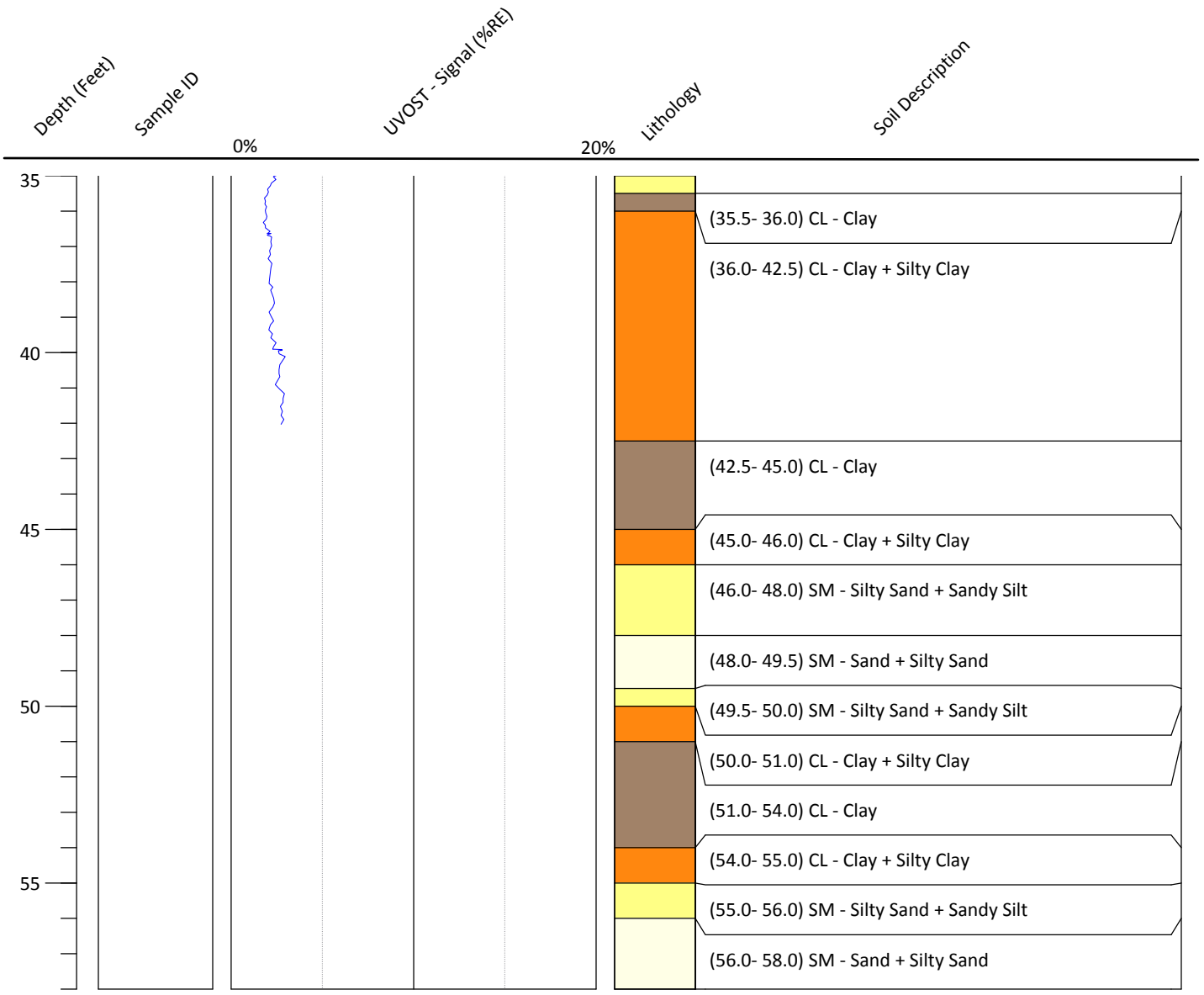
BORING ID: SB-10

DRILLING COMPANY: Gregg Drilling

SAMPLE METHOD: Direct Push

BORE HOLE DIAMETER: 1.78"

DRILLING METHOD: CPT



TOTAL BORING DEPTH: 58'

LITHOLOGIC LOG

PROJECT NAME: BP 498

PROJECT NUMBER: 08-82-603

DATE: 3/20/2013

SITE ADDRESS: 286 South Livermore Ave., Livermore, CA

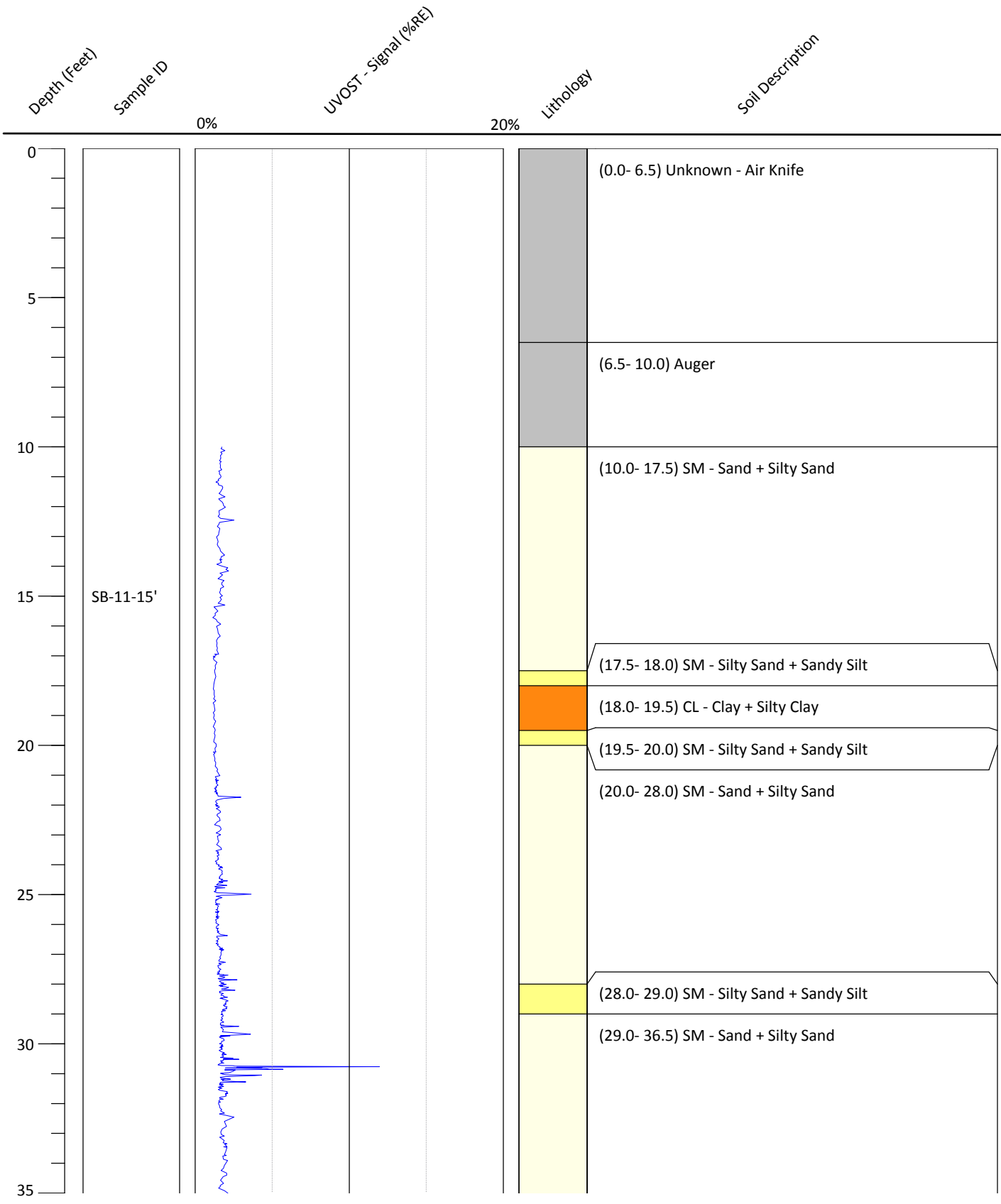
BORING ID: SB-11

DRILLING COMPANY: Gregg Drilling

SAMPLE METHOD: Direct Push

BORE HOLE DIAMETER: 1.78"

DRILLING METHOD: CPT



TOTAL BORING DEPTH: 58'

LITHOLOGIC LOG

PROJECT NAME: BP 498

PROJECT NUMBER: 08-82-603

DATE: 3/20/2013

SITE ADDRESS: 286 South Livermore Ave., Livermore, CA

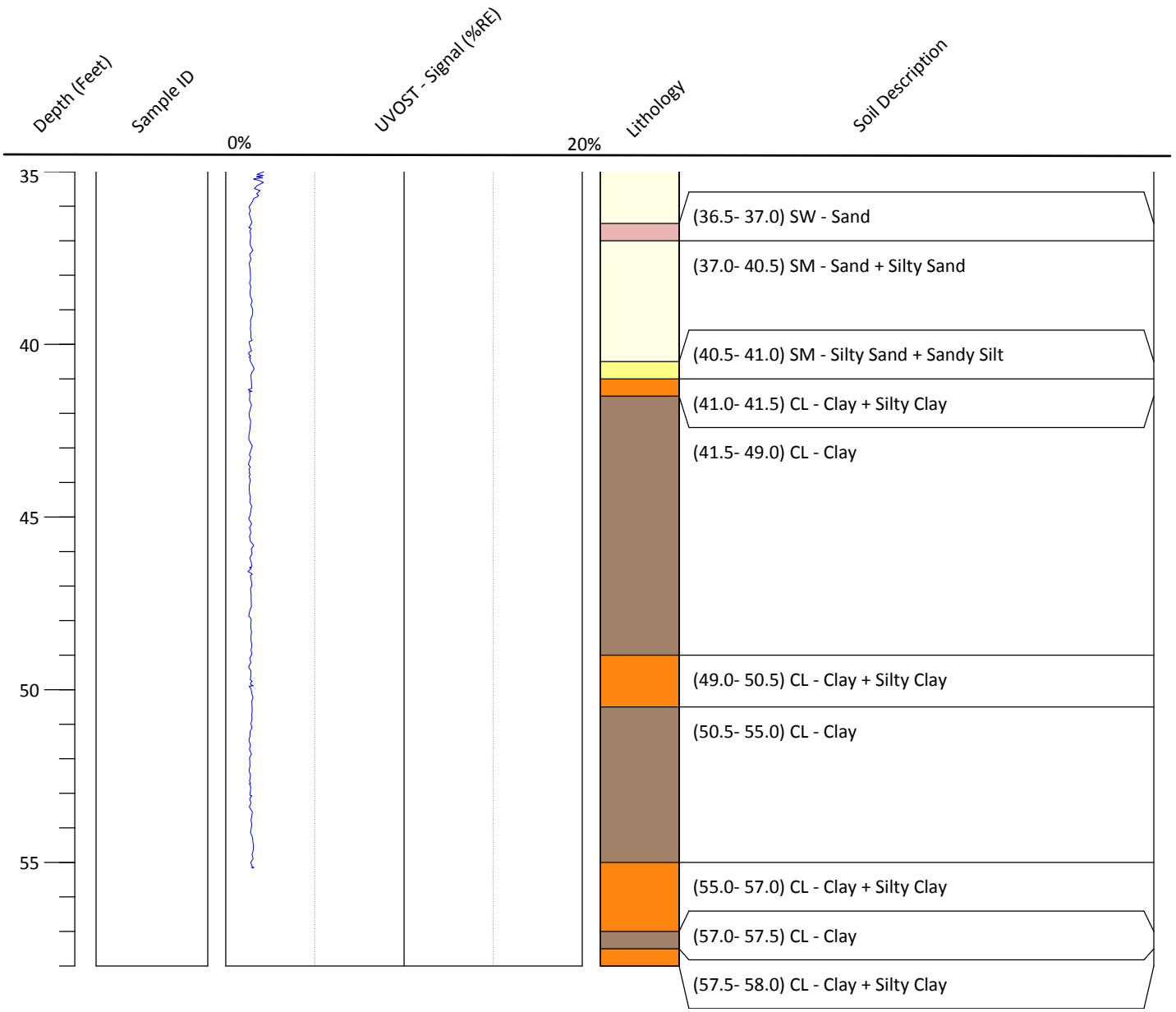
BORING ID: SB-11

DRILLING COMPANY: Gregg Drilling

SAMPLE METHOD: Direct Push

BORE HOLE DIAMETER: 1.78"

DRILLING METHOD: CPT



TOTAL BORING DEPTH: 58'

LITHOLOGIC LOG

PROJECT NAME: BP 498

PROJECT NUMBER: 08-82-603

DATE: 3/20/2013

SITE ADDRESS: 286 South Livermore Ave., Livermore, CA

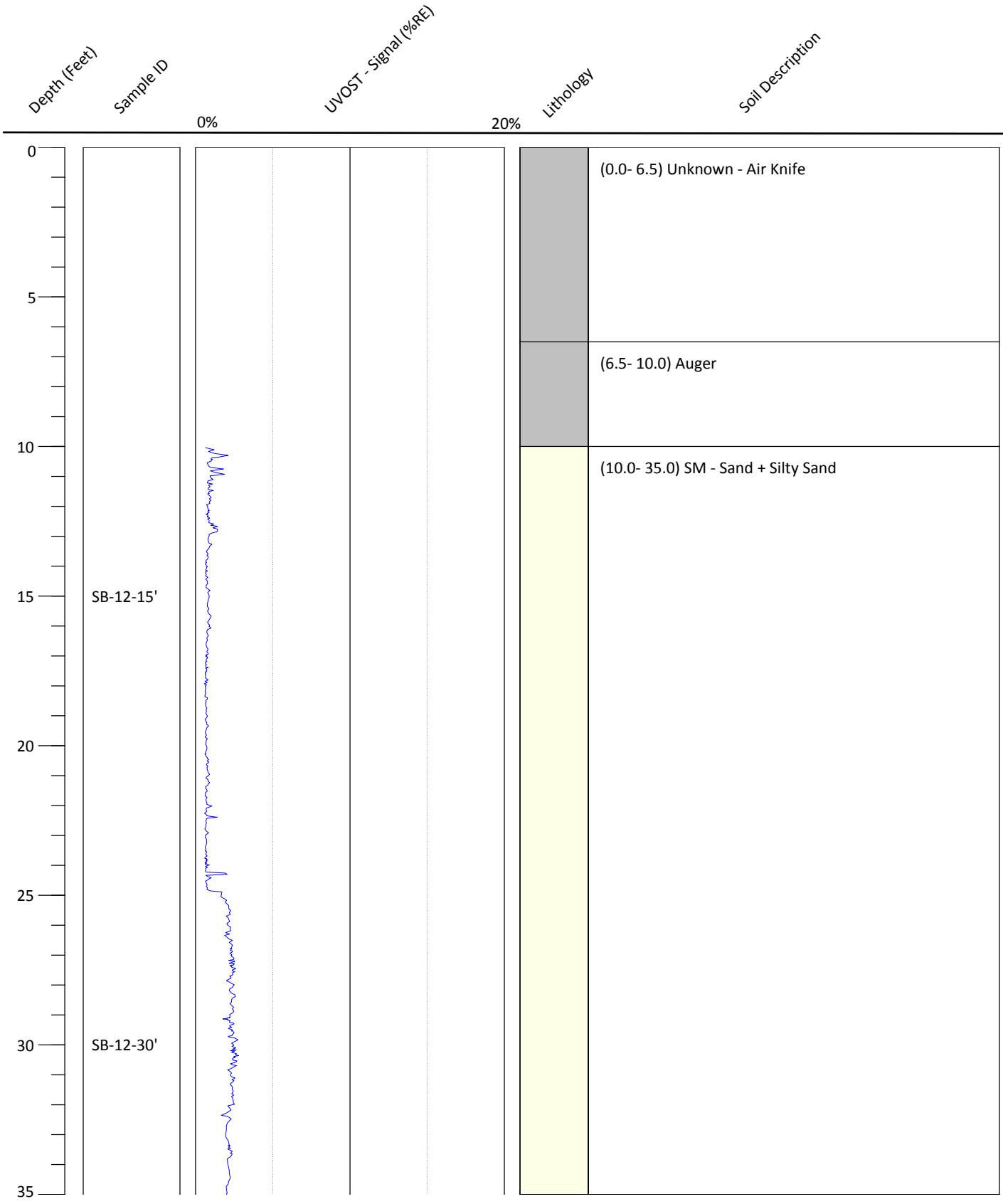
BORING ID: SB-12

DRILLING COMPANY: Gregg Drilling

SAMPLE METHOD: Direct Push

BORE HOLE DIAMETER: 1.78"

DRILLING METHOD: CPT



TOTAL BORING DEPTH: 58'

LITHOLOGIC LOG

PROJECT NAME: BP 498

PROJECT NUMBER: 08-82-603

DATE: 3/20/2013

SITE ADDRESS: 286 South Livermore Ave., Livermore, CA

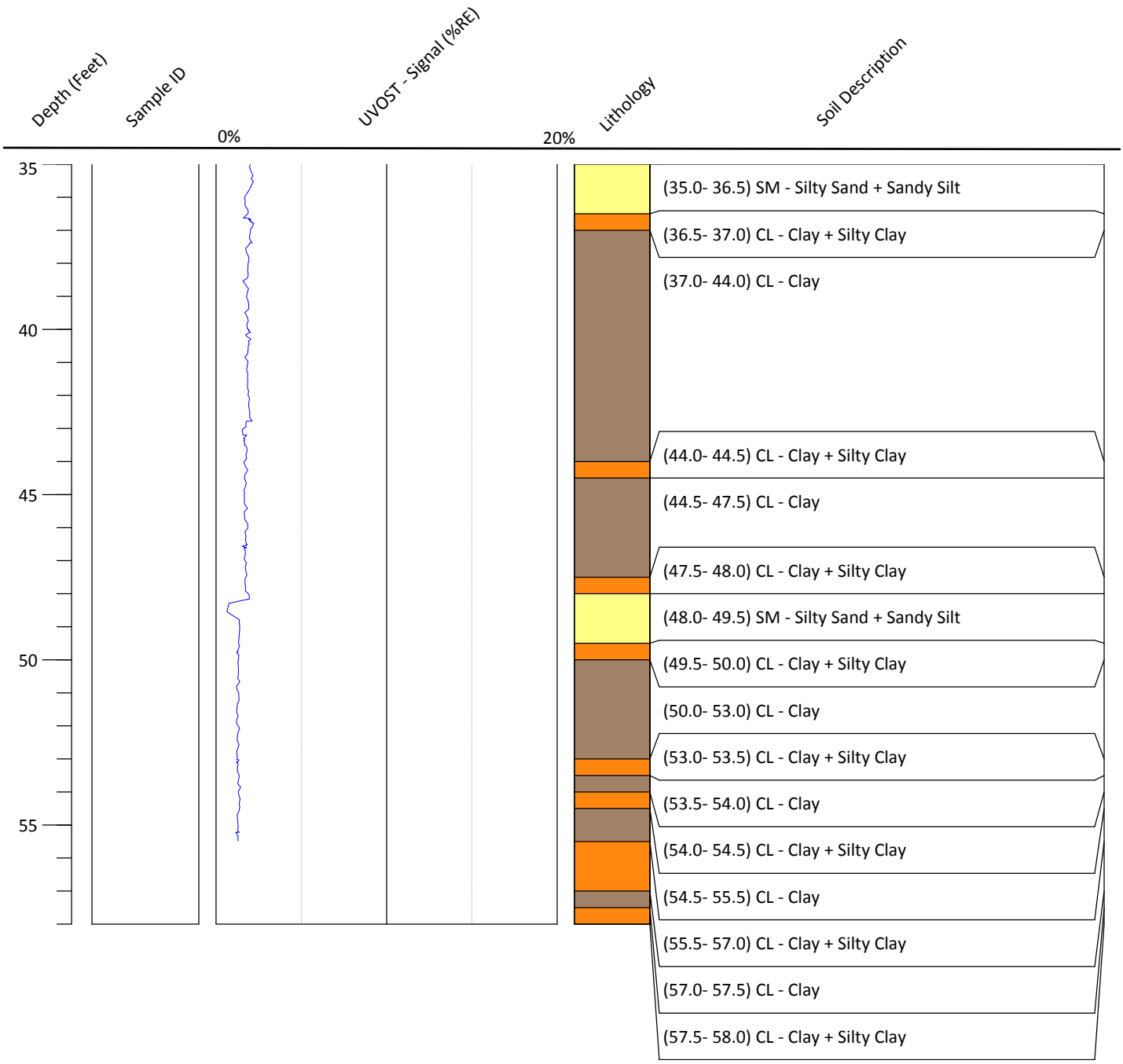
BORING ID: SB-12

DRILLING COMPANY: Gregg Drilling

SAMPLE METHOD: Direct Push

BORE HOLE DIAMETER: 1.78"

DRILLING METHOD: CPT



TOTAL BORING DEPTH: 58'

LITHOLOGIC LOG

PROJECT NAME: BP-498

PROJECT NUMBER: 08-82-603

DATE: 3/21/2013

SITE ADDRESS: 286 South Livermore Ave, Livermore, CA

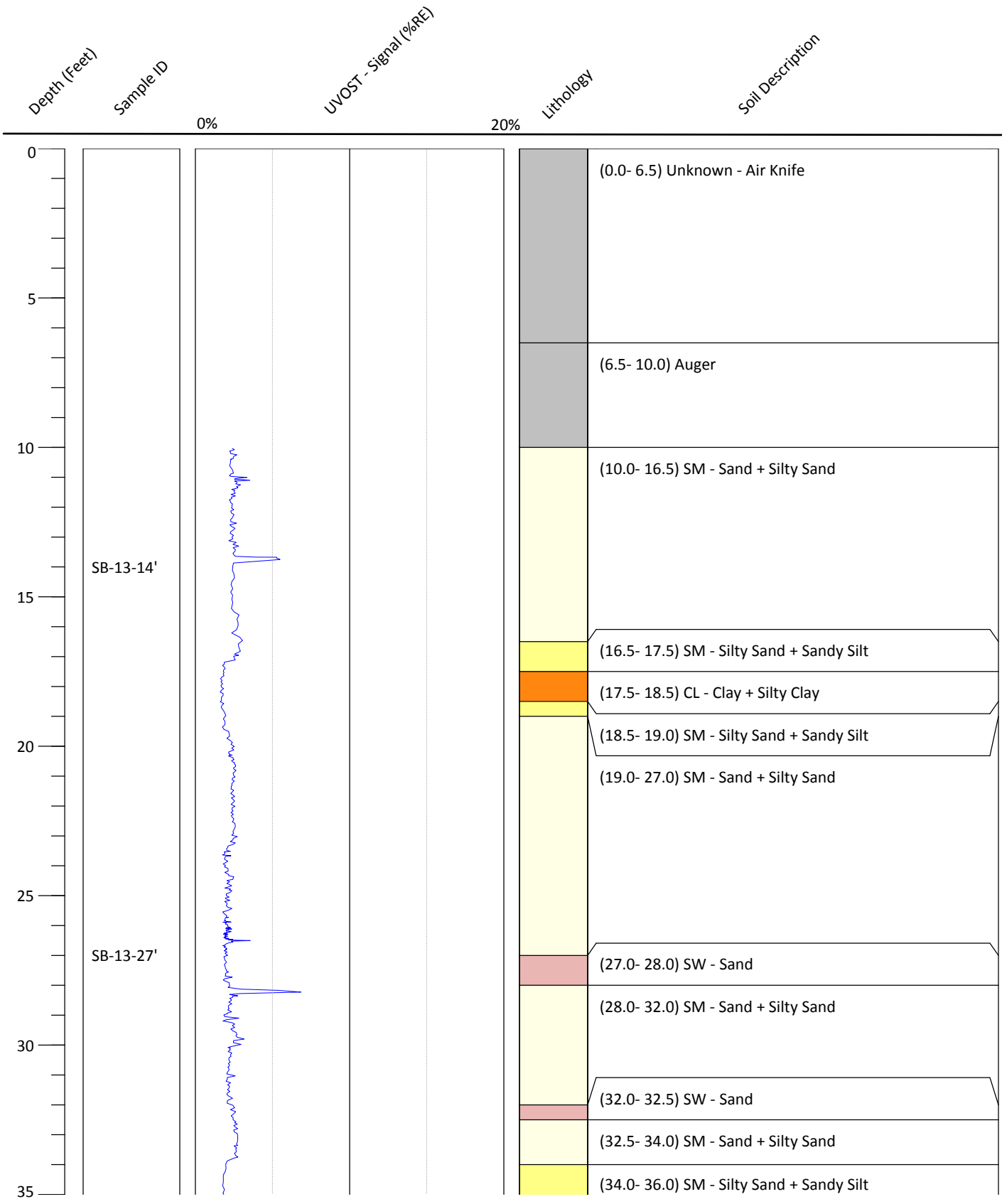
BORING ID: SB-13

DRILLING COMPANY: Gregg Drilling

SAMPLE METHOD: Direct Push

BORE HOLE DIAMETER: 1.78"

DRILLING METHOD: CPT



TOTAL BORING DEPTH: 58'

LITHOLOGIC LOG

PROJECT NAME: BP-498

PROJECT NUMBER: 08-82-603

DATE: 3/21/2013

SITE ADDRESS: 286 South Livermore Ave, Livermore, CA

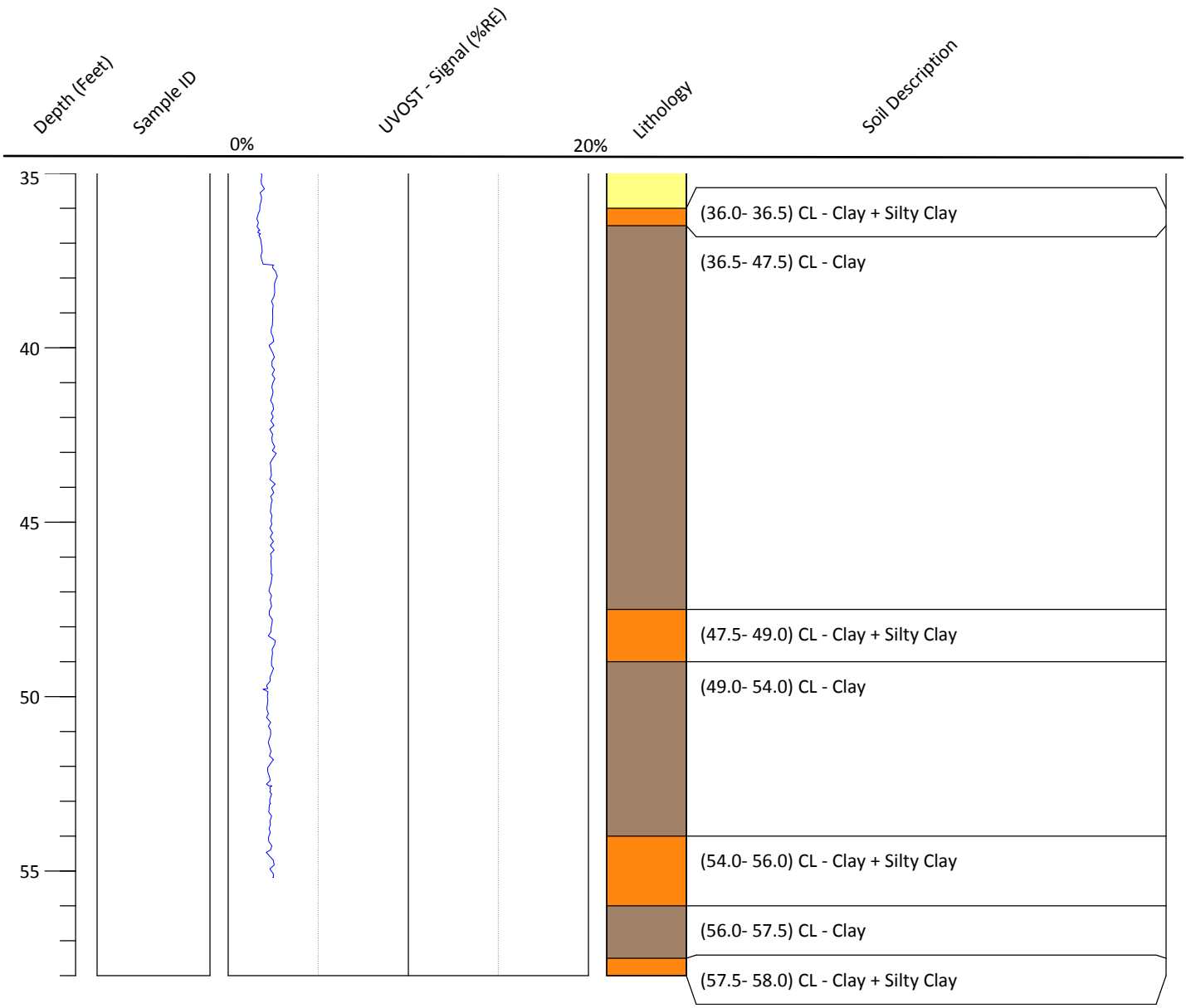
BORING ID: SB-13

DRILLING COMPANY: Gregg Drilling

SAMPLE METHOD: Direct Push

BORE HOLE DIAMETER: 1.78"

DRILLING METHOD: CPT



TOTAL BORING DEPTH: 58'

LITHOLOGIC LOG

PROJECT NAME: BP 498

PROJECT NUMBER: 08-82-603

DATE: 3/22/2013

SITE ADDRESS: 286 Livermore Ave., Livermore, CA

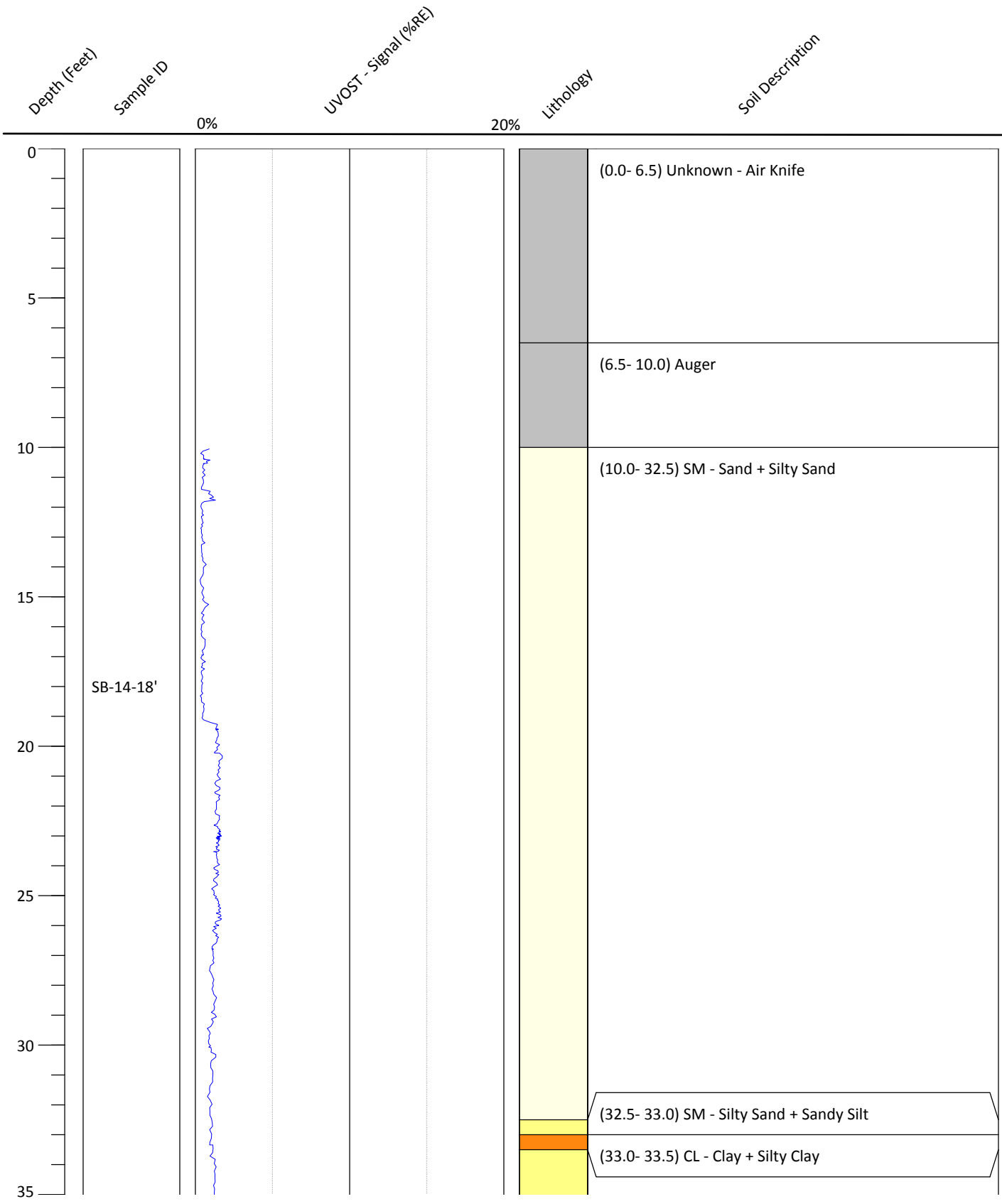
BORING ID: SB-14

DRILLING COMPANY: Gregg Drilling

SAMPLE METHOD: Direct Push

BORE HOLE DIAMETER: 1.78"

DRILLING METHOD: CPT



TOTAL BORING DEPTH: 58'

LITHOLOGIC LOG

PROJECT NAME: BP 498

PROJECT NUMBER: 08-82-603

DATE: 3/22/2013

SITE ADDRESS: 286 Livermore Ave., Livermore, CA

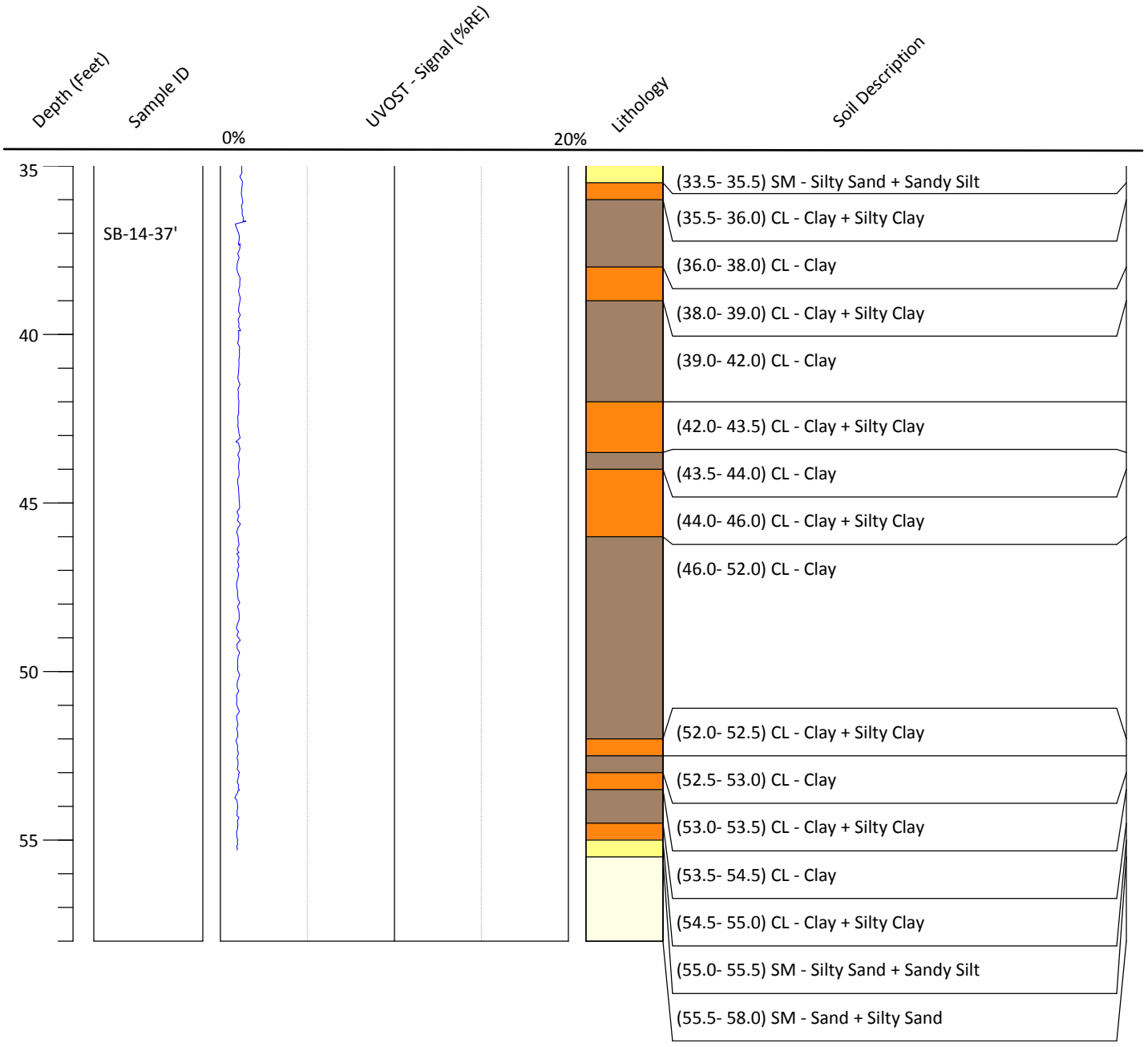
BORING ID: SB-14

DRILLING COMPANY: Gregg Drilling

SAMPLE METHOD: Direct Push

BORE HOLE DIAMETER: 1.78"

DRILLING METHOD: CPT



TOTAL BORING DEPTH: 58'

LITHOLOGIC LOG

PROJECT NAME: BP 498

PROJECT NUMBER: 08-82-603

DATE: 3/21/2013

SITE ADDRESS: 286 South Livermore Ave., Livermore, CA

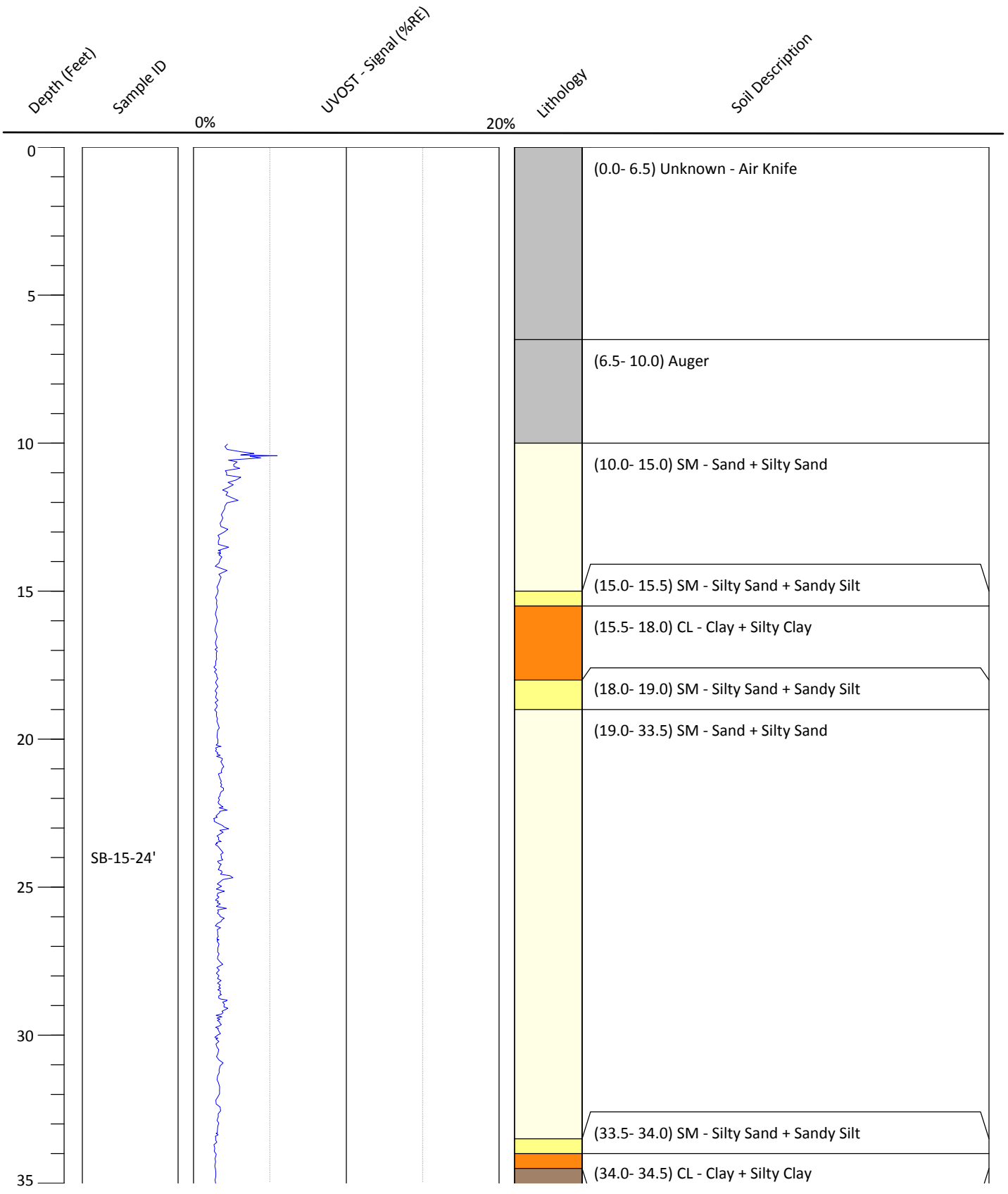
BORING ID: SB-15

DRILLING COMPANY: Gregg Drilling

SAMPLE METHOD: Direct Push

BORE HOLE DIAMETER: 1.78"

DRILLING METHOD: CPT



TOTAL BORING DEPTH: 58'

LITHOLOGIC LOG

PROJECT NAME: BP 498

PROJECT NUMBER: 08-82-603

DATE: 3/21/2013

SITE ADDRESS: 286 South Livermore Ave., Livermore, CA

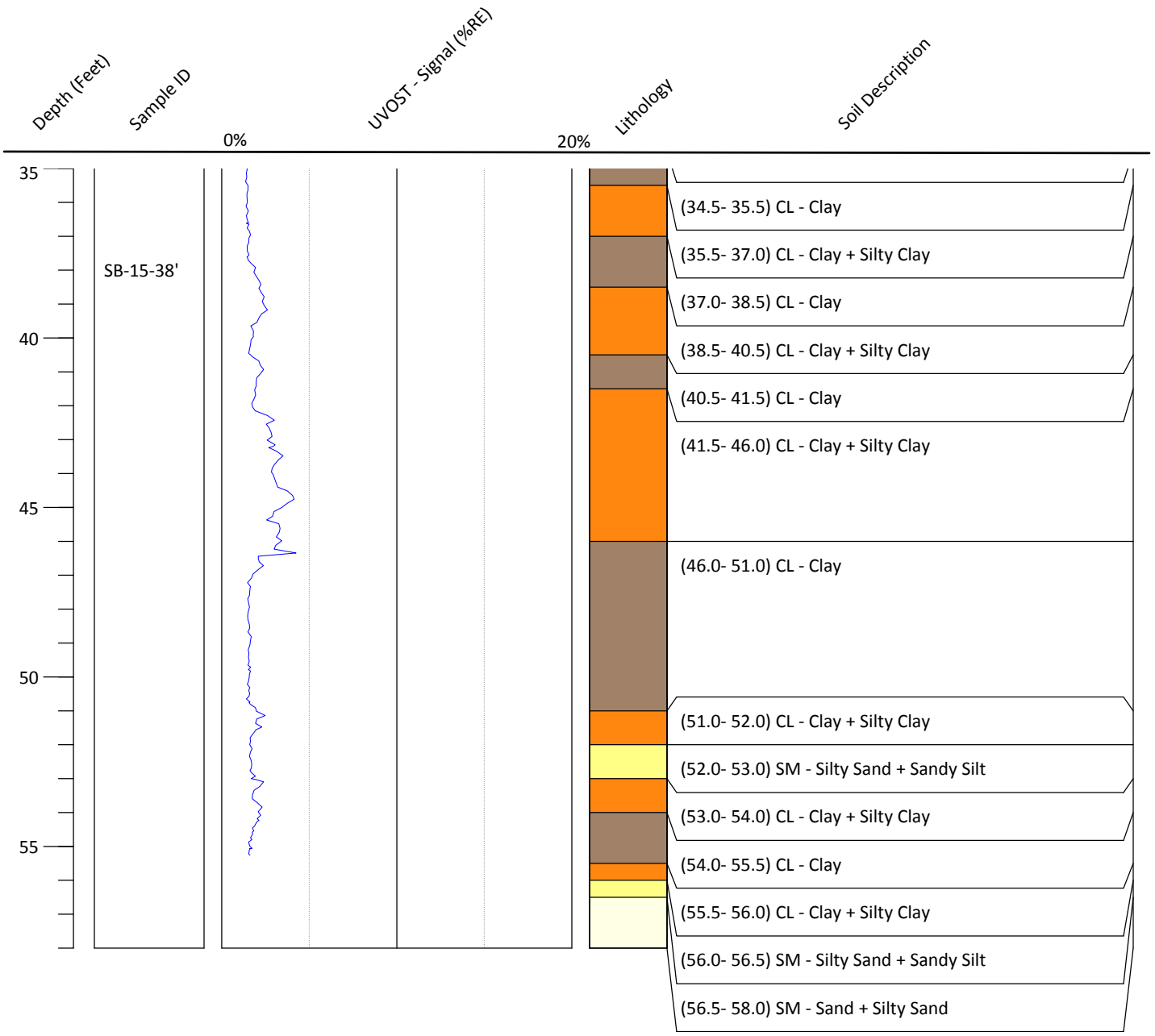
BORING ID: SB-15

DRILLING COMPANY: Gregg Drilling

SAMPLE METHOD: Direct Push

BORE HOLE DIAMETER: 1.78"

DRILLING METHOD: CPT



TOTAL BORING DEPTH: 58'

LITHOLOGIC LOG

PROJECT NAME: BP 498

PROJECT NUMBER: 08-82-603

DATE: 3/21/2013

SITE ADDRESS: 286 South Livermore Ave., Livermore, CA

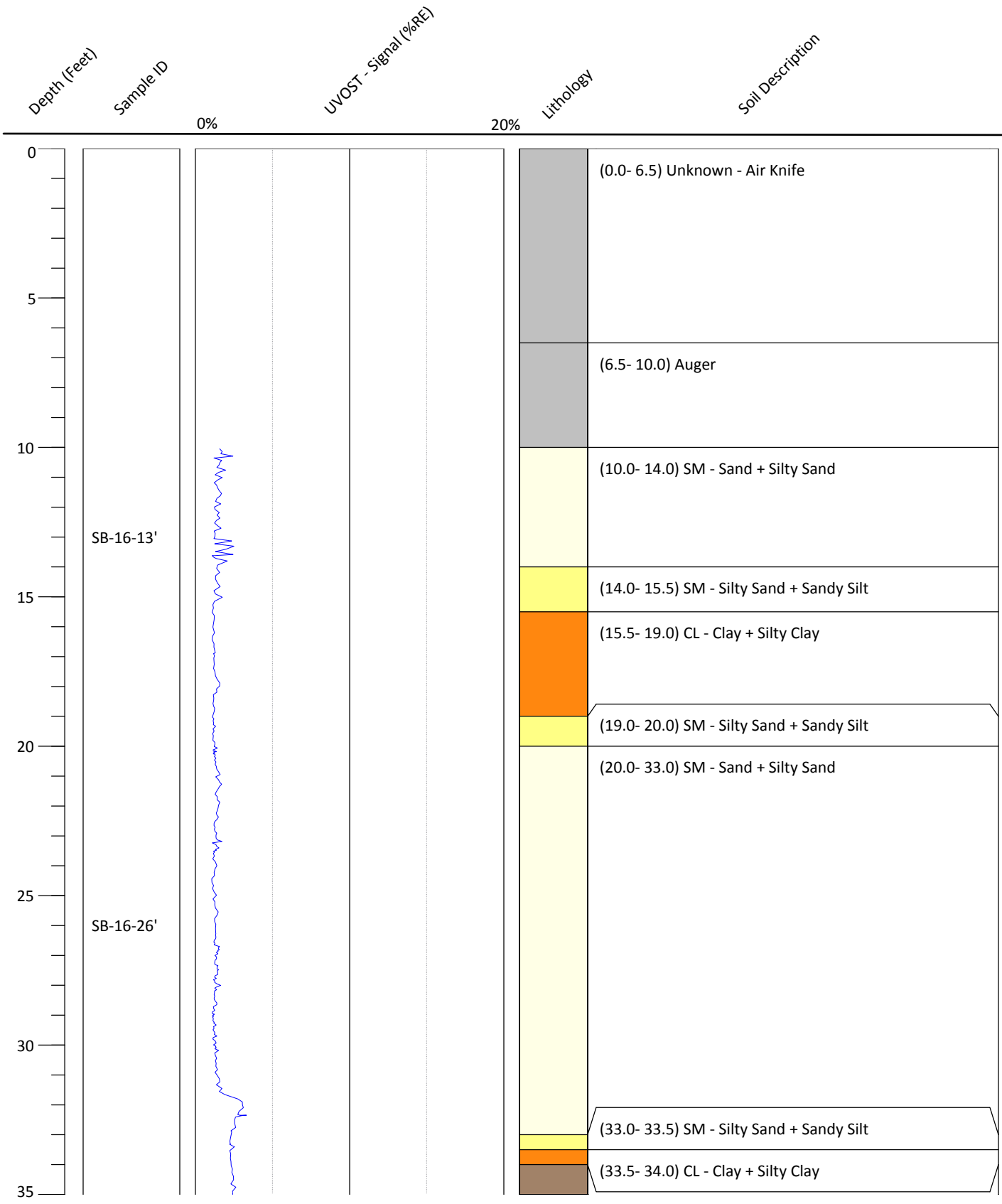
BORING ID: SB-16

DRILLING COMPANY: Gregg Drilling

SAMPLE METHOD: Direct Push

BORE HOLE DIAMETER: 1.78"

DRILLING METHOD: CPT



TOTAL BORING DEPTH: 58'

LITHOLOGIC LOG

PROJECT NAME: BP 498

PROJECT NUMBER: 08-82-603

DATE: 3/21/2013

SITE ADDRESS: 286 South Livermore Ave., Livermore, CA

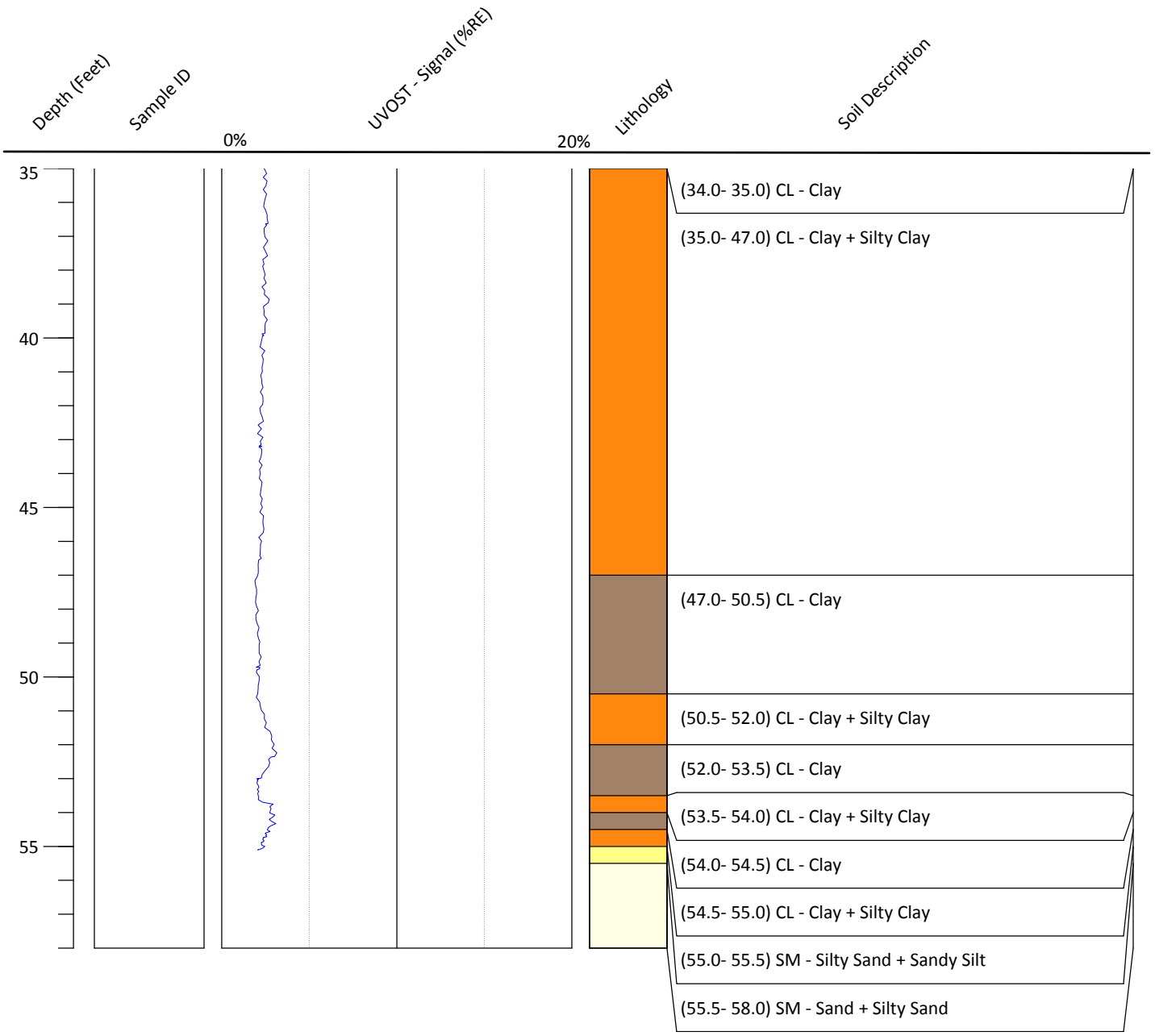
BORING ID: SB-16

DRILLING COMPANY: Gregg Drilling

SAMPLE METHOD: Direct Push

BORE HOLE DIAMETER: 1.78"

DRILLING METHOD: CPT



TOTAL BORING DEPTH: 58'

Appendix F

Laboratory Analytical Reports

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

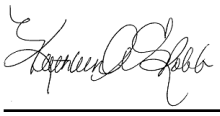
ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Irvine
17461 Derian Ave
Suite 100
Irvine, CA 92614-5817
Tel: (949)261-1022

TestAmerica Job ID: 440-41650-1
Client Project/Site: ARCO 0498, Livermore

For:
Broadbent & Associates, Inc.
1324 Mangrove Ave
Suite 212
Chico, California 95926

Attn: Mr. Jason Duda



Authorized for release by:
4/11/2013 10:52:10 AM

Kathleen Robb
Project Manager II
kathleen.robb@testamericainc.com

Table of Contents

Sample Summary

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 0498, Livermore

TestAmerica Job ID: 440-41650-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-41650-1	SB-10-15'	Solid	03/18/13 15:00	03/22/13 09:50
440-41650-2	SB-10	Water	03/18/13 16:00	03/22/13 09:50
440-41650-3	SB-12-15'	Solid	03/20/13 08:05	03/22/13 09:50
440-41650-4	SB-12-30'	Solid	03/20/13 08:25	03/22/13 09:50
440-41650-5	SB-12	Water	03/20/13 08:50	03/22/13 09:50
440-41650-6	SB-11-15'	Solid	03/20/13 14:00	03/22/13 09:50
440-41650-7	SB-11	Water	03/20/13 15:00	03/22/13 09:50
440-41650-8	SB-13-14'	Solid	03/21/13 07:55	03/22/13 09:50
440-41650-9	SB-13-27'	Solid	03/21/13 08:10	03/22/13 09:50
440-41650-10	SB-13	Water	03/21/13 08:30	03/22/13 09:50
440-41650-11	TB-498-03212013	Water	03/21/13 17:00	03/22/13 09:50

Job ID: 440-41650-1

Laboratory: TestAmerica Irvine

Narrative

Job Narrative
440-41650-1

Comments
No additional comments.

Receipt
The samples were received on 3/22/2013 9:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.7º C.

GC/MS VOA
No analytical or quality issues were noted.

GC VOA
Method(s) 8015B: The Gasoline Range Organics (GRO) concentration reported for the following sample(s) is due to the presence of discrete peaks: SB-11 (440-41650-7).

Method(s) 8015B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 95268 were outside control limits. The associated laboratory control sample (LCS) recovery met acceptance criteria.

No other analytical or quality issues were noted.

Subcontract non-Sister
No analytical or quality issues were noted.

VOA Prep
No analytical or quality issues were noted.

Client Sample ID: SB-10-15'
Date Collected: 03/18/13 15:00
Date Received: 03/22/13 09:50

Lab Sample ID: 440-41650-1
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		2.0		ug/Kg			03/29/13 10:28	1
Isopropyl Ether (DIPE)	ND		4.9		ug/Kg			03/29/13 10:28	1
Ethanol	ND		300		ug/Kg			03/29/13 10:28	1
Ethyl-t-butyl ether (ETBE)	ND		4.9		ug/Kg			03/29/13 10:28	1
Ethylbenzene	ND		2.0		ug/Kg			03/29/13 10:28	1
m,p-Xylene	ND		2.0		ug/Kg			03/29/13 10:28	1
Methyl-t-Butyl Ether (MTBE)	ND		4.9		ug/Kg			03/29/13 10:28	1
o-Xylene	ND		2.0		ug/Kg			03/29/13 10:28	1
Tert-amyl-methyl ether (TAME)	ND		4.9		ug/Kg			03/29/13 10:28	1
tert-Butyl alcohol (TBA)	ND		99		ug/Kg			03/29/13 10:28	1
Toluene	ND		2.0		ug/Kg			03/29/13 10:28	1
1,2-Dibromoethane (EDB)	ND		2.0		ug/Kg			03/29/13 10:28	1
Xylenes, Total	ND		4.0		ug/Kg			03/29/13 10:28	1
1,2-Dichloroethane	ND		2.0		ug/Kg			03/29/13 10:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*106*		*80 - 120*		*03/29/13 10:28*	*1*
4-Bromofluorobenzene (Surr)	*108*		*80 - 120*		*03/29/13 10:28*	*1*
Dibromofluoromethane (Surr)	*101*		*80 - 125*		*03/29/13 10:28*	*1*

Method: 8015B - Gasoline Range Organics - (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		400		ug/Kg			03/27/13 12:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*91*		*65 - 140*		*03/27/13 12:31*	*1*

Client Sample ID: SB-10
Date Collected: 03/18/13 16:00
Date Received: 03/22/13 09:50

Lab Sample ID: 440-41650-2
Matrix: Water

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		2.0		ug/L			03/29/13 22:27	4
1,2-Dichloroethane	ND		2.0		ug/L			03/29/13 22:27	4
Benzene	ND		2.0		ug/L			03/29/13 22:27	4
Ethanol	ND		600		ug/L			03/29/13 22:27	4
Ethylbenzene	ND		2.0		ug/L			03/29/13 22:27	4
Ethyl-t-butyl ether (ETBE)	ND		2.0		ug/L			03/29/13 22:27	4
Isopropyl Ether (DIPE)	ND		2.0		ug/L			03/29/13 22:27	4
m,p-Xylene	ND		4.0		ug/L			03/29/13 22:27	4
Methyl-t-Butyl Ether (MTBE)	**520**		2.0		ug/L			03/29/13 22:27	4
o-Xylene	ND		2.0		ug/L			03/29/13 22:27	4
Tert-amyl-methyl ether (TAME)	ND		2.0		ug/L			03/29/13 22:27	4
tert-Butyl alcohol (TBA)	**67**		40		ug/L			03/29/13 22:27	4
Toluene	ND		2.0		ug/L			03/29/13 22:27	4
Xylenes, Total	ND		4.0		ug/L			03/29/13 22:27	4

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*		*03/29/13 22:27*	*4*
Dibromofluoromethane (Surr)	*103*		*80 - 120*		*03/29/13 22:27*	*4*
Toluene-d8 (Surr)	*102*		*80 - 120*		*03/29/13 22:27*	*4*

Method: 8015B/5030B - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50		ug/L			03/28/13 09:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*65 - 140*		*03/28/13 09:45*	*1*

Client Sample ID: SB-12-15'
Date Collected: 03/20/13 08:05
Date Received: 03/22/13 09:50

Lab Sample ID: 440-41650-3
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		2.0		ug/Kg			03/29/13 12:30	1
Isopropyl Ether (DIPE)	ND		5.0		ug/Kg			03/29/13 12:30	1
Ethanol	ND		300		ug/Kg			03/29/13 12:30	1
Ethyl-t-butyl ether (ETBE)	ND		5.0		ug/Kg			03/29/13 12:30	1
Ethylbenzene	ND		2.0		ug/Kg			03/29/13 12:30	1
m,p-Xylene	ND		2.0		ug/Kg			03/29/13 12:30	1
Methyl-t-Butyl Ether (MTBE)	ND		5.0		ug/Kg			03/29/13 12:30	1
o-Xylene	ND		2.0		ug/Kg			03/29/13 12:30	1
Tert-amyl-methyl ether (TAME)	ND		5.0		ug/Kg			03/29/13 12:30	1
tert-Butyl alcohol (TBA)	ND		100		ug/Kg			03/29/13 12:30	1
Toluene	ND		2.0		ug/Kg			03/29/13 12:30	1
1,2-Dibromoethane (EDB)	ND		2.0		ug/Kg			03/29/13 12:30	1
Xylenes, Total	ND		4.0		ug/Kg			03/29/13 12:30	1
1,2-Dichloroethane	ND		2.0		ug/Kg			03/29/13 12:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*107*		*80 - 120*		*03/29/13 12:30*	*1*
4-Bromofluorobenzene (Surr)	*108*		*80 - 120*		*03/29/13 12:30*	*1*
Dibromofluoromethane (Surr)	*102*		*80 - 125*		*03/29/13 12:30*	*1*

Method: 8015B - Gasoline Range Organics - (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		400		ug/Kg			04/03/13 04:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*89*		*65 - 140*		*04/03/13 04:52*	*1*

Client Sample ID: SB-12-30'
Date Collected: 03/20/13 08:25
Date Received: 03/22/13 09:50

Lab Sample ID: 440-41650-4
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		2.0		ug/Kg			03/29/13 13:00	1
Isopropyl Ether (DIPE)	ND		5.0		ug/Kg			03/29/13 13:00	1
Ethanol	ND		300		ug/Kg			03/29/13 13:00	1
Ethyl-t-butyl ether (ETBE)	ND		5.0		ug/Kg			03/29/13 13:00	1
Ethylbenzene	ND		2.0		ug/Kg			03/29/13 13:00	1
m,p-Xylene	ND		2.0		ug/Kg			03/29/13 13:00	1
Methyl-t-Butyl Ether (MTBE)	ND		5.0		ug/Kg			03/29/13 13:00	1
o-Xylene	ND		2.0		ug/Kg			03/29/13 13:00	1
Tert-amyl-methyl ether (TAME)	ND		5.0		ug/Kg			03/29/13 13:00	1
tert-Butyl alcohol (TBA)	ND		99		ug/Kg			03/29/13 13:00	1
Toluene	ND		2.0		ug/Kg			03/29/13 13:00	1
1,2-Dibromoethane (EDB)	ND		2.0		ug/Kg			03/29/13 13:00	1
Xylenes, Total	ND		4.0		ug/Kg			03/29/13 13:00	1
1,2-Dichloroethane	ND		2.0		ug/Kg			03/29/13 13:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*109*		*80 - 120*		*03/29/13 13:00*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*03/29/13 13:00*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 125*		*03/29/13 13:00*	*1*

Method: 8015B - Gasoline Range Organics - (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		350		ug/Kg			04/03/13 05:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*96*		*65 - 140*		*04/03/13 05:18*	*1*

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 0498, Livermore

TestAmerica Job ID: 440-41650-1

Client Sample ID: SB-12
Date Collected: 03/20/13 08:50
Date Received: 03/22/13 09:50

Lab Sample ID: 440-41650-5
Matrix: Water

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		1.0		ug/L			03/29/13 21:05	2
1,2-Dichloroethane	ND		1.0		ug/L			03/29/13 21:05	2
Benzene	ND		1.0		ug/L			03/29/13 21:05	2
Ethanol	ND		300		ug/L			03/29/13 21:05	2
Ethylbenzene	ND		1.0		ug/L			03/29/13 21:05	2
Ethyl-t-butyl ether (ETBE)	ND		1.0		ug/L			03/29/13 21:05	2
Isopropyl Ether (DIPE)	ND		1.0		ug/L			03/29/13 21:05	2
m,p-Xylene	ND		2.0		ug/L			03/29/13 21:05	2
Methyl-t-Butyl Ether (MTBE)	**570**		1.0		ug/L			03/29/13 21:05	2
o-Xylene	ND		1.0		ug/L			03/29/13 21:05	2
Tert-amyl-methyl ether (TAME)	**4.0**		1.0		ug/L			03/29/13 21:05	2
tert-Butyl alcohol (TBA)	**21**	**ID**	20		ug/L			03/29/13 21:05	2
Toluene	ND		1.0		ug/L			03/29/13 21:05	2
Xylenes, Total	ND		2.0		ug/L			03/29/13 21:05	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*80 - 120*		*03/29/13 21:05*	*2*
Dibromofluoromethane (Surr)	*111*		*80 - 120*		*03/29/13 21:05*	*2*
Toluene-d8 (Surr)	*100*		*80 - 120*		*03/29/13 21:05*	*2*

Method: 8015B/5030B - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50		ug/L			03/29/13 19:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*106*		*65 - 140*		*03/29/13 19:32*	*1*

Client Sample ID: SB-11-15'
Lab Sample ID: 440-41650-6
Date Collected: 03/20/13 14:00
Matrix: Solid
Date Received: 03/22/13 09:50

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		2.0		ug/Kg			03/29/13 10:58	1
Isopropyl Ether (DIPE)	ND		4.9		ug/Kg			03/29/13 10:58	1
Ethanol	ND		300		ug/Kg			03/29/13 10:58	1
Ethyl-t-butyl ether (ETBE)	ND		4.9		ug/Kg			03/29/13 10:58	1
Ethylbenzene	ND		2.0		ug/Kg			03/29/13 10:58	1
m,p-Xylene	ND		2.0		ug/Kg			03/29/13 10:58	1
Methyl-t-Butyl Ether (MTBE)	ND		4.9		ug/Kg			03/29/13 10:58	1
o-Xylene	ND		2.0		ug/Kg			03/29/13 10:58	1
Tert-amyl-methyl ether (TAME)	ND		4.9		ug/Kg			03/29/13 10:58	1
tert-Butyl alcohol (TBA)	ND		99		ug/Kg			03/29/13 10:58	1
Toluene	ND		2.0		ug/Kg			03/29/13 10:58	1
1,2-Dibromoethane (EDB)	ND		2.0		ug/Kg			03/29/13 10:58	1
Xylenes, Total	ND		4.0		ug/Kg			03/29/13 10:58	1
1,2-Dichloroethane	ND		2.0		ug/Kg			03/29/13 10:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*108*		*80 - 120*		*03/29/13 10:58*	*1*
4-Bromofluorobenzene (Surr)	*106*		*80 - 120*		*03/29/13 10:58*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 125*		*03/29/13 10:58*	*1*

Method: 8015B - Gasoline Range Organics - (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		390		ug/Kg			04/03/13 05:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*83*		*65 - 140*		*04/03/13 05:44*	*1*

Client Sample ID: SB-11
Date Collected: 03/20/13 15:00
Date Received: 03/22/13 09:50

Lab Sample ID: 440-41650-7
Matrix: Water

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		5.0		ug/L			03/29/13 21:32	10
1,2-Dichloroethane	ND		5.0		ug/L			03/29/13 21:32	10
Benzene	ND		5.0		ug/L			03/29/13 21:32	10
Ethanol	ND		1500		ug/L			03/29/13 21:32	10
Ethylbenzene	ND		5.0		ug/L			03/29/13 21:32	10
Ethyl-t-butyl ether (ETBE)	ND		5.0		ug/L			03/29/13 21:32	10
Isopropyl Ether (DIPE)	ND		5.0		ug/L			03/29/13 21:32	10
m,p-Xylene	ND		10		ug/L			03/29/13 21:32	10
Methyl-t-Butyl Ether (MTBE)	**1700**		5.0		ug/L			03/29/13 21:32	10
o-Xylene	ND		5.0		ug/L			03/29/13 21:32	10
Tert-amyl-methyl ether (TAME)	**7.5**		5.0		ug/L			03/29/13 21:32	10
tert-Butyl alcohol (TBA)	**570**		100		ug/L			03/29/13 21:32	10
Toluene	ND		5.0		ug/L			03/29/13 21:32	10
Xylenes, Total	ND		10		ug/L			03/29/13 21:32	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*80 - 120*		*03/29/13 21:32*	*10*
Dibromofluoromethane (Surr)	*116*		*80 - 120*		*03/29/13 21:32*	*10*
Toluene-d8 (Surr)	*103*		*80 - 120*		*03/29/13 21:32*	*10*

Method: 8015B/5030B - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	**73**		50		ug/L			03/29/13 19:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*65 - 140*		*03/29/13 19:59*	*1*

Client Sample ID: SB-13-14'
Lab Sample ID: 440-41650-8
Date Collected: 03/21/13 07:55
Matrix: Solid
Date Received: 03/22/13 09:50

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		2.0		ug/Kg			03/29/13 13:31	1
Isopropyl Ether (DIPE)	ND		5.0		ug/Kg			03/29/13 13:31	1
Ethanol	ND		300		ug/Kg			03/29/13 13:31	1
Ethyl-t-butyl ether (ETBE)	ND		5.0		ug/Kg			03/29/13 13:31	1
Ethylbenzene	ND		2.0		ug/Kg			03/29/13 13:31	1
m,p-Xylene	ND		2.0		ug/Kg			03/29/13 13:31	1
Methyl-t-Butyl Ether (MTBE)	ND		5.0		ug/Kg			03/29/13 13:31	1
o-Xylene	ND		2.0		ug/Kg			03/29/13 13:31	1
Tert-amyl-methyl ether (TAME)	ND		5.0		ug/Kg			03/29/13 13:31	1
tert-Butyl alcohol (TBA)	ND		100		ug/Kg			03/29/13 13:31	1
Toluene	ND		2.0		ug/Kg			03/29/13 13:31	1
1,2-Dibromoethane (EDB)	ND		2.0		ug/Kg			03/29/13 13:31	1
Xylenes, Total	ND		4.0		ug/Kg			03/29/13 13:31	1
1,2-Dichloroethane	ND		2.0		ug/Kg			03/29/13 13:31	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*108*		*80 - 120*		*03/29/13 13:31*	*1*
4-Bromofluorobenzene (Surr)	*103*		*80 - 120*		*03/29/13 13:31*	*1*
Dibromofluoromethane (Surr)	*102*		*80 - 125*		*03/29/13 13:31*	*1*

Method: 8015B - Gasoline Range Organics - (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		390		ug/Kg			04/03/13 06:10	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*85*		*65 - 140*		*04/03/13 06:10*	*1*

Client Sample ID: SB-13-27'
Date Collected: 03/21/13 08:10
Date Received: 03/22/13 09:50

Lab Sample ID: 440-41650-9
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		2.0		ug/Kg			03/29/13 14:01	1
Isopropyl Ether (DIPE)	ND		5.0		ug/Kg			03/29/13 14:01	1
Ethanol	ND		300		ug/Kg			03/29/13 14:01	1
Ethyl-t-butyl ether (ETBE)	ND		5.0		ug/Kg			03/29/13 14:01	1
Ethylbenzene	ND		2.0		ug/Kg			03/29/13 14:01	1
m,p-Xylene	ND		2.0		ug/Kg			03/29/13 14:01	1
Methyl-t-Butyl Ether (MTBE)	ND		5.0		ug/Kg			03/29/13 14:01	1
o-Xylene	ND		2.0		ug/Kg			03/29/13 14:01	1
Tert-amyl-methyl ether (TAME)	ND		5.0		ug/Kg			03/29/13 14:01	1
tert-Butyl alcohol (TBA)	ND		99		ug/Kg			03/29/13 14:01	1
Toluene	ND		2.0		ug/Kg			03/29/13 14:01	1
1,2-Dibromoethane (EDB)	ND		2.0		ug/Kg			03/29/13 14:01	1
Xylenes, Total	ND		4.0		ug/Kg			03/29/13 14:01	1
1,2-Dichloroethane	ND		2.0		ug/Kg			03/29/13 14:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*109*		*80 - 120*		*03/29/13 14:01*	*1*
4-Bromofluorobenzene (Surr)	*108*		*80 - 120*		*03/29/13 14:01*	*1*
Dibromofluoromethane (Surr)	*105*		*80 - 125*		*03/29/13 14:01*	*1*

Method: 8015B - Gasoline Range Organics - (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		370		ug/Kg			04/03/13 06:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*78*		*65 - 140*		*04/03/13 06:36*	*1*

Client Sample ID: SB-13
Date Collected: 03/21/13 08:30
Date Received: 03/22/13 09:50

Lab Sample ID: 440-41650-10
Matrix: Water

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.50		ug/L			03/29/13 19:43	1
1,2-Dichloroethane	ND		0.50		ug/L			03/29/13 19:43	1
Benzene	ND		0.50		ug/L			03/29/13 19:43	1
Ethanol	ND		150		ug/L			03/29/13 19:43	1
Ethylbenzene	ND		0.50		ug/L			03/29/13 19:43	1
Ethyl-t-butyl ether (ETBE)	ND		0.50		ug/L			03/29/13 19:43	1
Isopropyl Ether (DIPE)	ND		0.50		ug/L			03/29/13 19:43	1
m,p-Xylene	ND		1.0		ug/L			03/29/13 19:43	1
Methyl-t-Butyl Ether (MTBE)	**100**		0.50		ug/L			03/29/13 19:43	1
o-Xylene	ND		0.50		ug/L			03/29/13 19:43	1
Tert-amyl-methyl ether (TAME)	ND		0.50		ug/L			03/29/13 19:43	1
tert-Butyl alcohol (TBA)	ND		10		ug/L			03/29/13 19:43	1
Toluene	ND		0.50		ug/L			03/29/13 19:43	1
Xylenes, Total	ND		1.0		ug/L			03/29/13 19:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*03/29/13 19:43*	*1*
Dibromofluoromethane (Surr)	*108*		*80 - 120*		*03/29/13 19:43*	*1*
Toluene-d8 (Surr)	*103*		*80 - 120*		*03/29/13 19:43*	*1*

Method: 8015B/5030B - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50		ug/L			03/31/13 05:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*91*		*65 - 140*		*03/31/13 05:51*	*1*

Client Sample ID: TB-498-03212013
Date Collected: 03/21/13 17:00
Date Received: 03/22/13 09:50

Lab Sample ID: 440-41650-11
Matrix: Water

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.50		ug/L			03/29/13 22:00	1
1,2-Dichloroethane	ND		0.50		ug/L			03/29/13 22:00	1
Benzene	ND		0.50		ug/L			03/29/13 22:00	1
Ethanol	ND		150		ug/L			03/29/13 22:00	1
Ethylbenzene	ND		0.50		ug/L			03/29/13 22:00	1
Ethyl-t-butyl ether (ETBE)	ND		0.50		ug/L			03/29/13 22:00	1
Isopropyl Ether (DIPE)	ND		0.50		ug/L			03/29/13 22:00	1
m,p-Xylene	ND		1.0		ug/L			03/29/13 22:00	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50		ug/L			03/29/13 22:00	1
o-Xylene	ND		0.50		ug/L			03/29/13 22:00	1
Tert-amyl-methyl ether (TAME)	ND		0.50		ug/L			03/29/13 22:00	1
tert-Butyl alcohol (TBA)	ND		10		ug/L			03/29/13 22:00	1
Toluene	ND		0.50		ug/L			03/29/13 22:00	1
Xylenes, Total	ND		1.0		ug/L			03/29/13 22:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*103*		*80 - 120*		*03/29/13 22:00*	*1*
Dibromofluoromethane (Surr)	*106*		*80 - 120*		*03/29/13 22:00*	*1*
Toluene-d8 (Surr)	*101*		*80 - 120*		*03/29/13 22:00*	*1*

Method: 8015B/5030B - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50		ug/L			03/31/13 05:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*91*		*65 - 140*		*03/31/13 05:23*	*1*

Method Summary

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 0498, Livermore

TestAmerica Job ID: 440-41650-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL IRV
8260B/5030B	Volatile Organic Compounds (GC/MS)	SW846	TAL IRV
8015B	Gasoline Range Organics - (GC)	SW846	TAL IRV
8015B/5030B	Gasoline Range Organics (GC)	SW846	TAL IRV
Bulk and Grain Density	Bulk Density	NONE	PTSL
FOC	Fractional Organic Carbon	NONE	PTSL
Grain Size Distribution	ASTM 422 Grain Size	NONE	PTSL
Moisture Content	ASTM D2216 Moisture Content	NONE	PTSL
TOC	Total Organic Carbon	NONE	PTSL
Total Porosity	ASTM D-50-84 Porosity	NONE	PTSL
Volumetric Moisture & Air	General Sub Contract Method	NONE	PTSL

Protocol References:

NONE = NONE

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

Laboratory References:

PTSL = PTS Laboratories, Inc, 8100 Secura Way, Santa Fe Springs, CA 90670

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Client Sample ID: SB-10-15' — **Lab Sample ID: 440-41650-1**
Date Collected: 03/18/13 15:00 — **Matrix: Solid**
Date Received: 03/22/13 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5.06 g	10 mL	95010	03/29/13 10:28	SS	TAL IRV
Total/NA	Analysis	8015B		1	5 g	10 mL	94510	03/27/13 12:31	PH	TAL IRV

Client Sample ID: SB-10 — **Lab Sample ID: 440-41650-2**
Date Collected: 03/18/13 16:00 — **Matrix: Water**
Date Received: 03/22/13 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/5030B		4	10 mL	10 mL	95180	03/29/13 22:27	AL	TAL IRV
Total/NA	Analysis	8015B/5030B		1	10 mL	10 mL	94476	03/28/13 09:45	IM	TAL IRV

Client Sample ID: SB-12-15' — **Lab Sample ID: 440-41650-3**
Date Collected: 03/20/13 08:05 — **Matrix: Solid**
Date Received: 03/22/13 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5.02 g	10 mL	95010	03/29/13 12:30	SS	TAL IRV
Total/NA	Analysis	8015B		1	5.04 g	10 mL	95671	04/03/13 04:52	TL	TAL IRV

Client Sample ID: SB-12-30' — **Lab Sample ID: 440-41650-4**
Date Collected: 03/20/13 08:25 — **Matrix: Solid**
Date Received: 03/22/13 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5.05 g	10 mL	95010	03/29/13 13:00	SS	TAL IRV
Total/NA	Analysis	8015B		1	5.79 g	10 mL	95671	04/03/13 05:18	TL	TAL IRV

Client Sample ID: SB-12 — **Lab Sample ID: 440-41650-5**
Date Collected: 03/20/13 08:50 — **Matrix: Water**
Date Received: 03/22/13 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/5030B		2	10 mL	10 mL	95180	03/29/13 21:05	AL	TAL IRV
Total/NA	Analysis	8015B/5030B		1	10 mL	10 mL	94992	03/29/13 19:32	PH	TAL IRV

Client Sample ID: SB-11-15' — **Lab Sample ID: 440-41650-6**
Date Collected: 03/20/13 14:00 — **Matrix: Solid**
Date Received: 03/22/13 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5.06 g	10 mL	95010	03/29/13 10:58	SS	TAL IRV

Client Sample ID: SB-11-15' — **Lab Sample ID: 440-41650-6**
Date Collected: 03/20/13 14:00 — **Matrix: Solid**
Date Received: 03/22/13 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8015B		1	5.1 g	10 mL	95671	04/03/13 05:44	TL	TAL IRV

Client Sample ID: SB-11 — **Lab Sample ID: 440-41650-7**
Date Collected: 03/20/13 15:00 — **Matrix: Water**
Date Received: 03/22/13 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/5030B		10	10 mL	10 mL	95180	03/29/13 21:32	AL	TAL IRV
Total/NA	Analysis	8015B/5030B		1	10 mL	10 mL	94992	03/29/13 19:59	PH	TAL IRV

Client Sample ID: SB-13-14' — **Lab Sample ID: 440-41650-8**
Date Collected: 03/21/13 07:55 — **Matrix: Solid**
Date Received: 03/22/13 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5.02 g	10 mL	95010	03/29/13 13:31	SS	TAL IRV
Total/NA	Analysis	8015B		1	5.19 g	10 mL	95671	04/03/13 06:10	TL	TAL IRV

Client Sample ID: SB-13-27' — **Lab Sample ID: 440-41650-9**
Date Collected: 03/21/13 08:10 — **Matrix: Solid**
Date Received: 03/22/13 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5.05 g	10 mL	95010	03/29/13 14:01	SS	TAL IRV
Total/NA	Analysis	8015B		1	5.47 g	10 mL	95671	04/03/13 06:36	TL	TAL IRV

Client Sample ID: SB-13 — **Lab Sample ID: 440-41650-10**
Date Collected: 03/21/13 08:30 — **Matrix: Water**
Date Received: 03/22/13 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/5030B		1	10 mL	10 mL	95180	03/29/13 19:43	AL	TAL IRV
Total/NA	Analysis	8015B/5030B		1	10 mL	10 mL	95268	03/31/13 05:51	TL	TAL IRV

Client Sample ID: TB-498-03212013 — **Lab Sample ID: 440-41650-11**
Date Collected: 03/21/13 17:00 — **Matrix: Water**
Date Received: 03/22/13 09:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/5030B		1	10 mL	10 mL	95180	03/29/13 22:00	AL	TAL IRV
Total/NA	Analysis	8015B/5030B		1	10 mL	10 mL	95268	03/31/13 05:23	TL	TAL IRV

Lab Chronicle

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 0498, Livermore

TestAmerica Job ID: 440-41650-1

Laboratory References:

PTSL = PTS Laboratories, Inc, 8100 Secura Way, Santa Fe Springs, CA 90670

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 440-95010/4
Matrix: Solid
Analysis Batch: 95010

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		2.0		ug/Kg			03/29/13 09:21	1
Isopropyl Ether (DIPE)	ND		5.0		ug/Kg			03/29/13 09:21	1
Ethanol	ND		300		ug/Kg			03/29/13 09:21	1
Ethyl-t-butyl ether (ETBE)	ND		5.0		ug/Kg			03/29/13 09:21	1
Ethylbenzene	ND		2.0		ug/Kg			03/29/13 09:21	1
m,p-Xylene	ND		2.0		ug/Kg			03/29/13 09:21	1
Methyl-t-Butyl Ether (MTBE)	ND		5.0		ug/Kg			03/29/13 09:21	1
o-Xylene	ND		2.0		ug/Kg			03/29/13 09:21	1
Tert-amyl-methyl ether (TAME)	ND		5.0		ug/Kg			03/29/13 09:21	1
tert-Butyl alcohol (TBA)	ND		100		ug/Kg			03/29/13 09:21	1
Toluene	ND		2.0		ug/Kg			03/29/13 09:21	1
1,2-Dibromoethane (EDB)	ND		2.0		ug/Kg			03/29/13 09:21	1
Xylenes, Total	ND		4.0		ug/Kg			03/29/13 09:21	1
1,2-Dichloroethane	ND		2.0		ug/Kg			03/29/13 09:21	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*108*		*80 - 120*		*03/29/13 09:21*	*1*
4-Bromofluorobenzene (Surr)	*108*		*80 - 120*		*03/29/13 09:21*	*1*
Dibromofluoromethane (Surr)	*106*		*80 - 125*		*03/29/13 09:21*	*1*

Lab Sample ID: LCS 440-95010/5
Matrix: Solid
Analysis Batch: 95010

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene			50.0	46.9		ug/Kg		94	65 - 120		
Isopropyl Ether (DIPE)			50.0	55.2		ug/Kg		110	60 - 140		
Ethanol			500	519		ug/Kg		104	35 - 160		
Ethyl-t-butyl ether (ETBE)			50.0	55.3		ug/Kg		111	60 - 140		
Ethylbenzene			50.0	49.5		ug/Kg		99	70 - 125		
m,p-Xylene			100	102		ug/Kg		102	70 - 125		
Methyl-t-Butyl Ether (MTBE)			50.0	56.5		ug/Kg		113	60 - 140		
o-Xylene			50.0	52.8		ug/Kg		106	70 - 125		
Tert-amyl-methyl ether (TAME)			50.0	57.7		ug/Kg		115	60 - 145		
tert-Butyl alcohol (TBA)			250	252		ug/Kg		101	70 - 135		
Toluene			50.0	49.3		ug/Kg		99	70 - 125		
1,2-Dibromoethane (EDB)			50.0	58.0		ug/Kg		116	70 - 130		
1,2-Dichloroethane			50.0	52.1		ug/Kg		104	60 - 140		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*106*		*80 - 120*
4-Bromofluorobenzene (Surr)	*108*		*80 - 120*
Dibromofluoromethane (Surr)	*105*		*80 - 125*

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

Lab Sample ID: 440-41650-6 MS
Matrix: Solid
Analysis Batch: 95010

Client Sample ID: SB-11-15'
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	ND		49.5	48.6		ug/Kg		98	65 - 130
Isopropyl Ether (DIPE)	ND		49.5	52.9		ug/Kg		107	60 - 150
Ethanol	ND		495	452		ug/Kg		91	30 - 165
Ethyl-t-butyl ether (ETBE)	ND		49.5	51.4		ug/Kg		104	60 - 145
Ethylbenzene	ND		49.5	52.5		ug/Kg		106	70 - 135
m,p-Xylene	ND		99.0	108		ug/Kg		109	70 - 130
Methyl-t-Butyl Ether (MTBE)	ND		49.5	52.8		ug/Kg		107	55 - 155
o-Xylene	ND		49.5	53.0		ug/Kg		107	65 - 130
Tert-amyl-methyl ether (TAME)	ND		49.5	54.8		ug/Kg		111	60 - 150
tert-Butyl alcohol (TBA)	ND		248	233		ug/Kg		94	65 - 145
Toluene	ND		49.5	52.0		ug/Kg		105	70 - 130
1,2-Dibromoethane (EDB)	ND		49.5	56.3		ug/Kg		114	65 - 140
1,2-Dichloroethane	ND		49.5	51.0		ug/Kg		103	60 - 150

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Toluene-d8 (Surr)	*108*		*80 - 120*
4-Bromofluorobenzene (Surr)	*109*		*80 - 120*
Dibromofluoromethane (Surr)	*101*		*80 - 125*

Lab Sample ID: 440-41650-6 MSD
Matrix: Solid
Analysis Batch: 95010

Client Sample ID: SB-11-15'
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	ND		49.6	48.2		ug/Kg		97	65 - 130	1	20
Isopropyl Ether (DIPE)	ND		49.6	52.8		ug/Kg		106	60 - 150	0	25
Ethanol	ND		496	521		ug/Kg		105	30 - 165	14	40
Ethyl-t-butyl ether (ETBE)	ND		49.6	52.2		ug/Kg		105	60 - 145	1	30
Ethylbenzene	ND		49.6	51.9		ug/Kg		105	70 - 135	1	25
m,p-Xylene	ND		99.2	106		ug/Kg		107	70 - 130	2	25
Methyl-t-Butyl Ether (MTBE)	ND		49.6	52.6		ug/Kg		106	55 - 155	0	35
o-Xylene	ND		49.6	53.8		ug/Kg		109	65 - 130	2	25
Tert-amyl-methyl ether (TAME)	ND		49.6	54.6		ug/Kg		110	60 - 150	0	25
tert-Butyl alcohol (TBA)	ND		248	239		ug/Kg		96	65 - 145	2	30
Toluene	ND		49.6	51.7		ug/Kg		104	70 - 130	0	20
1,2-Dibromoethane (EDB)	ND		49.6	55.7		ug/Kg		112	65 - 140	1	25
1,2-Dichloroethane	ND		49.6	50.8		ug/Kg		102	60 - 150	0	25

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*109*		*80 - 120*
4-Bromofluorobenzene (Surr)	*108*		*80 - 120*
Dibromofluoromethane (Surr)	*100*		*80 - 125*

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 440-95180/4
Matrix: Water
Analysis Batch: 95180

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.50		ug/L			03/29/13 18:46	1
1,2-Dichloroethane	ND		0.50		ug/L			03/29/13 18:46	1
Benzene	ND		0.50		ug/L			03/29/13 18:46	1
Ethanol	ND		150		ug/L			03/29/13 18:46	1
Ethylbenzene	ND		0.50		ug/L			03/29/13 18:46	1
Ethyl-t-butyl ether (ETBE)	ND		0.50		ug/L			03/29/13 18:46	1
Isopropyl Ether (DIPE)	ND		0.50		ug/L			03/29/13 18:46	1
m,p-Xylene	ND		1.0		ug/L			03/29/13 18:46	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50		ug/L			03/29/13 18:46	1
o-Xylene	ND		0.50		ug/L			03/29/13 18:46	1
Tert-amyl-methyl ether (TAME)	ND		0.50		ug/L			03/29/13 18:46	1
tert-Butyl alcohol (TBA)	ND		10		ug/L			03/29/13 18:46	1
Toluene	ND		0.50		ug/L			03/29/13 18:46	1
Xylenes, Total	ND		1.0		ug/L			03/29/13 18:46	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*102*		*80 - 120*		*03/29/13 18:46*	*1*
Dibromofluoromethane (Surr)	*105*		*80 - 120*		*03/29/13 18:46*	*1*
Toluene-d8 (Surr)	*101*		*80 - 120*		*03/29/13 18:46*	*1*

Lab Sample ID: LCS 440-95180/5
Matrix: Water
Analysis Batch: 95180

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,2-Dibromoethane (EDB)			25.0	26.4		ug/L		106	75 - 125		
1,2-Dichloroethane			25.0	21.7		ug/L		87	60 - 140		
Benzene			25.0	21.3		ug/L		85	70 - 120		
Ethanol			250	327		ug/L		131	40 - 155		
Ethylbenzene			25.0	27.2		ug/L		109	75 - 125		
Ethyl-t-butyl ether (ETBE)			25.0	21.9		ug/L		88	65 - 135		
Isopropyl Ether (DIPE)			25.0	23.3		ug/L		93	60 - 135		
m,p-Xylene			50.0	56.4		ug/L		113	75 - 125		
Methyl-t-Butyl Ether (MTBE)			25.0	20.1		ug/L		80	60 - 135		
o-Xylene			25.0	28.5		ug/L		114	75 - 125		
Tert-amyl-methyl ether (TAME)			25.0	19.8		ug/L		79	60 - 135		
tert-Butyl alcohol (TBA)			125	135		ug/L		108	70 - 135		
Toluene			25.0	23.5		ug/L		94	70 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*
Dibromofluoromethane (Surr)	*100*		*80 - 120*
Toluene-d8 (Surr)	*101*		*80 - 120*

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 440-41650-10 MS
Matrix: Water
Analysis Batch: 95180

Client Sample ID: SB-13
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane (EDB)	ND		25.0	25.7		ug/L		103	70 - 130
1,2-Dichloroethane	ND		25.0	22.2		ug/L		89	60 - 140
Benzene	ND		25.0	20.5		ug/L		82	65 - 125
Ethanol	ND		250	313		ug/L		125	40 - 155
Ethylbenzene	ND		25.0	25.2		ug/L		101	65 - 130
Ethyl-t-butyl ether (ETBE)	ND		25.0	24.4		ug/L		98	60 - 135
Isopropyl Ether (DIPE)	ND		25.0	25.0		ug/L		100	60 - 140
m,p-Xylene	ND		50.0	52.4		ug/L		105	65 - 130
Methyl-t-Butyl Ether (MTBE)	100		25.0	111	BB	ug/L		43	55 - 145
o-Xylene	ND		25.0	26.7		ug/L		107	65 - 125
Tert-amyl-methyl ether (TAME)	ND		25.0	22.6		ug/L		89	60 - 140
tert-Butyl alcohol (TBA)	ND		125	142		ug/L		108	65 - 140
Toluene	ND		25.0	23.2		ug/L		93	70 - 125

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*109*		*80 - 120*
Dibromofluoromethane (Surr)	*108*		*80 - 120*
Toluene-d8 (Surr)	*104*		*80 - 120*

Lab Sample ID: 440-41650-10 MSD
Matrix: Water
Analysis Batch: 95180

Client Sample ID: SB-13
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dibromoethane (EDB)	ND		25.0	26.1		ug/L		104	70 - 130	1	25
1,2-Dichloroethane	ND		25.0	23.0		ug/L		92	60 - 140	3	20
Benzene	ND		25.0	21.2		ug/L		85	65 - 125	3	20
Ethanol	ND		250	313		ug/L		125	40 - 155	0	30
Ethylbenzene	ND		25.0	26.0		ug/L		104	65 - 130	3	20
Ethyl-t-butyl ether (ETBE)	ND		25.0	25.5		ug/L		102	60 - 135	4	25
Isopropyl Ether (DIPE)	ND		25.0	25.9		ug/L		104	60 - 140	3	25
m,p-Xylene	ND		50.0	53.7		ug/L		107	65 - 130	2	25
Methyl-t-Butyl Ether (MTBE)	100		25.0	110	BB	ug/L		41	55 - 145	1	25
o-Xylene	ND		25.0	27.6		ug/L		110	65 - 125	3	20
Tert-amyl-methyl ether (TAME)	ND		25.0	22.5		ug/L		88	60 - 140	1	30
tert-Butyl alcohol (TBA)	ND		125	147		ug/L		112	65 - 140	4	25
Toluene	ND		25.0	23.7		ug/L		95	70 - 125	2	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*110*		*80 - 120*
Dibromofluoromethane (Surr)	*105*		*80 - 120*
Toluene-d8 (Surr)	*103*		*80 - 120*

Method: 8015B - Gasoline Range Organics - (GC)

Lab Sample ID: MB 440-94510/4
Matrix: Solid
Analysis Batch: 94510

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		400		ug/Kg			03/27/13 10:40	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*90*		*65 - 140*		*03/27/13 10:40*	*1*

Lab Sample ID: LCS 440-94510/2
Matrix: Solid
Analysis Batch: 94510

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (C4-C12)			1600	1640		ug/Kg		102	70 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*114*		*65 - 140*

Lab Sample ID: LCSD 440-94510/3
Matrix: Solid
Analysis Batch: 94510

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
GRO (C4-C12)			1600	1630		ug/Kg		102	70 - 135	0	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*115*		*65 - 140*

Lab Sample ID: MB 440-95671/4
Matrix: Solid
Analysis Batch: 95671

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		400		ug/Kg			04/02/13 17:52	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*65 - 140*		*04/02/13 17:52*	*1*

Lab Sample ID: LCS 440-95671/2
Matrix: Solid
Analysis Batch: 95671

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (C4-C12)			1600	1690		ug/Kg		106	70 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*111*		*65 - 140*

Method: 8015B - Gasoline Range Organics - (GC) (Continued)

Lab Sample ID: LCSD 440-95671/3
Matrix: Solid
Analysis Batch: 95671

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
GRO (C4-C12)			1600	1680		ug/Kg		105	70 - 135	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*109*		*65 - 140*

Lab Sample ID: 440-42079-A-1 MS
Matrix: Solid
Analysis Batch: 95671

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (C4-C12)	ND		1430	1350		ug/Kg		94	60 - 140		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*102*		*65 - 140*

Lab Sample ID: 440-42079-A-1 MSD
Matrix: Solid
Analysis Batch: 95671

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (C4-C12)	ND		1490	1360		ug/Kg		91	60 - 140	1	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*101*		*65 - 140*

Method: 8015B/5030B - Gasoline Range Organics (GC)

Lab Sample ID: MB 440-94476/27
Matrix: Water
Analysis Batch: 94476

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50		ug/L			03/28/13 03:11	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*65 - 140*		*03/28/13 03:11*	*1*

Lab Sample ID: LCS 440-94476/26
Matrix: Water
Analysis Batch: 94476

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (C4-C12)			800	864		ug/L		108	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*102*		*65 - 140*

Method: 8015B/5030B - Gasoline Range Organics (GC) (Continued)

Lab Sample ID: 440-41492-A-2 MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 94476

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
GRO (C4-C12)	ND		800	790		ug/L		99	65 - 140

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*104*		*65 - 140*

Lab Sample ID: 440-41492-A-2 MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 94476

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (C4-C12)	ND		800	826		ug/L		103	65 - 140	4	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*98*		*65 - 140*

Lab Sample ID: MB 440-94992/3 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 94992

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50		ug/L			03/29/13 05:24	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*65 - 140*		*03/29/13 05:24*	*1*

Lab Sample ID: LCS 440-94992/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 94992

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
GRO (C4-C12)			800	831		ug/L		104	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*114*		*65 - 140*

Lab Sample ID: 440-41541-B-4 MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 94992

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
GRO (C4-C12)	57		800	905		ug/L		106	65 - 140

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*98*		*65 - 140*

Method: 8015B/5030B - Gasoline Range Organics (GC) (Continued)

Lab Sample ID: 440-41541-B-4 MSD
Matrix: Water
Analysis Batch: 94992

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (C4-C12)	57		800	945		ug/L		111	65 - 140	4	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*93*		*65 - 140*

Lab Sample ID: MB 440-95268/29
Matrix: Water
Analysis Batch: 95268

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50		ug/L			03/31/13 04:56	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*99*		*65 - 140*		*03/31/13 04:56*	*1*

Lab Sample ID: LCS 440-95268/28
Matrix: Water
Analysis Batch: 95268

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (C4-C12)			800	738		ug/L		92	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*123*		*65 - 140*

GC/MS VOA

Analysis Batch: 95010

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-41650-1	SB-10-15'	Total/NA	Solid	8260B	
440-41650-3	SB-12-15'	Total/NA	Solid	8260B	
440-41650-4	SB-12-30'	Total/NA	Solid	8260B	
440-41650-6	SB-11-15'	Total/NA	Solid	8260B	
440-41650-6 MS	SB-11-15'	Total/NA	Solid	8260B	
440-41650-6 MSD	SB-11-15'	Total/NA	Solid	8260B	
440-41650-8	SB-13-14'	Total/NA	Solid	8260B	
440-41650-9	SB-13-27'	Total/NA	Solid	8260B	
LCS 440-95010/5	Lab Control Sample	Total/NA	Solid	8260B	
MB 440-95010/4	Method Blank	Total/NA	Solid	8260B	

Analysis Batch: 95180

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-41650-2	SB-10	Total/NA	Water	8260B/5030B	
440-41650-5	SB-12	Total/NA	Water	8260B/5030B	
440-41650-7	SB-11	Total/NA	Water	8260B/5030B	
440-41650-10	SB-13	Total/NA	Water	8260B/5030B	
440-41650-10 MS	SB-13	Total/NA	Water	8260B/5030B	
440-41650-10 MSD	SB-13	Total/NA	Water	8260B/5030B	
440-41650-11	TB-498-03212013	Total/NA	Water	8260B/5030B	
LCS 440-95180/5	Lab Control Sample	Total/NA	Water	8260B/5030B	
MB 440-95180/4	Method Blank	Total/NA	Water	8260B/5030B	

GC VOA

Analysis Batch: 94476

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-41492-A-2 MS	Matrix Spike	Total/NA	Water	8015B/5030B	
440-41492-A-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8015B/5030B	
440-41650-2	SB-10	Total/NA	Water	8015B/5030B	
LCS 440-94476/26	Lab Control Sample	Total/NA	Water	8015B/5030B	
MB 440-94476/27	Method Blank	Total/NA	Water	8015B/5030B	

Analysis Batch: 94510

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-41650-1	SB-10-15'	Total/NA	Solid	8015B	
LCS 440-94510/2	Lab Control Sample	Total/NA	Solid	8015B	
LCSD 440-94510/3	Lab Control Sample Dup	Total/NA	Solid	8015B	
MB 440-94510/4	Method Blank	Total/NA	Solid	8015B	

Analysis Batch: 94992

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-41541-B-4 MS	Matrix Spike	Total/NA	Water	8015B/5030B	
440-41541-B-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8015B/5030B	
440-41650-5	SB-12	Total/NA	Water	8015B/5030B	
440-41650-7	SB-11	Total/NA	Water	8015B/5030B	
LCS 440-94992/2	Lab Control Sample	Total/NA	Water	8015B/5030B	
MB 440-94992/3	Method Blank	Total/NA	Water	8015B/5030B	

GC VOA (Continued)

Analysis Batch: 95268

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-41650-10	SB-13	Total/NA	Water	8015B/5030B	
440-41650-11	TB-498-03212013	Total/NA	Water	8015B/5030B	
LCS 440-95268/28	Lab Control Sample	Total/NA	Water	8015B/5030B	
MB 440-95268/29	Method Blank	Total/NA	Water	8015B/5030B	

Analysis Batch: 95671

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-41650-3	SB-12-15'	Total/NA	Solid	8015B	
440-41650-4	SB-12-30'	Total/NA	Solid	8015B	
440-41650-6	SB-11-15'	Total/NA	Solid	8015B	
440-41650-8	SB-13-14'	Total/NA	Solid	8015B	
440-41650-9	SB-13-27'	Total/NA	Solid	8015B	
440-42079-A-1 MS	Matrix Spike	Total/NA	Solid	8015B	
440-42079-A-1 MSD	Matrix Spike Duplicate	Total/NA	Solid	8015B	
LCS 440-95671/2	Lab Control Sample	Total/NA	Solid	8015B	
LCSD 440-95671/3	Lab Control Sample Dup	Total/NA	Solid	8015B	
MB 440-95671/4	Method Blank	Total/NA	Solid	8015B	

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
BB	Sample > 4X spike concentration
ID	Analyte identified by RT & presence of single mass ion

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
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
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)
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)

Certification Summary

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 0498, Livermore

TestAmerica Job ID: 440-41650-1

Laboratory: TestAmerica Irvine

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	CA01531	06-30-13
Arizona	State Program	9	AZ0671	10-13-13
California	LA Cty Sanitation Districts	9	10256	01-31-14
California	NELAP	9	1108CA	01-31-14
California	State Program	9	2706	06-30-14
Guam	State Program	9	Cert. No. 12.002r	03-28-13 *
Hawaii	State Program	9	N/A	01-31-14
Nevada	State Program	9	CA015312007A	07-31-13
Northern Mariana Islands	State Program	9	MP0002	01-31-14
Oregon	NELAP	10	4005	09-12-13
USDA	Federal		P330-09-00080	06-06-14
USEPA UCMR	Federal	1	CA01531	01-31-15

* Expired certification is currently pending renewal and is considered valid.

PTS Laboratories, Inc.

8100 Secura Way • Santa Fe Springs, CA 90670
Telephone (562) 347-2500 • Fax (562) 907-3610

April 9, 2013

Kathleen Robb
TestAmerica
17461 Derian Avenue, Suite 100
Irvine, CA 92614-5817

Re: PTS File No: 43190
Physical Properties Data
ARCO 0498, Livermore; 440-41650-1

Dear Ms. Robb:

Please find enclosed report for Physical Properties analyses conducted upon samples received from your ARCO 0498, Livermore; 440-41650-1 project. All analyses were performed by applicable ASTM, EPA, or API methodologies. An electronic version of the report has previously been sent to your attention via the internet. The samples are currently in storage and will be retained for thirty days past completion of testing at no charge. Please note that the samples will be disposed of at that time. You may contact me regarding storage, disposal, or return of the samples.

PTS Laboratories appreciates the opportunity to be of service. If you have any questions or require additional information, please contact Morgan Richards at (562) 347-2509.

Sincerely,
PTS Laboratories

for Rachel S

Michael Mark Brady, P.G.
District Manager

Encl.

PTS Laboratories

Project Name: ARCO 0498, Livermore
Project Number: 440-41650-1

PTS File No: 43190
Client: TestAmerica

TEST PROGRAM - 20130326

CORE ID	Depth ft.	Core Recovery ft.	CAL-EPA DTSC Vapor Intrusion					Notes
		Plugs:	Various					
Date Received: 20130326								
SB-12-15' (440-41650-3)	15	0.50	X					
SB-12-30' (440-41650-4)	30	0.50	X					
TOTALS:	2 cores	1.00	2					

Laboratory Test Program Notes

Contaminant identification: _____

Standard TAT for basic analysis is 10 business days.

CAL-EPA DTSC Vapor Intrusion: Bulk & grain density, total porosity, moisture content, volumetric air & moisture, TOC/foc, and grain size distribution.

PTS File No: 43190
Client: TestAmerica

PTS Laboratories

PHYSICAL PROPERTIES DATA - CAL-EPA DTSC Vapor Intrusion PACKAGE

PROJECT NAME: ARCO 0498, Livermore
PROJECT NO: 440-41650-1

			METHODS:	API RP40/ASTM D2216		API RP40		API RP40		
								POROSITY,%Vb (2)		
SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENTATION (1)	ANALYSIS DATE	MOISTURE CONTENT, % weight	MOISTURE CONTENT, cm^3/cm^3	DENSITY DRY BULK, g/cm^3	DENSITY GRAIN, g/cm^3	TOTAL, cm^3/cm^3	AIR FILLED, cm^3/cm^3	WATER FILLED, cm^3/cm^3
SB-12-15' (440-41650-3)	15	V	20130401	7.3	0.130	1.79	2.78	0.355	0.224	0.130
SB-12-30' (440-41650-4)	30	V	20130401	5.0	0.098	1.97	2.73	0.277	0.179	0.098

(1) Sample Orientation: H = horizontal; V = vertical; R = remold (2) Total Porosity = no pore fluids in place; all interconnected pore channels; Air Filled = pore channels not occupied by pore fluids, native sample Vb = Bulk Volume, cc

PTS File No: 43190
Client: TestAmerica

ORGANIC CARBON DATA - TOC (foc)

(METHODOLOGY: WALKLEY-BLACK)

PROJECT NAME: ARCO 0498, Livermore
PROJECT NO: 440-41650-1

SAMPLE ID.	DEPTH, ft.	ANALYSIS DATE	ANALYSIS TIME	SAMPLE MATRIX	TOTAL ORGANIC CARBON, mg/kg	FRACTION ORGANIC CARBON, g/g
SB-12-15' (440-41650-3)	15	20130404	1410	SOIL	1200	1.20E-03
SB-12-30' (440-41650-4)	30	20130404	1410	SOIL	730	7.30E-04
Blank	N/A	20130404	1410	BLANK	ND	ND
SRM D079-542	N/A	20130404	1410	SRM	3240	3.24E-03
				Reporting Limit:	100	1.00E-04

QC DATA

SRM ID/Lot No.	REC (%)	Control Limits	Certified Concentration mg/kg	QC Performance Acceptance Limits, mg/kg Lower	Upper
SRM D079-542	95	75-125	3400	2550	4250

ND = Not Detected

PARTICLE SIZE SUMMARY

(METHODOLOGY: ASTM D422)

PROJECT NAME: ARCO 0498, Livermore
PROJECT NO: 440-41650-1

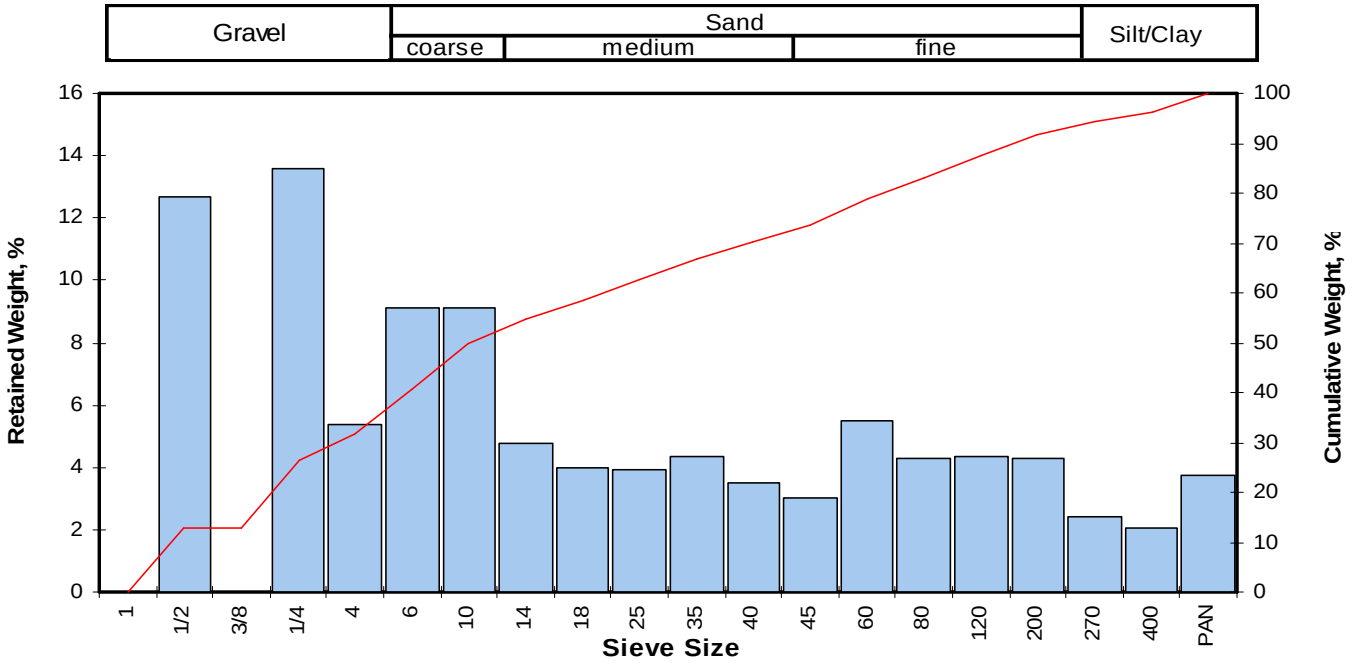
Sample ID	Depth, ft.	Description USCS/ASTM (1)	Median Grain Size, mm	Particle Size Distribution, wt. percent				
				Gravel	Sand Size			Silt/Clay
					Coarse	Medium	Fine	
SB-12-15' (440-41650-3)	15	Coarse sand	1.981	31.63	18.24	20.51	21.40	8.22
SB-12-30' (440-41650-4)	30	Gravel	N/A	64.11	2.85	16.80	12.79	3.45

(1) based on Mean fromTrask

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422M

Client:	TestAmerica	**PTS File No:**	43190
Project:	ARCO 0498, Livermore	**Sample ID:**	SB-12-15' (440-41650-3)
Project No:	440-41650-1	**Depth, ft:**	15



Opening		Phi of	U.S. Sieve	Sample Weight	Incremental Weight,	Cumulative Weight,
Inches	Millimeters	Screen	No.	grams	percent	percent
0.9844	25.002	-4.64	1	0.00	0.00	0.00
0.4922	12.501	-3.64	1/2	4.80	12.65	12.65
0.3740	9.500	-3.25	3/8	0.00	0.00	12.65
0.2500	6.351	-2.67	1/4	5.16	13.60	26.25
0.1873	4.757	-2.25	4	2.04	5.38	31.63
0.1324	3.364	-1.75	6	3.46	9.12	40.75
0.0787	2.000	-1.00	10	3.46	9.12	49.87
0.0557	1.414	-0.50	14	1.81	4.77	54.64
0.0394	1.000	0.00	18	1.52	4.01	58.65
0.0278	0.707	0.50	25	1.49	3.93	62.57
0.0197	0.500	1.00	35	1.64	4.32	66.90
0.0166	0.420	1.25	40	1.32	3.48	70.37
0.0139	0.354	1.50	45	1.15	3.03	73.41
0.0098	0.250	2.00	60	2.08	5.48	78.89
0.0070	0.177	2.50	80	1.63	4.30	83.18
0.0049	0.125	3.00	120	1.64	4.32	87.51
0.0029	0.074	3.75	200	1.62	4.27	91.78
0.0021	0.053	4.25	270	0.91	2.40	94.18
0.0015	0.037	4.75	400	0.78	2.06	96.23
			PAN	1.43	3.77	100.00
TOTALS				37.94	100.00	100.00

Cumulative Weight Percent greater than			
Weight	Phi	Particle Size	
percent	Value	Inches	Millimeters
5	-4.09	0.6715	17.057
10	-3.54	0.4581	11.636
16	-3.10	0.3387	8.604
25	-2.72	0.2595	6.591
40	-1.79	0.1362	3.461
50	-0.99	0.0780	1.981
60	0.17	0.0349	0.887
75	1.65	0.0126	0.320
84	2.59	0.0065	0.166
90	3.44	0.0036	0.092
95	4.45	0.0018	0.046

Measure	Trask	Inman	Folk-Ward
Median, phi	-0.99	-0.99	-0.99
Median, in.	0.0780	0.0780	0.0780
Median, mm	1.981	1.981	1.981
Mean, phi	-1.79	-0.26	-0.50
Mean, in.	0.1360	0.0470	0.0556
Mean, mm	3.455	1.194	1.413
Sorting	4.541	2.850	2.719
Skewness	0.733	0.256	0.265
Kurtosis	0.272	0.499	0.802

Grain Size Description (ASTM-USCS Scale)	Coarse sand (based on Mean from Trask)

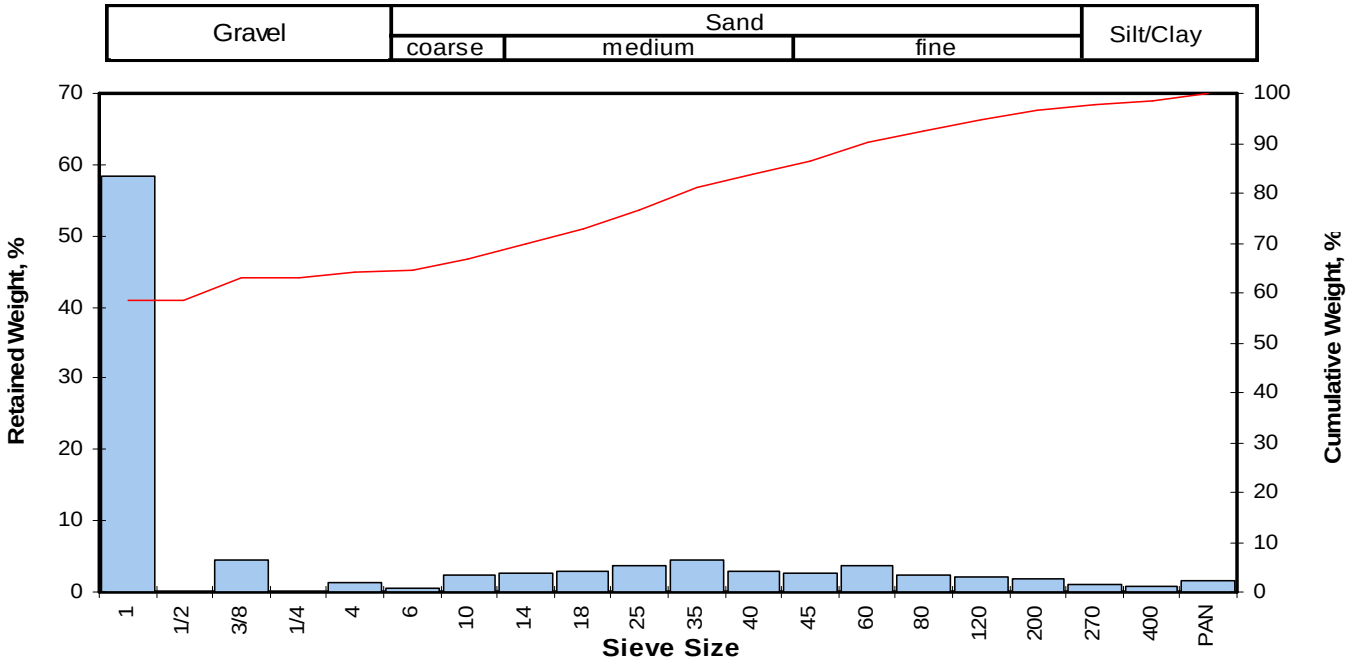
Description	Retained on Sieve #	Weight Percent
Gravel	4	31.63
Coarse Sand	10	18.24
Medium Sand	40	20.51
Fine Sand	200	21.40
Silt/Clay	<200	8.22
	Total	100

Phone: (562) 907-3607
Fax: (562) 907-3610

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422M

Client:	TestAmerica	**PTS File No:**	43190
Project:	ARCO 0498, Livermore	**Sample ID:**	SB-12-30' (440-41650-4)
Project No:	440-41650-1	**Depth, ft:**	30



Opening		Phi of	U.S. Sieve	Sample Weight	Incremental Weight,	Cumulative Weight,
Inches	Millimeters	Screen	No.	grams	percent	percent
0.9844	25.002	-4.64	1	26.20	58.36	58.36
0.4922	12.501	-3.64	1/2	0.00	0.00	58.36
0.3740	9.500	-3.25	3/8	2.01	4.48	62.84
0.2500	6.351	-2.67	1/4	0.00	0.00	62.84
0.1873	4.757	-2.25	4	0.57	1.27	64.11
0.1324	3.364	-1.75	6	0.24	0.53	64.65
0.0787	2.000	-1.00	10	1.04	2.32	66.96
0.0557	1.414	-0.50	14	1.23	2.74	69.70
0.0394	1.000	0.00	18	1.33	2.96	72.67
0.0278	0.707	0.50	25	1.70	3.79	76.45
0.0197	0.500	1.00	35	2.02	4.50	80.95
0.0166	0.420	1.25	40	1.26	2.81	83.76
0.0139	0.354	1.50	45	1.15	2.56	86.32
0.0098	0.250	2.00	60	1.71	3.81	90.13
0.0070	0.177	2.50	80	1.09	2.43	92.56
0.0049	0.125	3.00	120	0.94	2.09	94.65
0.0029	0.074	3.75	200	0.85	1.89	96.55
0.0021	0.053	4.25	270	0.45	1.00	97.55
0.0015	0.037	4.75	400	0.38	0.85	98.40
			PAN	0.72	1.60	100.00
TOTALS				44.89	100.00	100.00

Cumulative Weight Percent greater than			
Weight	Phi	Particle Size	
percent	Value	Inches	Millimeters
5			
10			
16			
25			
40			
50			
60	-3.29	0.3843	9.762
75	0.31	0.0318	0.808
84	1.27	0.0163	0.414
90	1.98	0.0100	0.253
95	3.14	0.0045	0.114

Measure	Trask	Inman	Folk-Ward
Median, phi			
Median, in.			
Median, mm			
Mean, phi			
Mean, in.			
Mean, mm			
Sorting			
Skewness			
Kurtosis			

Grain Size Description (ASTM-USCS Scale)	Gravel (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	64.11
Coarse Sand	10	2.85
Medium Sand	40	16.80
Fine Sand	200	12.79
Silt/Clay	<200	3.45
	Total	100

Phone: (562) 907-3607
Fax: (562) 907-3610

TestAmerica Irvine
17461 Derian Ave Suite 100
Irvine, CA 92614-5817
Phone (949) 261-1022 Fax (949) 260-3297

Chain of Custody Record

43190

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Robb, Kathleen	Carrier Tracking No(s):	COC No: 440-19650.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: kathleen.robb@testamericainc.com		Page: Page 1 of 1
Company: PTS laboratories, Inc				Job #: 440-41650-1
Address: 8100 Secura Way,	Due Date Requested: 4/3/2013			
City: Santa Fe Springs	TAT Requested (days):			
State, Zip: CA, 90670				
Phone:	PO #:			
Email:	WO #:			
Project Name: ARCO 0498, Livermore	Project #: 44006987			
Site: ARCO 0498, Livermore	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SUBCONTRACT/ Grain Size Distribution	SUBCONTRACT/ Moisture Content	SUBCONTRACT/ Volumetric Moisture & Air	SUBCONTRACT/ Total Porosity	SUBCONTRACT/ Bulk and Grain Density	SUBCONTRACT/ TOC	SUBCONTRACT/ FOC	Total Number of containers	Special Instructions/Note:
Preservation Code:															
SB-10-15 (440-41650-1)	3/18/13	15:00 Pacific		Solid			X	X	X	X	X	X	X	1	(2) 3/25/13
SB-12-15' (440-41650-3)	3/20/13	08:05 Pacific		Solid			X	X	X	X	X	X	X	1	
SB-12-30' (440-41650-4)	3/20/13	08:25 Pacific		Solid			X	X	X	X	X	X	X	1	
SB-11-15 (440-41650-6)	3/20/13	14:00 Pacific		Solid			X	X	X	X	X	X	X	1	(2) 3/25/13
SB-13-14 (440-41650-8)	3/21/13	07:55 Pacific		Solid			X	X	X	X	X	X	X	1	
SB-13-27 (440-41650-9)	3/21/13	08:10 Pacific		Solid			X	X	X	X	X	X	X	1	

Possible Hazard Identification
Unconfirmed

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

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

Special Instructions/QC Requirements:

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

	Date/Time:	Company		Date/Time:	Company
Relinquished by:	3/26/13 9:58	TAI	Received by:	3/26/13 9:58	TAI
Relinquished by:	3/26/13 9:58		Received by:	3/26/13 9:58	PTS LABS
Relinquished by:			Received by:		

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 4.6.1 GF

Atlantic Richfield Company
A BP affiliated company

Laboratory Management Program LaMP Chain of Custody Record

BP/ARC Project Name: BP 498 | Req Due Date (mm/dd/yy): ____ | Rush TAT: Yes ____ No X

BP/ARC Facility No: 498 | Lab Work Order Number: 440-41650

Lab Name: TestAmerica	BP/ARC Facility Address: 286 South Livermore Avenue	Consultant/Contractor: Broadbent & Associates, Inc.
Lab Address: 17461 Derian Ave., Suite 100	City, State, ZIP Code: Livermore, CA	Consultant/Contractor Project No: 08-82-603
Lab PM: Kathleen Robb	Lead Regulatory Agency: ACEH	Address: 1370 Ridgewood Drive, Ste. 5, Chico, CA 95973
Lab Phone: 949-261-1022	California Global ID No.: T0600124081	Consultant/Contractor PM: Jason Duda
Lab Shipping Accnt: Fedex# 1103-6633-7	Enfos Proposal No: 005X3-0004	Phone: 530-566-1400
Lab Bottle Order No:	Accounting Mode: Provision X OOC-BU ____ OOC-RM ____	Email EDD To: jduda@broadbentinc.com
Other Info:	Stage: Execute (4) Activity: Project Spend (80)	Invoice To: BP/ARC X Contractor ____
BP/ARC EBM: Shannon Couch		
EBM Phone:		
EBM Email: shannon.couch@bp.com		

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor	Matrix:	No. Containers / Preservative: Total Number of Containers	Unpreserved	H_2SO_4	HNO_3	HCl	Methanol		Requested Analyses: GRO (8015)	BTEX, 5 Oxys, EDB (8260)	1,2-DCA, Ethanol (8260)	Bulk & Grain Density	Total Porosity	Moisture Content	Volumetric Moisture & Air	TOC & FOC	Grain Size Distribution
	SB-10-15'	3/18/13	1500	X				2	X						X								X
	SB-10	3/18/13	1600		X			6				X			X	X	X						
	SB-12-15'	3/20/13	0805	X				2	X						X								X
	SB-12-30'	3/20/13	0825	X				2	X						X								X
	SB-12	3/20/13	0850		X			6				X			X	X	X						
	SB-11-15'	3/20/13	1460	X				2	X						X								X
	SB-11	3/20/13	1500		X			6				X			X	X	X						
	SB-13-15'	3/21/13	0755	X				2	X						X								X
	SB-13-27'	3/21/13	0810	X				2	X						X								X
	SB-13	3/21/13	0830		X			6				X			X	X	X						

Report Type & QC Level: Standard X; Full Data Package ____

Comments: Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

Sampler's Name: James Ramos	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company: Broadbent		3-21-13	1700			
Shipment Method: Fedex Ship Date: 3/21/13						
Shipment Tracking No:					3/22/13	9:50

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: 3.0/2.9 °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

Atlantic Richfield Company
A BP affiliated company

Laboratory Management Program LaMP Chain of Custody Record

Page ____ of ____

BP/ARC Project Name: BP 498 **Req Due Date (mm/dd/yy):** _____ **Rush TAT:** Yes ___ No X

BP/ARC Facility No: 498 **Lab Work Order Number:** 440-41650

Lab Name:	TestAmerica	BP/ARC Facility Address:	286 South Livermore Avenue	Consultant/Contractor:	Broadbent & Associates, Inc.
Lab Address:	17461 Derian Ave., Suite 100	City, State, ZIP Code:	Livermore, CA	Consultant/Contractor Project No:	08-82-603
Lab PM:	Kathleen Robb	Lead Regulatory Agency:	ACEH	Address:	1370 Ridgewood Drive, Ste. 5, Chico, CA 95973
Lab Phone:	949-261-1022	California Global ID No.:	T0600124081	Consultant/Contractor PM:	Jason Duda
Lab Shipping Accnt:		Enfos Proposal No:	005X3-0004	Phone:	530-566-1400
Lab Bottle Order No:		Accounting Mode:	Provision X OOC-BU ___ OOC-RM ___	Email EDD To:	jduda@broadbentinc.com
Other Info:		Stage:	Execute (4) Activity: Project Spend (80)	Invoice To:	BP/ARC X Contractor ___

BP/ARC EBM: Shannon Couch
EBM Phone:
EBM Email: shannon.couch@bp.com

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor	Matrix:	No. Containers / Preservative: Total Number of Containers	Unpreserved	H_2SO_4	HNO_3	HCl	Methanol		Requested Analyses: GRO (8015)	BTEX, 5 Oxys, EDB (8260)	1,2-DCA, Ethanol (8260)							
	TB-498-03212013	3/21/13	1700		X			2				X												

Report Type & QC Level
Standard X
Full Data Package ____

Comments
Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

GW Hold

Sampler's Name:	James Ramos
Sampler's Company:	Broadbent
Shipment Method:	Fedex Ship Date: 3-21-13
Shipment Tracking No:	

Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
	3-21-13	1700			

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: _____ °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

BP/ARC LaMP COC Rev. 6 01/01/2009

Login Sample Receipt Checklist

Client: Broadbent & Associates, Inc.

Job Number: 440-41650-1

Login Number: 41650

List Source: TestAmerica Irvine

List Number: 1

Creator: King, Ronald

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
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	James Ramos
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 <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

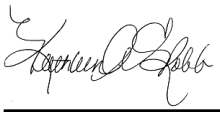
ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Irvine
17461 Derian Ave
Suite 100
Irvine, CA 92614-5817
Tel: (949)261-1022

TestAmerica Job ID: 440-41677-1
Client Project/Site: ARCO 0498, Livermore

For:
Broadbent & Associates, Inc.
1324 Mangrove Ave
Suite 212
Chico, California 95926

Attn: Mr. Jason Duda



Authorized for release by:
4/11/2013 12:55:58 PM

Kathleen Robb
Project Manager II
kathleen.robb@testamericainc.com

Table of Contents

Sample Summary

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 0498, Livermore

TestAmerica Job ID: 440-41677-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-41677-1	SB-16	Water	03/21/13 14:15	03/23/13 10:05
440-41677-2	SB-15	Water	03/21/13 18:05	03/23/13 10:05
440-41677-3	SB-14	Water	03/22/13 15:00	03/23/13 10:05
440-41677-4	SB-9	Water	03/22/13 11:10	03/23/13 10:05
440-41677-6	SB-16-13'	Solid	03/21/13 13:45	03/23/13 10:05
440-41677-7	SB-16-26'	Solid	03/21/13 13:50	03/23/13 10:05
440-41677-8	SB-15-24'	Solid	03/21/13 17:35	03/23/13 10:05
440-41677-9	SB-15-38'	Solid	03/21/13 17:50	03/23/13 10:05
440-41677-10	SB-9-20'	Solid	03/22/13 10:25	03/23/13 10:05
440-41677-11	SB-9-37'	Solid	03/22/13 10:50	03/23/13 10:05
440-41677-12	SB-14-18'	Solid	03/22/13 14:30	03/23/13 10:05
440-41677-13	SB-14-37'	Solid	03/22/13 14:45	03/23/13 10:05

Job ID: 440-41677-1

Laboratory: TestAmerica Irvine

Narrative

Job Narrative
440-41677-1

Comments
No additional comments.

Receipt
The samples were received on 3/23/2013 10:05 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.6º C.

GC/MS VOA
No analytical or quality issues were noted.

GC VOA
Method(s) 8015B: Surrogate recovery for the following sample(s) was outside control limits: MW-12 (440-41567-18). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Method(s) 8015B: Surrogate recovery was outside control limits for the following sample: (CCVRT 440-95738/1). The BFB surrogate coeluted with the TPH standard. Data not impacted.

No other analytical or quality issues were noted.

Subcontract non-Sister
No analytical or quality issues were noted.

VOA Prep
No analytical or quality issues were noted.

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 0498, Livermore

TestAmerica Job ID: 440-41677-1

Client Sample ID: SB-16
Date Collected: 03/21/13 14:15
Date Received: 03/23/13 10:05

Lab Sample ID: 440-41677-1
Matrix: Water

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		25		ug/L			03/31/13 16:22	50
1,2-Dichloroethane	ND		25		ug/L			03/31/13 16:22	50
Benzene	**180**		25		ug/L			03/31/13 16:22	50
Ethanol	ND		7500		ug/L			03/31/13 16:22	50
Ethylbenzene	**1500**		25		ug/L			03/31/13 16:22	50
Ethyl-t-butyl ether (ETBE)	ND		25		ug/L			03/31/13 16:22	50
Isopropyl Ether (DIPE)	ND		25		ug/L			03/31/13 16:22	50
m,p-Xylene	**6700**		50		ug/L			03/31/13 16:22	50
Methyl-t-Butyl Ether (MTBE)	ND		25		ug/L			03/31/13 16:22	50
o-Xylene	**2600**		25		ug/L			03/31/13 16:22	50
Tert-amyl-methyl ether (TAME)	ND		25		ug/L			03/31/13 16:22	50
tert-Butyl alcohol (TBA)	ND		500		ug/L			03/31/13 16:22	50
Toluene	**360**		25		ug/L			03/31/13 16:22	50
Xylenes, Total	**9300**		50		ug/L			03/31/13 16:22	50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*110*		*80 - 120*		*03/31/13 16:22*	*50*
Dibromofluoromethane (Surr)	*110*		*80 - 120*		*03/31/13 16:22*	*50*
Toluene-d8 (Surr)	*104*		*80 - 120*		*03/31/13 16:22*	*50*

Method: 8015B/5030B - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	**26000**		10000		ug/L			04/02/13 12:05	200

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*134*		*65 - 140*		*04/02/13 12:05*	*200*

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 0498, Livermore

TestAmerica Job ID: 440-41677-1

Client Sample ID: SB-15
Date Collected: 03/21/13 18:05
Date Received: 03/23/13 10:05

Lab Sample ID: 440-41677-2
Matrix: Water

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		1.0		ug/L			04/01/13 12:54	2
1,2-Dichloroethane	ND		1.0		ug/L			04/01/13 12:54	2
Benzene	**4.7**		1.0		ug/L			04/01/13 12:54	2
Ethanol	ND		300		ug/L			04/01/13 12:54	2
Ethylbenzene	**110**		1.0		ug/L			04/01/13 12:54	2
Ethyl-t-butyl ether (ETBE)	ND		1.0		ug/L			04/01/13 12:54	2
Isopropyl Ether (DIPE)	ND		1.0		ug/L			04/01/13 12:54	2
m,p-Xylene	**38**		2.0		ug/L			04/01/13 12:54	2
Methyl-t-Butyl Ether (MTBE)	ND		1.0		ug/L			04/01/13 12:54	2
o-Xylene	**14**		1.0		ug/L			04/01/13 12:54	2
Tert-amyl-methyl ether (TAME)	ND		1.0		ug/L			04/01/13 12:54	2
tert-Butyl alcohol (TBA)	ND		20		ug/L			04/01/13 12:54	2
Toluene	**8.2**		1.0		ug/L			04/01/13 12:54	2
Xylenes, Total	**52**		2.0		ug/L			04/01/13 12:54	2

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*113*		*80 - 120*		*04/01/13 12:54*	*2*
Dibromofluoromethane (Surr)	*104*		*80 - 120*		*04/01/13 12:54*	*2*
Toluene-d8 (Surr)	*113*		*80 - 120*		*04/01/13 12:54*	*2*

Method: 8015B/5030B - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	**6300**		5000		ug/L			04/02/13 12:33	100

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*137*		*65 - 140*		*04/02/13 12:33*	*100*

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 0498, Livermore

TestAmerica Job ID: 440-41677-1

Client Sample ID: SB-14
Date Collected: 03/22/13 15:00
Date Received: 03/23/13 10:05

Lab Sample ID: 440-41677-3
Matrix: Water

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.50		ug/L			03/31/13 17:17	1
1,2-Dichloroethane	ND		0.50		ug/L			03/31/13 17:17	1
Benzene	ND		0.50		ug/L			03/31/13 17:17	1
Ethanol	ND		150		ug/L			03/31/13 17:17	1
Ethylbenzene	ND		0.50		ug/L			03/31/13 17:17	1
Ethyl-t-butyl ether (ETBE)	ND		0.50		ug/L			03/31/13 17:17	1
Isopropyl Ether (DIPE)	ND		0.50		ug/L			03/31/13 17:17	1
m,p-Xylene	ND		1.0		ug/L			03/31/13 17:17	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50		ug/L			03/31/13 17:17	1
o-Xylene	ND		0.50		ug/L			03/31/13 17:17	1
Tert-amyl-methyl ether (TAME)	ND		0.50		ug/L			03/31/13 17:17	1
tert-Butyl alcohol (TBA)	ND		10		ug/L			03/31/13 17:17	1
Toluene	ND		0.50		ug/L			03/31/13 17:17	1
Xylenes, Total	ND		1.0		ug/L			03/31/13 17:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*107*		*80 - 120*		*03/31/13 17:17*	*1*
Dibromofluoromethane (Surr)	*111*		*80 - 120*		*03/31/13 17:17*	*1*
Toluene-d8 (Surr)	*102*		*80 - 120*		*03/31/13 17:17*	*1*

Method: 8015B/5030B - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50		ug/L			04/01/13 15:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*131*		*65 - 140*		*04/01/13 15:36*	*1*

Client Sample ID: SB-9
Date Collected: 03/22/13 11:10
Date Received: 03/23/13 10:05

Lab Sample ID: 440-41677-4
Matrix: Water

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.50		ug/L			03/31/13 17:45	1
1,2-Dichloroethane	ND		0.50		ug/L			03/31/13 17:45	1
Benzene	ND		0.50		ug/L			03/31/13 17:45	1
Ethanol	ND		150		ug/L			03/31/13 17:45	1
Ethylbenzene	ND		0.50		ug/L			03/31/13 17:45	1
Ethyl-t-butyl ether (ETBE)	ND		0.50		ug/L			03/31/13 17:45	1
Isopropyl Ether (DIPE)	ND		0.50		ug/L			03/31/13 17:45	1
m,p-Xylene	ND		1.0		ug/L			03/31/13 17:45	1
Methyl-t-Butyl Ether (MTBE)	**1.9**		0.50		ug/L			03/31/13 17:45	1
o-Xylene	ND		0.50		ug/L			03/31/13 17:45	1
Tert-amyl-methyl ether (TAME)	ND		0.50		ug/L			03/31/13 17:45	1
tert-Butyl alcohol (TBA)	ND		10		ug/L			03/31/13 17:45	1
Toluene	ND		0.50		ug/L			03/31/13 17:45	1
Xylenes, Total	ND		1.0		ug/L			03/31/13 17:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*107*		*80 - 120*		*03/31/13 17:45*	*1*
Dibromofluoromethane (Surr)	*108*		*80 - 120*		*03/31/13 17:45*	*1*
Toluene-d8 (Surr)	*101*		*80 - 120*		*03/31/13 17:45*	*1*

Method: 8015B/5030B - Gasoline Range Organics (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50		ug/L			04/01/13 16:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*130*		*65 - 140*		*04/01/13 16:04*	*1*

Client Sample ID: SB-16-13'
Date Collected: 03/21/13 13:45
Date Received: 03/23/13 10:05

Lab Sample ID: 440-41677-6
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0020		mg/Kg			03/29/13 16:12	1
Isopropyl Ether (DIPE)	ND		0.0049		mg/Kg			03/29/13 16:12	1
Ethanol	ND		0.30		mg/Kg			03/29/13 16:12	1
Ethyl-t-butyl ether (ETBE)	ND		0.0049		mg/Kg			03/29/13 16:12	1
Ethylbenzene	ND		0.0020		mg/Kg			03/29/13 16:12	1
m,p-Xylene	ND		0.0020		mg/Kg			03/29/13 16:12	1
Methyl-t-Butyl Ether (MTBE)	ND		0.0049		mg/Kg			03/29/13 16:12	1
o-Xylene	ND		0.0020		mg/Kg			03/29/13 16:12	1
Tert-amyl-methyl ether (TAME)	ND		0.0049		mg/Kg			03/29/13 16:12	1
tert-Butyl alcohol (TBA)	ND		0.099		mg/Kg			03/29/13 16:12	1
Toluene	ND		0.0020		mg/Kg			03/29/13 16:12	1
1,2-Dibromoethane (EDB)	ND		0.0020		mg/Kg			03/29/13 16:12	1
Xylenes, Total	ND		0.0040		mg/Kg			03/29/13 16:12	1
1,2-Dichloroethane	ND		0.0020		mg/Kg			03/29/13 16:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*105*		*80 - 120*		*03/29/13 16:12*	*1*
4-Bromofluorobenzene (Surr)	*103*		*80 - 120*		*03/29/13 16:12*	*1*
Dibromofluoromethane (Surr)	*104*		*80 - 125*		*03/29/13 16:12*	*1*

Method: 8015B - Gasoline Range Organics - (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		0.40		mg/Kg			04/04/13 03:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*73*		*65 - 140*		*04/04/13 03:45*	*1*

Client Sample ID: SB-16-26'
Date Collected: 03/21/13 13:50
Date Received: 03/23/13 10:05

Lab Sample ID: 440-41677-7
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0020		mg/Kg			03/29/13 16:42	1
Isopropyl Ether (DIPE)	ND		0.0050		mg/Kg			03/29/13 16:42	1
Ethanol	ND		0.30		mg/Kg			03/29/13 16:42	1
Ethyl-t-butyl ether (ETBE)	ND		0.0050		mg/Kg			03/29/13 16:42	1
Ethylbenzene	ND		0.0020		mg/Kg			03/29/13 16:42	1
m,p-Xylene	ND		0.0020		mg/Kg			03/29/13 16:42	1
Methyl-t-Butyl Ether (MTBE)	ND		0.0050		mg/Kg			03/29/13 16:42	1
o-Xylene	ND		0.0020		mg/Kg			03/29/13 16:42	1
Tert-amyl-methyl ether (TAME)	ND		0.0050		mg/Kg			03/29/13 16:42	1
tert-Butyl alcohol (TBA)	ND		0.10		mg/Kg			03/29/13 16:42	1
Toluene	ND		0.0020		mg/Kg			03/29/13 16:42	1
1,2-Dibromoethane (EDB)	ND		0.0020		mg/Kg			03/29/13 16:42	1
Xylenes, Total	ND		0.0040		mg/Kg			03/29/13 16:42	1
1,2-Dichloroethane	ND		0.0020		mg/Kg			03/29/13 16:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*109*		*80 - 120*		*03/29/13 16:42*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*03/29/13 16:42*	*1*
Dibromofluoromethane (Surr)	*104*		*80 - 125*		*03/29/13 16:42*	*1*

Method: 8015B - Gasoline Range Organics - (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		0.36		mg/Kg			04/02/13 23:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*65 - 140*		*04/02/13 23:38*	*1*

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 0498, Livermore

TestAmerica Job ID: 440-41677-1

Client Sample ID: SB-15-24'
Date Collected: 03/21/13 17:35
Date Received: 03/23/13 10:05

Lab Sample ID: 440-41677-8
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0020		mg/Kg			03/29/13 17:13	1
Isopropyl Ether (DIPE)	ND		0.0050		mg/Kg			03/29/13 17:13	1
Ethanol	ND		0.30		mg/Kg			03/29/13 17:13	1
Ethyl-t-butyl ether (ETBE)	ND		0.0050		mg/Kg			03/29/13 17:13	1
Ethylbenzene	ND		0.0020		mg/Kg			03/29/13 17:13	1
m,p-Xylene	ND		0.0020		mg/Kg			03/29/13 17:13	1
Methyl-t-Butyl Ether (MTBE)	ND		0.0050		mg/Kg			03/29/13 17:13	1
o-Xylene	ND		0.0020		mg/Kg			03/29/13 17:13	1
Tert-amyl-methyl ether (TAME)	ND		0.0050		mg/Kg			03/29/13 17:13	1
tert-Butyl alcohol (TBA)	ND		0.10		mg/Kg			03/29/13 17:13	1
Toluene	ND		0.0020		mg/Kg			03/29/13 17:13	1
1,2-Dibromoethane (EDB)	ND		0.0020		mg/Kg			03/29/13 17:13	1
Xylenes, Total	ND		0.0040		mg/Kg			03/29/13 17:13	1
1,2-Dichloroethane	ND		0.0020		mg/Kg			03/29/13 17:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*109*		*80 - 120*		*03/29/13 17:13*	*1*
4-Bromofluorobenzene (Surr)	*107*		*80 - 120*		*03/29/13 17:13*	*1*
Dibromofluoromethane (Surr)	*102*		*80 - 125*		*03/29/13 17:13*	*1*

Method: 8015B - Gasoline Range Organics - (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		0.38		mg/Kg			04/03/13 00:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*65 - 140*		*04/03/13 00:04*	*1*

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 0498, Livermore

TestAmerica Job ID: 440-41677-1

Client Sample ID: SB-15-38'
Date Collected: 03/21/13 17:50
Date Received: 03/23/13 10:05

Lab Sample ID: 440-41677-9
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	**4.8**		1.0		mg/Kg		03/26/13 14:42	03/29/13 11:41	1000
Isopropyl Ether (DIPE)	ND		2.5		mg/Kg		03/26/13 14:42	03/29/13 11:41	1000
Ethanol	ND		150		mg/Kg		03/26/13 14:42	03/29/13 11:41	1000
Ethyl-t-butyl ether (ETBE)	ND		2.5		mg/Kg		03/26/13 14:42	03/29/13 11:41	1000
Ethylbenzene	**35**		1.0		mg/Kg		03/26/13 14:42	03/29/13 11:41	1000
m,p-Xylene	**160**		1.0		mg/Kg		03/26/13 14:42	03/29/13 11:41	1000
Methyl-t-Butyl Ether (MTBE)	ND		2.5		mg/Kg		03/26/13 14:42	03/29/13 11:41	1000
o-Xylene	**69**		1.0		mg/Kg		03/26/13 14:42	03/29/13 11:41	1000
Tert-amyl-methyl ether (TAME)	ND		2.5		mg/Kg		03/26/13 14:42	03/29/13 11:41	1000
tert-Butyl alcohol (TBA)	ND		50		mg/Kg		03/26/13 14:42	03/29/13 11:41	1000
Toluene	**53**		1.0		mg/Kg		03/26/13 14:42	03/29/13 11:41	1000
1,2-Dibromoethane (EDB)	ND		1.0		mg/Kg		03/26/13 14:42	03/29/13 11:41	1000
Xylenes, Total	**230**		2.0		mg/Kg		03/26/13 14:42	03/29/13 11:41	1000
1,2-Dichloroethane	ND		1.0		mg/Kg		03/26/13 14:42	03/29/13 11:41	1000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*103*		*60 - 140*	*03/26/13 14:42*	*03/29/13 11:41*	*1000*
4-Bromofluorobenzene (Surr)	*101*		*65 - 140*	*03/26/13 14:42*	*03/29/13 11:41*	*1000*
Dibromofluoromethane (Surr)	*98*		*55 - 140*	*03/26/13 14:42*	*03/29/13 11:41*	*1000*

Method: 8015B - Gasoline Range Organics - (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	**1500**		800		mg/Kg		03/26/13 14:42	04/04/13 13:36	2000

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*71*		*65 - 140*	*03/26/13 14:42*	*04/04/13 13:36*	*2000*

Client Sample ID: SB-9-20'
Date Collected: 03/22/13 10:25
Date Received: 03/23/13 10:05

Lab Sample ID: 440-41677-10
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0020		mg/Kg			03/29/13 17:43	1
Isopropyl Ether (DIPE)	ND		0.0049		mg/Kg			03/29/13 17:43	1
Ethanol	ND		0.30		mg/Kg			03/29/13 17:43	1
Ethyl-t-butyl ether (ETBE)	ND		0.0049		mg/Kg			03/29/13 17:43	1
Ethylbenzene	ND		0.0020		mg/Kg			03/29/13 17:43	1
m,p-Xylene	ND		0.0020		mg/Kg			03/29/13 17:43	1
Methyl-t-Butyl Ether (MTBE)	ND		0.0049		mg/Kg			03/29/13 17:43	1
o-Xylene	ND		0.0020		mg/Kg			03/29/13 17:43	1
Tert-amyl-methyl ether (TAME)	ND		0.0049		mg/Kg			03/29/13 17:43	1
tert-Butyl alcohol (TBA)	ND		0.099		mg/Kg			03/29/13 17:43	1
Toluene	ND		0.0020		mg/Kg			03/29/13 17:43	1
1,2-Dibromoethane (EDB)	ND		0.0020		mg/Kg			03/29/13 17:43	1
Xylenes, Total	ND		0.0040		mg/Kg			03/29/13 17:43	1
1,2-Dichloroethane	ND		0.0020		mg/Kg			03/29/13 17:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*108*		*80 - 120*		*03/29/13 17:43*	*1*
4-Bromofluorobenzene (Surr)	*107*		*80 - 120*		*03/29/13 17:43*	*1*
Dibromofluoromethane (Surr)	*109*		*80 - 125*		*03/29/13 17:43*	*1*

Method: 8015B - Gasoline Range Organics - (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		0.38		mg/Kg			04/03/13 00:30	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*91*		*65 - 140*		*04/03/13 00:30*	*1*

Client Sample ID: SB-9-37'
Date Collected: 03/22/13 10:50
Date Received: 03/23/13 10:05

Lab Sample ID: 440-41677-11
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0020		mg/Kg			03/29/13 18:14	1
Isopropyl Ether (DIPE)	ND		0.0049		mg/Kg			03/29/13 18:14	1
Ethanol	ND		0.29		mg/Kg			03/29/13 18:14	1
Ethyl-t-butyl ether (ETBE)	ND		0.0049		mg/Kg			03/29/13 18:14	1
Ethylbenzene	ND		0.0020		mg/Kg			03/29/13 18:14	1
m,p-Xylene	ND		0.0020		mg/Kg			03/29/13 18:14	1
Methyl-t-Butyl Ether (MTBE)	ND		0.0049		mg/Kg			03/29/13 18:14	1
o-Xylene	ND		0.0020		mg/Kg			03/29/13 18:14	1
Tert-amyl-methyl ether (TAME)	ND		0.0049		mg/Kg			03/29/13 18:14	1
tert-Butyl alcohol (TBA)	ND		0.098		mg/Kg			03/29/13 18:14	1
Toluene	ND		0.0020		mg/Kg			03/29/13 18:14	1
1,2-Dibromoethane (EDB)	ND		0.0020		mg/Kg			03/29/13 18:14	1
Xylenes, Total	ND		0.0039		mg/Kg			03/29/13 18:14	1
1,2-Dichloroethane	ND		0.0020		mg/Kg			03/29/13 18:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*108*		*80 - 120*		*03/29/13 18:14*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*03/29/13 18:14*	*1*
Dibromofluoromethane (Surr)	*103*		*80 - 125*		*03/29/13 18:14*	*1*

Method: 8015B - Gasoline Range Organics - (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		0.39		mg/Kg			04/03/13 00:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*65 - 140*		*04/03/13 00:56*	*1*

Client Sample ID: SB-14-18'
Date Collected: 03/22/13 14:30
Date Received: 03/23/13 10:05

Lab Sample ID: 440-41677-12
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0020		mg/Kg			03/29/13 18:44	1
Isopropyl Ether (DIPE)	ND		0.0050		mg/Kg			03/29/13 18:44	1
Ethanol	ND		0.30		mg/Kg			03/29/13 18:44	1
Ethyl-t-butyl ether (ETBE)	ND		0.0050		mg/Kg			03/29/13 18:44	1
Ethylbenzene	ND		0.0020		mg/Kg			03/29/13 18:44	1
m,p-Xylene	ND		0.0020		mg/Kg			03/29/13 18:44	1
Methyl-t-Butyl Ether (MTBE)	ND		0.0050		mg/Kg			03/29/13 18:44	1
o-Xylene	ND		0.0020		mg/Kg			03/29/13 18:44	1
Tert-amyl-methyl ether (TAME)	ND		0.0050		mg/Kg			03/29/13 18:44	1
tert-Butyl alcohol (TBA)	ND		0.10		mg/Kg			03/29/13 18:44	1
Toluene	ND		0.0020		mg/Kg			03/29/13 18:44	1
1,2-Dibromoethane (EDB)	ND		0.0020		mg/Kg			03/29/13 18:44	1
Xylenes, Total	ND		0.0040		mg/Kg			03/29/13 18:44	1
1,2-Dichloroethane	ND		0.0020		mg/Kg			03/29/13 18:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*108*		*80 - 120*		*03/29/13 18:44*	*1*
4-Bromofluorobenzene (Surr)	*101*		*80 - 120*		*03/29/13 18:44*	*1*
Dibromofluoromethane (Surr)	*106*		*80 - 125*		*03/29/13 18:44*	*1*

Method: 8015B - Gasoline Range Organics - (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		0.38		mg/Kg			04/04/13 04:12	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*80*		*65 - 140*		*04/04/13 04:12*	*1*

Client Sample ID: SB-14-37'
Date Collected: 03/22/13 14:45
Date Received: 03/23/13 10:05

Lab Sample ID: 440-41677-13
Matrix: Solid

Method: 8260B - Volatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0020		mg/Kg			03/29/13 19:15	1
Isopropyl Ether (DIPE)	ND		0.0049		mg/Kg			03/29/13 19:15	1
Ethanol	ND		0.29		mg/Kg			03/29/13 19:15	1
Ethyl-t-butyl ether (ETBE)	ND		0.0049		mg/Kg			03/29/13 19:15	1
Ethylbenzene	ND		0.0020		mg/Kg			03/29/13 19:15	1
m,p-Xylene	ND		0.0020		mg/Kg			03/29/13 19:15	1
Methyl-t-Butyl Ether (MTBE)	ND		0.0049		mg/Kg			03/29/13 19:15	1
o-Xylene	ND		0.0020		mg/Kg			03/29/13 19:15	1
Tert-amyl-methyl ether (TAME)	ND		0.0049		mg/Kg			03/29/13 19:15	1
tert-Butyl alcohol (TBA)	ND		0.098		mg/Kg			03/29/13 19:15	1
Toluene	ND		0.0020		mg/Kg			03/29/13 19:15	1
1,2-Dibromoethane (EDB)	ND		0.0020		mg/Kg			03/29/13 19:15	1
Xylenes, Total	ND		0.0039		mg/Kg			03/29/13 19:15	1
1,2-Dichloroethane	ND		0.0020		mg/Kg			03/29/13 19:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*108*		*80 - 120*		*03/29/13 19:15*	*1*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*		*03/29/13 19:15*	*1*
Dibromofluoromethane (Surr)	*108*		*80 - 125*		*03/29/13 19:15*	*1*

Method: 8015B - Gasoline Range Organics - (GC)

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		0.38		mg/Kg			04/03/13 01:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*86*		*65 - 140*		*04/03/13 01:49*	*1*

Method Summary

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 0498, Livermore

TestAmerica Job ID: 440-41677-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL IRV
8260B/5030B	Volatile Organic Compounds (GC/MS)	SW846	TAL IRV
8015B	Gasoline Range Organics - (GC)	SW846	TAL IRV
8015B/5030B	Gasoline Range Organics (GC)	SW846	TAL IRV
Bulk and Grain Density	Bulk Density	NONE	PTSL
FOC	Fractional Organic Carbon	NONE	PTSL
Grain Size Distribution	ASTM 422 Grain Size	NONE	PTSL
Moisture Content	ASTM D2216 Moisture Content	NONE	PTSL
TOC	Total Organic Carbon	NONE	PTSL
Total Porosity	ASTM D-50-84 Porosity	NONE	PTSL
Volumetric Moisture & Air	General Sub Contract Method	NONE	PTSL

Protocol References:

NONE = NONE

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

Laboratory References:

PTSL = PTS Laboratories, Inc, 8100 Secura Way, Santa Fe Springs, CA 90670

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Client Sample ID: SB-16 — **Lab Sample ID: 440-41677-1**
Date Collected: 03/21/13 14:15 — **Matrix: Water**
Date Received: 03/23/13 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/5030B		50	10 mL	10 mL	95277	03/31/13 16:22	NS	TAL IRV
Total/NA	Analysis	8015B/5030B		200	10 mL	10 mL	95322	04/02/13 12:05	SC	TAL IRV

Client Sample ID: SB-15 — **Lab Sample ID: 440-41677-2**
Date Collected: 03/21/13 18:05 — **Matrix: Water**
Date Received: 03/23/13 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/5030B		2	10 mL	10 mL	95305	04/01/13 12:54	AL	TAL IRV
Total/NA	Analysis	8015B/5030B		100	10 mL	10 mL	95322	04/02/13 12:33	SC	TAL IRV

Client Sample ID: SB-14 — **Lab Sample ID: 440-41677-3**
Date Collected: 03/22/13 15:00 — **Matrix: Water**
Date Received: 03/23/13 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/5030B		1	10 mL	10 mL	95277	03/31/13 17:17	NS	TAL IRV
Total/NA	Analysis	8015B/5030B		1	10 mL	10 mL	95322	04/01/13 15:36	SC	TAL IRV

Client Sample ID: SB-9 — **Lab Sample ID: 440-41677-4**
Date Collected: 03/22/13 11:10 — **Matrix: Water**
Date Received: 03/23/13 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/5030B		1	10 mL	10 mL	95277	03/31/13 17:45	NS	TAL IRV
Total/NA	Analysis	8015B/5030B		1	10 mL	10 mL	95322	04/01/13 16:04	SC	TAL IRV

Client Sample ID: SB-16-13' — **Lab Sample ID: 440-41677-6**
Date Collected: 03/21/13 13:45 — **Matrix: Solid**
Date Received: 03/23/13 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5.06 g	10 mL	95010	03/29/13 16:12	SS	TAL IRV
Total/NA	Analysis	8015B		1	5.02 g	10 mL	96038	04/04/13 03:45	TL	TAL IRV

Client Sample ID: SB-16-26' — **Lab Sample ID: 440-41677-7**
Date Collected: 03/21/13 13:50 — **Matrix: Solid**
Date Received: 03/23/13 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5.02 g	10 mL	95010	03/29/13 16:42	SS	TAL IRV

Client Sample ID: SB-16-26' — **Lab Sample ID: 440-41677-7**
Date Collected: 03/21/13 13:50 — **Matrix: Solid**
Date Received: 03/23/13 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8015B		1	5.6 g	10 mL	95671	04/02/13 23:38	TL	TAL IRV

Client Sample ID: SB-15-24' — **Lab Sample ID: 440-41677-8**
Date Collected: 03/21/13 17:35 — **Matrix: Solid**
Date Received: 03/23/13 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 g	10 mL	95010	03/29/13 17:13	SS	TAL IRV
Total/NA	Analysis	8015B		1	5.25 g	10 mL	95671	04/03/13 00:04	TL	TAL IRV

Client Sample ID: SB-15-38' — **Lab Sample ID: 440-41677-9**
Date Collected: 03/21/13 17:50 — **Matrix: Solid**
Date Received: 03/23/13 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	5030B			10.00 g	10 mL	94314	03/26/13 14:42	HR	TAL IRV
Total/NA	Analysis	8260B		1000			95014	03/29/13 11:41	AL	TAL IRV
Total/NA	Prep	5030B			10.00 g	10 mL	94314	03/26/13 14:42	HR	TAL IRV
Total/NA	Analysis	8015B		2000			96156	04/04/13 13:36	SC	TAL IRV

Client Sample ID: SB-9-20' — **Lab Sample ID: 440-41677-10**
Date Collected: 03/22/13 10:25 — **Matrix: Solid**
Date Received: 03/23/13 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5.06 g	10 mL	95010	03/29/13 17:43	SS	TAL IRV
Total/NA	Analysis	8015B		1	5.32 g	10 mL	95671	04/03/13 00:30	TL	TAL IRV

Client Sample ID: SB-9-37' — **Lab Sample ID: 440-41677-11**
Date Collected: 03/22/13 10:50 — **Matrix: Solid**
Date Received: 03/23/13 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5.09 g	10 mL	95010	03/29/13 18:14	SS	TAL IRV
Total/NA	Analysis	8015B		1	5.09 g	10 mL	95671	04/03/13 00:56	TL	TAL IRV

Client Sample ID: SB-14-18' — **Lab Sample ID: 440-41677-12**
Date Collected: 03/22/13 14:30 — **Matrix: Solid**
Date Received: 03/23/13 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5 g	10 mL	95010	03/29/13 18:44	SS	TAL IRV

Lab Chronicle

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 0498, Livermore

TestAmerica Job ID: 440-41677-1

Client Sample ID: SB-14-18'

Lab Sample ID: 440-41677-12

Date Collected: 03/22/13 14:30

Matrix: Solid

Date Received: 03/23/13 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8015B		1	5.33 g	10 mL	96038	04/04/13 04:12	TL	TAL IRV

Client Sample ID: SB-14-37'

Lab Sample ID: 440-41677-13

Date Collected: 03/22/13 14:45

Matrix: Solid

Date Received: 03/23/13 10:05

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	5.09 g	10 mL	95010	03/29/13 19:15	SS	TAL IRV
Total/NA	Analysis	8015B		1	5.23 g	10 mL	95671	04/03/13 01:49	TL	TAL IRV

Laboratory References:

PTSL = PTS Laboratories, Inc, 8100 Secura Way, Santa Fe Springs, CA 90670

TAL IRV = TestAmerica Irvine, 17461 Derian Ave, Suite 100, Irvine, CA 92614-5817, TEL (949)261-1022

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 440-95010/4
Matrix: Solid
Analysis Batch: 95010

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.0020		mg/Kg			03/29/13 09:21	1
Isopropyl Ether (DIPE)	ND		0.0050		mg/Kg			03/29/13 09:21	1
Ethanol	ND		0.30		mg/Kg			03/29/13 09:21	1
Ethyl-t-butyl ether (ETBE)	ND		0.0050		mg/Kg			03/29/13 09:21	1
Ethylbenzene	ND		0.0020		mg/Kg			03/29/13 09:21	1
m,p-Xylene	ND		0.0020		mg/Kg			03/29/13 09:21	1
Methyl-t-Butyl Ether (MTBE)	ND		0.0050		mg/Kg			03/29/13 09:21	1
o-Xylene	ND		0.0020		mg/Kg			03/29/13 09:21	1
Tert-amyl-methyl ether (TAME)	ND		0.0050		mg/Kg			03/29/13 09:21	1
tert-Butyl alcohol (TBA)	ND		0.10		mg/Kg			03/29/13 09:21	1
Toluene	ND		0.0020		mg/Kg			03/29/13 09:21	1
1,2-Dibromoethane (EDB)	ND		0.0020		mg/Kg			03/29/13 09:21	1
Xylenes, Total	ND		0.0040		mg/Kg			03/29/13 09:21	1
1,2-Dichloroethane	ND		0.0020		mg/Kg			03/29/13 09:21	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*108*		*80 - 120*		*03/29/13 09:21*	*1*
4-Bromofluorobenzene (Surr)	*108*		*80 - 120*		*03/29/13 09:21*	*1*
Dibromofluoromethane (Surr)	*106*		*80 - 125*		*03/29/13 09:21*	*1*

Lab Sample ID: LCS 440-95010/5
Matrix: Solid
Analysis Batch: 95010

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	0.0500	0.0469		mg/Kg		94	65 - 120
Isopropyl Ether (DIPE)	0.0500	0.0552		mg/Kg		110	60 - 140
Ethanol	0.500	0.519		mg/Kg		104	35 - 160
Ethyl-t-butyl ether (ETBE)	0.0500	0.0553		mg/Kg		111	60 - 140
Ethylbenzene	0.0500	0.0495		mg/Kg		99	70 - 125
m,p-Xylene	0.100	0.102		mg/Kg		102	70 - 125
Methyl-t-Butyl Ether (MTBE)	0.0500	0.0565		mg/Kg		113	60 - 140
o-Xylene	0.0500	0.0528		mg/Kg		106	70 - 125
Tert-amyl-methyl ether (TAME)	0.0500	0.0577		mg/Kg		115	60 - 145
tert-Butyl alcohol (TBA)	0.250	0.252		mg/Kg		101	70 - 135
Toluene	0.0500	0.0493		mg/Kg		99	70 - 125
1,2-Dibromoethane (EDB)	0.0500	0.0580		mg/Kg		116	70 - 130
1,2-Dichloroethane	0.0500	0.0521		mg/Kg		104	60 - 140

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*106*		*80 - 120*
4-Bromofluorobenzene (Surr)	*108*		*80 - 120*
Dibromofluoromethane (Surr)	*105*		*80 - 125*

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

Lab Sample ID: 440-41650-B-6 MS
Matrix: Solid
Analysis Batch: 95010

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	ND		0.0495	0.0486		mg/Kg		98	65 - 130
Isopropyl Ether (DIPE)	ND		0.0495	0.0529		mg/Kg		107	60 - 150
Ethanol	ND		0.495	0.452		mg/Kg		91	30 - 165
Ethyl-t-butyl ether (ETBE)	ND		0.0495	0.0514		mg/Kg		104	60 - 145
Ethylbenzene	ND		0.0495	0.0525		mg/Kg		106	70 - 135
m,p-Xylene	ND		0.0990	0.108		mg/Kg		109	70 - 130
Methyl-t-Butyl Ether (MTBE)	ND		0.0495	0.0528		mg/Kg		107	55 - 155
o-Xylene	ND		0.0495	0.0530		mg/Kg		107	65 - 130
Tert-amyl-methyl ether (TAME)	ND		0.0495	0.0548		mg/Kg		111	60 - 150
tert-Butyl alcohol (TBA)	ND		0.248	0.233		mg/Kg		94	65 - 145
Toluene	ND		0.0495	0.0520		mg/Kg		105	70 - 130
1,2-Dibromoethane (EDB)	ND		0.0495	0.0563		mg/Kg		114	65 - 140
1,2-Dichloroethane	ND		0.0495	0.0510		mg/Kg		103	60 - 150

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Toluene-d8 (Surr)	*108*		*80 - 120*
4-Bromofluorobenzene (Surr)	*109*		*80 - 120*
Dibromofluoromethane (Surr)	*101*		*80 - 125*

Lab Sample ID: 440-41650-B-6 MSD
Matrix: Solid
Analysis Batch: 95010

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzene	ND		0.0496	0.0482		mg/Kg		97	65 - 130	1	20
Isopropyl Ether (DIPE)	ND		0.0496	0.0528		mg/Kg		106	60 - 150	0	25
Ethanol	ND		0.496	0.521		mg/Kg		105	30 - 165	14	40
Ethyl-t-butyl ether (ETBE)	ND		0.0496	0.0522		mg/Kg		105	60 - 145	1	30
Ethylbenzene	ND		0.0496	0.0519		mg/Kg		105	70 - 135	1	25
m,p-Xylene	ND		0.0992	0.106		mg/Kg		107	70 - 130	2	25
Methyl-t-Butyl Ether (MTBE)	ND		0.0496	0.0526		mg/Kg		106	55 - 155	0	35
o-Xylene	ND		0.0496	0.0538		mg/Kg		109	65 - 130	2	25
Tert-amyl-methyl ether (TAME)	ND		0.0496	0.0546		mg/Kg		110	60 - 150	0	25
tert-Butyl alcohol (TBA)	ND		0.248	0.239		mg/Kg		96	65 - 145	2	30
Toluene	ND		0.0496	0.0517		mg/Kg		104	70 - 130	0	20
1,2-Dibromoethane (EDB)	ND		0.0496	0.0557		mg/Kg		112	65 - 140	1	25
1,2-Dichloroethane	ND		0.0496	0.0508		mg/Kg		102	60 - 150	0	25

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*109*		*80 - 120*
4-Bromofluorobenzene (Surr)	*108*		*80 - 120*
Dibromofluoromethane (Surr)	*100*		*80 - 125*

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

Lab Sample ID: MB 440-95014/4
Matrix: Solid
Analysis Batch: 95014

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.10		mg/Kg			03/29/13 09:13	100
Isopropyl Ether (DIPE)	ND		0.25		mg/Kg			03/29/13 09:13	100
Ethanol	ND		15		mg/Kg			03/29/13 09:13	100
Ethyl-t-butyl ether (ETBE)	ND		0.25		mg/Kg			03/29/13 09:13	100
Ethylbenzene	ND		0.10		mg/Kg			03/29/13 09:13	100
m,p-Xylene	ND		0.10		mg/Kg			03/29/13 09:13	100
Methyl-t-Butyl Ether (MTBE)	ND		0.25		mg/Kg			03/29/13 09:13	100
o-Xylene	ND		0.10		mg/Kg			03/29/13 09:13	100
Tert-amyl-methyl ether (TAME)	ND		0.25		mg/Kg			03/29/13 09:13	100
tert-Butyl alcohol (TBA)	ND		5.0		mg/Kg			03/29/13 09:13	100
Toluene	ND		0.10		mg/Kg			03/29/13 09:13	100
1,2-Dibromoethane (EDB)	ND		0.10		mg/Kg			03/29/13 09:13	100
Xylenes, Total	ND		0.20		mg/Kg			03/29/13 09:13	100
1,2-Dichloroethane	ND		0.10		mg/Kg			03/29/13 09:13	100

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*107*		*60 - 140*		*03/29/13 09:13*	*100*
4-Bromofluorobenzene (Surr)	*107*		*65 - 140*		*03/29/13 09:13*	*100*
Dibromofluoromethane (Surr)	*107*		*55 - 140*		*03/29/13 09:13*	*100*

Lab Sample ID: LCS 440-95014/14
Matrix: Solid
Analysis Batch: 95014

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Benzene			2.50	2.37		mg/Kg		95	65 - 120		
Isopropyl Ether (DIPE)			2.50	2.33		mg/Kg		93	60 - 140		
Ethanol			25.0	26.2		mg/Kg		105	35 - 160		
Ethyl-t-butyl ether (ETBE)			2.50	2.29		mg/Kg		92	60 - 140		
Ethylbenzene			2.50	2.39		mg/Kg		95	80 - 120		
m,p-Xylene			5.00	4.90		mg/Kg		98	70 - 125		
Methyl-t-Butyl Ether (MTBE)			2.50	2.58		mg/Kg		103	55 - 145		
o-Xylene			2.50	2.44		mg/Kg		97	70 - 125		
Tert-amyl-methyl ether (TAME)			2.50	2.61		mg/Kg		105	60 - 145		
tert-Butyl alcohol (TBA)			12.5	11.6		mg/Kg		93	65 - 140		
Toluene			2.50	2.45		mg/Kg		98	80 - 120		
1,2-Dibromoethane (EDB)			2.50	2.74		mg/Kg		110	70 - 130		
1,2-Dichloroethane			2.50	2.67		mg/Kg		107	60 - 145		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Toluene-d8 (Surr)	*100*		*60 - 140*
4-Bromofluorobenzene (Surr)	*93*		*65 - 140*
Dibromofluoromethane (Surr)	*97*		*55 - 140*

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

Lab Sample ID: LCSD 440-95014/15
Matrix: Solid
Analysis Batch: 95014

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	2.50	2.34		mg/Kg		94	65 - 120	1	20
Isopropyl Ether (DIPE)	2.50	2.39		mg/Kg		96	60 - 140	3	20
Ethanol	25.0	24.7		mg/Kg		99	35 - 160	6	30
Ethyl-t-butyl ether (ETBE)	2.50	2.38		mg/Kg		95	60 - 140	4	20
Ethylbenzene	2.50	2.49		mg/Kg		100	80 - 120	4	20
m,p-Xylene	5.00	5.16		mg/Kg		103	70 - 125	5	20
Methyl-t-Butyl Ether (MTBE)	2.50	2.69		mg/Kg		108	55 - 145	4	25
o-Xylene	2.50	2.58		mg/Kg		103	70 - 125	6	20
Tert-amyl-methyl ether (TAME)	2.50	2.70		mg/Kg		108	60 - 145	3	25
tert-Butyl alcohol (TBA)	12.5	10.9		mg/Kg		87	65 - 140	6	20
Toluene	2.50	2.42		mg/Kg		97	80 - 120	1	20
1,2-Dibromoethane (EDB)	2.50	2.93		mg/Kg		117	70 - 130	7	20
1,2-Dichloroethane	2.50	2.73		mg/Kg		109	60 - 145	2	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Toluene-d8 (Surr)	*101*		*60 - 140*
4-Bromofluorobenzene (Surr)	*97*		*65 - 140*
Dibromofluoromethane (Surr)	*98*		*55 - 140*

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 440-95277/5
Matrix: Water
Analysis Batch: 95277

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

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.50	ug/L			03/31/13 11:32	1
1,2-Dichloroethane	ND		0.50	ug/L			03/31/13 11:32	1
Benzene	ND		0.50	ug/L			03/31/13 11:32	1
Ethanol	ND		150	ug/L			03/31/13 11:32	1
Ethylbenzene	ND		0.50	ug/L			03/31/13 11:32	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	ug/L			03/31/13 11:32	1
Isopropyl Ether (DIPE)	ND		0.50	ug/L			03/31/13 11:32	1
m,p-Xylene	ND		1.0	ug/L			03/31/13 11:32	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50	ug/L			03/31/13 11:32	1
o-Xylene	ND		0.50	ug/L			03/31/13 11:32	1
Tert-amyl-methyl ether (TAME)	ND		0.50	ug/L			03/31/13 11:32	1
tert-Butyl alcohol (TBA)	ND		10	ug/L			03/31/13 11:32	1
Toluene	ND		0.50	ug/L			03/31/13 11:32	1
Xylenes, Total	ND		1.0	ug/L			03/31/13 11:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*80 - 120*		*03/31/13 11:32*	*1*
Dibromofluoromethane (Surr)	*102*		*80 - 120*		*03/31/13 11:32*	*1*
Toluene-d8 (Surr)	*101*		*80 - 120*		*03/31/13 11:32*	*1*

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 440-95277/6
Matrix: Water
Analysis Batch: 95277

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane (EDB)	25.0	24.4		ug/L		98	75 - 125
1,2-Dichloroethane	25.0	19.8		ug/L		79	60 - 140
Benzene	25.0	19.8		ug/L		79	70 - 120
Ethanol	250	310		ug/L		124	40 - 155
Ethylbenzene	25.0	25.0		ug/L		100	75 - 125
Ethyl-t-butyl ether (ETBE)	25.0	20.4		ug/L		82	65 - 135
Isopropyl Ether (DIPE)	25.0	21.8		ug/L		87	60 - 135
m,p-Xylene	50.0	51.4		ug/L		103	75 - 125
Methyl-t-Butyl Ether (MTBE)	25.0	18.7		ug/L		75	60 - 135
o-Xylene	25.0	25.9		ug/L		103	75 - 125
Tert-amyl-methyl ether (TAME)	25.0	18.2		ug/L		73	60 - 135
tert-Butyl alcohol (TBA)	125	129		ug/L		104	70 - 135
Toluene	25.0	21.6		ug/L		86	70 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*
Dibromofluoromethane (Surr)	*101*		*80 - 120*
Toluene-d8 (Surr)	*101*		*80 - 120*

Lab Sample ID: 440-41869-C-1 MS
Matrix: Water
Analysis Batch: 95277

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane (EDB)	ND		25.0	25.7		ug/L		103	70 - 130
1,2-Dichloroethane	ND		25.0	22.5		ug/L		90	60 - 140
Benzene	ND		25.0	20.3		ug/L		81	65 - 125
Ethanol	ND		250	294		ug/L		118	40 - 155
Ethylbenzene	ND		25.0	24.2		ug/L		97	65 - 130
Ethyl-t-butyl ether (ETBE)	ND		25.0	24.4		ug/L		98	60 - 135
Isopropyl Ether (DIPE)	ND		25.0	24.9		ug/L		99	60 - 140
m,p-Xylene	ND		50.0	50.4		ug/L		101	65 - 130
Methyl-t-Butyl Ether (MTBE)	2.4		25.0	24.9		ug/L		90	55 - 145
o-Xylene	ND		25.0	26.2		ug/L		105	65 - 125
Tert-amyl-methyl ether (TAME)	ND		25.0	22.1		ug/L		89	60 - 140
tert-Butyl alcohol (TBA)	ND		125	130		ug/L		104	65 - 140
Toluene	ND		25.0	22.8		ug/L		91	70 - 125

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*108*		*80 - 120*
Dibromofluoromethane (Surr)	*108*		*80 - 120*
Toluene-d8 (Surr)	*104*		*80 - 120*

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 440-41869-C-1 MSD
Matrix: Water
Analysis Batch: 95277

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dibromoethane (EDB)	ND		25.0	28.0		ug/L		112	70 - 130	9	25
1,2-Dichloroethane	ND		25.0	23.9		ug/L		96	60 - 140	6	20
Benzene	ND		25.0	20.8		ug/L		83	65 - 125	2	20
Ethanol	ND		250	294		ug/L		117	40 - 155	0	30
Ethylbenzene	ND		25.0	25.3		ug/L		101	65 - 130	4	20
Ethyl-t-butyl ether (ETBE)	ND		25.0	26.3		ug/L		105	60 - 135	7	25
Isopropyl Ether (DIPE)	ND		25.0	26.9		ug/L		108	60 - 140	8	25
m,p-Xylene	ND		50.0	52.4		ug/L		105	65 - 130	4	25
Methyl-t-Butyl Ether (MTBE)	2.4		25.0	27.6		ug/L		101	55 - 145	11	25
o-Xylene	ND		25.0	27.2		ug/L		109	65 - 125	4	20
Tert-amyl-methyl ether (TAME)	ND		25.0	23.8		ug/L		95	60 - 140	7	30
tert-Butyl alcohol (TBA)	ND		125	134		ug/L		107	65 - 140	3	25
Toluene	ND		25.0	23.3		ug/L		93	70 - 125	2	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*110*		*80 - 120*
Dibromofluoromethane (Surr)	*112*		*80 - 120*
Toluene-d8 (Surr)	*104*		*80 - 120*

Lab Sample ID: MB 440-95305/4
Matrix: Water
Analysis Batch: 95305

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dibromoethane (EDB)	ND		0.50		ug/L			04/01/13 09:17	1
1,2-Dichloroethane	ND		0.50		ug/L			04/01/13 09:17	1
Benzene	ND		0.50		ug/L			04/01/13 09:17	1
Ethanol	ND		150		ug/L			04/01/13 09:17	1
Ethylbenzene	ND		0.50		ug/L			04/01/13 09:17	1
Ethyl-t-butyl ether (ETBE)	ND		0.50		ug/L			04/01/13 09:17	1
Isopropyl Ether (DIPE)	ND		0.50		ug/L			04/01/13 09:17	1
m,p-Xylene	ND		1.0		ug/L			04/01/13 09:17	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50		ug/L			04/01/13 09:17	1
o-Xylene	ND		0.50		ug/L			04/01/13 09:17	1
Tert-amyl-methyl ether (TAME)	ND		0.50		ug/L			04/01/13 09:17	1
tert-Butyl alcohol (TBA)	ND		10		ug/L			04/01/13 09:17	1
Toluene	ND		0.50		ug/L			04/01/13 09:17	1
Xylenes, Total	ND		1.0		ug/L			04/01/13 09:17	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*110*		*80 - 120*		*04/01/13 09:17*	*1*
Dibromofluoromethane (Surr)	*110*		*80 - 120*		*04/01/13 09:17*	*1*
Toluene-d8 (Surr)	*113*		*80 - 120*		*04/01/13 09:17*	*1*

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 440-95305/5
Matrix: Water
Analysis Batch: 95305

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane (EDB)	25.0	26.4		ug/L		106	75 - 125
1,2-Dichloroethane	25.0	26.0		ug/L		104	60 - 140
Benzene	25.0	24.7		ug/L		99	70 - 120
Ethanol	250	279		ug/L		112	40 - 155
Ethylbenzene	25.0	24.6		ug/L		98	75 - 125
Ethyl-t-butyl ether (ETBE)	25.0	26.6		ug/L		106	65 - 135
Isopropyl Ether (DIPE)	25.0	28.5		ug/L		114	60 - 135
m,p-Xylene	50.0	50.8		ug/L		102	75 - 125
Methyl-t-Butyl Ether (MTBE)	25.0	27.5		ug/L		110	60 - 135
o-Xylene	25.0	26.4		ug/L		105	75 - 125
Tert-amyl-methyl ether (TAME)	25.0	27.3		ug/L		109	60 - 135
tert-Butyl alcohol (TBA)	125	123		ug/L		98	70 - 135
Toluene	25.0	26.4		ug/L		105	70 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*109*		*80 - 120*
Dibromofluoromethane (Surr)	*110*		*80 - 120*
Toluene-d8 (Surr)	*109*		*80 - 120*

Lab Sample ID: 440-41881-D-1 MS
Matrix: Water
Analysis Batch: 95305

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,2-Dibromoethane (EDB)	ND		25.0	28.4		ug/L		114	70 - 130
1,2-Dichloroethane	ND		25.0	26.6		ug/L		106	60 - 140
Benzene	ND		25.0	25.2		ug/L		101	65 - 125
Ethanol	ND		250	269		ug/L		108	40 - 155
Ethylbenzene	ND		25.0	26.1		ug/L		104	65 - 130
Ethyl-t-butyl ether (ETBE)	ND		25.0	26.1		ug/L		104	60 - 135
Isopropyl Ether (DIPE)	ND		25.0	28.1		ug/L		112	60 - 140
m,p-Xylene	ND		50.0	52.2		ug/L		104	65 - 130
Methyl-t-Butyl Ether (MTBE)	ND		25.0	27.2		ug/L		109	55 - 145
o-Xylene	ND		25.0	27.1		ug/L		108	65 - 125
Tert-amyl-methyl ether (TAME)	ND		25.0	28.0		ug/L		112	60 - 140
tert-Butyl alcohol (TBA)	ND		125	136		ug/L		109	65 - 140
Toluene	ND		25.0	27.5		ug/L		110	70 - 125

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*111*		*80 - 120*
Dibromofluoromethane (Surr)	*110*		*80 - 120*
Toluene-d8 (Surr)	*113*		*80 - 120*

Method: 8260B/5030B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 440-41881-D-1 MSD
Matrix: Water
Analysis Batch: 95305

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,2-Dibromoethane (EDB)	ND		25.0	27.7		ug/L		111	70 - 130	3	25
1,2-Dichloroethane	ND		25.0	26.4		ug/L		105	60 - 140	1	20
Benzene	ND		25.0	25.0		ug/L		100	65 - 125	1	20
Ethanol	ND		250	264		ug/L		106	40 - 155	2	30
Ethylbenzene	ND		25.0	25.1		ug/L		101	65 - 130	4	20
Ethyl-t-butyl ether (ETBE)	ND		25.0	25.7		ug/L		103	60 - 135	1	25
Isopropyl Ether (DIPE)	ND		25.0	27.8		ug/L		111	60 - 140	1	25
m,p-Xylene	ND		50.0	50.9		ug/L		102	65 - 130	3	25
Methyl-t-Butyl Ether (MTBE)	ND		25.0	27.4		ug/L		110	55 - 145	1	25
o-Xylene	ND		25.0	26.6		ug/L		106	65 - 125	2	20
Tert-amyl-methyl ether (TAME)	ND		25.0	28.0		ug/L		112	60 - 140	0	30
tert-Butyl alcohol (TBA)	ND		125	132		ug/L		106	65 - 140	3	25
Toluene	ND		25.0	26.7		ug/L		107	70 - 125	3	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*
Dibromofluoromethane (Surr)	*109*		*80 - 120*
Toluene-d8 (Surr)	*110*		*80 - 120*

Method: 8015B - Gasoline Range Organics - (GC)

Lab Sample ID: MB 440-95671/4
Matrix: Solid
Analysis Batch: 95671

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		0.40		mg/Kg			04/02/13 17:52	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*101*		*65 - 140*		*04/02/13 17:52*	*1*

Lab Sample ID: LCS 440-95671/2
Matrix: Solid
Analysis Batch: 95671

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (C4-C12)			1.60	1.69		mg/Kg		106	70 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*111*		*65 - 140*

Lab Sample ID: LCSD 440-95671/3
Matrix: Solid
Analysis Batch: 95671

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
GRO (C4-C12)			1.60	1.68		mg/Kg		105	70 - 135	1	20

Method: 8015B - Gasoline Range Organics - (GC) (Continued)

Lab Sample ID: LCSD 440-95671/3
Matrix: Solid
Analysis Batch: 95671

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

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	109		65 - 140

Lab Sample ID: 440-42079-A-1 MS
Matrix: Solid
Analysis Batch: 95671

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (C4-C12)	ND		1.43	1.35		mg/Kg		94	60 - 140		

Surrogate	MS %Recovery	MS Qualifier	Limits
4-Bromofluorobenzene (Surr)	102		65 - 140

Lab Sample ID: 440-42079-A-1 MSD
Matrix: Solid
Analysis Batch: 95671

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (C4-C12)	ND		1.49	1.36		mg/Kg		91	60 - 140	1	30

Surrogate	MSD %Recovery	MSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	101		65 - 140

Lab Sample ID: MB 440-96038/28
Matrix: Solid
Analysis Batch: 96038

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		0.40		mg/Kg			04/04/13 02:01	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	92		65 - 140		04/04/13 02:01	1

Lab Sample ID: LCS 440-96038/26
Matrix: Solid
Analysis Batch: 96038

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (C4-C12)			1.60	1.60		mg/Kg		100	70 - 135		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	101		65 - 140

Method: 8015B - Gasoline Range Organics - (GC) (Continued)

Lab Sample ID: LCSD 440-96038/27
Matrix: Solid
Analysis Batch: 96038

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
GRO (C4-C12)			1.60	1.55		mg/Kg		97	70 - 135	4	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*97*		*65 - 140*

Lab Sample ID: 440-42246-A-1 MS
Matrix: Solid
Analysis Batch: 96038

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (C4-C12)	ND		1.56	1.49		mg/Kg		95	60 - 140		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*99*		*65 - 140*

Lab Sample ID: 440-42246-A-1 MSD
Matrix: Solid
Analysis Batch: 96038

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (C4-C12)	ND		1.49	1.41		mg/Kg		95	60 - 140	5	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*102*		*65 - 140*

Lab Sample ID: MB 440-96156/58
Matrix: Solid
Analysis Batch: 96156

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		40		mg/Kg			04/04/13 12:12	100

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*130*		*65 - 140*		*04/04/13 12:12*	*100*

Lab Sample ID: LCS 440-96156/56
Matrix: Solid
Analysis Batch: 96156

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (C4-C12)			160	168		mg/Kg		105	70 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*81*		*65 - 140*

Method: 8015B - Gasoline Range Organics - (GC) (Continued)

Lab Sample ID: LCSD 440-96156/57
Matrix: Solid
Analysis Batch: 96156

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
GRO (C4-C12)			160	170		mg/Kg		106	70 - 135	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*85*		*65 - 140*

Method: 8015B/5030B - Gasoline Range Organics (GC)

Lab Sample ID: MB 440-95322/8
Matrix: Water
Analysis Batch: 95322

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

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
GRO (C6-C12)	ND		50	ug/L			04/01/13 08:14	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*125*		*65 - 140*		*04/01/13 08:14*	*1*

Lab Sample ID: LCS 440-95322/7
Matrix: Water
Analysis Batch: 95322

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (C4-C12)			800	895		ug/L		112	80 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*91*		*65 - 140*

Lab Sample ID: 440-41567-B-18 MS
Matrix: Water
Analysis Batch: 95322

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
GRO (C4-C12)	4100		8000	12900		ug/L		109	65 - 140		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*120*		*65 - 140*

Lab Sample ID: 440-41567-B-18 MSD
Matrix: Water
Analysis Batch: 95322

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
GRO (C4-C12)	4100		8000	12900		ug/L		109	65 - 140	0	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*99*		*65 - 140*

GC/MS VOA

Prep Batch: 94314

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-41677-9	SB-15-38'	Total/NA	Solid	5030B	

Analysis Batch: 95010

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-41650-B-6 MS	Matrix Spike	Total/NA	Solid	8260B	
440-41650-B-6 MSD	Matrix Spike Duplicate	Total/NA	Solid	8260B	
440-41677-6	SB-16-13'	Total/NA	Solid	8260B	
440-41677-7	SB-16-26'	Total/NA	Solid	8260B	
440-41677-8	SB-15-24'	Total/NA	Solid	8260B	
440-41677-10	SB-9-20'	Total/NA	Solid	8260B	
440-41677-11	SB-9-37'	Total/NA	Solid	8260B	
440-41677-12	SB-14-18'	Total/NA	Solid	8260B	
440-41677-13	SB-14-37'	Total/NA	Solid	8260B	
LCS 440-95010/5	Lab Control Sample	Total/NA	Solid	8260B	
MB 440-95010/4	Method Blank	Total/NA	Solid	8260B	

Analysis Batch: 95014

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-41677-9	SB-15-38'	Total/NA	Solid	8260B	94314
LCS 440-95014/14	Lab Control Sample	Total/NA	Solid	8260B	
LCSD 440-95014/15	Lab Control Sample Dup	Total/NA	Solid	8260B	
MB 440-95014/4	Method Blank	Total/NA	Solid	8260B	

Analysis Batch: 95277

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-41677-1	SB-16	Total/NA	Water	8260B/5030B	
440-41677-3	SB-14	Total/NA	Water	8260B/5030B	
440-41677-4	SB-9	Total/NA	Water	8260B/5030B	
440-41869-C-1 MS	Matrix Spike	Total/NA	Water	8260B/5030B	
440-41869-C-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B/5030B	
LCS 440-95277/6	Lab Control Sample	Total/NA	Water	8260B/5030B	
MB 440-95277/5	Method Blank	Total/NA	Water	8260B/5030B	

Analysis Batch: 95305

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-41677-2	SB-15	Total/NA	Water	8260B/5030B	
440-41881-D-1 MS	Matrix Spike	Total/NA	Water	8260B/5030B	
440-41881-D-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B/5030B	
LCS 440-95305/5	Lab Control Sample	Total/NA	Water	8260B/5030B	
MB 440-95305/4	Method Blank	Total/NA	Water	8260B/5030B	

GC VOA

Prep Batch: 94314

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-41677-9	SB-15-38'	Total/NA	Solid	5030B	

Analysis Batch: 95322

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-41567-B-18 MS	Matrix Spike	Total/NA	Water	8015B/5030B	

GC VOA (Continued)

Analysis Batch: 95322 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-41567-B-18 MSD	Matrix Spike Duplicate	Total/NA	Water	8015B/5030B	
440-41677-1	SB-16	Total/NA	Water	8015B/5030B	
440-41677-2	SB-15	Total/NA	Water	8015B/5030B	
440-41677-3	SB-14	Total/NA	Water	8015B/5030B	
440-41677-4	SB-9	Total/NA	Water	8015B/5030B	
LCS 440-95322/7	Lab Control Sample	Total/NA	Water	8015B/5030B	
MB 440-95322/8	Method Blank	Total/NA	Water	8015B/5030B	

Analysis Batch: 95671

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-41677-7	SB-16-26'	Total/NA	Solid	8015B	
440-41677-8	SB-15-24'	Total/NA	Solid	8015B	
440-41677-10	SB-9-20'	Total/NA	Solid	8015B	
440-41677-11	SB-9-37'	Total/NA	Solid	8015B	
440-41677-13	SB-14-37'	Total/NA	Solid	8015B	
440-42079-A-1 MS	Matrix Spike	Total/NA	Solid	8015B	
440-42079-A-1 MSD	Matrix Spike Duplicate	Total/NA	Solid	8015B	
LCS 440-95671/2	Lab Control Sample	Total/NA	Solid	8015B	
LCSD 440-95671/3	Lab Control Sample Dup	Total/NA	Solid	8015B	
MB 440-95671/4	Method Blank	Total/NA	Solid	8015B	

Analysis Batch: 96038

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-41677-6	SB-16-13'	Total/NA	Solid	8015B	
440-41677-12	SB-14-18'	Total/NA	Solid	8015B	
440-42246-A-1 MS	Matrix Spike	Total/NA	Solid	8015B	
440-42246-A-1 MSD	Matrix Spike Duplicate	Total/NA	Solid	8015B	
LCS 440-96038/26	Lab Control Sample	Total/NA	Solid	8015B	
LCSD 440-96038/27	Lab Control Sample Dup	Total/NA	Solid	8015B	
MB 440-96038/28	Method Blank	Total/NA	Solid	8015B	

Analysis Batch: 96156

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-41677-9	SB-15-38'	Total/NA	Solid	8015B	94314
LCS 440-96156/56	Lab Control Sample	Total/NA	Solid	8015B	
LCSD 440-96156/57	Lab Control Sample Dup	Total/NA	Solid	8015B	
MB 440-96156/58	Method Blank	Total/NA	Solid	8015B	

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
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
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)
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)

Certification Summary

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 0498, Livermore

TestAmerica Job ID: 440-41677-1

Laboratory: TestAmerica Irvine

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	CA01531	06-30-13
Arizona	State Program	9	AZ0671	10-13-13
California	LA Cty Sanitation Districts	9	10256	01-31-14
California	NELAP	9	1108CA	01-31-14
California	State Program	9	2706	06-30-14
Guam	State Program	9	Cert. No. 12.002r	03-28-13 *
Hawaii	State Program	9	N/A	01-31-14
Nevada	State Program	9	CA015312007A	07-31-13
Northern Mariana Islands	State Program	9	MP0002	01-31-14
Oregon	NELAP	10	4005	09-12-13
USDA	Federal		P330-09-00080	06-06-14
USEPA UCMR	Federal	1	CA01531	01-31-15

* Expired certification is currently pending renewal and is considered valid.

PTS Laboratories, Inc.

8100 Secura Way • Santa Fe Springs, CA 90670
Telephone (562) 347-2500 • Fax (562) 907-3610

April 9, 2013

Kathleen Robb
TestAmerica
17461 Derian Avenue, Suite 100
Irvine, CA 92614-5817

Re: PTS File No: 43191
Physical Properties Data
ARCO 0498, Livermore; 440-41677-1

Dear Ms. Robb:

Please find enclosed report for Physical Properties analyses conducted upon samples received from your ARCO 0498, Livermore; 440-41677-1 project. All analyses were performed by applicable ASTM, EPA, or API methodologies. An electronic version of the report has previously been sent to your attention via the internet. The samples are currently in storage and will be retained for thirty days past completion of testing at no charge. Please note that the samples will be disposed of at that time. You may contact me regarding storage, disposal, or return of the samples.

PTS Laboratories appreciates the opportunity to be of service. If you have any questions or require additional information, please contact Morgan Richards at (562) 347-2509.

Sincerely,
PTS Laboratories

Michael Mark Brady, P.G.
District Manager

Encl.

PTS Laboratories

Project Name: ARCO 0498, Livermore
Project Number: 440-41677-1

PTS File No: 43191
Client: TestAmerica

TEST PROGRAM - 20130326

CORE ID	Depth ft.	Core Recovery ft.	CAL-EPA DTSC Vapor Intrusion					Notes
		Plugs:	Various					
Date Received: 20130326								
SB-16-13' (440-41677-6)	13	0.50	X					
SB-16-26' (440-41677-7)	26	0.50	X					
SB-9-20' (440-41677-10)	20	0.50	X					
SB-9-37' (440-41677-11)	37	0.50	X					
SB-14-18' (440-41677-12)	18	0.50	X					
SB-14-37' (440-41677-13)	37	0.50	X					
TOTALS:	6 cores	3.00	6					

Laboratory Test Program Notes

Contaminant identification:

Standard TAT for basic analysis is 10 business days.

CAL-EPA DTSC Vapor Intrusion: Bulk & grain density, total porosity, moisture content, volumetric air & moisture, TOC/foc, and grain size distribution.

PTS File No: 43191
Client: TestAmerica

PTS Laboratories

PHYSICAL PROPERTIES DATA - CAL-EPA DTSC Vapor Intrusion PACKAGE

PROJECT NAME: ARCO 0498, Livermore
PROJECT NO: 440-41677-1

			METHODS:	API RP40/ASTM D2216		API RP40		API RP40		
								POROSITY,%Vb (2)		
SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENTATION (1)	ANALYSIS DATE	MOISTURE CONTENT, % weight	MOISTURE CONTENT, cm^3/cm^3	DENSITY DRY BULK, g/cm^3	DENSITY GRAIN, g/cm^3	TOTAL, cm^3/cm^3	AIR FILLED, cm^3/cm^3	WATER FILLED, cm^3/cm^3
SB-16-13' (440-41677-6)	13	V	20130403	8.0	0.145	1.81	2.69	0.329	0.184	0.145
SB-16-26' (440-41677-7)	26	V	20130403	7.3	0.142	1.93	2.72	0.290	0.148	0.142
SB-9-20' (440-41677-10)	20	V	20130403	6.5	0.107	1.64	2.71	0.395	0.287	0.107
SB-9-37' (440-41677-11)	37	V	20130403	17.0	0.270	1.59	2.76	0.424	0.154	0.270
SB-14-18' (440-41677-12)	18	V	20130403	7.4	0.125	1.69	2.73	0.380	0.255	0.125
SB-14-37' (440-41677-13)	37	V	20130403	16.9	0.282	1.67	2.74	0.392	0.111	0.282

(1) Sample Orientation: H = horizontal; V = vertical; R = remold (2) Total Porosity = no pore fluids in place; all interconnected pore channels; Air Filled = pore channels not occupied by pore fluids, native sample Vb = Bulk Volume, cc

PTS File No: 43191
Client: TestAmerica

ORGANIC CARBON DATA - TOC (foc)

(METHODOLOGY: WALKLEY-BLACK)

PROJECT NAME: ARCO 0498, Livermore
PROJECT NO: 440-41677-1

SAMPLE ID.	DEPTH, ft.	ANALYSIS DATE	ANALYSIS TIME	SAMPLE MATRIX	TOTAL ORGANIC CARBON, mg/kg	FRACTION ORGANIC CARBON, g/g
SB-16-13' (440-41677-6)	13	20130404	1410	SOIL	3850	3.85E-03
SB-16-26' (440-41677-7)	26	20130404	1410	SOIL	780	7.80E-04
SB-9-20' (440-41677-10)	20	20130404	1410	SOIL	620	6.20E-04
SB-9-37' (440-41677-11)	37	20130404	1410	SOIL	710	7.10E-04
SB-14-18' (440-41677-12)	18	20130404	1410	SOIL	840	8.40E-04
SB-14-37' (440-41677-13)	37	20130404	1410	SOIL	640	6.40E-04
Blank	N/A	20130404	1410	BLANK	ND	ND
SRM D079-542	N/A	20130404	1410	SRM	3240	3.24E-03
				Reporting Limit:	100	1.00E-04

QC DATA

SRM ID/Lot No.	REC (%)	Control Limits	Certified Concentration mg/kg	QC Performance Acceptance Limits, mg/kg Lower	Upper
SRM D079-542	95	75-125	3400	2550	4250

ND = Not Detected

PARTICLE SIZE SUMMARY

(METHODOLOGY: ASTM D422/D4464M)

PROJECT NAME: ARCO 0498, Livermore
PROJECT NO: 440-41677-1

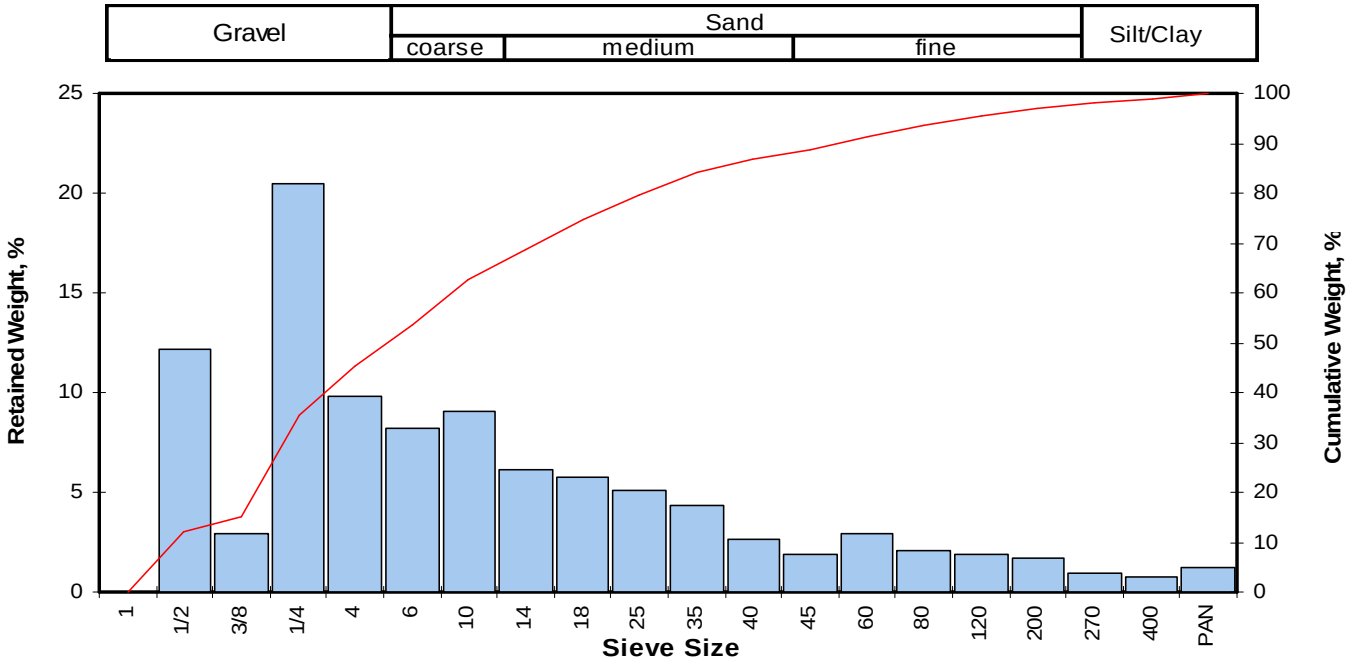
Sample ID	Depth, ft.	Mean Grain Size Description (1)	Median Grain Size mm	Particle Size Distribution, wt. percent						Silt & Clay
				Gravel	Sand Size			Silt	Clay	
					Coarse	Medium	Fine			
SB-16-13' (440-41677-6)	13	Coarse sand	3.911	45.34	17.33	24.05	10.44	(2)	(2)	2.83
SB-16-26' (440-41677-7)	26	Coarse sand	1.719	23.63	21.80	33.55	15.94	(2)	(2)	5.08
SB-9-20' (440-41677-10)	20	Gravel	7.807	60.92	10.43	15.33	9.93	(2)	(2)	3.38
SB-9-37' (440-41677-11)	37	Silt	0.032	0.00	0.00	10.77	21.09	50.23	17.92	68.15
SB-14-18' (440-41677-12)	18	Coarse sand	1.879	25.19	23.16	27.89	17.43	(2)	(2)	6.33
SB-14-37' (440-41677-13)	37	Silt	0.019	0.00	0.00	0.00	21.33	56.20	22.47	78.67

(1) Based on Mean from Trask
(2) Mechanical sieve does not differentiate silt/clay fractions

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422M

Client:	TestAmerica	**PTS File No:**	43191
Project:	ARCO 0498, Livermore	**Sample ID:**	SB-16-13' (440-41677-6)
Project No:	440-41677-1	**Depth, ft:**	13



Opening		Phi of	U.S. Sieve	Sample Weight	Incremental Weight,	Cumulative Weight,
Inches	Millimeters	Screen	No.	grams	percent	percent
0.9844	25.002	-4.64	1	0.00	0.00	0.00
0.4922	12.501	-3.64	1/2	12.47	12.13	12.13
0.3740	9.500	-3.25	3/8	3.00	2.92	15.05
0.2500	6.351	-2.67	1/4	21.07	20.50	35.56
0.1873	4.757	-2.25	4	10.06	9.79	45.34
0.1324	3.364	-1.75	6	8.47	8.24	53.59
0.0787	2.000	-1.00	10	9.34	9.09	62.67
0.0557	1.414	-0.50	14	6.35	6.18	68.85
0.0394	1.000	0.00	18	5.92	5.76	74.61
0.0278	0.707	0.50	25	5.27	5.13	79.74
0.0197	0.500	1.00	35	4.50	4.38	84.12
0.0166	0.420	1.25	40	2.68	2.61	86.73
0.0139	0.354	1.50	45	1.91	1.86	88.59
0.0098	0.250	2.00	60	2.97	2.89	91.48
0.0070	0.177	2.50	80	2.15	2.09	93.57
0.0049	0.125	3.00	120	1.95	1.90	95.47
0.0029	0.074	3.75	200	1.75	1.70	97.17
0.0021	0.053	4.25	270	0.93	0.90	98.07
0.0015	0.037	4.75	400	0.75	0.73	98.80
			PAN	1.23	1.20	100.00
TOTALS				102.77	100.00	100.00

Cumulative Weight Percent greater than			
Weight	Phi	Particle Size	
percent	Value	Inches	Millimeters
5	-4.23	0.7398	18.790
10	-3.82	0.5560	14.122
16	-3.22	0.3671	9.325
25	-2.97	0.3076	7.814
40	-2.48	0.2193	5.570
50	-1.97	0.1540	3.911
60	-1.22	0.0918	2.331
75	0.04	0.0384	0.974
84	0.99	0.0199	0.505
90	1.74	0.0117	0.298
95	2.88	0.0054	0.136

Measure	Trask	Inman	Folk-Ward
Median, phi	-1.97	-1.97	-1.97
Median, in.	0.1540	0.1540	0.1540
Median, mm	3.911	3.911	3.911
Mean, phi	-2.14	-1.12	-1.40
Mean, in.	0.1730	0.0854	0.1040
Mean, mm	4.394	2.170	2.640
Sorting	2.832	2.104	2.129
Skewness	0.705	0.404	0.384
Kurtosis	0.247	0.690	0.970

Grain Size Description (ASTM-USCS Scale)	Coarse sand (based on Mean from Trask)

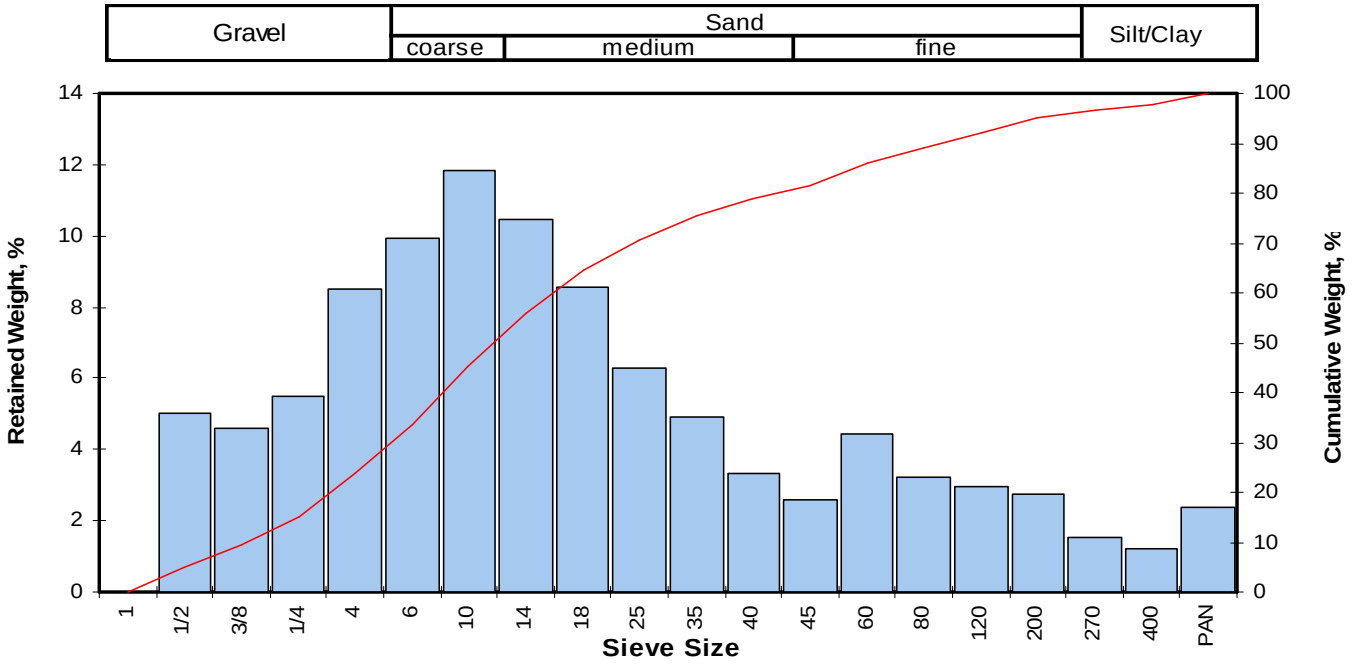
Description	Retained on Sieve #	Weight Percent
Gravel	4	45.34
Coarse Sand	10	17.33
Medium Sand	40	24.05
Fine Sand	200	10.44
Silt/Clay	<200	2.83
	Total	100

Phone: (562) 907-3607
Fax: (562) 907-3610

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422M

Client:	TestAmerica	**PTS File No:**	43191
Project:	ARCO 0498, Livermore	**Sample ID:**	SB-16-26' (440-41677-7)
Project No:	440-41677-1	**Depth, ft:**	26



Opening		Phi of	U.S. Sieve	Sample Weight	Incremental Weight,	Cumulative Weight,
Inches	Millimeters	Screen	No.	grams	percent	percent
0.9844	25.002	-4.64	1	0.00	0.00	0.00
0.4922	12.501	-3.64	1/2	5.62	5.00	5.00
0.3740	9.500	-3.25	3/8	5.19	4.62	9.62
0.2500	6.351	-2.67	1/4	6.20	5.52	15.13
0.1873	4.757	-2.25	4	9.55	8.50	23.63
0.1324	3.364	-1.75	6	11.18	9.95	33.58
0.0787	2.000	-1.00	10	13.32	11.85	45.43
0.0557	1.414	-0.50	14	11.75	10.45	55.89
0.0394	1.000	0.00	18	9.61	8.55	64.44
0.0278	0.707	0.50	25	7.08	6.30	70.74
0.0197	0.500	1.00	35	5.50	4.89	75.63
0.0166	0.420	1.25	40	3.77	3.35	78.98
0.0139	0.354	1.50	45	2.88	2.56	81.55
0.0098	0.250	2.00	60	4.97	4.42	85.97
0.0070	0.177	2.50	80	3.62	3.22	89.19
0.0049	0.125	3.00	120	3.35	2.98	92.17
0.0029	0.074	3.75	200	3.09	2.75	94.92
0.0021	0.053	4.25	270	1.70	1.51	96.43
0.0015	0.037	4.75	400	1.36	1.21	97.64
			PAN	2.65	2.36	100.00
TOTALS				112.39	100.00	100.00

Cumulative Weight Percent greater than			
Weight	Phi	Particle Size	
percent	Value	Inches	Millimeters
5	-3.64	0.4922	12.502
10	-3.21	0.3638	9.239
16	-2.62	0.2428	6.167
25	-2.18	0.1786	4.535
40	-1.34	0.0999	2.538
50	-0.78	0.0677	1.719
60	-0.26	0.0471	1.197
75	0.94	0.0206	0.523
84	1.78	0.0115	0.292
90	2.64	0.0063	0.161
95	3.78	0.0029	0.073

Measure	Trask	Inman	Folk-Ward
Median, phi	-0.78	-0.78	-0.78
Median, in.	0.0677	0.0677	0.0677
Median, mm	1.719	1.719	1.719
Mean, phi	-1.34	-0.42	-0.54
Mean, in.	0.0996	0.0528	0.0574
Mean, mm	2.529	1.341	1.457
Sorting	2.945	2.201	2.225
Skewness	0.896	0.163	0.196
Kurtosis	0.221	0.686	0.976

Grain Size Description (ASTM-USCS Scale)	Coarse sand (based on Mean from Trask)

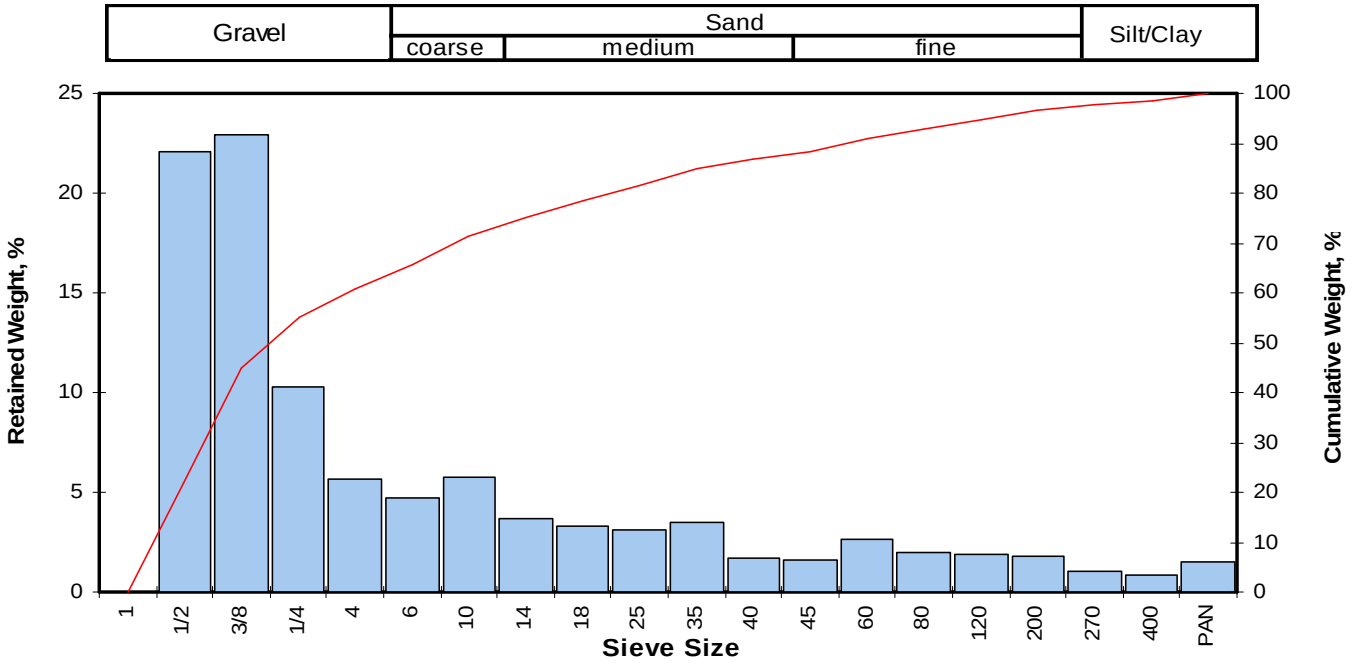
Description	Retained on Sieve #	Weight Percent
Gravel	4	23.63
Coarse Sand	10	21.80
Medium Sand	40	33.55
Fine Sand	200	15.94
Silt/Clay	<200	5.08
	Total	100

Phone: (562) 907-3607
Fax: (562) 907-3610

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422M

Client:	TestAmerica	**PTS File No:**	43191
Project:	ARCO 0498, Livermore	**Sample ID:**	SB-9-20' (440-41677-10)
Project No:	440-41677-1	**Depth, ft:**	20



Opening		Phi of	U.S. Sieve	Sample Weight	Incremental Weight,	Cumulative Weight,
Inches	Millimeters	Screen	No.	grams	percent	percent
0.9844	25.002	-4.64	1	0.00	0.00	0.00
0.4922	12.501	-3.64	1/2	15.46	22.03	22.03
0.3740	9.500	-3.25	3/8	16.11	22.96	44.99
0.2500	6.351	-2.67	1/4	7.21	10.28	55.27
0.1873	4.757	-2.25	4	3.97	5.66	60.92
0.1324	3.364	-1.75	6	3.30	4.70	65.63
0.0787	2.000	-1.00	10	4.02	5.73	71.36
0.0557	1.414	-0.50	14	2.61	3.72	75.07
0.0394	1.000	0.00	18	2.33	3.32	78.40
0.0278	0.707	0.50	25	2.19	3.12	81.52
0.0197	0.500	1.00	35	2.45	3.49	85.01
0.0166	0.420	1.25	40	1.18	1.68	86.69
0.0139	0.354	1.50	45	1.13	1.61	88.30
0.0098	0.250	2.00	60	1.84	2.62	90.92
0.0070	0.177	2.50	80	1.37	1.95	92.87
0.0049	0.125	3.00	120	1.34	1.91	94.78
0.0029	0.074	3.75	200	1.29	1.84	96.62
0.0021	0.053	4.25	270	0.74	1.05	97.68
0.0015	0.037	4.75	400	0.59	0.84	98.52
			PAN	1.04	1.48	100.00
TOTALS				70.17	100.00	100.00

Cumulative Weight Percent greater than			
Weight	Phi	Particle Size	
percent	Value	Inches	Millimeters
5	-4.42	0.8411	21.363
10	-4.19	0.7187	18.254
16	-3.92	0.5950	15.114
25	-3.59	0.4750	12.065
40	-3.33	0.3970	10.085
50	-2.96	0.3074	7.807
60	-2.32	0.1963	4.987
75	-0.51	0.0561	1.424
84	0.86	0.0218	0.553
90	1.82	0.0111	0.282
95	3.09	0.0046	0.118

Measure	Trask	Inman	Folk-Ward
Median, phi	-2.96	-2.96	-2.96
Median, in.	0.3074	0.3074	0.3074
Median, mm	7.807	7.807	7.807
Mean, phi	-2.75	-1.53	-2.01
Mean, in.	0.2655	0.1138	0.1585
Mean, mm	6.745	2.890	4.025
Sorting	2.911	2.387	2.331
Skewness	0.531	0.601	0.607
Kurtosis	0.296	0.572	0.998
Grain Size Description (ASTM-USCS Scale)		Gravel (based on Mean from Trask)	

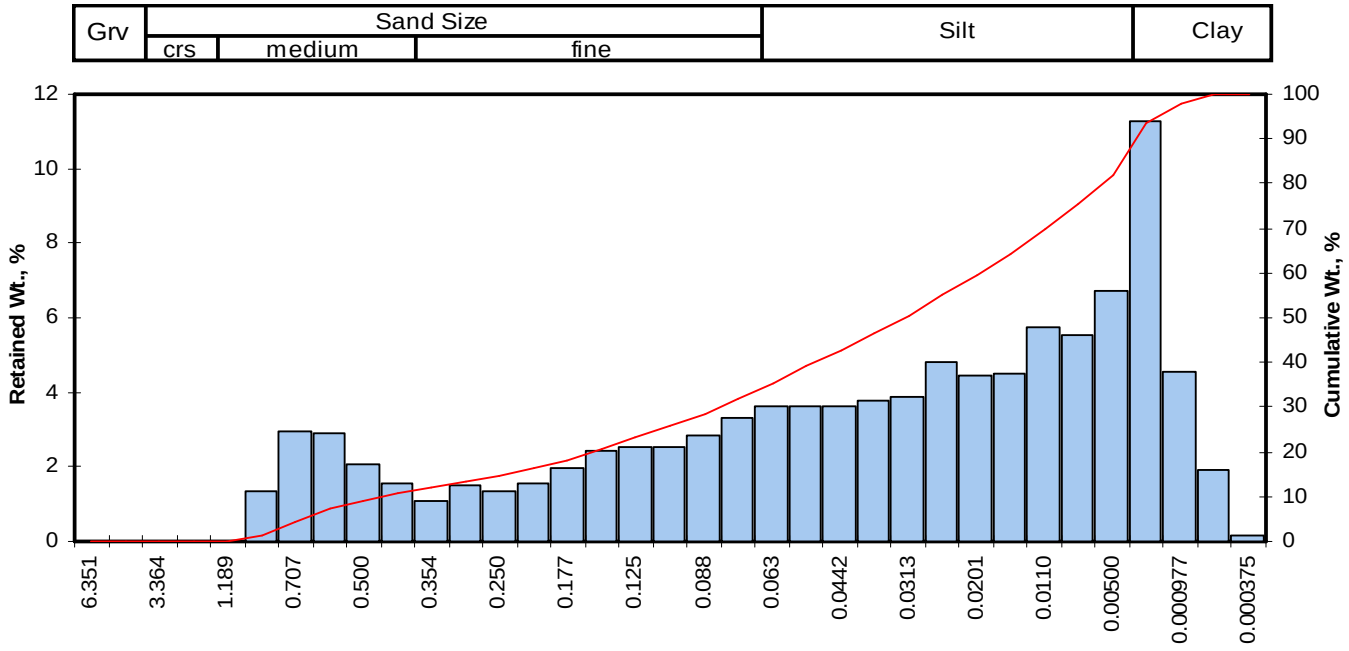
Description	Retained on Sieve #	Weight Percent
Gravel	4	60.92
Coarse Sand	10	10.43
Medium Sand	40	15.33
Fine Sand	200	9.93
Silt/Clay	<200	3.38
	Total	100

Phone: (562) 907-3607
Fax: (562) 907-3610

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client:	TestAmerica	**PTS File No:**	43191
Project:	ARCO 0498, Livermore	**Sample ID:**	SB-9-37' (440-41677-11)
Project No:	440-41677-1	**Depth, ft:**	37



Opening		Phi of	U.S.	Sample Weight,	Increment Weight,	Cumulative Weight,
Inches	Millimeters	Screen	No.	grams	percent	percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.00	0.00	0.00
0.0331	0.841	0.25	20	1.32	1.32	1.32
0.0278	0.707	0.50	25	2.93	2.93	4.25
0.0234	0.595	0.75	30	2.88	2.88	7.13
0.0197	0.500	1.00	35	2.09	2.09	9.22
0.0166	0.420	1.25	40	1.55	1.55	10.77
0.0139	0.354	1.50	45	1.11	1.11	11.88
0.0117	0.297	1.75	50	1.50	1.50	13.38
0.0098	0.250	2.00	60	1.33	1.33	14.71
0.0083	0.210	2.25	70	1.53	1.53	16.24
0.0070	0.177	2.50	80	1.96	1.96	18.20
0.0059	0.149	2.75	100	2.43	2.43	20.63
0.0049	0.125	3.00	120	2.54	2.54	23.17
0.0041	0.105	3.25	140	2.54	2.54	25.70
0.0035	0.088	3.50	170	2.83	2.83	28.53
0.0029	0.074	3.75	200	3.32	3.32	31.85
0.0025	0.063	4.00	230	3.62	3.62	35.47
0.0021	0.053	4.25	270	3.62	3.62	39.09
0.00174	0.0442	4.50	325	3.63	3.63	42.72
0.00146	0.0372	4.75	400	3.76	3.76	46.48
0.00123	0.0313	5.00	450	3.88	3.88	50.36
0.000986	0.0250	5.32	500	4.83	4.83	55.19
0.000790	0.0201	5.64	635	4.43	4.43	59.62
0.000615	0.0156	6.00		4.48	4.48	64.10
0.000435	0.0110	6.50		5.73	5.73	69.83
0.000308	0.00781	7.00		5.53	5.53	75.35
0.000197	0.00500	7.65		6.73	6.73	82.08
0.000077	0.00195	9.00		11.30	11.30	93.38
0.000038	0.000977	10.00		4.55	4.55	97.93
0.000019	0.000488	11.00		1.89	1.89	99.82
0.000015	0.000375	11.38		0.18	0.18	100.00
TOTALS				**100.00**	**100.00**	**100.00**

Cumulative Weight Percent greater than

Weight percent	Phi Value	Particle Size Inches	Particle Size Millimeters
5	0.57	0.0266	0.676
10	1.13	0.0180	0.458
16	2.21	0.0085	0.216
25	3.18	0.0043	0.110
40	4.31	0.0020	0.050
50	4.98	0.0013	0.032
60	5.67	0.0008	0.020
75	6.97	0.0003	0.008
84	7.87	0.0002	0.004
90	8.59	0.0001	0.003
95	9.36	0.0001	0.002

Measure	Trask	Inman	Folk-Ward
Median, phi	4.98	4.98	4.98
Median, in.	0.0013	0.0013	0.0013
Median, mm	0.032	0.032	0.032
Mean, phi	4.08	5.04	5.02
Mean, in.	0.0023	0.0012	0.0012
Mean, mm	0.059	0.030	0.031
Sorting	3.716	2.832	2.748
Skewness	0.935	0.023	0.010
Kurtosis	0.112	0.552	0.951
Grain Size Description (ASTM-USCS Scale)		Silt (based on Mean from Trask)	

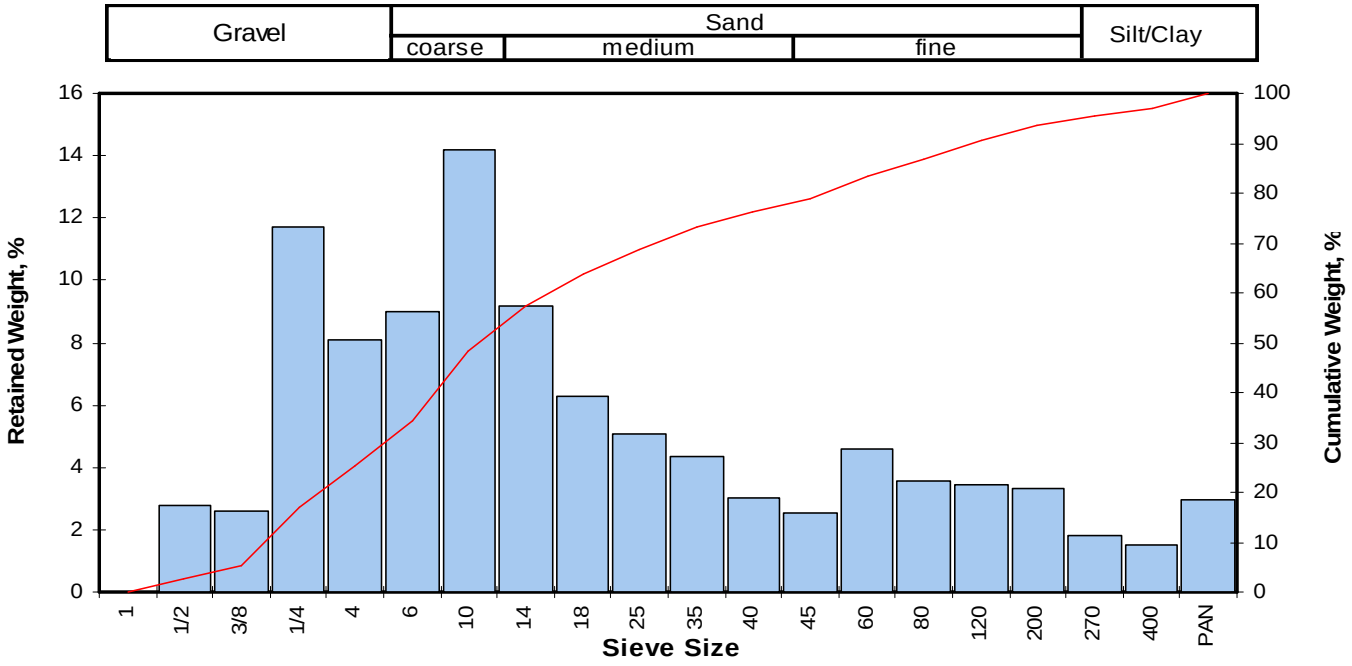
Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	10.77
Fine Sand	200	21.09
Silt	>0.005 mm	50.23
Clay	<0.005 mm	17.92
	Total	**100**

Phone: (562) 907-3607
Fax: (562) 907-3610

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D422M

Client:	TestAmerica	**PTS File No:**	43191
Project:	ARCO 0498, Livermore	**Sample ID:**	SB-14-18' (440-41677-12)
Project No:	440-41677-1	**Depth, ft:**	18



Opening		Phi of	U.S. Sieve	Sample Weight	Incremental Weight,	Cumulative Weight,
Inches	Millimeters	Screen	No.	grams	percent	percent
0.9844	25.002	-4.64	1	0.00	0.00	0.00
0.4922	12.501	-3.64	1/2	2.95	2.79	2.79
0.3740	9.500	-3.25	3/8	2.74	2.59	5.38
0.2500	6.351	-2.67	1/4	12.40	11.73	17.12
0.1873	4.757	-2.25	4	8.53	8.07	25.19
0.1324	3.364	-1.75	6	9.50	8.99	34.18
0.0787	2.000	-1.00	10	14.98	14.17	48.35
0.0557	1.414	-0.50	14	9.71	9.19	57.54
0.0394	1.000	0.00	18	6.61	6.25	63.79
0.0278	0.707	0.50	25	5.34	5.05	68.84
0.0197	0.500	1.00	35	4.60	4.35	73.20
0.0166	0.420	1.25	40	3.22	3.05	76.24
0.0139	0.354	1.50	45	2.69	2.55	78.79
0.0098	0.250	2.00	60	4.84	4.58	83.37
0.0070	0.177	2.50	80	3.78	3.58	86.94
0.0049	0.125	3.00	120	3.63	3.43	90.38
0.0029	0.074	3.75	200	3.48	3.29	93.67
0.0021	0.053	4.25	270	1.94	1.84	95.51
0.0015	0.037	4.75	400	1.61	1.52	97.03
			PAN	3.14	2.97	100.00
TOTALS				105.69	100.00	100.00

Cumulative Weight Percent greater than			
Weight	Phi	Particle Size	
percent	Value	Inches	Millimeters
5	-3.31	0.3895	9.894
10	-3.02	0.3192	8.108
16	-2.72	0.2598	6.599
25	-2.26	0.1885	4.789
40	-1.44	0.1070	2.717
50	-0.91	0.0740	1.879
60	-0.30	0.0486	1.234
75	1.15	0.0178	0.451
84	2.09	0.0093	0.235
90	2.95	0.0051	0.130
95	4.11	0.0023	0.058

Measure	Trask	Inman	Folk-Ward
Median, phi	-0.91	-0.91	-0.91
Median, in.	0.0740	0.0740	0.0740
Median, mm	1.879	1.879	1.879
Mean, phi	-1.39	-0.32	-0.51
Mean, in.	0.1031	0.0490	0.0562
Mean, mm	2.620	1.246	1.429
Sorting	3.258	2.405	2.327
Skewness	0.782	0.247	0.300
Kurtosis	0.272	0.542	0.892
Grain Size Description (ASTM-USCS Scale)		Coarse sand (based on Mean from Trask)	

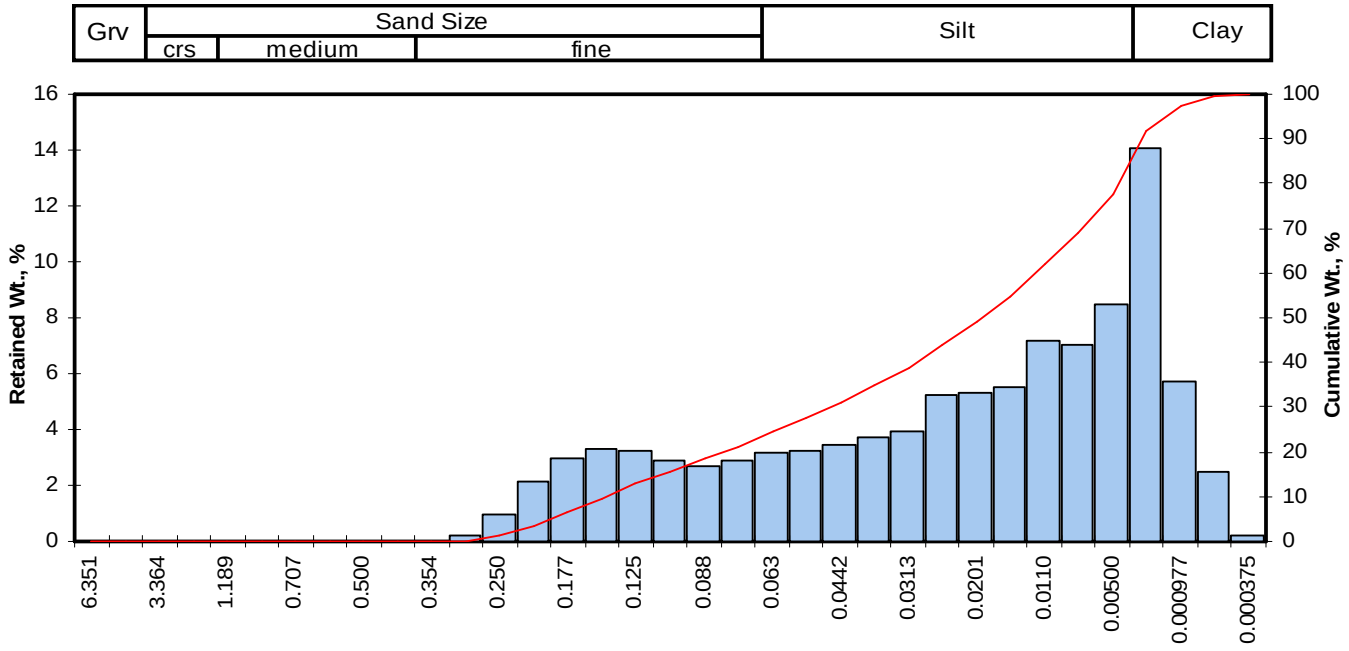
Description	Retained on Sieve #	Weight Percent
Gravel	4	25.19
Coarse Sand	10	23.16
Medium Sand	40	27.89
Fine Sand	200	17.43
Silt/Clay	<200	6.33
	Total	100

Phone: (562) 907-3607
Fax: (562) 907-3610

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client:	TestAmerica	**PTS File No:**	43191
Project:	ARCO 0498, Livermore	**Sample ID:**	SB-14-37' (440-41677-13)
Project No:	440-41677-1	**Depth, ft:**	37



Particle Size, mm

Opening		Phi of	U.S.	Sample Weight,	Increment Weight,	Cumulative Weight,
Inches	Millimeters	Screen	No.	grams	percent	percent
0.2500	6.351	-2.67	1/4	0.00	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00	0.00
0.0468	1.189	-0.25	16	0.00	0.00	0.00
0.0331	0.841	0.25	20	0.00	0.00	0.00
0.0278	0.707	0.50	25	0.00	0.00	0.00
0.0234	0.595	0.75	30	0.00	0.00	0.00
0.0197	0.500	1.00	35	0.00	0.00	0.00
0.0166	0.420	1.25	40	0.00	0.00	0.00
0.0139	0.354	1.50	45	0.00	0.00	0.00
0.0117	0.297	1.75	50	0.18	0.18	0.18
0.0098	0.250	2.00	60	0.98	0.98	1.16
0.0083	0.210	2.25	70	2.16	2.16	3.32
0.0070	0.177	2.50	80	2.97	2.97	6.29
0.0059	0.149	2.75	100	3.34	3.34	9.63
0.0049	0.125	3.00	120	3.23	3.23	12.86
0.0041	0.105	3.25	140	2.87	2.87	15.73
0.0035	0.088	3.50	170	2.71	2.71	18.44
0.0029	0.074	3.75	200	2.89	2.89	21.33
0.0025	0.063	4.00	230	3.14	3.14	24.47
0.0021	0.053	4.25	270	3.26	3.26	27.73
0.00174	0.0442	4.50	325	3.45	3.45	31.18
0.00146	0.0372	4.75	400	3.70	3.70	34.87
0.00123	0.0313	5.00	450	3.93	3.93	38.80
0.000986	0.0250	5.32	500	5.23	5.23	44.03
0.000790	0.0201	5.64	635	5.28	5.28	49.31
0.000615	0.0156	6.00		5.54	5.54	54.85
0.000435	0.0110	6.50		7.17	7.17	62.02
0.000308	0.00781	7.00		7.01	7.01	69.03
0.000197	0.00500	7.65		8.50	8.50	77.53
0.000077	0.00195	9.00		14.10	14.10	91.62
0.000038	0.000977	10.00		5.70	5.70	97.32
0.000019	0.000488	11.00		2.45	2.45	99.77
0.000015	0.000375	11.38		0.23	0.23	100.00
TOTALS				**100.00**	**100.00**	**100.00**

Cumulative Weight Percent greater than

Weight	Phi	Particle Size	
percent	Value	Inches	Millimeters
5	2.39	0.0075	0.191
10	2.78	0.0057	0.146
16	3.28	0.0041	0.103
25	4.04	0.0024	0.061
40	5.07	0.0012	0.030
50	5.68	0.0008	0.019
60	6.36	0.0005	0.012
75	7.45	0.0002	0.006
84	8.27	0.0001	0.003
90	8.84	0.0001	0.002
95	9.59	0.0001	0.001

Measure	Trask	Inman	Folk-Ward
Median, phi	5.68	5.68	5.68
Median, in.	0.0008	0.0008	0.0008
Median, mm	0.019	0.019	0.019
Mean, phi	4.91	5.77	5.74
Mean, in.	0.0013	0.0007	0.0007
Mean, mm	0.033	0.018	0.019
Sorting	3.263	2.496	2.339
Skewness	0.958	0.035	0.060
Kurtosis	0.192	0.442	0.865
Grain Size Description (ASTM-USCS Scale)			Silt (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	0.00
Fine Sand	200	21.33
Silt	>0.005 mm	56.20
Clay	<0.005 mm	22.47
	Total	**100**

TestAmerica Irvine
17461 Derian Ave Suite 100
Irvine, CA 92614-5817
Phone (949) 261-1022 Fax (949) 260-3297

Chain of Custody Record 43191

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Robb, Kathleen	Carrier Tracking No(s):	COC No: 440-19650.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: kathleen.robb@testamericainc.com		Page: Page 1 of 1
Company: PTS laboratories, Inc				Job #: 440-41677-1

Address: 8100 Secura Way,	Due Date Requested: 4/4/2013
City: Santa Fe Springs	TAT Requested (days):
State, Zip: CA, 90670	
Phone:	PO #:
Email:	WO #:
Project Name: ARCO 0498, Livermore	Project #: 44006987
Site: ARCO 0498, Livermore	SSOW#:

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SUBCONTRACT/ Moisture Content	SUBCONTRACT/ Bulk and Grain Density	SUBCONTRACT/ TOC	SUBCONTRACT/ FOC	SUBCONTRACT/ Total Porosity	SUBCONTRACT/ Volumetric Moisture & Air	SUBCONTRACT/ Grain Size Distribution	Total Number of containers	Special Instructions/Note:
			Preservation Code:												
SB-16-13' (440-41677-6)	3/21/13	13:45 Pacific		Solid			X							1	
SB-16-26' (440-41677-7)	3/21/13	13:50 Pacific		Solid			X	X	X	X	X	X	X	1	
~~SB-15-24' (440-41677-8)~~	~~3/21/13~~	~~17:35 Pacific~~		~~Solid~~			~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	1	3/25/13
~~SB-15-38' (440-41677-9)~~	~~3/21/13~~	~~17:50 Pacific~~		~~Solid~~			~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	1	
SB-9-20' (440-41677-10)	3/22/13	10:25 Pacific		Solid			X	X	X	X	X	X	X	1	
SB-9-37' (440-41677-11)	3/22/13	10:50 Pacific		Solid			X	X	X	X	X	X	X	1	
SB-14-18' (440-41677-12)	3/22/13	14:30 Pacific		Solid			X	X	X	X	X	X	X	1	
SB-14-37' (440-41677-13)	3/22/13	14:45 Pacific		Solid			X	X			X	X	X	1	
SB-16-13' (440-41677-6)	3/21/13	13:45 Pacific		Solid				X	X	X	X	X	X	1	
SB-14-37' (440-41677-13)	3/22/13	14:45 Pacific		Solid					X	X				1	

Possible Hazard Identification
Unconfirmed

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

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

Special Instructions/QC Requirements:

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

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1					3/26/13 9:58	TDI
2		3/26/13 9:58	TAI		3/26/13 9:58	PTS LABS
3						

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 4.6 | 4

4/11/2013

Atlantic Richfield Company
A BP affiliated company

Laboratory Management Program LaMP Chain of Custody Record

BP/ARC Project Name: BP 498 **Req Due Date (mm/dd/yy):** ____ **Rush TAT:** Yes ____ No X

BP/ARC Facility No: 498 **Lab Work Order Number:** 440-41677

Lab Name:	TestAmerica	BP/ARC Facility Address:	286 South Livermore Avenue	Consultant/Contractor:	Broadbent & Associates, Inc.
Lab Address:	17461 Derian Ave., Suite 100	City, State, ZIP Code:	Livermore, CA	Consultant/Contractor Project No:	08-82-603
Lab PM:	Kathleen Robb	Lead Regulatory Agency:	ACEH	Address:	1370 Ridgewood Drive, Ste. 5, Chico, CA 95973
Lab Phone:	949-261-1022	California Global ID No.:	T0600124081	Consultant/Contractor PM:	Jason Duda
Lab Shipping Accnt:		Enfos Proposal No:	005X3-0004	Phone:	530-566-1400
Lab Bottle Order No:		Accounting Mode:	Provision X OOC-BU ___ OOC-RM ___	Email EDD To:	jduda@broadbentinc.com
Other Info:		Stage: Execute (4)	Activity: Project Spend (80)	Invoice To:	BP/ARC X Contractor ___

BP/ARC EBM: Shannon Couch
EBM Phone:
EBM Email: shannon.couch@bp.com

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor	Matrix:	No. Containers / Preservative: Total Number of Containers	Unpreserved	H_2SO_4	HNO_3	HCl	Methanol		Requested Analyses: GRO (8015)	BTEX, 5 Oxys, EDB (8260)	1,2-DCA, Ethanol (8260)								Report Type & QC Level
	SB-16	3-21-13	1415		X			6				X			X	X	X								
	SB-15	3-21-13	1805		X			6				X			X	X	X								
	SB-14	3-22-13	1500		X			6				X			X	X	X								
	SB-9	3-22-13	1110		X			6				X			X	X	X								
	TB-498-032213	3-22-13	1700		X			2				X													ON HOLD

Comments
Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

Standard X
Full Data Package ____

		Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Name:	James Ramos		3-22-13	1700			
Sampler's Company:	Broadbent						
Shipment Method:	FedEx	Ship Date: 3-22-13					
Shipment Tracking No:							

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: 2.9 / 2.6 °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

Atlantic Richfield Company
A BP affiliated company

Laboratory Management Program LaMP Chain of Custody Record

BP/ARC Project Name: BP 498 **Req Due Date (mm/dd/yy):** ____ **Rush TAT:** Yes ____ No X

BP/ARC Facility No: 498 **Lab Work Order Number:** 440 41677

Lab Name:	TestAmerica	BP/ARC Facility Address:	286 South Livermore Avenue	Consultant/Contractor:	Broadbent & Associates, Inc.
Lab Address:	17461 Derian Ave., Suite 100	City, State, ZIP Code:	Livermore, CA	Consultant/Contractor Project No:	08-82-603
Lab PM:	Kathleen Robb	Lead Regulatory Agency:	ACEH	Address:	1370 Ridgewood Drive, Ste. 5, Chico, CA 95973
Lab Phone:	949-261-1022	California Global ID No.:	T0600124081	Consultant/Contractor PM:	Jason Duda
Lab Shipping Accnt:		Enfos Proposal No:	005X3-0004	Phone:	530-566-1400
Lab Bottle Order No:		Accounting Mode:	Provision X OOC-BU ____ OOC-RM ____	Email EDD To:	jduda@broadbentinc.com
Other Info:		Stage:	Execute (4) Activity: Project Spend (80)	Invoice To:	BP/ARC X Contractor ____
BP/ARC EBM:	Shannon Couch				
EBM Phone:					
EBM Email:	shannon.couch@bp.com				

Lab No.	Sample Description	Date	Time	Matrix: Soil / Solid	Matrix: Water / Liquid	Matrix: Air / Vapor	Matrix:	No. Containers / Preservative: Total Number of Containers	Unpreserved	H_2SO_4	HNO_3	HCl	Methanol	Requested Analyses: GRO (8015)	BTEX, 5 Oxys, EDB (8260)	1,2-DCA, Ethanol (8260)	Bulk & Grain Density	Total Porosity	Moisture Content	Volumetric Moisture & Air	TOC & FOC	Grain Size Distribution	
	SB-16-13'	3-21-13	1345	X				2	X					X								X	
	SB-16-26'	3-21-13	1350	X				2	X					X								X	
	[illegible]	[illegible]																					
	SB-15-24'	3-21-13	1735	X				2	X					X								X	
	SB-15-38'	3-21-13	1750	X				2	X					X								X	
	SB-9-20'	3-22-13	1025	X				2	X					X								X	
	SB-9-37'	3-22-13	1050	X				2	X					X								X	
	SB-14-18'	3-22-13	1430	X				2	X					X								X	
	SB-14-37'	3-22-13	1445	X				2	X					X								X	

Report Type & QC Level: Standard X; Full Data Package ____

Comments

Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.

Sampler's Name:	James Ramos	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Company:	Broadbent	[signature]	3-22-13	1700	[illegible] / TA IRV	3/23/13	1025
Shipment Method:	Fedex	Ship Date: 3-22-13					
Shipment Tracking No:							

Special Instructions:

THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No | Temp Blank: Yes / No | Cooler Temp on Receipt: 2.9/2.6 °F/C | Trip Blank: Yes / No | MS/MSD Sample Submitted: Yes / No

Login Sample Receipt Checklist

Client: Broadbent & Associates, Inc.

Job Number: 440-41677-1

Login Number: 41677

List Source: TestAmerica Irvine

List Number: 1

Creator: Freitag, Kevin R

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
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	James Ramos
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 <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Appendix G

GeoTracker Upload Receipts