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January 17, 2014

Re: Updated Conceptual Site Model and Soil and Groundwater Investigation Report
Atlantic Richfield Company Station #771
899 Rincon Avenue
Livermore, California
ACEH Case RO0000200

"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,

Chuck Carmel
Project Manager

Attachment

Updated Conceptual Site Model and
Soil and Groundwater Investigation Report
Atlantic Richfield Company Station No. 771
899 Rincon Avenue, Livermore, California
ACEH Fuel Leak Case No. RO0000200

Prepared for

Mr. Chuck Carmel
Project Manager
Atlantic Richfield Company
P.O. Box 1257
San Ramon, California 94583

Prepared by

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January 17, 2014

Project No. 06-82-608

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January 17, 2014

Project No. 06-82-608

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

Attn.: Mr. Chuck Carmel

Re: Updated Conceptual Site Model and Soil and Groundwater Investigation Report, Atlantic Richfield Company Station No.771, 899 Rincon Avenue, Livermore, California; ACEH Case No.RO0000200

Dear Mr. Carmel:

Broadbent & Associates, Inc. (Broadbent) is pleased to submit this *Updated Conceptual Site Model and Soil and Groundwater Investigation Report* (CSM and Investigation Report) for Atlantic Richfield Company Station No. 771 (herein referred to as Station No. 771) located at 899 Rincon Avenue, Livermore, California (Site). This Updated CSM and Investigation Report has been prepared in response to a request from the Alameda County Environmental Health Agency (ACEH) in a letter dated June 24, 2013.

Should you have questions or require additional information, please do not hesitate to contact us at (530) 566-1400.

Sincerely,
BROADBENT & ASSOCIATES, INC.

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cc: Mr. Jerry Wickham, Alameda County Environmental Health (Submitted via ACEH ftp site)
Electronic copy uploaded to GeoTracker

UPDATED CONCEPTUAL SITE MODEL AND SOIL AND GROUNDWATER INVESTIGATION REPORT
Atlantic Richfield Company Station No. 771
899 Rincon Avenue, Livermore, California
Fuel Leak Case No. RO0000200

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899 Rincon Avenue, Livermore, California
Fuel Leak Case No. RO0000200

1.0 INTRODUCTION

On behalf of the Atlantic Richfield Company, RM – a BP affiliated company; Broadbent & Associates, Inc. (Broadbent) has prepared this *Updated Conceptual Site Model and Soil and Groundwater Investigation Report* (CSM and Report) for the Atlantic Richfield Company (ARC) Station No. 771, located at 899 Rincon Avenue, Livermore, California (Site). This work was conducted in general accordance with the *Conceptual Site Model and Work Plan for Soil and Groundwater Investigation* dated May 29, 2013, which was approved by the Alameda County Environmental Health Agency (ACEH) in a letter dated June 24, 2013. The purpose of this work was to further evaluate current Site conditions and close the data gaps identified by the ACEH, as well as enhance overall Site understanding. This report includes discussions on the Site background and previous investigations, an updated Conceptual Site Model (CSM), details and results of the soil and groundwater investigation, conclusions, and recommendations.

2.0 SITE BACKGROUND

The Site is located at 899 Rincon Avenue, on the southwest corner of Rincon Avenue and Pine Street in Livermore, California. The latitude and longitude of the center of the Site is approximately 37°41'17.33"N, 121°47'1.22"W (37.688147°, -121.783673°). The Site property is recognized by the Alameda County Assessor's Office as Assessor's Parcel Number 98-351-5. The approximate ground surface elevation at the Site is approximately 455 feet above mean sea level. A Site Location Map is provided as Drawing 1.

The land use in the immediate area is mixed residential and commercial. The adjacent property to the west is a shopping complex with various restaurants. The property to the south is May Nissen Community Park and Swim Center and Rincon Library. Across Pine Street to the north of the Site is the Livermore-Pleasanton Fire Department Fire Station No.7. Residential homes reside to the northeast across the intersection of Pine Street and Rincon Avenue and east of the Site across Rincon Avenue. A Site Map is included as Drawing 2. A Site Map depicting current groundwater elevation and analytical date is presented as Drawing 3.

2.1 Updated Conceptual Site Model

An updated conceptual site model (CSM) has been prepared to incorporate the findings of the soil and groundwater investigation discussed in Sections 3.0 and 4.0 and to identify any remaining data gaps. The CSM is presented as Table 1 and includes the following:

- Regional and Site Geology
- Extent of light, non-aqueous phase liquid (LNAPL), gasoline range organics (GRO), benzene, and methyl tertiary butyl ether (MTBE) in groundwater
- Release mechanisms
- Nature and extent of constituents of concern in soil, groundwater, and soil vapor
- On- and offsite receptors
- Identified data gaps

This updated CSM addresses many of the items identified by the ACEH March 18, 2013 letter including variability in groundwater monitoring data (Item 4; ACEH, 2013), hydraulic gradient (Item 5; ACEH, 2013), and potential perched groundwater (Item 6; ACEH, 2013). These items were, in part, the focus of the current investigation reported herein. Recent regulator correspondence is presented in Appendix A.

2.2 Previous Site Investigations

In August 1987, a waste-oil tank was removed from the Site. A soil sample (AL-1) was collected at 10 feet below ground surface (ft bgs) and analyzed for halogenated volatile compounds (HVC), polychlorinated biphenyl (PCB's), total petroleum fuel hydrocarbons (TPFH), and benzene, toluene, and xylenes (BTX). Results indicated TPFH at a concentration of 378 milligrams per kilogram (mg/kg). The excavation was deepened and a second sample (AL-2) was collected from 12 feet bgs. No analytes (HVC, PCB's, TPFH, and BTX) were detected above laboratory reporting limits in the deeper sample. Summarized analytical results are provided within Appendix B. It is important to note that a waste-oil tank removal report summarizing work activities could not be located. The data discussed above and analytical results and drawing also included in Appendix B were taken from the 1990 Applied GeoSystems (AGS) report titled Limited Subsurface Environmental Assessment (AGS, 1990).

In February 1990, AGS conducted a limited onsite subsurface environmental assessment to evaluate the presence of gasoline hydrocarbons in the subsurface soil in the area adjacent to the four gasoline underground storage tanks (USTs) prior to their planned removal. Three exploratory soil borings (B-1, B-2, and B-3) were drilled and soil samples were collected from each boring. Groundwater was encountered in soil boring B-1 at approximately 33 ft bgs. Soil borings B-2 and B-3 were terminated prior to encountering groundwater. Soil samples were analyzed for total petroleum hydrocarbons as gasoline (TPHg) and benzene, toluene, ethylbenzene, and total xylenes (BTEX). Results indicated petroleum hydrocarbon impacted soil (TPHg) in excess of 100 mg/kg in one of the soil samples from boring B-3 at a depth of 32 ft bgs. A grab groundwater sample was obtained from soil boring B-1 for visual inspection. Approximately 1/8-inch of floating product was present (AGS, 1990).

In December 1990, a supplemental subsurface investigation was initiated by AGS to evaluate the lateral and vertical extent of petroleum hydrocarbons in soil and groundwater near the onsite gasoline USTs. This investigation included drilling three soil borings (B-4, B-5, and B-6), converting the borings to monitoring wells (MW-1, MW-2, and MW-3, respectively), and collecting and analyzing soil and groundwater samples. Groundwater was encountered in each of the soil borings at approximately 37 ft bgs during this investigation. Sheen of light, non-aqueous phase liquid (LNAPL) was observed in well MW-1 and 0.16 feet of LNAPL was measured in well MW-2. Sixteen soil samples and one groundwater sample (MW-3) were submitted for analysis of TPHg and BTEX. Results indicated impacted soil (TPHg) in excess of 100 mg/kg in two of the soil samples collected from boring B-4. Groundwater results indicated TPHg at 230 µg/L in MW-3 (AGS, 1991).

In June and July 1991, an additional subsurface investigation was conducted by RESNA to further evaluate the lateral and vertical extent of impacted soil and groundwater and to confirm the vertical extent of hydrocarbons in the area of the former waste-oil tank. This investigation included advancing five soil borings (B-7 through B-11), converting four of the borings (B-7 through B-10) to monitoring wells (MW-4 through MW-7), and collecting and analyzing soil and groundwater samples. Soil boring B-11 was drilled in the area of the former waste-oil tank. Groundwater was encountered in borings B-7 through B-10 at depths of approximately 35.5 to 37 ft bgs. A total of 33 soil samples collected at various

depths were submitted for analysis of TPHg and BTEX. Soil samples from boring B-11 were also analyzed for total petroleum hydrocarbons as diesel (TPHd) and total oil and grease (TOG). Groundwater samples were collected from wells MW-3 through MW-7 and analyzed for TPHg and BTEX. Samples were not collected for laboratory analysis from wells MW-1 and MW-2 as LNAPL was observed in the wells. Soil analytical results indicated impacted soil (TPHg) in excess of 100 mg/kg in three of the soil samples. No analytes were detected above the laboratory reporting limits in the soil samples from boring B-11. Groundwater analytical results showed impacted groundwater in each of the monitor wells sampled (RESNA, 1991). Summarized analytical results are provided within Appendix B. Soil boring and monitoring well construction logs are provided in Appendix C.

In December 1991, RESNA conducted a vapor extraction test from wells MW-1, MW-2, MW-4, MW-5, and MW-7. Test results showed that vapor extraction was an effective method to remediate subsurface soils at the Site (RESNA, 1992). Vapor extraction test monitoring data and summarized analytical results are provided in Appendix B.

Between December 30, 1991 and January 3, 1992, four USTs, with the following capacities: one 10,000 gallon, one 6,000 gallon, and two 4,000 gallon, were removed from the Site (Roux, 1992). Initially, two soil samples were collected from underneath each tank for a total of eight soil samples at depths ranging from 14 to 16 ft bgs. Soil samples were analyzed for TPHg and BTEX. Results showed petroleum impacted soil (TPHg) in excess of 100 mg/kg below three of the four tanks. Additional excavation and sampling occurred on January 21, 1992. Six soil samples were collected at a depth of 18 feet and additionally analyzed for Organic Lead. Two of the samples indicated TPHg at or above 100 mg/kg. Product line replacement was conducted in February 1992. Ten soil samples from various depths within the product line trenches were collected and analyzed for TPHg and BTEX, with select samples additionally analyzed for Organic Lead. Results showed TPHg impacted soil exceeding 100 mg/kg in two of the samples collected within the product line trenches (Roux, 1992). Approximately 1,100 cubic yards of soil were produced during removal of the USTs and product lines. The soil was disposed of at the Browning Ferris Industries' Class III landfill in Livermore, California. Historic sample locations and a table of analytical results are contained within Appendix B.

In April 1992 and January 1993, RESNA conducted an additional onsite and initial offsite subsurface investigation. This investigation included drilling four offsite soil borings (B-12 through B-15) and two onsite soil borings (B-16 and B-17), converting borings B-12 through B-15 to monitoring wells MW-8 through MW-11, converting boring B-16 to a vapor extraction well (VW-1), and boring B-17 to a recovery well (RW-1; Drawing 2). Monitoring wells MW-8 through MW- 10 were originally proposed to be located on the immediate adjacent property south and west of the Site. After repeated attempts by RESNA and ARCO, the owner of the adjacent property refused to allow installation of the wells. These locations were then changed to northeast, east, and southeast of the Site along Rincon Avenue and were installed in January 1993 (RESNA, 1993). Groundwater and soil samples were collected and submitted for analysis of TPHg and BTEX. Three of the eight soil samples from onsite borings B-16 and B-17 contained slight detections of various analytes. No analytes were detected above laboratory reporting limits in any of the offsite soil or groundwater samples. Onsite well RW-1 contained significant TPHg and BTEX concentrations (RESNA, 1993). Summarized analytical results are provided within Appendix B. Soil boring and monitor well construction logs are provided in Appendix C.

In March 1993, EMCON completed construction of a Soil Vapor Extraction (SVE) system to extract vapors from wells VW-1, MW-1, MW-2, MW-4, MW-5, and MW-7. Initial startup of the remediation system was

postponed due to heavy rain, which caused water levels at the Site to rise and submerge the screen intervals within the remediation wells. The SVE system was initially activated on December 20, 1994, extracting from wells VW-1 and MW-4. The other SVE wells had submerged screen intervals. Influent samples showed detectable concentrations of TPHg and total xylenes (EMCON, 1995). The system was shut down on January 17, 1995 due to re-submergence of the well screen intervals. During the First Quarter 1995, modifications were completed to the SVE system to facilitate in-well air bubbling in conjunction with SVE. On July 12, 1995, the system was restarted in conjunction with air-bubbling in wells VW-1, MW-1, MW-2, MW-4, MW-5, MW-7, and RW-1. The SVE system was shut down on October 10, 1995 due to low hydrocarbon concentrations in extracted soil vapor. Review of historic reports did not indicate when air-bubbling was discontinued. During operation of the SVE system, a total of 56.9 pounds of hydrocarbons were removed from the subsurface (EMCON, 1996). Historic data associated with operation of the SVE system are provided in Appendix B.

In June 2001, Cambria Environmental Technology, Inc. (Cambria) supervised the removal of the dispensers and product piping by Paradiso Construction and performed compliance sampling activities (Cambria, 2001). Soil sampling was performed beneath each dispenser unit, at each piping elbow joint, and along the product piping. Four soil samples were submitted for analysis of TPHg, BTEX, and MTBE. Minor concentrations of TPHg, toluene, total xylenes, and MTBE were detected in two of the soil samples. Summarized analytical results are provided in Appendix B.

In 2006, URS installed an Air Diffusion (AD) Treatment system for remediation of dissolved phase hydrocarbons. A 1.5 horsepower single-phase air sparge compressor was installed in the existing remediation system compound at the Site. Air bubblers were affixed to onsite wells MW-2, MW-4, MW-5, MW-6, and MW-7. Air bubbling activities with the new system began in 2006 and were discontinued in March 2010.

On March 25, 2011, Broadbent field personnel observed RSI advance two off-site soil borings (SB-2 and SB-3; Drawing 2) on the adjacent property to the south and west of the Site in the cross- and upgradient directions. RSI utilized a hollow stem auger drill rig to advance the soil borings to a maximum depth of 35 ft bgs. Physical soil samples were collected at approximate five foot intervals during soil boring activities. Following completion of soil boring advancement, a grab groundwater sample was collected from each boring within the augers utilizing a stainless-steel bailer between approximately 30 and 35 ft bgs. Select samples were submitted to the laboratory for analysis. Laboratory analytical results for the soil samples submitted from this investigation were below laboratory reporting limits for each constituent analyzed. GRO and MTBE were detected above laboratory reporting limits in the groundwater sample collected from boring SB-3 at concentrations of 81 micrograms per liter (µg/L) and 3.8 µg/L, respectively (Broadbent, 2011). The remaining analytes were not detected above laboratory reporting limits in the two groundwater samples collected. Summarized analytical data is provided in Appendix B.

Groundwater monitoring and sampling was initiated during the First Quarter 1992. Drawings 4 through 6 present contaminant Isoconcentration maps for GRO, benzene, and MTBE, respectively, for the most recent monitoring and sampling results (Third Quarter 2013). Sampling of the following wells was discontinued following the respective sampling event: MW-10 – Second Quarter 1999, MW-8 and MW-9 – First Quarter 2000, and MW-1 and MW-3– Second Quarter 2000. Historic groundwater elevation and laboratory analytical results are included in Table 2 and Appendix B. During the Third Quarter 2012, LNAPL was observed in well MW-7, when it had not been noted during prior sampling

events. Tables 2 and 3 summarize the historical groundwater monitoring and sampling data. As noted in Table 2, groundwater elevations during the Third Quarter were at their lowest level since monitoring was initiated in well MW-7. Based on that observation, the presence of this LNAPL may be related to groundwater elevation. During the First Quarter 2013 groundwater monitoring event, water levels rebounded by almost 10 ft bgs, and no LNAPL was noted in this well. LNAPL was also not present during the Third Quarter 2013 monitoring event, where water levels decreased again to within three feet of the level observed during First Quarter 2013. Per directions by the ACEH in the March 18, 2013 letter, Broadbent has continued to monitor the presence of this LNAPL.

Recent quarterly groundwater elevation and laboratory analytical results are provided in Drawing 3 and in Tables 2 and 3. Historical groundwater flow directions and gradients are presented in Table 4. The most recent groundwater monitoring results are presented in Broadbent's *Third Quarter 2013 Monitoring Report* dated October 24, 2013 (Broadbent, 2013).

3.0 SOIL AND GROUNDWATER INVESTIGATION

The purpose of the soil and groundwater investigation was to define the downgradient vertical extent of petroleum hydrocarbons in groundwater, and to provide a better understanding of lithologic conditions in the subsurface. The investigation was conducted to further assess:

- Potential perched-groundwater zones
- A possible lithologic ridge/mound near well VW-1
- Presence of a sandy clay layer and how it is possibly related to changing groundwater levels and variability in petroleum concentrations, and the recent LNAPL presence in well MW-7

The updated CSM (Table 1) describes these conditions and data gaps in detail following completion of additional Site characterization activities including the soil and groundwater investigation and groundwater monitoring/sampling. In order to evaluate these identified data gaps, Broadbent advanced a total of three (3) cone penetration (CPT) borings at the locations shown in Drawing 2. A fourth boring location was initially proposed (previously B-3 in Work Plan) to the south of B-2 within the vicinity of MW-7. However, due to the presence of numerous underground utilities in this location, the boring could not safely be advanced and was removed from the scope of work. The omission of this boring was approved by the ACEH via email correspondence received on October 16, 2013 (Appendix A). As indicated in Drawing 2, two of the CPT borings (B-1 and B-2) were located onsite near and downgradient of the source area and the current UST's. The remaining CPT boring (B-4) was located west of borings B-1 and B-2. Boring B-4 was installed to determine if the presence of a potential ridge of higher sandy clay (See Table 1) in well VW-1 extends laterally onsite to the west.

3.1 Preliminary Field Activities

Prior to initiating field activities, Broadbent obtained the necessary well drilling permit from the Zone 7 Water Agency (Appendix D), 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. (NorCal), to confirm the absence of underground utilities at each boring location. The private utility locating activities were conducted on October 14, 2013. Borehole locations were also cleared to a depth

of 6.5 feet bgs using an air knife rig by Gregg Drilling on October 18, 2013 prior to borehole advancement.

3.2 CPT Boring Advancement

Between October 22 and 23, 2013, Broadbent field personnel observed Gregg Drilling advance three soil borings onsite (B-1 through B-3; Drawing 2). CPT borings were advanced to a maximum depth of approximately 60 ft bgs to evaluate the sandy clay layer (ACEH, 2013) where soil impacts were previously observed and deeper groundwater. 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 E). Pore pressure dissipation tests (PPDTs) were initially proposed for this investigation but were not utilized due to the current understanding of Site lithology and the groundwater table. Additionally, the presence of finer grained layers, which are known to be present on-Site were assumed to negate the applicability of the PPDTs.

Saturated intervals for first-encountered groundwater and for deeper groundwater potentially beneath the sandy clay at approximately 45 feet bgs were initially targeted for grab-groundwater sampling, as well as any perched intervals between approximately 20 and 28 feet bgs, as groundwater data from well VW-1 indicates may be present. Additionally, groundwater just above the sandy clay layer noted at approximately 36 to 42 feet bgs (ACEH, 2013) was intended to be collected.

One soil sample from each boring was anticipated for collection at the top of the sandy clay layer.

3.3 Soil and Groundwater Sampling Activities

Following completion of the CPT borings, a second borehole immediately adjacent to the first was installed in order to collect soil and groundwater samples. One soil sample was collected from each boring between approximately 28.5 and 31.5 ft bgs within the upper portion of the first encountered silty clay/sandy clay layer observed.

Two groundwater samples were collected during the investigation from boring B-1 between approximately 37 and 42 ft bgs and boring B-2 between approximately 53 and 58 ft bgs. Attempts to collect groundwater samples between approximately 23 and 28 ft bgs and 35 and 40 ft bgs in boring B-2 and between approximately 38 and 42 ft bgs in boring B-3 were made but groundwater did not accumulate in the sample interval due to low-permeability conditions and/or lack of groundwater. However, the overall objective of obtaining a groundwater sample from just above the sandy clay/clayey silt layer located between approximately 36 and 42 ft bgs was met with the groundwater sample collected from B-1 and the goal of evaluating deeper groundwater within a sandy layer observed between approximately 53 to 58 ft bgs was accomplished with the groundwater sample collected from B-2. Furthermore, the location of boring B-3 was cross-gradient, away from the source area, and its primary goal was to evaluate whether the ridge of sandy clay observed within the boring for VW-1 extended west across the property.

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.

3.4 Investigation-Derived Residuals Management

Investigation-derived residuals were temporarily accumulated onsite in 55-gallon, DOT-approved drums, pending characterization for proper management. Broadbent coordinated the removal and transportation of surplus soils and liquids with Belshire Environmental Services, Inc. to an appropriate California-regulated facility.

3.5 Additional Groundwater Sampling

It was recommended to conduct additional groundwater monitoring/sampling in all wells associated with the Site in order to evaluate current concentrations in downgradient, off-Site wells and confirm the continued absence of petroleum compounds in on-Site wells that have not been sampled in years. Each well associated with the Site with the exception of MW-10, due to the presence of a parked car, were sampled on July 25, 2013 during the Third Quarter 2013 monitoring event. Analytical results are summarized in Tables 2 and 3 and select results depicted on Drawing 3. The second monitoring/sampling event is anticipated to be completed in January 2014. Final results will be detailed within the First Quarter 2014 Monitoring Report.

4.0 RESULTS OF INVESTIGATION

4.1 Soil Sample Analytical Results

Laboratory analytical results for GRO, BTEX, and MTBE are summarized in Table 5. Review of Table 5 indicates that analytical results were below laboratory detection limits for each constituent analyzed for in the three soil samples collected from borings B-1 through B-3. As results were not observed above laboratory detection limits, the revised residential Environmental Screening Levels (ESLs) established by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB, May 2013) under a potential drinking water resource scenario were not exceeded. A copy of the laboratory analytical report including chain-of-custody documentation is provided in Appendix F. The analytical results (EDF) were also uploaded to the GeoTracker AB2886 database. Upload confirmation receipts are provided in Appendix G.

4.2 Groundwater Sample Analytical Results

Laboratory analytical results for GRO, BTEX, and MTBE are summarized in Table 6. Review of Table 6 indicates that analytical results were below laboratory detection limits for each constituent analyzed for in the two groundwater samples collected from borings B-1 and B-2. As petroleum hydrocarbons were not reported above laboratory detection limits, the revised residential Environmental Screening Levels (ESLs) established by the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB, May 2013) under a potential drinking water resource scenario were not exceeded. A copy of the laboratory analytical report including chain-of-custody documentation is provided in Appendix F. The analytical results (EDF) were also uploaded to the GeoTracker AB2886 database. Upload confirmation receipts are provided in Appendix G.

4.3 Subsurface Lithology

Vertical profiles for soil behavior type (SBT) from each CPT boring were used to update the geologic cross-sections, which are shown in Drawing 7 through Drawing 9. As depicted on the cross sections, the soil underlying the site primarily consists of a layer of gravel and/or gravelly sand that extends to approximately 33 to 43 ft bgs resting on top of a layer of silt and/or clay which extends to a depth of approximately 54 to 58 ft bgs. A small layer of gravel and/or gravelly sand appears to be present beneath the silt and/or clay layer between approximately 54 and 60 ft bgs, the maximum depth explored. The gravel and/or gravelly sand layer also consists of occasional finer grained clay and silt layers and well graded sand. The deeper clay and silt layer consists of intermittent beds of gravel and/or gravelly sand within the vicinity of boring B-2. CPT boring logs are provided in Appendix H. The site map with boring locations (GEO_MAP) and boring logs (GEO_BORE) were also uploaded to the GeoTracker AB2886 database. Upload confirmation receipts are provided in Appendix G.

4.4 Additional Groundwater Sampling Analytical Results

Additional wells MW-1, MW-3, MW-8, and MW-9 were sampled during the Third Quarter 2013 monitoring/sampling event in order to further evaluate current concentrations associated with the Site, both on- and off-Site. Well MW-10 was also scheduled for sampling but could not be accessed due to the presence of a parked car. Concentrations were not detected above laboratory reporting limits in downgradient wells MW-3 and MW-8 nor in off-Site well MW-9. The GRO concentration appears to have increased in well MW-1 since it was last sampled in 2000. However, it should be noted that adequate purging could not be completed during sampling due to an insufficient amount of groundwater present within the well casing. This may have led to the collection of stagnant water within the bottom cap of the well casing and observed concentrations may not resemble current or accurate groundwater conditions. Additionally, the concentration of GRO was within the range of generally observed on-Site. Laboratory analytical results from this sampling event are summarized in Tables 2 and 3. Select results are also depicted on Drawing 3. An additional evaluation of these results along with those obtained during First Quarter 2014 will provided within the First Quarter 2014 Monitoring Report, as proposed in the initial Work Plan.

5.0 CONCLUSIONS

On behalf of Atlantic Richfield Company, Broadbent has prepared this *Updated Conceptual Site Model and Soil and Groundwater Investigation Report* for Station 771 located at 899 Rincon Avenue, Livermore, CA. Based on the findings of this investigation, Broadbent concludes the following:

- Analytical results from soil samples collected on-Site were all below laboratory detection limits, indicating little to no residual contamination resides within the top portion of the of the first encountered silty clay/sandy clay layer between approximately 28.5 and 31.5 ft bgs.

- Analytical results from the two groundwater samples collect were below laboratory detection limits. The groundwater sample collected from B-1 appears to suggest that hydrocarbon impact within the vicinity of the upper portion of the first encountered silty clay/sandy clay layer is not a concern. The deeper sample collected from B-2 suggests that vertical migration of hydrocarbon contaminants to the lower gravel and/or gravelly sand layer observed between approximately 54 and 60 feet bgs has not occurred.

- The cross sections generated generally show a gravel and/or gravelly sand layer overlaying a less permeable finer grained silt and/or clay layer that includes intermittent beds of finer grained material. A layer of gravel and/or gravelly sand was observed beneath the silt/clay layer beginning at approximately 54 feet bgs and also consists of intermittent finer grained layers. Saturated conditions were not encountered above a depth of approximately 36 feet bgs. The silt/clay lens observed within the boring for VW-1 at approximately 28 feet bgs appears to be an isolated, intermittent layer, as it was not observed in boring B-3 located to the west of B-2. Any perched groundwater near well VW-1 is likewise small and isolated.

- Laboratory analytical results from the additional groundwater sampling confirmed the absence of hydrocarbon impact within downgradient wells MW-3 and MW-8 along with cross-gradient, off-Site well MW-9. An increased GRO concentration was detected within well MW-1 on-Site, but within the generally observed range for source area wells and MW-1.

- Additional research into the use of the nearest municipal well located approximately 1,075 ft in the downgradient direction, as requested by the ACEH, concluded that the well is currently in use for water supply. However, the absence of hydrocarbon impact to wells MW-3, MW-8, and MW-11 in the downgradient direction, the wells distance from the Site, and the screen interval indicate that it is unlikely to be affected by contamination associated with Station #771. Additional discussion is provided in the updated CSM presented as Table 1.

6.0 SUMMARY AND RECOMMENDATIONS

Impact to soils within the top portion of the first encountered silty clay/sandy clay layer between approximately 28.5 and 31.5 ft bgs have been adequately characterized and analytical results did not exceed laboratory reporting limits for the three soil samples collected during the on-Site CPT investigation. It does not appear that contamination within this zone contributed to the relatively recent observance of LNAPL in well MW-7. However, the boring originally proposed closer to MW-7 could not be installed due to underground utilities.

Groundwater samples collected during the CPT investigation were below laboratory reporting limits for each analyzed constituent. This suggests that impact to both the upper portion of the first encountered silty clay/sandy clay layer and lower gravel and/or gravelly sand layer observed between approximately 54 and 60 feet bgs does not appear to have occurred in the downgradient direction (B-1) and near the source area (B-2).

Lithologic data collected during the CPT investigation shows that a deeper, more permeable gravel/gravelly sand layer is present beginning at approximately 52 to 54 ft bgs onsite. CPT data also appears to indicate that the silt/clay layer observed at approximately 28 ft bgs within the boring for VW-1 represents an intermittent lens instead of a consistent ridge or mound. Evidence of this was provided by the absence of the same layer within boring B-3 located to the west of B-2 on the opposing side of the Station building.

Groundwater sampling conducted during Third Quarter 2013 for wells MW-3, MW-8, MW-9, and MW-11, which have not been sampled since 1999/2000, demonstrated the continued absence of hydrocarbon impact within downgradient and off-site wells associated with the Site. An increase in the GRO concentration within well MW-1 was observed when compared to the most recent sample collected in June 2000. However, it should be noted that the well was not purged prior to sample

collection due to insufficient water within the well casing, which could potentially have led to the collection of a stagnant, non-representative groundwater sample. Additionally, the GRO concentration was within the range of concentrations previously exhibited in well MW-1. This well is scheduled to be sampled again during First Quarter 2014 and concentrations will be re-evaluated at that time. Overall, the hydrocarbon plume appears to be mainly isolated to the southern portion of the property within the vicinity of the current and historic UST complex (see Drawings 4-6).

Based on current Site conditions and data collected during the CPT investigation, the site does appear to meet the requirement of the Low-Threat Closure Policy. Upon concurrence from ACEH and following conduct of additional groundwater sampling during the First Quarter 2014, it is anticipated that a case closure request will be prepared and submitted for review.

7.0 LIMITATIONS

The findings presented in this document are based upon: observation of field personnel from previous consultants, the points investigated, and results of laboratory tests performed by various laboratories. Our services were performed in accordance with the generally accepted standard of practice at the time this document was written. No other warranty, expressed or implied was made. This report has been prepared for the exclusive use of Atlantic Richfield Company. It is possible that variations in soil or groundwater conditions could exist beyond points explored in this investigation. Also changes in site conditions could occur in the future due to variations in rainfall, temperature, regional water usage, or other factors.

8.0 REFERENCES

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DRAWINGS

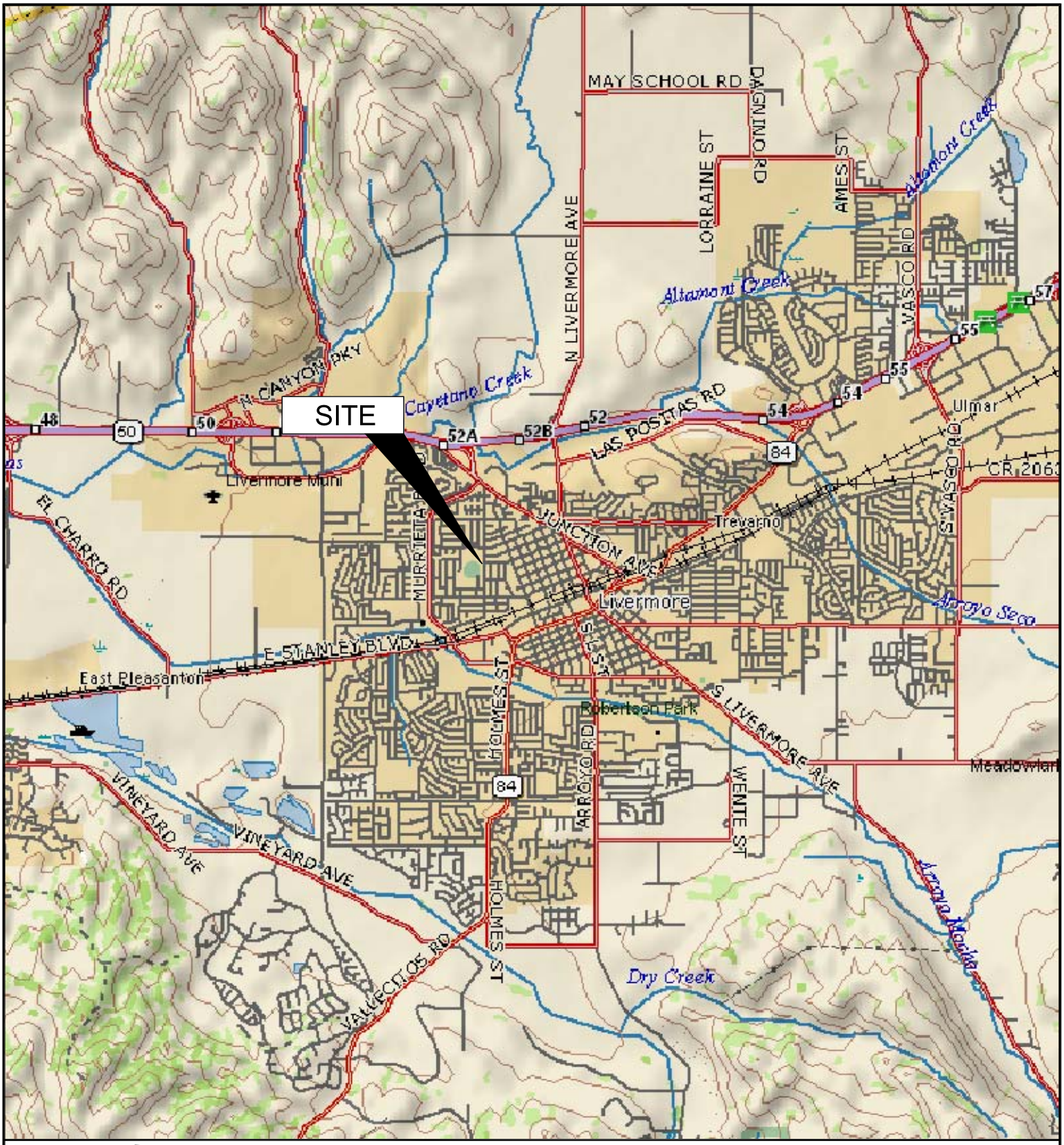


IMAGE SOURCE: DELORME

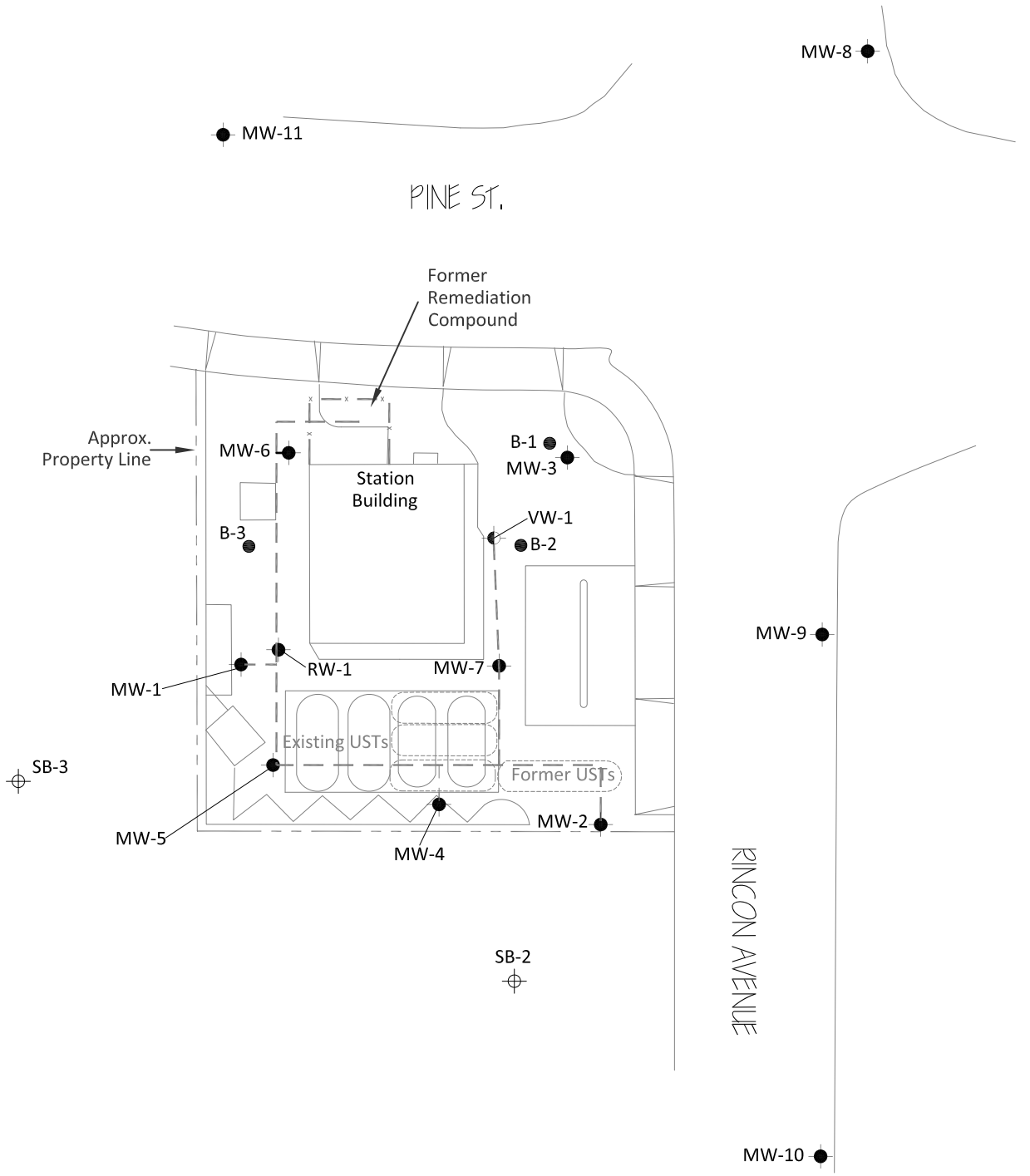
BROADBENT
1370 Ridgewood Drive, Suite 5
Chico, California 95973

Project No.: 06-82-608 Date: 9/6/2012

Station #771
899 Rincon Avenue
Livermore, California

Site Location Map

Drawing
1



LEGEND

- Monitoring Well Location
- Vapor Extraction Well Location
- CPT Boring Locations
- Soil Boring Locations
- Remediation Piping

NOTE: SITE MAP ADAPTED FROM URS FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

N

0 40 80

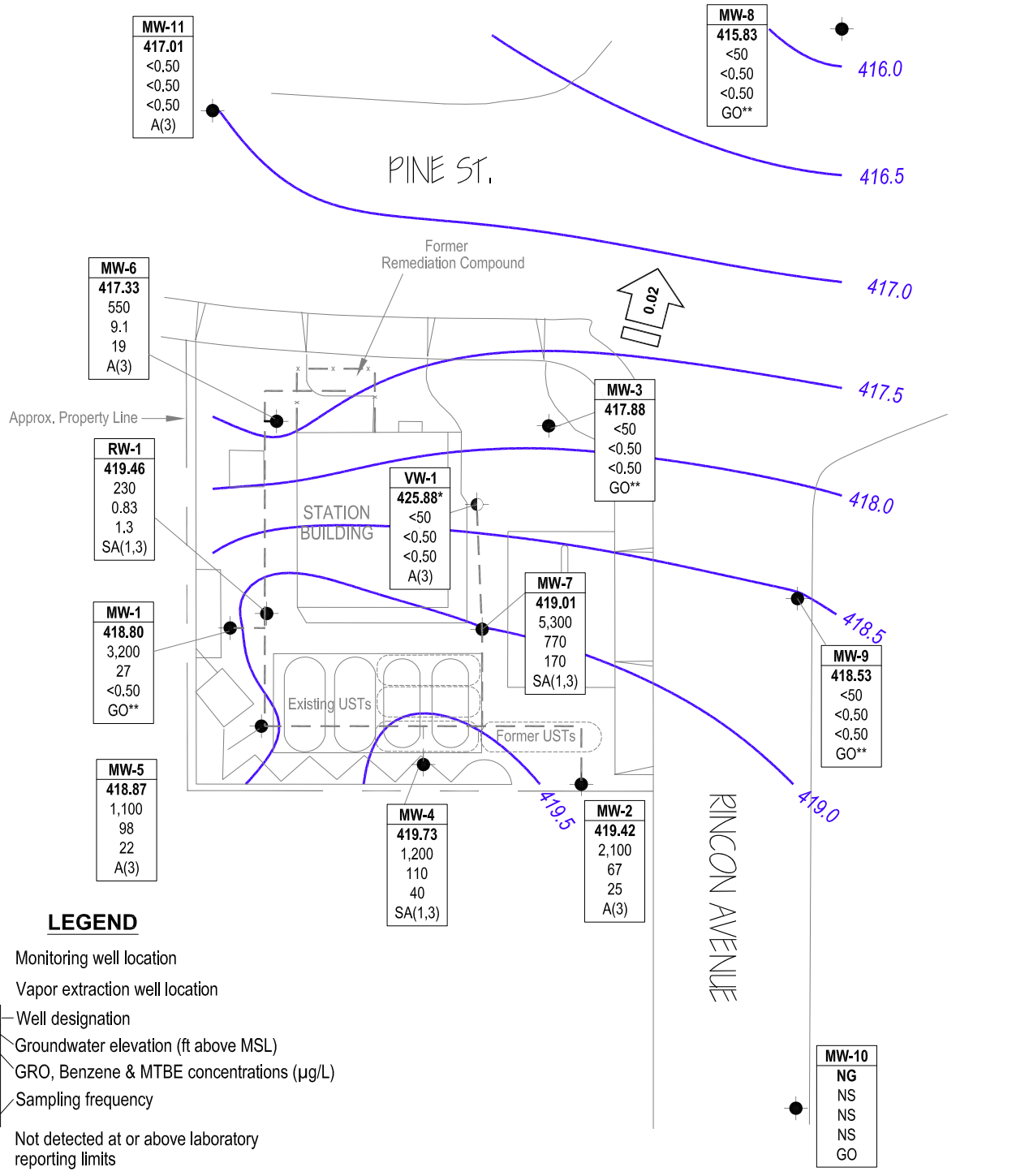
SCALE (ft)

BROADBENT
1370 Ridgewood Dr., Suite 5
Chico, California 95973
Project No.: 06-82-608 Date: 5/17/2013

Station #771
899 Rincon Avenue
Livermore, California

Site Map with Current Monitoring Well and CPT Boring Locations

Drawing
2



LEGEND

- Monitoring well location
- Vapor extraction well location
- **Well ID** — Well designation
- **ELEV** — Groundwater elevation (ft above MSL)
- GRO, Benzene & MTBE — GRO, Benzene & MTBE concentrations (µg/L)
- SA or A — Sampling frequency
- < — Not detected at or above laboratory reporting limits
- * — Not used in contouring
- ** — Sampled during current event
- NG — Not gauged
- NS — Not sampled
- A(3) — Sampled annually during 3rd quarter
- GO — Not sampled, gauged only
- SA(1,3) — Sampled semi-annually, 1st & 3rd quarters
- 425.5 — Groundwater elevation contour (ft above MSL)
- 0.02 — Approximate groundwater flow direction and gradient (ft/ft)
- Remediation piping

0 40 80
SCALE (ft)

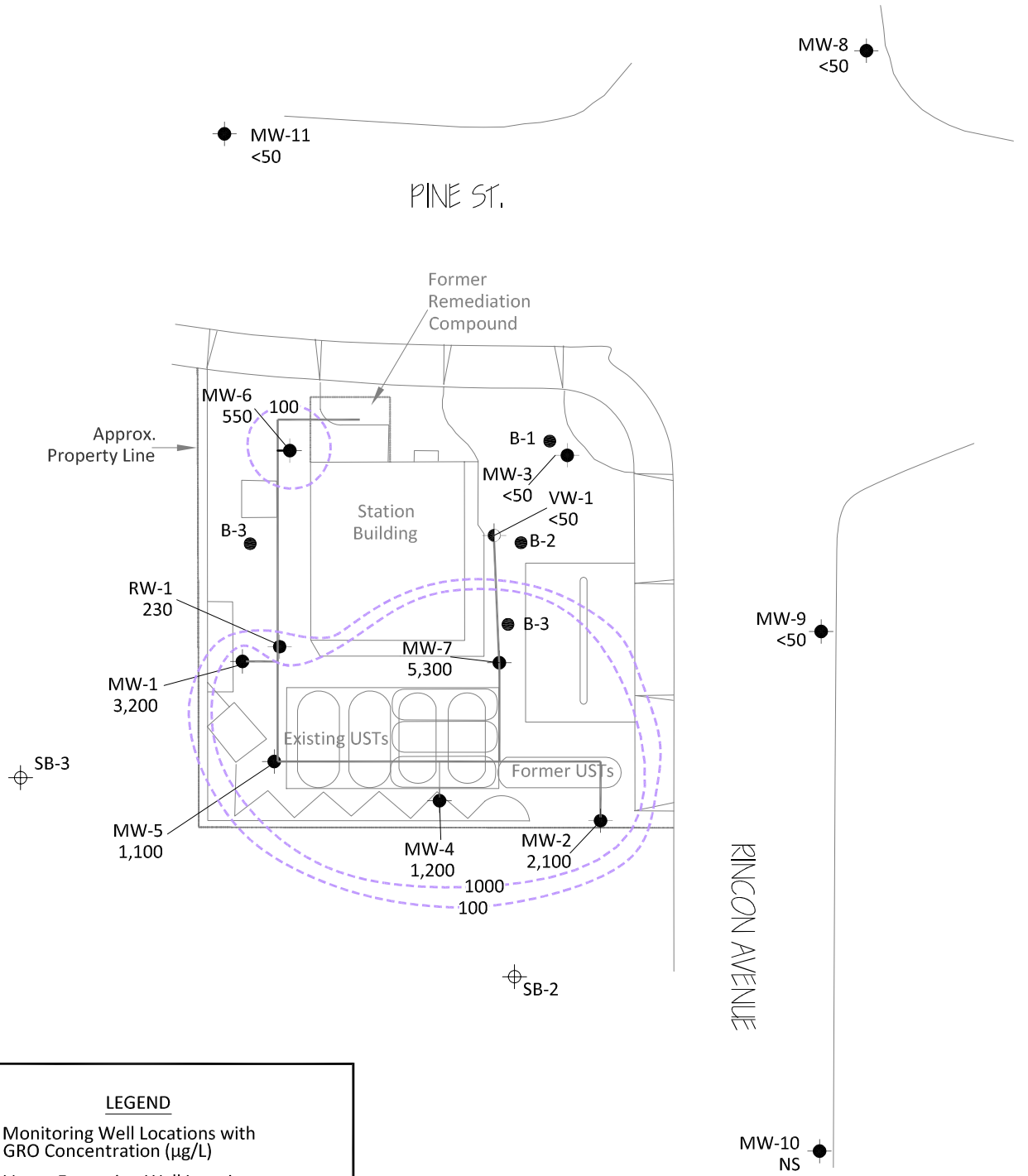
NOTE: SITE MAP ADAPTED FROM URS FIGURES.SITE DIMESIONS AND FACILITY LOCATIONS NOT VERIFIED.

BROADBENT
1370 Ridgewood Drive, Suite 5
Chico, California 95973
Project No.: 06-82-608 Date: 10/2/2012

Station #771
899 Rincon Avenue
Livermore, California

Groundwater Elevation Contour
and Analytical Summary Map
July 25, 2013

Drawing
3



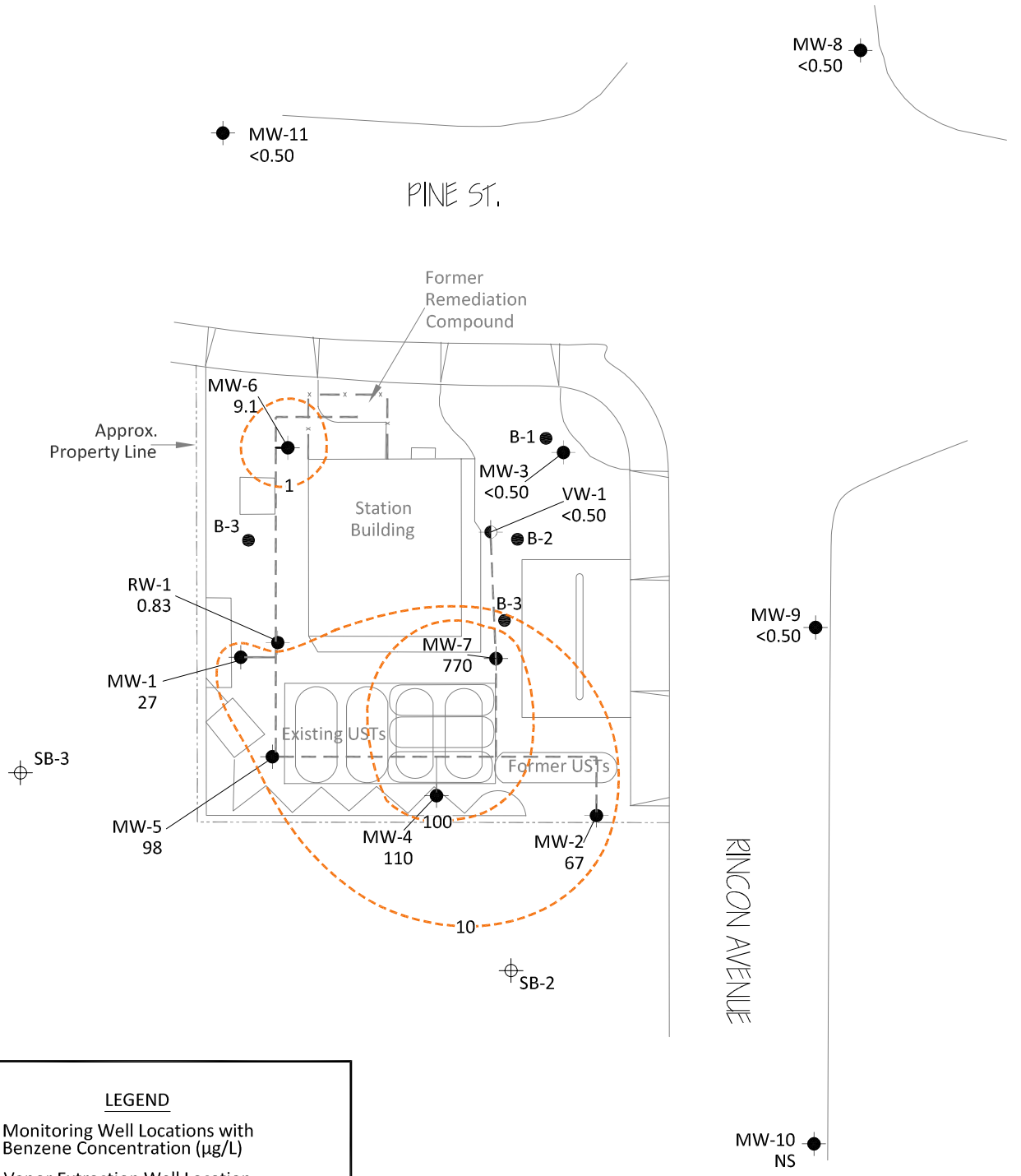
NOTE: SITE MAP ADAPTED FROM URS FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

BROADBENT
1370 Ridgewood Dr., Suite 5
Chico, California 95973
Project No.: 06-82-608 Date: 1/4/2013

Station #771
899 Rincon Avenue
Livermore, California

GRO Isoconcentration Contour Map
July 25, 2013

Drawing
4



LEGEND

- Monitoring Well Locations with Benzene Concentration (µg/L)
- Vapor Extraction Well Location
- Proposed CPT Boring Locations
- Soil Boring Locations
- Benzene Isoconcentration Contour (µg/L)
- < Not Detected at or Above Laboratory Reporting Limits
- NS Not Sampled
- Remediation Piping

N

0 40 80

SCALE (ft)

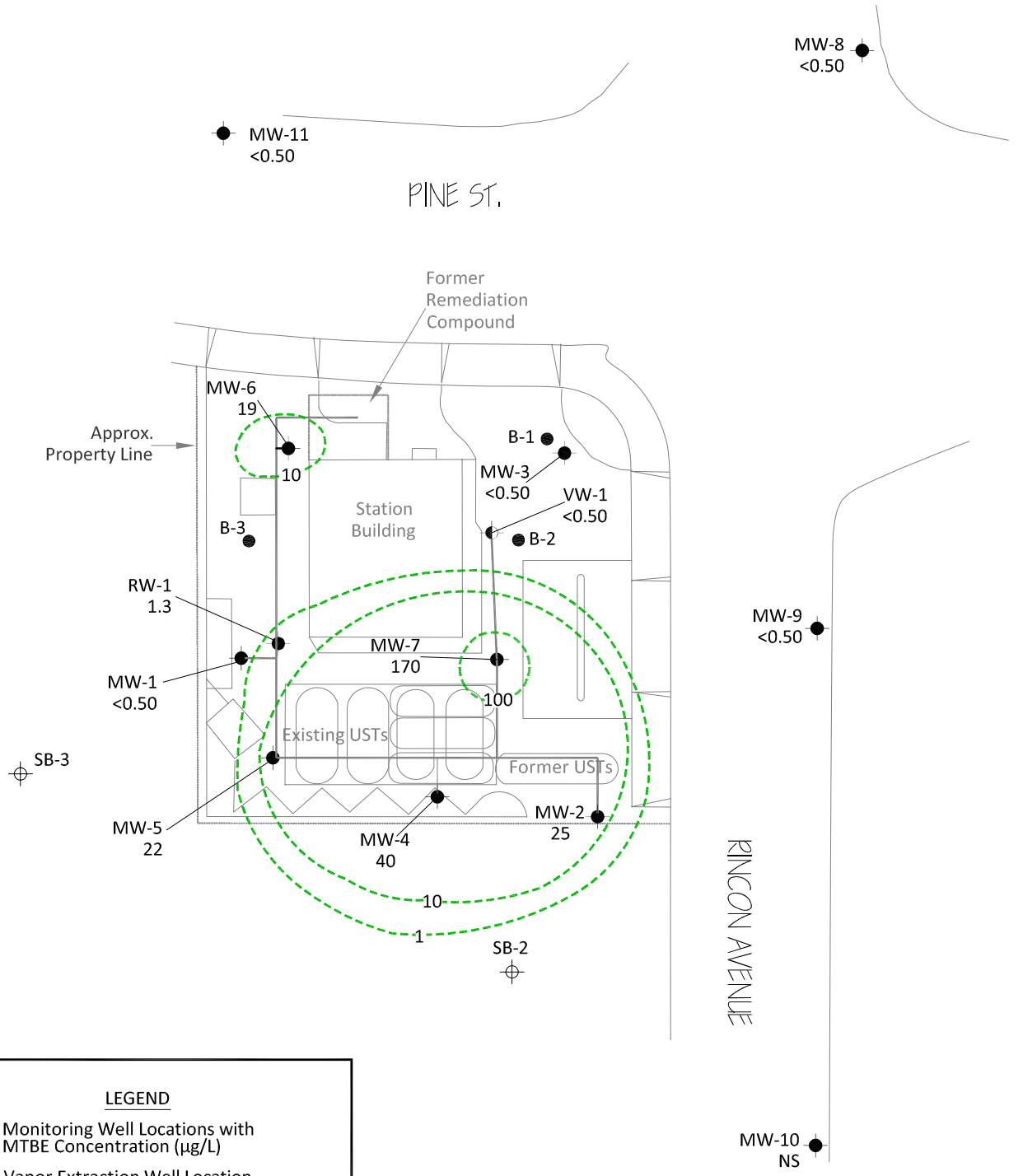
NOTE: SITE MAP ADAPTED FROM URS FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

BROADBENT
1370 Ridgewood Dr., Suite 5
Chico, California 95973
Project No.: 06-82-608 Date: 1/03/2014

Station #771
899 Rincon Avenue
Livermore, California

Benzene Isoconcentration Contour Map
July 25, 2013

Drawing
5



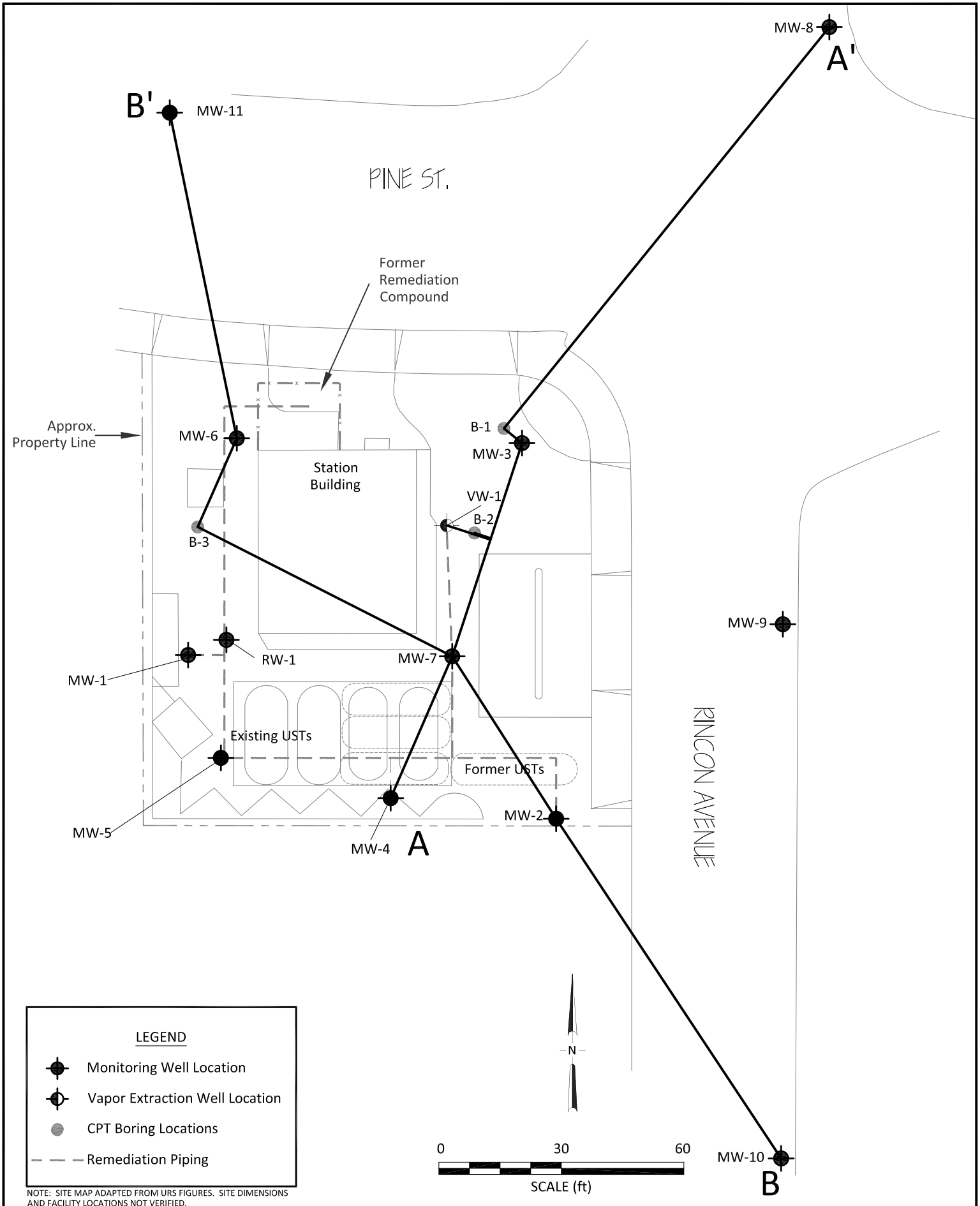
NOTE: SITE MAP ADAPTED FROM URS FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

BROADBENT
1370 Ridgewood Dr., Suite 5
Chico, California 95973
Project No.: 06-82-608 Date: 1/2/2013

Station #771
899 Rincon Avenue
Livermore, California

MTBE Isoconcentration Contour Map,
July 25, 2013

Drawing
6



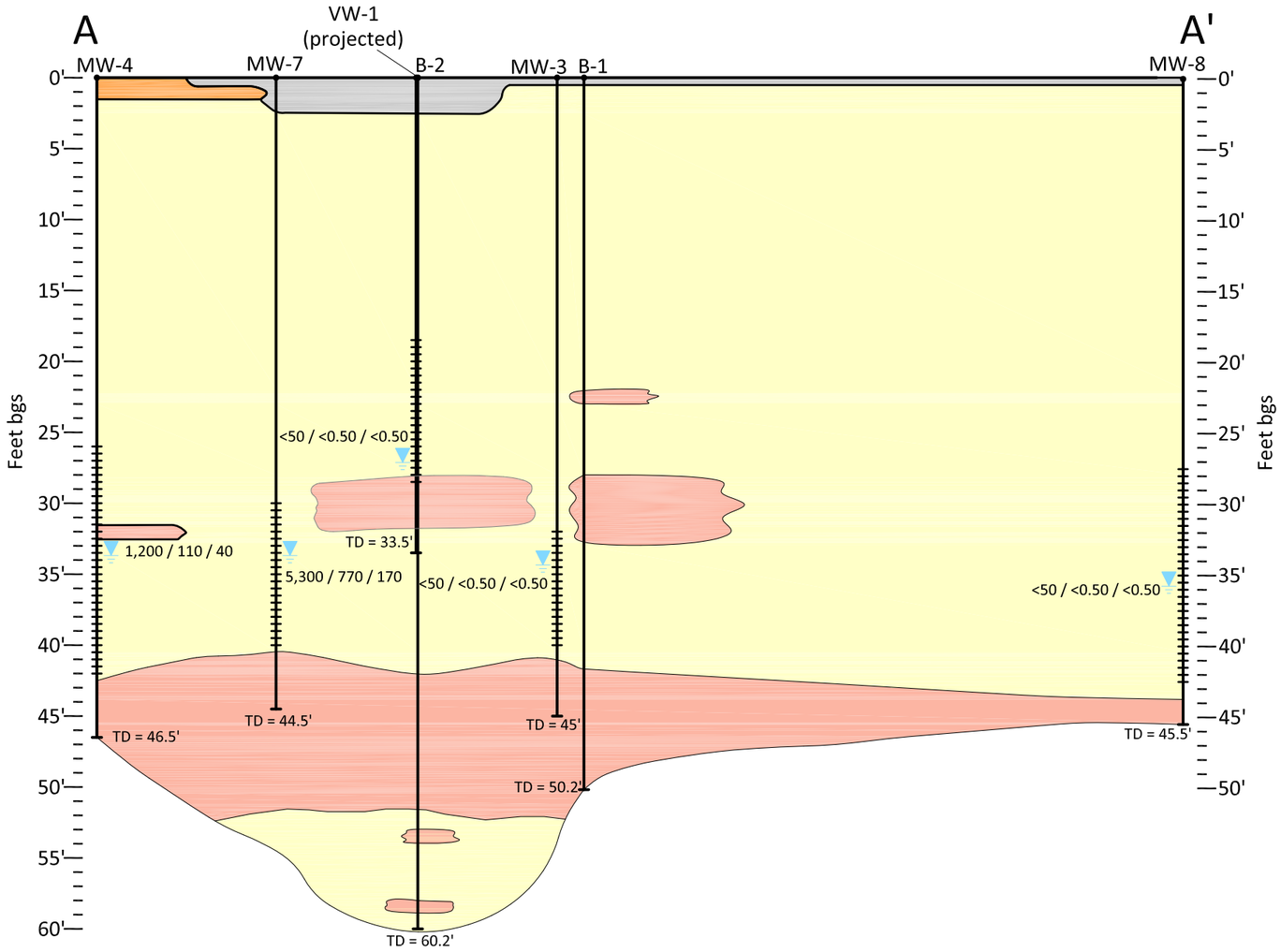
NOTE: SITE MAP ADAPTED FROM URS FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

BROADBENT
1370 Ridgewood Dr., Suite 5
Chico, California 95973
Project No.: 06-82-608 Date: 5/17/2013

Station #771
899 Rincon Avenue
Livermore, California

Site Map with Cross Section Locations

Drawing
7



Asphalt/Backfill

Gravels, Gravelly Sands

Well Graded Sands

Clayey Silts, Sandy Silts, Silty Clays

Groundwater Elevation (July 25, 2013)

1,200 / 110 / 40 — GRO, Benzene, and MTBE Concentrations in µg/L (July 25, 2013)

GRO — Gasoline Range Organics

NS — Not Sampled

µg/L — Micrograms per Liter

Boring ID

Extent of Boring

Extent of Well Screen

TD = Total Depth (feet)

0 30 60

HORIZONTAL SCALE (ft)
VERTICAL EXAGGERATION 3:1

Note: CPT lithology data was determined using soil behavior types and field logging observations during previous investigations.

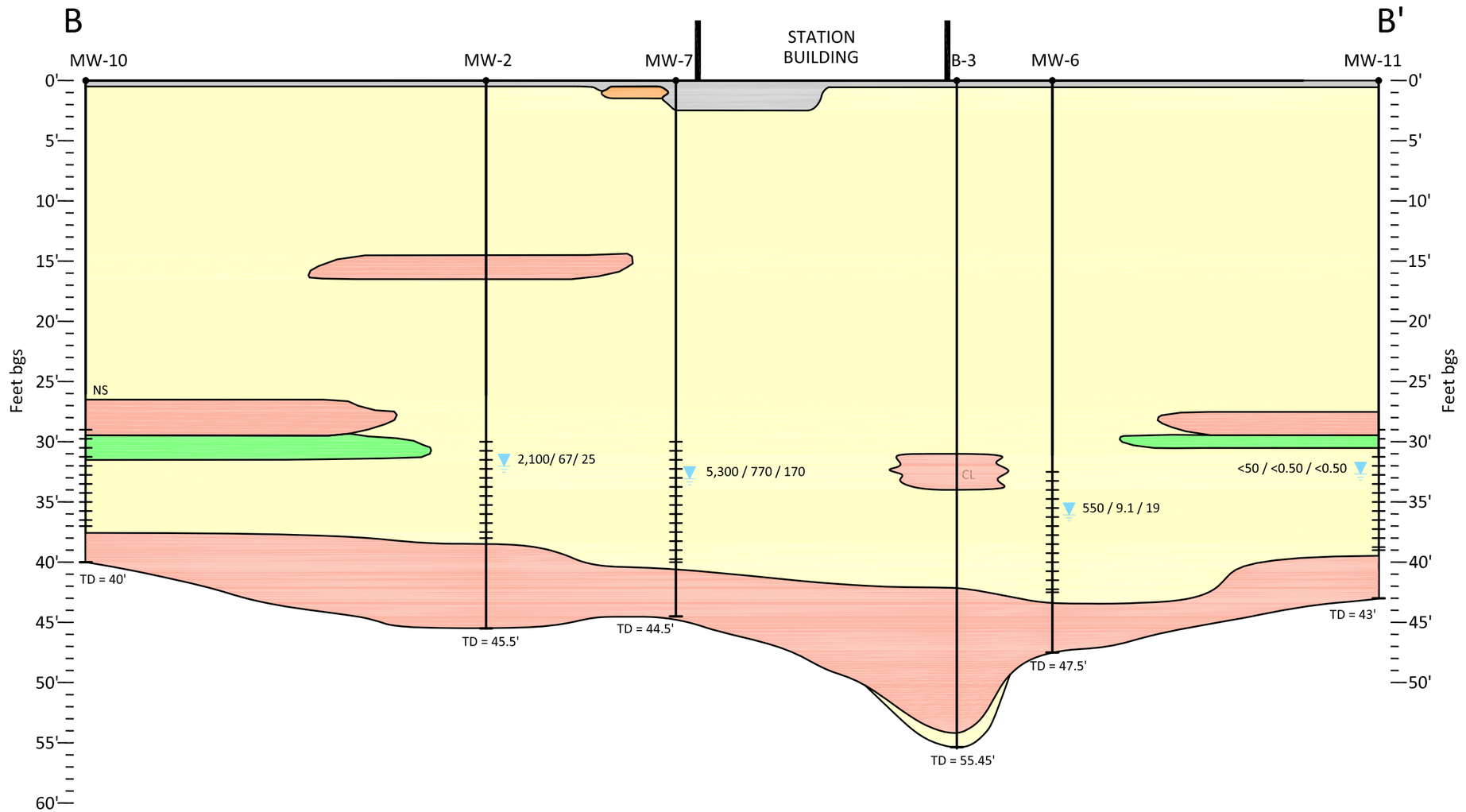
Drawing 8

Geologic Cross Section A - A'

Station #7771
899 Rincon Avenue
Livermore, California

BROADBENT
1370 Ridgewood Dr., Suite 5
Chico, California 95973

Project No.: 06-82-608 Date: 1/14/2014



Asphalt/Backfill

Gravels, Gravelly Sands

Well Graded Sands

Clayey Silts, Sandy Silts, Silty Clays

Clayey Sands, Silty Sands

▼	Groundwater Elevation (January 17, 2013)
3,100 / 430 / 120	GRO, Benzene, and MTBE Concentrations in µg/L (July 25, 2013)
GRO	Gasoline Range Organics
NS	Not Sampled
µg/L	Micrograms per Liter

Note: CPT lithology data was determined using soil behavior types and field logging observations during previous investigations.

Boring ID

Extent of Boring

Extent of Well Screen

TD = Total Depth (feet)

0 30 60

HORIZONTAL SCALE (ft)
VERTICAL EXAGGERATION 3:1

Drawing 9

Geologic Cross Section B - B'

Station #771
899 Rincon Avenue
Livermore, California

BROADBENT
1370 Ridgewood Dr., Suite 5
Chico, California 95973

Project No.: 06-88-608 Date: 1/14/2014

TABLES

TABLE 1

CONCEPTUAL SITE MODEL
Atlantic Richfield Company Station 771
899 Rincon Avenue
Livermore, California

CSM Element	CSM Sub-Element	Description	Data Gap Y/N	Data Gap Detail
Geology and Hydrogeology	Regional	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 groundwater 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. Mine quarrying pits on the west side of the Livermore Valley are currently 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	N	NA

TABLE 1

CONCEPTUAL SITE MODEL
Atlantic Richfield Company Station 771
899 Rincon Avenue
Livermore, California

CSM Element	CSM Sub-Element	Description	Data Gap Y/N	Data Gap Detail
Geology and Hydrogeology (Cont.)	Regional (Cont.)	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. These natural drainages are located approximately 0.7 miles (Arroyo las Positas) north, 0.75 miles south-southwest (Arroyo Mocho), and 2.75 miles southwest (Arroyo Valle) of the Site.		
Geology and Hydrogeology	Site	Depth to groundwater varies across the Site and through time from approximately 16.03 to 43.25 ft bgs. Resulting groundwater elevations have varied from approximately 408.12 ft to 433.18 ft. Since March of 1995 the groundwater flow direction was been predominately toward the north. However, on occasion a southwesterly flow direction has been observed. During this same time period the gradient magnitude has varied from 0.009 to 0.071. Groundwater flow direction and gradient data from the time period March 1995 through the present are provided in Table 4. Groundwater flow direction and gradient are generally	N	NA

TABLE 1

CONCEPTUAL SITE MODEL
Atlantic Richfield Company Station 771
899 Rincon Avenue
Livermore, California

CSM Element	CSM Sub-Element	Description	Data Gap Y/N	Data Gap Detail
Geology and Hydrogeology (Cont.)	Site (Cont.)	consistent with regional conditions, which do not account for localized variations due to slight local variations in lithology, differences in well screens, and local water withdrawals and surface infiltrations which include, but are not limited to, groundwater pumping. It is beyond the scope of any one Site to determine the causes of slight variations in groundwater gradient and direction, particularly when the general overall direction and gradient are consistent with regional conditions. Nearby municipal pumping rates and seasonal pumping variations may be useful in determining the apparent variations in the overall local groundwater flow direction at the Site. Soil underlying the Site has been consistently characterized as primarily clayey to sandy gravel interbedded with some silty sand and sandy silt to clay. A four and a half to five foot layer of moist sandy clay is encountered at varying depths ranging from 37 to 42.5 feet bgs. In well VW-1, a similar layer is present at approximately 30 feet bgs extending to the bottom of the well at 33.5 ft bgs. Following additional investigation activities conducted in October 2013, this layer appears to be intermittent and isolated within the vicinity of VW-1 as it was not observed in boring B-3 (see Drawing 2) located west of VW-1. Higher groundwater elevations could occur in this area when groundwater flow through the adjacent permeable gravels encounters this less permeable mound/ridge consisting of the sandy clay. Lithologic cross-sections are presented as Drawings 7 through 9. Available lithologic soil boring logs and well construction details are provided in Appendix C.		
Surface Water Bodies		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	N	NA

TABLE 1

CONCEPTUAL SITE MODEL
Atlantic Richfield Company Station 771
899 Rincon Avenue
Livermore, California

CSM Element	CSM Sub-Element	Description	Data Gap Y/N	Data Gap Detail
Surface Water Bodies (Cont.)		joins Alameda Creek in Sunol Valley. These natural drainages are located approximately 0.7 miles (Arroyo las Positas) north, 0.75 miles south-southwest (Arroyo Mocho), and 2.75 miles southwest (Arroyo Valle) of the Site.		
Nearby Wells		A water well survey was conducted by URS in September 2003. A more recent survey has recently been conducted in 2013. The 2003 survey concluded that four water wells were located within 2,640 feet (0.5 miles) of the Site. Two were water supply wells located approximately 2,500 feet and 2,300 feet crossgradient of the Site. The other two wells were of unknown use and were reported as being located approximately 240 feet cross-gradient and 2,300 feet up-gradient of the Site. Upon further review of the well logs, the well of unknown use that was believed to be located approximately 240 feet crossgradient from the Site was incorrectly located by URS. The correct location of the well is 450 feet downgradient of the Site (across Pine Street and on the north side of the fire station). It is unknown whether this well was properly abandoned, however, following conversations with fire station personnel, it has been determined that this well is no longer in use and currently located beneath the existing fire station building. During the recent well survey (Section 3.0 of the Work Plan) a total of three municipal supply wells and one domestic well were identified within 2,000 feet of the Site. Potential impact to these municipal and domestic wells within the search radius is possible; however, the Coon domestic well (Drawing 4 ID#3), if present, and one of the three municipal wells (Drawing 4 ID#4) are both located in a general upgradient direction from the Site, while another of the three municipal wells (Drawing 4 ID#4) is located in a general cross-gradient direction. The final municipal well (Drawing 4 ID#1) is located to the Northeast of the Site in a general downgradient direction. Offsite monitoring well MW-8 is located downgradient of	N	NA

TABLE 1

CONCEPTUAL SITE MODEL
Atlantic Richfield Company Station 771
899 Rincon Avenue
Livermore, California

CSM Element	CSM Sub-Element	Description	Data Gap Y/N	Data Gap Detail
Nearby Wells (Cont.)		the Site, between the Site and the downgradient municipal well. Well MW-8 only contained very sporadic and low petroleum concentrations during previous monitoring events conducted prior to 2001. MW-8 was recently sampled during Third Quarter 2013 and hydrocarbon concentrations were not observed above laboratory reporting limits. This municipal well was verified to currently be in use by Cal Water. However, based on its distance from the Site and current non-detect concentrations observed in downgradient wells MW-3, MW-8 and MW-11, impact to this well from Station #771 is unlikely. Potable water is provided to residences and businesses in the general area by Cal Water.		
Constituents of Concern	Light-Non Aqueous Phase Liquids (LNAPL)	LNAPL was first detected in onsite soil boring B-1 (0.01 ft) during a limited subsurface assessment on February 1, 1990. LNAPL in monitoring wells was first observed in MW-1 (0.10 ft) on July 25, 1991, in MW-2 (0.16 ft) on January 15, 1991, and in MW-5 (0.03 ft) on August 13, 1991. Passive skimmers were installed in these three wells. Approximately 3.06 gallons of LNAPL were recovered in 1991 and 1992. LNAPL had not been observed in any of the monitoring wells since November 1992 until recently. Historic LNAPL measurements and removal volumes are summarized in Appendix B. During the Third Quarter 2012, LNAPL was reported in well MW-7 for the first time during its monitoring history. This measurement coincided with the lowest groundwater level ever noted in this well. No LNAPL was noted during the First or Third Quarter 2013 events, after groundwater levels had rebounded. The origin and extent of this recent LNAPL remains unclear, but may be related to depressed groundwater elevations.	N	NA

TABLE 1

CONCEPTUAL SITE MODEL
Atlantic Richfield Company Station 771
899 Rincon Avenue
Livermore, California

CSM Element	CSM Sub-Element	Description	Data Gap Y/N	Data Gap Detail
Constituents of Concern	Gasoline Range Organics (GRO)	GRO has been detected in onsite wells MW-1 through MW-7, RW-1, and VW-1. Since 1995 concentrations of GRO have ranged from 90,000 µg/L in well MW-1 (1995) to below laboratory reporting limits in wells MW-1 through MW-6, RW-1, and VW-1. GRO concentrations in VW-1 have remained below laboratory detection limits since Third Quarter 2007. GRO has significantly decreased over time in all onsite wells. However, recently GRO has increased in concentration in well MW-7, but significant increases have not been noted in other Site wells. It appears that this increase may be the result of fluctuating groundwater levels as opposed to a new release based on the recent decrease in concentrations and lack of continued observance of LNAPL. The fact that the most recent GRO concentration in well VW-1 was below the laboratory reporting limit indicates that the plume terminates between MW-7 and VW-1. GRO concentrations reported in recently-collected groundwater samples from CPT borings B-1 and B-2 confirm this definition, as GRO were not detected in these samples. Drawing 4 presents a GRO isoconcentration contour map for the Third Quarter 2013. GRO has not been detected in offsite wells MW-8 through MW-11, although MW-10 has not been sampled for over ten years. Recent detections below laboratory reporting limits during conduct of the Third Quarter 2013 sampling event confirmed the absence of hydrocarbon impact in wells MW-8, MW-9, and MW-11. However, the concentration of GRO observed in well MW-1 increased by an order of magnitude from the last time this well was sampled. However, it should be noted that appropriate purging could not be completed during sampling activities due to an insufficient amount of water present within the well casing. Although this is not currently considered a data gap, an attempt will be made to sample well MW-1 again during the First Quarter 2014 groundwater monitoring event in order to further evaluate current concentrations.	N	NA

TABLE 1

CONCEPTUAL SITE MODEL
Atlantic Richfield Company Station 771
899 Rincon Avenue
Livermore, California

CSM Element	CSM Sub-Element	Description	Data Gap Y/N	Data Gap Detail
Constituents of Concern	Benzene	Benzene has been detected in all onsite wells MW-1 through MW-7, RW-1, and VW-1. Since 1995, concentrations of benzene have ranged from 4,000 µg/L in well MW-1 (1995) to non-detect. The maximum current benzene concentration is present in well MW-7 at a concentration of 770 µg/L, a decrease of one order of magnitude from the historic maximum. Currently no benzene is detected in wells MW-3, MW-8, MW-9, MW-11 and VW-1. Available benzene analytical data indicates that the majority of benzene concentrations are present near the former USTs, with lower to non-detect concentrations in the northern, downgradient direction. The lack of benzene impacts in well VW-1 indicate that the plume terminates between MW-7 and VW-1. Benzene concentrations reported in recently-collected groundwater samples from CPT borings B-1 and B-2 confirm this definition, as benzene was not detected in these samples. A benzene isoconcentration contour map is presented as Drawing 5. With the exception of the occasional detection, benzene has not been observed in offsite wells MW-8 through MW-11.	N	NA
Constituents of Concern	MTBE	MTBE has been detected at relatively low concentrations in onsite wells MW-1, MW-2, MW-4 through MW-7, and RW-1. Since 1995, maximum concentrations of MTBE have been recorded at 270 µg/L in MW-1 (1999), 130 µg/L in MW-2 (1998), 360 µg/L in MW-4 (2001), 330 µg/L in MW-5 (2001), 57.1 µg/L in MW-6 (2001), 350 µg/L in MW-7 (1995), and 530 µg/L in RW-1 (1999). MTBE concentrations have generally decreased over time and are currently near or below detection limits in wells MW-2, MW-3, MW-5, MW-6, RW-1, and VW-1. The lack of MTBE impacts in well VW-1 indicates that the plume terminates between MW-7 and VW-1. MTBE concentrations reported in recently-collected groundwater samples from CPT borings B-1 and B-2 confirm this definition, as MTBE was not detected in these samples. An MTBE isoconcentration contour map is presented as Drawing 6.	N	NA

TABLE 1

CONCEPTUAL SITE MODEL
Atlantic Richfield Company Station 771
899 Rincon Avenue
Livermore, California

CSM Element	CSM Sub-Element	Description	Data Gap Y/N	Data Gap Detail
Constituents of Concern (Cont.)	MTBE (Cont.)	MTBE has not been detected in offsite wells MW-8 through MW-11, however, well MW-10 has not been sampled for over 10 years.		
Potential Sources	Onsite	The exact source and volume released is unknown. However, based on historic reports and observed contaminant concentrations, the source area is suspected to be the former UST complex located in the southern portion of the Site. However, concentrations of petroleum hydrocarbons were also observed in shallow soils beneath the dispenser pump islands while trenching to replace the product lines. Due to the area and predominant depth of first detected impacted soil in the vicinity of the UST complex, it appears that the majority of the release occurred beneath the former USTs.	N	NA
Potential Sources	Offsite	No offsite sources have been identified.	N	NA
Nature and Extent of Environmental Impacts	Extent in Soil	Overexcavation in the former UST area was completed to a depth of 18 feet. Two soil samples from this depth showed detections of TPHg at or in excess of 100 mg/kg. Overexcavation was conducted to a depth of five feet in the product line area. One soil sample from this depth showed a detection of TPHg at 91 mg/kg. An unknown amount of petroleum hydrocarbon may be presently bound within the soil matrix within these areas. A fluctuating groundwater table has also likely "smeared" contaminants in soils up to the high water mark. Sorbed hydrocarbon mass may also be present in finer-grained soils noted at approximately 42 feet bgs in most borings and wells at the Site.	N	NA
Nature and Extent of Environmental Impacts	Extent in Shallow Groundwater	During the Third Quarter 2013 monitoring event, the maximum GRO, Benzene, and MTBE concentrations were detected in well MW-7 at 5,300 ug/L, 770 ug/L, and 170 ug/L, respectively. The highest concentrations of petroleum hydrocarbons recently observed in Site groundwater are consistently reported in well MW-7, which is consistent with its location adjacent to the former USTs.	N	NA

TABLE 1

CONCEPTUAL SITE MODEL
Atlantic Richfield Company Station 771
899 Rincon Avenue
Livermore, California

CSM Element	CSM Sub-Element	Description	Data Gap Y/N	Data Gap Detail
Nature and Extent of Environmental Impacts (Cont.)	Extent in Shallow Groundwater (Cont.)	Petroleum hydrocarbon impacts are defined in the downgradient and crossgradient directions by wells MW-8 through MW-11, although well MW-10 has not been sampled in over 10 years. Petroleum hydrocarbons are defined in the upgradient direction by borings SB-2 and SB-3 (Drawing 2), advanced in 2011. GRO and MTBE were detected in the groundwater samples collected from SB-2 and SB-3, however these concentrations were significantly lower than in onsite wells, and below CRWQCB ESLs (CRWQCB, 2013). No other hydrocarbons were detected. Therefore, the plume is considered defined in the upgradient direction. Isoconcentration maps for the most recent groundwater monitoring and sampling event (3Q13) for GRO, benzene, and MTBE are included as Drawings 4 through 6, respectively. Based on these drawings, the extent of petroleum compounds is well defined in all directions, and is predominately limited to onsite.		
Nature and Extent of Environmental Impacts	Extent in Deeper Groundwater	The extent of deeper groundwater was defined during additional on-Site investigation activities conducted in October 2013. A depth discrete groundwater sample was collected from boring B-2 (see Drawing 2) between approximately 53 and 58 feet bgs. Hydrocarbon concentrations were not detected above laboratory reporting limits in the sample collected. Analytical results are summarized on Table 6.	N	NA
Migration Pathways	Potential Conduits	Broadbent has no record of a formal utility survey of the Site and surrounding area. Soil excavation conducted during tank removal activities was completed to a depth of 18 feet bgs and groundwater underneath the Site, at its shallowest, has been 16.03 feet bgs. Therefore, it is unlikely that utility trenches within and near the Site could be serving as preferential pathways for contaminant migration above or below the groundwater table.	N	NA
Potential Receptors	Onsite	No onsite water supply wells or surface water exists. The only potential onsite receptor would be onsite workers exposed to gasoline vapors. However, the	N	NA

TABLE 1

CONCEPTUAL SITE MODEL
Atlantic Richfield Company Station 771
899 Rincon Avenue
Livermore, California

CSM Element	CSM Sub-Element	Description	Data Gap Y/N	Data Gap Detail
Potential Receptors (Cont.)	Onsite (Cont.)	exposure from current fueling operations for onsite workers represents a greater risk than any associated with potential groundwater or soil vapor exposure (SWRCB, 2012).		
Potential Receptors	Offsite	Recent sensitive receptor survey activities identified three nearby municipal supply wells and one domestic well. However, only one of these wells is located in the downgradient direction. This downgradient well (Drawing 4, ID#1) is located approximately 1,075 feet downgradient of the Site. Currently, the presence of the well (ID#1) has been confirmed via a telephone conversation to Cal Water (the well owner and water service provider). Cal Water also verified that the well is currently in use for water supply purposes. However, the absence of hydrocarbon impact to the groundwater within downgradient Site monitoring wells MW-3, MW-8, and MW-11, which all appear to be located between the Site plume and the municipal well, was confirmed during the Third Quarter 2013 monitoring/sampling event. Based on data gathered regarding this well, the screen interval is deeper than known impacts (screen interval is approximately 133-433 feet bgs whereas impacts do not extend past first-encountered groundwater at approximately 30 feet bgs). Assuming a standard sanitary seal of 50 feet bgs or more, the depth of the supply well screen interval, the lateral distance from the Site to the well (over 1,000 feet), and the presence of multiple monitoring wells between impacts and the offsite well, there is no risk to this receptor from onsite groundwater impacts.	N	NA

Notes:

bgs = below ground surface
TPHg = Total Petroleum Hydrocarbons as Gasoline
GRO = Gasoline Range Organics
DRO = Diesel Range Organics
MTBE = Methyl tert-butyl Ether
All report references are included in Section 3 of the preceding report

MTBE = Methyl tert-butyl Ether
BTEX = benzene, toluene, ethylbenzene, xylenes
µg/L = micrograms per liter
mg/Kg = milligrams per kilogram
ESLs = Environmental Screening Levels

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (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															
3/20/1995	--	451.73	32.00	41.00	24.50	427.23	90,000	1,800	1,100	1,000	5,600	--	--	--	
6/2/1995	--		32.00	41.00	25.60	426.13	81,000	2,000	1,400	990	4,600	--	--	--	
8/23/1995	--		32.00	41.00	29.04	422.69	44,000	2,400	1,900	670	3,800	<300	--	--	
12/4/1995	--		32.00	41.00	31.31	420.42	22,000	870	660	390	2,200	--	--	--	
2/20/1996	--		32.00	41.00	22.26	429.47	21,000	1,500	1,200	650	3,500	<300	--	--	
5/15/1996	--		32.00	41.00	23.42	428.31	36,000	3,000	2,500	960	5,700	<250	--	--	
8/13/1996	--		32.00	41.00	26.83	424.90	19,000	730	580	450	2,500	<200	--	--	
11/13/1996	--		32.00	41.00	31.05	420.68	6,600	47	16	74	160	<30	--	--	
3/26/1997	--		32.00	41.00	26.29	425.44	1,900	100	55	37	200	<30	--	--	
5/15/1997	--		32.00	41.00	28.65	423.08	16,000	490	250	250	1,100	<120	--	--	
8/26/1997	--		32.00	41.00	31.53	420.20	190	6.7	3	6.3	25	<3	--	--	
11/5/1997	--		32.00	41.00	33.93	417.80	63	0.5	<0.5	0.8	2.4	29	--	--	
2/18/1998	--		32.00	41.00	20.46	431.27	23,000	1,500	610	550	3,000	<120	--	--	
5/20/1998	--		32.00	41.00	23.84	427.89	50,000	4,400	1,900	1,400	80,000	<300	--	--	
7/30/1998	P		32.00	41.00	26.94	424.79	150	<0.5	<0.5	<0.5	1.6	<3	8.74	--	
10/29/1998	NP		32.00	41.00	32.58	419.15	<50	<0.5	<0.5	<0.5	1.8	<3	2.0	--	
3/16/1999	P		32.00	41.00	26.20	425.53	3,200	160	32	89	390	270	2.0	--	
5/5/1999	P		32.00	41.00	27.57	424.16	3,600	140	46	76	290	170	11.65	--	
8/26/1999	P		32.00	41.00	30.25	421.48	3,200	210	29	100	220	120	1.43	--	
12/3/1999	NP		32.00	41.00	32.70	419.03	53	<0.5	<0.5	<0.5	1	<3	2.12	--	
3/13/2000	P		32.00	41.00	24.45	427.28	<50	<0.5	<0.5	<0.5	<1	<3	5.81	--	
6/20/2000	--		32.00	41.00	27.79	423.94	67.4	3.88	<0.500	1.78	1.48	<2.50	--	--	b
6/20/2000	P		32.00	41.00	27.79	423.94	356	40.1	7.17	11.9	22.7	<2.50	5.1	--	
8/31/2000	--		32.00	41.00	30.35	421.38	--	--	--	--	--	--	--	--	
2/9/2001	--		32.00	41.00	30.95	420.78	--	--	--	--	--	--	--	--	
9/17/2001	--		32.00	41.00	30.85	420.88	--	--	--	--	--	--	--	--	
1/21/2002	--		32.00	41.00	30.61	421.12	--	--	--	--	--	--	--	--	
7/19/2002	--		32.00	41.00	31.55	420.18	--	--	--	--	--	--	--	--	
1/15/2003	--		32.00	41.00	22.99	428.74	--	--	--	--	--	--	--	--	
7/9/2003	--		32.00	41.00	30.35	421.38	--	--	--	--	--	--	--	--	

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (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 Cont.															
02/19/2004	--	451.73	32.00	41.00	26.24	425.49	--	--	--	--	--	--	--	--	
08/04/2004	--	454.23	32.00	41.00	26.36	427.87	--	--	--	--	--	--	--	--	
01/18/2005	--		32.00	41.00	24.47	429.76	--	--	--	--	--	--	--	--	
07/15/2005	--		32.00	41.00	29.44	424.79	--	--	--	--	--	--	--	--	
01/10/2006	--		32.00	41.00	22.58	431.65	--	--	--	--	--	--	--	--	
7/21/2006	--		32.00	41.00	20.73	433.50	--	--	--	--	--	--	--	--	
1/17/2007	--		32.00	41.00	31.88	422.35	--	--	--	--	--	--	--	--	
7/18/2007	--		32.00	41.00	32.85	421.38	--	--	--	--	--	--	--	--	
1/15/2008	--		32.00	41.00	28.76	425.47	--	--	--	--	--	--	--	--	
7/7/2008	--		32.00	41.00	35.56	418.67	--	--	--	--	--	--	--	--	
1/7/2009	--		32.00	41.00	34.07	420.16	--	--	--	--	--	--	--	--	
7/22/2009	--		32.00	41.00	--	--	--	--	--	--	--	--	--	--	Dry
3/12/2010	--		32.00	41.00	27.61	426.62	--	--	--	--	--	--	--	--	
9/9/2010	--		32.00	41.00	31.72	422.51	--	--	--	--	--	--	--	--	
2/17/2011	--		32.00	41.00	32.11	422.12	--	--	--	--	--	--	--	--	
7/7/2011	--		32.00	41.00	31.12	423.11	--	--	--	--	--	--	--	--	
1/23/2012	--		32.00	41.00	34.34	419.89	--	--	--	--	--	--	--	--	
7/25/2012	--		32.00	41.00	--	--	--	--	--	--	--	--	--	--	Dry
1/17/2013	--		32.00	41.00	30.14	424.09	--	--	--	--	--	--	--	--	
7/25/2013	**--**		**32.00**	**41.00**	**35.43**	**418.80**	**3,200**	**27**	**1.9**	**35**	**17**	**<0.50**	**--**	**--**	**j**
MW-2															
3/20/1995	--	449.49	30.00	38.00	20.27	429.22	54,000	2,600	1,600	1,200	7,600	--	--	--	
6/2/1995	--		30.00	38.00	22.32	427.17	37,000	2,200	800	980	4,800	--	--	--	
8/23/1995	--		30.00	38.00	25.69	423.80	65,000	1,100	310	840	3,000	<500	--	--	
12/4/1995	--		30.00	38.00	28.52	420.97	19,000	680	150	410	1,600	--	--	--	
2/20/1996	--		30.00	38.00	19.00	430.49	22,000	1,200	240	590	2,200	<300	--	--	
5/15/1996	--		30.00	38.00	20.03	429.46	25,000	1,200	240	610	2,100	<300	--	--	
8/13/1996	--		30.00	38.00	24.44	425.05	19,000	640	110	420	1,200	<300	--	--	
11/13/1996	--		30.00	38.00	28.42	421.07	15,000	260	52	220	640	<200	--	--	
3/26/1997	--		30.00	38.00	22.98	426.51	17,000	580	120	360	980	<120	--	--	

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-2 Cont.															
5/15/1997	--	449.49	30.00	38.00	25.40	424.09	18,000	420	63	340	730	<120	--	--	
8/26/1997	--		30.00	38.00	28.38	421.11	5,300	210	26	140	270	<120	--	--	
11/5/1997	--		30.00	38.00	31.93	417.56	560	42	2.6	7	9	<40	--	--	
2/18/1998	--		30.00	38.00	16.87	432.62	18,000	710	120	480	1,100	130	--	--	
5/20/1998	--		30.00	38.00	20.29	429.20	16,000	480	72	440	1,100	<120	--	--	
7/30/1998	P		30.00	38.00	23.51	425.98	9,700	240	33	210	490	<120	9.21	--	
10/29/1998	NP		30.00	38.00	30.08	419.41	58	<0.5	<0.5	<0.5	1.2	<3	1.0	--	
3/16/1999	P		30.00	38.00	23.22	426.27	4,700	120	13	90	220	60	2.0	--	
5/5/1999	P		30.00	38.00	24.05	425.44	5,500	58	7.1	58	98	17	9.09	--	
8/26/1999	P		30.00	38.00	26.44	423.05	3,700	55	11	60	64	26	1.9	--	
12/3/1999	NP		30.00	38.00	30.15	419.34	130	<0.5	<0.5	0.7	1.8	<3	1.96	--	
3/13/2000	P		30.00	38.00	20.68	428.81	<50	<0.5	<0.5	<0.5	<1	<3	--	--	
6/20/2000	P		30.00	38.00	23.08	426.41	226	2.2	<0.500	4.83	7.88	<2.50	4.9	--	
8/31/2000	P		30.00	38.00	26.71	422.78	87.1	1.78	<0.500	1.33	1.15	<2.50	1.59	--	
2/9/2001	--		30.00	38.00	29.65	419.84	--	--	--	--	--	--	--	--	
9/17/2001	P		30.00	38.00	27.62	421.87	3,100	300	12	8.8	18	120	1.7	--	
1/21/2002	--		30.00	38.00	27.09	422.40	--	--	--	--	--	--	--	--	
7/19/2002	P		30.00	38.00	27.82	421.67	4,700	280	13	120	19	16	0.8	7.4	a
1/15/2003	--		30.00	38.00	22.18	427.31	--	--	--	--	--	--	--	--	
7/9/2003	--		30.00	38.00	26.40	423.09	3,900	170	<5.0	100	19	39	2.5	7.0	
02/19/2004	--		30.00	38.00	23.85	425.64	--	--	--	--	--	--	--	--	
08/04/2004	P	452.05	30.00	38.00	24.71	427.34	5,400	650	21	160	56	78	0.8	7.2	
01/18/2005	--		30.00	38.00	20.86	431.19	--	--	--	--	--	--	--	--	
07/15/2005	P		30.00	38.00	25.92	426.13	5,200	160	5.3	56	10	46	3.1	6.9	
01/10/2006	--		30.00	38.00	19.25	432.80	--	--	--	--	--	--	--	--	
7/21/2006	P		30.00	38.00	25.73	426.32	120	0.90	<0.50	<0.50	<0.50	<0.50	6.08	8.3	
1/17/2007	--		30.00	38.00	28.70	423.35	--	--	--	--	--	--	--	--	
7/18/2007	P		30.00	38.00	29.07	422.98	2,300	58	2.4	9.5	3.5	45	1.19	7.51	
1/15/2008	--		30.00	38.00	24.65	427.40	--	--	--	--	--	--	--	--	
7/7/2008	NP		30.00	38.00	32.41	419.64	3,600	28	<5.0	<5.0	<5.0	19	2.81	7.24	

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ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-2 Cont.															
1/7/2009	--	452.05	30.00	38.00	31.67	420.38	--	--	--	--	--	--	--	--	
7/22/2009	--		30.00	38.00	33.48	418.57	--	--	--	--	--	--	--	--	
3/12/2010	--		30.00	38.00	23.84	428.21	--	--	--	--	--	--	--	--	
9/9/2010	P		30.00	38.00	27.84	424.21	6,200	53	3.8	18	9.5	13	--	6.8	
2/17/2011	--		30.00	38.00	27.52	424.53	--	--	--	--	--	--	--	--	
7/7/2011	P		30.00	38.00	26.62	425.43	1,600	17	0.76	1.2	1.5	6.2	1.02	7.1	g (GRO)
1/23/2012	--		30.00	38.00	32.32	419.73	--	--	--	--	--	--	--	--	
7/25/2012	--		30.00	38.00	34.10	417.95	--	--	--	--	--	--	--	--	h
8/31/2012	--		30.00	38.00	--	--	--	--	--	--	--	--	--	--	Dry
1/17/2013	--		30.00	38.00	26.14	425.91	--	--	--	--	--	--	--	--	
7/25/2013	**NP**		**30.00**	**38.00**	**32.63**	**419.42**	**2,100**	**67**	**3.9**	**1.2**	**4.9**	**25**	**4.03**	**7.20**	**j**
MW-3															
3/20/1995	--	450.28	32.00	40.00	22.19	428.09	94	<0.5	<0.5	<0.5	<0.5	--	--	--	
6/2/1995	--		32.00	40.00	23.28	427.00	72	<0.5	<0.5	<0.5	<0.5	--	--	--	
8/23/1995	--		32.00	40.00	26.55	423.73	98	<0.5	<0.5	<0.6	0.5	<3	--	--	
12/4/1995	--		32.00	40.00	29.52	420.76	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	
2/20/1996	--		32.00	40.00	19.83	430.45	130	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/15/1996	--		32.00	40.00	21.03	429.25	120	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	
8/13/1996	--		32.00	40.00	25.67	424.61	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
11/13/1996	--		32.00	40.00	21.57	428.71	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
3/26/1997	--		32.00	40.00	24.15	426.13	<50	1.1	<0.5	<0.5	<0.5	<3	--	--	
5/15/1997	--		32.00	40.00	26.85	423.43	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
8/26/1997	--		32.00	40.00	30.07	420.21	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
11/5/1997	--		32.00	40.00	32.46	417.82	<50	<0.5	0.7	<0.5	<0.5	<3	--	--	
2/18/1998	--		32.00	40.00	17.82	432.46	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/20/1998	--		32.00	40.00	21.41	428.87	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
7/30/1998	P		32.00	40.00	26.41	423.87	<50	<0.5	<0.5	<0.5	<0.5	<3	9.56	--	
10/29/1998	P		32.00	40.00	31.33	418.95	<50	<0.5	<0.5	<0.5	<0.5	<3	1.0	--	
3/16/1999	P		32.00	40.00	24.61	425.67	<50	<0.5	<0.5	<0.5	<0.5	<3	1.0	--	
5/5/1999	P		32.00	40.00	25.75	424.53	140	<0.5	<0.5	0.6	<0.5	<3	4.43	--	

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (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.															
8/26/1999	P	450.28	32.00	40.00	28.49	421.79	80	0.6	0.6	0.6	1	<3	1.69	--	
12/3/1999	P		32.00	40.00	31.45	418.83	<50	<0.5	<0.5	<0.5	<1	<3	2.26	--	
3/13/2000	P		32.00	40.00	22.18	428.10	<50	<0.5	<0.5	<0.5	<1	<3	4.41	--	
6/20/2000	P		32.00	40.00	26.03	424.25	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	2.3	--	
8/31/2000	--		32.00	40.00	28.75	421.53	--	--	--	--	--	--	--	--	
2/9/2001	--		32.00	40.00	31.04	419.24	--	--	--	--	--	--	--	--	
9/17/2001	--		32.00	40.00	29.04	421.24	--	--	--	--	--	--	--	--	
1/21/2002	--		32.00	40.00	28.81	421.47	--	--	--	--	--	--	--	--	
7/19/2002	--		32.00	40.00	28.92	421.36	--	--	--	--	--	--	--	--	
1/15/2003	--		32.00	40.00	22.88	427.40	--	--	--	--	--	--	--	--	
7/9/2003	--		32.00	40.00	28.00	422.28	--	--	--	--	--	--	--	--	
02/19/2004	--		32.00	40.00	25.29	424.99	--	--	--	--	--	--	--	--	
08/04/2004	--	452.75	32.00	40.00	27.40	425.35	--	--	--	--	--	--	--	--	
01/18/2005	--		32.00	40.00	22.76	429.99	--	--	--	--	--	--	--	--	
07/15/2005	--		32.00	40.00	25.95	426.80	--	--	--	--	--	--	--	--	
01/10/2006	--		32.00	40.00	21.18	431.57	--	--	--	--	--	--	--	--	
7/21/2006	--		32.00	40.00	25.73	427.02	--	--	--	--	--	--	--	--	
1/17/2007	--		32.00	40.00	30.51	422.24	--	--	--	--	--	--	--	--	
7/18/2007	--		32.00	40.00	29.53	423.22	--	--	--	--	--	--	--	--	
1/15/2008	--		32.00	40.00	27.65	425.10	--	--	--	--	--	--	--	--	
7/7/2008	--		32.00	40.00	33.38	419.37	--	--	--	--	--	--	--	--	
1/7/2009	--		32.00	40.00	34.09	418.66	--	--	--	--	--	--	--	--	
7/22/2009	--		32.00	40.00	34.98	417.77	--	--	--	--	--	--	--	--	
3/12/2010	--		32.00	40.00	25.89	426.86	--	--	--	--	--	--	--	--	
9/9/2010	--		32.00	40.00	31.13	421.62	--	--	--	--	--	--	--	--	
2/17/2011	--		32.00	40.00	30.28	422.47	--	--	--	--	--	--	--	--	
7/7/2011	--		32.00	40.00	30.48	422.27	--	--	--	--	--	--	--	--	
1/23/2012	--		32.00	40.00	34.29	418.46	--	--	--	--	--	--	--	--	
7/25/2012	--		32.00	40.00	37.39	415.36	--	--	--	--	--	--	--	--	
1/17/2013	--		32.00	40.00	29.24	423.51	--	--	--	--	--	--	--	--	

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (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.															
7/25/2013	**P**	**452.75**	**32.00**	**40.00**	**34.87**	**417.88**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<1.0**	**<0.50**	**3.95**	**7.38**	
MW-4															
3/20/1995	--	451.09	26.00	42.00	22.68	428.41	12,000	1,000	100	450	700	--	--	--	
6/2/1995	--		26.00	42.00	24.41	426.68	9,000	850	56	380	430	--	--	--	
8/23/1995	--		26.00	42.00	27.72	423.37	5,300	400	25	240	170	<100	--	--	
12/4/1995	--		26.00	42.00	29.85	421.24	6,700	100	<10	90	38	--	--	--	
2/20/1996	--		26.00	42.00	21.16	429.93	7,000	360	22	180	160	<70	--	--	
5/15/1996	--		26.00	42.00	22.18	428.91	--	--	--	--	--	--	--	--	
8/13/1996	--		26.00	42.00	26.20	424.89	--	--	--	--	--	--	--	--	
11/13/1996	--		26.00	42.00	29.72	421.37	--	--	--	--	--	--	--	--	
3/26/1997	--		26.00	42.00	21.86	429.23	8,900	390	33	200	250	<70	--	--	
5/15/1997	--		26.00	42.00	26.92	424.17	--	--	--	--	--	--	--	--	
8/26/1997	--		26.00	42.00	29.30	421.79	--	--	--	--	--	--	--	--	
11/5/1997	--		26.00	42.00	32.14	418.95	--	--	--	--	--	--	--	--	
2/18/1998	--		26.00	42.00	19.30	431.79	5,300	220	19	160	130	120	--	--	
5/20/1998	--		26.00	42.00	22.40	428.69	--	--	--	--	--	--	--	--	
7/30/1998	--		26.00	42.00	25.74	425.35	--	--	--	--	--	--	--	--	
10/29/1998	--		26.00	42.00	31.26	419.83	--	--	--	--	--	--	--	--	
3/16/1999	P		26.00	42.00	25.05	426.04	1,900	49	<5	43	<5	82	1.5	--	
5/5/1999	--		26.00	42.00	26.15	424.94	--	--	--	--	--	--	--	--	
8/26/1999	--		26.00	42.00	28.60	422.49	--	--	--	--	--	--	1.43	--	
12/3/1999	--		26.00	42.00	31.53	419.56	--	--	--	--	--	--	--	--	
3/13/2000	P		26.00	42.00	23.61	427.48	<50	<0.5	<0.5	<0.5	<1	<3	3.82	--	
6/20/2000	--		26.00	42.00	26.38	424.71	--	--	--	--	--	--	0.4	--	
8/31/2000	NP		26.00	42.00	29.55	421.54	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	1.04	--	
2/9/2001	NP		26.00	42.00	30.30	420.79	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	1.39	--	
9/17/2001	NP		26.00	42.00	29.90	421.19	3,400	51	<5.0	16	23	360	0.92	--	
1/21/2002	NP		26.00	42.00	29.51	421.58	1,900	140	12	27	48	300	1.03	--	
7/19/2002	NP		26.00	42.00	30.77	420.32	2,700	150	9.9	<5.0	<5.0	130	1.0	7.3	a
1/15/2003	--		26.00	42.00	23.56	427.53	4,800	150	5.3	28	46	150	1.3	7.0	a

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-4 Cont.															
7/9/2003	--	451.09	26.00	42.00	29.50	421.59	3,000	210	9.4	6	20	150	2.0	6.9	
02/19/2004	P		26.00	42.00	26.35	424.74	4,800	270	11	25	19	180	1.8	6.2	c
08/04/2004	NP	453.80	26.00	42.00	26.48	427.32	4,200	410	13	49	59	300	0.7	6.7	
01/18/2005	P		26.00	42.00	23.15	430.65	4,500	250	9.5	62	22	160	1.2	6.9	
07/15/2005	NP		26.00	42.00	28.13	425.67	3,500	230	6.1	19	15	230	0.5	7.0	
01/10/2006	P		26.00	42.00	21.49	432.31	5,500	250	7.6	37	25	190	1.3	7.1	
7/21/2006	NP		26.00	42.00	28.88	424.92	66	0.60	<0.50	0.52	0.82	3.1	4.75	8.3	
1/17/2007	NP		26.00	42.00	30.80	423.00	<50	<0.50	<0.50	<0.50	<0.50	11	6.19	8.03	
7/18/2007	NP		26.00	42.00	32.00	421.80	2,400	140	6.8	1.3	4.1	74	5.03	7.12	
1/15/2008	NP		26.00	42.00	27.30	426.50	220	1.2	<0.50	<0.50	0.50	61	3.29	6.94	f (MTBE)
7/7/2008	NP		26.00	42.00	34.78	419.02	<50	3.1	<0.50	<0.50	0.66	17	4.03	7.26	
1/7/2009	NP		26.00	42.00	32.59	421.21	110	1.1	<0.50	<0.50	<0.50	37	2.79	7.26	
7/22/2009	NP		26.00	42.00	36.77	417.03	3,000	320	7.8	5.3	16	63	10.82	7.45	
3/12/2010	NP		26.00	42.00	26.38	427.42	1,700	150	4.6	8.3	2.3	43	1.14	7.08	
9/9/2010	NP		26.00	42.00	28.20	425.60	3,300	70	<2.5	3.6	3.6	51	--	6.8	
2/17/2011	NP		26.00	42.00	30.62	423.18	2,300	59	2.2	2.2	5.0	33	1.03	7.8	g (GRO)
7/7/2011	NP		26.00	42.00	27.98	425.82	2,000	79	2.7	<2.5	3.3	57	0.70	6.9	g (GRO)
1/23/2012	P		26.00	42.00	33.57	420.23	980	51	2.4	<2.0	<2.0	44	1.14	6.89	g (GRO)
7/25/2012	P		26.00	42.00	35.81	417.99	1,700	86	4.1	1.1	4.6	49	3.45	7.23	
8/31/2012	--		26.00	42.00	36.53	417.27	--	--	--	--	--	--	--	--	
1/17/2013	P		26.00	42.00	28.31	425.49	1,500	460	12	8.0	<5.0	110	1.16	7.62	
7/25/2013	**P**		**26.00**	**42.00**	**34.07**	**419.73**	**1,200**	**110**	**3.8**	**0.83**	**1.9**	**40**	**4.35**	**7.07**	
MW-5															
3/20/1995	--	451.40	31.50	41.00	23.20	428.20	26,000	1,300	180	890	2,900	--	--	--	
6/2/1995	--		31.50	41.00	24.80	426.60	39,000	940	160	740	1,900	--	--	--	
8/23/1995	--		31.50	41.00	28.10	423.30	14,000	490	74	250	890	<300	--	--	
12/4/1995	--		31.50	41.00	29.83	421.57	7,600	230	13	61	80	--	--	--	
2/20/1996	--		31.50	41.00	21.63	429.77	4,300	220	12	45	130	<50	--	--	
5/15/1996	--		31.50	41.00	22.87	428.53	2,200	380	17	58	84	<40	--	--	
8/13/1996	--		31.50	41.00	26.48	424.92	1,700	150	16	24	35	47	--	--	

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Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-5 Cont.															
11/13/1996	--	451.40	31.50	41.00	29.68	421.72	850	150	11	19	37	66	--	--	
3/26/1997	--		31.50	41.00	25.14	426.26	2,400	440	21	79	210	68	--	--	
5/15/1997	--		31.50	41.00	27.38	424.02	3,900	510	19	140	240	48	--	--	
8/26/1997	--		31.50	41.00	29.89	421.51	76	4.9	<0.5	1.5	2	9	--	--	
11/5/1997	--		31.50	41.00	32.57	418.83	63	0.8	<0.5	<0.5	1.2	34	--	--	
2/18/1998	--		31.50	41.00	19.99	431.41	6,200	630	70	320	640	320	--	--	
5/20/1998	--		31.50	41.00	23.21	428.19	2,300	340	21	110	140	62	--	--	
7/30/1998	P		31.50	41.00	26.19	425.21	<50	0.8	<0.5	0.6	0.9	<3	8.83	--	
10/29/1998	NP		31.50	41.00	31.92	419.48	<50	<0.5	<0.5	<0.5	<0.5	<3	2.0	--	
3/16/1999	P		31.50	41.00	25.80	425.60	1,300	170	8	59	65	120	2.0	--	
5/5/1999	P		31.50	41.00	27.09	424.31	320	31	1.1	13	13	19	12.09	--	
8/26/1999	P		31.50	41.00	29.67	421.73	260	13	1.7	4.2	6.3	150	1.31	--	
12/3/1999	--		31.50	41.00	--	--	--	--	--	--	--	--	--	--	d
3/13/2000	P		31.50	41.00	24.51	426.89	<50	<0.5	<0.5	<0.5	<1	<3	4.41	--	
6/20/2000	P		31.50	41.00	27.37	424.03	60.8	4.84	<0.500	1.9	1.59	<2.50	5.3	--	
8/31/2000	P		31.50	41.00	30.21	421.19	<50.0	1.18	<0.500	<0.500	<0.500	3.83	0.97	--	
2/9/2001	--		31.50	41.00	30.19	421.21	--	--	--	--	--	--	--	--	
9/17/2001	P		31.50	41.00	30.71	420.69	2,700	120	10	90	77	330	0.81	--	
1/21/2002	--		31.50	41.00	30.40	421.00	--	--	--	--	--	--	--	--	
7/19/2002	P		31.50	41.00	31.93	419.47	1,600	170	7	120	<5.0	180	1.7	7.2	a
1/15/2003	--		31.50	41.00	23.12	428.28	--	--	--	--	--	--	--	--	
7/9/2003	--		31.50	41.00	30.95	420.45	2,000	160	5.7	67	27	260	1.5	6.9	
02/19/2004	--		31.50	41.00	26.73	424.67	--	--	--	--	--	--	--	--	
08/04/2004	P	453.52	31.50	41.00	26.61	426.91	2,100	250	5.3	73	22	250	2.7	7.0	
01/18/2005	--		31.50	41.00	24.10	429.42	--	--	--	--	--	--	--	--	
07/15/2005	P		31.50	41.00	29.27	424.25	1,600	61	<5.0	8.7	<5.0	270	2.1	6.9	
01/10/2006	--		31.50	41.00	22.19	431.33	--	--	--	--	--	--	--	--	
7/21/2006	P		31.50	41.00	30.36	423.16	2,100	29	<5.0	7.5	11	14	2.98	7.1	
1/17/2007	--		31.50	41.00	31.77	421.75	--	--	--	--	--	--	--	--	
7/18/2007	NP		31.50	41.00	33.42	420.10	470	36	0.84	0.97	2.2	110	1.73	7.50	

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Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-5 Cont.															
1/15/2008	--	453.52	31.50	41.00	28.60	424.92	--	--	--	--	--	--	--	--	
7/7/2008	NP		31.50	41.00	35.80	417.72	<50	<0.50	<0.50	<0.50	<0.50	<0.50	7.55	7.79	
1/7/2009	--		31.50	41.00	33.14	420.38	--	--	--	--	--	--	--	--	
7/22/2009	NP		31.50	41.00	37.84	415.68	100	3.0	<0.50	<0.50	<0.50	12	12.34	7.24	
3/12/2010	--		31.50	41.00	27.29	426.23	--	--	--	--	--	--	--	--	
9/9/2010	P		31.50	41.00	28.96	424.56	1,000	18	1.4	0.55	3.2	10	--	6.9	
2/17/2011	--		31.50	41.00	31.49	422.03	--	--	--	--	--	--	--	--	
7/7/2011	P		31.50	41.00	28.72	424.80	620	9.0	0.60	<0.50	0.61	4.6	1.60	7.0	g (GRO)
1/23/2012	--		31.50	41.00	33.27	420.25	--	--	--	--	--	--	--	--	
7/25/2012	P		31.50	41.00	36.29	417.23	500	11	1.1	<0.50	2.6	11	3.07	7.23	
1/17/2013	--		31.50	41.00	29.11	424.41	--	--	--	--	--	--	--	--	
7/25/2013	**P**		**31.50**	**41.00**	**34.65**	**418.87**	**1,100**	**98**	**2.9**	**90**	**28**	**22**	**5.11**	**7.07**	
MW-6															
3/20/1995	--	451.37	32.00	42.00	25.19	426.18	2,600	210	87	82	140	--	--	--	
6/2/1995	--		32.00	42.00	25.75	425.62	1,600	55	7.9	40	26	--	--	--	
8/23/1995	--		32.00	42.00	29.53	421.84	1,400	42	2.5	36	13	<20	--	--	
12/4/1995	--		32.00	42.00	32.28	419.09	2,500	52	5.8	59	13	--	--	--	
2/20/1996	--		32.00	42.00	22.27	429.10	2,500	120	16	73	12	<30	--	--	
5/15/1996	--		32.00	42.00	23.86	427.51	2,000	71	6.4	47	25	<15	--	--	
8/13/1996	--		32.00	42.00	28.55	422.82	3,800	91	8.2	69	25	<20	--	--	
11/13/1996	--		32.00	42.00	32.04	419.33	1,900	55	3.3	55	8.5	16	--	--	
3/26/1997	--		32.00	42.00	26.84	424.53	1,800	51	5	32	15	<30	--	--	
5/15/1997	--		32.00	42.00	29.58	421.79	2,400	46	3	29	9	<12	--	--	
8/26/1997	--		32.00	42.00	32.67	418.70	1,400	61	6	33	10	<12	--	--	
11/5/1997	--		32.00	42.00	34.62	416.75	690	29	2.7	18	3.4	9	--	--	
2/18/1998	--		32.00	42.00	20.09	431.28	1,800	74	5	24	12	19	--	--	
5/20/1998	--		32.00	42.00	24.05	427.32	1,900	280	4	31	16	9	--	--	
7/30/1998	P		32.00	42.00	28.72	422.65	2,300	110	7	36	20	<15	--	--	
10/29/1998	P		32.00	42.00	32.77	418.60	2,500	14	13	17	12	<12	1.0	--	
3/16/1999	P		32.00	42.00	26.45	424.92	1,200	65	4	27	13	18	0.5	--	

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							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-6 Cont.															
5/5/1999	P	451.37	32.00	42.00	27.86	423.51	2,200	53	4	26	6	25	5.59	--	
8/26/1999	P		32.00	42.00	30.49	420.88	1,100	11	6	10	4	13	2.35	--	
12/3/1999	P		32.00	42.00	32.35	419.02	370	<0.5	<0.5	0.8	<1	4	2.36	--	
3/13/2000	P		32.00	42.00	28.36	423.01	54	2.1	0.5	0.9	1.4	<3	4.22	--	
6/20/2000	P		32.00	42.00	28.35	423.02	195	1.83	<0.500	0.528	<0.500	<2.50	3.5	--	
8/31/2000	P		32.00	42.00	30.20	421.17	276	3.52	0.788	1.15	0.621	8.73	7.0	--	
2/9/2001	P		32.00	42.00	30.70	420.67	253	5.44	2.93	0.924	0.977	48.9	0.59	--	
2/9/2001	--		32.00	42.00	30.70	420.67	222	4.49	2.73	0.579	0.523	57.1	--	--	b
9/17/2001	--		32.00	42.00	30.94	420.43	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	--	b
9/17/2001	P		32.00	42.00	30.94	420.43	<50	<0.50	<0.50	<0.50	<0.50	<2.5	2.79	--	
1/21/2002	P		32.00	42.00	30.55	420.82	<50	<0.50	<0.50	<0.50	<0.50	<5.0	1.9	--	
7/19/2002	P		32.00	42.00	30.27	421.10	60	2	<0.50	<0.50	<0.50	<0.50	3.5	7.9	a
1/15/2003	--		32.00	42.00	22.86	428.51	83	9.1	<0.50	3.4	4.6	1	2.5	7.2	a
7/9/2003	P		32.00	42.00	29.41	421.96	110	<0.50	<0.50	<0.50	<0.50	0.98	2.6	7.1	
02/19/2004	--		32.00	42.00	43.25	408.12	--	--	--	--	--	--	--	--	
08/04/2004	P	453.83	32.00	42.00	27.71	426.12	540	36	3.8	17	24	5.2	3.5	7.1	
01/18/2005	--		32.00	42.00	24.56	429.27	--	--	--	--	--	--	--	--	
07/15/2005	P		32.00	42.00	27.61	426.22	4,600	210	44	150	670	32	3.5	7.1	
01/10/2006	--		32.00	42.00	23.75	430.08	--	--	--	--	--	--	--	--	
7/21/2006	P		32.00	42.00	27.96	425.87	260	<0.50	<0.50	<0.50	0.86	5.1	2.60	7.2	
1/17/2007	--		32.00	42.00	30.57	423.26	--	--	--	--	--	--	--	--	
7/18/2007	P		32.00	42.00	30.96	422.87	<50	<0.50	<0.50	<0.50	<0.50	<0.50	4.95	7.57	
1/15/2008	--		32.00	42.00	28.89	424.94	--	--	--	--	--	--	--	--	
7/7/2008	NP		32.00	42.00	34.57	419.26	<50	<0.50	<0.50	<0.50	<0.50	<0.50	6.00	7.19	
1/7/2009	--		32.00	42.00	34.75	419.08	--	--	--	--	--	--	--	--	
7/22/2009	NP		32.00	42.00	35.84	417.99	<50	<0.50	<0.50	<0.50	<0.50	<0.50	16.67	7.68	
3/12/2010	--		32.00	42.00	27.89	425.94	--	--	--	--	--	--	--	--	
9/9/2010	NP		32.00	42.00	33.06	420.77	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	7.2	
2/17/2011	--		32.00	42.00	32.60	421.23	--	--	--	--	--	--	--	--	
7/7/2011	NP		32.00	42.00	32.72	421.11	430	<0.50	<0.50	<0.50	<0.50	8.0	2.04	7.1	g (GRO)

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-6 Cont.															
1/23/2012	--	453.83	32.00	42.00	35.61	418.22	--	--	--	--	--	--	--	--	
7/25/2012	P		32.00	42.00	38.78	415.05	500	3.3	<0.50	<0.50	1.7	10	3.07	7.45	
1/17/2013	--		32.00	42.00	31.11	422.72	--	--	--	--	--	--	--	--	
7/25/2013	**P**		**32.00**	**42.00**	**36.50**	**417.33**	**550**	**9.1**	**0.84**	**<0.50**	**<1.0**	**19**	**5.27**	**7.35**	
MW-7															
3/20/1995	--	450.33	30.00	40.00	22.07	428.26	31,000	2,300	400	620	2,900	--	--	--	
6/2/1995	--		30.00	40.00	23.42	426.91	40,000	1,400	280	610	2,400	--	--	--	
8/23/1995	--		30.00	40.00	27.13	423.20	25,000	1,400	200	600	1,600	350	--	--	
12/4/1995	--		30.00	40.00	29.45	420.88	23,000	1,100	74	490	720	--	--	--	
2/20/1996	--		30.00	40.00	20.25	430.08	39,000	1,200	140	640	1,800	<400	--	--	
5/15/1996	--		30.00	40.00	21.38	428.95	--	--	--	--	--	--	--	--	
8/13/1996	--		30.00	40.00	25.52	424.81	--	--	--	--	--	--	--	--	
11/13/1996	--		30.00	40.00	29.38	420.95	--	--	--	--	--	--	--	--	
3/26/1997	--		30.00	40.00	24.36	425.97	35,000	1,100	180	460	1,700	<300	--	--	
5/15/1997	--		30.00	40.00	26.90	423.43	--	--	--	--	--	--	--	--	
8/26/1997	--		30.00	40.00	30.21	420.12	--	--	--	--	--	--	--	--	
11/5/1997	--		30.00	40.00	32.49	417.84	--	--	--	--	--	--	--	--	
2/18/1998	--		30.00	40.00	18.10	432.23	19,000	1,100	120	460	1,700	240	--	--	
5/20/1998	--		30.00	40.00	21.68	428.65	--	--	--	--	--	--	--	--	
7/30/1998	--		30.00	40.00	26.07	424.26	--	--	--	--	--	--	--	--	
10/29/1998	--		30.00	40.00	31.13	419.20	--	--	--	--	--	--	--	--	
3/16/1999	P		30.00	40.00	24.45	425.88	8,600	430	51	200	680	<120	1.5	--	
5/5/1999	--		30.00	40.00	25.84	424.49	--	--	--	--	--	--	--	--	
8/26/1999	--		30.00	40.00	28.28	422.05	--	--	--	--	--	--	1.51	--	
12/3/1999	--		30.00	40.00	31.57	418.76	--	--	--	--	--	--	--	--	
3/13/2000	--		30.00	40.00	--	--	--	--	--	--	--	--	--	--	d
6/20/2000	--		30.00	40.00	25.91	424.42	--	--	--	--	--	--	5.4	--	
8/31/2000	--		30.00	40.00	28.40	421.93	8,410	344	58.9	276	581	202	0.09	--	
2/9/2001	--		30.00	40.00	30.04	420.29	2,030	203	12	17.9	49.4	128	1.55	--	
9/17/2001	P		30.00	40.00	29.03	421.30	4,800	200	14	9.9	27	160	0.29	--	

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-7 Cont.															
1/21/2002	--	450.33	30.00	40.00	28.98	421.35	2,600	280	17	41	50	97	--	--	b
1/21/2002	P		30.00	40.00	28.98	421.35	4,200	350	20	52	63	99	0.81	--	
7/19/2002	P		30.00	40.00	28.70	421.63	5,700	630	31	330	160	64	0.7	7.3	a
1/15/2003	--		30.00	40.00	21.91	428.42	12,000	470	19	340	310	91	1.5	7.0	a
7/9/2003	P		30.00	40.00	27.88	422.45	6,700	590	23	280	92	110	1.0	6.9	
02/19/2004	P		30.00	40.00	25.12	425.21	8,900	670	24	470	120	100	0.8	6.6	c
08/04/2004	P	452.70	30.00	40.00	25.92	426.78	9,100	930	29	460	130	140	0.6	7.2	
01/18/2005	P		30.00	40.00	22.31	430.39	16,000	770	33	590	220	87	1.0	6.9	
07/15/2005	P		30.00	40.00	27.20	425.50	12,000	1,000	38	490	220	150	1.5	6.9	
01/10/2006	P		30.00	40.00	20.61	432.09	13,000	1,200	50	760	330	120	0.8	7.1	
7/21/2006	P		30.00	40.00	28.10	424.60	8,000	110	<50	380	180	54	3.20	7.8	
1/17/2007	P		30.00	40.00	29.70	423.00	5,600	16	<2.5	26	12	3.1	1.08	7.83	
7/18/2007	P		30.00	40.00	29.73	422.97	2,400	140	2.8	9.1	7.3	67	4.86	7.67	
1/15/2008	P		30.00	40.00	26.18	426.52	3,500	120	3.6	9.0	29	26	3.16	7.07	
7/7/2008	NP		30.00	40.00	33.10	419.60	70	0.76	<0.50	<0.50	<0.50	0.69	7.81	8.24	
1/7/2009	NP		30.00	40.00	33.21	419.49	<50	1.5	<0.50	<0.50	<0.50	<0.50	3.00	7.73	
7/22/2009	NP		30.00	40.00	34.54	418.16	<50	<0.50	<0.50	<0.50	<0.50	0.53	11.95	7.65	
3/12/2010	P		30.00	40.00	25.46	427.24	2,600	36	1.0	14	9.1	11	0.42	8.07	
9/9/2010	NP		30.00	40.00	30.10	422.60	2,800	430	11	32	46	110	--	--	
2/17/2011	--		30.00	40.00	29.71	422.99	--	--	--	--	--	--	--	--	
7/7/2011	NP		30.00	40.00	29.68	423.02	2,600	310	8.3	7.5	46	150	0.77	6.9	g (GRO)
1/23/2012	P		30.00	40.00	34.59	418.11	2,100	330	9.4	10	24	150	0.86	6.76	
7/25/2012	--		30.00	40.00	36.16	416.54	--	--	--	--	--	--	3.67	7.09	i
8/31/2012	P		30.00	40.00	37.08	415.62	15,000	650	16	31	51	120	2.52	7.42	k
1/17/2013	P		30.00	40.00	27.53	425.17	3,100	430	10	10	42	120	1.21	7.58	
7/25/2013	**--**		**30.00**	**40.00**	**33.69**	**419.01**	**5,300**	**770**	**17**	**14**	**40**	**170**	**--**	**--**	**j**
MW-8															
3/20/1995	--	449.43	27.50	42.50	24.75	424.68	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	
6/2/1995	--		27.50	42.50	24.95	424.48	--	--	--	--	--	--	--	--	
8/23/1995	--		27.50	42.50	30.94	418.49	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	

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ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-8 Cont.															
12/4/1995	--	449.43	27.50	42.50	31.99	417.44	--	--	--	--	--	--	--	--	
2/20/1996	--		27.50	42.50	21.13	428.30	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/15/1996	--		27.50	42.50	21.96	427.47	--	--	--	--	--	--	--	--	
8/13/1996	--		27.50	42.50	30.20	419.23	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
11/13/1996	--		27.50	42.50	33.24	416.19	--	--	--	--	--	--	--	--	
3/26/1997	--		27.50	42.50	26.85	422.58	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/15/1997	--		27.50	42.50	29.69	419.74	--	--	--	--	--	--	--	--	
8/26/1997	--		27.50	42.50	34.00	415.43	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
11/5/1997	--		27.50	42.50	35.94	413.49	--	--	--	--	--	--	--	--	
2/18/1998	--		27.50	42.50	18.18	431.25	<50	0.6	0.6	<0.5	1.1	<3	--	--	
5/20/1998	--		27.50	42.50	22.85	426.58	--	--	--	--	--	--	--	--	
7/30/1998	NP		27.50	42.50	30.31	419.12	<50	<0.5	<0.5	<0.5	<0.5	<3	8.21	--	
10/29/1998	--		27.50	42.50	35.88	413.55	--	--	--	--	--	--	--	--	
3/16/1999	NP		27.50	42.50	28.50	420.93	<50	<0.5	<0.5	<0.5	<0.5	<3	1.0	--	
5/5/1999	--		27.50	42.50	29.76	419.67	--	--	--	--	--	--	--	--	
8/26/1999	P		27.50	42.50	33.51	415.92	<50	<0.5	<0.5	<0.5	<0.5	<3	4.93	--	
12/3/1999	--		27.50	42.50	35.83	413.60	--	--	--	--	--	--	--	--	
3/13/2000	P		27.50	42.50	26.12	423.31	<50	<0.5	<0.5	<0.5	<1	<3	2.81	--	
6/20/2000	--		27.50	42.50	30.91	418.52	--	--	--	--	--	--	5.8	--	
8/31/2000	--		27.50	42.50	33.70	415.73	--	--	--	--	--	--	--	--	
2/9/2001	--		27.50	42.50	30.90	418.53	--	--	--	--	--	--	--	--	
9/17/2001	--		27.50	42.50	33.95	415.48	--	--	--	--	--	--	--	--	
1/21/2002	--		27.50	42.50	33.71	415.72	--	--	--	--	--	--	--	--	
7/19/2002	--		27.50	42.50	35.30	414.13	--	--	--	--	--	--	--	--	
1/15/2003	--		27.50	42.50	27.10	422.33	--	--	--	--	--	--	--	--	
7/9/2003	--		27.50	42.50	33.10	416.33	--	--	--	--	--	--	--	--	
02/19/2004	--		27.50	42.50	28.92	420.51	--	--	--	--	--	--	--	--	
08/04/2004	--	451.80	27.50	42.50	34.28	417.52	--	--	--	--	--	--	--	--	
01/18/2005	--		27.50	42.50	26.76	425.04	--	--	--	--	--	--	--	--	
07/15/2005	--		27.50	42.50	31.14	420.66	--	--	--	--	--	--	--	--	

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ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-8 Cont.															
01/10/2006	--	451.80	27.50	42.50	22.88	428.92	--	--	--	--	--	--	--	--	
7/21/2006	--		27.50	42.50	30.84	420.96	--	--	--	--	--	--	--	--	
1/17/2007	--		27.50	42.50	33.20	418.60	--	--	--	--	--	--	--	--	
7/18/2007	--		27.50	42.50	31.92	419.88	--	--	--	--	--	--	--	--	
1/15/2008	--		27.50	42.50	31.52	420.28	--	--	--	--	--	--	--	--	
7/7/2008	--		27.50	42.50	36.32	415.48	--	--	--	--	--	--	--	--	
1/7/2009	--		27.50	42.50	40.52	411.28	--	--	--	--	--	--	--	--	
7/22/2009	--		27.50	42.50	40.38	411.42	--	--	--	--	--	--	--	--	
3/12/2010	--		27.50	42.50	31.48	420.32	--	--	--	--	--	--	--	--	
9/9/2010	--		27.50	42.50	35.28	416.52	--	--	--	--	--	--	--	--	
2/17/2011	--		27.50	42.50	33.49	418.31	--	--	--	--	--	--	--	--	
7/7/2011	--		27.50	42.50	32.74	419.06	--	--	--	--	--	--	--	--	
1/23/2012	--		27.50	42.50	32.11	419.69	--	--	--	--	--	--	--	--	
7/25/2012	--		27.50	42.50	40.00	411.80	--	--	--	--	--	--	--	--	
1/17/2013	--		27.50	42.50	32.23	419.57	--	--	--	--	--	--	--	--	
7/25/2013	**P**		**27.50**	**42.50**	**35.97**	**415.83**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<1.0**	**<0.50**	**7.55**	**7.44**	
MW-9															
3/20/1995	--	449.21	29.50	39.50	19.11	430.10	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	
6/2/1995	--		29.50	39.50	21.23	427.98	--	--	--	--	--	--	--	--	
8/23/1995	--		29.50	39.50	24.33	424.88	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
12/4/1995	--		29.50	39.50	27.90	421.31	--	--	--	--	--	--	--	--	
2/20/1996	--		29.50	39.50	17.86	431.35	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/15/1996	--		29.50	39.50	18.69	430.52	--	--	--	--	--	--	--	--	
8/13/1996	--		29.50	39.50	24.17	425.04	--	--	--	--	--	--	--	--	
11/13/1996	--		29.50	39.50	28.01	421.20	--	--	--	--	--	--	--	--	
3/26/1997	--		29.50	39.50	22.58	426.63	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/15/1997	--		29.50	39.50	25.12	424.09	--	--	--	--	--	--	--	--	
8/26/1997	--		29.50	39.50	28.28	420.93	--	--	--	--	--	--	--	--	
11/5/1997	--		29.50	39.50	31.18	418.03	--	--	--	--	--	--	--	--	
2/18/1998	--		29.50	39.50	16.03	433.18	<50	0.6	0.5	<0.5	1	<3	--	--	

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							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-9 Cont.															
5/20/1998	--	449.21	29.50	39.50	19.31	429.90	--	--	--	--	--	--	--	--	
7/30/1998	--		29.50	39.50	24.90	424.31	--	--	--	--	--	--	--	--	
10/29/1998	--		29.50	39.50	30.08	419.13	--	--	--	--	--	--	--	--	
3/16/1999	P		29.50	39.50	22.68	426.53	<50	<0.5	<0.5	<0.5	<0.5	<3	1.0	--	
5/5/1999	--		29.50	39.50	23.82	425.39	--	--	--	--	--	--	--	--	
8/26/1999	--		29.50	39.50	26.57	422.64	--	--	--	--	--	--	5.08	--	
12/3/1999	--		29.50	39.50	--	--	--	--	--	--	--	--	--	--	d
3/13/2000	P		29.50	39.50	25.62	423.59	<50	<0.5	<0.5	<0.5	<1	<3	5.43	--	
6/20/2000	--		29.50	39.50	23.55	425.66	--	--	--	--	--	--	6.2	--	
8/31/2000	--		29.50	39.50	27.39	421.82	--	--	--	--	--	--	--	--	
2/9/2001	--		29.50	39.50	28.65	420.56	--	--	--	--	--	--	--	--	
9/17/2001	--		29.50	39.50	27.51	421.70	--	--	--	--	--	--	--	--	
1/21/2002	--		29.50	39.50	27.09	422.12	--	--	--	--	--	--	--	--	
7/19/2002	--		29.50	39.50	27.06	422.15	--	--	--	--	--	--	--	--	
1/15/2003	--		29.50	39.50	21.78	427.43	--	--	--	--	--	--	--	--	
7/9/2003	--		29.50	39.50	26.18	423.03	--	--	--	--	--	--	--	--	
02/19/2004	--		29.50	39.50	23.45	425.76	--	--	--	--	--	--	--	--	
08/04/2004	--	451.63	29.50	39.50	29.24	422.39	--	--	--	--	--	--	--	--	
01/18/2005	--		29.50	39.50	20.64	430.99	--	--	--	--	--	--	--	--	
07/15/2005	--		29.50	39.50	25.72	425.91	--	--	--	--	--	--	--	--	
01/10/2006	--		29.50	39.50	18.86	432.77	--	--	--	--	--	--	--	--	
7/21/2006	--		29.50	39.50	25.58	426.05	--	--	--	--	--	--	--	--	
1/17/2007	--		29.50	39.50	29.11	422.52	--	--	--	--	--	--	--	--	
7/18/2007	--		29.50	39.50	--	--	--	--	--	--	--	--	--	--	d
1/15/2008	--		29.50	39.50	24.89	426.74	--	--	--	--	--	--	--	--	
7/7/2008	--		29.50	39.50	32.06	419.57	--	--	--	--	--	--	--	--	
1/7/2009	--		29.50	39.50	32.65	418.98	--	--	--	--	--	--	--	--	
7/22/2009	--		29.50	39.50	33.74	417.89	--	--	--	--	--	--	--	--	
3/12/2010	--		29.50	39.50	23.44	428.19	--	--	--	--	--	--	--	--	
9/9/2010	--		29.50	39.50	29.56	422.07	--	--	--	--	--	--	--	--	

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-9 Cont.															
2/17/2011	--	451.63	29.50	39.50	27.18	424.45	--	--	--	--	--	--	--	--	
7/7/2011	--		29.50	39.50	27.71	423.92	--	--	--	--	--	--	--	--	
1/23/2012	--		29.50	39.50	32.04	419.59	--	--	--	--	--	--	--	--	
7/25/2012	--		29.50	39.50	35.37	416.26	--	--	--	--	--	--	--	--	
1/17/2013	--		29.50	39.50	26.89	424.74	--	--	--	--	--	--	--	--	
7/25/2013	**P**		**29.50**	**39.50**	**33.10**	**418.53**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<1.0**	**<0.50**	**5.76**	**7.32**	
MW-10															
3/20/1995	--	449.22	29.00	37.00	20.96	428.26	--	--	--	--	--	--	--	--	
6/2/1995	--		29.00	37.00	22.15	427.07	--	--	--	--	--	--	--	--	
8/23/1995	--		29.00	37.00	24.47	424.75	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
12/4/1995	--		29.00	37.00	26.97	422.25	--	--	--	--	--	--	--	--	
2/20/1996	--		29.00	37.00	18.40	430.82	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/15/1996	--		29.00	37.00	--	--	--	--	--	--	--	--	--	--	d
8/13/1996	--		29.00	37.00	23.70	425.52	--	--	--	--	--	--	--	--	
11/13/1996	--		29.00	37.00	27.15	422.07	--	--	--	--	--	--	--	--	
3/26/1997	--		29.00	37.00	22.23	426.99	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/15/1997	--		29.00	37.00	24.57	424.65	--	--	--	--	--	--	--	--	
8/26/1997	--		29.00	37.00	27.62	421.60	--	--	--	--	--	--	--	--	
11/5/1997	--		29.00	37.00	30.79	418.43	--	--	--	--	--	--	--	--	
2/18/1998	--		29.00	37.00	--	--	--	--	--	--	--	--	--	--	d
5/20/1998	--		29.00	37.00	--	--	--	--	--	--	--	--	--	--	
7/30/1998	--		29.00	37.00	23.90	425.32	--	--	--	--	--	--	--	--	
10/29/1998	--		29.00	37.00	30.55	418.67	--	--	--	--	--	--	--	--	
3/16/1999	P		29.00	37.00	23.05	426.17	<50	<0.5	<0.5	<0.5	<0.5	<3	1.0	--	
5/5/1999	--		29.00	37.00	24.00	425.22	--	--	--	--	--	--	--	--	
8/26/1999	--		29.00	37.00	26.50	422.72	--	--	--	--	--	--	5.15	--	
12/3/1999	--		29.00	37.00	30.80	418.42	--	--	--	--	--	--	--	--	
3/13/2000	--		29.00	37.00	26.21	423.01	--	--	--	--	--	--	--	--	d
6/20/2000	--		29.00	37.00	23.52	425.70	--	--	--	--	--	--	5.5	--	
8/31/2000	--		29.00	37.00	27.52	421.70	--	--	--	--	--	--	--	--	

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-10 Cont.															
2/9/2001	--	449.22	29.00	37.00	28.71	420.51	--	--	--	--	--	--	--	--	
9/17/2001	--		29.00	37.00	27.94	421.28	--	--	--	--	--	--	--	--	
1/21/2002	--		29.00	37.00	27.44	421.78	--	--	--	--	--	--	--	--	
7/19/2002	--		29.00	37.00	27.80	421.42	--	--	--	--	--	--	--	--	
1/15/2003	--		29.00	37.00	23.09	426.13	--	--	--	--	--	--	--	--	
7/9/2003	--		29.00	37.00	26.87	422.35	--	--	--	--	--	--	--	--	
02/19/2004	--		29.00	37.00	23.39	425.83	--	--	--	--	--	--	--	--	
01/18/2005	--	451.65	29.00	37.00	21.40	430.25	--	--	--	--	--	--	--	--	
07/15/2005	--		29.00	37.00	25.37	426.28	--	--	--	--	--	--	--	--	
01/10/2006	--		29.00	37.00	19.81	431.84	--	--	--	--	--	--	--	--	
7/21/2006	--		29.00	37.00	25.16	426.49	--	--	--	--	--	--	--	--	
1/17/2007	--		29.00	37.00	28.95	422.70	--	--	--	--	--	--	--	--	
7/18/2007	--		29.00	37.00	--	--	--	--	--	--	--	--	--	--	d
1/15/2008	--		29.00	37.00	24.62	427.03	--	--	--	--	--	--	--	--	
7/7/2008	--		29.00	37.00	--	--	--	--	--	--	--	--	--	--	d
1/7/2009	--		29.00	37.00	--	--	--	--	--	--	--	--	--	--	d
7/22/2009	--		29.00	37.00	--	--	--	--	--	--	--	--	--	--	Dry
3/12/2010	--		29.00	37.00	24.13	427.52	--	--	--	--	--	--	--	--	
9/9/2010	--		29.00	37.00	27.91	423.74	--	--	--	--	--	--	--	--	
2/17/2011	--		29.00	37.00	27.16	424.49	--	--	--	--	--	--	--	--	
7/7/2011	--		29.00	37.00	26.38	425.27	--	--	--	--	--	--	--	--	
1/23/2012	--		29.00	37.00	31.25	420.40	--	--	--	--	--	--	--	--	
7/25/2012	--		29.00	37.00	--	--	--	--	--	--	--	--	--	--	Dry
1/17/2013	--		29.00	37.00	26.00	425.65	--	--	--	--	--	--	--	--	
7/25/2013	**--**		**29.00**	**37.00**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**d**
MW-11															
3/20/1995	--	448.02	29.00	39.00	25.02	423.00	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	
6/2/1995	--		29.00	39.00	23.82	424.20	--	--	--	--	--	--	--	--	
8/23/1995	--		29.00	39.00	30.15	417.87	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
12/4/1995	--		29.00	39.00	31.63	416.39	--	--	--	--	--	--	--	--	

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-11 Cont.															
2/20/1996	--	448.02	29.00	39.00	20.94	427.08	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/15/1996	--		29.00	39.00	23.03	424.99	--	--	--	--	--	--	--	--	
8/13/1996	--		29.00	39.00	29.19	418.83	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
11/13/1996	--		29.00	39.00	31.96	416.06	--	--	--	--	--	--	--	--	
3/26/1997	--		29.00	39.00	26.61	421.41	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
5/15/1997	--		29.00	39.00	29.39	418.63	--	--	--	--	--	--	--	--	
8/26/1997	--		29.00	39.00	33.47	414.55	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	
11/5/1997	--		29.00	39.00	35.12	412.90	--	--	--	--	--	--	--	--	
2/18/1998	--		29.00	39.00	18.03	429.99	<50	<0.5	<0.5	<0.5	1	<3	--	--	
5/20/1998	--		29.00	39.00	23.00	425.02	--	--	--	--	--	--	--	--	
7/30/1998	P		29.00	39.00	29.30	418.72	<50	<0.5	<0.5	<0.5	<0.5	<3	5.59	--	
10/29/1998	--		29.00	39.00	34.47	413.55	--	--	--	--	--	--	--	--	
3/16/1999	P		29.00	39.00	27.88	420.14	<50	<0.5	<0.5	<0.5	<0.5	<3	1.0	--	
5/5/1999	--		29.00	39.00	26.85	421.17	--	--	--	--	--	--	--	--	
8/26/1999	P		29.00	39.00	32.74	415.28	<50	<0.5	<0.5	<0.5	<0.5	<3	4.59	--	
12/3/1999	--		29.00	39.00	34.70	413.32	--	--	--	--	--	--	--	--	
3/13/2000	P		29.00	39.00	25.94	422.08	<50	<0.5	<0.5	<0.5	<1	<3	3.21	--	
6/20/2000	--		29.00	39.00	30.40	417.62	--	--	--	--	--	--	3.3	--	
8/31/2000	--		29.00	39.00	32.68	415.34	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	--	--	b
8/31/2000	NP		29.00	39.00	32.68	415.34	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	0.4	--	
2/9/2001	--		29.00	39.00	31.17	416.85	--	--	--	--	--	--	--	--	
9/17/2001	NP		29.00	39.00	32.98	415.04	<50	<0.50	<0.50	<0.50	<0.50	<2.5	0.62	--	
1/21/2002	--		29.00	39.00	31.05	416.97	--	--	--	--	--	--	--	--	
7/19/2002	P		29.00	39.00	31.67	416.35	<50	<0.50	<0.50	<0.50	<0.50	<0.50	3.7	7.7	
1/15/2003	--		29.00	39.00	23.75	424.27	--	--	--	--	--	--	--	--	
7/9/2003	P		29.00	39.00	31.06	416.96	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.4	6.6	
02/19/2004	--		29.00	39.00	27.21	420.81	--	--	--	--	--	--	--	--	
08/04/2004	P	450.41	29.00	39.00	31.71	418.70	<50	<0.50	<0.50	<0.50	<0.50	<0.50	3.3	7.1	
01/18/2005	--		29.00	39.00	24.80	425.61	--	--	--	--	--	--	--	--	
07/15/2005	P		29.00	39.00	29.15	421.26	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.7	7.1	

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Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
MW-11 Cont.															
01/10/2006	--	450.41	29.00	39.00	20.87	429.54	--	--	--	--	--	--	--	--	
7/21/2006	P		29.00	39.00	29.30	421.11	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.7	7.2	
1/17/2007	--		29.00	39.00	31.59	418.82	--	--	--	--	--	--	--	--	
7/18/2007	NP		29.00	39.00	29.22	421.19	<50	<0.50	<0.50	<0.50	<0.50	<0.50	5.35	7.12	
1/15/2008	--		29.00	39.00	29.12	421.29	--	--	--	--	--	--	--	--	
7/7/2008	NP		29.00	39.00	34.21	416.20	<50	<0.50	<0.50	<0.50	<0.50	<0.50	4.08	7.94	
1/7/2009	--		29.00	39.00	37.45	412.96	--	--	--	--	--	--	--	--	
7/22/2009	NP		29.00	39.00	37.33	413.08	<50	<0.50	<0.50	<0.50	<0.50	<0.50	15.97	7.81	
3/12/2010	--		29.00	39.00	28.47	421.94	--	--	--	--	--	--	--	--	
9/9/2010	NP		29.00	39.00	33.03	417.38	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	7.2	
2/17/2011	--		29.00	39.00	31.70	418.71	--	--	--	--	--	--	--	--	
7/7/2011	NP		29.00	39.00	31.44	418.97	<50	<0.50	<0.50	<0.50	<0.50	<0.50	3.65	7.1	
1/23/2012	--		29.00	39.00	34.55	415.86	--	--	--	--	--	--	--	--	
7/25/2012	--		29.00	39.00	38.00	412.41	--	--	--	--	--	--	--	--	h
1/17/2013	--		29.00	39.00	31.32	419.09	--	--	--	--	--	--	--	--	
7/25/2013	**P**		**29.00**	**39.00**	**33.40**	**417.01**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<1.0**	**<0.50**	**9.04**	**7.39**	
RW-1															
3/20/1995	--	451.67	25.50	40.50	23.76	427.91	15,000	1,000	140	310	950	--	--	--	
6/2/1995	--		25.50	40.50	25.12	426.55	12,000	1,300	280	420	1,100	--	--	--	
8/23/1995	--		25.50	40.50	28.80	422.87	8,200	520	190	240	610	<50	--	--	
12/4/1995	--		25.50	40.50	31.15	420.52	2,600	140	59	83	210	--	--	--	
2/20/1996	--		25.50	40.50	21.45	430.22	6,300	410	160	180	650	<40	--	--	
5/15/1996	--		25.50	40.50	22.97	428.70	--	--	--	--	--	--	--	--	
8/13/1996	--		25.50	40.50	24.74	426.93	--	--	--	--	--	--	--	--	
11/13/1996	--		25.50	40.50	30.69	420.98	--	--	--	--	--	--	--	--	
3/26/1997	--		25.50	40.50	25.69	425.98	500	57	3	6.4	18	54	--	--	
5/15/1997	--		25.50	40.50	28.19	423.48	--	--	--	--	--	--	--	--	
8/26/1997	--		25.50	40.50	31.21	420.46	--	--	--	--	--	--	--	--	
11/5/1997	--		25.50	40.50	33.67	418.00	--	--	--	--	--	--	--	--	
2/18/1998	--		25.50	40.50	20.14	431.53	9,400	200	70	190	710	<60	--	--	

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							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
RW-1 Cont.															
5/20/1998	--	451.67	25.50	40.50	23.43	428.24	--	--	--	--	--	--	--	--	
7/30/1998	--		25.50	40.50	27.42	424.25	--	--	--	--	--	--	--	--	
10/29/1998	--		25.50	40.50	32.47	419.20	--	--	--	--	--	--	--	--	
3/16/1999	NP		25.50	40.50	25.45	426.22	1,100	140	19	45	83	530	1.0	--	
5/5/1999	--		25.50	40.50	27.23	424.44	--	--	--	--	--	--	--	--	
8/26/1999	--		25.50	40.50	29.98	421.69	--	--	--	--	--	--	1.39	--	
12/3/1999	--		25.50	40.50	32.38	419.29	--	--	--	--	--	--	--	--	
3/13/2000	NP		25.50	40.50	25.53	426.14	1,100	130	3.5	0.7	95	230	4.43	--	
6/20/2000	--		25.50	40.50	28.31	423.36	--	--	--	--	--	--	1.9	--	
8/31/2000	NP		25.50	40.50	30.61	421.06	<50.0	<0.500	<0.500	<0.500	<0.500	82.5	3.21	--	
2/9/2001	NP		25.50	40.50	31.14	420.53	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	0.84	--	
9/17/2001	NP		25.50	40.50	31.70	419.97	<50	<0.50	<0.50	<0.50	<0.50	<2.5	1.51	--	
1/21/2002	NP		25.50	40.50	30.15	421.52	<50	7.7	<0.50	<0.50	1.5	18	0.63	--	
7/19/2002	NP		25.50	40.50	31.15	420.52	<50	<0.50	<0.50	<0.50	<0.50	13	1.4	6.6	
1/15/2003	--		25.50	40.50	22.20	429.47	860	9	1.6	17	42	1.5	2.8	7.2	a
7/9/2003	--		25.50	40.50	29.56	422.11	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.8	7.1	
02/19/2004	NP		25.50	40.50	23.53	428.14	<50	<0.50	<0.50	<0.50	<0.50	<0.50	2.4	6.7	c
08/04/2004	P	454.11	25.50	40.50	22.45	431.66	600	<0.50	<0.50	3.3	3.4	<0.50	4.4	7.2	
01/18/2005	P		25.50	40.50	23.57	430.54	1,400	8.0	1.9	22	68	<0.50	3.6	6.9	
07/15/2005	NP		25.50	40.50	29.02	425.09	<50	<0.50	<0.50	<0.50	<0.50	2.0	1.1	7.8	
01/10/2006	P		25.50	40.50	21.88	432.23	480	4.3	0.67	8.3	18	0.54	4.4	7.1	
7/21/2006	--		25.50	40.50	--	--	--	--	--	--	--	--	--	--	d
1/17/2007	P		25.50	40.50	31.48	422.63	6,900	17	2.8	22	31	2.6	4.08	7.74	
7/18/2007	NP		25.50	40.50	32.45	421.66	<50	<0.50	<0.50	<0.50	<0.50	<0.50	1.33	7.48	
1/15/2008	NP		25.50	40.50	28.39	425.72	<50	<0.50	<0.50	<0.50	<0.50	8.3	2.73	6.87	
7/7/2008	NP		25.50	40.50	35.19	418.92	<50	<0.50	<0.50	<0.50	<0.50	0.53	2.51	7.05	
1/7/2009	NP		25.50	40.50	33.31	420.80	120	0.96	<0.50	<0.50	<0.50	1.6	2.13	6.84	
7/22/2009	NP		25.50	40.50	36.15	417.96	<50	<0.50	<0.50	<0.50	<0.50	0.84	10.39	7.40	
3/12/2010	P		25.50	40.50	25.01	429.10	240	15	<0.50	<0.50	<0.50	2.7	0.78	7.06	
9/9/2010	NP		25.50	40.50	31.01	423.10	440	<0.50	<0.50	<0.50	0.53	1.9	--	7.3	

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
RW-1 Cont.															
2/17/2011	NP	454.11	25.50	40.50	26.45	427.66	500	1.5	<0.50	<0.50	0.55	<0.50	0.98	8.0	g (GRO)
7/7/2011	NP		25.50	40.50	30.42	423.69	750	2.4	<0.50	0.64	2.2	2.2	0.82	6.7	g (GRO)
1/23/2012	P		25.50	40.50	29.13	424.98	430	13	<0.50	<0.50	2.4	1.8	0.43	6.61	g (GRO)
7/25/2012	P		25.50	40.50	36.50	417.61	<50	<0.50	<0.50	<0.50	<1.0	<0.50	2.21	6.93	
1/17/2013	P		25.50	40.50	28.80	425.31	<50	1.4	<0.50	<0.50	<1.0	0.85	1.49	7.65	
7/25/2013	**P**		**25.50**	**40.50**	**34.65**	**419.46**	**230**	**0.83**	**<0.50**	**<0.50**	**<1.0**	**1.3**	**4.72**	**6.94**	
VW-1															
8/31/2000	P	NS	18.50	28.50	20.61	--	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	10.08	--	
2/9/2001	P		18.50	28.50	22.10	--	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	0.53	--	
9/17/2001	P		18.50	28.50	21.99	--	<50	<0.50	<0.50	<0.50	<0.50	<2.5	6.59	--	
1/21/2002	P		18.50	28.50	21.50	--	<50	<0.50	<0.50	<0.50	<0.50	<5.0	0.7	--	
7/19/2002	P		18.50	28.50	22.42	--	<50	<0.50	<0.50	<0.50	<0.50	<0.50	4.9	7.1	
1/15/2003	--		18.50	28.50	22.59	--	<50	<0.50	<0.50	0.63	1.7	<0.50	5.4	7.2	
7/9/2003	--		18.50	28.50	22.50	--	<50	<0.50	<0.50	<0.50	0.61	<0.50	2.0	7.0	
02/19/2004	--		18.50	28.50	21.04	--	--	--	--	--	--	--	--	--	
08/04/2004	P	453.29	18.50	28.50	20.48	432.81	<50	<0.50	<0.50	<0.50	<0.50	<0.50	5.7	7.0	
01/18/2005	--		18.50	28.50	21.72	431.57	--	--	--	--	--	--	--	--	
07/15/2005	P		18.50	28.50	22.50	430.79	<50	<0.50	<0.50	<0.50	<0.50	<0.50	5.1	7.4	
01/10/2006	--		18.50	28.50	20.17	433.12	--	--	--	--	--	--	--	--	
7/21/2006	P		18.50	28.50	22.50	430.79	220	<0.50	<0.50	<0.50	<0.50	<0.50	5.91	7.3	e
1/17/2007	--		18.50	28.50	21.67	431.62	--	--	--	--	--	--	--	--	
7/18/2007	NP		18.50	28.50	23.58	429.71	<50	<0.50	<0.50	<0.50	<0.50	<0.50	6.45	8.52	
1/15/2008	--		18.50	28.50	21.87	431.42	--	--	--	--	--	--	--	--	
7/7/2008	NP		18.50	28.50	23.70	429.59	<50	<0.50	<0.50	<0.50	<0.50	<0.50	7.54	8.46	
1/7/2009	--		18.50	28.50	22.00	431.29	--	--	--	--	--	--	--	--	
7/22/2009	NP		18.50	28.50	23.95	429.34	<50	<0.50	<0.50	<0.50	<0.50	<0.50	10.12	7.66	
3/12/2010	--		18.50	28.50	21.85	431.44	--	--	--	--	--	--	--	--	
9/9/2010	NP		18.50	28.50	23.65	429.64	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	6.93	
2/17/2011	NP		18.50	28.50	23.83	429.46	<50	<0.50	<0.50	<0.50	<0.50	<0.50	4.57	7.9	
7/7/2011	NP		18.50	28.50	25.17	428.12	<50	<0.50	<0.50	<0.50	<0.50	<0.50	3.85	7.2	

Table 2. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	P/NP	TOC (feet)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	DTW (feet)	Water Level Elevation (feet)	Concentrations in µg/L						DO (mg/L)	pH	Footnote
							GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE			
VW-1 Cont.															
1/23/2012	--	453.29	18.50	28.50	27.40	425.89	--	--	--	--	--	--	--	--	
7/25/2012	NP		18.50	28.50	27.40	425.89	80	<0.50	<0.50	<0.50	<1.0	<0.50	5.12	7.39	j
8/31/2012	--		18.50	28.50	28.03	425.26	--	--	--	--	--	--	--	--	
1/17/2013	--		18.50	28.50	24.60	428.69	--	--	--	--	--	--	--	--	
7/25/2013	**--**		**18.50**	**28.50**	**27.41**	**425.88**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<1.0**	**<0.50**	**--**	**--**	**j**

Symbols & Abbreviations:
--/- - = Not analyzed/applicable/sampled/measured
< = 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, range C4-C12
GWE = Groundwater elevation in ft MSL
g/L = Micrograms per liter
mg/L = Milligrams per liter
MTBE = Methyl tert-butyl ether
NP = Not purged before sampling
P = Purged before sampling
TPH-g = Total petroleum hydrocarbons as gasoline
TOC = Top of casing elevation in ft MSL

Footnotes:
a = Chromatogram Pattern: Gasoline C6-C10
b = Duplicate sample
c = GRO analyzed by EPA Method 8015B modified
d = Well inaccessible
e = Hydrocarbon result partly due to individ. peak(s) in quant. range
f = Sample > 4x spike concentration
g = Quantitated against gasoline
h = Insufficient water within well to collect sample
i = Well not sampled due to the presence of Light Non-Aqueous Phase Liquid (LNAPL)
j = Insufficient water within well to purge prior to sample collection
k = Sample collected following removal of approximately 1.5 gallson of LNAPL/water mixture from well

Notes:
For previous historical GWE and analytical data please refer to Fourth Quarter 1995 Groundwater Monitoring Program Results and Remediation System Performance Evaluation Report, ARCO Service Station 771, Livermore, California, (EMCON, March 1, 1996)

Please note that beginning in the fourth quarter 2003, the laboratory modified the reported analyte list. TPH-g was changed to GRO. The resulting data may be impacted by the potential inclusion of non-TPH-g analytes within the requested fuel range resulting in a higher concentration being reported

All analytes unless otherwise notes utilized EPA Method 8260B, EPA method 8015B modified prior to 1/15/03, and EPA method 8020 prior to 12/03/99

Site wells were resurveyed to NAVD '88 datum on March 8, 2004

Top of screen and bottom of screen depths for MW-3 and MW-6 are estimated from cross-sections

GRO analysis was completed by EPA method 8260B (C4-C12) for samples collected from the time period April 2006 through February 4, 2008. The analysis for GRO was changed to EPA method 8015B (C6-C12) for samples collected from the time period February 5, 2008 through the present

The data within this table collected prior to April 2006 was provided to Broadbent & Associates, Inc. by Atlantic Richfield Company and their previous consultants. Broadbent & Associates, Inc. has not verified the accuracy of this information

Table 3. Summary of Fuel Additives Analytical Data

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-1									
8/23/1995	--	--	<300	--	--	--	--	--	
2/20/1996	--	--	<300	--	--	--	--	--	
5/15/1996	--	--	<250	--	--	--	--	--	
8/13/1996	--	--	<200	--	--	--	--	--	
11/13/1996	--	--	<30	--	--	--	--	--	
3/26/1997	--	--	<30	--	--	--	--	--	
5/15/1997	--	--	<120	--	--	--	--	--	
8/26/1997	--	--	<3	--	--	--	--	--	
11/5/1997	--	--	29	--	--	--	--	--	
2/18/1998	--	--	<120	--	--	--	--	--	
5/20/1998	--	--	<300	--	--	--	--	--	
7/30/1998	--	--	<3	--	--	--	--	--	
10/29/1998	--	--	<3	--	--	--	--	--	
3/16/1999	--	--	270	--	--	--	--	--	
5/5/1999	--	--	170	--	--	--	--	--	
8/26/1999	--	--	120	--	--	--	--	--	
12/3/1999	--	--	<3	--	--	--	--	--	
3/13/2000	--	--	<3	--	--	--	--	--	
6/20/2000	--	--	<2.50	--	--	--	--	--	
6/20/2000	--	--	<2.50	--	--	--	--	--	
7/25/2013	**<150**	**40**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
MW-2									
8/23/1995	--	--	<500	--	--	--	--	--	
2/20/1996	--	--	<300	--	--	--	--	--	
5/15/1996	--	--	<300	--	--	--	--	--	
8/13/1996	--	--	<300	--	--	--	--	--	
11/13/1996	--	--	<200	--	--	--	--	--	
3/26/1997	--	--	<120	--	--	--	--	--	
5/15/1997	--	--	<120	--	--	--	--	--	
8/26/1997	--	--	<120	--	--	--	--	--	
11/5/1997	--	--	<40	--	--	--	--	--	

Table 3. Summary of Fuel Additives Analytical Data

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-2 Cont.									
2/18/1998	--	--	130	--	--	--	--	--	
5/20/1998	--	--	<120	--	--	--	--	--	
7/30/1998	--	--	<120	--	--	--	--	--	
10/29/1998	--	--	<3	--	--	--	--	--	
3/16/1999	--	--	60	--	--	--	--	--	
5/5/1999	--	--	17	--	--	--	--	--	
8/26/1999	--	--	26	--	--	--	--	--	
12/3/1999	--	--	<3	--	--	--	--	--	
3/13/2000	--	--	<3	--	--	--	--	--	
6/20/2000	--	--	<2.50	--	--	--	--	--	
8/31/2000	--	--	<2.50	--	--	--	--	--	
9/17/2001	--	--	120	--	--	--	--	--	
7/19/2002	--	--	16	--	--	--	--	--	
7/9/2003	<1,000	<200	39	<5.0	<5.0	<5.0	<5.0	<5.0	
08/04/2004	<2,000	<400	78	<10	<10	<10	<10	<10	
07/15/2005	<500	120	46	<2.5	<2.5	<2.5	<2.5	<2.5	
7/21/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/18/2007	<600	89	45	<1.0	<1.0	<1.0	<1.0	<1.0	
7/7/2008	--	<100	19	<5.0	<5.0	<5.0	<5.0	--	
9/9/2010	<600	41	13	<1.0	<1.0	<1.0	<1.0	<1.0	
7/7/2011	<300	<10	6.2	<0.50	<0.50	<0.50	<0.50	<0.50	
7/25/2013	**<150**	**93**	**25**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
MW-3									
8/23/1995	--	--	<3	--	--	--	--	--	
2/20/1996	--	--	<3	--	--	--	--	--	
5/15/1996	--	--	<0.5	--	--	--	--	--	
8/13/1996	--	--	<3	--	--	--	--	--	
11/13/1996	--	--	<3	--	--	--	--	--	
3/26/1997	--	--	<3	--	--	--	--	--	
5/15/1997	--	--	<3	--	--	--	--	--	
8/26/1997	--	--	<3	--	--	--	--	--	

Table 3. Summary of Fuel Additives Analytical Data

ARCO Service Station #0771, 899 Rincon Ave., 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.									
11/5/1997	--	--	<3	--	--	--	--	--	
2/18/1998	--	--	<3	--	--	--	--	--	
5/20/1998	--	--	<3	--	--	--	--	--	
7/30/1998	--	--	<3	--	--	--	--	--	
10/29/1998	--	--	<3	--	--	--	--	--	
3/16/1999	--	--	<3	--	--	--	--	--	
5/5/1999	--	--	<3	--	--	--	--	--	
8/26/1999	--	--	<3	--	--	--	--	--	
12/3/1999	--	--	<3	--	--	--	--	--	
3/13/2000	--	--	<3	--	--	--	--	--	
6/20/2000	--	--	<2.50	--	--	--	--	--	
7/25/2013	**<150**	**<10**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
MW-4									
8/23/1995	--	--	<100	--	--	--	--	--	
2/20/1996	--	--	<70	--	--	--	--	--	
3/26/1997	--	--	<70	--	--	--	--	--	
2/18/1998	--	--	120	--	--	--	--	--	
3/16/1999	--	--	82	--	--	--	--	--	
3/13/2000	--	--	<3	--	--	--	--	--	
8/31/2000	--	--	<2.50	--	--	--	--	--	
2/9/2001	--	--	<2.50	--	--	--	--	--	
9/17/2001	--	--	360	--	--	--	--	--	
1/21/2002	--	--	300	--	--	--	--	--	
7/19/2002	--	--	130	--	--	--	--	--	
1/15/2003	--	--	150	--	--	--	--	--	
7/9/2003	<1,000	750	150	<5.0	<5.0	<5.0	<5.0	<5.0	
02/19/2004	<1,000	630	180	<10	<10	<10	<5.0	<5.0	
08/04/2004	<2,000	1,300	300	<10	<10	<10	<10	<10	
01/18/2005	<1,000	630	160	<5.0	<5.0	<5.0	<5.0	<5.0	a
07/15/2005	<1,000	850	230	<5.0	<5.0	<5.0	<5.0	<5.0	
01/10/2006	<1,500	810	190	<2.5	<2.5	<2.5	<2.5	<2.5	

Table 3. Summary of Fuel Additives Analytical Data

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-4 Cont.									
7/21/2006	<300	35	3.1	<0.50	<0.50	<0.50	<0.50	<0.50	
1/17/2007	<300	<20	11	<0.50	<0.50	<0.50	<0.50	<0.50	
7/18/2007	<300	830	74	<0.50	<0.50	<0.50	0.76	<0.50	
1/15/2008	<300	280	61	<0.50	<0.50	<0.50	<0.50	<0.50	b (MTBE)
7/7/2008	--	19	17	<0.50	<0.50	<0.50	<0.50	--	
1/7/2009	--	74	37	<0.50	<0.50	<0.50	<0.50	<0.50	
7/22/2009	<300	580	63	0.85	<0.50	<0.50	<0.50	<0.50	
3/12/2010	<300	460	43	<0.50	<0.50	<0.50	<0.50	<0.50	
9/9/2010	<1,500	880	51	<2.5	<2.5	<2.5	<2.5	<2.5	
2/17/2011	<1200	430	33	<2.0	<2.0	<2.0	<2.0	<2.0	
7/7/2011	<1,500	580	57	<2.5	<2.5	<2.5	<2.5	<2.5	
1/23/2012	<1,200	620	44	<2.0	<2.0	<2.0	<2.0	<2.0	
7/25/2012	<150	990	49	<0.50	<0.50	<0.50	<0.50	<0.50	
1/17/2013	<750	590	110	<2.5	<2.5	<2.5	<2.5	<2.5	
7/25/2013	**<150**	**940**	**40**	**0.51**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
MW-5									
8/23/1995	--	--	<300	--	--	--	--	--	
2/20/1996	--	--	<50	--	--	--	--	--	
5/15/1996	--	--	<40	--	--	--	--	--	
8/13/1996	--	--	47	--	--	--	--	--	
11/13/1996	--	--	66	--	--	--	--	--	
3/26/1997	--	--	68	--	--	--	--	--	
5/15/1997	--	--	48	--	--	--	--	--	
8/26/1997	--	--	9	--	--	--	--	--	
11/5/1997	--	--	34	--	--	--	--	--	
2/18/1998	--	--	320	--	--	--	--	--	
5/20/1998	--	--	62	--	--	--	--	--	
7/30/1998	--	--	<3	--	--	--	--	--	
10/29/1998	--	--	<3	--	--	--	--	--	
3/16/1999	--	--	120	--	--	--	--	--	
5/5/1999	--	--	19	--	--	--	--	--	

Table 3. Summary of Fuel Additives Analytical Data

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-5 Cont.									
8/26/1999	--	--	150	--	--	--	--	--	
3/13/2000	--	--	<3	--	--	--	--	--	
6/20/2000	--	--	<2.50	--	--	--	--	--	
8/31/2000	--	--	3.83	--	--	--	--	--	
9/17/2001	--	--	330	--	--	--	--	--	
7/19/2002	--	--	180	--	--	--	--	--	
7/9/2003	<1,000	1,100	260	<5.0	<5.0	<5.0	<5.0	<5.0	
08/04/2004	<1,000	850	250	<5.0	<5.0	<5.0	<5.0	<5.0	
07/15/2005	<1,000	720	270	<5.0	<5.0	<5.0	<5.0	<5.0	
7/21/2006	<3,000	<200	14	<5.0	<5.0	<5.0	<5.0	<5.0	
7/18/2007	<300	260	110	<0.50	<0.50	<0.50	<0.50	<0.50	
7/7/2008	--	<10	<0.50	<0.50	<0.50	<0.50	<0.50	--	
7/22/2009	<300	11	12	<0.50	<0.50	<0.50	<0.50	<0.50	
9/9/2010	<300	420	10	<0.50	<0.50	<0.50	<0.50	<0.50	
7/7/2011	<300	350	4.6	<0.50	<0.50	<0.50	<0.50	<0.50	
7/25/2012	<150	480	11	<0.50	<0.50	<0.50	<0.50	<0.50	
7/25/2013	**<150**	**220**	**22**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
MW-6									
8/23/1995	--	--	<20	--	--	--	--	--	
2/20/1996	--	--	<30	--	--	--	--	--	
5/15/1996	--	--	<15	--	--	--	--	--	
8/13/1996	--	--	<20	--	--	--	--	--	
11/13/1996	--	--	16	--	--	--	--	--	
3/26/1997	--	--	<30	--	--	--	--	--	
5/15/1997	--	--	<12	--	--	--	--	--	
8/26/1997	--	--	<12	--	--	--	--	--	
11/5/1997	--	--	9	--	--	--	--	--	
2/18/1998	--	--	19	--	--	--	--	--	
5/20/1998	--	--	9	--	--	--	--	--	
7/30/1998	--	--	<15	--	--	--	--	--	
10/29/1998	--	--	<12	--	--	--	--	--	

Table 3. Summary of Fuel Additives Analytical Data

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-6 Cont.									
3/16/1999	--	--	18	--	--	--	--	--	
5/5/1999	--	--	25	--	--	--	--	--	
8/26/1999	--	--	13	--	--	--	--	--	
12/3/1999	--	--	4	--	--	--	--	--	
3/13/2000	--	--	<3	--	--	--	--	--	
6/20/2000	--	--	<2.50	--	--	--	--	--	
8/31/2000	--	--	8.73	--	--	--	--	--	
2/9/2001	--	--	48.9	--	--	--	--	--	
2/9/2001	--	--	57.1	--	--	--	--	--	
9/17/2001	--	--	<2.5	--	--	--	--	--	
9/17/2001	--	--	<2.5	--	--	--	--	--	
1/21/2002	--	--	<5.0	--	--	--	--	--	
7/19/2002	--	--	<0.50	--	--	--	--	--	
1/15/2003	--	--	1	--	--	--	--	--	
7/9/2003	<100	<20	0.98	<0.50	<0.50	<0.50	<0.50	<0.50	
08/04/2004	<100	<20	5.2	<0.50	<0.50	<0.50	<0.50	<0.50	
07/15/2005	<500	110	32	<2.5	<2.5	<2.5	<2.5	<2.5	
7/21/2006	<300	<20	5.1	<0.50	<0.50	<0.50	<0.50	<0.50	
7/18/2007	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/7/2008	--	<10	<0.50	<0.50	<0.50	<0.50	<0.50	--	
7/22/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
9/9/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/7/2011	<300	19	8.0	<0.50	<0.50	<0.50	<0.50	<0.50	
7/25/2012	<150	22	10	<0.50	<0.50	<0.50	<0.50	<0.50	
7/25/2013	**<150**	**40**	**19**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
MW-7									
8/23/1995	--	--	350	--	--	--	--	--	
2/20/1996	--	--	<400	--	--	--	--	--	
3/26/1997	--	--	<300	--	--	--	--	--	
2/18/1998	--	--	240	--	--	--	--	--	
3/16/1999	--	--	<120	--	--	--	--	--	

Table 3. Summary of Fuel Additives Analytical Data

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-7 Cont.									
8/31/2000	--	--	202	--	--	--	--	--	
2/9/2001	--	--	128	--	--	--	--	--	
9/17/2001	--	--	160	--	--	--	--	--	
1/21/2002	--	--	97	--	--	--	--	--	
1/21/2002	--	--	99	--	--	--	--	--	
7/19/2002	--	--	64	--	--	--	--	--	
1/15/2003	--	--	91	--	--	--	--	--	
7/9/2003	<1,000	350	110	<5.0	<5.0	<5.0	<5.0	<5.0	
02/19/2004	<1,000	420	100	<10	<10	<10	<5.0	<5.0	
08/04/2004	<5,000	<1,000	140	<25	<25	<25	<25	<25	
01/18/2005	<1,000	260	87	<5.0	<5.0	<5.0	<5.0	<5.0	a
07/15/2005	<5,000	<1,000	150	<25	<25	<25	<25	<25	
01/10/2006	<30,000	<2,000	120	<50	<50	<50	<50	<50	
7/21/2006	<30,000	<2,000	54	<50	<50	<50	<50	<50	
1/17/2007	<1,500	<100	3.1	<2.5	<2.5	<2.5	<2.5	<2.5	
7/18/2007	<600	220	67	<1.0	<1.0	<1.0	<1.0	<1.0	
1/15/2008	<1,500	<100	26	<2.5	<2.5	<2.5	<2.5	<2.5	
7/7/2008	--	<10	0.69	<0.50	<0.50	<0.50	<0.50	--	
1/7/2009	--	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/22/2009	<300	<10	0.53	<0.50	<0.50	<0.50	<0.50	<0.50	
3/12/2010	<300	51	11	<0.50	<0.50	<0.50	<0.50	<0.50	
9/9/2010	<300	180	110	<0.50	<0.50	<0.50	<0.50	<0.50	
7/7/2011	<3,000	390	150	<5.0	<5.0	<5.0	<5.0	<5.0	
1/23/2012	<3,000	510	150	<5.0	<5.0	<5.0	<5.0	<5.0	
8/31/2012	<3,000	510	120	<10	<10	<10	<10	<10	
1/17/2013	<750	340	120	<2.5	<2.5	<2.5	<2.5	<2.5	
7/25/2013	**<150**	**490**	**170**	**0.75**	**<0.50**	**<0.50**	**0.62**	**<0.50**	
MW-8									
8/23/1995	--	--	<3	--	--	--	--	--	
2/20/1996	--	--	<3	--	--	--	--	--	
8/13/1996	--	--	<3	--	--	--	--	--	

Table 3. Summary of Fuel Additives Analytical Data

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-8 Cont.									
3/26/1997	--	--	<3	--	--	--	--	--	
8/26/1997	--	--	<3	--	--	--	--	--	
2/18/1998	--	--	<3	--	--	--	--	--	
7/30/1998	--	--	<3	--	--	--	--	--	
3/16/1999	--	--	<3	--	--	--	--	--	
8/26/1999	--	--	<3	--	--	--	--	--	
3/13/2000	--	--	<3	--	--	--	--	--	
7/25/2013	**<150**	**<10**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
MW-9									
8/23/1995	--	--	<3	--	--	--	--	--	
2/20/1996	--	--	<3	--	--	--	--	--	
3/26/1997	--	--	<3	--	--	--	--	--	
2/18/1998	--	--	<3	--	--	--	--	--	
3/16/1999	--	--	<3	--	--	--	--	--	
3/13/2000	--	--	<3	--	--	--	--	--	
7/25/2013	**<150**	**<10**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
MW-10									
8/23/1995	--	--	<3	--	--	--	--	--	
2/20/1996	--	--	<3	--	--	--	--	--	
3/26/1997	--	--	<3	--	--	--	--	--	
3/16/1999	--	--	<3	--	--	--	--	--	
MW-11									
8/23/1995	--	--	<3	--	--	--	--	--	
2/20/1996	--	--	<3	--	--	--	--	--	
8/13/1996	--	--	<3	--	--	--	--	--	
3/26/1997	--	--	<3	--	--	--	--	--	
8/26/1997	--	--	<3	--	--	--	--	--	
2/18/1998	--	--	<3	--	--	--	--	--	
7/30/1998	--	--	<3	--	--	--	--	--	
3/16/1999	--	--	<3	--	--	--	--	--	

Table 3. Summary of Fuel Additives Analytical Data

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
MW-11 Cont.									
8/26/1999	--	--	<3	--	--	--	--	--	
3/13/2000	--	--	<3	--	--	--	--	--	
8/31/2000	--	--	<2.50	--	--	--	--	--	
8/31/2000	--	--	<2.50	--	--	--	--	--	
9/17/2001	--	--	<2.5	--	--	--	--	--	
7/19/2002	--	--	<0.50	--	--	--	--	--	
7/9/2003	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
08/04/2004	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
07/15/2005	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/21/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/18/2007	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/7/2008	--	<10	<0.50	<0.50	<0.50	<0.50	<0.50	--	
7/22/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
9/9/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/7/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/25/2013	**<150**	**<10**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
RW-1									
8/23/1995	--	--	<50	--	--	--	--	--	
2/20/1996	--	--	<40	--	--	--	--	--	
3/26/1997	--	--	54	--	--	--	--	--	
2/18/1998	--	--	<60	--	--	--	--	--	
3/16/1999	--	--	530	--	--	--	--	--	
3/13/2000	--	--	230	--	--	--	--	--	
8/31/2000	--	--	82.5	--	--	--	--	--	
2/9/2001	--	--	<2.50	--	--	--	--	--	
9/17/2001	--	--	<2.5	--	--	--	--	--	
1/21/2002	--	--	18	--	--	--	--	--	
7/19/2002	--	--	13	--	--	--	--	--	
1/15/2003	--	--	1.5	--	--	--	--	--	
7/9/2003	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
02/19/2004	<100	<20	<0.50	<1.0	<1.0	<1.0	<0.50	<0.50	

Table 3. Summary of Fuel Additives Analytical Data

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
RW-1 Cont.									
08/04/2004	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
01/18/2005	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	a
07/15/2005	<100	<20	2.0	<0.50	<0.50	<0.50	<0.50	<0.50	
01/10/2006	<300	<20	0.54	<0.50	<0.50	<0.50	<0.50	<0.50	
1/17/2007	<1,500	<100	2.6	<2.5	<2.5	<2.5	<2.5	<2.5	
7/18/2007	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
1/15/2008	<300	<20	8.3	<0.50	<0.50	<0.50	<0.50	<0.50	
7/7/2008	--	<10	0.53	<0.50	<0.50	<0.50	<0.50	--	
1/7/2009	--	<10	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	
7/22/2009	<300	12	0.84	<0.50	<0.50	<0.50	<0.50	<0.50	
3/12/2010	<300	13	2.7	<0.50	<0.50	<0.50	<0.50	<0.50	
9/9/2010	<300	<10	1.9	<0.50	<0.50	<0.50	<0.50	<0.50	
2/17/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/7/2011	<300	<10	2.2	<0.50	<0.50	<0.50	<0.50	<0.50	
1/23/2012	<300	<10	1.8	<0.50	<0.50	<0.50	<0.50	<0.50	
7/25/2012	<150	19	<0.50	<0.50	<0.50	0.50	<0.50	<0.50	
1/17/2013	<150	<10	0.85	<0.50	<0.50	<0.50	<0.50	<0.50	
7/25/2013	**<150**	**23**	**1.3**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
VW-1									
8/31/2000	--	--	<2.50	--	--	--	--	--	
2/9/2001	--	--	<2.50	--	--	--	--	--	
9/17/2001	--	--	<2.5	--	--	--	--	--	
1/21/2002	--	--	<5.0	--	--	--	--	--	
7/19/2002	--	--	<0.50	--	--	--	--	--	
1/15/2003	--	--	<0.50	--	--	--	--	--	
7/9/2003	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
08/04/2004	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
07/15/2005	<100	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/21/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/18/2007	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/7/2008	--	<10	<0.50	<0.50	<0.50	<0.50	<0.50	--	

Table 3. Summary of Fuel Additives Analytical Data

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Well ID and Date Monitored	Concentrations in µg/L								Footnote
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
VW-1 Cont.									
7/22/2009	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
9/9/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
2/17/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/7/2011	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/25/2012	<150	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
7/25/2013	**<150**	**<10**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	

Symbols & Abbreviations:
-- = Not analyzed/sampled
< = 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
µg/L = Micrograms per liter
TAME = tert-Amyl methyl ether
TBA = tert-Butyl alcohol

Footnotes:
a = Calibration verification was within the method limits but outside the contract limits for ethanol
b = Sample >4x spike concentration

Notes:
The data within this table collected prior to April 2006 was provided to Broadbent & Associates, Inc. by Atlantic Richfield Company and their previous consultants. Broadbent & Associates, Inc. has not verified the accuracy of this information

Table 4. Summary of Groundwater Gradient - Direction and Magnitude

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Date Measured	Approximate Gradient Direction	Approximate Gradient Magnitude (ft/ft)
3/20/1995	Northwest	0.030
6/2/1995	North-Northwest	0.014
8/23/1995	North-Northwest	0.030
12/4/1995	North-Northwest	0.030
2/20/1996	Northwest	0.016
5/15/1996	Northwest	0.024
8/13/1996	North-Northwest	0.030
11/13/1996	North-Northwest	0.031
3/26/1997	North-Northwest	0.044
5/15/1997	North-Northwest	0.031
8/26/1997	North-Northwest	0.042
11/5/1997	North-Northwest	0.030
2/18/1998	Northwest	0.010
5/20/1998	Northwest	0.030
7/30/1998	North	0.040
10/29/1998	North	0.005
3/16/1999	North-Northwest	0.030
5/5/1999	North	0.040
8/26/1999	North-Northwest	0.050
12/3/1999	North-Northeast	0.060
3/13/2000	North-Northwest	0.066
6/20/2000	North-Northwest	0.050
8/31/2000	North-Northwest	0.062
2/9/2001	North-Northeast	0.014
9/17/2001	North-Northwest	0.061
1/21/2002	North-Northwest	0.050
7/19/2002	North-Northwest	0.044
1/15/2003	Northeast to Southeast	0.038 - 0.016
7/9/2003	Northwest to North-Northwest	0.009 - 0.063
2/19/2004	North	0.044
8/4/2004	Northeast	0.071
1/18/2005	North-Northeast	0.04
7/15/2005	Northeast and Southwest	0.05 and 0.02
1/10/2006	North	0.02
7/21/2006	North and Southwest	0.05 and 0.02
1/17/2007	North-Northeast and Southwest	0.03 and 0.02
7/18/2007	North-Northeast to Southwest	0.03 and 0.04
1/15/2008	North	0.04
7/7/2008	North	0.03
1/7/2009	North	0.06
7/22/2009	North	0.04
3/12/2010	North	0.05
9/9/2010	North	0.04
2/17/2011	North	0.03
7/7/2011	North	0.04

Table 4. Summary of Groundwater Gradient - Direction and Magnitude

ARCO Service Station #0771, 899 Rincon Ave., Livermore, CA

Date Measured	Approximate Gradient Direction	Approximate Gradient Magnitude (ft/ft)
1/23/2012	Northwest	0.02
7/25/2012	North	0.03
1/17/2013	North	0.03
7/25/2013	**North-Northeast**	**0.02**

Notes:
The data within this table collected prior to April 2006 was provided to Broadbent & Associates, Inc. by Atlantic Richfield Company and their previous consultants. Broadbent & Associates, Inc. has not verified the accuracy of this information

Table 5. Summary of Soil Sample Analytical Data
Station #771, 899 Rincon 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
B-1	B-1@30.5	10/22/2013	<0.099	<0.00099	<0.00099	<0.00099	<0.002	<0.002	
B-2	B-2@28.5	10/22/2013	<0.099	<0.00099	<0.00099	<0.00099	<0.002	<0.002	
B-3	B-3@31.5	10/23/2013	<0.099	<0.00099	<0.00099	<0.00099	<0.002	<0.002	
ESLs	--	--	100	0.044	2.9	3.3	2.3	0.023	

Abbreviations & Symbols:

* = See Drawing 2 for soil boring locations.

GRO: Gasoline range organics.

TestAmerica: Volatile Fuel Hydrocarbons (C4-C12)

GRO, 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, May 2013).

bgs = Below ground surface

Notes:

Tert-butyl alcohol (TBA), Di-isopropyl ether (DIPE), ethyl tert-butyl ether (ETBE), ter-amyl methyl ether (TAME), and naphthalene 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., B-1@30.5 was collected at a depth of 30.5 feet bgs)

Table 6. Summary of Groundwater Sample Analytical Data
Station #771, 899 Rincon 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	Comments
B-1@40'	35-40	10/23/2013	<50	<0.50	<0.50	<0.50	<1.0	<0.50	
B-2@58'	53-58	10/23/2013	<50	<0.50	<0.50	<0.50	<1.0	<0.50	
ESLs	--	--	100	1.0	40	30	20	5.0	

Abbreviations & Symbols:

* = See Drawing 2 for soil boring locations.

-- = Not applicable or available

GRO: Gasoline range organics.

TestAmerica.: Volatile Fuel Hydrocarbons (C4-C12)

GRO, Benzene, Toluene, Ethylbenzene, Total Xylenes, and MTBE 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, May 2013).

bgs = Below ground surface

Notes:

Di-isopropyl ether (DIPE), ethyl tert-butyl ether (ETBE), tert-Butyl alcohol (TBA), tert-amyl-methyl ether (TAME), and naphthalene were not detected at or above their respective laboratory reporting limit.

APPENDICES

APPENDIX A

RECENT REGULATORY CORRESPONDENCE

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
ALEX BRISCOE, Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

June 24, 2013

Shannon Couch
Atlantic Richfield Company
PO Box 1257
San Ramon, CA 94583
(*Sent via E-mail to: shannon.couch@bp.com*)

Subject: Work Plan Approval for Fuel Leak Case No. RO0000200 and GeoTracker Global ID T0600100113, ARCO #00771, 899 Rincon Avenue, Livermore, CA 94550

Dear Ms. Couch:

Alameda County Environmental Health (ACEH) staff has reviewed the fuel leak case file for the above-referenced site including the recent document entitled, "*Conceptual Site Model and Work Plan for Soil and Groundwater Investigation*," dated May 29, 2013 (Work Plan). The Work Plan, which was prepared on behalf of Atlantic Richfield Company by Broadbent & Associates, Inc., presents plans to define the vertical downgradient extent of contamination and to better define the site hydrogeology. Four cone penetration (CPT) borings will be advanced to collect CPT data and soil and groundwater samples.

The proposed scope of work is acceptable and may be implemented as proposed. Therefore, we request that you implement the proposed work and submit a report with the results **no later than October 24, 2013**.

TECHNICAL REPORT REQUEST

Please upload technical reports to the ACEH ftp site (Attention: Jerry Wickham), and to the State Water Resources Control Board's GeoTracker website according to the following schedule and file-naming convention:

- **October 24, 2013** – Soil and Groundwater Investigation Report
  File to be named: SWI_R_yyyy-mm-dd RO200

- **October 26, 2013** – Third Quarter 2013 Semi-Annual Groundwater Monitoring Report
  File to be named: GWM_R_yyyy-mm-dd RO200

These reports are being requested pursuant to California Health and Safety Code Section 25296.10. 23 CCR Sections 2652 through 2654, and 2721 through 2728 outline the responsibilities of a responsible party in response to an unauthorized release from a petroleum UST system, and require your compliance with this request.

If you have any questions, please call me at (510) 567-6791 or send me an electronic mail message at jerry.wickham@acgov.org. Case files can be reviewed online at the following website: http://www.acgov.org/aceh/index.htm.

Sincerely,

Jerry Wickham, California PG 3766, CEG 1177, and CHG 297
Senior Hazardous Materials Specialist

Attachments: Responsible Party(ies) Legal Requirements/Obligations

Enclosure: ACEH Electronic Report Upload (ftp) Instructions

cc: Danielle Stefani, Livermore Pleasanton Fire Department, 3560 Nevada St, Pleasanton, CA 94566 (*Sent via E-mail to: dstefani@lpfire.org*)

Colleen Winey (QIC 8021), Zone 7 Water Agency, 100 North Canyons Pkwy, Livermore, CA 94551 (*Sent via E-mail to: cwiney@zone7water.com*)

Jason Duda, Broadbent & Associates, Inc., 875 Cotting Lane, Suite G, Vacaville, CA 95688 (*Sent via E-mail to: jduda@broadbentinc.com*)

Donna Drogos, ACEH (*Sent via E-mail to: donna.drogos@acgov.org*)
Jerry Wickham, ACEH (*Sent via E-mail to: jerry.wickham@acgov.org*)

GeoTracker, eFile

Attachment 1

Responsible Party(ies) Legal Requirements/Obligations

REPORT/DATA REQUESTS

These reports/data are being requested pursuant to Division 7 of the California Water Code (Water Quality), Chapter 6.7 of Division 20 of the California Health and Safety Code (Underground Storage of Hazardous Substances), and Chapter 16 of Division 3 of Title 23 of the California Code of Regulations (Underground Storage Tank Regulations).

ELECTRONIC SUBMITTAL OF REPORTS

ACEH's Environmental Cleanup Oversight Programs (Local Oversight Program [LOP] for unauthorized releases from petroleum Underground Storage Tanks [USTs], and Site Cleanup Program [SCP] for unauthorized releases of non-petroleum hazardous substances) require submission of reports in electronic format pursuant to Chapter 3 of Division 7, Sections 13195 and 13197.5 of the California Water Code, and Chapter 30, Articles 1 and 2, Sections 3890 to 3895 of Division 3 of Title 23 of the California Code of Regulations (23 CCR). Instructions for submission of electronic documents to the ACEH FTP site are provided on the attached "Electronic Report Upload Instructions."

Submission of reports to the ACEH FTP site is in addition to requirements for electronic submittal of information (ESI) to the State Water Resources Control Board's (SWRCB) Geotracker website. In April 2001, the SWRCB adopted 23 CCR, Division 3, Chapter 16, Article 12, Sections 2729 and 2729.1 (Electronic Submission of Laboratory Data for UST Reports). Article 12 required electronic submittal of analytical laboratory data submitted in a report to a regulatory agency (effective September 1, 2001), and surveyed locations (latitude, longitude and elevation) of groundwater monitoring wells (effective January 1, 2002) in Electronic Deliverable Format (EDF) to Geotracker. Article 12 was subsequently repealed in 2004 and replaced with Article 30 (Electronic Submittal of Information) which expanded the ESI requirements to include electronic submittal of any report or data required by a regulatory agency from a cleanup site. The expanded ESI submittal requirements for petroleum UST sites subject to the requirements of 23 CCR, Division, 3, Chapter 16, Article 11, became effective December 16, 2004. All other electronic submittals required pursuant to Chapter 30 became effective January 1, 2005. Please visit the SWRCB website for more information on these requirements. (http://www.waterboards.ca.gov/water_issues/programs/ust/electronic_submittal/)

PERJURY STATEMENT

All work plans, technical reports, or technical documents submitted to ACEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge." This letter must be signed by an officer or legally authorized representative of your company. Please include a cover letter satisfying these requirements with all future reports and technical documents submitted for this fuel leak case.

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6735, 7835, and 7835.1) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately registered or certified professional. For your submittal to be considered a valid technical report, you are to present site specific data, data interpretations, and recommendations prepared by an appropriately licensed professional and include the professional registration stamp, signature, and statement of professional certification. Please ensure all that all technical reports submitted for this fuel leak case meet this requirement.

UNDERGROUND STORAGE TANK CLEANUP FUND

Please note that delays in investigation, late reports, or enforcement actions may result in your becoming ineligible to receive grant money from the state's Underground Storage Tank Cleanup Fund (Senate Bill 2004) to reimburse you for the cost of cleanup.

AGENCY OVERSIGHT

If it appears as though significant delays are occurring or reports are not submitted as requested, we will consider referring your case to the Regional Board or other appropriate agency, including the County District Attorney, for possible enforcement actions. California Health and Safety Code, Section 25299.76 authorizes enforcement including administrative action or monetary penalties of up to $10,000 per day for each day of violation.

Alameda County Environmental Cleanup Oversight Programs (LOP and SCP)	**REVISION DATE:** July 25, 2012
	ISSUE DATE: July 5, 2005
	PREVIOUS REVISIONS: October 31, 2005; December 16, 2005; March 27, 2009; July 8, 2010
SECTION: Miscellaneous Administrative Topics & Procedures	**SUBJECT:** Electronic Report Upload (ftp) Instructions

The Alameda County Environmental Cleanup Oversight Programs (petroleum UST and SCP) require submission of all reports in electronic form to the county's FTP site. Paper copies of reports will no longer be accepted. The electronic copy replaces the paper copy and will be used for all public information requests, regulatory review, and compliance/enforcement activities.

REQUIREMENTS

- **Please do not submit reports as attachments to electronic mail.**
- Entire report including cover letter must be submitted to the ftp site as **a single Portable Document Format (PDF) with no password protection**.
- It is **preferable** that reports be converted to PDF format from their original format, (e.g., Microsoft Word) rather than scanned.
- **Signature pages and perjury statements must be included and have either original or electronic signature.**
- **Do not password protect the document**. Once indexed and inserted into the correct electronic case file, the document will be secured in compliance with the County's current security standards and a password. **Documents with password protection will not be accepted**.
- Each page in the PDF document should be rotated in the direction that will make it easiest to read on a computer monitor.
- Reports must be named and saved using the following naming convention:

  RO#_Report Name_Year-Month-Date (e.g., RO#5555_WorkPlan_2005-06-14)

Submission Instructions

1) Obtain User Name and Password
   a) Contact the Alameda County Environmental Health Department to obtain a User Name and Password to upload files to the ftp site.
      i) Send an e-mail to .loptoxic@acgov.org
   b) In the subject line of your request, be sure to include **"ftp PASSWORD REQUEST"** and in the body of your request, include the **Contact Information, Site Addresses**, and the **Case Numbers (RO# available in Geotracker) you will be posting for**.

2) Upload Files to the ftp Site
   a) Using Internet Explorer (IE4+), go to ://alcoftp1.acgov.org
      (i) Note: Netscape, Safari, and Firefox browsers will not open the FTP site as they are NOT being supported at this time.
   b) Click on Page located on the Command bar on upper right side of window, and then scroll down to Open FTP Site in Windows Explorer.
   c) Enter your User Name and Password. (Note: Both are Case Sensitive.)
   d) Open "My Computer" on your computer and navigate to the file(s) you wish to upload to the ftp site.
   e) With both "My Computer" and the ftp site open in separate windows, drag and drop the file(s) from "My Computer" to the ftp window.

3) Send E-mail Notifications to the Environmental Cleanup Oversight Programs
   a) Send email to .loptoxic@acgov.org notify us that you have placed a report on our ftp site.
   b) Copy your Caseworker on the e-mail. Your Caseworker's e-mail address is the entire first name then a period and entire last name @acgov.org. (e.g., firstname.lastname@acgov.org)
   c) The subject line of the e-mail must start with the RO# followed by **Report Upload**. (e.g., Subject: RO1234 Report Upload) If site is a new case without an RO#, use the street address instead.
   d) If your document meets the above requirements and you follow the submission instructions, you will receive a notification by email indicating that your document was successfully uploaded to the ftp site.

From:	Wickham, Jerry, Env. Health
To:	Jason Duda
Cc:	Rob Miller; Carmel, Charles
Subject:	RE: BP Station #771, Livermore (RO000200)
Date:	Wednesday, October 16, 2013 3:02:21 PM

Hello Jason,

Eliminating boring B-3 due to utilities in the area is acceptable. The site characterization data will be reviewed following the onsite CPT investigation.

Regards,
Jerry Wickham
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502-6577
phone: 510-567-6791
jerry.wickham@acgov.org

From: Jason Duda [mailto:jduda@broadbentinc.com]
Sent: Tuesday, October 15, 2013 1:44 PM
To: Wickham, Jerry, Env. Health
Cc: Rob Miller; Carmel, Charles
Subject: BP Station #771, Livermore (RO000200)

Hi Jerry,

I wanted to let you know that we have decided to eliminate boring B-3 (see attached Site Map) from the upcoming onsite CPT investigation at BP Station #771 located at 899 Rincon Ave., Livermore. After conducting the private utility locate yesterday, we discovered that the proposed area for B-3 is riddled with underground utilities, as is the area immediately south of the proposed location (see attached photos). I still believe that the other 3 proposed borings will provide us with adequate data to further evaluate onsite hydrogeology and potential contaminant concentrations. Please let me know if this decision appears appropriate. Thank you.

Jason Duda
Project Scientist

1370 Ridgewood Dr., Suite 5, Chico, CA 95973
[T] 530-566-1400 • [C] 530-592-6822 • [F] 530-566-1401
jduda @ broadbentinc.com

BROADBENT
www.broadbentinc.com

APPENDIX B

HISTORIC SITE DATA

TABLE 1
ANALYTICAL RESULTS OF SOIL AND SLUDGE SAMPLES
BY BROWN AND CALDWELL
ARCO Station 771
899 Rincon Avenue
Livermore, California
August 25, 1987

Sample Identification	HVC	TPFH	B	T	X	PCBs
AL-1	ND	378	ND	ND	ND	ND
AL-2	ND	ND	ND	ND	ND	ND
LS-1	ND	3,779	ND	0.009	0.05	ND
LS-2	ND	808	ND	0.011	0.06	ND
WO-1	ND	256,508	ND	2.920	0.128	ND

Results in milligrams per kilogram (mg/kg) or parts per million (ppm).
HVC: Halogenated volatile compounds by EPA Method 8010.
TPFH: Total petroleum fuel hydrocarbons by modified EPA Method 8015.
B: Benzene by EPA Method 8020.
T: Toluene by EPA Method 8020.
X: Total xylene isomers by EPA Method 8020.
PCBs: Polychlorinated biphenyls (PCBs) by EPA Method 8080.
ND: Below laboratory reported detection concentration.

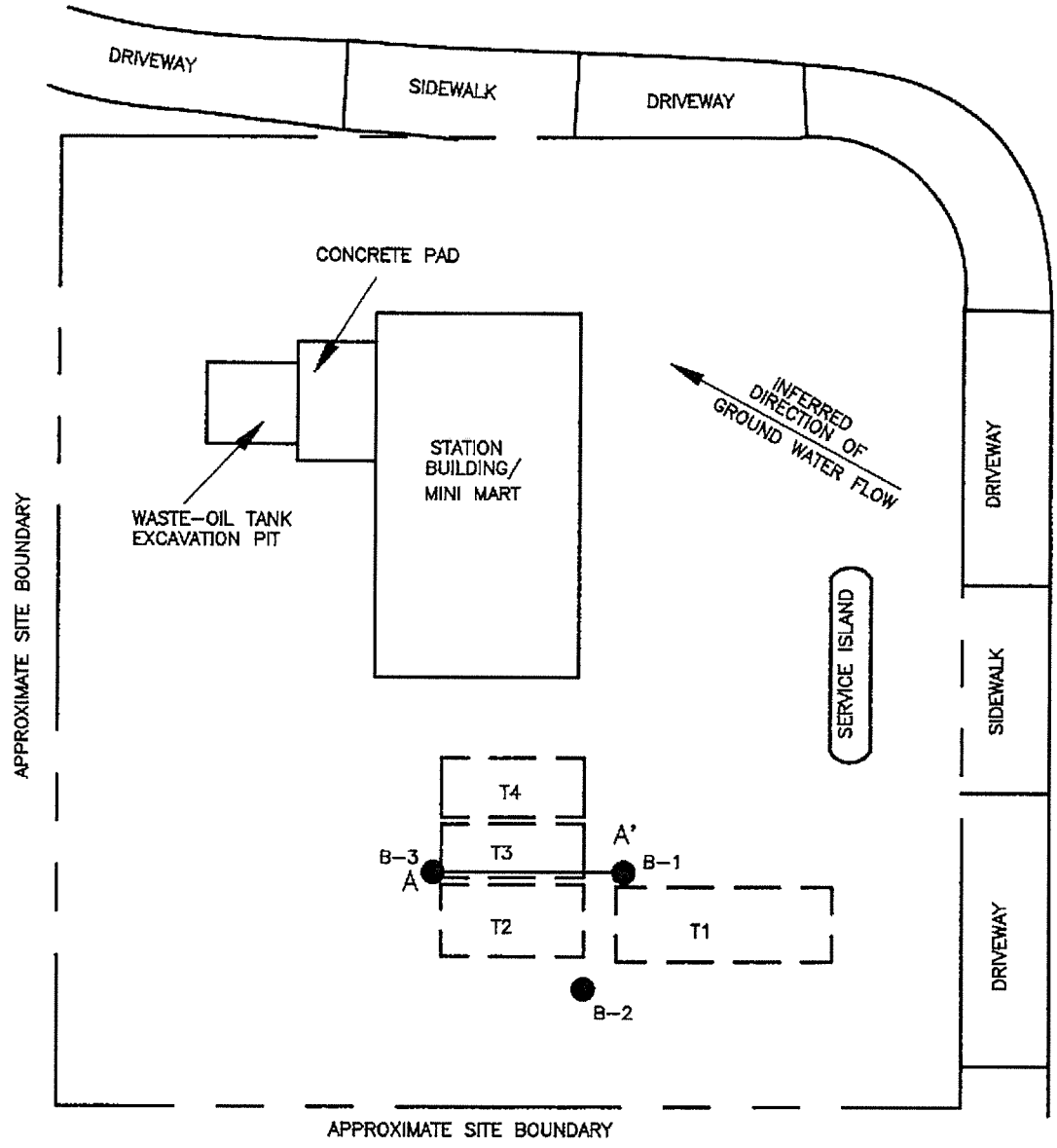
Sample designation: LS-2
Sample number
AL = Soil sample
LS = Stockpile sample
WO = Waste oil sample

TABLE 2
RESULTS OF LABORATORY ANALYSES
OF SOIL SAMPLES
ARCO Station 771
899 Rincon Avenue
Livermore, California

Sample Identification	Date	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes
S-10-B1	2/1/90	<1.0	<0.005	<0.005	<0.005	<0.005
S-19.5-B1	2/1/90	<1.0	0.022	0.024	<0.005	0.022
S-24.5-B1	2/1/90	<1.0	0.022	0.015	0.010	0.048
S-29.5-B1	2/1/90	<1.0	<0.005	<0.005	<0.005	<0.005
S-10-B2	2/1/90	<1.0	<0.005	<0.005	<0.005	<0.005
S-20-B2	2/1/90	<1.0	0.016	0.020	<0.005	0.025
S-25-B2	2/1/90	1.4	<0.01	<0.01	<0.01	0.018
S-31-B2	2/1/90	<1.0	<0.005	<0.005	<0.005	<0.005
S-10-B3	2/2/90	<1.0	<0.005	<0.005	<0.005	<0.005
S-19.5-B3	2/2/90	<1.0	0.028	<0.005	<0.005	0.017
S-25-B3	2/2/90	4.5	0.047	<0.01	0.011	0.038
S-32-B3	2/2/90	190	<1.0	<1.0	<1.0	1.7

Results in parts per million (ppm)
TPHg = Total Petroleum Hydrocarbons as gasoline
< = Indicates less than the detection limit for the specified method of analysis.

S-25-B2
- S: Soil sample
- 25: Approximate sample depth
- B2: Boring number



EXPLANATION

B-3 ● = Soil boring

A ——— A' = Cross section

T4 = Underground gasoline-storage tank

Approximate Scale

20 10 0 20 40

feet

Source: Modified from plan supplied by ARCO.

Applied GeoSystems

PROJECT 60000-1

GENERALIZED SITE PLAN
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 2

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF SOIL SAMPLES
ARCO Station 771
Livermore, California
(Page 1 of 4)

Sample Identification	TPHg	TPHd	B	T	E	X	TOG
February 1990							
S-10-B1	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-19.5-B1	<1.0	NA	0.022	0.024	<0.005	0.022	NA
S-24.5-B1	<1.0	NA	0.022	0.015	0.010	0.048	NA
S-29.5-B1	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-10-B2	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-20-B2	<1.0	NA	0.016	0.020	<0.005	0.025	NA
S-25-B2	1.4	NA	<0.01	<0.01	<0.01	0.018	NA
S-31-B2	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-10-B3	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-19.5-B3	<1.0	NA	0.028	<0.005	<0.005	0.017	NA
S-25-B3	4.5	NA	0.047	<0.01	0.011	0.038	NA
S-32.5-B3	190	NA	<1.0	<1.0	<1.0	1.7	NA
December 1990							
S-20-B4	<1.0	NA	0.006	<0.005	<0.005	<0.005	NA
S-30-B4	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-32.5-B4	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-36.5-B4	140	NA	<0.15	0.80	1.7	4.2	NA
S-43-B4	3,800	NA	<1.5	130	50	280	NA
S-45.5-B4	5.5	NA	0.16	0.51	0.11	0.82	NA
S-20-B5	<1.0	NA	0.068	0.013	0.009	0.026	NA
S-30-B5	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-34.5-B5	97	NA	<0.005	0.13	0.087	0.22	NA
S-39.5-B5	13	NA	0.15	0.66	0.16	1.5	NA
S-45-B5	<1.0	NA	<0.005	0.006	<0.005	0.009	NA
S-20-B6	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-30-B6	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-36.5-B6	<1.0	NA	<0.005	<0.005	<0.005	0.006	NA
S-41-B6	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-44.5-B6	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-011591-1ABCD*	31	NA	0.25	0.67	0.34	2.8	NA
June, July 1991							
S-10-B7	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-20-B7	2.2	NA	0.074	0.12	0.061	0.43	NA
S-25-B7	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-30-B7	48	NA	0.064	0.15	0.41	1.9	NA

See notes on page 4 of 4.

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF SOIL SAMPLES
ARCO Station 771
Livermore, California
(Page 2 of 4)

Sample Identification	TPHg	TPHd	B	T	E	X	TOG
June, July 1991 cont.							
S-33-B7	<1.0	NA	<0.005	0.006	<0.005	0.010	NA
S-40-B7	19	NA	0.019	0.059	0.14	0.74	NA
S-44-B7	<1.0	NA	0.049	0.020	0.021	0.024	NA
S-10.5-B8	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-20.5-B8	<1.0	NA	0.013	<0.005	<0.005	<0.005	NA
S-25.5-B8	3.5	NA	<0.005	0.007	0.015	0.028	NA
S-34.5-B8	210	NA	0.27	1.0	2.0	12	NA
S-41-B8	3,200	NA	10	70	37	170	NA
S-43-B8	4.9	NA	0.26	1.2	0.13	0.67	NA
S-10.5-B9	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-15.5-B9	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-25.5-B9	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-34.5-B9	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-36-B9	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-42-B9	1.8	NA	0.049	0.006	0.020	0.030	NA
S-45-B9	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-10.5-B10	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
S-20.5-B10	<1.0	NA	0.042	<0.005	0.007	<0.005	NA
S-25.5-B10	27	NA	0.44	0.74	0.36	2.0	NA
S-34.5-10	88	NA	0.20	0.50	0.84	0.96	NA
S-36-B10	110	NA	0.28	0.51	0.86	2.7	NA
S-42-B10	<1.0	NA	0.008	<0.005	<0.005	0.021	NA
S-7-B11	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<30
S-8.5-B11	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<30
S-15.5-B11	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<30
S-20.5-B11	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<30
S-25.5-B11	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<30
S-35.5-B11	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<30
S-40-B11	<1.0	<1.0	<0.005	<0.005	<0.005	<0.005	<30
August 12, 1991							
SP1-ABCD*	<1.0	NA	<0.005	<0.005	<0.005	<0.005	NA
April 1992							
S-10.5-B15	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-20.5-B15	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-28.5-B15	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-41-B15	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA

See notes on page 4 of 4.

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF SOIL SAMPLES
ARCO Station 771
Livermore, California
(Page 3 of 4)

Sample Identification	TPHg	TPHd	B	T	E	X	TOG
April 1992 cont.							
S-11-B16	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-21-B16	<1.0	NA	0.0080	<0.0050	<0.0050	<0.0050	NA
S-31-B16	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-11-B17	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-21-B17	<1.0	NA	0.021	<0.0050	0.017	0.0080	NA
S-30.5-B17	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-33-B17	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-43-B17	7.0	NA	0.30	0.77	0.15	1.1	NA
S-0409-SP1-A-D*	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-0409-SP2-A-D*	6.4	NA	0.0070	0.015	0.020	0.12	
January 1993							
S-9-B12	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-17-B12	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-26-B12	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-43.5-B12	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-9.5-B13	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-14.5-B13	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-26-B13	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-40-B13	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-9.5-B14	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-17-B14	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-27.5-B14	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-38-B14	<1.0	NA	<0.0050	<0.0050	<0.0050	<0.0050	NA
S-0115-SP-A-D**	<1.0 [<0.050]	NA [NA]	<0.0050 [0.00050]	<0.0050 [0.00050]	<0.0050 [0.00050]	<0.0050 [0.00050]	NA [NA]

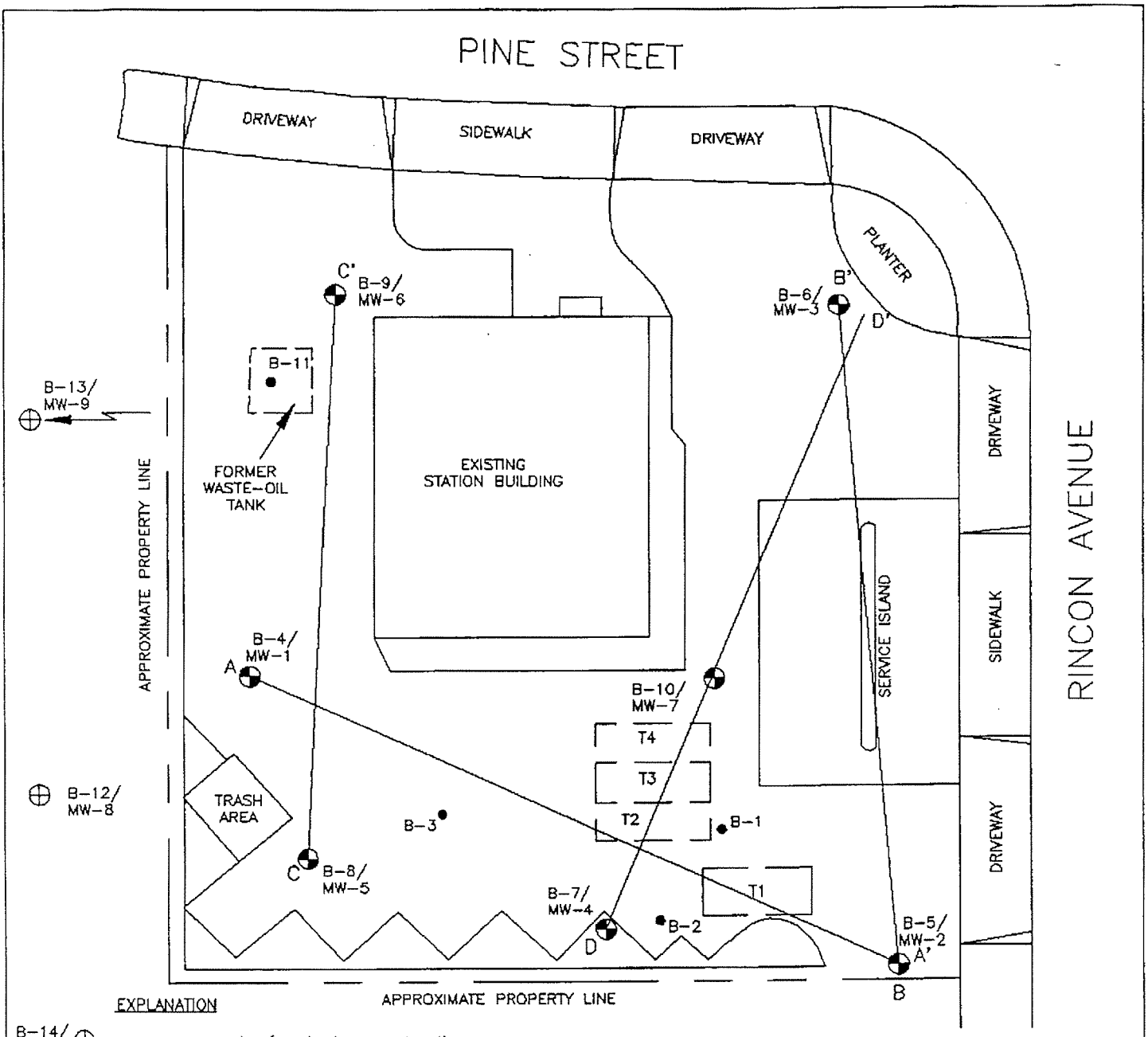
See notes on page 4 of 4.

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF SOIL SAMPLES
ARCO Station 771
Livermore, California
(Page 4 of 4)

Sample Identification	TPHg	TPHd	B	T	E	X	TOG

Results measured in part per million (ppm).
TPHg: Total petroleum hydrocarbons as gasoline (analyzed by EPA Method 5030/8015/8020).
TPHd: Total petroleum hydrocarbons as diesel (analyzed by EPA Method 5030/8015).
B: benzene; T: toluene; E: ethylbenzene; X: xylenes.
BTEX: Analyzed by EPA Method 5030/8015/8020.
TOG: Total oil and grease (analyzed by Standard Method 5520 E&F (Gravimetric).
*: Composite sample of four soil samples obtained from stockpiled soil.
<: Less than the laboratory detection limit.
NA: Sample not analyzed.
*: Sample was also analyzed for:
STLC lead by EPA Method 7421 - < 0.10 ppm;
corrosivity by EPA Method 9045 - pH = 7.1;
ignitability by EPA Method 1010 - flashpoint >100°C;
and reactivity by EPA Methods 9030, 9010 and 9045 - sulfide <10 ppm,
cyanide <0.50 ppm,reaction with water - negative.
[]: TPHg and BTEX analyzed by EPA Method 5030/8015/8020 TCLP extract of soil.

Sample Identification: S-43-B17
- S: Soil sample
- 43: Depth of boring in feet
- B17: Boring number



Source: Surveyed by John Koch, Licensed Land Surveyor.

RESNA	**PROPOSED BORING/ MONITORING WELL LOCATIONS ARCO Station 771 899 Rincon Avenue Livermore, California**	**PLATE A**
PROJECT 60000.06		

Table 1. Soil Sample Analytical Results
ARCO Facility No. 771, Livermore, California

Sample Designation	Date	Depth (feet bgs)	TPH-G (1)	BTEX Distinction (1)				Organic Lead (2)
				Benzene	Toluene	Ethylbenzene	Xylenes	
Former Tank Cavity								
T1A	12/30/91	15	**1,500**	1.3	28	24	210	NA
T1B	12/30/91	15	1.4	0.019	0.015	0.0089	0.2	NA
T2A	12/30/91	16	**1,900**	1.3	9.4	8.6	94	NA
T2B	12/30/91	16	ND	ND	ND	ND	ND	NA
T3A	12/30/91	14	**45**	0.089	1.2	0.52	4.7	NA
T3B	12/30/91	14	1.3	0.0097	0.045	0.023	0.24	NA
T4A	12/30/91	14	**4,600**	28	470	170	1,100	NA
T4B	12/30/91	14	2.4	0.0095	0.050	0.041	0.33	NA
New Tank Cavity								
TP-1	1/21/92	18	**100**	ND	0.059	ND	1.4	ND
TP-2	1/21/92	18	2.6	0.0057	0.012	0.012	0.12	ND
TP-3	1/21/92	18	1.8	0.0058	0.011	0.0071	0.053	ND
TP-4	1/21/92	18	1.4	0.0052	0.02	0.0094	0.092	ND
TP-5	1/21/92	18	1.5	0.0062	0.036	0.016	0.14	ND
TP-6	1/21/92	18	**830**	ND	2.5	1.5	47	ND
Product Line Trenches								
L1	2/7/92	1.5	ND	ND	0.035	ND	ND	ND
L2	2/7/92	1.5	**750**	0.35	30	26	200	ND
L3	2/7/92	0.5	41	0.091	0.28	0.1	0.93	ND
L4	2/7/92	1.5	2.2	0.0093	0.52	0.011	0.061	ND
L5	2/7/92	1.5	ND	ND	ND	ND	ND	ND
L6	2/7/92	1.5	ND	ND	ND	ND	ND	ND
L7	2/7/92	**0.5**	**600**	ND	0.21	ND	26	ND
L8	2/7/92	1.5	1.2	ND	0.027	ND	0.0068	ND
L2B	2/18/92	**5**	**91**	ND	ND	ND	2.4	NA
L7B	2/18/92	**5**	**ND**	ND	ND	ND	ND	NA

FOOTNOTES

(1) = Concentrations reported in mg/kg (= parts per million).

(2) = Concentrations reported in mg/L (= parts per million).

TPH-G = Total Petroleum Fuel Hydrocarbons as Low/Medium Boiling Point Hydrocarbons (USEPA Method 8015).

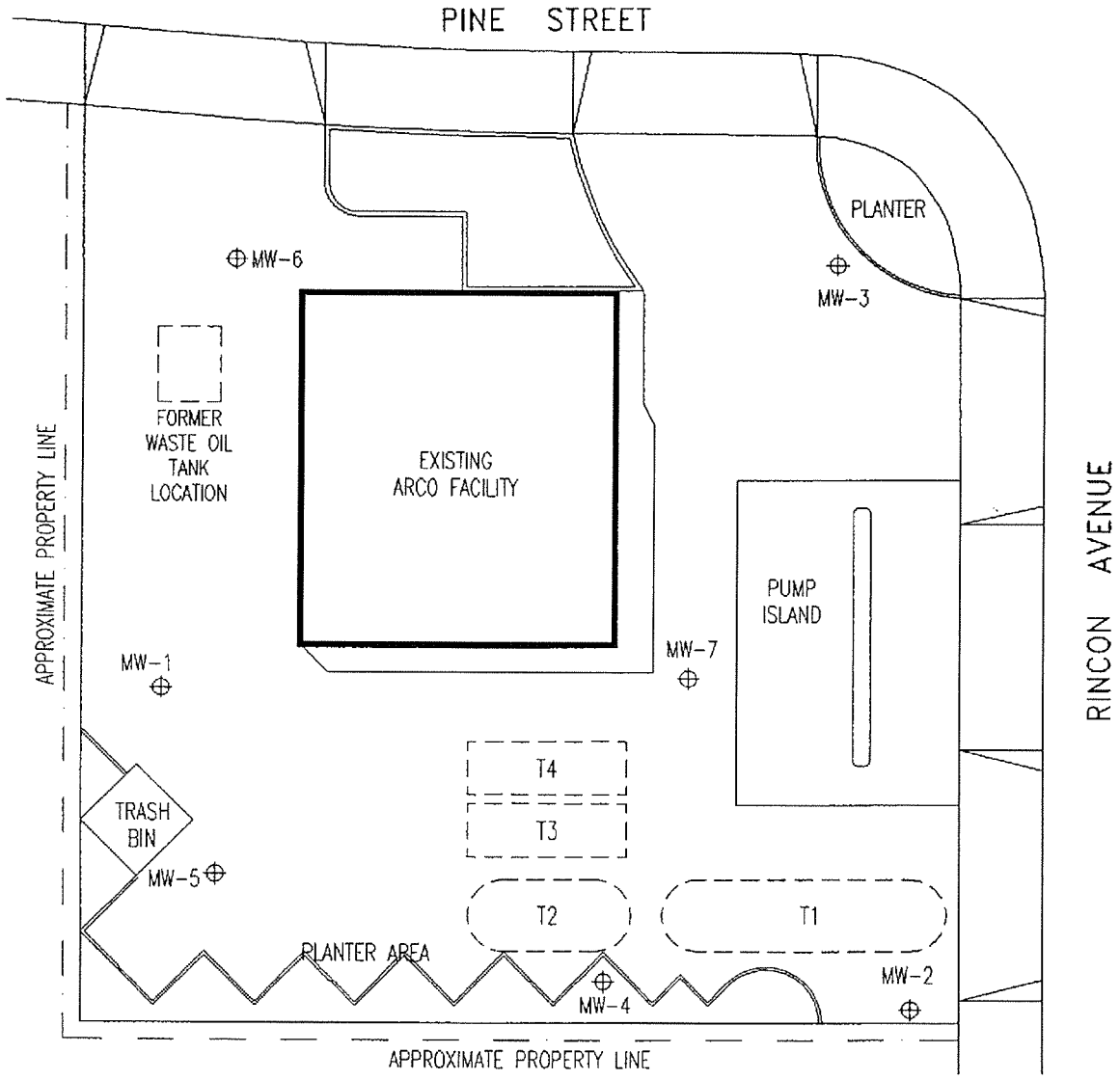
BTEX Distinction (USEPA Method 8020).

Organic Lead by method described in California LUFT Manual 12/87.

ND = Not detected.

NA = Not analyzed.

bgs = below ground surface.



EXPLANATION

⊕MW-5 MONITORING WELL LOCATION AND DESIGNATION

FORMER LOCATION OF UNDERGROUND STORAGE TANKS.

T1	10,000 GAL. SUPER UNLEADED.
T2	6,000 GAL. REGULAR.
T3	4,000 GAL. UNLEADED.
T4	4,000 GAL. UNLEADED.

N

0' 20' 40'

APPROXIMATE SCALE

SOURCE:

MAP MODIFIED FROM
RESNA CONSULTANTS, 1991.

ROUX ASSOCIATES
ENVIRONMENTAL CONSULTING & MANAGEMENT

COMPILED BY:	G.M.
PREPARED BY:	R.P.
PROJECT MNGR.	G.M.
DATE:	01/92
SCALE:	AS SHOWN
PROJECT NO.	A135W01
FILE NAME:	AR_771XX

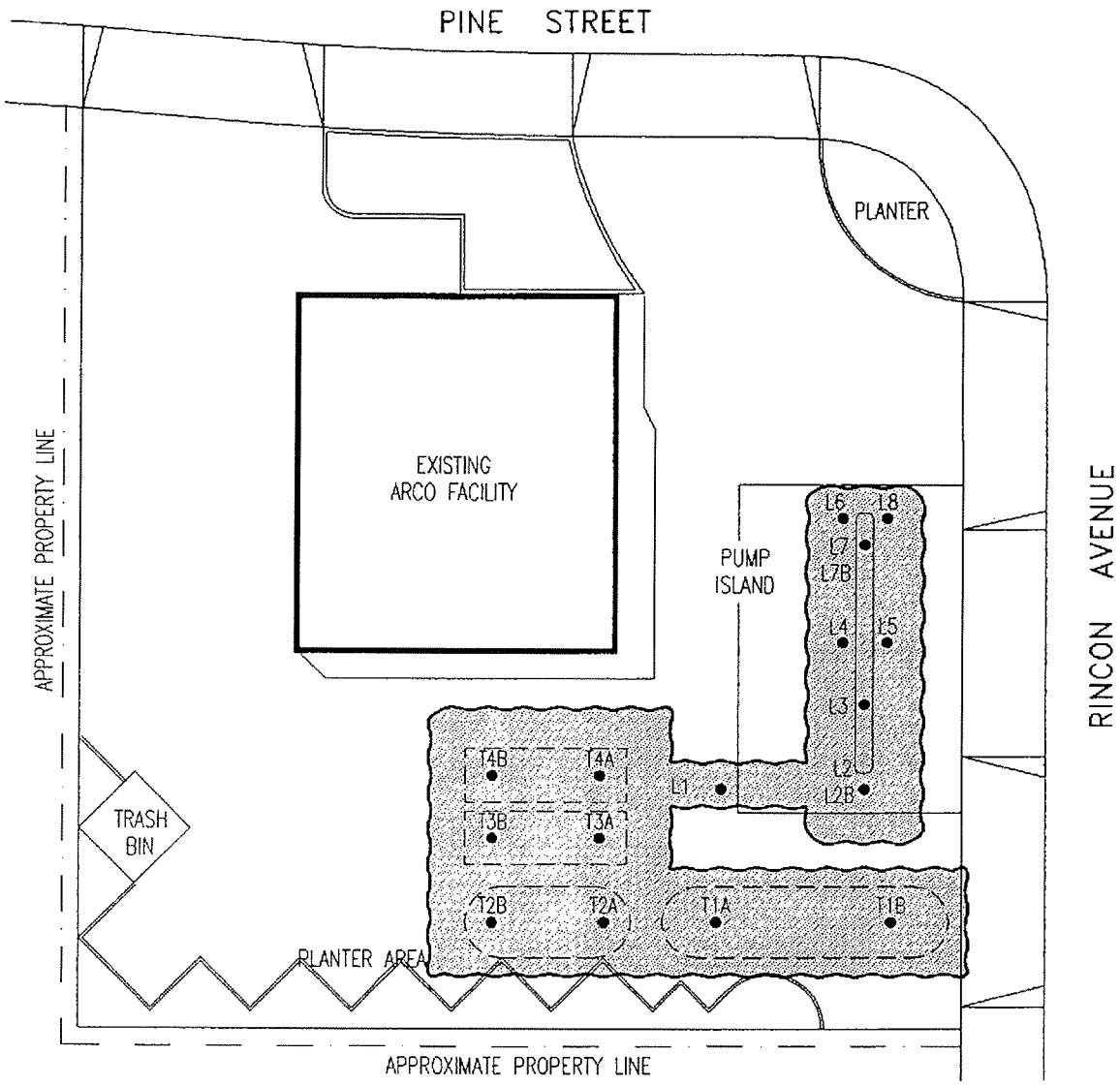
PREPARED FOR: ARCO PRODUCTS COMPANY

TITLE:

SITE PLAN

ARCO FACILITY NO. 771

FIGURE 2



EXPLANATION

FORMER LOCATION OF UNDERGROUND STORAGE TANKS.

EXCAVATED AREAS.

●T4A SOIL SAMPLE LOCATION AND DESIGNATION.

N

0' 20' 40'

APPROXIMATE SCALE

SOURCE:

MAP MODIFIED FROM
RESNA CONSULTANTS, 1991.

ROUX ASSOCIATES
ENVIRONMENTAL CONSULTING & MANAGEMENT

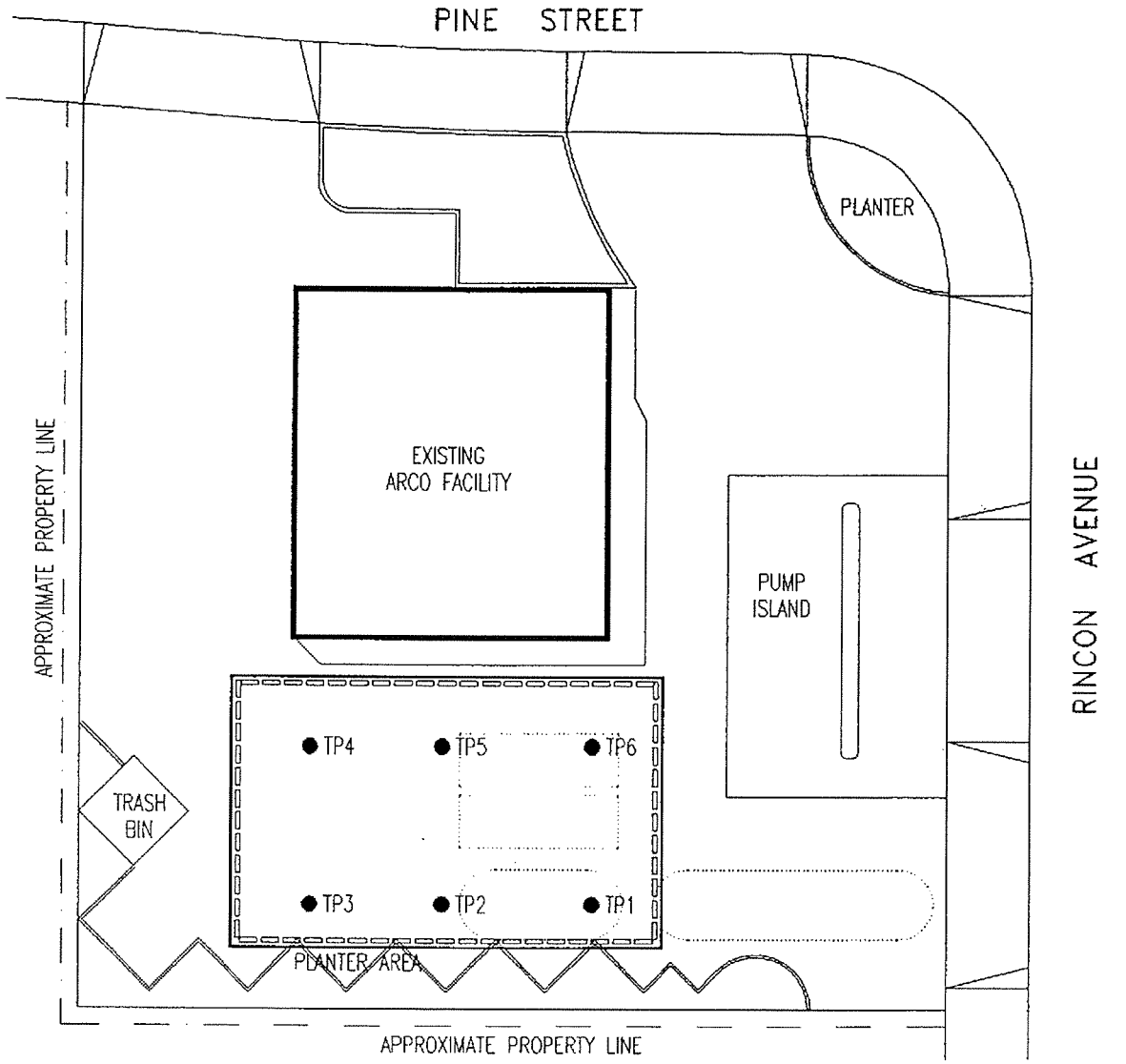
COMPILED BY:	T.R.
PREPARED BY:	R.P.
PROJECT MNGR.	G.M.
DATE:	04/92
SCALE:	AS SHOWN
PROJECT NO.	A135W01
FILE NAME:	AR_771XX

PREPARED FOR: ARCO PRODUCTS COMPANY

TITLE: LOCATION OF TANK CAVITY AND PRODUCT LINE TRENCH SOIL SAMPLES

ARCO FACILITY NO. 771

FIGURE 3



EXPLANATION

SHEET PILES AT LIMITS OF NEW TANK EXCAVATION.

● TP4 SOIL SAMPLE LOCATION AND DESIGNATION.

N

0' 20' 40'

APPROXIMATE SCALE

SOURCE:

MAP MODIFIED FROM
RESNA CONSULTANTS, 1991.

ROUX ASSOCIATES
ENVIRONMENTAL CONSULTING & MANAGEMENT

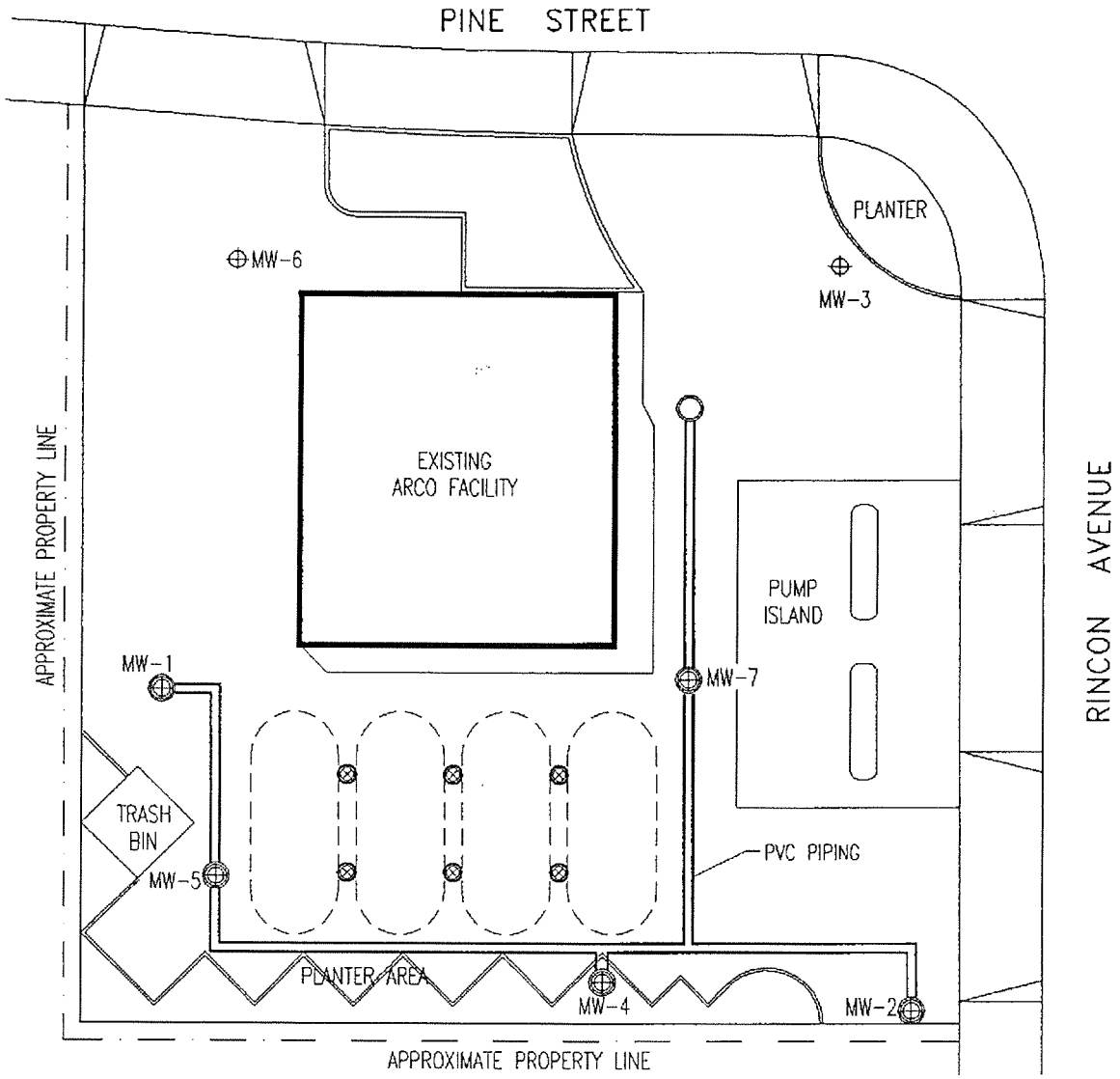
COMPILED BY:	G.M.
PREPARED BY:	R.P.
PROJECT MNGR.	G.M.
DATE:	01/92
SCALE:	AS SHOWN
PROJECT NO.	A135W01
FILE NAME:	AR_771XX

PREPARED FOR: ARCO PRODUCTS COMPANY

TITLE: LOCATION OF NEW TANK EXCAVATION AND SOIL SAMPLES

ARCO FACILITY NO. 771

FIGURE 4



EXPLANATION

- ⊕MW-5 MONITORING WELL LOCATION AND DESIGNATION
- LOCATION OF NEW UNDERGROUND STORAGE TANKS.
- LOCATION OF VAULT BOX.
- LOCATION OF CONDUCTOR CASING.
- PVC PIPING.

N

0' 20' 40'

APPROXIMATE SCALE

SOURCE:

MAP MODIFIED FROM
RESNA CONSULTANTS, 1991.

ROUX
ROUX ASSOCIATES
ENVIRONMENTAL CONSULTING & MANAGEMENT

COMPILED BY:	G.M.
PREPARED BY:	R.P.
PROJECT MNGR.	G.M.
DATE:	01/92
SCALE:	AS SHOWN
PROJECT NO.	A135W01
FILE NAME:	AR_771XX

PREPARED FOR: ARCO PRODUCTS COMPANY

TITLE: LOCATION OF WELLS, VAULT BOXES, AND PVC PIPING

ARCO FACILITY NO. 771

FIGURE 5

Table 1
Product Piping Removal Compliance Sampling Results

June 15, 2001

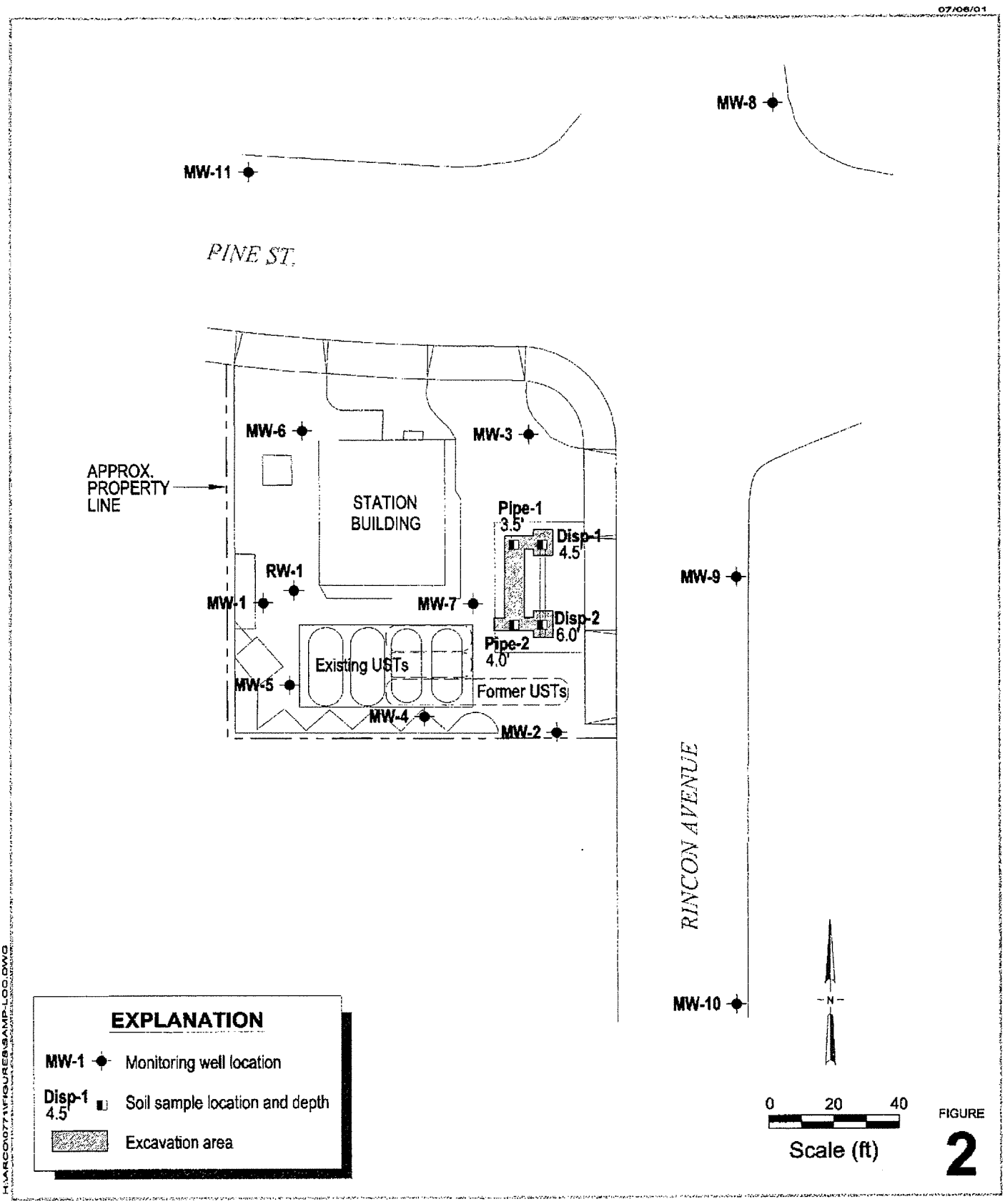
ARCO Service Station 0771
899 Rincon Ave, Livermore, California

Sample ID	Depth Sampled (fbg)	TPHg (mg/kg)	Benzene (mg/kg)	Toulene (mg/kg)	Ethyl-benzene (mg/kg)	Xylene (mg/kg)	MTBE (mg/kg)
Disp-1-4.5	4.5	<1.0	<0.0050	**0.017**	<0.0050	**0.019**	**0.78**
Disp-2-6	6.0	**1.0**	<0.0050	**0.017**	<0.0050	**0.049**	**2.1**
Pipe-1-3.5	3.5	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.050
Pipe-2-4	4.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.050

Notes

fbg = feet below grade
mg/kg = milligrams per kilogram

TPHg = total petroluem hydrocarbons as gasoline
MTBE = methyl tert butyl ether



ARCO Service Station 0771

899 Rincon Avenue

Livermore, California

CAMBRIA

Site Plan and Soil Sampling Locations

Table 1. Summary of Soil Sample Analytical Data
Station #771, 899 Rincon 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-2									
	SB-2-10'	3/25/2011	<0.50	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	SB-2-30'	3/25/2011	<0.50	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
SB-3									
	SB-3-10'	3/25/2011	<0.50	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
	SB-3-30'	3/25/2011	<0.50	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
ESLs	--	--	83	0.044	2.9	3.3	2.3	0.023	

Abbreviations & Symbols:

* = See Drawing 2 for soil boring locations.

GRO: Gasoline range organics.

Calscience Environmental Laboratories, Inc.: 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, 2008).

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-2 10' was collected at a depth of 10 feet bgs)

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Desig-nation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
MW-1	01-15-91	451.80	32.77	419.03	Sheen	NR	NR
MW-1	02-27-91	451.80	32.23	419.57	ND	NR	NR
MW-1	03-20-91	451.80	27.38	424.42	Sheen	NR	NR
MW-1	04-10-91	451.80	26.49	425.31	ND	NR	NR
MW-1	05-20-91	451.80	Not surveyed: interface probe failure				
MW-1	06-20-91	451.80	33.95	417.85	Sheen	NR	NR
MW-1	07-25-91	451.80	^36.59	^415.21	0.10	NR	NR
MW-1	08-13-91	451.80	^37.72	^414.08	0.20	NR	NR
MW-1	09-12-91	451.80	^39.25	^412.55	0.23	NR	NR
MW-1	10-30-91	451.80	^39.14	^412.66	0.20	NR	NR
MW-1	11-13-91	451.80	DRY	DRY	ND	NR	NR
MW-1	12-26-91	451.80	^39.30	^412.50	0.01	NR	NR
MW-1	01-18-92	NR	37.81	NR	Skimmer	NR	NR
MW-1	02-21-92	NR	Not surveyed: well inaccessible due to construction				
MW-1	03-31-92	NR	31.90	NR	Skimmer	NR	NR
MW-1	04-24-92	451.42	Not surveyed: well inaccessible due to construction				
MW-1	05-20-92	451.42	33.00	418.42	Skimmer	NR	NR
MW-1	06-12-92	451.42	33.25	418.17	0.02	NR	NR
MW-1	07-28-92	451.42	32.31	419.11	ND	NR	NR
MW-1	08-24-92	451.42	30.87	420.55	ND	NR	NR
MW-1	09-15-92	451.42	^32.24	^419.18	0.01	NR	NR
MW-1	10-29-92	451.42	32.29	419.13	ND	NR	NR
MW-1	11-25-92	451.73	32.15	419.58	ND*	NR	NR
MW-1	12-14-92	451.73	30.54	421.19	ND	NR	NR
MW-1	01-29-93	451.73	23.49	428.24	ND	NR	NR
MW-1	02-26-93	451.73	25.23	426.50	ND	NR	NR
MW-1	03-29-93	451.73	25.66	426.07	ND	NR	NR
MW-1	04-27-93	451.73	28.02	423.71	ND	NR	NR
MW-1	05-10-93	451.73	30.38	421.35	ND	NR	NR
MW-1	06-17-93	451.73	30.81	420.92	ND	NR	NR
MW-1	07-27-93	451.73	Not surveyed: vehicle parked on well				
MW-1	08-26-93	451.73	31.23	420.50	ND	NR	NR
MW-1	09-14-93	451.73	32.59	419.14	ND	NR	NR
MW-1	11-05-93	451.73	32.13	419.60	ND	NR	NR
MW-1	03-26-94	451.73	28.22	423.51	ND	NR	NR
MW-1	06-13-94	451.73	29.86	421.87	ND	NR	NR
MW-1	09-22-94	451.73	31.61	420.12	ND	NNE	0.056
MW-1	11-25-94	451.73	29.76	421.97	ND	N	0.06

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Designation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
MW-2	01-15-91	449.52	^30.89	^418.63	0.16	NR	NR
MW-2	02-27-91	449.52	^29.11	^420.41	0.02	NR	NR
MW-2	03-20-91	449.52	^24.57	^424.95	0.02	NR	NR
MW-2	04-10-91	449.52	^22.85	^426.67	0.05	NR	NR
MW-2	05-20-91	449.51	Not surveyed:				
MW-2	06-20-91	449.51	^31.42	^418.09	0.15	NR	NR
MW-2	07-25-91	449.51	^33.69	^415.82	0.49	NR	NR
MW-2	08-13-91	449.51	^34.80	^414.71	0.47	NR	NR
MW-2	09-12-91	449.51	^36.39	^413.12	0.45	NR	NR
MW-2	10-30-91	449.51	DRY	DRY	ND	NR	NR
MW-2	11-13-91	449.51	DRY	DRY	ND	NR	NR
MW-2	12-26-91	449.51	36.45	413.06	Sheen	NR	NR
MW-2	01-18-92	449.51	Not surveyed: well inaccessible due to construction				
MW-2	02-21-92	449.51	26.27	NR	Skimmer	NR	NR
MW-2	03-31-92	449.51	28.85	NR	Skimmer	NR	NR
MW-2	04-24-92	449.51	30.95	418.56	Skimmer	NR	NR
MW-2	05-20-92	449.51	30.69	418.82	Skimmer	NR	NR
MW-2	06-12-92	449.51	31.25	418.26	ND	NR	NR
MW-2	07-28-92	449.51	30.31	419.20	ND	NR	NR
MW-2	08-24-92	449.51	29.83	419.68	ND	NR	NR
MW-2	09-15-92	449.51	30.06	419.45	Sheen	NR	NR
MW-2	10-29-92	449.51	30.90	418.61	ND	NR	NR
MW-2	11-25-92	449.49	31.13	418.36	ND*	NR	NR
MW-2	12-14-92	449.49	29.24	420.25	ND	NR	NR
MW-2	01-29-93	449.49	20.12	429.37	ND	NR	NR
MW-2	02-26-93	449.49	22.59	426.90	ND	NR	NR
MW-2	03-29-93	449.49	22.83	426.66	ND	NR	NR
MW-2	04-27-93	449.49	25.10	424.39	ND	NR	NR
MW-2	05-10-93	449.49	27.23	422.26	ND	NR	NR
MW-2	06-17-93	449.49	28.26	421.23	ND	NR	NR
MW-2	07-27-93	449.49	29.50	419.99	ND	NR	NR
MW-2	08-26-93	449.49	29.85	419.64	ND	NR	NR
MW-2	09-14-93	449.49	30.43	419.06	ND	NR	NR
MW-2	11-05-93	449.49	30.20	419.29	ND	NR	NR
MW-2	03-26-94	449.49	25.30	424.19	ND	NR	NR
MW-2	06-13-94	449.49	27.28	422.21	ND	NR	NR
MW-2	09-22-94	449.49	29.54	419.95	ND	NNE	0.056
MW-2	11-25-94	449.49	27.85	421.64	ND	N	0.06

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Designation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
MW-3	01-15-91	450.29	32.34	417.95	ND	NR	NR
MW-3	02-27-91	450.29	31.78	418.51	ND	NR	NR
MW-3	03-20-91	450.29	27.74	422.55	ND	NR	NR
MW-3	04-10-91	450.29	25.05	425.24	ND	NR	NR
MW-3	05-20-91	450.28	27.06	423.22	ND	NR	NR
MW-3	06-20-91	450.28	32.35	417.93	ND	NR	NR
MW-3	07-25-91	450.28	35.02	415.26	ND	NR	NR
MW-3	08-13-91	450.28	36.50	413.78	ND	NR	NR
MW-3	09-12-91	450.28	38.47	411.81	ND	NR	NR
MW-3	10-30-91	450.28	DRY	DRY	ND	NR	NR
MW-3	11-13-91	450.28	DRY	DRY	ND	NR	NR
MW-3	12-26-91	450.28	38.53	411.75	ND	NR	NR
MW-3	01-18-92	450.28	Not surveyed: well inaccessible due to construction				
MW-3	02-21-92	450.28	Not surveyed: well inaccessible due to construction				
MW-3	03-31-92	450.28	30.61	NR	ND	NR	NR
MW-3	04-24-92	450.28	32.83	417.45	ND	NR	NR
MW-3	05-20-92	450.28	33.85	416.43	ND	NR	NR
MW-3	06-12-92	450.28	34.51	415.77	ND	NR	NR
MW-3	07-28-92	450.28	34.42	415.86	ND	NR	NR
MW-3	08-24-92	450.28	32.46	417.82	ND	NR	NR
MW-3	09-15-92	450.28	34.29	415.99	ND	NR	NR
MW-3	10-29-92	450.28	33.40	416.88	ND	NR	NR
MW-3	11-25-92	450.28	33.67	416.61	ND	NR	NR
MW-3	12-14-92	450.28	34.26	416.02	ND	NR	NR
MW-3	01-29-93	450.28	21.88	428.40	ND	NR	NR
MW-3	02-26-93	450.28	24.71	425.57	ND	NR	NR
MW-3	03-29-93	450.28	24.74	425.54	ND	NR	NR
MW-3	04-27-93	450.28	25.96	424.32	ND	NR	NR
MW-3	05-10-93	450.28	27.61	422.67	ND	NR	NR
MW-3	06-17-93	450.28	28.73	421.55	ND	NR	NR
MW-3	07-27-93	450.28	30.37	419.91	ND	NR	NR
MW-3	08-26-93	450.28	30.94	419.34	ND	NR	NR
MW-3	09-14-93	450.28	31.84	418.44	ND	NR	NR
MW-3	11-05-93	450.28	33.22	417.06	ND	NR	NR
MW-3	03-26-94	450.28	26.97	423.31	ND	NR	NR
MW-3	06-13-94	450.28	28.71	421.57	ND	NR	NR
MW-3	09-22-94	450.28	32.34	417.94	ND	NNE	0.056
MW-3	11-25-94	450.28	30.76	419.52	ND	N	0.06

Table 2
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ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-4	07-25-91	451.56	36.07	415.49	ND	NR	NR
MW-4	08-13-91	451.56	37.54	414.02	ND	NR	NR
MW-4	09-12-91	451.56	38.73	412.83	ND	NR	NR
MW-4	10-30-91	451.56	39.90	411.66	ND	NR	NR
MW-4	11-13-91	451.56	40.56	411.00	ND	NR	NR
MW-4	12-26-91	450.99	38.78	412.21	ND	NR	NR
MW-4	01-18-92	450.99	38.71	NR	ND	NR	NR
MW-4	02-21-92	450.99	31.91	NR	ND	NR	NR
MW-4	03-31-92	450.99	30.36	NR	ND	NR	NR
MW-4	04-24-92	450.99	32.65	418.34	ND	NR	NR
MW-4	05-20-92	450.99	32.62	418.37	ND	NR	NR
MW-4	06-12-92	450.99	32.73	418.26	ND	NR	NR
MW-4	07-28-92	450.99	31.48	419.51	ND	NR	NR
MW-4	08-24-92	450.99	32.84	418.15	ND	NR	NR
MW-4	09-15-92	450.99	31.37	419.62	ND	NR	NR
MW-4	10-29-92	450.99	32.58	418.41	ND	NR	NR
MW-4	11-25-92	451.09	32.37	418.72	ND	NR	NR
MW-4	12-14-92	451.09	30.99	420.10	ND	NR	NR
MW-4	01-29-93	451.09	22.30	428.79	ND	NR	NR
MW-4	02-26-93	451.09	24.47	426.62	ND	NR	NR
MW-4	03-29-93	451.09	24.67	426.42	ND	NR	NR
MW-4	04-27-93	451.09	26.68	424.41	ND	NR	NR
MW-4	05-10-93	451.09	28.64	422.45	ND	NR	NR
MW-4	06-17-93	451.09	29.28	421.81	ND	NR	NR
MW-4	07-27-93	451.09	31.14	419.95	ND	NR	NR
MW-4	08-26-93	451.09	31.38	419.71	ND	NR	NR
MW-4	09-14-93	451.09	32.00	419.09	ND	NR	NR
MW-4	11-05-93	451.09	31.16	419.93	ND	NR	NR
MW-4	03-26-94	451.09	26.94	424.15	ND	NR	NR
MW-4	06-13-94	451.09	28.88	422.21	ND	NR	NR
MW-4	09-22-94	451.09	30.98	420.11	ND	NNE	0.056
MW-4	11-25-94	451.09	29.08	422.01	ND	N	0.06

Table 2
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ARCO Service Station 771
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Date: 03-07-95
Project Number: 0805-122.01

Well Designation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
MW-5	07-25-91	451.41	36.67	414.74	Sheen	NR	NR
MW-5	08-13-91	451.41	^37.98	^413.43	0.01	NR	NR
MW-5	09-12-91	451.41	^39.01	^412.40	0.05	NR	NR
MW-5	10-30-91	451.41	38.28	413.13	Sheen	NR	NR
MW-5	11-13-91	451.41	39.24	412.17	Sheen	NR	NR
MW-5	12-26-91	451.41	39.11	412.30	Sheen	NR	NR
MW-5	01-18-92	451.41	38.15	NR	Skimmer	NR	NR
MW-5	02-21-92	451.41	30.59	NR	Skimmer	NR	NR
MW-5	03-18-92	451.41	30.84	NR	Skimmer	NR	NR
MW-5	04-24-92	451.40	33.00	418.40	Skimmer	NR	NR
MW-5	05-20-92	451.40	32.86	418.54	Skimmer	NR	NR
MW-5	06-12-92	451.40	33.03	418.37	ND	NR	NR
MW-5	07-28-92	451.40	31.92	419.48	ND	NR	NR
MW-5	08-24-92	451.40	32.17	419.23	ND	NR	NR
MW-5	09-15-92	451.40	31.90	419.50	ND	NR	NR
MW-5	10-29-92	451.40	32.94	418.46	ND	NR	NR
MW-5	11-25-92	451.40 Not surveyed: new wellhead prevented measurement					
MW-5	12-14-92	451.40	30.90	NR	ND	NR	NR
MW-5	01-29-93	451.40	23.25	NR	ND	NR	NR
MW-5	02-26-93	451.40	25.02	NR	ND	NR	NR
MW-5	03-29-93	451.40	24.72	NR	ND	NR	NR
MW-5	04-27-93	451.40	27.11	NR	ND	NR	NR
MW-5	05-10-93	451.40	29.04	NR	ND	NR	NR
MW-5	06-17-93	451.40	29.33	NR	ND	NR	NR
MW-5	07-27-93	451.40	31.12	420.28	ND	NR	NR
MW-5	08-26-93	451.40	31.37	420.03	ND	NR	NR
MW-5	09-14-93	451.40	31.96	419.44	ND	NR	NR
MW-5	11-05-93	451.40	31.03	420.37	ND	NR	NR
MW-5	03-26-94	451.40	27.41	423.99	ND	NR	NR
MW-5	06-13-94	451.40	29.29	422.11	ND	NR	NR
MW-5	09-22-94	451.40 Not surveyed: vehicle was parked on well					
MW-5	11-25-94	451.40	29.76	421.64	ND	N	0.06

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Designation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
MW-6	07-25-91	451.38	37.68	413.70	ND	NR	NR
MW-6	08-13-91	451.38	39.17	412.21	ND	NR	NR
MW-6	09-12-91	451.38	41.14	410.24	ND	NR	NR
MW-6	10-30-91	451.38	42.10	409.28	ND	NR	NR
MW-6	11-13-91	451.38	41.45	409.93	ND	NR	NR
MW-6	12-26-91	451.38	41.23	410.15	ND	NR	NR
MW-6	01-18-92	451.38	38.23	NR	ND	NR	NR
MW-6	02-21-92	451.37	35.21	NR	ND	NR	NR
MW-6	03-31-92	451.37	32.26	NR	ND	NR	NR
MW-6	04-24-92	451.37	33.24	418.13	ND	NR	NR
MW-6	05-20-92	451.37	33.14	418.23	ND	NR	NR
MW-6	06-12-92	451.37	33.43	417.94	ND	NR	NR
MW-6	07-28-92	451.37	32.52	418.85	ND	NR	NR
MW-6	08-24-92	451.37	32.57	418.80	ND	NR	NR
MW-6	09-15-92	451.37	32.58	418.79	ND	NR	NR
MW-6	10-29-92	451.37	32.33	419.04	ND	NR	NR
MW-6	11-25-92	451.37	32.43	418.94	ND	NR	NR
MW-6	12-14-92	451.37	31.52	419.85	ND	NR	NR
MW-6	01-29-93	451.37	23.70	427.67	ND	NR	NR
MW-6	02-26-93	451.37	26.22	425.15	ND	NR	NR
MW-6	03-29-93	451.37	26.13	425.24	ND	NR	NR
MW-6	04-27-93	451.37	27.27	424.10	ND	NR	NR
MW-6	05-10-93	451.37	29.74	421.63	ND	NR	NR
MW-6	06-17-93	451.37	30.92	420.45	ND	NR	NR
MW-6	07-27-93	451.37	30.90	420.47	ND	NR	NR
MW-6	08-26-93	451.37	31.18	420.19	ND	NR	NR
MW-6	09-14-93	451.37	31.70	419.67	ND	NR	NR
MW-6	11-05-93	451.37	31.83	419.54	ND	NR	NR
MW-6	03-26-94	451.37	28.24	423.13	ND	NR	NR
MW-6	06-13-94	451.37	29.20	422.17	ND	NR	NR
MW-6	09-22-94	451.37	30.37	421.00	ND	NNE	0.056
MW-6	11-25-94	451.37	29.88	421.49	ND	N	0.06

Table 2
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Date: 03-07-95
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Well Desig-nation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
MW-7	07-25-91	450.65	34.88	415.77	Sheen	NR	NR
MW-7	08-13-91	450.65	36.17	414.48	ND	NR	NR
MW-7	09-12-91	450.65	37.81	412.84	ND	NR	NR
MW-7	10-30-91	450.65	38.50	412.15	ND	NR	NR
MW-7	11-13-91	450.65	38.31	412.34	ND	NR	NR
MW-7	12-26-91	450.65	37.90	412.75	ND	NR	NR
MW-7	01-18-92	450.65	Not surveyed: well inaccessible due to construction				
MW-7	02-21-92	450.65	31.50	NR	ND	NR	NR
MW-7	03-31-92	450.65	29.40	NR	ND	NR	NR
MW-7	04-24-92	450.63	32.14	418.49	ND	NR	NR
MW-7	05-20-92	450.63	32.51	418.12	ND	NR	NR
MW-7	06-12-92	450.63	32.45	418.18	ND	NR	NR
MW-7	07-28-92	450.63	32.08	418.55	ND	NR	NR
MW-7	08-24-92	450.63	32.29	418.34	ND	NR	NR
MW-7	09-15-92	450.63	31.93	418.70	ND	NR	NR
MW-7	10-29-92	450.63	32.37	418.26	ND	NR	NR
MW-7	11-25-92	450.33	31.80	418.53	ND	NR	NR
MW-7	12-14-92	450.33	30.44	419.89	ND	NR	NR
MW-7	01-29-93	450.33	21.76	428.57	ND	NR	NR
MW-7	02-26-93	450.33	24.16	426.17	ND	NR	NR
MW-7	03-29-93	450.33	24.32	426.01	ND	NR	NR
MW-7	04-27-93	450.33	25.44	424.89	ND	NR	NR
MW-7	05-10-93	450.33	27.40	422.93	ND	NR	NR
MW-7	06-17-93	450.33	28.80	421.53	ND	NR	NR
MW-7	07-27-93	450.33	29.89	420.44	ND	NR	NR
MW-7	08-26-93	450.33	30.52	419.81	ND	NR	NR
MW-7	09-14-93	450.33	31.09	419.24	ND	NR	NR
MW-7	11-05-93	450.33	31.42	418.91	ND	NR	NR
MW-7	03-26-94	450.33	26.03	424.30	ND	NR	NR
MW-7	06-13-94	450.33	27.94	422.39	ND	NR	NR
MW-7	09-22-94	450.33	30.46	419.87	ND	NNE	0.056
MW-7	11-25-94	450.33	28.30	422.03	ND	N	0.06

Table 2
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ARCO Service Station 771
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Date: 03-07-95
Project Number: 0805-122.01

Well Desig-nation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
MW-8	01-29-93	449.43	23.23	426.20	ND	NR	NR
MW-8	02-26-93	449.43	29.20	420.23	ND	NR	NR
MW-8	03-29-93	449.43	29.77	419.66	ND	NR	NR
MW-8	04-27-93	449.43	31.52	417.91	ND	NR	NR
MW-8	05-10-93	449.43	33.88	415.55	ND	NR	NR
MW-8	06-17-93	449.43	35.25	414.18	ND	NR	NR
MW-8	07-27-93	449.43	36.61	412.82	ND	NR	NR
MW-8	08-26-93	449.43	37.71	411.72	ND	NR	NR
MW-8	09-14-93	449.43	38.78	410.65	ND	NR	NR
MW-8	11-05-93	449.43	39.01	410.42	ND	NR	NR
MW-8	03-26-94	449.43	31.40	418.03	ND	NR	NR
MW-8	06-13-94	449.43	35.10	414.33	ND	NR	NR
MW-8	09-22-94	449.43	38.77	410.66	ND	NNE	0.056
MW-8	11-25-94	449.43	36.46	412.97	ND	N	0.06
MW-9	01-29-93	449.21	18.91	430.30	ND	NR	NR
MW-9	02-26-93	449.21	21.35	427.86	ND	NR	NR
MW-9	03-29-93	449.21	21.78	427.43	ND	NR	NR
MW-9	04-27-93	449.21	24.70	424.51	ND	NR	NR
MW-9	05-10-93	449.21	26.19	423.02	ND	NR	NR
MW-9	06-17-93	449.21	27.50	421.71	ND	NR	NR
MW-9	07-27-93	449.21	29.11	420.10	ND	NR	NR
MW-9	08-26-93	449.21	29.55	419.66	ND	NR	NR
MW-9	09-14-93	449.21	30.65	418.56	ND	NR	NR
MW-9	11-05-93	449.21	32.24	416.97	ND	NR	NR
MW-9	03-26-94	449.21	25.68	423.53	ND	NR	NR
MW-9	06-13-94	449.21	27.69	421.52	ND	NR	NR
MW-9	09-22-94	449.21	31.36	417.85	ND	NNE	0.056
MW-9	11-25-94	449.21	29.84	419.37	ND	N	0.06

Table 2
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Well Designation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
MW-10	01-29-93	449.22	19.27	429.95	ND	NR	NR
MW-10	02-26-93	449.22	21.34	427.88	ND	NR	NR
MW-10	03-29-93	449.22	20.89	428.33	ND	NR	NR
MW-10	04-27-93	449.22	25.40	423.82	ND	NR	NR
MW-10	05-10-93	449.22	26.77	422.45	ND	NR	NR
MW-10	06-17-93	449.22	26.80	422.42	ND	NR	NR
MW-10	07-27-93	449.22	29.87	419.35	ND	NR	NR
MW-10	08-26-93	449.22	29.67	419.55	ND	NR	NR
MW-10	09-14-93	449.22	31.07	418.15	ND	NR	NR
MW-10	11-05-93	449.22	30.42	418.80	ND	NR	NR
MW-10	03-26-94	449.22	26.20	423.02	ND	NR	NR
MW-10	06-13-94	449.22	28.23	420.99	ND	NR	NR
MW-10	09-22-94	449.22	31.79	417.43	ND	NNE	0.056
MW-10	11-25-94	449.22	30.30	418.92	ND	N	0.06
MW-11	04-24-92	448.02	35.06	412.96	ND	NR	NR
MW-11	05-20-92	448.02	34.10	413.92	ND	NR	NR
MW-11	06-12-92	448.02	34.48	413.54	ND	NR	NR
MW-11	07-28-92	448.02	35.13	412.89	ND	NR	NR
MW-11	08-24-92	448.02	33.32	414.70	ND	NR	NR
MW-11	09-15-92	448.02	35.72	412.30	ND	NR	NR
MW-11	10-29-92	448.02	35.26	412.76	ND	NR	NR
MW-11	11-25-92	448.02	36.44	411.58	ND	NR	NR
MW-11	12-14-92	448.02	33.18	414.84	ND	NR	NR
MW-11	01-29-93	448.02	23.89	424.13	ND	NR	NR
MW-11	02-26-93	448.02	27.31	420.71	ND	NR	NR
MW-11	03-29-93	448.02	27.27	420.75	ND	NR	NR
MW-11	04-27-93	448.02	30.61	417.41	ND	NR	NR
MW-11	05-10-93	448.02	32.78	415.24	ND	NR	NR
MW-11	06-17-93	448.02	33.25	414.77	ND	NR	NR
MW-11	07-27-93	448.02	34.49	413.53	ND	NR	NR
MW-11	08-26-93	448.02	35.44	412.58	ND	NR	NR
MW-11	09-14-93	448.02	36.62	411.40	ND	NR	NR
MW-11	11-05-93	448.02	36.68	411.34	ND	NR	NR
MW-11	03-26-94	448.02	30.20	417.82	ND	NR	NR
MW-11	06-13-94	448.02	33.39	414.63	ND	NR	NR
MW-11	09-22-94	448.02	34.75	413.27	ND	NNE	0.056
MW-11	11-25-94	448.02	33.84	414.18	ND	N	0.06

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Desig-nation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
RW-1	04-24-92	451.44	32.85	418.59	ND	NR	NR
RW-1	05-20-92	451.44	32.60	418.84	ND	NR	NR
RW-1	06-12-92	451.44	32.72	418.72	ND	NR	NR
RW-1	07-28-92	451.44	31.94	419.50	ND	NR	NR
RW-1	08-24-92	451.44	31.73	419.71	ND	NR	NR
RW-1	09-15-92	451.44	31.94	419.50	ND	NR	NR
RW-1	10-29-92	451.44	32.15	419.29	ND	NR	NR
RW-1	11-25-92	451.67	32.21	419.46	ND	NR	NR
RW-1	12-14-92	451.67	30.58	421.09	ND	NR	NR
RW-1	01-29-93	451.67	22.89	428.78	ND	NR	NR
RW-1	02-26-93	451.67	23.97	427.70	ND	NR	NR
RW-1	03-29-93	451.67	23.98	427.69	ND	NR	NR
RW-1	04-27-93	451.67	27.26	424.41	ND	NR	NR
RW-1	05-10-93	451.67	29.64	422.03	ND	NR	NR
RW-1	06-17-93	451.67	30.18	421.49	ND	NR	NR
RW-1	07-27-93	451.67	31.55	420.12	ND	NR	NR
RW-1	08-26-93	451.67	31.82	419.85	ND	NR	NR
RW-1	09-14-93	451.67	32.32	419.35	ND	NR	NR
RW-1	11-05-93	451.67	31.91	419.76	ND	NR	NR
RW-1	03-26-94	451.67	27.78	423.89	ND	NR	NR
RW-1	06-13-94	451.67	29.48	422.19	ND	NR	NR
RW-1	09-22-94	451.67	30.52	421.15	ND	NNE	0.056
RW-1	11-25-94	451.67	30.89	420.78	ND	N	0.06

TOC = Top of casing
ft-MSL = Elevation in feet, relative to mean sea level
MWN = Ground-water flow direction and gradient apply to the entire monitoring well network
NR = Not reported; data not available
ND = None detected
^ = Groundwater elevation (GWE) and depth to water (DTW) adjusted to include 80 percent of the floating product thickness (FPT):
[GWE = (TOC - DTW) + (FPT x 0.8)]
* = Floating product was not initially detected, but entered the well during purging
NNE = North-northeast
N = North

Table 3
Historical Groundwater Analytical Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHD	TOG
		ppb	ppb	ppb	ppb	ppb	ppb	ppm
MW-1	01-15-91	Not sampled: well contained floating product						
MW-1	04-10-91	98000	11000	18000	2800	20000	NA	NA
MW-1	07-25-91	Not sampled: well contained floating product						
MW-1	10-30-91	Not sampled: well contained floating product						
MW-1	03-31-92	Not sampled: well contained floating product						
MW-1	06-12-92	Not sampled: well contained floating product						
MW-1	09-16-92	Not sampled: well contained floating product						
MW-1	11-25-92	Not sampled: well contained floating product						
MW-1	01-29-93	360000	2500	9300	5100	41000	NA	NA
MW-1	05-10-93	1900000	4100	15000	21000	140000	NA	NA
MW-1	09-16-93	1800000	6400	21000	19000	140000	NA	NA
MW-1	11-05-93	700000	3000	7600	8600	65000	NA	NA
MW-1	03-26-94	29000	1000	290	610	3300	NA	NA
MW-1	06-13-94	25000	600	160	500	2500	NA	NA
MW-1	09-22-94	51000	1400	280	570	2800	NA	NA
MW-1	11-25-94	170000	990	1000	1700	9400	NA	NA
MW-2	01-15-91	Not sampled: well contained floating product						
MW-2	04-10-91	Not sampled: well contained floating product						
MW-2	07-25-91	Not sampled: well contained floating product						
MW-2	10-30-91	Not sampled: well contained floating product						
MW-2	03-31-92	270000	7000	12000	4400	40000	NA	NA
MW-2	06-12-92	110000	8900	13000	2800	16000	NA	NA
MW-2	09-16-92	Not sampled: well contained floating product						
MW-2	11-25-92	Not sampled: well contained floating product						
MW-2	01-29-93	89000	4600	5700	1800	15000	NA	NA
MW-2	05-10-93	440000	3900	4300	4400	36000	NA	NA
MW-2	09-16-93	200000	5500	4300	2300	19000	NA	NA
MW-2	11-05-93	250000	7800	8400	3100	24000	NA	NA
MW-2	03-26-94	22000	1100	1400	190	3700	NA	NA
MW-2	06-13-94	71000	4100	4600	1700	9900	NA	NA
MW-2	09-22-94	42000	1200	620	710	2000	NA	NA
MW-2	11-25-94	60000	3900	4100	1400	7400	NA	NA

Table 3
Historical Groundwater Analytical Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHD	TOG
		ppb	ppb	ppb	ppb	ppb	ppb	ppm
MW-3	01-15-91	230	<0.5	<0.5	2.2	2.1	NA	NA
MW-3	04-10-91	530	12	8.4	4	7	NA	NA
MW-3	07-25-91	110	0.32	0.75	1.2	1	NA	NA
MW-3	10-30-91	Not sampled: dry well						
MW-3	03-31-92	670	12	1.1	7.4	27	NA	NA
MW-3	06-12-92	280	<0.5	<0.5	2.1	2	NA	NA
MW-3	09-15-92	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-3	11-25-92	220	1	<0.5	4.9	1.2	NA	NA
MW-3	01-29-93	380*	0.8	0.6	2.1	2	NA	NA
MW-3	05-10-93	170	<0.5	<0.5	2	0.6	NA	NA
MW-3	09-15-93	120	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-3	11-05-93	110	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-3	03-26-94	54	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-3	06-13-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-3	09-22-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-3	11-25-94	54	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-4	07-25-91	23000	590	730	360	3500	NA	NA
MW-4	10-30-91	19000	320	340	230	180	NA	NA
MW-4	03-31-92	30000	1300	740	770	4800	NA	NA
MW-4	06-12-92	28000	990	440	550	3200	NA	NA
MW-4	09-16-92	21000	740	240	350	1300	NA	NA
MW-4	11-25-92	26000	1200	300	350	730	NA	NA
MW-4	01-29-93	23000	2000	580	770	2500	NA	NA
MW-4	05-10-93	74000	2200	890	1400	4000	NA	NA
MW-4	09-16-93	43000	640	90	360	690	NA	NA
MW-4	11-05-93	30000	1000	240	390	1300	NA	NA
MW-4	03-26-94	27000	1800	830	1300	2900	NA	NA
MW-4	06-13-94	17000	1300	620	670	1600	NA	NA
MW-4	09-22-94	10000	700	61	420	570	NA	NA
MW-4	11-25-94	13000	1400	250	490	1200	NA	NA

Table 3
Historical Groundwater Analytical Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHD	TOG
		ppb	ppb	ppb	ppb	ppb	ppb	ppm
MW-5	07-25-91	57000	2300	4200	77	14000	NA	NA
MW-5	10-30-91	Not sampled: well contained floating product						
MW-5	03-31-92	80000	7100	9100	2000	16000	NA	NA
MW-5	06-12-92	69000	4000	5300	2200	12000	NA	NA
MW-5	09-16-92	65000	2300	2600	1700	9900	NA	NA
MW-5	11-25-92	Not sampled: new wellhead made casing inaccessible for sampling						
MW-5	01-29-93	Not sampled: new wellhead made casing inaccessible for sampling						
MW-5	05-10-93	220000	3900	3700	3400	15000	NA	NA
MW-5	09-16-93	180000	3500	3300	2700	10000	NA	NA
MW-5	11-05-93	66000	3000	2300	1700	6200	NA	NA
MW-5	03-26-94	39000	4000	2300	1600	6200	NA	NA
MW-5	06-13-94	28000	2500	1700	1100	3900	NA	NA
MW-5	09-22-94	Not sampled: vehicle was parked on well						
MW-5	11-25-94	31000	2400	1100	1100	4400	NA	NA
MW-6	07-25-91	10000	3000	200	340	1000	NA	NA
MW-6	10-30-91	970	150	4.4	4.9	6.6	NA	NA
MW-6	03-31-92	16000	3600	1500	660	1700	2400*	2.5(a), 4.0(b)
MW-6	06-12-92	2900	480	17	190	170	1100*	1.2(c)
MW-6	09-16-92	2300	220	<5	92	43	810*	1.5(d)
MW-6	11-25-92	2700	240	11	103	32	720*	1.6(a), 1.8(b)
MW-6	01-29-93	20000	1800	1700	490	2600	2300*	3.6(a), 4.0(b)
MW-6	05-10-93	43000	3000	1700	1100	4800	3900*	16(a), 110(b)
MW-6	09-15-93	3500	300	10	100	180	1100*	1.0(a), 1.0(b)
MW-6	11-05-93	1100	140	<5	35	23	290	1.0(a), 1.0(b)
MW-6	03-26-94	3100	350	99	130	340	880	1.5(d)
MW-6	06-13-94	2300	250	12	130	31	350*	0.80(d)
MW-6	09-22-94	73	2.6	<0.5	1.7	0.7	<50	<0.5(a)
MW-6	11-25-94	1100	78	<2.5	46	17	<50	<0.5(d)

Table 3
Historical Groundwater Analytical Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Designation	Water Sample Field Date	TPHG ppb	Benzene ppb	Toluene ppb	Ethyl-benzene ppb	Total Xylenes ppb	TPHD ppb	TOG ppm
MW-7	07-25-91	45000	1500	2700	1200	9200	NA	NA
MW-7	10-30-91	93000	1800	770	780	6700	NA	NA
MW-7	03-31-92	35000	960	350	300	5900	NA	NA
MW-7	06-12-92	27000	900	270	340	4800	NA	NA
MW-7	09-16-92	39000	1900	410	470	5000	NA	NA
MW-7	11-25-92	49000	2900	810	750	5300	NA	NA
MW-7	01-29-93	38000	3200	1100	740	4300	NA	NA
MW-7	05-10-93	54000	1600	160	560	3100	NA	NA
MW-7	09-16-93	37000	1400	170	560	2700	NA	NA
MW-7	11-05-93	40000	1900	210	570	2900	NA	NA
MW-7	03-26-94	22000	2700	280	500	2600	NA	NA
MW-7	06-13-94	21000	1500	180	360	1900	NA	NA
MW-7	09-22-94	22000	1800	240	430	1900	NA	NA
MW-7	11-25-94	29000	2600	380	640	3300	NA	NA
MW-8	01-29-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-8	05-10-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-8	09-15-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-8	11-05-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-8	03-26-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-8	06-13-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-8	09-22-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-8	11-25-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-9	01-29-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-9	05-10-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-9	09-15-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-9	11-05-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-9	03-26-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-9	06-13-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-9	09-22-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-9	11-25-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA

Table 3
Historical Groundwater Analytical Data
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 03-07-95
Project Number: 0805-122.01

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHD	TOG
		ppb	ppb	ppb	ppb	ppb	ppb	ppm
MW-10	01-29-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-10	05-10-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-10	09-15-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-10	11-05-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-10	03-26-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-10	06-13-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-10	09-22-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-10	11-25-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-11	06-12-92	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-11	09-15-92	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-11	11-25-92	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-11	01-29-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-11	05-10-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-11	09-15-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-11	11-05-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-11	03-26-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-11	06-13-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-11	09-22-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-11	11-25-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
RW-1	06-12-92	54000	2300	4400	1200	12000	NA	NA
RW-1	09-15-92	49000	1500	2200	870	6900	NA	NA
RW-1	11-25-92	32000	1500	2500	1000	5500	NA	NA
RW-1	01-29-93	43000	3100	2500	990	7400	NA	NA
RW-1	05-10-93	30000	2900	1100	690	4300	NA	NA
RW-1	09-16-93	20000	1800	580	620	2300	NA	NA
RW-1	11-05-93	25000	1800	250	740	1300	NA	NA
RW-1	03-26-94	8100	780	100	360	340	NA	NA
RW-1	06-13-94	4900	510	32	150	170	NA	NA
RW-1	09-22-94	4900	390	30	190	210	NA	NA
RW-1	11-25-94	4900	550	68	200	230	NA	NA

TPHG = Total petroleum hydrocarbons as gasoline
TPHD = Total petroleum hydrocarbons as diesel
TOG = Total oil and grease/petroleum hydrocarbons using method: (a) 5520F-IR, (b) 5520C, (c) 413.2, or (d) 418.1
ppb = Parts per billion or micrograms per liter (µg/l)
ppm = Parts per million or milligrams per liter (mg/l); TOG only
NA = Not analyzed
* = Chromatogram does not match the typical fingerprint for gasoline or diesel

Table 4
Approximate Cumulative Floating Product Recovered
Summary Report

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 02-09-95
Project Number: 0805-122.01

Well Designation	Date	Floating Product Recovered gallons
MW-1, MW-2, and MW-5	1991	2.77
MW-1, MW-2, and MW-5	1992	0.29
MW-1, MW-2, and MW-5	1993	0.00
	1994 to Date:	
MW-1	11-25-94	0.00
MW-2	11-25-94	0.00
MW-5	11-25-94	0.00
	1994 Total:	0.00
	1991 to 1994 Total:	3.06

TABLE 1
VAPOR-EXTRACTION TEST MONITORING DATA
ARCO Station 771
Livermore, California

Influent Air Stream					Observation Wells			
Flow	Concentration	Applied Vacuum	Temp.	Elapsed Time (min)	MW-2 Induced Vacuum	MW-5 Induced Vacuum	MW-7 Induced Vacuum	MW-1 Induced Vacuum
53.4	NM	39	50	0	1.0	0.8	0.7	NM
87.2	>10,000	>100	55	30	4.3	5.8	3.7	NM
89.4	>10,000	98	57	60	4.8	6.9	5.0	NM
91.6	>10,000	105	57	90	4.9	7.2	5.7	NM
91.6	>10,000	105	60	120	4.9	7.3	6.0	NM
91.6	>10,000	105	60	150	4.9	7.3	6.0	NM
63.2	>10,000	49	64	30	4.8	5.0	5.1	NM
63.2	>10,000	49	63	60	4.8	5.0	5.1	>3
				Distance from extraction well MW-4 (feet):	40.0	40.0	35.0	60.0

Influent Air Stream					Observation Wells			
Flow	Concentration	Applied Vacuum	Temp.	Elapsed Time (min)	MW-1 Induced Vacuum	MW-4 Induced Vacuum	MW-2 Induced Vacuum	MW-7 Induced Vacuum
81.6	>10,000	96	56	0	2.0	0.9	0.04	0.0
81.6	>10,000	81.8	55	30	5.0	3.3	0.5	1.1
				Distance from extraction well MW-5 (feet):	30.0	40.0	80.0	60.0

Influent Air Stream					Observation Wells		
Flow	Concentration	Applied Vacuum	Temp.	Elapsed Time (min)	MW-2 Induced Vacuum	MW-4 Induced Vacuum	MW-5 Induced Vacuum
82.8	>10,000	95	57	0	2.0	2.0	1.2
82.8	>10,000	100	54	30	2.0	2.3	1.3
				Distance from extraction well MW-7 (feet):	44.0	35.0	57.0

Flow measured in cubic feet per minute (CFM).
Concentration measured in parts per million by volume (ppmv) on Lower Explosion Level (LEL) Meter.
Vacuum measured in inches of water column vacuum.
Temperature measured in degrees Fahrenheit.
NM = Not Measured.

TABLE 2
LABORATORY ANALYSIS OF AIR SAMPLES
ARCO Station 771
Livermore, California

Sample ID	Sample Location	Elapsed Time of Sample	TPHg	B	T	E	X
60000.07-AS1	MW-4	30	62,000	1200	150	28	48
60000.07-AS2	MW-4	150	58,000	1100	180	43	86
effluent	Outlet*	30	1,000	19	14	6.4	18
60000.07-AS3	MW-4	30	14,000	180	23	<12	<12
60000.07-AS4	MW-7	30	30,000	740	150	15	87
60000.07-AS5	MW-5	30	8,600	220	<12	<12	<12

Concentrations reported in milligrams per cubic meter (mg/m^3)
< : Below the minimum laboratory detection limit for air.
NA: Not analyzed.
TPHg: Total petroleum hydrocarbons as gasoline (analyzed by EPA Methods 8015 and 8020).
B: benzene, T: toluene, E: ethylbenzene, X: total xylene isomers
BTEX: Analyzed by EPA Methods 8015 and 8020
*: Outlet effluent vapors sampled after abatement by the internal combustion engine.

TABLE 1
LABORATORY ANALYTICAL RESULTS OF AIR SAMPLES
SVE STARTUP AND PERFORMANCE TEST

ARCO Station 771
899 Rincon Avenue, Livermore, California

Sample Location	Date	Sample ID	Concentration in air (mg/m³)				
			Benzene	Toluene	Ethylbenzene	Total Xylenes	TPHG
Detection Limit			0.5	0.5	0.5	1.0	60
Well Field Influent (before dilution)	12/20/94	I-1	<0.5	<0.5	<0.5	7.1	300
Influent to System (after dilution)	12/20/94	I-2	<0.5	<0.5	<0.5	1.9	<60
Effluent (stack exhaust)	12/20/94	E-1	<0.5	0.7	<0.5	2.5	<60

Notes:
mg/m³: Milligrams per cubic meter
TPHG: Total Petroleum Hydrocarbons as Gasoline
Analysis Method: Modified EPA 8015/8020

TABLE 2
HYDROCARBON REMOVAL AND EMISSION RATES
SVE STARTUP AND PERFORMANCE TEST

ARCO Station 771
899 Rincon Avenue, Livermore, California

Date	Compound	Concentration (mg/m^3)		Flow Rate	Mass Removal	Mass Emisson	Destruction
		Influent(I-2)	Effluent (E-1)	(scfm or ft^3/min)	Rate (lbs/day)	Rate (lbs/day)	Efficiency (%)
12/20/94	Benzene	<0.5	<0.5	130	<0.0058	<0.0058	NC
12/20/94	TPHG	<60	<60	130	<0.7	<0.7	NC

Notes:

mg/m^3:	milligrams per cubic meter
scfm:	standard cubic feet per minute
ft^3/min:	cubic feet per minute
TPHG:	Total Petroleum Hydrocarbons as Gasoline
lbs/day:	pouinds per day
NC:	Not calculated

Sample Calculation:

TPHG removal rate:

inf.conc. (mg TPHG/m^3 air) x flow rate(ft^3 air/min) x 1 lb/454,000 mg x 0.0283 m^3/ft^3 x 1440 min/day = lbs TPHG /day

Table 5
Soil-Vapor Extraction System
Operation and Performance Data

Facility Number: 771
Location: 899 Rincon Avenue
Livermore, California

Consultant: EMCON
1921 Ringwood Avenue
San Jose, California

Vapor Treatment Unit: King Buck / 200 cfm
Model MMC-6A/E
catalytic oxidizer

Start-Up Date: 12-20-94
Reporting Period From: 12-01-94
To: 04-01-96
System was shut down on 10-10-95.

Date Begin:	12-01-94	01-01-95	02-01-95	07-01-95	08-01-95
Date End:	01-01-95	02-01-95	07-01-95	08-01-95	09-01-95
Mode of Oxidation:	Catalytic	Catalytic	Catalytic	Catalytic	Catalytic
Days of Operation:	11	11	0	8	14
Days of Downtime:	20	20	150	23	17
Average Vapor Concentrations (1)					
Well Field Influent: ppmv (2) as gasoline	100	<15	NA	54	33
mg/m3 (3) as gasoline	300	<60	NA	218	120
ppmv as benzene	<0.1	<0.1	NA	1.2	0.4
mg/m3 as benzene	<0.5	<0.5	NA	3.6	1.2
System Influent: ppmv as gasoline	<15	NA	NA	48	24
mg/m3 as gasoline	<60	NA	NA	200	87
ppmv as benzene	<0.1	NA	NA	1.2	0.3
mg/m3 as benzene	<0.5	NA	NA	3.8	0.8
System Effluent: ppmv as gasoline	<15	NA	NA	<15	<15
mg/m3 as gasoline	<60	NA	NA	<60	<60
ppmv as benzene	<0.1	NA	NA	<0.1	<0.1
mg/m3 as benzene	<0.5	NA	NA	<0.5	<0.5
Average Well Field Flow Rate (4), scfm (5):	27.3	13.0	0.0	83.3	104.3
Average System Influent Flow Rate (4), scfm:	201.7	180.7	0.0	163.4	170.9
Average Destruction Efficiency (6), percent (7):	NA (13)	NA	NA	70.0 (14)	31.0 (14)
Average Emission Rates (8), pounds per day (9)					
Gasoline:	1.09	0.97	0.00	0.88	0.92
Benzene:	0.01	0.01	0.00	0.01	0.01
Operating Hours This Period:	275.50	269.23	0.00	195.40	342.12
Operating Hours To Date:	275.5	544.7	544.7	740.1	1082.3
Pounds/ Hour Removal Rate, as gasoline (10):	0.03	0.00	0.00	0.07	0.05
Pounds Removed This Period, as gasoline (11):	8.4	0.8	0.0	13.3	16.0
Pounds Removed To Date, as gasoline:	8.4	9.2	9.2	22.5	38.5
Gallons Removed This Period, as gasoline (12):	1.4	0.1	0.0	2.1	2.6
Gallons Removed To Date, as gasoline:	1.4	1.5	1.5	3.6	6.2

Table 5
Soil-Vapor Extraction System
Operation and Performance Data

Facility Number: 771
Location: 899 Rincon Avenue
Livermore, California

Consultant: EMCON
1921 Ringwood Avenue
San Jose, California

Vapor Treatment Unit: King Buck / 200 cfm
Model MMC-6A/E
catalytic oxidizer

Start-Up Date: 12-20-94
Reporting Period From: 12-01-94
To: 04-01-96
System was shut down on 10-10-95.

Date Begin:		09-01-95	10-01-95	01-01-96
Date End:		10-01-95	01-01-96	04-01-96
Mode of Oxidation:		Catalytic	Catalytic	Catalytic
Days of Operation:		27	0	0
Days of Downtime:		3	92	91
Average Vapor Concentrations (1)				
Well Field Influent:	ppmv (2) as gasoline	20	NA	NA
	mg/m3 (3) as gasoline	89	NA	NA
	ppmv as benzene	<0.1	NA	NA
	mg/m3 as benzene	<0.5	NA	NA
System Influent:	ppmv as gasoline	18	NA	NA
	mg/m3 as gasoline	79	NA	NA
	ppmv as benzene	<0.1	NA	NA
	mg/m3 as benzene	<0.5	NA	NA
System Effluent:	ppmv as gasoline	<15	NA	NA
	mg/m3 as gasoline	<60	NA	NA
	ppmv as benzene	<0.1	NA	NA
	mg/m3 as benzene	<0.5	NA	NA
Average Well Field Flow Rate (4), scfm (5):		84.0	0.0	0.0
Average System Influent Flow Rate (4), scfm:		84.0	0.0	0.0
Average Destruction Efficiency (6), percent (7):		24.1 (14)	NA	NA
Average Emission Rates (8), pounds per day (9)				
Gasoline:		0.45	0.00	0.00
Benzene:		0.00	0.00	0.00
Operating Hours This Period:		654.88	0.00	0.40
Operating Hours To Date:		1737.1	1737.1	1737.5
Pounds/ Hour Removal Rate, as gasoline (10):		0.03	0.00	0.00
Pounds Removed This Period, as gasoline (11):		18.3	0.0	0.0
Pounds Removed To Date, as gasoline:		56.9	56.9	56.9
Gallons Removed This Period, as gasoline (12):		3.0	0.0	0.0
Gallons Removed To Date, as gasoline:		9.2	9.2	9.2

Table 5
Soil-Vapor Extraction System
Operation and Performance Data

Facility Number: 771	Vapor Treatment Unit: King Buck / 200 cfm
Location: 899 Rincon Avenue	Model MMC-6A/E
Livermore, California	catalytic oxidizer
Consultant: EMCON	Start-Up Date: 12-20-94
1921 Ringwood Avenue	Reporting Period From: 12-01-94
San Jose, California	To: 04-01-96
	System was shut down on 10-10-95.

CURRENT REPORTING PERIOD:	01-01-96	to	04-01-96
DAYS / HOURS IN PERIOD:	91	2184.0	
DAYS / HOURS OF OPERATION:	0	0.0	
DAYS / HOURS OF DOWN TIME:	91	2184.0	
PERCENT OPERATIONAL:		0.0	%
PERIOD POUNDS REMOVED:	9.2		
PERIOD GALLONS REMOVED:	0.0		
AVERAGE SYSTEM INFLUENT FLOW RATE (scfm):		0.0	

1. Average concentrations are based on discrete sample results reported during the month; refer to Appendix C for discrete sample results.
2. ppmv: parts per million by volume
3. mg/m3: milligrams per cubic meter
4. Average flow rates (time weighted average) are based on instantaneous flow rates recorded during the month; refer to Appendix C for instantaneous flow data.
5. scfm: flow in standard cubic feet per minute at one atmosphere and 70 degrees Fahrenheit
6. Average destruction efficiencies are calculated using monthly average concentrations; refer to Appendix C for instantaneous destruction efficiency data.
7. destruction efficiency, percent = ([system influent concentration (as gasoline in mg/m3) - system effluent concentration (as gasoline in mg/m3)] / system influent concentration (as gasoline in mg/m3)) x 100 percent
8. Average emission rates are calculated using monthly average concentrations and flow rates; refer to Appendix C for instantaneous emission rate data.
9. emission rates (pounds per day) = system effluent concentration (as gasoline or benzene in mg/m3) x system influent flow rate (scfm) x 0.02832 m3/ft3 x 1440 minutes/day x 1 pound/454,000 mg
10. pounds/ hour removal rate (as gasoline) = well field influent concentration (as gasoline in mg/m3) x well field influent flow rate (scfm) x 0.02832 m3/ft3 x 60 minutes/hour x 1 pound/454,000 mg
11. pounds removed this period (as gasoline) = pounds/ hour removal rate x hours of operation
12. gallons removed this period (as gasoline) = pounds removed this period (as gasoline) x 0.1613 gallons/pound of gasoline
13. NA: not analyzed, not available, or not applicable
14. Although the destruction efficiency appeared to be less than 90 percent, laboratory analytical results collected during this period indicate the effluent TVHG and benzene concentrations in off-gas discharged to the atmosphere were below laboratory detection limits, indicating compliance with BAAQMD discharge requirements.

Table 6
Soil-Vapor Extraction Well Data

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 04-11-96

Date	Well Identification											
	VW-1			MW-1			MW-2			MW-4		
	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O
12-20-94	open	177 LAB	32.5	passive	NA	NA	passive	NA	NA	open	53 LAB	25.0
01-17-95	System shut down											
07-12-95	System was restarted											
07-12-95	open	NA	NA	open	NA	NA	open	NA	NA	open	NA	NA
08-01-95	open	NA	NA	open	NA	NA	open	NA	NA	open	NA	NA
08-29-95	open	NA	NA	open	NA	NA	open	NA	NA	open	NA	NA
09-18-95	open	44.8 PID	53.7	open	10.7 PID	56.9	open	12.0 PID	52.8	open	13.3 PID	54.7
09-18-95	open (b)	66.8 PID	56.0	open (b)	113 PID	58.2	open (b)	25.9 PID	55.1	open (b)	21.8 PID	56.9
10-10-95	open	NA	NA	open	NA	NA	open	NA	NA	open	NA	NA
10-10-95	System shut down											
12-19-95	closed (b)	NA	NA	closed (b)	NA	NA	closed (b)	NA	NA	closed (b)	NA	NA
02-08-96	closed (b)	NA	NA	closed (b)	NA	NA	closed (b)	NA	NA	closed (b)	NA	NA
02-14-96	closed (b)	NA	NA	closed (b)	NA	NA	closed (b)	NA	NA	closed (b)	NA	NA
03-22-96	closed (b)	NA	NA	closed (b)	NA	NA	closed (b)	NA	NA	closed (b)	NA	NA

TVHG: concentration of total volatile hydrocarbons as gasoline
ppmv: parts per million by volume
in-H2O: inches of water
open: open to the system
open (b): open to the system and bubbling air at 1 scfm per well
passive: open to the atmosphere
closed: closed to the system and atmosphere
closed (b): closed to the system and atmosphere, but bubbling air at 1 scfm per well
NA: not analyzed or not measured
FID: TVHG concentration was measured with a portable flame ionization detector
LAB: TVHG concentration was analyzed in the laboratory

Table 6
Soil-Vapor Extraction Well Data

ARCO Service Station 771
899 Rincon Avenue, Livermore, California

Date: 04-11-96

Date	Well Identification							
	MW-5			MW-7			Bubbler-Only Well	
	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O	RW-1	
12-20-94	passive	NA	NA	passive	NA	NA		
01-17-95	System shut down							
07-12-95	System was restarted							
07-12-95	open	NA	NA	open	NA	NA		
08-01-95	open	NA	NA	open	NA	NA		
08-29-95	open	NA	NA	open	NA	NA		
09-18-95	open	11.2 PID	55.9	open	19.0 PID	53.9		
09-18-95	open (b)	117 PID	58.0	open (b)	20.0 PID	56.2		
10-10-95	open	NA	NA	open	NA	NA		
10-10-95	System shut down							
12-19-96	closed (b)	NA	NA	closed (b)	NA	NA		
02-08-96	closed (b)	NA	NA	closed (b)	NA	NA	bubbling	
02-14-96	closed (b)	NA	NA	closed (b)	NA	NA	bubbling	
03-22-96	closed (b)	NA	NA	closed (b)	NA	NA	bubbling	

TVHG: concentration of total volatile hydrocarbons as gasoline
ppmv: parts per million by volume
in-H2O: inches of water
open: open to the system
open (b): open to the system and bubbling air at 1 scfm per well
passive: open to the atmosphere
closed: closed to the system and atmosphere
closed (b): closed to the system and atmosphere, but bubbling air at 1 scfm per well
NA: not analyzed or not measured
FID: TVHG concentration was measured with a portable flame ionization detector
LAB: TVHG concentration was analyzed in the laboratory

APPENDIX C

SOIL BORING AND WELL CONSTRUCTION LOGS

Total depth of boring: 35 feet **Diameter of boring:** 6 inches **Date drilled:** 2/1/90

Casing diameter: N/A **Length:** N/A **Slot size:** N/A

Screen diameter: N/A **Length:** N/A **Material type:** N/A

Drilling Company: Bakersfield Well & Pump **Driller:** Sid & Tom

Method Used: Hollow-Stem Auger **Field Geologist:** Steve Bittman

Signature of Registered Professional:

Registration No.: **State:** CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0						
					Asphalt (6 inches).	
2				GW	Sandy gravel with clay, brown, damp, dense with subrounded gravel.	
4		7				
		10				
6	S-5	19	0			
8						
		16				
10		27				
	S-10	39	2.4		Moist, very dense, noticeable odor.	
12						
14		27				
	S-14.5	45	20			
16						
18						
		31			Obvious odor.	
20	S-19.5	50+	200			
					(Section continues downward)	

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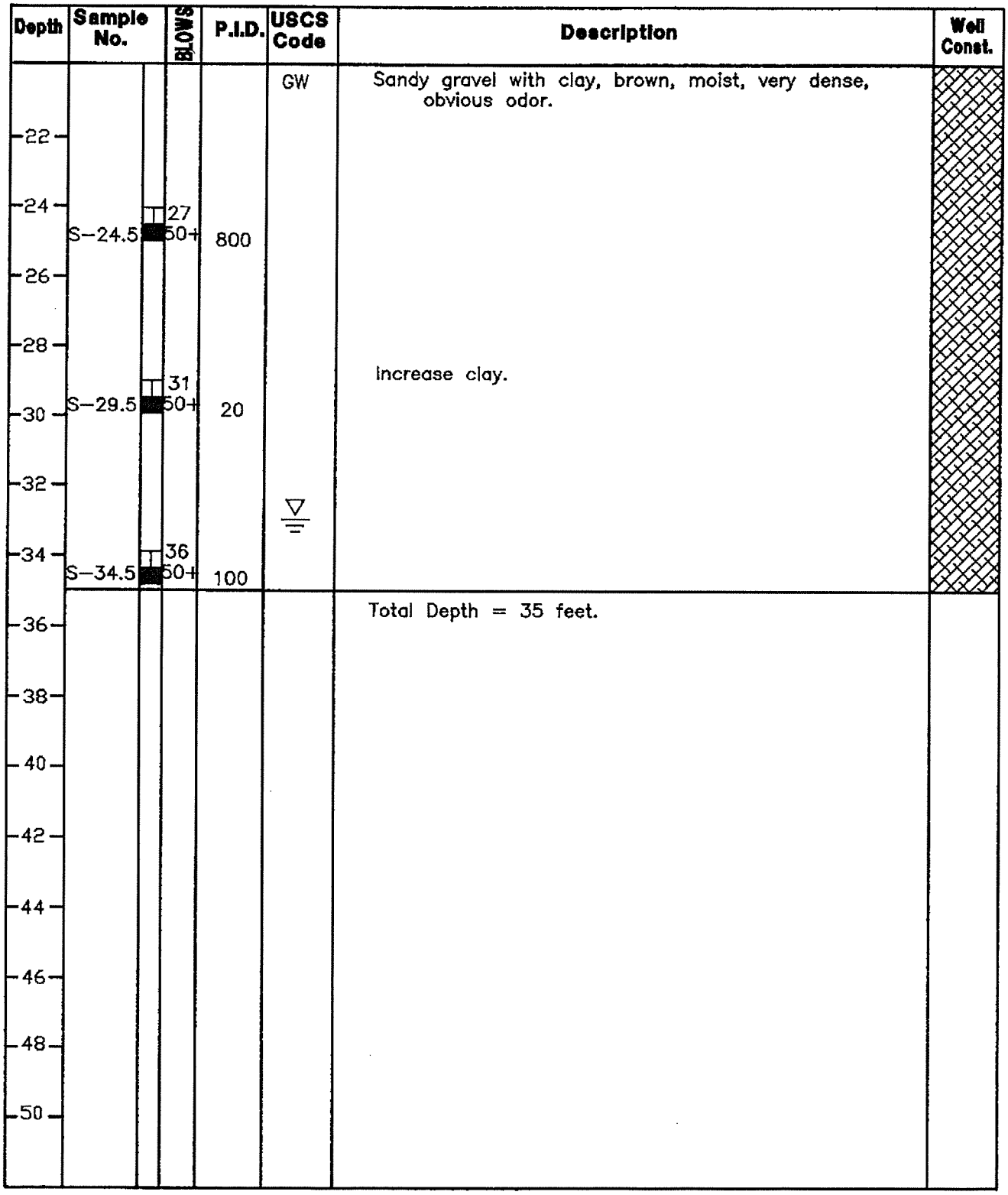
PROJECT 60000-1

LOG OF BORING B - 1

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 4



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PROJECT 60000-1

LOG OF BORING B - 1

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 5

Total depth of boring: 31.5 feet **Diameter of boring:** 6 inches **Date drilled:** 2/1/90

Casing diameter: N/A **Length:** N/A **Slot size:** N/A

Screen diameter: N/A **Length:** N/A **Material type:** N/A

Drilling Company: Bakersfield Well & Pump **Driller:** Sid & Tom

Method Used: Hollow-Stem Auger **Field Geologist:** Steve Bittman

Signature of Registered Professional:

Registration No.: **State:** CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (6 inches).	
2				GW	Sandy gravel with clay, brown, damp, dense with subrounded gravel.	
4		10 17				
6	S-5	20	5		Noticeable odor.	
8						
10	S-10	11 17 29	0			
12						
14		17 20	10		Gray.	
16	S-15	15				
18				CL	Sandy clay, gray, moist, low to medium plasticity, stiff, noticeable odor.	
20	S-20	20 41 50+	210	GC	Clayey gravel with sand, gray-brown, moist, very dense with subangular gravel, obvious odor.	

(Section continues downward)

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PROJECT 60000-1

LOG OF BORING B - 2

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 6

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				GC	Clayey gravel with sand, gray–brown, moist, very dense with subangular gravel, obvious odor.	
24		21				
		37				
	S–25	50+	35			
26						
28						
30		7				
		15		CL	Gravelly clay, brown, moist, subangular gravel, medium plasticity, hard.	
	S–31	40	2			
32					Total Depth = 31–1/2 feet.	
34						
36						
38						
40						
42						
44						
46						
48						
50						

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PROJECT 60000-1

LOG OF BORING B - 2

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 7

Total depth of boring: 32.5 feet **Diameter of boring:** 6 inches **Date drilled:** 2/1/90

Casing diameter: N/A **Length:** N/A **Slot size:** N/A

Screen diameter: N/A **Length:** N/A **Material type:** N/A

Drilling Company: Bakersfield Well & Pump **Driller:** Sid & Tom

Method Used: Hollow-Stem Auger **Field Geologist:** Steve Bittman

Signature of Registered Professional:

Registration No.: **State:** CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (6 inches).	
2				GW	Sandy gravel with clay, brown, damp, medium dense with subrounded gravel.	
4		6 8				
6	S-5	9	0			
8						
10		24 37				
12	S-10	25	0		Very dense.	
14		41				
16	S-14.5	50+	2		Moist.	
18						
20		27		GC	Clayey gravel with sand, gray-brown, moist, very dense with subangular gravel, noticeable odor.	
	S-19.5	50+	110		(Section continues downward)	

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PROJECT 60000-1

LOG OF BORING B - 3

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 8

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				GC	Clayey gravel with sand, gray–brown, moist, very dense with subangular gravel, noticeable odor.	
24		25				
26	S–25	50+	240		Obvious odor.	
28						
30		24 45 45				
	S–30	30	700			
32	S–32	41 50	720		Obvious odor.	
					Total Depth = 32–1/2 feet.	
34						
36						
38						
40						
42						
44						
46						
48						
50						

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PROJECT 60000-1

LOG OF BORING B - 3

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 9

Depth of boring: 46-1/2 feet Diameter of boring: 10 inches Date drilled: 12-10-90

Well depth: 41 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 32 to 41 feet Slot size: 0.020-inch

Drilling Company: Kvilhaug Drilling Co. Driller: Rod and Brian

Method Used: Hollow-Stem Auger Field Geologist: Mike Barminski

Signature of Registered Professional: _____

Registration No.: CE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (4 inches).	
2				CL	Gravelly clay with sand, dark brown, moist, low to medium plasticity, hard.	
4	S-5	12 18 27	6.5			
6						
8				GW	Sandy gravel with clay, brown, moist, very dense.	
10	S-10	7 22 40	0			
12						
14						
16	S-15	25 50	0			
18						
20	S-20	30 50	4.2		Noticeable product odor.	
					(Section continues downward)	

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PROJECT: 60000-4

LOG OF BORING B-4/MW-1

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 5

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				GW	Sandy gravel with clay, brown, moist, very dense; noticeable product odor.	
24	S-25					
26	S-26.5	30 50 50	4.6			
28						
30	S-30	30 50 50	0	GC	Clayey gravel with sand, brown, moist, very dense.	
32	S-32.5	30				
	S-33	50 50	2.8		12/12/90	
34	S-35	50 50	0		Very moist.	
36	S-36.5	40 50 50	0			
	S-37.5	40				
38	S-38	50 50	2669	GW	Sandy gravel with clay, brown, moist, very dense; obvious product odor.	
40	S-40					
42	S-43	15 20 30	187.8	CL	Sandy clay, brown, moist, medium to low plasticity, hard; obvious product odor.	
44					Damp, noticeable product odor.	
46	S-45.5	15 25				
	S-46	35	27.1	SC	Clayey sand with pebbles to 1/8", brown, moist, very dense	
48					Total Depth = 46-1/2 feet.	
50						

Applied GeoSystems

PROJECT 60000-4

LOG OF BORING B-4/MW-1
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 6

Depth of boring: 45-1/2 feet Diameter of boring: 10 inches Date drilled: 12-10-90

Well depth: 38 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 30 to 38 feet Slot size: 0.020-inch

Drilling Company: Kvilhaug Drilling Co. Driller: Rod and Brian

Method Used: Hollow-Stem Auger Field Geologist: Mike Barminski

Signature of Registered Professional: _____

Registration No.: CE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (4 inches).	
2				GW	Sandy gravel with clay, brown, damp, dense.	
4	S-5	10 38 50	0		Very dense.	
6						
8						
10	S-10	50 50	0.9		Moist.	
12	S-11.5	50 50	0			
14					Smoother drilling at 14 feet.	
16	S-15	35 50 50	0	CL	Sandy clay, gray, very moist, low to medium plasticity, hard. Rougher drilling at 16 feet.	
18				GW	Sandy gravel with clay, brown, very moist, very dense; noticeable product odor?	
20	S-20	30 50 50	4.6		(Section continues downward)	

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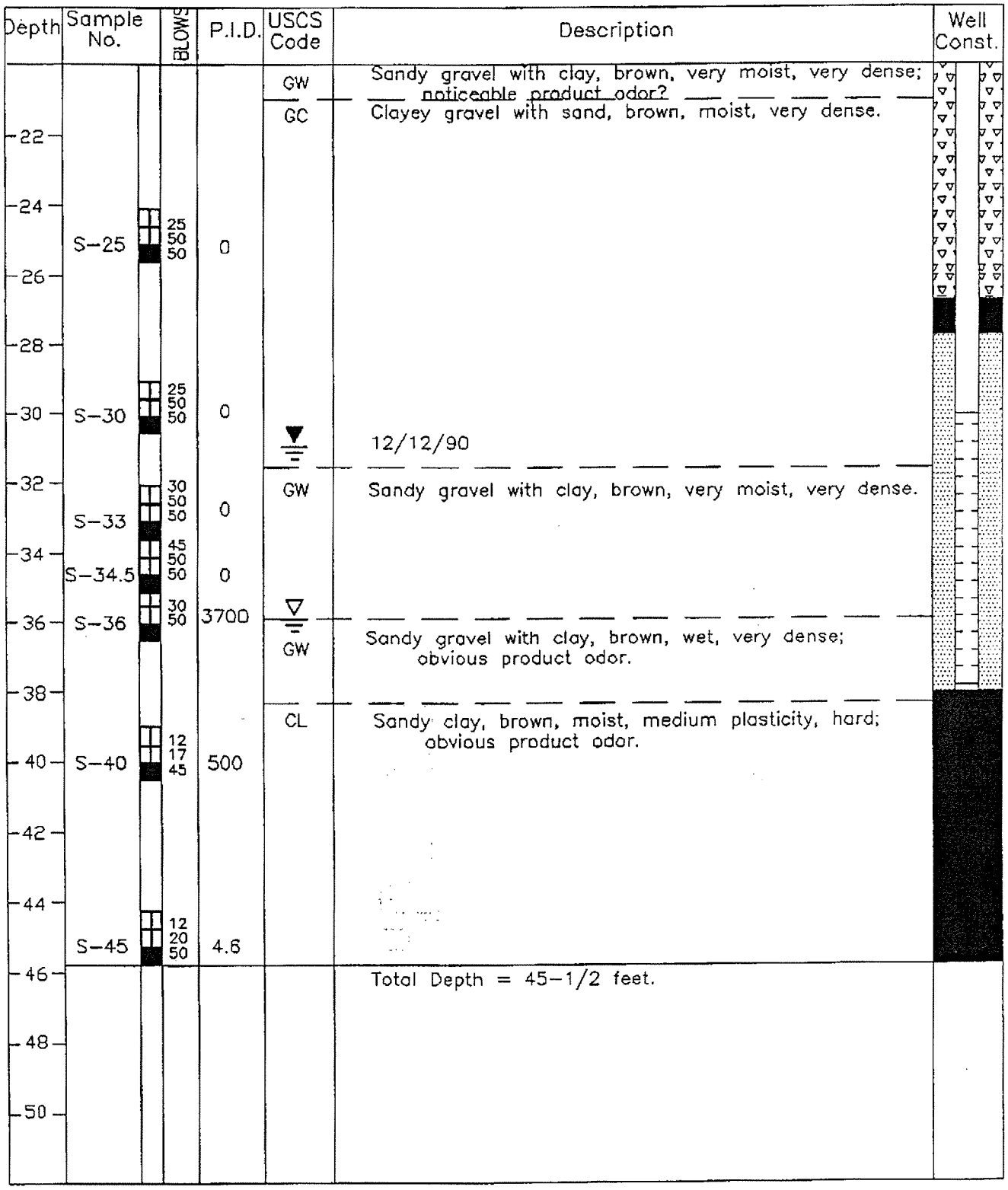
PROJECT: 60000-4

LOG OF BORING B-5/MW-2

ARCO Station 771
899 Rincon Avenue
Livemore, California

PLATE 7



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PROJECT 60000-4

LOG OF BORING B-5/MW-2
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE
8

Depth of boring: 45 feet Diameter of boring: 10 inches Date drilled: 12-11-90

Well depth: 40 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 32 to 40 feet Slot size: 0.020-inch

Drilling Company: Kvilhaug Drilling Co. Driller: Rod and Brian

Method Used: Hollow-Stem Auger Field Geologist: Mike Barminski

Signature of Registered Professional: _____

Registration No.: CE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (4 inches).	
				GC	Clayey gravel with sand, brown, damp, very dense.	
2						
4	S-5	30 30 45	0			
6						
8						
10	S-10	50 50	0		Moist.	
12				GW	Sandy gravel with clay, brown, moist, very dense.	
14						
	S-15	45 50	0			
16						
18						
20	S-20	25 40	0			

(Section continues downward)

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PROJECT: 60000-4

LOG OF BORING B-6/MW-3

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 9

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				GW	Sandy gravel with clay, brown, moist, very dense.	
24	S-25	35 50	6.8		Clayier.	
26						
28				GC	Clayey gravel with sand, brown, moist, very dense.	
30	S-29.5 S-30	35 35 35	4.2			
32					12/12/90	
34	S-34.5	50 50	2.8	GW	Sandy gravel with clay, brown, moist, very dense.	
36	S-36.5	14 35 50	3.1			
38	S-38	20 50 50	?		Wet.	
40	S-40.5 S-41	12 15 20	2.8	CL	Sandy clay, brown, moist, low to medium plasticity, hard.	
42						
44	S-44.5	10 18 20	3.2			
46					Total Depth = 45 feet.	
48						
50						

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PROJECT 60000-4

LOG OF BORING B-6/MW-3
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE
10

Depth of boring: 46-1/2 feet Diameter of boring: 10 inches Date drilled: 6-28-91

Well depth: 42 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 26 to 42 feet Slot size: 0.020-inch

Drilling Company: Exceltech Driller: Don & Kenny

Method Used: Hollow-Stem Auger Field Geologist: Barbara Sieminski

Signature of Registered Professional:

Registration No.: CE044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0						
				SW	Sand, with small gravel, yellow, damp, loose: fill.	
2				GW	Sandy gravel with cobbles, brown, damp, medium dense: fill.	
				GW	Sandy gravel with clay, brown, damp, medium dense.	
4		3				
	S-5.5	4	0			
6		10				
8						
		18				
10	S-10	16	0		Moist, dense.	
		21				
12						
14		18				
	S-15	21	0		Gray, very moist.	
		28				
16					Noticeable product odor.	
18						
		18				
20	S-20	26	82		Very dense.	
		35			(Section continues downward)	

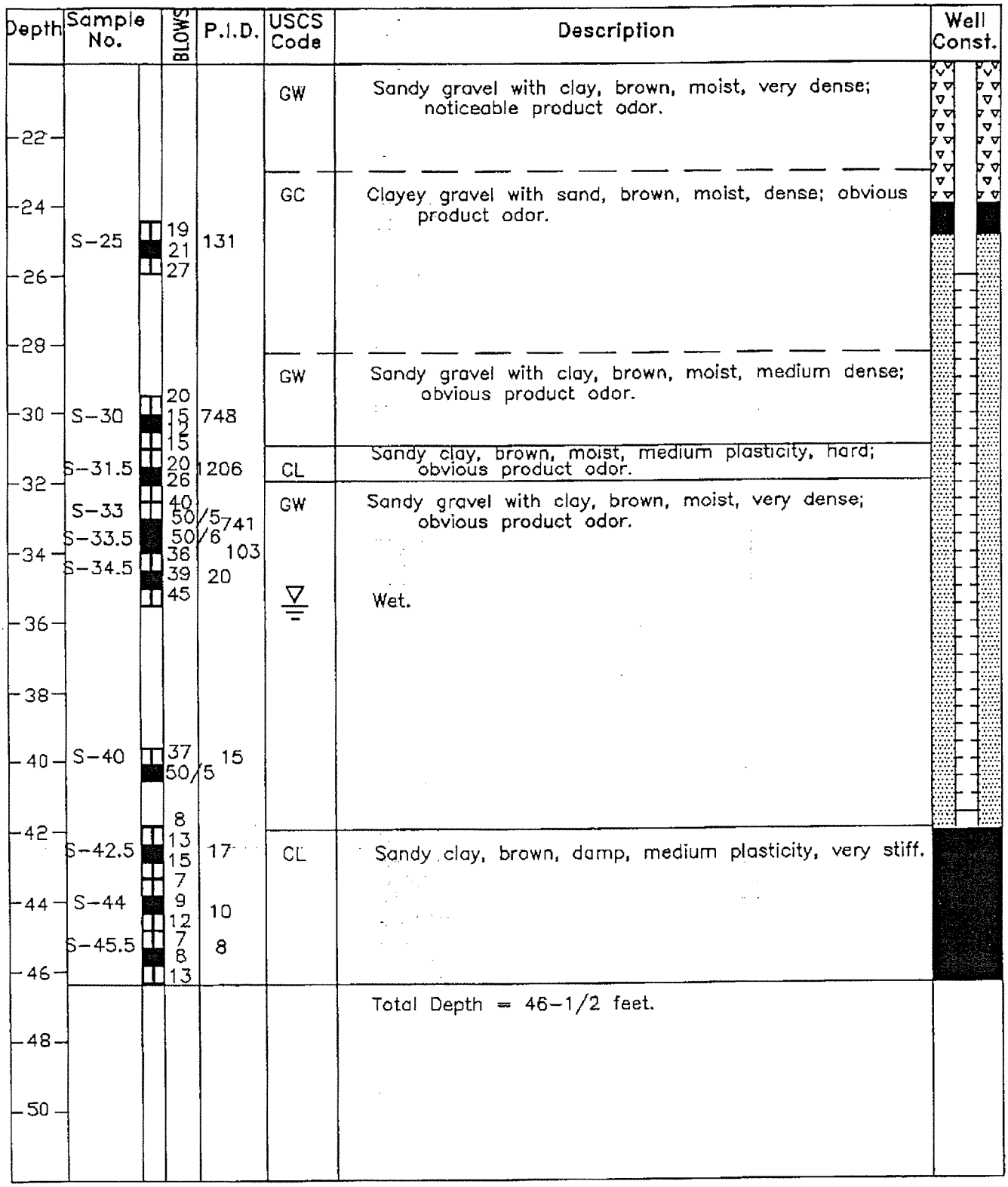
RESNA

PROJECT: 60000.06

LOG OF BORING B-7/MW-4

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 4



RESNA

PROJECT 60000.06

LOG OF BORING B-7/MW-4

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 5

Depth of boring: 45–1/2 feet Diameter of boring: 10 inches Date drilled: 7–2–91

Well depth: 41 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 31–1/2 to 41 feet Slot size: 0.020–inch

Drilling Company: Exceltech Driller: Dan, Kenny, and Adam

Method Used: Hollow–Stem Auger Field Geologist: Barbara Sieminski

Signature of Registered Professional:

Registration No.: CE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (4 inches).	
2				GW	Sandy gravel, dark brown, damp, medium dense; fill.	
4				GW	Sandy gravel with clay, brown, damp, medium dense; gravel up to 3–inches diameter.	
6	S–5.5	7 8 13	3.4			
8						
10	S–10.5	12 30 37	9.6		More sand, moist, very dense.	
12						
14						
16	S–15.5	12 13 20	0		Dense.	
18						
20	S–20.5	18 19 22	34		More clay.	

(Section continues downward)

RESNA

PROJECT: 60000.06

LOG OF BORING B–8/MW–5

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 6

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				GW	Sandy gravel with clay, brown, moist, dense.	
24				GC	Clayey gravel with sand, brown, moist, very dense.	
26	S-25.5	20 30 30	37			
28						
30	S-30.5	5 6 11	0	CL	Sandy clay with small gravel, brown, moist, medium plasticity, very stiff.	
32				SC	Clayey sand with small gravel, brown, moist, medium dense.	
34	S-34.5	35 30	364	GW	Sandy gravel with clay, brown, moist, very dense; obvious product odor.	
36	S-36	40 25 39	35		Noticeable product odor. Wet.	
38		26 17 29 33	27			
40						
42	S-41	11 12 18	305	CL	Sandy clay, brown, moist, medium plasticity, very stiff; obvious product odor.	
44	S-43	8 9 13 5 8 13	49			
46					Total Depth = 45-1/2 feet.	
48						
50						

RESNA

PROJECT 60000.06

LOG OF BORING B-8/MW-5

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 7

Depth of boring: 47-1/2 feet Diameter of boring: 10 inches Date drilled: 7-1-91

Well depth: 42-1/2 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 32-1/2 to 42-1/2 feet Slot size: 0.020-inch

Drilling Company: Exceltech Driller: Don & Kenny

Method Used: Hollow-Stem Auger Field Geologist: Barbara Sieminski

Signature of Registered Professional:

Registration No.: CE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (4 inches).	
				GW	Sandy gravel, brown, dry, loose: fill.	
2				GC	Clayey gravel with sand, dark brown, damp, dense.	
4				GW	Sandy gravel with clay, brown, damp, dense; gravel up to 2-inches diameter.	
6	S-5.5	10 17 15	0			
8						
10	S-10.5	20 36 45	0		Very dense.	
12						
14						
16	S-15.5	15 16 16	0		Moist, dense.	
18						
20	S-20	17 50/1	0		Gravel up to 3-inches diameter.	
					(Section continues downward)	

RESNA

PROJECT: 60000.06

LOG OF BORING B-9/MW-6

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 8

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				GW	Sandy gravel with clay, brown, dense; gravel up to 3-inches diameter.	
24					More clay.	
26	S-25.5	18 27 50/1	0			
28				GC	Clayey gravel with sand, brown, moist, dense.	
30	S-30.5	15 34 28	0	GW	Sandy gravel with clay, brown, moist, very dense.	
32						
34	S-34.5	32 44 50	0			
36	S-36	36 49 40	0	▽	Wet.	
38		19 18 30	0			
40	S-40.5	30 33 28	0			
42	S-42	10 16 8	19			
44	S-43.5	4 6 9	0	CL	Sandy clay, brown, moist, medium plasticity, stiff.	
46	S-45	6 11 14	0			
48		6 11 13	0		Total Depth = 47-1/2 feet.	
50						

RESNA

PROJECT 60000.06

LOG OF BORING B-9/MW-6

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 9

Depth of boring: 44-1/2 feet Diameter of boring: 10 inches Date drilled: 7-2-91

Well depth: 40 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 30 to 40 feet Slot size: 0.020-inch

Drilling Company: Exceltech Driller: Don, Kenny, and Adam

Method Used: Hollow-Stem Auger Field Geologist: Barbara Sieminski

Signature of Registered Professional: /E Dawson

Registration No.: CE 044600 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0						
					Asphalt (4 inches).	
2				GW	Sandy gravel, dark brown, damp, medium dense: fill.	
4				GW	Sandy gravel with clay, brown, damp, medium dense; gravel up to 3-inches diameter.	
6	S-5.5	6 7 8	0			
8						
10	S-10.5	19 20 29	0		Moist, dense.	
12						
14						
16		35 50/1				
18						
20	S-20.5	17 35 43	152		Very dense; obvious product odor.	
					(Section continues downward)	

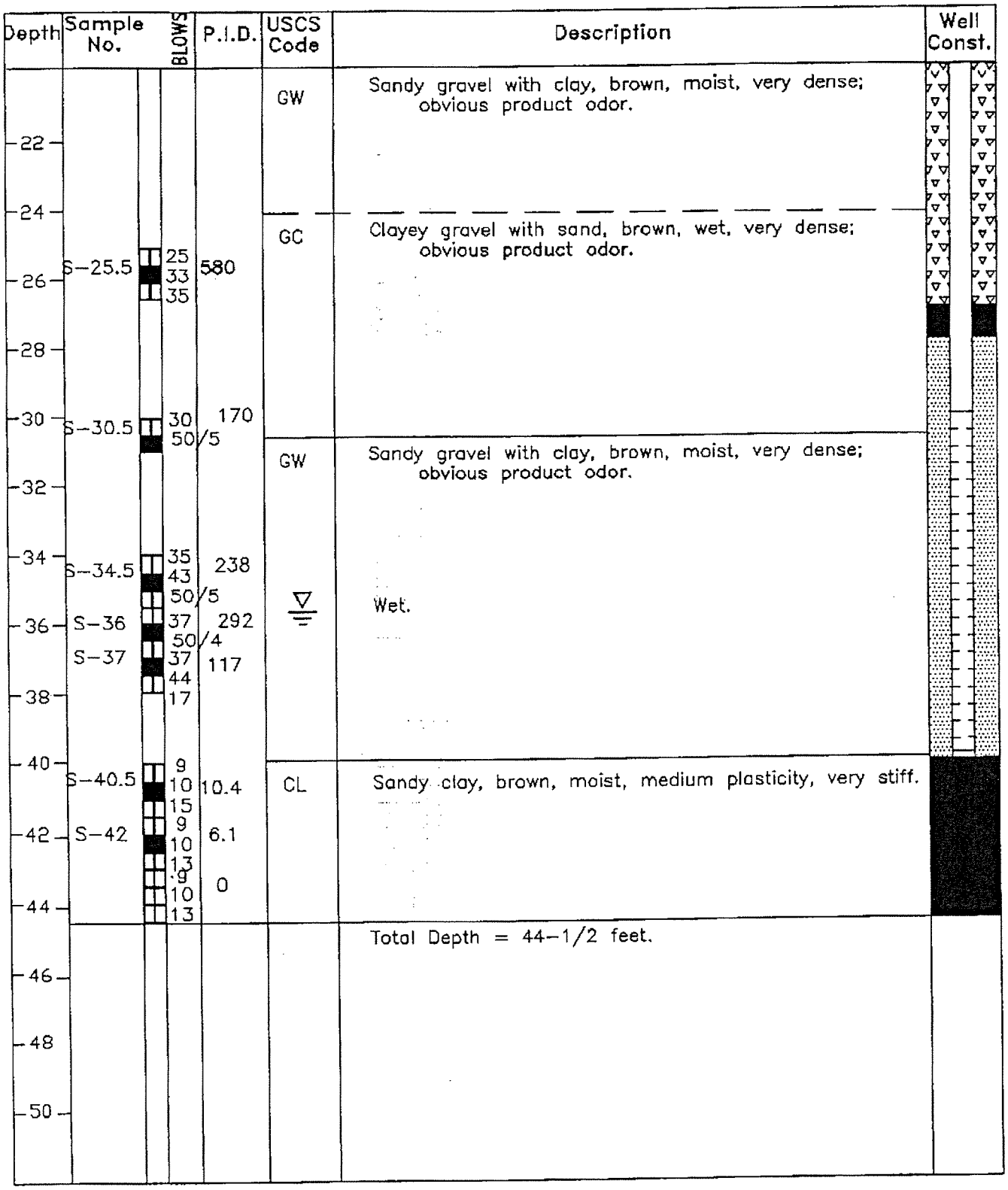
RESNA

PROJECT: 60000.06

LOG OF BORING B-10/MW-7

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 10



RESNA

PROJECT 60000.06

LOG OF BORING B-10/MW-7

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 11

Depth of boring: 40-1/2 feet Diameter of boring: 8 inches Date drilled: 7-1-91

Well depth: NA Material type: NA Casing diameter: NA

Screen interval: NA Slot size: NA

Drilling Company: Exceltech Driller: Don, Kenny

Method Used: Hollow-Stem Auger Field Geologist: Barbara Sieminski

Signature of Registered Professional: _____

Registration No.: _____ State: _____

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (4 inches).	
2				GW	Sandy gravel, dark brown, damp, medium dense: fill.	
4						
6	S-7	12 17	0		With clay, brown, dense.	
8		17 16				
	S-8.5	12 26	0			
10		15 26	0		Very dense.	
12		50 50/3				
14				GW	Sandy gravel with clay, brown, damp, dense.	
	S-15.5	32 36			Moist.	
16		36	0			
18						
20	S-20.5	23 30	0			
		33			(Section continues downward)	

RESNA

PROJECT: 60000.06

LOG OF BORING B-11

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 12

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				GW	Sandy gravel with clay, brown, moist, very dense.	
24						
26	S-25	25 50/5	3.4		More clay.	
28				GC	Clayey gravel with sand, brown, moist, dense.	
30	S-30.5	14 10 10	0			
32				GW	Sandy gravel with clay, brown, moist, medium dense.	
34						
36	S-35.5	40 50/5	0		Very dense.	
38				▽	Wet.	
40	S-40	50/5	0			
42					Total Depth = 40-1/2 feet.	
44						
46						
48						
50						

RESNA

PROJECT 60000.06

LOG OF BORING B-11

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 13

Depth of boring: 45 1/2 feet Diameter of boring: 8 inches Date drilled: 01/15/93

Well depth: 42 1/2 feet Material type: Sch 40 PVC Casing diameter: 2 inches

Screen interval: 27 1/2 to 42 1/2 feet Slot size: 0.020-inch

Drilling Company: Exploration GeoServices Driller: John and Mike

Method Used: Hollow-Stem Auger Field Geologist: Barbara Sieminski

Signature of Registered Professional:

Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (4 inches).	
				GP	Sandy gravel, gray, damp, dense; baserock.	
2				GW	Sandy gravel, brown, damp, very dense; fine- to coarse-grained sand.	
4	S-4.5	26 38 50/6"	0			
6						
8						
	S-9	50/5"	0			
10						
12						
14	S-14.5	27 50/6"	0		Becoming very moist.	
16				GC	Clayey gravel with sand, brown, damp, very dense	
	S-17	50/6"	0			
18						
	S-19.5	48 39 37	0		Becoming moist	
20						

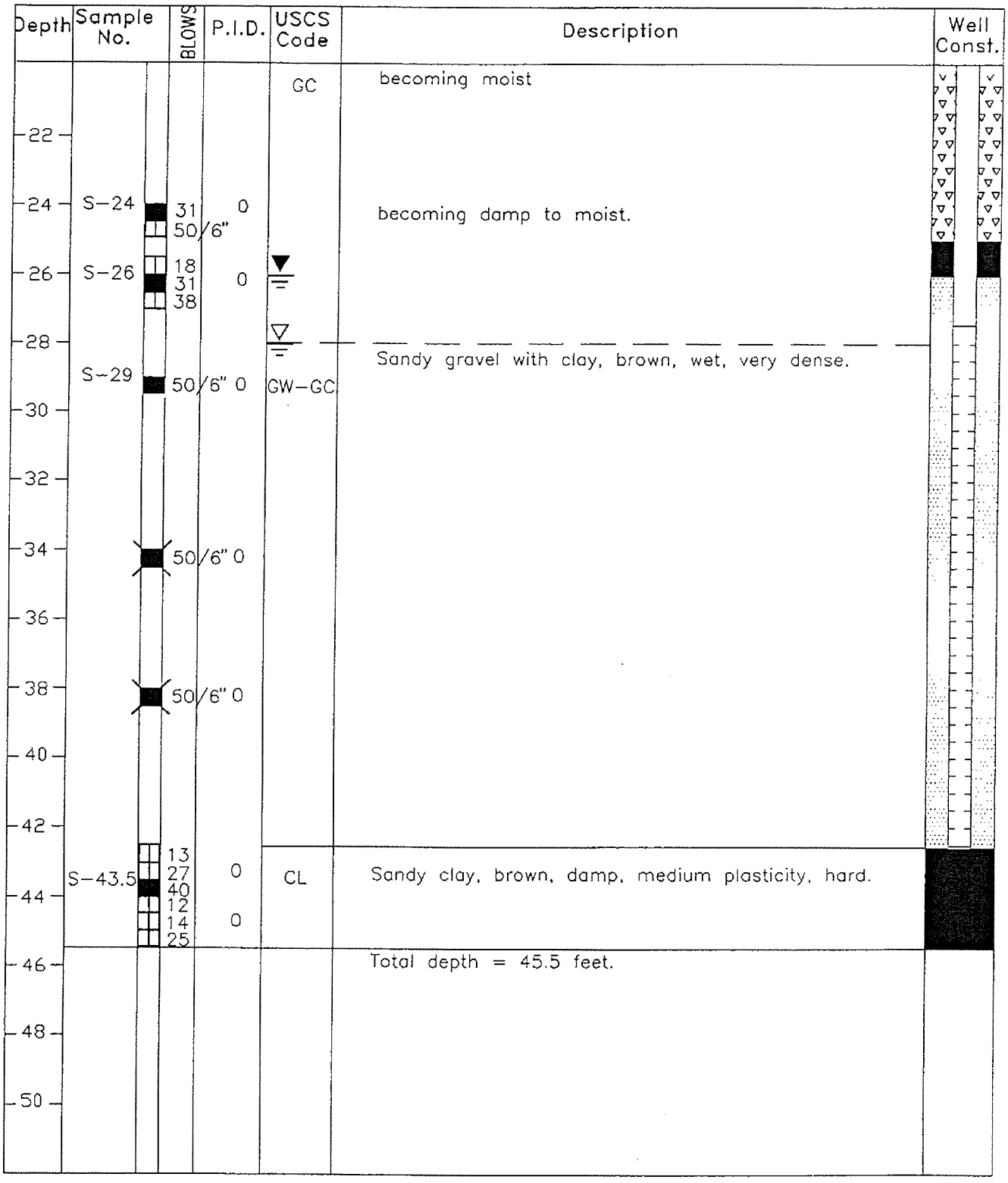
(Section continues downward)

RESNA
Working to Restore Nature

PROJECT: 60000.09

LOG OF BORING B-12/MW-8
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE
4



RESNA
Working to Restore Nature

PROJECT 60000.09

LOG OF BORING B-12/MW-8
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE
5

Depth of boring: 42 feet Diameter of boring: 8 inches Date drilled: 01/14/93

Well depth: 39 1/2 feet Material type: Sch 40 PVC Casing diameter: 2 inches

Screen interval: 29 1/2 to 39 1/2 feet Slot size: 0.020-inch

Drilling Company: Exploration GeoServices Driller: John and Mike

Method Used: Hollow-Stem Auger Field Geologist: Barbara Sieminski

Signature of Registered Professional:

Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0						
					Asphalt (4 inches).	
				GP	Sandy gravel, gray, damp, dense; baserock.	
				GW	Sandy gravel, brown, moist, dense; fine- to coarse-grained sand.	
2						
4	S-4.5	10 13 34	0			
6						
8						
10	S-9.5	34 50/3"	0		Very dense, gravel up to 3" diameter with cobbles	
12						
14	S-14.5	35 50/5"	0		with clay becoming very moist.	
16						
18					Trace water at 18.5'	
	S-19	50/6"	0			
20				GC	Clayey gravel with sand, brown, moist to wet, very dense.	

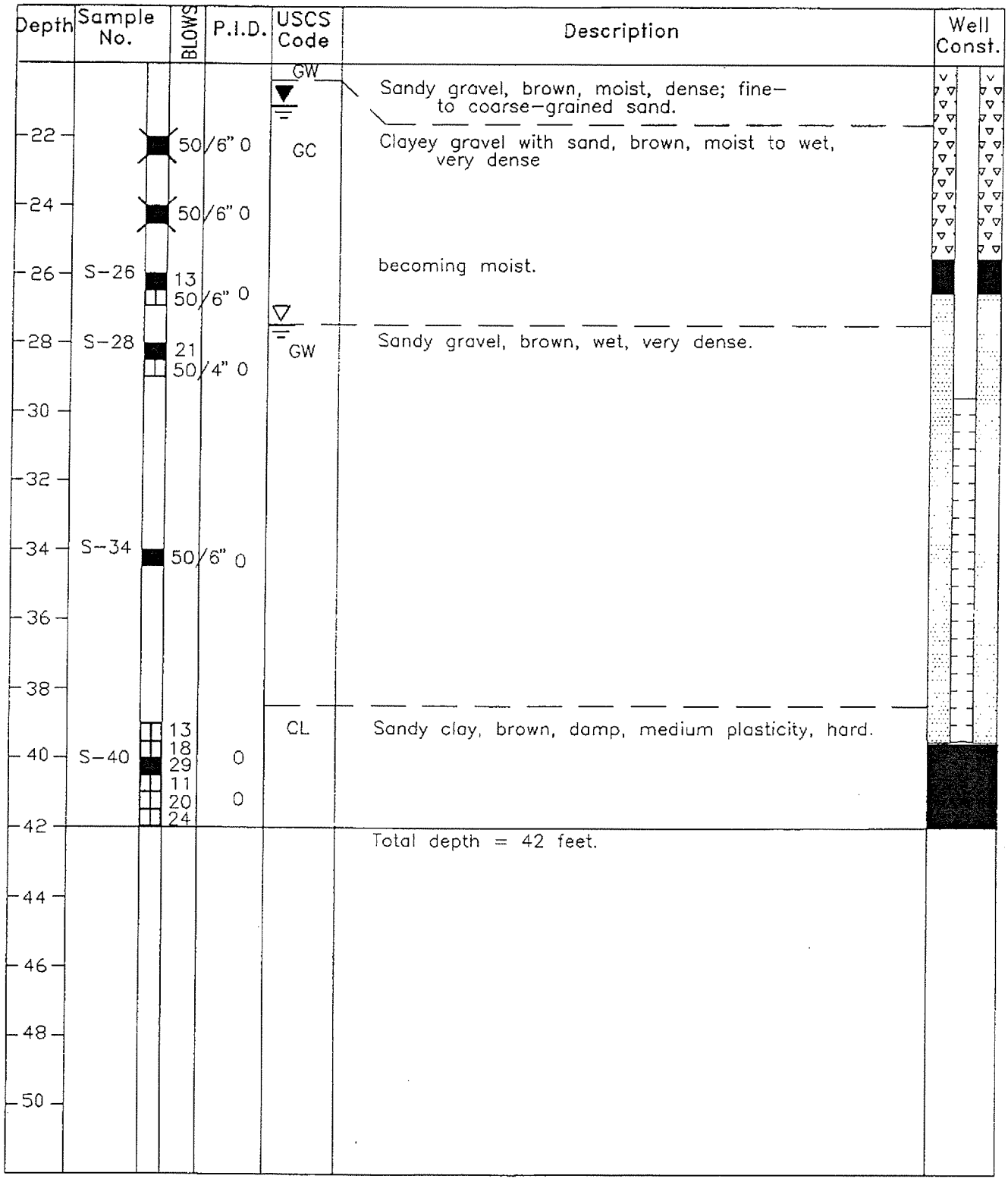
(Section continues downward)

RESNA
Working to Restore Nature

PROJECT: 60000.09

LOG OF BORING B-13/MW-9
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE
6



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PROJECT 60000.09

LOG OF BORING B-13/MW-9
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE
7

Depth of boring: 40 feet Diameter of boring: 8 inches Date drilled: 01/14/93

Well depth: 37 feet Material type: Sch 40 PVC Casing diameter: 2 inches

Screen interval: 29 to 37 feet Slot size: 0.020-inch

Drilling Company: Exploration GeoServices Driller: John and Mike

Method Used: Hollow-Stem Auger Field Geologist: Barbara Sieminski

Signature of Registered Professional:

Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (4 inches).	
				GP	Sandy gravel, gray, damp, dense; baserock.	
2				GW	Sandy gravel, brown, damp, very dense; fine- to coarse-grained sand; gravel up to 3" diameter; roots.	
4	S-4.5	26 28 50/5"	0			
6						
8						
10	S-9.5	28 50/2"	0			
12						
14	S-14.5	27 50/5"	0		With clay, becoming moist.	
16						
16	S-17	50/5"	0			
18					Trace water at 17.5'	
				GC	Clayey gravel with sand, brown, moist to wet, very dense.	
20	S-19	50/5"	0			

(Section continues downward)

RESNA
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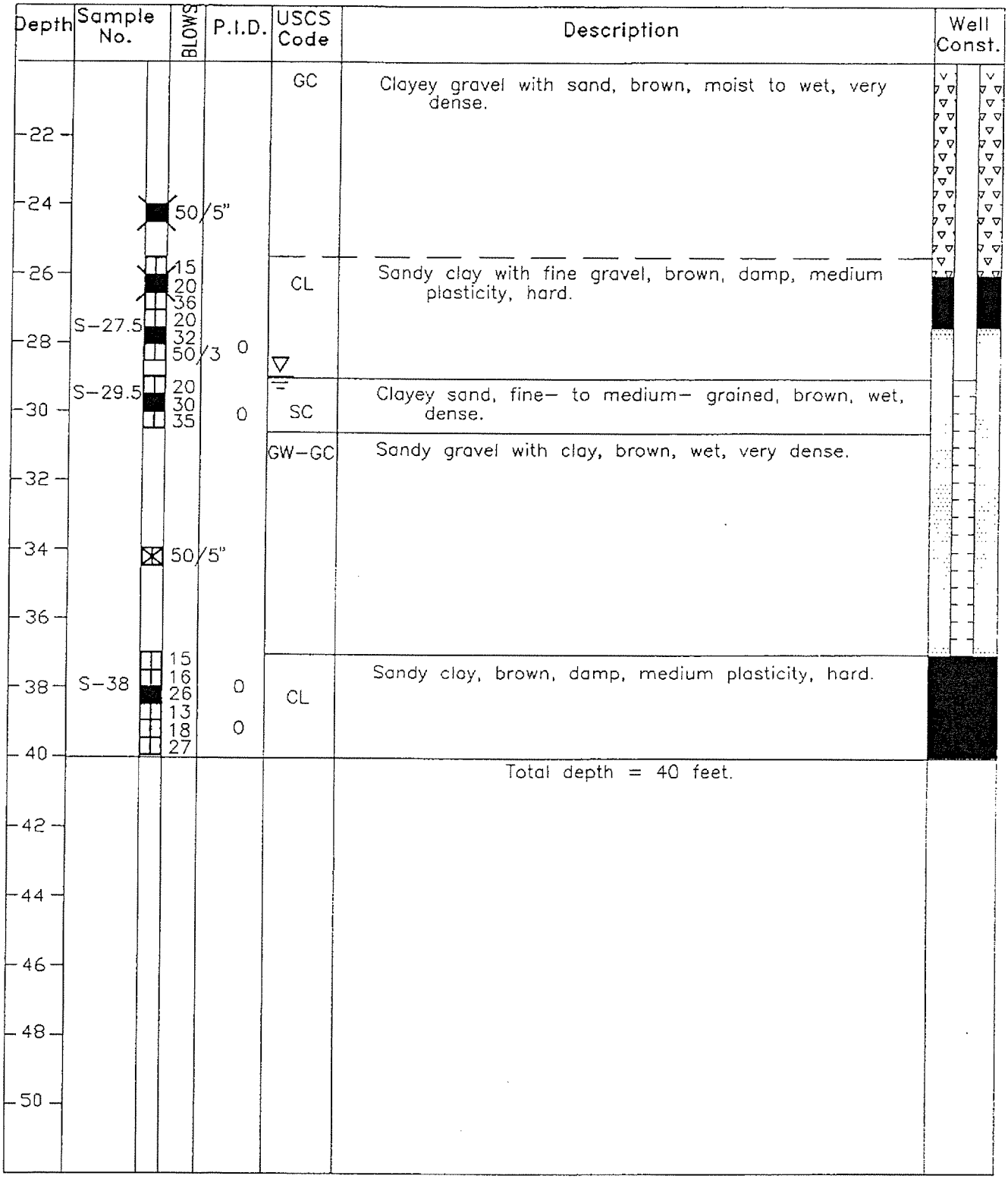
PROJECT: 60000.09

LOG OF BORING B-14/MW-10

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 8



RESNA
Working to Restore Nature

PROJECT 60000.09

LOG OF BORING B-14/MW-10
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE
9

Depth of boring: 43 feet Diameter of boring: 8 inches Date drilled: 04/09/92

Well depth: 39 feet Material type: Sch 40 PVC Casing diameter: 2 inches

Screen interval: 29 to 39 feet Slot size: 0.020-inch

Drilling Company: HEW Drilling Driller: Phil and Perfecto

Method Used: Hollow-Stem Auger Field Geologist: Barbara Sieminski

Signature of Registered Professional:

Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
					Asphalt-covered surface.	
0					Asphalt (4 inches).	
				GW	Sandy gravel, dark brown, damp, medium dense: fill.	
2				GW-GC	Sandy gravel with clay, brown, damp, dense; gravel up to 3" diameter.	
4						
6	S-5.5	17 17 39	0			
8						
10	S-10.5	24 34 50	0		Becoming moist, very dense.	
12						
14						
	S-15	50/6"	0		Increasing clay.	
16						
18						
20	S-20.5	30 38 40	0			

(Section continues downward)

RESNA
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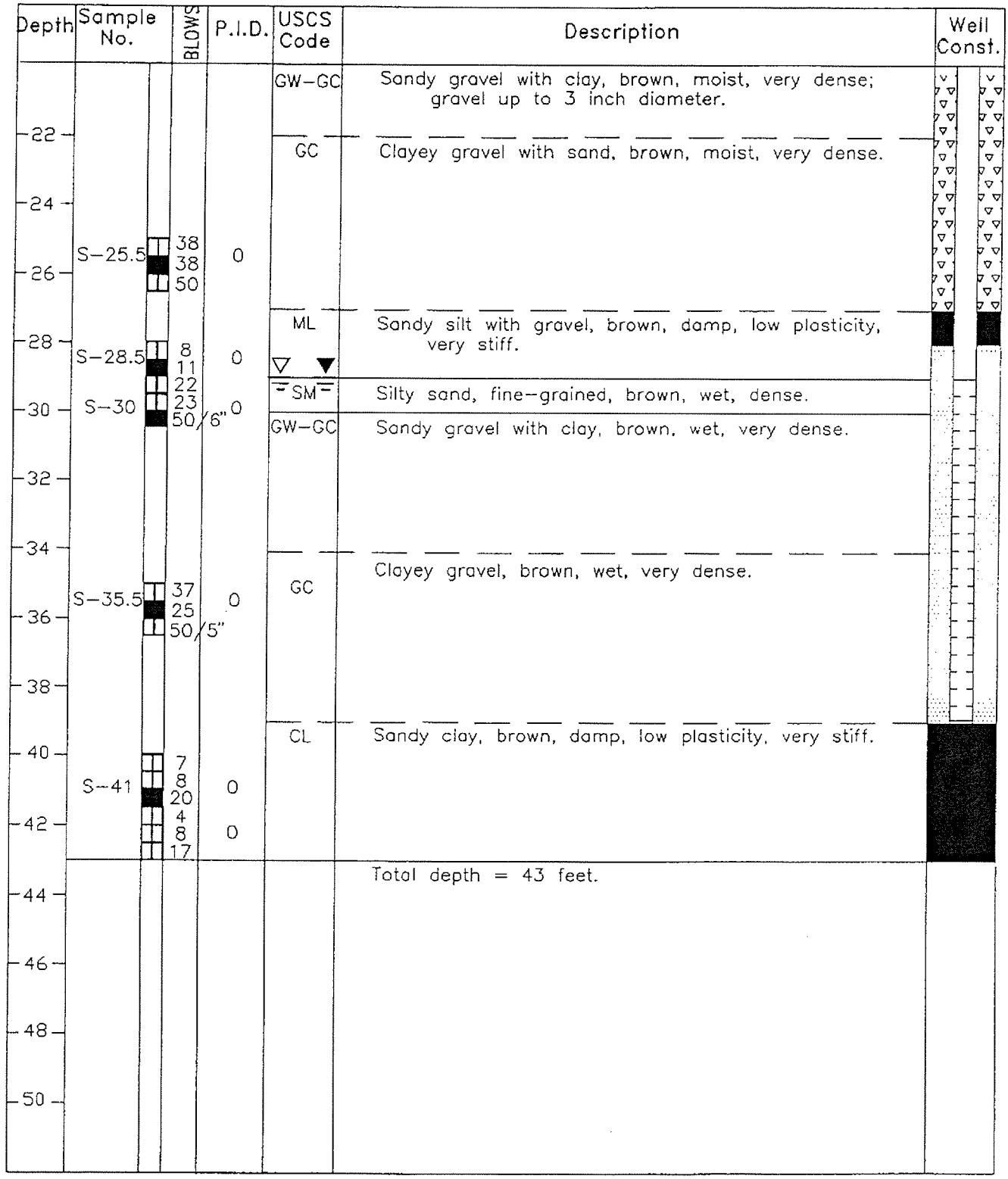
PROJECT: 60000.09

LOG OF BORING B-15/MW-11
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE
10



RESNA
Working to Restore Nature

PROJECT 60000.09

LOG OF BORING B-15/MW-11

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE
11

Depth of boring: 33–1/2 feet Diameter of boring: 12 inches Date drilled: 04/08/92

Well depth: 28–1/2 feet Material type: Sch 40 PVC Casing diameter: 4 inches

Screen interval: 18–1/2 to 28–1/2 feet Slot size: 0.100–inch

Drilling Company: HEW Drilling Driller: Phil and Perfecto

Method Used: Hollow–Stem Auger Field Geologist: Barbara Sieminski

Signature of Registered Professional:

Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
					Asphalt–covered surface.	
0					Asphalt (4 inches).	
					Sump.	
2						
				GW–GC	Sandy gravel with clay, brown, moist, medium dense.	
4						
6	S–6	9 10 17	0			
8						
10						
	S–11	24 30 26	0		Becoming damp to moist, very dense.	
12						
14						
					Increasing clay, becoming moist to wet.	
16	S–16	12 10 21	0			
				GC	Clayey gravel with sand, brown, moist, dense.	
18				GW	Sandy gravel, brown, moist, very dense; gravel up to 3" diameter.	
20						
	S–21	13 30 28	120		Product odor at 21 feet. Color change to gray at 21–1/2 feet.	

(Section continues downward)

RESNA
Working to Restore Nature

PROJECT: 60000.09

LOG OF BORING B–16/VW–1

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 12

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				GW	Sandy gravel, gray, moist, very dense; gravel up to 3" diameter. Product odor at 21 feet.	
24				GC	Clayey gravel with sand, brown, moist, very dense.	
26	S-26	11 25 27	320		Product odor at 26 feet.	
28				ML	Sandy silt with fine gravel, brown, damp, low plasticity, very stiff.	
30	S-29.5	7 11 16	58		Product odor at 30 feet.	
	S-31	11 13 15	33		Increasing sand, becoming moist.	
32	S-32.5	14 30 30	34▽			
				GW-GC	Sandy gravel with clay, brown, wet, very dense.	
34					Total depth = 33-1/2 feet.	
36						
38						
40						
42						
44						
46						
48						
50						

RESNA
Working to Restore Nature

PROJECT 60000.09

LOG OF BORING B-16/VW-1

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 13

Depth of boring: 45 feet Diameter of boring: 12 inches Date drilled: 04/08/92

Well depth: 40 1/2 feet Material type: Sch 80 PVC/Steel Casing diameter: 6 inches

Screen interval: 25 1/2 to 40 1/2 feet Slot size: 0.020-inch

Drilling Company: HEW Drilling Driller: Phil and Perfecto

Method Used: Hollow-Stem Auger Field Geologist: Barbara Sieminski

Signature of Registered Professional:

Registration No.: CEG 1463 State: CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
					Asphalt-covered surface.	
0					Asphalt (4 inches).	
				SP	Gravelly sand, gray, damp, medium dense: fill.	
2				GC	Clayey gravel with sand, dark brown, damp, medium dense.	
4						
6	S-6	6 8 8	0			
				GW-GC	Sandy gravel with clay, brown, damp, medium dense; gravel up to 3" diameter.	
8						
10						
	S-11	11 16 17	0		Becoming dense, damp to moist, with increasing clay.	
12						
14						
16		50/6"			Large cobble	
18						
20						
	S-21	38 31 30	105		Color change to gray, moist; product odor at 21 feet.	

(Section continues downward)

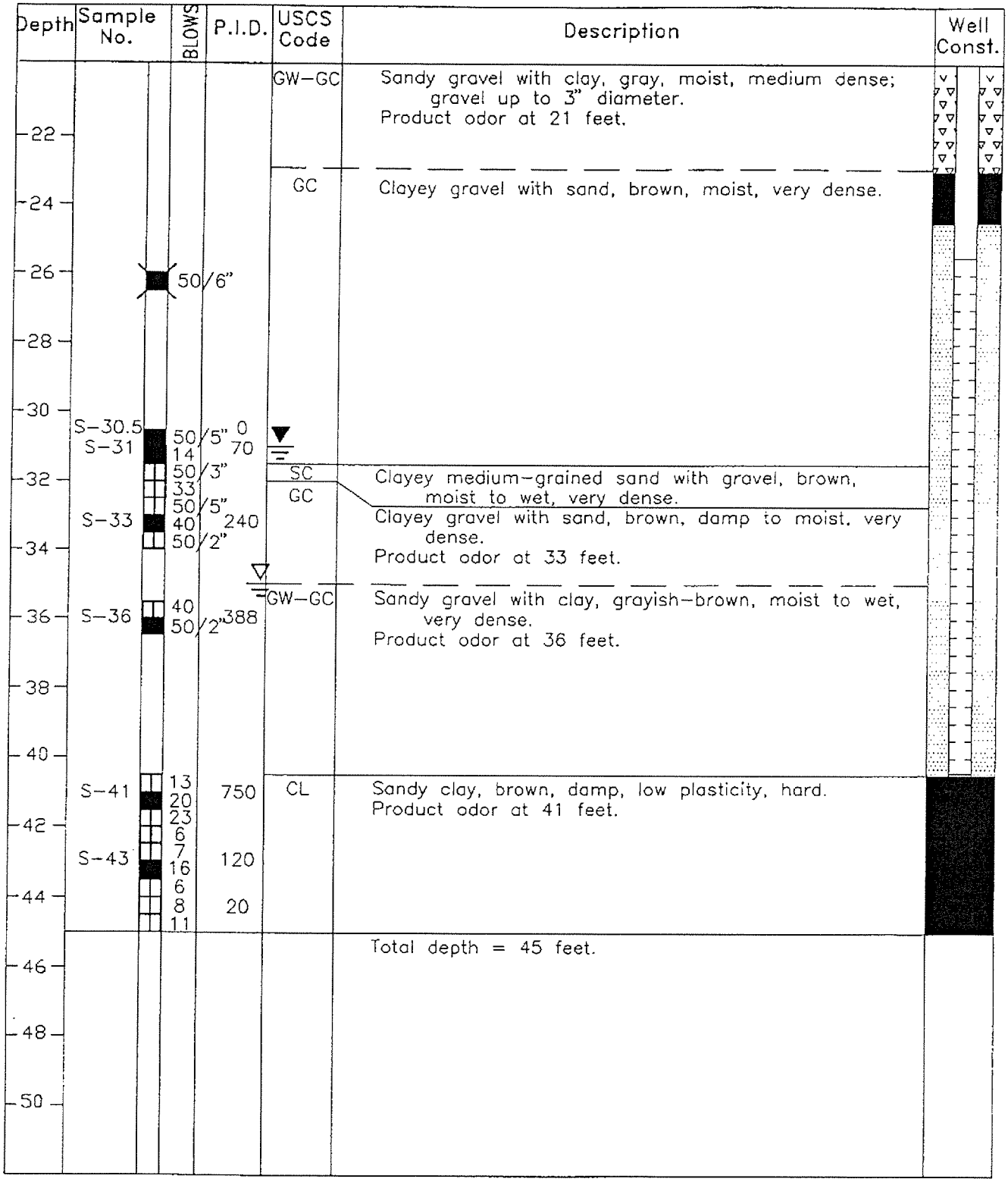
RESNA
Working to Restore Nature

PROJECT: 60000.09

LOG OF BORING B-17/RW-1

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 14



RESNA
Working to Restore Nature

PROJECT 60000.09

LOG OF BORING B-17/RW-1

ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 15

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL

LITHOLOGIC AND SOIL BORING LOG

PROJECT NAME: BP/ARCO 771 | SITE ADDRESS: 899 Rincon Ave., Livermore, CA

PROJECT NUMBER: 06-82-608 | LEGAL DESC: | APN:

LOGGED BY: Sam Barkley | FACILITY ID OR WAIVER: | NOI NUMBER:

DATE: 3/25/11 | START: 1245 | DRILLING COMPANY: RSI | DRILLER: Jorge Morales

WELL ID: SB-2 | STOP: 1335 | DRILLING METHOD: HSA | SAMPLE METHOD: Core Barrel

DEPTH (FEET)	Soil Boring	SAMPLE ID	PID	MOISTURE	COLOR	CONSISTENCY	GRAIN SIZE	CLASSIFICATION	ODORS
2–6	GROUT								
8				Dry	Lt. brown	Loose			
10		SB-2-10'	0.0 ppm	Slightly moist					None
14		SB-2-15'	0.0 ppm						None
16–18							Gravelly sand with silt - 35% gravel, 45% sand and 20% fines; sub-rounded gravel up to 3 inches.	GM	
20		SB-2-20'	0.0 ppm						None
22				Moist					
24		SB-2-25'	0.0 ppm						None
28				Moist	Lt. brown	Soft	Silty clay about 3 inches thick	CL	
30		SB-2-30'	0.0 ppm		Lt. brown	Loose	Gravelly sand with silt - 35% gravel, 45% sand and 20% fines; sub-rounded gravel up to 3 inches.	GM	
34		SB-2-33'	0.0 ppm	Wet			Gravelly sand with silt - 10% gravel, 60% sand and 30% fines; gravel up to $\frac{1}{2}$ inch.		
36–40									

TOTAL BORING DEPTH: 35.0' | PAGE NO: 1 OF 1 | ESTIMATED GROUNDWATER DEPTH: 33'

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL

LITHOLOGIC AND SOIL BORING LOG

PROJECT NAME: BP/ARCO 771 | SITE ADDRESS: 899 Rincon Ave., Livermore, CA

PROJECT NUMBER: 06-82-608 | LEGAL DESC: | APN:

LOGGED BY: Sam Barkley | FACILITY ID OR WAIVER: | NOI NUMBER:

DATE: 3/25/11 | START: 0930 | DRILLING COMPANY: RSI | DRILLER: Jorge Morales

WELL ID: SB-3 | STOP: 1035 | DRILLING METHOD: HSA | SAMPLE METHOD: Core Barrel

DEPTH (FEET)	Soil Boring	SAMPLE ID	PID	MOISTURE	COLOR	CONSISTENCY	GRAIN SIZE / CLASSIFICATION	CLASS	ODORS
2–6	GROUT								
8				Dry	Lt. brown	Loose	Gravelly sand with silt - 35% gravel, 40% sand and 25% fines; sub-rounded gravel up to 3 inches.		
10		SB-3-10'	0.0 ppm						None
12–14				Slightly moist					
14		SB-3-15'	0.0 ppm						None
16–18									
20		SB-3-20'	0.0 ppm				Gravelly sand with silt - 35% gravel, 35% sand and 30% fines; gravel up to 3 inches.	GM	None
22–24				Moist					
24		SB-3-25'	0.0 ppm						None
26–28									
30		SB-3-30'	0.0 ppm						None
32				Wet					
34			0.0 ppm						None
36–40									

TOTAL BORING DEPTH: 35.0' | PAGE NO: 1 OF 1 | ESTIMATED GROUNDWATER DEPTH: 31'

APPENDIX D

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

LOCATION OF PROJECT BP Station #771
899 Rincon Ave., Livermore, CA

Coordinates Source _____ ft. Accuracy∀ _____ ft.
LAT: _____ ft. LONG: _____ ft.
APN 99-351-5

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

APPLICANT
Name Jason Ovda - Broadbent & Associates
Email jovda@broadbentinc.com Fax (530) 566-1401
Address 1370 Ridgewood Dr., Ste. 5 Phone (530) 566-1400
City Chico Zip 95973

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 __ Other CPT X

DRILLING COMPANY Gregg Drilling
DRILLER'S LICENSE NO. _____

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

SOIL BORINGS:
Number of Borings 4
Hole Diameter 1.75 in. Maximum Depth 60 ft.

ESTIMATED STARTING DATE 10-22-13
ESTIMATED COMPLETION DATE 10-23-13

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

APPLICANT'S SIGNATURE _____ Date 10-4-13

ATTACH SITE PLAN OR SKETCH

FOR OFFICE USE

PERMIT NUMBER 2013125
WELL NUMBER _____
APN 98-0351-005-00

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.

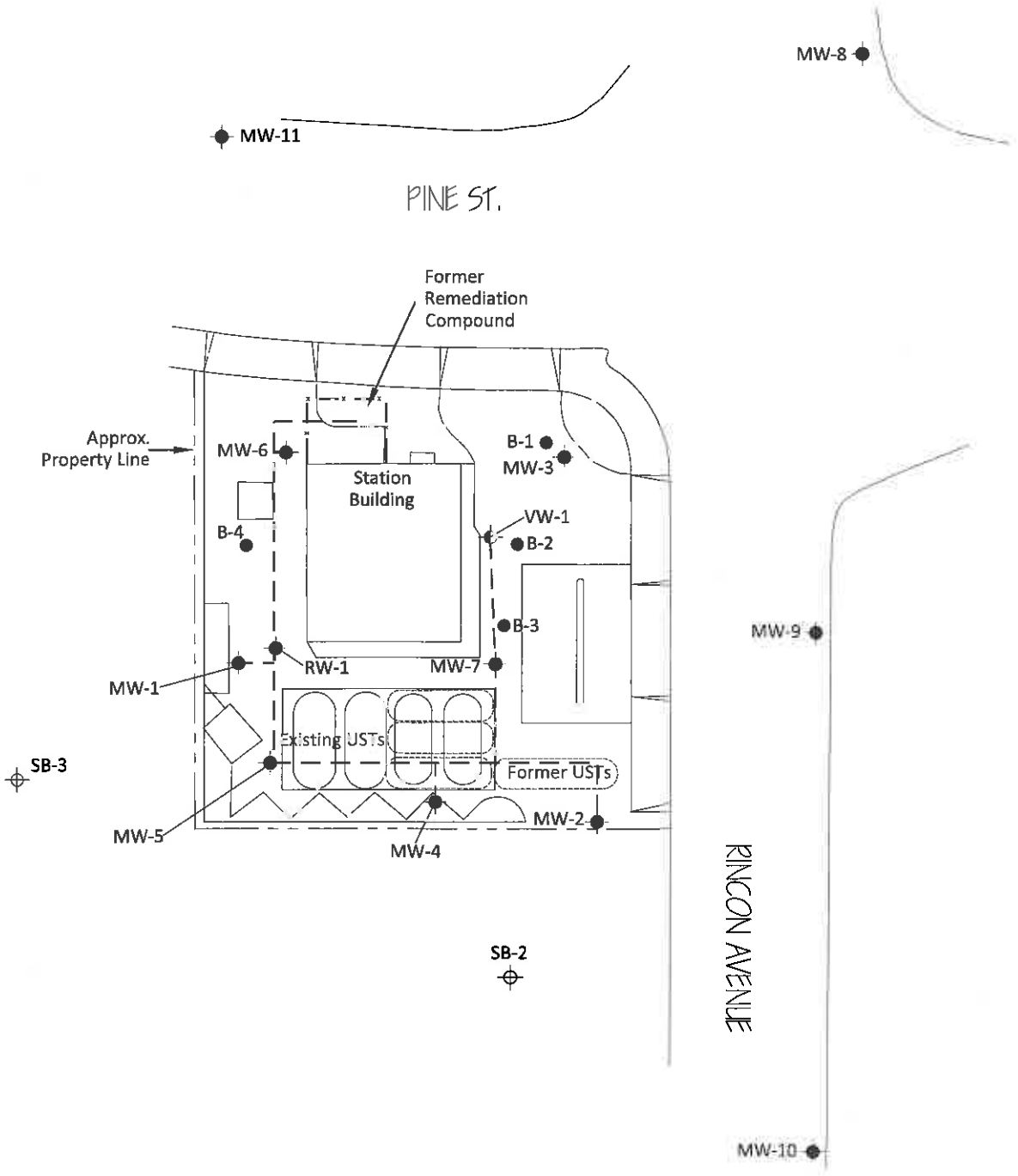
E. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

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 10/7/13
Wyman Hong

Revised: January 4, 2010



LEGEND

- Monitoring Well Location
- Vapor Extraction Well Location
- Proposed CPT Boring Locations
- Soil Boring Locations
- Remediation Piping

NOTE: SITE MAP ADAPTED FROM URS FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

N

0 40 80

SCALE (ft)

BROADBENT 1370 Ridgewood Dr., Suite 5 Chico, California 95973 Project No.: 06-82-608 Date: 5/17/2013	Station #771 899 Rincon Avenue Livermore, California	Site Map with Current Monitoring Well and Proposed CPT Boring Locations	Drawing 2

APPENDIX E

CPT DATA PACKAGE AND FIELD NOTES

October 24, 2013

Broadbent
Attn: Jason Duda

Subject: CPT Site Investigation
Arco #771
Livermore, California
GREGG Project Number: 13-175MA

Dear Mr. Duda:

The following report presents the results of GREGG Drilling & Testing's Cone Penetration Test investigation for the above referenced site. The following testing services were performed:

1	Cone Penetration Tests	(CPTU)	☒
2	Pore Pressure Dissipation Tests	(PPD)	☒
3	Seismic Cone Penetration Tests	(SCPTU)	☐
4	UVOST Laser Induced Fluorescence	(UVOST)	☐
5	Groundwater Sampling	(GWS)	☒
6	Soil Sampling	(SS)	☒
7	Vapor Sampling	(VS)	☐
8	Pressuremeter Testing	(PMT)	☐
9	Vane Shear Testing	(VST)	☐
10	Dilatometer Testing	(DMT)	☐

A list of reference papers providing additional background on the specific tests conducted is provided in the bibliography following the text of the report. If you would like a copy of any of these publications or should you have any questions or comments regarding the contents of this report, please do not hesitate to contact our office at (925) 313-5800.

Sincerely,
GREGG Drilling & Testing, Inc.

Mary Walden
Operations Manager

Cone Penetration Test Sounding Summary

-Table 1-

CPT Sounding Identification	Date	Termination Depth (feet)	Depth of Groundwater Samples (feet)	Depth of Soil Samples (feet)	Depth of Pore Pressure Dissipation Tests (feet)
CPT-01	10/22/13	50	42	30	42.2
CPT-02	10/22/13	60	28NR, 40NR, 58	28	-
CPT-03	10/23/13	55	43NR	30	-

Bibliography

Lunne, T., Robertson, P.K. and Powell, J.J.M., "Cone Penetration Testing in Geotechnical Practice" E & FN Spon. ISBN 0 419 23750, 1997

Roberston, P.K., "Soil Classification using the Cone Penetration Test", Canadian Geotechnical Journal, Vol. 27, 1990 pp. 151-158.

Mayne, P.W., "NHI (2002) Manual on Subsurface Investigations: Geotechnical Site Characterization", available through www.ce.gatech.edu/~geosys/Faculty/Mayne/papers/index.html, Section 5.3, pp. 107-112.

Robertson, P.K., R.G. Campanella, D. Gillespie and A. Rice, "Seismic CPT to Measure In-Situ Shear Wave Velocity", Journal of Geotechnical Engineering ASCE, Vol. 112, No. 8, 1986 pp. 791-803.

Robertson, P.K., Sully, J., Woeller, D.J., Lunne, T., Powell, J.J.M., and Gillespie, D.J., "Guidelines for Estimating Consolidation Parameters in Soils from Piezocone Tests", Canadian Geotechnical Journal, Vol. 29, No. 4, August 1992, pp. 539-550.

Robertson, P.K., T. Lunne and J.J.M. Powell, "Geo-Environmental Application of Penetration Testing", Geotechnical Site Characterization, Robertson & Mayne (editors), 1998 Balkema, Rotterdam, ISBN 90 5410 939 4 pp 35-47.

Campanella, R.G. and I. Weemees, "Development and Use of An Electrical Resistivity Cone for Groundwater Contamination Studies", Canadian Geotechnical Journal, Vol. 27 No. 5, 1990 pp. 557-567.

DeGroot, D.J. and A.J. Lutenegger, "Reliability of Soil Gas Sampling and Characterization Techniques", International Site Characterization Conference - Atlanta, 1998.

Woeller, D.J., P.K. Robertson, T.J. Boyd and Dave Thomas, "Detection of Polyaromatic Hydrocarbon Contaminants Using the UVIF-CPT", 53rd Canadian Geotechnical Conference Montreal, QC October pp. 733-739, 2000.

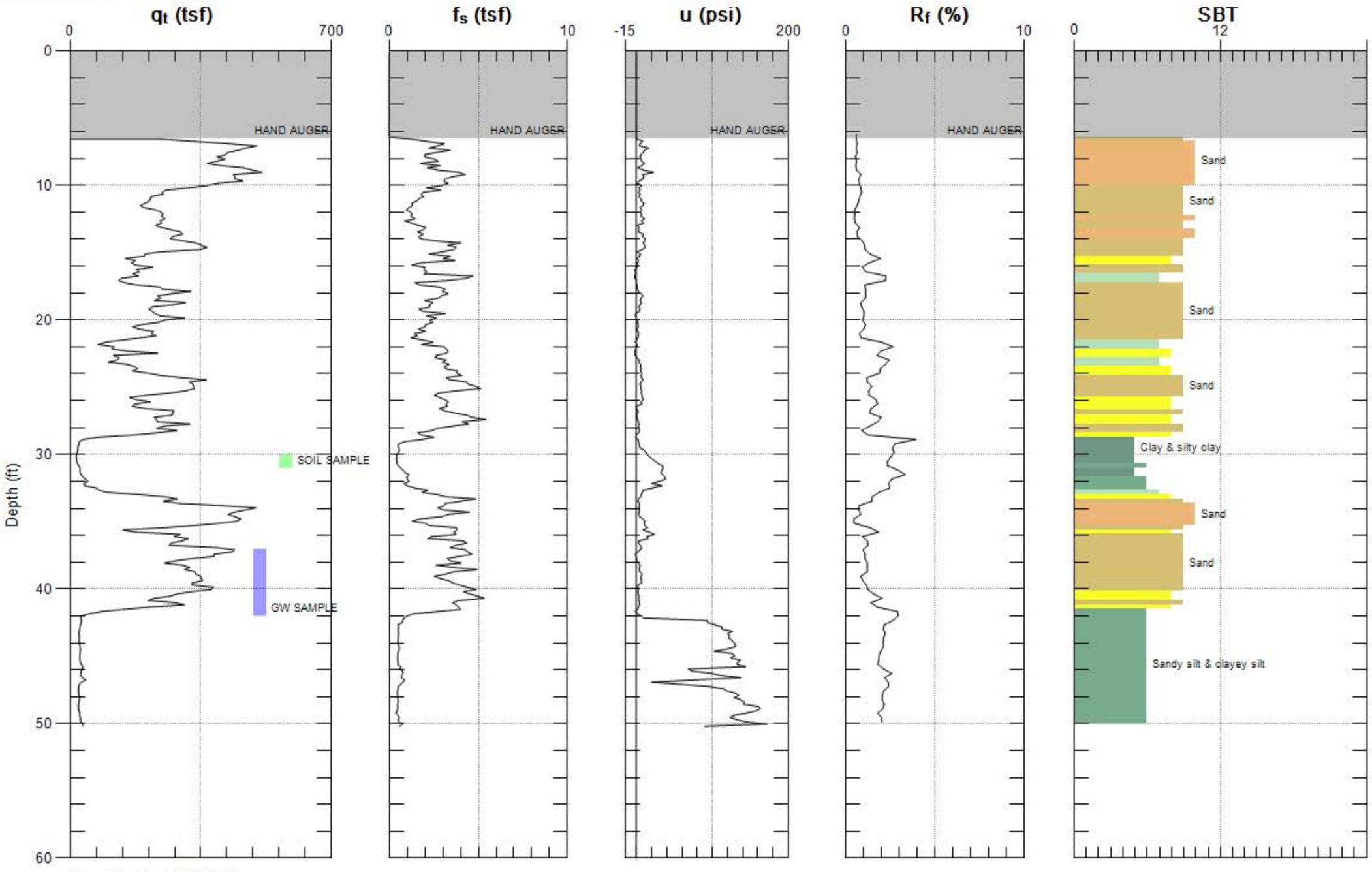
Zemo, D.A., T.A. Delfino, J.D. Gallinatti, V.A. Baker and L.R. Hilpert, "Field Comparison of Analytical Results from Discrete-Depth Groundwater Samplers" BAT EnviroProbe and QED HydroPunch, Sixth national Outdoor Action Conference, Las Vegas, Nevada Proceedings, 1992, pp 299-312.

Copies of ASTM Standards are available through www.astm.org

BROADBENT

Site: ARCO #771
Sounding: CPT-01

Engineer: K.TIDWELL
Date: 10/22/2013 02:46



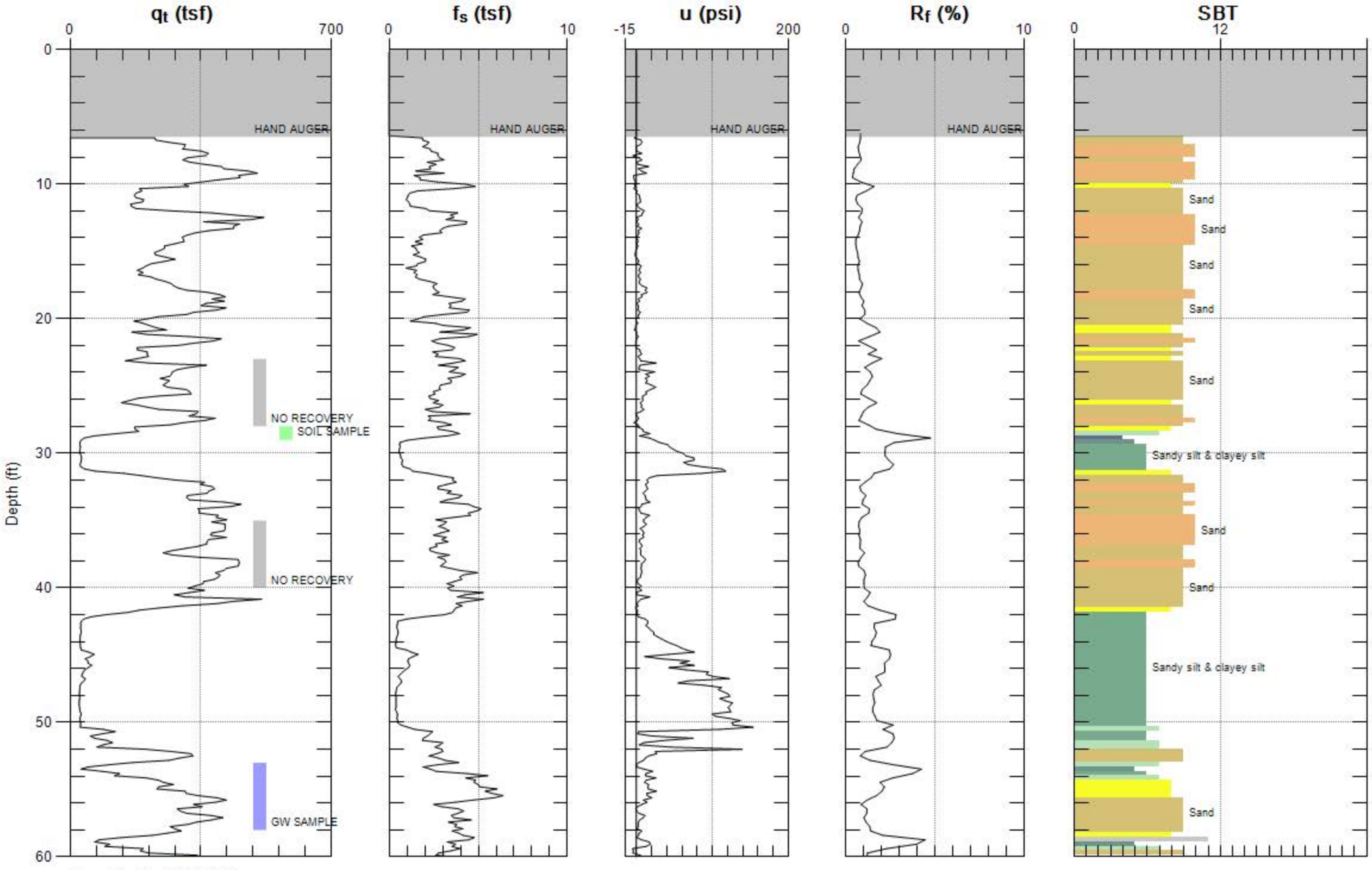
Max. Depth: 50.197 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

BROADBENT

Site: ARCO #771
Sounding: CPT-02

Engineer: K.TIDWELL
Date: 10/22/2013 09:01



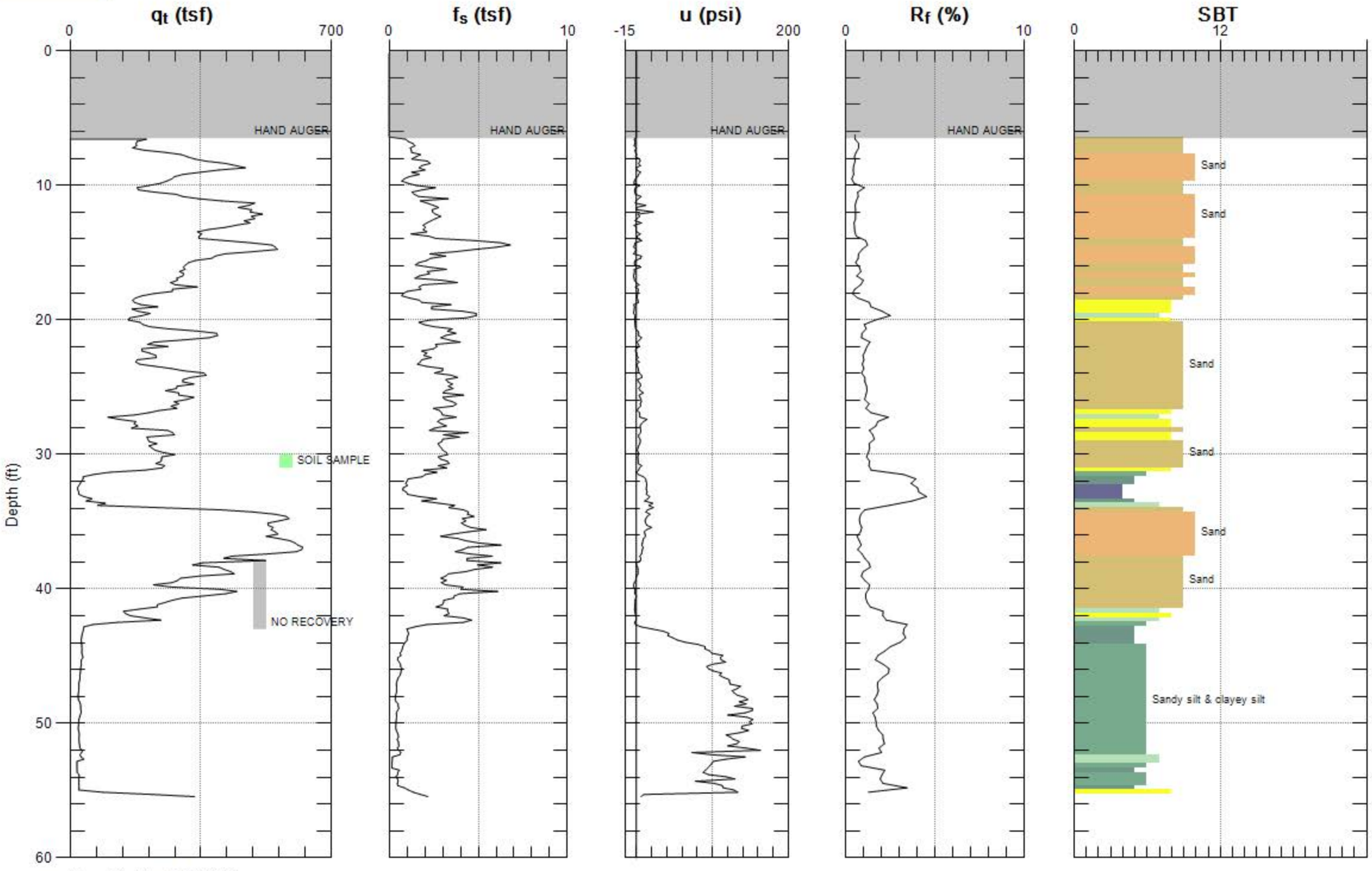
Max. Depth: 60.203 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

BROADBENT

Site: ARCO #771
Sounding: CPT-03

Engineer: K.TIDWELL
Date: 10/23/2013 07:22



Max. Depth: 55.446 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

BROADBENT

DAILY REPORT

Page ____ of ____

Project: BP 771 Project No.: 06-82-6058

Field Representative(s): JR Day: ~~Tuesday~~ Monday Date: 10/14/13

Time Onsite: From: _____ To: _____; From: _____ To: _____; From: _____ To: _____

x Signed HASP x Safety Glasses x Hard Hat x Steel Toe Boots x Safety Vest

x UST Emergency System Shut-off Switches Located x Proper Gloves

x Proper Level of Barricading ___ Other PPE (describe) _____

Weather: sunny; ≈75°F

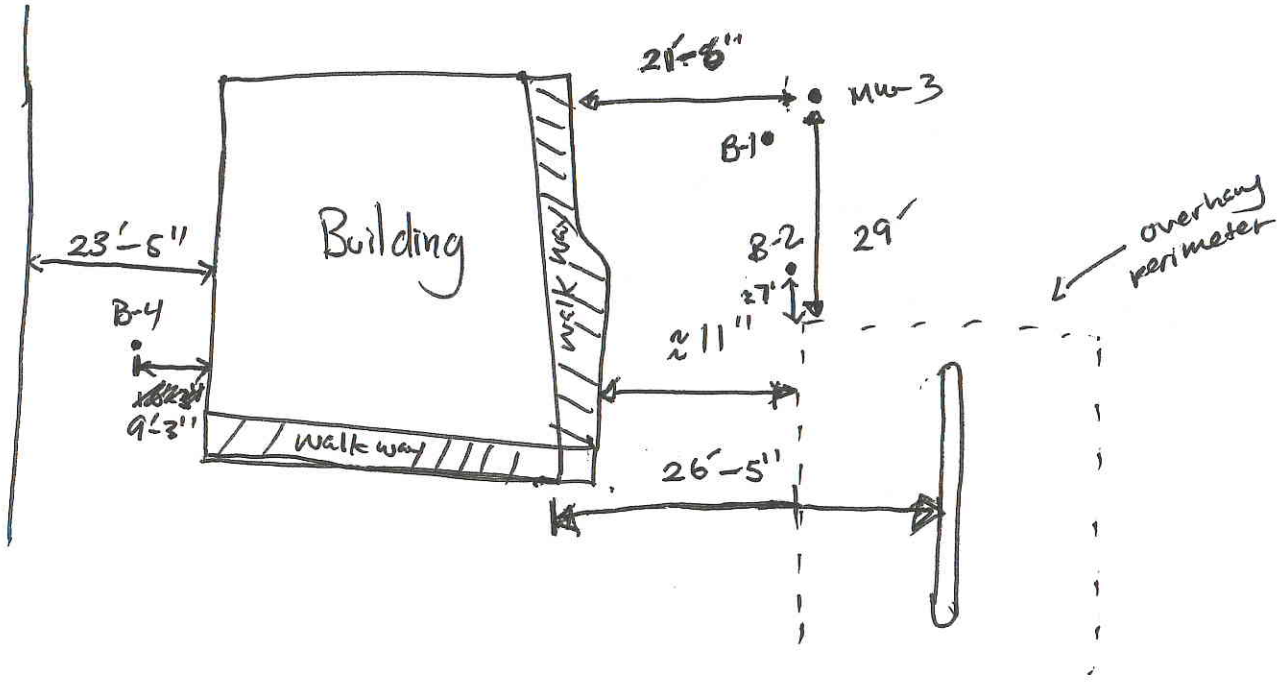
Equipment In Use: _____

Visitors: Kristene Tidwell

TIME:	WORK DESCRIPTION:
0930	Arrived on-site; Nurcal arrives on-site; proceeded w/safety meeting & paperwork
1000	Completed ~~safety~~ safety meeting
1010	Setup on B-4; B-2 setup at 1145
1230	Kristene Tidwell arrives on-site; proceeded w/safety meeting
1245	Setup on B-3 & B-3 alt & B-2
1515	~~Ops~~ Proceeded to ~~detail~~ sketching utilities located
1600	Signed out & left site

Signature: _____

BP 771 Notes



height of canopy: 11'-6"

Roof of building extends out ± 2'-5"

height of roof: 11'-6"

BROADBENT

DAILY REPORT

Page ____ of ____

Project: BP 771 Project No.: 06-82-608

Field Representative(s): JR/LD Day: Friday Date: 10/10/13

Time Onsite: From: 0700 To: 1630 ; From: ____ To: ____ ; From: ____ To: ____

- X Signed HASP
- X Safety Glasses
- X Hard Hat
- X Steel Toe Boots
- X Safety Vest
- X UST Emergency System Shut-off Switches Located
- X Proper Gloves
- X Proper Level of Barricading
- X Other PPE (describe) Sun block

Weather: sunny; 79°F

Equipment In Use: ____

Visitors: ____

TIME:	WORK DESCRIPTION:
0700	Arrived onsite; Gregg Drilling Arrives onsite; proceeded
	w/ tail gate meeting & paperwork
0820	Completed tail gate meeting; proceeded to check boreholes
	& determine setup for each hole
0845	Setup on Borehole-4
1030	Finished first borehole at B-4; moving to Borehole 2 due to delivery truck expected
1035	Setup at Borehole 2 location
1115	Delivery truck arrive: stop work & take lunch
1145	Resume work/delivery truck leaves
1255	Finish B-2; back-filling
1315	Gregg Drilling Focus break
1320	Setup on B-1
1455	Finished B-1; setup on B-4 2nd hole
1600	Finished air knifing & back Filling; proceeded to clean
	up & pack
1630	signed out & left site

Signature: ____

Revision: 1/24/2012

BROADBENT

DAILY REPORT

Page 1 of 1

Project: BP 771 Project No.: 06-82608

Field Representative(s): KT + LB Day: Wednesday Date: 10/23/13

Time Onsite: From: 0645 To: 1300; From: _____ To: _____; From: _____ To: _____

✓ Signed HASP ✓ Safety Glasses ✓ Hard Hat ✓ Steel Toe Boots ✓ Safety Vest

✓ UST Emergency System Shut-off Switches Located ✓ Proper Gloves

✓ Proper Level of Barricading N/A Other PPE (describe) _____

Weather: foggy cool am; ~

Equipment In Use: Gregg Drillers - CPT + support truck.

Visitors: _____

TIME:	WORK DESCRIPTION:
0645	Arrived on site
0655	Begin safety meeting.
0730	Finished meeting & signed in.
0745	Setup @ B-3.
0935	Finished CPT @ B-3 start pushing for samples (@ 1000)
	Soil taken @ 31.5' @ 1010. No evidence of impact.
1045	Sample B-3 H_2O @ 1045
1100	Attempt to sample B-3 H_2O -> DRY!
	Begin set-up to grout.
1245	Finish grouting & close permit
1300	Off-site.

Signature: _____

BROADBENT

DAILY REPORT

Page 1 of 1

Project: 06-82-608 / BP/ARCO 771 Project No.: _____

Field Representative(s): LDB + KT Day: Tuesday Date: 10/22/13

Time Onsite: From: 0715 To: 1830; From: _____ To: _____; From: _____ To: _____

✓ Signed HASP ✓ Safety Glasses ✓ Hard Hat ✓ Steel Toe Boots ✓ Safety Vest

✓ UST Emergency System Shut-off Switches Located ✓ Proper Gloves

✓ Proper Level of Barricading N/A Other PPE (describe) _____

Weather: Clear + Cool to warm to hot

Equipment In Use: CPT + Chase truck, hand tools (all w/ Gregg)

Visitors: Gregg.

TIME:	WORK DESCRIPTION:
0715	Arrival on-site
	Gregg Drilless already here.
	Begin Safety meeting
0930	Finish Safety meeting, move onto site.
0915	Begin pushing @ B-2
1015	Finish soil characterization B-2. - Call inspector.
	Push for grout
1100	Grout inspector on site / off-site - Ok!
1140-1155	Wait for GW → B-2 28' → DRY ; Collect soil @ 28.5' 1215
1235	Water @ 35-40' - Wait 6 mm no water.
1245	Return from lunch.
	Called Duda → no H_2O go to step + collect H_2O @ step.
	LEL acting wierd when restarted → new one from Enviro Tech.
	@ 1400
1445	Set up @ B-1 soil @ 1645 → PPL 60% clay, 10% sand 30% silt → slightly moist.

NOTE: Fresh air cal. on LEL @ 1000. reading 0% now.

NOTE: 1045 H_2O Heater. back fine w/ pop.

Signature: _____

APPENDIX F

LABORATORY ANALYTICAL REPORT

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

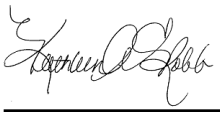
ANALYTICAL REPORT

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

TestAmerica Job ID: 440-60786-1
Client Project/Site: ARCO 0771, Livermore

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

Attn: Mr. Jason Duda



Authorized for release by:
11/6/2013 2:59:03 PM

Kathleen Robb, Project Manager II
(949)261-1022
kathleen.robb@testamericainc.com

Table of Contents

Sample Summary

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 0771, Livermore

TestAmerica Job ID: 440-60786-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
440-60786-1	B-1@30.5	Solid	10/22/13 16:45	10/25/13 10:10
440-60786-2	B-2@28.5	Solid	10/22/13 12:15	10/25/13 10:10
440-60786-3	B-3@31.5	Solid	10/23/13 10:10	10/25/13 10:10
440-60786-4	B-1@40'	Water	10/23/13 10:40	10/25/13 10:10
440-60786-5	B-2@58'	Water	10/23/13 13:25	10/25/13 10:10

Job ID: 440-60786-1

Laboratory: TestAmerica Irvine

Narrative

Job Narrative
440-60786-1

Comments
No additional comments.

Receipt
The samples were received on 10/25/2013 10:10 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.5º C.

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

VOA Prep
No analytical or quality issues were noted.

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 0771, Livermore

TestAmerica Job ID: 440-60786-1

Client Sample ID: B-1@30.5
Date Collected: 10/22/13 16:45
Date Received: 10/25/13 10:10

Lab Sample ID: 440-60786-1
Matrix: Solid

Method: 8260B/CA_LUFTMS - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Volatile Fuel Hydrocarbons (C4-C12)	ND		99		ug/Kg			10/30/13 13:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane (Surr)	*94*		*60 - 120*		*10/30/13 13:43*	*1*
4-Bromofluorobenzene (Surr)	*97*		*79 - 120*		*10/30/13 13:43*	*1*
Toluene-d8 (Surr)	*105*		*79 - 123*		*10/30/13 13:43*	*1*

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

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.99		ug/Kg			10/30/13 13:43	1
Isopropyl Ether (DIPE)	ND		2.0		ug/Kg			10/30/13 13:43	1
Ethyl-t-butyl ether (ETBE)	ND		2.0		ug/Kg			10/30/13 13:43	1
Ethylbenzene	ND		0.99		ug/Kg			10/30/13 13:43	1
m,p-Xylene	ND		2.0		ug/Kg			10/30/13 13:43	1
Methyl-t-Butyl Ether (MTBE)	ND		2.0		ug/Kg			10/30/13 13:43	1
o-Xylene	ND		0.99		ug/Kg			10/30/13 13:43	1
Tert-amyl-methyl ether (TAME)	ND		2.0		ug/Kg			10/30/13 13:43	1
tert-Butyl alcohol (TBA)	ND		50		ug/Kg			10/30/13 13:43	1
Toluene	ND		0.99		ug/Kg			10/30/13 13:43	1
Xylenes, Total	ND		2.0		ug/Kg			10/30/13 13:43	1
Naphthalene	ND		2.0		ug/Kg			10/30/13 13:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*79 - 120*		*10/30/13 13:43*	*1*
Dibromofluoromethane (Surr)	*94*		*60 - 120*		*10/30/13 13:43*	*1*
Toluene-d8 (Surr)	*105*		*79 - 123*		*10/30/13 13:43*	*1*

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 0771, Livermore

TestAmerica Job ID: 440-60786-1

Client Sample ID: B-2@28.5
Date Collected: 10/22/13 12:15
Date Received: 10/25/13 10:10

Lab Sample ID: 440-60786-2
Matrix: Solid

Method: 8260B/CA_LUFTMS - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Volatile Fuel Hydrocarbons (C4-C12)	ND		99		ug/Kg			10/30/13 14:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane (Surr)	*107*		*60 - 120*		*10/30/13 14:13*	*1*
4-Bromofluorobenzene (Surr)	*97*		*79 - 120*		*10/30/13 14:13*	*1*
Toluene-d8 (Surr)	*103*		*79 - 123*		*10/30/13 14:13*	*1*

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

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.99		ug/Kg			10/30/13 14:13	1
Isopropyl Ether (DIPE)	ND		2.0		ug/Kg			10/30/13 14:13	1
Ethyl-t-butyl ether (ETBE)	ND		2.0		ug/Kg			10/30/13 14:13	1
Ethylbenzene	ND		0.99		ug/Kg			10/30/13 14:13	1
m,p-Xylene	ND		2.0		ug/Kg			10/30/13 14:13	1
Methyl-t-Butyl Ether (MTBE)	ND		2.0		ug/Kg			10/30/13 14:13	1
o-Xylene	ND		0.99		ug/Kg			10/30/13 14:13	1
Tert-amyl-methyl ether (TAME)	ND		2.0		ug/Kg			10/30/13 14:13	1
tert-Butyl alcohol (TBA)	ND		50		ug/Kg			10/30/13 14:13	1
Toluene	ND		0.99		ug/Kg			10/30/13 14:13	1
Xylenes, Total	ND		2.0		ug/Kg			10/30/13 14:13	1
Naphthalene	ND		2.0		ug/Kg			10/30/13 14:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*79 - 120*		*10/30/13 14:13*	*1*
Dibromofluoromethane (Surr)	*107*		*60 - 120*		*10/30/13 14:13*	*1*
Toluene-d8 (Surr)	*103*		*79 - 123*		*10/30/13 14:13*	*1*

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 0771, Livermore

TestAmerica Job ID: 440-60786-1

Client Sample ID: B-3@31.5
Date Collected: 10/23/13 10:10
Date Received: 10/25/13 10:10

Lab Sample ID: 440-60786-3
Matrix: Solid

Method: 8260B/CA_LUFTMS - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Volatile Fuel Hydrocarbons (C4-C12)	ND		99		ug/Kg			10/30/13 14:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane (Surr)	*104*		*60 - 120*		*10/30/13 14:44*	*1*
4-Bromofluorobenzene (Surr)	*93*		*79 - 120*		*10/30/13 14:44*	*1*
Toluene-d8 (Surr)	*103*		*79 - 123*		*10/30/13 14:44*	*1*

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

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.99		ug/Kg			10/30/13 14:44	1
Isopropyl Ether (DIPE)	ND		2.0		ug/Kg			10/30/13 14:44	1
Ethyl-t-butyl ether (ETBE)	ND		2.0		ug/Kg			10/30/13 14:44	1
Ethylbenzene	ND		0.99		ug/Kg			10/30/13 14:44	1
m,p-Xylene	ND		2.0		ug/Kg			10/30/13 14:44	1
Methyl-t-Butyl Ether (MTBE)	ND		2.0		ug/Kg			10/30/13 14:44	1
o-Xylene	ND		0.99		ug/Kg			10/30/13 14:44	1
Tert-amyl-methyl ether (TAME)	ND		2.0		ug/Kg			10/30/13 14:44	1
tert-Butyl alcohol (TBA)	ND		50		ug/Kg			10/30/13 14:44	1
Toluene	ND		0.99		ug/Kg			10/30/13 14:44	1
Xylenes, Total	ND		2.0		ug/Kg			10/30/13 14:44	1
Naphthalene	ND		2.0		ug/Kg			10/30/13 14:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*93*		*79 - 120*		*10/30/13 14:44*	*1*
Dibromofluoromethane (Surr)	*104*		*60 - 120*		*10/30/13 14:44*	*1*
Toluene-d8 (Surr)	*103*		*79 - 123*		*10/30/13 14:44*	*1*

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 0771, Livermore

TestAmerica Job ID: 440-60786-1

Client Sample ID: B-1@40'
Date Collected: 10/23/13 10:40
Date Received: 10/25/13 10:10

Lab Sample ID: 440-60786-4
Matrix: Water

Method: 8260B/CA_LUFTMS - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Volatile Fuel Hydrocarbons (C4-C12)	ND		50		ug/L			11/04/13 20:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane (Surr)	*101*		*76 - 132*		*11/04/13 20:18*	*1*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*11/04/13 20:18*	*1*
Toluene-d8 (Surr)	*108*		*80 - 128*		*11/04/13 20:18*	*1*

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

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.50		ug/L			11/04/13 20:18	1
Isopropyl Ether (DIPE)	ND		0.50		ug/L			11/04/13 20:18	1
Ethyl-t-butyl ether (ETBE)	ND		0.50		ug/L			11/04/13 20:18	1
Ethylbenzene	ND		0.50		ug/L			11/04/13 20:18	1
m,p-Xylene	ND		1.0		ug/L			11/04/13 20:18	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50		ug/L			11/04/13 20:18	1
o-Xylene	ND		0.50		ug/L			11/04/13 20:18	1
Tert-amyl-methyl ether (TAME)	ND		0.50		ug/L			11/04/13 20:18	1
tert-Butyl alcohol (TBA)	ND		10		ug/L			11/04/13 20:18	1
Toluene	ND		0.50		ug/L			11/04/13 20:18	1
Xylenes, Total	ND		1.0		ug/L			11/04/13 20:18	1
Naphthalene	ND		0.50		ug/L			11/04/13 20:18	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*99*		*80 - 120*		*11/04/13 20:18*	*1*
Dibromofluoromethane (Surr)	*101*		*76 - 132*		*11/04/13 20:18*	*1*
Toluene-d8 (Surr)	*108*		*80 - 128*		*11/04/13 20:18*	*1*

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 0771, Livermore

TestAmerica Job ID: 440-60786-1

Client Sample ID: B-2@58'
Date Collected: 10/23/13 13:25
Date Received: 10/25/13 10:10

Lab Sample ID: 440-60786-5
Matrix: Water

Method: 8260B/CA_LUFTMS - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Volatile Fuel Hydrocarbons (C4-C12)	ND		50		ug/L			11/04/13 21:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane (Surr)	*100*		*76 - 132*		*11/04/13 21:47*	*1*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*11/04/13 21:47*	*1*
Toluene-d8 (Surr)	*109*		*80 - 128*		*11/04/13 21:47*	*1*

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

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.50		ug/L			11/04/13 21:47	1
Isopropyl Ether (DIPE)	ND		0.50		ug/L			11/04/13 21:47	1
Ethyl-t-butyl ether (ETBE)	ND		0.50		ug/L			11/04/13 21:47	1
Ethylbenzene	ND		0.50		ug/L			11/04/13 21:47	1
m,p-Xylene	ND		1.0		ug/L			11/04/13 21:47	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50		ug/L			11/04/13 21:47	1
o-Xylene	ND		0.50		ug/L			11/04/13 21:47	1
Tert-amyl-methyl ether (TAME)	ND		0.50		ug/L			11/04/13 21:47	1
tert-Butyl alcohol (TBA)	ND		10		ug/L			11/04/13 21:47	1
Toluene	ND		0.50		ug/L			11/04/13 21:47	1
Xylenes, Total	ND		1.0		ug/L			11/04/13 21:47	1
Naphthalene	ND		0.50		ug/L			11/04/13 21:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*		*11/04/13 21:47*	*1*
Dibromofluoromethane (Surr)	*100*		*76 - 132*		*11/04/13 21:47*	*1*
Toluene-d8 (Surr)	*109*		*80 - 128*		*11/04/13 21:47*	*1*

Method Summary

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 0771, Livermore

TestAmerica Job ID: 440-60786-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL IRV
8260B/CA_LUFTMS	Volatile Organic Compounds by GC/MS	SW846	TAL IRV

Protocol References:

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

Laboratory References:

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

Lab Chronicle

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 0771, Livermore

TestAmerica Job ID: 440-60786-1

Client Sample ID: B-1@30.5

Lab Sample ID: 440-60786-1

Date Collected: 10/22/13 16:45

Matrix: Solid

Date Received: 10/25/13 10:10

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	141016	10/30/13 13:43	AL	TAL IRV
Total/NA	Analysis	8260B/CA_LUFTMS		1	5.05 g	10 mL	141017	10/30/13 13:43	MP	TAL IRV

Client Sample ID: B-2@28.5

Lab Sample ID: 440-60786-2

Date Collected: 10/22/13 12:15

Matrix: Solid

Date Received: 10/25/13 10:10

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	5.04 g	10 mL	141016	10/30/13 14:13	AL	TAL IRV
Total/NA	Analysis	8260B/CA_LUFTMS		1	5.04 g	10 mL	141017	10/30/13 14:13	MP	TAL IRV

Client Sample ID: B-3@31.5

Lab Sample ID: 440-60786-3

Date Collected: 10/23/13 10:10

Matrix: Solid

Date Received: 10/25/13 10:10

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	5.03 g	10 mL	141016	10/30/13 14:44	AL	TAL IRV
Total/NA	Analysis	8260B/CA_LUFTMS		1	5.03 g	10 mL	141017	10/30/13 14:44	MP	TAL IRV

Client Sample ID: B-1@40'

Lab Sample ID: 440-60786-4

Date Collected: 10/23/13 10:40

Matrix: Water

Date Received: 10/25/13 10:10

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	10 mL	10 mL	142061	11/04/13 20:18	AT	TAL IRV
Total/NA	Analysis	8260B/CA_LUFTMS		1	10 mL	10 mL	142062	11/04/13 20:18	AT	TAL IRV

Client Sample ID: B-2@58'

Lab Sample ID: 440-60786-5

Date Collected: 10/23/13 13:25

Matrix: Water

Date Received: 10/25/13 10:10

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	10 mL	10 mL	142061	11/04/13 21:47	AT	TAL IRV
Total/NA	Analysis	8260B/CA_LUFTMS		1	10 mL	10 mL	142062	11/04/13 21:47	AT	TAL IRV

Laboratory References:

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 440-141016/4
Matrix: Solid
Analysis Batch: 141016

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		1.0		ug/Kg			10/30/13 09:03	1
Isopropyl Ether (DIPE)	ND		2.0		ug/Kg			10/30/13 09:03	1
Ethyl-t-butyl ether (ETBE)	ND		2.0		ug/Kg			10/30/13 09:03	1
Ethylbenzene	ND		1.0		ug/Kg			10/30/13 09:03	1
m,p-Xylene	ND		2.0		ug/Kg			10/30/13 09:03	1
Methyl-t-Butyl Ether (MTBE)	ND		2.0		ug/Kg			10/30/13 09:03	1
o-Xylene	ND		1.0		ug/Kg			10/30/13 09:03	1
Tert-amyl-methyl ether (TAME)	ND		2.0		ug/Kg			10/30/13 09:03	1
tert-Butyl alcohol (TBA)	ND		50		ug/Kg			10/30/13 09:03	1
Toluene	ND		1.0		ug/Kg			10/30/13 09:03	1
Xylenes, Total	ND		2.0		ug/Kg			10/30/13 09:03	1
Naphthalene	ND		2.0		ug/Kg			10/30/13 09:03	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*79 - 120*		*10/30/13 09:03*	*1*
Dibromofluoromethane (Surr)	*89*		*60 - 120*		*10/30/13 09:03*	*1*
Toluene-d8 (Surr)	*103*		*79 - 123*		*10/30/13 09:03*	*1*

Lab Sample ID: LCS 440-141016/5
Matrix: Solid
Analysis Batch: 141016

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	52.8		ug/Kg		106	65 - 120
Isopropyl Ether (DIPE)	50.0	51.9		ug/Kg		104	60 - 140
Ethyl-t-butyl ether (ETBE)	50.0	49.9		ug/Kg		100	60 - 140
Ethylbenzene	50.0	53.3		ug/Kg		107	70 - 125
m,p-Xylene	100	105		ug/Kg		105	70 - 125
Methyl-t-Butyl Ether (MTBE)	50.0	52.5		ug/Kg		105	60 - 140
o-Xylene	50.0	52.7		ug/Kg		105	70 - 125
Tert-amyl-methyl ether (TAME)	50.0	50.5		ug/Kg		101	60 - 145
tert-Butyl alcohol (TBA)	250	243		ug/Kg		97	70 - 135
Toluene	50.0	52.7		ug/Kg		105	70 - 125
Naphthalene	50.0	60.4		ug/Kg		121	55 - 135

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*97*		*79 - 120*
Dibromofluoromethane (Surr)	*96*		*60 - 120*
Toluene-d8 (Surr)	*104*		*79 - 123*

Lab Sample ID: 440-60924-A-1 MS
Matrix: Solid
Analysis Batch: 141016

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		50.1	54.0		ug/Kg		107	65 - 130
Isopropyl Ether (DIPE)	ND		50.1	53.0		ug/Kg		106	60 - 150

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

Lab Sample ID: 440-60924-A-1 MS
Matrix: Solid
Analysis Batch: 141016

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
Ethyl-t-butyl ether (ETBE)	ND		50.1	53.2		ug/Kg		106	60 - 145
Ethylbenzene	1.7		50.1	58.4		ug/Kg		113	70 - 135
m,p-Xylene	ND		100	115		ug/Kg		115	70 - 130
Methyl-t-Butyl Ether (MTBE)	ND		50.1	56.4		ug/Kg		113	55 - 155
o-Xylene	ND		50.1	55.8		ug/Kg		111	65 - 130
Tert-amyl-methyl ether (TAME)	ND		50.1	57.1		ug/Kg		114	60 - 150
tert-Butyl alcohol (TBA)	ND		251	274		ug/Kg		109	65 - 145
Toluene	ND		50.1	55.3		ug/Kg		110	70 - 130
Naphthalene	21		50.1	91.5		ug/Kg		140	40 - 150

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*95*		*79 - 120*
Dibromofluoromethane (Surr)	*96*		*60 - 120*
Toluene-d8 (Surr)	*102*		*79 - 123*

Lab Sample ID: 440-60924-A-1 MSD
Matrix: Solid
Analysis Batch: 141016

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		50.0	53.9		ug/Kg		107	65 - 130	0	20
Isopropyl Ether (DIPE)	ND		50.0	52.5		ug/Kg		105	60 - 150	1	25
Ethyl-t-butyl ether (ETBE)	ND		50.0	52.4		ug/Kg		105	60 - 145	2	30
Ethylbenzene	1.7		50.0	56.0		ug/Kg		109	70 - 135	4	25
m,p-Xylene	ND		100	110		ug/Kg		110	70 - 130	5	25
Methyl-t-Butyl Ether (MTBE)	ND		50.0	56.4		ug/Kg		113	55 - 155	0	35
o-Xylene	ND		50.0	55.1		ug/Kg		110	65 - 130	1	25
Tert-amyl-methyl ether (TAME)	ND		50.0	54.6		ug/Kg		109	60 - 150	4	25
tert-Butyl alcohol (TBA)	ND		250	239		ug/Kg		96	65 - 145	14	30
Toluene	ND		50.0	54.5		ug/Kg		109	70 - 130	2	20
Naphthalene	21		50.0	88.7		ug/Kg		135	40 - 150	3	40

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*100*		*79 - 120*
Dibromofluoromethane (Surr)	*98*		*60 - 120*
Toluene-d8 (Surr)	*105*		*79 - 123*

Lab Sample ID: MB 440-142061/4
Matrix: Water
Analysis Batch: 142061

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

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	ND		0.50	ug/L			11/04/13 18:49	1
Isopropyl Ether (DIPE)	ND		0.50	ug/L			11/04/13 18:49	1
Ethyl-t-butyl ether (ETBE)	ND		0.50	ug/L			11/04/13 18:49	1
Ethylbenzene	ND		0.50	ug/L			11/04/13 18:49	1
m,p-Xylene	ND		1.0	ug/L			11/04/13 18:49	1
Methyl-t-Butyl Ether (MTBE)	ND		0.50	ug/L			11/04/13 18:49	1

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

Lab Sample ID: MB 440-142061/4
Matrix: Water
Analysis Batch: 142061

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
o-Xylene	ND		0.50		ug/L			11/04/13 18:49	1
Tert-amyl-methyl ether (TAME)	ND		0.50		ug/L			11/04/13 18:49	1
tert-Butyl alcohol (TBA)	ND		10		ug/L			11/04/13 18:49	1
Toluene	ND		0.50		ug/L			11/04/13 18:49	1
Xylenes, Total	ND		1.0		ug/L			11/04/13 18:49	1
Naphthalene	ND		0.50		ug/L			11/04/13 18:49	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*11/04/13 18:49*	*1*
Dibromofluoromethane (Surr)	*105*		*76 - 132*		*11/04/13 18:49*	*1*
Toluene-d8 (Surr)	*109*		*80 - 128*		*11/04/13 18:49*	*1*

Lab Sample ID: LCS 440-142061/6
Matrix: Water
Analysis Batch: 142061

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	25.0	23.3		ug/L		93	68 - 130
Isopropyl Ether (DIPE)	25.0	28.0		ug/L		112	58 - 139
Ethyl-t-butyl ether (ETBE)	25.0	25.1		ug/L		101	60 - 136
Ethylbenzene	25.0	25.0		ug/L		100	70 - 130
m,p-Xylene	50.0	49.6		ug/L		99	70 - 130
Methyl-t-Butyl Ether (MTBE)	25.0	26.7		ug/L		107	63 - 131
o-Xylene	25.0	26.0		ug/L		104	70 - 130
Tert-amyl-methyl ether (TAME)	25.0	24.8		ug/L		99	57 - 139
tert-Butyl alcohol (TBA)	125	120		ug/L		96	70 - 130
Toluene	25.0	24.5		ug/L		98	70 - 130
Naphthalene	25.0	27.4		ug/L		110	60 - 140

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*105*		*80 - 120*
Dibromofluoromethane (Surr)	*107*		*76 - 132*
Toluene-d8 (Surr)	*109*		*80 - 128*

Lab Sample ID: 440-60786-4 MS
Matrix: Water
Analysis Batch: 142061

Client Sample ID: B-1@40'
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Benzene	ND		25.0	23.4		ug/L		94	66 - 130
Isopropyl Ether (DIPE)	ND		25.0	27.5		ug/L		110	64 - 138
Ethyl-t-butyl ether (ETBE)	ND		25.0	25.4		ug/L		102	70 - 130
Ethylbenzene	ND		25.0	25.0		ug/L		100	70 - 130
m,p-Xylene	ND		50.0	49.6		ug/L		99	70 - 133
Methyl-t-Butyl Ether (MTBE)	ND		25.0	26.7		ug/L		107	70 - 130
o-Xylene	ND		25.0	25.3		ug/L		101	70 - 133
Tert-amyl-methyl ether (TAME)	ND		25.0	24.9		ug/L		100	68 - 133
tert-Butyl alcohol (TBA)	ND		125	115		ug/L		92	70 - 130

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

Lab Sample ID: 440-60786-4 MS
Matrix: Water
Analysis Batch: 142061

Client Sample ID: B-1@40'
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Toluene	ND		25.0	25.0		ug/L		99	70 - 130
Naphthalene	ND		25.0	27.6		ug/L		110	60 - 140

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*
Dibromofluoromethane (Surr)	*105*		*76 - 132*
Toluene-d8 (Surr)	*110*		*80 - 128*

Lab Sample ID: 440-60786-4 MSD
Matrix: Water
Analysis Batch: 142061

Client Sample ID: B-1@40'
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		25.0	23.6		ug/L		94	66 - 130	1	20
Isopropyl Ether (DIPE)	ND		25.0	26.6		ug/L		106	64 - 138	3	25
Ethyl-t-butyl ether (ETBE)	ND		25.0	25.3		ug/L		101	70 - 130	0	25
Ethylbenzene	ND		25.0	26.0		ug/L		104	70 - 130	4	20
m,p-Xylene	ND		50.0	51.1		ug/L		102	70 - 133	3	25
Methyl-t-Butyl Ether (MTBE)	ND		25.0	26.2		ug/L		105	70 - 130	2	25
o-Xylene	ND		25.0	26.4		ug/L		106	70 - 133	4	20
Tert-amyl-methyl ether (TAME)	ND		25.0	24.7		ug/L		99	68 - 133	1	30
tert-Butyl alcohol (TBA)	ND		125	122		ug/L		98	70 - 130	6	25
Toluene	ND		25.0	25.0		ug/L		99	70 - 130	0	20
Naphthalene	ND		25.0	28.1		ug/L		113	60 - 140	2	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*103*		*80 - 120*
Dibromofluoromethane (Surr)	*100*		*76 - 132*
Toluene-d8 (Surr)	*108*		*80 - 128*

Method: 8260B/CA_LUFTMS - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 440-141017/4
Matrix: Solid
Analysis Batch: 141017

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Volatile Fuel Hydrocarbons (C4-C12)	ND		100		ug/Kg			10/30/13 09:03	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane (Surr)	*89*		*60 - 120*		*10/30/13 09:03*	*1*
4-Bromofluorobenzene (Surr)	*97*		*79 - 120*		*10/30/13 09:03*	*1*
Toluene-d8 (Surr)	*103*		*79 - 123*		*10/30/13 09:03*	*1*

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

Lab Sample ID: LCS 440-141017/6
Matrix: Solid
Analysis Batch: 141017

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Volatile Fuel Hydrocarbons (C4-C12)			1000	1030		ug/Kg		103	60 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*95*		*60 - 120*
4-Bromofluorobenzene (Surr)	*97*		*79 - 120*
Toluene-d8 (Surr)	*104*		*79 - 123*

Lab Sample ID: 440-60924-A-1 MS
Matrix: Solid
Analysis Batch: 141017

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		
Volatile Fuel Hydrocarbons (C4-C12)	220		3460	3870		ug/Kg		106	55 - 140		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*60 - 120*
4-Bromofluorobenzene (Surr)	*95*		*79 - 120*
Toluene-d8 (Surr)	*102*		*79 - 123*

Lab Sample ID: 440-60924-A-1 MSD
Matrix: Solid
Analysis Batch: 141017

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
Volatile Fuel Hydrocarbons (C4-C12)	220		3450	3720		ug/Kg		101	55 - 140	4	25

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*98*		*60 - 120*
4-Bromofluorobenzene (Surr)	*100*		*79 - 120*
Toluene-d8 (Surr)	*105*		*79 - 123*

Lab Sample ID: MB 440-142062/4
Matrix: Water
Analysis Batch: 142062

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

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
Volatile Fuel Hydrocarbons (C4-C12)	ND		50		ug/L			11/04/13 18:49	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane (Surr)	*105*		*76 - 132*		*11/04/13 18:49*	*1*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*11/04/13 18:49*	*1*
Toluene-d8 (Surr)	*109*		*80 - 128*		*11/04/13 18:49*	*1*

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

Lab Sample ID: LCS 440-142062/5
Matrix: Water
Analysis Batch: 142062

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Volatile Fuel Hydrocarbons (C4-C12)			500	486		ug/L		97	55 - 130		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*99*		*76 - 132*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*
Toluene-d8 (Surr)	*112*		*80 - 128*

Lab Sample ID: 440-60786-4 MS
Matrix: Water
Analysis Batch: 142062

Client Sample ID: B-1@40'
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Volatile Fuel Hydrocarbons (C4-C12)	ND		1730	1910		ug/L		108	50 - 145		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*105*		*76 - 132*
4-Bromofluorobenzene (Surr)	*104*		*80 - 120*
Toluene-d8 (Surr)	*110*		*80 - 128*

Lab Sample ID: 440-60786-4 MSD
Matrix: Water
Analysis Batch: 142062

Client Sample ID: B-1@40'
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Volatile Fuel Hydrocarbons (C4-C12)	ND		1730	1870		ug/L		106	50 - 145	2	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*100*		*76 - 132*
4-Bromofluorobenzene (Surr)	*103*		*80 - 120*
Toluene-d8 (Surr)	*108*		*80 - 128*

GC/MS VOA

Analysis Batch: 141016

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-60786-1	B-1@30.5	Total/NA	Solid	8260B	
440-60786-2	B-2@28.5	Total/NA	Solid	8260B	
440-60786-3	B-3@31.5	Total/NA	Solid	8260B	
440-60924-A-1 MS	Matrix Spike	Total/NA	Solid	8260B	
440-60924-A-1 MSD	Matrix Spike Duplicate	Total/NA	Solid	8260B	
LCS 440-141016/5	Lab Control Sample	Total/NA	Solid	8260B	
MB 440-141016/4	Method Blank	Total/NA	Solid	8260B	

Analysis Batch: 141017

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-60786-1	B-1@30.5	Total/NA	Solid	8260B/CA_LUFT MS	
440-60786-2	B-2@28.5	Total/NA	Solid	8260B/CA_LUFT MS	
440-60786-3	B-3@31.5	Total/NA	Solid	8260B/CA_LUFT MS	
440-60924-A-1 MS	Matrix Spike	Total/NA	Solid	8260B/CA_LUFT MS	
440-60924-A-1 MSD	Matrix Spike Duplicate	Total/NA	Solid	8260B/CA_LUFT MS	
LCS 440-141017/6	Lab Control Sample	Total/NA	Solid	8260B/CA_LUFT MS	
MB 440-141017/4	Method Blank	Total/NA	Solid	8260B/CA_LUFT MS	

Analysis Batch: 142061

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-60786-4	B-1@40'	Total/NA	Water	8260B	
440-60786-4 MS	B-1@40'	Total/NA	Water	8260B	
440-60786-4 MSD	B-1@40'	Total/NA	Water	8260B	
440-60786-5	B-2@58'	Total/NA	Water	8260B	
LCS 440-142061/6	Lab Control Sample	Total/NA	Water	8260B	
MB 440-142061/4	Method Blank	Total/NA	Water	8260B	

Analysis Batch: 142062

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
440-60786-4	B-1@40'	Total/NA	Water	8260B/CA_LUFT MS	
440-60786-4 MS	B-1@40'	Total/NA	Water	8260B/CA_LUFT MS	
440-60786-4 MSD	B-1@40'	Total/NA	Water	8260B/CA_LUFT MS	
440-60786-5	B-2@58'	Total/NA	Water	8260B/CA_LUFT MS	
LCS 440-142062/5	Lab Control Sample	Total/NA	Water	8260B/CA_LUFT MS	
MB 440-142062/4	Method Blank	Total/NA	Water	8260B/CA_LUFT MS	

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)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Certification Summary

Client: Broadbent & Associates, Inc.
Project/Site: ARCO 0771, Livermore

TestAmerica Job ID: 440-60786-1

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	06-30-14
Arizona	State Program	9	AZ0671	10-13-14
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	01-28-14 *
Hawaii	State Program	9	N/A	01-31-14
Nevada	State Program	9	CA015312007A	07-31-14
New Mexico	State Program	6	N/A	01-31-14
Northern Mariana Islands	State Program	9	MP0002	01-31-14
Oregon	NELAP	10	4005	09-12-14
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.

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TESTAMERICA San Francisco Chain of Custody
1220 Quarry Lane ● Pleasanton CA 94566-4756
Phone: (925) 484-1919 ● Fax: (925) 600-3002

Reference #: _____

Date 10/24/13 Page 1 of 1

Report To

Attn: Jason Dude
Company: Broadbent
Address:
Phone: 530 566 1400 Email: jdude@broadbentinc.com
Bill To: BP
Sampled By: ET
Attn:
Phone: 707 430 7133

Analysis Request

Sample ID	Date	Time	Matrix	Preserv	TPH EPA - ☐ 8260B ☐ Gas w/ ☐ BTEX ☐ MTBE	TEPH EPA 8015M* ☐ Silica Gel ☐ Diesel ☐ Motor Oil ☐ Other	EPA 8260B ☐ Gas ☐ BTEX ☐ 5 Oxygenates ☐ DCA, EDB ☐ Ethanol	(HVOCs) EPA 8021 by 8260B	Volatile Organics GC/MS (VOCs) ☐ EPA 8260B ☐ 624	Semivolatiles GC/MS ☐ EPA 8270 ☐ 625	Oil and Grease ☐ Petroleum (EPA 1664) ☐ Total	Pesticides ☐ EPA 8081 ☐ 608 PCBs ☐ EPA 8082 ☐ 608	PNAs by ☐ 8270 ☐ 8310	CAM17 Metals (EPA 6010/7470/7471)	Metals: ☐ Lead ☐ LUFT ☐ RCRA ☐ Other	Low Level Metals by EPA 200.8/6020 (ICP-MS):	☐ WET (STLC) ☐ TCLP	☐ Hexavalent Chromium ☐ pH (24h hold time for H_2O)	☐ Spec Cond. ☐ Alkalinity ☐ TSS ☐ TDS	Anions: ☐ Cl ☐ SO_4 ☐ NO_3 ☐ F ☐ Br ☐ NO_2 ☐ PO_4	Naphthalene 8260	440-60786 Chain of Custody	Number of Containers
B-1 @ 30.5	10/24/13	1605	S				X														X		
B-2 @ 28.5	10/22/13	1215	S				X														X		
B-3 @ 31.5	10/23/13	1010	S				X														X		
B5 40'	10/23/13	1040	W	HCl			X														X		
B-2 @ 58'	10/22/13	1325	W	HCl			X														X		
																					9:10		
																					10-28-13		

Project Info.

Project Name: BP 771
Project#: 06-82-6081
PO#:
Credit Card#:

Sample Receipt

of Containers: 7
Head Space:
Temp:
Conforms to record:

TAT: 5 Day | 3 Day | 2 Day | 1 Day
Other:

Report: ☑ Routine ☐ Level 3 ☐ Level 4 ☐ EDD ☐ State Tank Fund EDR
Special Instructions / Comments: ☐ Global ID _____

See Terms and Conditions on reverse
*TestAmerica SF reports 8015M from C_8-C_{40} (industry norm) Default for 8015B is C_{10}-C_{28}

1) Relinquished by:	2) Relinquished by:	3) Relinquished by:
Signature: [signature] Time: 1400	Signature: Time:	Signature: Time:
Printed Name: Date:	Printed Name: Date:	Printed Name: Date:
Company:	Company:	Company:

1) Received by:	2) Received by:	3) Received by:
Signature: [signature] Time: 10:10	Signature: Time:	Signature: Time:
Printed Name: JUBANH Date: 10/25/13	Printed Name: Date:	Printed Name: Date:
Company: TAT 4.3/3.5°C TR-64	Company:	Company:

Rev09/09

11/6/2013

Login Sample Receipt Checklist

Client: Broadbent & Associates, Inc.

Job Number: 440-60786-1

Login Number: 60786

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.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
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	KT
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

STATE WATER RESOURCES CONTROL BOARD

GEOTRACKER ESI

UPLOADING A GEO_MAP FILE

SUCCESS

Your GEO_MAP file has been successfully submitted!

Submittal Type:	**GEO_MAP**
Facility Global ID:	**T0600100113**
Facility Name:	**ARCO #00771**
File Name:	**Drawing 2 - Site Map.pdf**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**69.170.45.210**
Submittal Date/Time:	**1/16/2014 10:38:49 AM**
Confirmation Number:	**3084446012**

STATE WATER RESOURCES CONTROL BOARD

GEOTRACKER ESI

UPLOADING A GEO_BORE FILE

SUCCESS

Your GEO_BORE file has been successfully submitted!

Submittal Type:	**GEO_BORE**
Facility Global ID:	**T0600100113**
Field Point:	**B-1**
Facility Name:	**ARCO #00771**
File Name:	**B-1.pdf**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**69.170.45.210**
Submittal Date/Time:	**1/16/2014 10:40:00 AM**
Confirmation Number:	**9975327968**

STATE WATER RESOURCES CONTROL BOARD

GEOTRACKER ESI

UPLOADING A GEO_BORE FILE

SUCCESS

Your GEO_BORE file has been successfully submitted!

Submittal Type:	**GEO_BORE**
Facility Global ID:	**T0600100113**
Field Point:	**B-2**
Facility Name:	**ARCO #00771**
File Name:	**B-2.pdf**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**69.170.45.210**
Submittal Date/Time:	**1/16/2014 10:40:35 AM**
Confirmation Number:	**9429267227**

STATE WATER RESOURCES CONTROL BOARD

GEOTRACKER ESI

UPLOADING A GEO_BORE FILE

SUCCESS

Your GEO_BORE file has been successfully submitted!

Submittal Type:	**GEO_BORE**
Facility Global ID:	**T0600100113**
Field Point:	**B-3**
Facility Name:	**ARCO #00771**
File Name:	**B-3.pdf**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**69.170.45.210**
Submittal Date/Time:	**1/16/2014 10:41:07 AM**
Confirmation Number:	**1743976652**

STATE WATER RESOURCES CONTROL BOARD

GEOTRACKER ESI

UPLOADING A EDF FILE

SUCCESS

Processing is complete. No errors were found!
Your file has been successfully submitted!

Submittal Type:	**EDF**
Report Title:	**CPT Investigation Laboratory Analytical Data - October 2013**
Report Type:	**Site Investigation**
Facility Global ID:	**T0600100113**
Facility Name:	**ARCO #00771**
File Name:	**440-60786-1_06 Nov 13 1454_EDF2.zip**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**69.170.45.210**
Submittal Date/Time:	**1/16/2014 11:02:44 AM**
Confirmation Number:	**8262696743**

VIEW QC REPORT

VIEW DETECTIONS REPORT

APPENDIX H

CPT BORING LOGS

BROADBENT

BORING LOG

PROJECT NAME: BP 771

SITE ADDRESS: 899 Rincon Ave., Livermore, California

PROJECT NUMBER: 06-82-608

LEGAL DESC: _____ APN: 007-0113-034-0000

LOGGED BY: CPT

FACILITY ID OR WAIVER: _____ NOI NUMBER: _____

DATE: 10 / 22 / 2013 START: 14:45

DRILLING COMPANY: Gregg Drilling DRILLER: German Garcia

WELLID: B-1 STOP: 16:45

DRILLING METHOD: CPT SAMPLE METHOD: Direct Push

DEPTH (FEET)	SOIL BORING	SAMPLE ID	PID (ppm)	MOISTURE	COLOR	CONSISTENCY	GRAIN SIZE	CLASSIFICATION	REMARKS & ODORS
2							Air Knife		
4									
6									
8							Gravel/Gravelly Sands	GW SP	
10	Grout								
12									
14									
16									
18									
20									
22							Sandy Silt	ML	
24							Gravel/Gravelly Sands	GW SP	
26									
28									
30		B-1 @30.5' (soil)					Silty Clay	CL	
32									
34							Gravel/Gravelly Sands	GW SP	
36									

TOTAL BORING DEPTH: 50.2 ft

PAGE NO: 1 OF 2

ESTIMATED FIRST ENCOUNTERED GROUNDWATER DEPTH: 40 ft

STATIC GROUNDWATER DEPTH: NA

BORING LOG

PROJECT NAME: BP 2183 | SITE ADDRESS: 899 Rincon Ave., Livermore, California

PROJECT NUMBER: 06-82-608 | LEGAL DESC: | APN: 007-0113-034-0000

LOGGED BY: CPT | FACILITY ID OR WAIVER: | NOI NUMBER:

DATE: 10 / 22 / 2013 | START: 14:45 | DRILLING COMPANY: Gregg Drilling | DRILLER: German Garcia

WELLID: B-1 | STOP: 16:45 | DRILLING METHOD: CPT | SAMPLE METHOD: Direct Push

DEPTH (FEET)	SOIL BORING	SAMPLE ID	PID (ppm)	MOISTURE	COLOR	CONSISTENCY	GRAIN SIZE / CLASSIFICATION	REMARKS & ODORS
38							Gravel/Gravelly Sands — GW SP	
40	▽ Grout	B-1 @40' (water)						
42							Silty Clay — CL	
44								
46								
48								
50							Boring terminated at 50.2 ft bgs.	

TOTAL BORING DEPTH: 50.2 ft

PAGE NO: 2 OF 2

▽ ESTIMATED FIRST ENCOUNTERED GROUNDWATER DEPTH: 40 ft

▼ STATIC GROUNDWATER DEPTH: NA

BROADBENT

BORING LOG

PROJECT NAME: BP 771

SITE ADDRESS: 899 Rincon Ave., Livermore, California

PROJECT NUMBER: 06-82-608

LEGAL DESC: _____ APN: 007-0113-034-0000

LOGGED BY: CPT

FACILITY ID OR WAIVER: _____ NOI NUMBER: _____

DATE: 10 / 22 / 2013 START: 09:15

DRILLING COMPANY: Gregg Drilling DRILLER: German Garcia

WELLID: B-2 STOP: 11:00

DRILLING METHOD: CPT SAMPLE METHOD: Direct Push

DEPTH (FEET)	SOIL BORING	SAMPLE ID	PID (ppm)	MOISTURE	COLOR	CONSISTENCY	GRAIN SIZE	CLASSIFICATION	REMARKS & ODORS
0							Air Knife		
2									
4									
6									
8	Grout						Gravel/Gravelly Sands	GW SP	
10									
12									
14									
16									
18									
20									
22									
24									
26									
28		B-2 @28.5' (soil)					Silty Clay	CL	
30									
32							Gravel/Gravelly Sand	GW SP	
34									
36									

TOTAL BORING DEPTH: 60.2 ft

PAGE NO: 1 OF 2

ESTIMATED FIRST ENCOUNTERED GROUNDWATER DEPTH: 58 ft

STATIC GROUNDWATER DEPTH: NA

BORING LOG

PROJECT NAME: BP 771

SITE ADDRESS: 899 Rincon Ave., Livermore, California

PROJECT NUMBER: 06-82-608

LEGAL DESC: _____ APN: 007-0113-034-0000

LOGGED BY: CPT

FACILITY ID OR WAIVER: _____ NOI NUMBER: _____

DATE: 10 / 22 / 2013 START: 09:15

DRILLING COMPANY: Gregg Drilling DRILLER: German Garcia

WELLID: B-2 STOP: 11:00

DRILLING METHOD: CPT SAMPLE METHOD: Direct Push

DEPTH (FEET)	SOIL BORING	SAMPLE ID	PID (ppm)	MOISTURE	COLOR	CONSISTENCY	GRAIN SIZE	CLASSIFICATION	REMARKS & ODORS
38							Gravels/Gravelly Sand	GW SP	
40									
42							Silty Clay	CL	
44									
46									
48	Grout								
50									
52							Gravel/Gravelly Sand	GW SP	
							Silty Clay	CL	
54							Gravel/Gravelly Sand	GW SP	
56									
58	▽	B-2 @28.5' (water)					Silty Clay	CL	
							Gravel/Gravelly Sand	GW SP	
60							Boring terminated at 60.2 ft bgs.		

TOTAL BORING DEPTH: 60.2 ft

PAGE NO: 2 OF 2

▽ ESTIMATED FIRST ENCOUNTERED GROUNDWATER DEPTH: 58 ft

▼ STATIC GROUNDWATER DEPTH: NA

BROADBENT

BORING LOG

PROJECT NAME: BP 771

SITE ADDRESS: 899 Rincon Ave., Livermore, California

PROJECT NUMBER: 06-82-608

LEGAL DESC: _____ APN: 007-0113-034-0000

LOGGED BY: CPT

FACILITY ID OR WAIVER: _____ NOI NUMBER: _____

DATE: 10 / 23 / 2013 START: 08:00

DRILLING COMPANY: Gregg Drilling DRILLER: German Garcia

WELLID: B-3 STOP: 11:00

DRILLING METHOD: CPT SAMPLE METHOD: Direct Push

DEPTH (FEET)	SOIL BORING	SAMPLE ID	PID (ppm)	MOISTURE	COLOR	CONSISTENCY	GRAIN SIZE	CLASSIFICATION	REMARKS & ODORS
0							Air Knife		
6	Grout						Gravel/Gravelly Sands	GW SP	
30		B-3 @31.5' (soil)					Silty Clay	CL	
34							Gravel/Gravelly Sands	GW SP	
36									

TOTAL BORING DEPTH: 55.45 ft

PAGE NO: 1 OF 2

ESTIMATED FIRST ENCOUNTERED GROUNDWATER DEPTH: NA ft

STATIC GROUNDWATER DEPTH: NA

THIS SUMMARY APPLIES ONLY AT THIS LOCATION AND AT THE TIME OF LOGGING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

BROADBENT

BORING LOG

PROJECT NAME: BP 2183 SITE ADDRESS: 899 Rincon Ave., Livermore, California

PROJECT NUMBER: 06-82-608 LEGAL DESC: APN: 007-0113-034-0000

LOGGED BY: CPT FACILITY ID OR WAIVER: NOI NUMBER:

DATE: 10 / 23 / 2013 START: 08:00 DRILLING COMPANY: Gregg Drilling DRILLER: German Garcia

WELLID: B-3 STOP: 11:00 DRILLING METHOD: CPT SAMPLE METHOD: Direct Push

DEPTH (FEET)	SOIL BORING	SAMPLE ID	PID (ppm)	MOISTURE	COLOR	CONSISTENCY	GRAIN SIZE	CLASSIFICATION	REMARKS & ODORS
38							Gravel/Gravelly Sands	GW SP	
40									
42	Grout						Silty Clay	CL	
44									
46									
48									
50									
52									
54							Gravel/Gravelly Sands	GW SP	
56							Boring terminated at 55.45 ft bgs.		

TOTAL BORING DEPTH: 55.45 ft PAGE NO: 2 OF 2

ESTIMATED FIRST ENCOUNTERED GROUNDWATER DEPTH: NA ft

STATIC GROUNDWATER DEPTH: NA