Atlantic Richfield Company

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September 7, 2012

RECEIVED

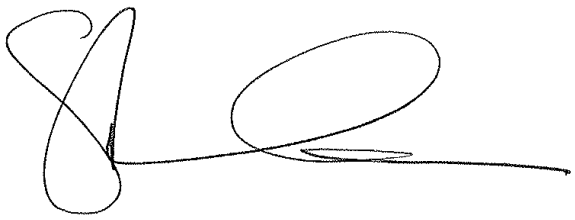
7:51 am, Sep 11, 2012

Alameda County
Environmental Health

Re: Vapor Intrusion Assessment Report
Atlantic Richfield Company Station #2112
1260 Park Street, Alameda, California
ACEH Case #RO0000044

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

Submitted by,



Shannon Couch
Operations Project Manager

Attachment

VAPOR INTRUSION ASSESSMENT REPORT
Atlantic Richfield Company Station #2112
1260 Park Street, Alameda, California
ACEH Fuel Leak Case #RO0000044

Prepared for:

Ms. Shannon Couch
RM Operations Project Manager
Atlantic Richfield Company
P.O. Box 1257
San Ramon, California 94583

Prepared by:

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September 7, 2012

Project #06-88-616

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September 7, 2012

Project No. 06-88-616

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

Attn.: Ms. Shannon Couch

Re: Vapor Intrusion Assessment Report, Atlantic Richfield Company Station #2112, 1260 Park Street, Alameda, Alameda County, California; ACEH Case #RO0000044

Dear Ms. Couch:

Broadbent & Associates, Inc. (Broadbent) respectfully submits this *Vapor Intrusion Assessment Report* for Atlantic Richfield Company (a BP affiliated company) Station #2112 located at 1260 Park Street, Alameda, Alameda County, California (Site). This report contains the results of an on-site vapor intrusion assessment.

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

Sincerely,

BROADBENT & ASSOCIATES, INC.

Thomas A. Venus
Senior Engineer, PE

Enclosures

cc: Ms. Dilan Roe, PE, Alameda County Environmental Health (Submitted via ACEH ftp site)
Electronic copy uploaded to GeoTracker

VAPOR INTRUSION ASSESSMENT REPORT
Atlantic Richfield Company Station #2112
1260 Park Street, Alameda, California

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Atlantic Richfield Company Station #2112
1260 Park Street, Alameda, California

1.0 INTRODUCTION

On behalf of the Atlantic Richfield Company, RM - a BP affiliated company, Broadbent & Associates, Inc. (Broadbent) has prepared this *Vapor Intrusion Assessment Report* concerning Atlantic Richfield Company Station #2112, located at 1260 Park Street, Alameda, Alameda County, California (Site). The vapor intrusion assessment activities were conducted following the *Addendum to Vapor Intrusion Assessment Work Plan* (Broadbent, 5/31/2012). This document includes discussions on the site background, descriptions of soil gas sampling procedures, laboratory analyses, discussion of results, conclusions and recommendations. Drawings and appendices referenced within this document are provided following the conclusion of the document's text.

2.0 SITE BACKGROUND

The Site is an active ARCO-branded gasoline retail outlet located on the southern corner of Park Street and Encinal Avenue in Alameda, California (Drawing 1 and Drawing 2). The land use in the immediate vicinity of the Site is mixed commercial and residential. The Site consists of a service station building and four gasoline underground storage tanks (USTs) with associated piping and dispensers. The Site is covered with asphalt or concrete surfacing except for planters along the northwest, northeast, and southeast property boundaries containing mature trees. The Fuel Leak Case Number assigned by the Alameda County Environmental Health (ACEH) is RO0000044 / GeoTracker Global ID No. T0600100083.

Numerous subsurface investigations and remedial activities have been conducted on-site since 1987. A comprehensive Site history can be found within the *Vapor Intrusion Assessment Work Plan* (Broadbent, 10/26/2009). Of special significance within the history of previous environmental investigations was that in 2009 Stratus Environmental field personnel observed RSI Drilling advance three borings on the eastern side of the Station Building around the former UST pits. Soil samples under the influence of groundwater were collected at a depth of 11 feet from boring B-8. Within this sample Gasoline Range Organics (GRO, hydrocarbon chain lengths between C6-C12) were detected at 2,000 milligrams per kilogram (mg/kg, or parts per million, ppm). Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX) were also detected in this same sample at concentrations of 0.23 mg/kg, 14 mg/kg, 18 mg/kg, and 210 mg/kg, respectively. The location of boring B-8 is shown on Drawing 2.

In the letter dated September 3, 2009, ACEH thought it conceivable that Benzene concentrations reported in the *Soil & Groundwater Investigation Report* (Broadbent, 5/20/2009) were indicative of vadose zone soil conditions that might potentially pose a vapor intrusion risk at the Site. In response, Broadbent proposed to perform a vapor intrusion assessment using active soil gas sampling in the vicinity of the Station Building from two soil gas boring locations on the southeast side of the Station Building (*Vapor Intrusion Assessment Work Plan*, Broadbent, 10/26/2009). The first soil gas boring location (SG-1) was proposed to be located between 2009 soil boring B-8 discussed above, and the Station Building. The second soil gas boring location (SG-2) was proposed to be located approximately five feet from the Station Building approximately midway between SG-1 and the east corner of the Station Building. The proposed soil gas locations were thus located above an area of suspected residual contamination to the

groundwater by petroleum hydrocarbons, an appreciable distance from the existing vapor well AV-4 which might have allowed short-circuiting of soil gas, and close to the foundation slab for the Station Building to closely represent sub-slab conditions.

In the letter dated February 10, 2010, ACEH expressed concerns about the sampling depths initially proposed and requested revisions to the previously submitted work plan. Broadbent subsequently submitted the *Revised Vapor Intrusion Assessment Work Plan* on April 15, 2010. Prior to the receipt of comments or approval from ACEH, Broadbent submitted a *Case Evaluation and Justification for No Further Action* report for the Site dated May 31, 2010. In this report, Broadbent presented the numerous findings of the California State Water Resources Control Board (SWRCB) that there was no need to assess the vapor intrusion pathway with low concentrations of dissolved petroleum hydrocarbons in groundwater (i.e. Benzene less than 1 mg/L and GRO less than 10 mg/L) and greater than five feet separation between a contaminant source and building. According to the SWRCB draft guidance referenced, there had been no published examples of petroleum vapor intrusion for this condition and that modeling studies indicated that bioattenuation would limit the potential for vapor intrusion (SWRCB, 2009a, 2009b, 2010a, 2010b).

In their letter dated August 12, 2010, ACEH responded that the *Revised Vapor Intrusion Assessment Work Plan* submitted by Broadbent on April 15, 2010 was acceptable to implement. Through phone calls and emails Broadbent requested that instead of implementing any vapor intrusion assessment, ACEH instead consider and respond to the *Case Evaluation and Justification for No Further Action* report submitted by Broadbent on May 31, 2010. In their letter dated October 27, 2011, ACEH responded that the draft guidance could not be considered until such legislation was formally adopted, and again requested the implementation of the approved *Revised Vapor Intrusion Assessment Work Plan* submitted by Broadbent on April 15, 2010.

In the meantime, the California Environmental Protection Agency Department of Toxic Substances Control (DTSC), along with the Los Angeles Regional Water Quality Control Board (LARWQCB) and San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) issued new guidelines in their *Advisory – Active Soil Gas Investigations* (April 2012). This new advisory, along with comments from Atlantic Richfield Company's Remediation & Engineering Technology Group Leader in vapor intrusion regarding changes in industry practice and quality assurance. Therefore, Broadbent submitted an *Addendum to Vapor Intrusion Assessment Work Plan* for the Site dated May 31, 2012. Contained therein were the revised installation and sampling procedures implemented in this investigation.

It should also be noted that in the interim, the SWRCB adopted Resolution No. 2012-16: *Approve a Substitute Environmental Document and Adopt a Proposed Water Quality Control Policy for Low-Threat UST Case Closure* on May 1, 2012. This resolution and the underlying policy were codified into the California Code of Regulations, Title 23, Division 3, Chapter 22, Section 2923 – *Low-Threat UST Case Closure Policy* on July 30, 2012, making into law the draft guidelines referenced in the *Case Evaluation and Justification for No Further Action* report submitted by Broadbent on May 31, 2010.

3.0 VAPOR INTRUSION ASSESSMENT

3.1 Preliminary Field Activities

Prior to initiating field activities, Broadbent obtained the necessary Well Drilling Permit No. 2011-0765 from the Alameda County Public Works Agency – Water Resources Section (ACPWA). A copy of this permit is provided within Appendix A. Broadbent also prepared a Health & Safety Plan (HASP) specific to the Site and work scope. The proposed boring locations at the Site were next cleared of conflicts with existing subsurface utilities and infrastructure. The utility clearance included notifying Underground Services Alert (USA-North) of the work a minimum of 48-hours prior to initiating the field investigation, and additionally securing the services of Cruz Brothers Locators, a private underground utility locating subcontractor to confirm the absence of underground utilities at the boring locations.

3.2 Soil Borings

With the objective of developing vertical concentration profiles if necessary, two soil gas monitoring implants were to be advanced at each boring location: an "A" or 3.5-4 ft bgs shallow soil gas monitoring implant and a "B" or 5.5-6 ft bgs deeper soil gas monitoring implant. Soil borings for soil gas sampling locations SG-1A, SG-1B, SG-2A, and SG-2B were advanced on June 15, 2012 by WDC Exploration & Wells (WDC) by 3.25-inch diameter hand auger. Borings SG-1A and SG-2A were advanced to a total depth of four feet below ground surface (ft bgs). Borings SG-1B and SG-2B were advanced to a total depth of six ft bgs. Underneath 6 inches of bituminous asphalt pavement (typical in the four borings), soil encountered in boring SG-1A was silty sand with gravel, well graded/poorly sorted fine to medium coarse sand (Unified Soil Classification System/USCS designation "SM"). Soil encountered in boring SG-1B was silty sand with gravel, poorly sorted (USCS designation "SM"). Soil encountered in boring SG-2B was silty sand, fine-grained, poorly sorted with some rocks and cobbles, with cobbles declining after two ft bgs (USCS designation "SM"). Boring SG-2A encountered a cement concrete slab 1.5 ft thick below the asphalt pavement at the surface. It is suspected that this concrete slab was associated with the former remediation compound at the Site. Below the concrete, soil encountered in boring SG-2A was silty sand (USCS designation "SM"). Field notes and boring logs are provided in Appendix A. A GEO_MAP depicting the boring locations was uploaded to the GeoTracker AB2886 database.

3.3 Construction of Soil Gas Monitoring Implants

The soil gas sampling implants were constructed by placing a 6-inch long soil gas probe at the bottom of each boring attached to 1/8-inch diameter NylaFlow tubing extending to the surface. The soil gas probes were constructed of double-woven stainless steel wire mesh screen with a pore opening diameter of 0.013-inch. Soil gas sampling implants SG-1A and SG-2A were constructed with a filter pack of No.2/12 sorted sand from 3-4 ft bgs, dry Bentonite from 2.5-3 ft bgs, hydrated Bentonite from 2-2.5 ft bgs, and neat Portland cement from 2 ft bgs to the surface. Soil gas sampling implants SG-1B and SG-2B were constructed similarly with a filter pack of No.2/12 sorted sand from 5-6 ft bgs, dry Bentonite from 4.5-5 ft bgs, hydrated Bentonite from 4-4.5 ft bgs, and neat Portland cement from 4 ft bgs to the surface. The soil gas sampling implants

were completed with flush-mounted, 6-inch diameter traffic-rated well vault, set in a cement concrete surface seal to match existing grade. Construction details are provided within Appendix A on the Well Completion Reports prepared by WDC and submitted to ACPWA and California Department of Water Resources in accordance with the ACPWA permit requirements. Boring/well completion logs (GEO_BORE files) were uploaded to the GeoTracker AB2886 database.

3.4 Soil Gas Sampling Procedures

Soil gas sampling activities were completed on June 28-29, 2012. No precipitation had been recorded in the area within the previous 24-hour period. Six-liter Summa® canisters were used to collect the samples for analysis. The Summa canisters were shipped by the laboratory under high vacuum, leak checked, and batch certified to be free of contaminants. Each initial canister vacuum was measured before use and verified to be -30 inches of Mercury (in.Hg).

After setting up a secure and barricaded work area, the sampling train was assembled. The 1/8-inch diameter Nylaflow tubing coming from the soil gas monitoring implant was connected to a Swagelok valve. Behind the Swagelok valve was an in-line vacuum gauge then a tee, which branched one short 1/8-inch line to the Summa canister (with its own vacuum gauge) and the other short 1/8-inch line to a three-way valve on the tip of a 60 cubic centimeter (cc) calibrated syringe.

With the valve to the soil gas monitoring implant closed, the sampling train was checked for leaks during a "shut-in" leak test by applying with the calibrated syringe a vacuum of at least -15 inches Mercury (in.Hg) for a period of 5 minutes (-15 in.Hg is 100 percent above the standard threshold of -7.5 in.Hg, considered representative of "No Flow" conditions). When the applied vacuum did not drop over the 5 minutes, the vacuum test indicated that the sampling train was leak-tested tight. Observations were recorded on the field notes, contained within Appendix A.

After the shut-in leak test, the closed valve to the soil gas monitoring implant was opened and the sampling train slowly purged of three calculated interior volumes using the calibrated syringe. Following completion of purging, a clear plastic shroud was setup over the sampling train to contain the chemical tracer/leak-check compound (Helium gas) that was to be released within. The shroud was placed to completely cover the soil gas sampling implant wellhead, its aboveground tubing, and the tubing, fittings, sample Summa canister and calibrated purge syringe that made up the sampling train. Once setup, Helium gas was released via tubing under the shroud. A Radiodetection Model MGD-2002 Helium Detector was used to monitor the concentration within the shroud by placing its probe within. Prior to and during sampling an attempt was made to create and maintain a positive-pressure concentration of approximately 20 percent Helium within the shroud using the compressed gas cylinder's flow regulator. Helium concentrations within the shroud were recorded in the field notes at one-minute intervals.

Once a positive-pressure Helium atmosphere was created under the shroud, the valve to the Summa canister was opened and the sample was collected. The sampling rates into the Summa canister were fixed by the laboratory-supplied critical orifice assemblies (flow regulator) with 0.0060 inch orifice allowing approximately 200 standard cc per minute (cc/min). Samples were

collected into the Summa canisters until the vacuum had dropped from -30 in.Hg to -5 in.Hg. Sample start times, end times, starting vacuums, ending vacuums, and Helium concentrations during sampling were recorded on the field notes, contained in Appendix B and summarized in Table 1.

Helium was used as the quality assurance tracer compound during sampling of soil gas monitoring implants SG-2A and SG-2B. However, the supply of Helium ran out before sampling of soil gas monitoring implants SG-1A or SG-1B. Seventy-percent Isopropyl Alcohol (aka Isopropanol, IPA) was used as an alternative quality assurance tracer compound during sampling of soil gas monitoring implants SG-1A and SG-1B. The IPA was poured onto paper towels and the moist towels laid over the connection fittings of the sampling train. The shroud was again placed over the wellhead, aboveground tubing, fittings, sample Summa canister and calibrated syringe that made up the sampling train.

Finally, for comparison purposes, one Summa canister was used to collect an ambient air sample (identified as 'Ambient') from the ground level just outside the door into the Station Building. No leak-check compound was required or utilized for this Ambient sample.

3.5 Laboratory Analysis of Soil Gas Samples

Collected samples were submitted promptly under chain-of-custody protocol to Calscience Environmental Laboratories, Inc. in Garden Grove, California (CA-ELAP #1230, NELAP #03220CA). Soil gas samples were analyzed for GRO (C6-C12) by EPA Method TO-3, and for BTEX, Methyl Tertiary Butyl Ether (MTBE), Tertiary Butyl Alcohol (TBA), Di-Isopropyl Ether (DIPE), Ethyl Tertiary Butyl Ether (ETBE), Tertiary Amyl Methyl Ether (TAME), Ethanol and IPA (tracer/leak check compound) by EPA Method TO-15. Soil gas samples were also analyzed for Oxygen (O_2) and Argon, Carbon Dioxide (CO_2), Methane (CH_4), and Helium (tracer/leak-check compound) by Modified Method ASTM D-1946. Laboratory analyses for soil gas samples were performed in accordance with the EPA standard holding times for Summa canisters.

No significant irregularities were reported during laboratory analysis of the soil gas samples. The laboratory analytical report for the soil gas samples, including chain-of-custody documentation, is provided in Appendix C. Soil gas sample laboratory analytical results are summarized in Table 2, along with Environmental Screening Levels (ESLs) for shallow soil gas (commercial/industrial land use, and residential land use) established by the California Regional Water Quality Control Board, San Francisco Bay Region (SFRWQCB).

As summarized in Table 2, Benzene was detected at 2.2 micrograms per cubic meter ($\mu g/m^3$) in sample SG-1A, 1.6 $\mu g/m^3$ in sample SG-2A, and 1.7 $\mu g/m^3$ in the Ambient sample. These detected concentrations were very close to the laboratory reporting limit of 1.6 $\mu g/m^3$. Toluene was detected at 3.3 $\mu g/m^3$ in sample SG-1B, and 11 $\mu g/m^3$ in the Ambient sample. Ethylbenzene was detected at 3.1 $\mu g/m^3$ in sample SG-2A, and 2.4 $\mu g/m^3$ in the Ambient sample. Finally, TBA was detected in sample SG-1B at 11 $\mu g/m^3$ and sample SG-2A at 36 $\mu g/m^3$. The remaining petroleum hydrocarbon contaminants GRO, Total Xylenes, MTBE, ETBE, DIPE, TAME, and Ethanol were not detected above the analyte-specific laboratory reporting limits given. The tracer/leak-check compound Helium was found in samples SG-2A and SG-2B at very minor

concentrations of 0.0324 percent and 0.0668 percent, respectively. The tracer/leak-check compound IPA was found in samples SG-1A and SG-1B at the minor concentrations of 140 $\mu g/m^3$and 370 $\mu g/m^3$, respectively.

3.6 Discussion of Vapor Intrusion Assessment Results

Taken at their laboratory reported values, none of the petroleum hydrocarbon contaminant concentrations detected in the soil gas samples exceeded their respective ESLs for shallow soil gas in the applicable commercial/industrial land use scenario, or even in the more restrictive residential land use scenario. However, the detection of the tracer/leak check compound Helium in samples SG-2A and SG-2B requires that these sample results be further qualified due to the effect of minor dilution. As 0.0324 percent Helium was detected in sample SG-2A when the concentration within the shroud was a time-weighted average of 23.4 percent means that the laboratory reported concentrations should be adjusted upwards by a dilution factor of 0.00138 (0.0324 divided by 23.4). Similarly, as 0.0668 percent Helium was detected in sample SG-2B when the concentration within the shroud was a time-weighted average concentration of 19.5 percent means that the laboratory reported concentrations should be adjusted upwards by the dilution factor of 0.00342 (0.0668 divided by 19.5). These factors are well below the five percent dilution deemed acceptable by the most current guidelines (*Advisor – Active Soil Gas Investigations*, DTSC/LARWQCB/SFBRWQCB, April 2012). Obviously, detected concentrations re-quantified so very slightly are still significantly below the ESLs. This means that concentrations of petroleum hydrocarbons in soil gas migrating through the vadose zone in the vicinity of SG-2 do not present an unacceptable risk for exposure within the Station Building via the migration to indoor air pathway model.

The detection of tracer/leak check compound IPA in samples SG-1A and SG-1B requires that these sample results be further qualified also. However, in this case no comparable concentrations of IPA within the sampling shroud were made, precluding a similar dilution calculation and adjustment as was made above for samples SG-2A and SG-2B. However, it should be noted that the same individuals collected both sets of samples, just one day apart, under similar meteorological conditions, using the same sampling methodology, with the exception of using a different tracer/leak check compound. In fact, subsurface concentration results were quite similar between the two pairs of samples, including the Oxygen and Carbon Dioxide results. To discount the results of samples SG-1A and SG-1B completely would be a mistake. Results from sampling SG-1A and SG-1B should be considered acceptable on this basis. It is very highly probable that the concentrations of petroleum hydrocarbons are still significantly below the ESLs. Therefore soil gas migrating through the vadose zone in the vicinity of SG-1 (between the former UST pit and near historic boring B-8) does not present an unacceptable risk for exposure within the Station Building via the migration to indoor air pathway model.

It should also be noted that the slightly depleted Oxygen concentrations (between 17.1-20.0 percent) and increased Carbon Dioxide concentrations (between 2.00-5.32 percent) reported in subsurface soil gas samples provides direct albeit secondary evidence of active aerobic microbiological respiration in the subsurface, indicating that bioremediation or at least bioattenuation is occurring.

Finally, the concentrations of Benzene (1.7 µg/m^3), Toluene (11 µg/m^3), Ethylbenzene (2.4 µg/m^3), and Ethanol (16 µg/m^3) reported in the Ambient sample were below their corresponding ESLs. These low concentrations are not considered to be a hazard, although they do indicate existing onsite concentrations above the slab outside the entrance door of the Station Building on the day and time sampled.

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

Broadbent prepared this *Vapor Intrusion Assessment Report* for Station #2112 following implementation of the scope of work proposed in the *Addendum to Vapor Intrusion Assessment Work Plan* (Broadbent, 5/31/2012). Based on the observations and results, the following can be concluded:

- Four soil gas monitoring implants were competently constructed on the southeastern side of the Station Building, between the wall of the building and the former edge of the UST excavation pit in an area where an historic boring sample indicated contamination of soil under the influence of groundwater by petroleum hydrocarbons. Two soil gas monitoring implants (SG-1A and SG-2A) were constructed with screen probe intervals between 3.5-4.0 ft bgs, and two soil gas monitoring implants (SG-1B and SG-2B) were constructed with screened probe intervals between 5.5-6.0 ft bgs.
- No GRO, Total Xylenes, MTBE, ETBE, DIPE, TAME, TBA or Ethanol were detected in the four soil gas samples collected.
- Low concentrations of Benzene (SG-1A and SG-2A), Toluene (SG-1B), Ethylbenzene (SG-2A) and TBA (SG-1B and SG-2A) were detected in some of the soil gas samples.
- The low concentrations of Benzene detected in SG-1A (2.2 µg/m^3) and SG-2A (1.6 µg/m^3) were not significantly different from the concentration detected in the Ambient air sample (1.7 µg/m^3) at least within laboratory uncertainty.
- Very low concentrations of the tracer/leak check compound Helium were detected in the samples SG-2A and SG-2B. When the field personnel ran out of Helium, they used IPA as a tracer/leak check compound during sampling of SG-1A and SG-1B. Similarly, very low concentrations of the tracer/leak check compound IPA were detected in the samples from SG-1A and SG-1B.
- Comparison of the very low concentrations of the Helium tracer/leak check compound within samples SG-2A and SG-2B to the time-weighted average concentrations within the shroud during their sampling show extremely low dilution factors of 0.00138 and 0.00342, respectively. These dilution rates are well below the five percent deemed acceptable in the most current guidelines.
- When the SG-2A and SG-2B sample results were adjusted by their respective dilution rates they were still several orders of magnitude below the ESLs for shallow soil gas in

the appropriate commercial/ industrial land use scenario, and even the residential land use scenario.

- The lack of field measurements of the tracer/leak check compound IPA from within the shroud during sampling at SG-1A and SG-1B prevents the calculation of a dilution rate. However, as the same field personnel collected both sets of samples, just one day apart, under similar meteorological conditions, using the same sampling methodology, with the exception of using a different tracer/leak check compound, it is very highly probable that the concentrations of petroleum hydrocarbons in SG-1A and SG-1B are still very significantly below the ESLs.
- The absence of petroleum hydrocarbon contaminants at concentrations in soil gas above the ESLs indicates that the vapor intrusion to indoor air pathway does not present an unacceptable risk for exposure within the building at Station #2112.

4.2 Recommendations

Based on the information obtained and presented in this report, the following recommendations are presented:

- No conditions were encountered or observed which justify further investigation, characterization or remediation with respect to petroleum hydrocarbons in soil gas at the Site. It is recommended that ACEH proceed with processing the case closure and issue a certificate of remedial action completion.

5.0 CLOSURE

The findings presented in this document are based upon: observation of Broadbent personnel, the points investigated, and results of laboratory tests performed by Calscience Environmental Laboratories, Inc. (Garden Grove, California). Our services were performed in accordance with the generally accepted standard of practice at the time this document was written. No other warranty, expressed on implied was made. This report has been prepared for the exclusive use of Atlantic Richfield Company. It is possible that variations in soil or ground-water 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.

6.0 REFERENCES

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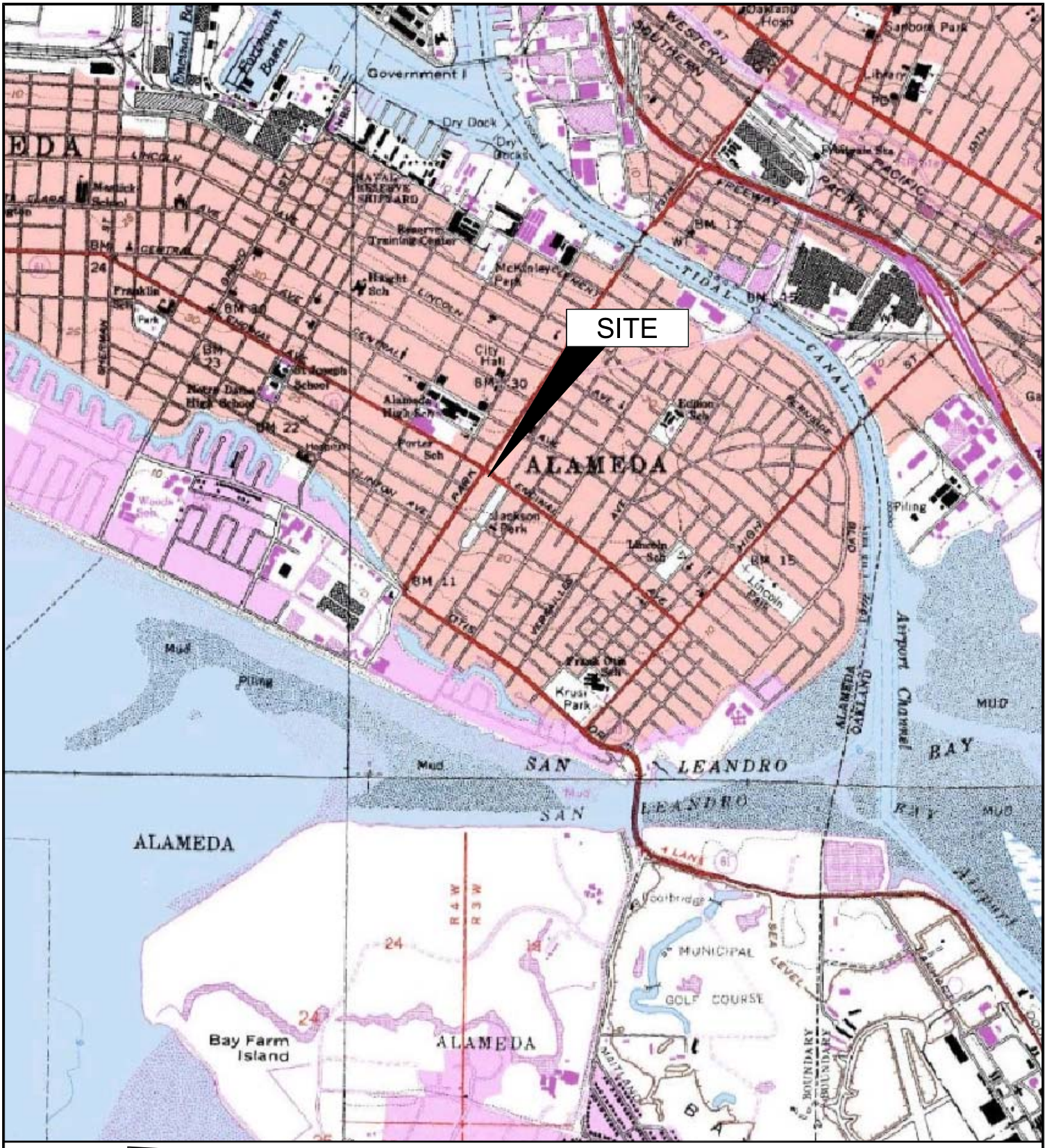


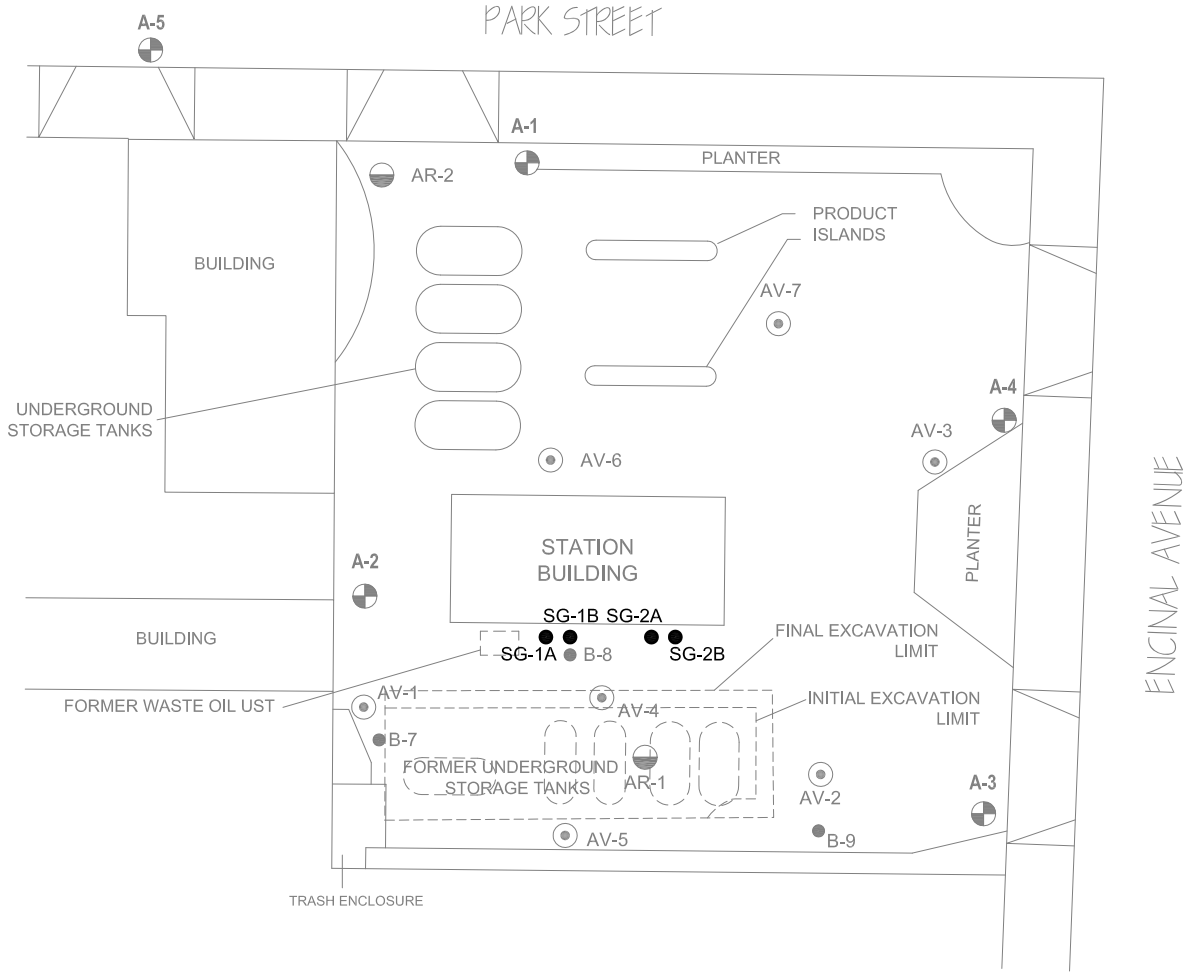
IMAGE SOURCE: USGS

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
1324 Mangrove Ave. Suite 212, Chico, CA 95926
Project No.: 06-88-616 Date: 07/27/09

Station #2112
1260 Park Street
Alameda, California

Site Location Map

Drawing
1



LEGEND:

SG-2B	SOIL-GAS MONITORING IMPLANT
A-1	MONITORING WELL LOCATION
AR-1	GROUND-WATER EXTRACTION WELL LOCATION
AV-1	VAPOR EXTRACTION WELL LOCATION
B-9	RECENT BORING LOCATION
- - - - - -	EXCAVATED AREA

0 40 80

SCALE (ft)

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
1324 Mangrove Ave. Suite 212, Chico, California 95926
Project No.: 06-88-616 Date: 7/20/2012

Station #2112
1260 Park Street
Alameda, California

Site Map with Soil-Gas Monitoring Implant Locations

Drawing
2

Table 1 - Soil Gas Sampling Field Data
Station #2112, 1260 Park Street, Alameda, California

Sample ID	SG-2A	SG-2B	SG-1A	SG-1B	Ambient
Sample Date	6/28/2012	6/28/2012	6/29/2012	6/29/2012	6/28/20102
Shut-In Start Time	11:56	13:42	11:10	12:04	--
Shut-In Start Vac.	-16.5	-15.0	-16.0	-15.0	--
Shut-In End Time	12:01	13:47	11:15	12:09	--
Shut-In End Vac.	-16.5	-15.0	-16.0	-15.0	--
Purge Volume	52.5	63.0	53.0	63.0	--
Purge Start Time	12:22	13:47	11:09	12:03	--
Purge End Time	12:22	13:47	11:09	12:03	--
Summa Can. ID#	D080	D633	D311	D664	D179
Flow Orifice ID#	A336	A289	A115	A381	--
Sample Start Time T	12:46	13:58	11:17	12:13	14:45
Sample Start Vac.	-30.0	-30.0	-30.0	-30.0	-30.0
Helium Concentrations	21.1	21.0	--	--	--
T+1 min	24.3	19.0	--	--	--
T+2 min	20.7	16.0	--	--	--
T+3 min	29.1	23.0	--	--	--
T+4 min	28.1	19.7	--	--	--
T+5 min	25.7	19.0	--	--	--
T+6 min	21.3	21.0	--	--	--
T+7 min	26.2	23.0	--	--	--
T+8 min	26.0	21.0	--	--	--
T+9 min	23.3	20.0	--	--	--
T+10 min	22.0	22.0	--	--	--
T+11 min	24.0	21.0	--	--	--
T+12 min	23.0	16.0	--	--	--
T+13 min	21.6	17.0	--	--	--
T+14 min	23.2	19.0	--	--	--
T+15 min	22.9	18.0	--	--	--
T+16 min	26.0	19.0	--	--	--
T+17 min	29.4	20.0	--	--	--
T+18 min	28.0	19.0	--	--	--
T+19 min	25.0	27.0	--	--	--
T+20 min	22.0	17.0	--	--	--
T+21 min	19.0	18.0	--	--	--
T+22 min	22.0	19.0	--	--	--
T+23 min	21.0	18.0	--	--	--
T+24 min	22.0	19.0	--	--	--
T+25 min	21.0	20.0	--	--	--
T+26 min	19.0	19.0	--	--	--
T+27 min	17.0	17.0	--	--	--
T+28 min	--	17.0	--	--	--
T+29 min	--	21.0	--	--	--
T+30 min	--	21.0	--	--	--
T+31 min	--	21.0	--	--	--
T+32 min	--	15.0	--	--	--
Sample End Time	13:13	14:30	11:45	12:44	14:46
Elapsed Time	0:27	0:32	0:28	0:31	0:01
Sample End Vac.	-5.0	-5.0	-5.0	-5.0	-5.0
TWA Helium Conc.	23.4	19.5	--	--	--

Notes:

(1) Vacuums recorded in negative inches Mercury (in. Hg)
(2) Purge volume recorded in cubic centimeters (cc)
(3) Helium Concentrations recorded in percent (%)

Table 2 - Soil Gas Sampling Laboratory Analytical Results
Station #2112, 1260 Park Street, Alameda, California

Sample ID	Sample Date	GRO (C6-C12) (mg/m^3)	Benzene ($\mu g/m^3$)	Toluene ($\mu g/m^3$)	Ethyl-benzene ($\mu g/m^3$)	Total Xylenes ($\mu g/m^3$)	MTBE ($\mu g/m^3$)	ETBE ($\mu g/m^3$)	DIPE ($\mu g/m^3$)	TAME ($\mu g/m^3$)	TBA ($\mu g/m^3$)	Ethanol ($\mu g/m^3$)	IPA ($\mu g/m^3$)	Helium (%)	Oxygen + Argon (%)	Carbon Dioxide (%)	Methane (%)
SG-1A	6/29/2012	<38	**2.2**	<1.9	<2.2	<8.7	<7.2	<8.4	<8.4	<8.4	<6.1	<9.4	**140**	<0.0100	**20.0**	**2.00**	<0.500
SG-1B	6/29/2012	<38	<1.6	**3.3**	<2.2	<8.7	<7.2	<8.4	<8.4	<8.4	**11**	<9.4	**370**	<0.0100	**19.1**	**3.28**	<0.500
SG-2A	6/28/2012	<38	**1.6**	<1.9	**3.1**	<8.7	<7.2	<8.4	<8.4	<8.4	**36**	<9.4	<12	**0.0324**	**18.7**	**3.29**	<0.500
SG-2B	6/28/2012	<38	<1.6	<1.9	<2.2	<8.7	<7.2	<8.4	<8.4	<8.4	<6.1	<9.4	<12	**0.0668**	**17.1**	**5.32**	<0.500
Ambient	6/28/2012	<38	**1.7**	**11**	**2.4**	<8.7	<7.2	<8.4	<8.4	<8.4	<6.1	**16**	<12	<0.0100	**22.1**	<0.500	<0.500
ESL-Residential		10 mg/m^3	84	63,000	980	21,000	9,400	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
ESL-Commercial		29 mg/m^3	280	180,000	3,300	58,000	31,000	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Notes:
(1) GRO analysis by EPA TO-3; Benzene through Isopropanol (IPA) analysis by EPA TO-15; $He/C_2+Ar/CO_2/CH_4$ analysis by ASTM D-1946.
(2) <X = Not detected above the given laboratory reporting limit (X) in milligrams per cubic meter (mg/m^3) or micrograms per cubic meter ($\mu g/m^3$)
(3) ESL-Res = Environmental Screening Level for shallow soil gas (residential land use); from California Regional Water Quality Control Board, San Francisco Bay Region (SFBRWQCB), May 2008.
(4) ESL-Comm = Environmental Screening Level for shallow soil gas (commercial or industrial land use); from SFBRWQCB, May 2008.
(5) n/a = ESL not available or not applicable.

APPENDIX A

SOIL GAS IMPLANT INSTALLATION PERMIT, FIELD NOTES AND BORING/WELL LOGS

Alameda County Public Works Agency - Water Resources Well Permit

399 Elmhurst Street
Hayward, CA 94544-1395
Telephone: (510)670-6633 Fax:(510)782-1939

Application Approved on: 12/16/2011 By jamesy

Permit Numbers: W2011-0765
Permits Valid from 06/15/2012 to 06/15/2012

Application Id:	1323989757116	**City of Project Site:**	Alameda
Site Location:	ARCO Sta. 2112, 1260 Park St, Alameda, CA 94501		
Project Start Date:	12/30/2011	**Completion Date:**	12/30/2011
Extension Start Date:	06/15/2012	**Extension End Date:**	06/15/2012
Extension Count:	1	**Extended By:**	vickyh1

Assigned Inspector: Contact Vicky Hamlin at (510) 670-5443 or vickyh@acpwa.org

Applicant:	Broadbent & Associates, Inc. - Thomas Venus 1324 Mangrove Ave, #212, Chico, CA 95926	**Phone:** 530-566-1400
Property Owner:	M&S Mini Mart Inc. 1260 Park St, Alameda, CA 94501	**Phone:** 562-755-3071
Client:	Atlantic Richfield Co. PO Box 1257, San Ramon, CA 94583	**Phone:** 925-275-3804 x

	Total Due:	$265.00
Receipt Number: WR2011-0374	**Total Amount Paid:**	$265.00
Payer Name : Broadbent & Associates, Inc.	Paid By: CHECK	**PAID IN FULL**

Works Requesting Permits:

Well Construction-Vapor monitoring well-Vapor monitoring well - 4 Wells
Driller: WDC Exploration Geoservices - Lic #: 283326 - Method: Hand **Work Total: $265.00**

Specifications

Permit #	Issued Date	Expire Date	Owner Well Id	Hole Diam.	Casing Diam.	Seal Depth	Max. Depth
W2011-0765	12/16/2011	03/29/2012	SG-1A	3.00 in.	0.25 in.	2.50 ft	3.50 ft
W2011-0765	12/16/2011	03/29/2012	SG-1B	3.00 in.	0.25 in.	4.50 ft	5.50 ft
W2011-0765	12/16/2011	03/29/2012	SG-2A	3.00 in.	0.25 in.	2.50 ft	3.50 ft
W2011-0765	12/16/2011	03/29/2012	SG-2B	3.00 in.	0.25 in.	4.50 ft	5.50 ft

Specific Work Permit Conditions

1. Drilling Permit(s) can be voided/ cancelled only in writing. It is the applicant's responsibility to notify Alameda County Public Works Agency, Water Resources Section in writing for an extension or to cancel the drilling permit application. No drilling permit application(s) shall be extended beyond ninety (90) days from the original start date. Applicants may not cancel a drilling permit application after the completion date of the permit issued has passed.

2. Compliance with the above well-sealing specifications shall not exempt the well-sealing contractor from complying with appropriate state reporting-requirements related to well destruction (Sections 13750 through 13755 (Division 7, Chapter 10, Article 3) of the California Water Code). Contractor must complete State DWR Form 188 and mail original to the Alameda County Public Works Agency, Water Resources Section, within 60 days, including permit number and site map.

3. Permittee shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend and save the Alameda County Public Works Agency, its officers, agents, and employees free and harmless from any and all expense, cost, liability in connection with or resulting from the exercise of this Permit including, but not limited to, properly damage, personal injury and wrongful death.

4. Permittee, permittee's contractors, consultants or agents shall be responsible to assure that all material or waters generated during drilling, boring destruction, and/or other activities associated with this Permit will be safely handled, properly managed, and disposed of according to all applicable federal, state, and local statutes regulating such. In no case shall these materials and/or waters be allowed to enter, or potentially enter, on or off-site storm sewers, dry wells, or waterways or be allowed to move off the property where work is being completed.

5. Prior to any drilling activities, it shall be the applicant's responsibility to contact and coordinate an Underground Service Alert (USA), obtain encroachment permit(s), excavation permit(s) or any other permits or agreements required for that Federal, State, County or City, and follow all City or County Ordinances. No work shall begin until all the permits and requirements have been approved or obtained. It shall also be the applicants responsibilities to provide to the Cities or to Alameda County an Traffic Safety Plan for any lane closures or detours planned. No work shall begin until all the permits and requirements have been approved or obtained.

6. No changes in construction procedures or well type shall change, as described on this permit application. This permit may be voided if it contains incorrect information.

7. Applicant shall contact Vicky Hamlin for an inspection time at 510-670-5443 or email to vickyh@acpwa.org at least five (5) working days prior to starting, once the permit has been approved. Confirm the scheduled date(s) at least 24 hours prior to drilling.

8. Wells shall have a Christy box or similar structure with a locking cap or cover. Well(s) shall be kept locked at all times. Well(s) that become damaged by traffic or construction shall be repaired in a timely manner or destroyed immediately (through permit process). No well(s) shall be left in a manner to act as a conduit at any time.

9. Copy of approved drilling permit must be on site at all times. Failure to present or show proof of the approved permit application on site shall result in a fine of $500.00.

10. Vapor monitoring wells above water level constructed with tubing maybe be backfilled with pancake-batter consistency bentonite. Minimum surface seal thickness is two inches of cement grout around well box.

Vapor monitoring wells above water level constructed with pvc pipe shall have a minimum seal depth (Neat Cement Seal) of 2 feet below ground surface (BGS). Minimum surface seal thickness is two inches of cement grout around well box. All other conditions for monitoring well construction shall apply.

BROADBENT

DAILY REPORT

Page 1 of 1

Project: BP 2112 Project No.: 06-88-616

Field Representative(s): JR & KT Day: Friday Date: 6-15-12

Time Onsite: From: 0730 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 X Other PPE (describe) sun block

Weather: Sunny w/breeze; 60°F

Equipment In Use: ____

Visitors: Vicky Hamilton

TIME:	WORK DESCRIPTION:
0730	Arrived on-site; discussed scope of work
0800	WDC arrived on-site; proceeded w/safety meeting
0915	Conducted safety meeting; setup exclusion zone
0920	setup & clear borehole SG-2A
1015	Finished SG-2A install; proceeded to clear borehole SG-2B, SG1A, SG-1B while waiting for SG-2A to dry
1100	Initial SG-1B has pea gravel; redesignating SG-1A to SG-1B & relocating SG-1A
1110	SG-2B install complete; waiting to dry before adding well box
1120	applying concrete to SG-2A & SG-2B
1150	Vicky Hamilton arrives on-site; safety meeting & signed in
1200	Vicky Hamilton leaves site
1330	Signed out & left site

Signature: [signature]

Revision: 1/24/2012

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

LITHOLOGIC AND MONITOR WELL CONSTRUCTION LOG

PROJECT NAME: BP-2112 SITE ADDRESS: 1260 Park St., Alameda, CA

PROJECT NUMBER: _____ LEGAL DESC: _____ APN: _____

LOGGED BY: K. Tidwell FACILITY ID OR WAIVER: _____ NOI NUMBER: _____

DATE: 6/15/12 START: 1145 DRILLING COMPANY: WDC DRILLER: _____

WELLID: ~~SG-7A~~ SG-1A STOP: 12:15 DRILLING METHOD: Hand Auger SAMPLE METHOD: Hand Auger

DEPTH (FEET)	MONITOR WELL CONSTRUCTION DIAMETER: ____	SAMPLE ID	PID	MOISTURE	COLOR	CONSISTENCY	GRAIN SIZE CLASSIFICATION		REMARKS & ODORS
1				D	Brn		6" Asphalt		
2							Silty Sand w/ Gravel (20, 60, 20, 0) well graded/ poorly sorted	SM	No odor
3		SG-1A @ 3.5'	0				fine to medium coarse sand		
							3.5'		

TOTAL BORING DEPTH: 3.5' PAGE NO: 1 OF 1 ESTIMATED GROUND WATER DEPTH: NA

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

LITHOLOGIC AND MONITOR WELL CONSTRUCTION LOG

PROJECT NAME: BP 2112 SITE ADDRESS: 1260 Park St, Alameda

PROJECT NUMBER: _____ LEGAL DESC: _____ APN: _____

LOGGED BY: K. Tidwell FACILITY ID OR WAIVER: _____ NOI NUMBER: _____

DATE: 6/15/12 START: 1215 DRILLING COMPANY: WDC DRILLER: _____

WELLID: SG-1B STOP: 1245 DRILLING METHOD: Hand Auger SAMPLE METHOD: Hand Auger

DEPTH (FEET)	MONITOR WELL CONSTRUCTION DIAMETER: ____	SAMPLE ID	PID	MOISTURE	COLOR	CONSISTENCY	GRAIN SIZE / CLASSIFICATION	REMARKS & ODORS
1							6" Asphalt	
2							~~Hard gravel~~	
3							Silty Sand w/ gravel, poorly sorted	SM
4				D	Brn/Yellow		Mod est K	
5		SB-1B @ 5'					(20, 60, 30, 0)	

TOTAL BORING DEPTH: 5.5' PAGE NO: 1 OF 1 ESTIMATED GROUND WATER DEPTH: NA

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

LITHOLOGIC AND MONITOR WELL CONSTRUCTION LOG

PROJECT NAME: 2112 SITE ADDRESS: 1260 Park St, Alameda

PROJECT NUMBER: LEGAL DESC: APN:

LOGGED BY: K. Tidwell FACILITY ID OR WAIVER: NOI NUMBER:

DATE: 6/15/12 START: 9 AM DRILLING COMPANY: WDC DRILLER: [illegible]

WELLID: SG2-2A STOP: 945 DRILLING METHOD: Hand Auger SAMPLE METHOD:

DEPTH (FEET)	MONITOR WELL CONSTRUCTION DIAMETER:	SAMPLE ID	PID	MOISTURE	COLOR	CONSISTENCY	GRAIN SIZE / CLASSIFICATION	REMARKS & ODORS
1							6" Asphalt	No odor
							1.5' Concrete	
2				D	B		Silty Sand (0,80,20,0), low plast. mod est. K, SM	
3							"	few roots @ 3.25
4							bottom @ Probe 3.5'	
5								
6								
7								
8								
9								
10								

TOTAL BORING DEPTH: 3.5 PAGE NO: 1 OF 1 ESTIMATED GROUND WATER DEPTH:

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

LITHOLOGIC AND MONITOR WELL CONSTRUCTION LOG

PROJECT NAME: BP-2112 SITE ADDRESS: 1260 Park St. Alameda

PROJECT NUMBER: _____ LEGAL DESC: _____ APN: _____

LOGGED BY: K. Tidwell FACILITY ID OR WAIVER: _____ NOI NUMBER: _____

DATE: 6/15/12 START: 945 DRILLING COMPANY: WDC DRILLER: _____

WELLID: SG-2B STOP: 1015 DRILLING METHOD: Hand Auger SAMPLE METHOD: Hand Auger

DEPTH (FEET)	MONITOR WELL CONSTRUCTION DIAMETER: ___	SAMPLE ID	PID	MOISTURE	COLOR	CONSISTENCY	GRAIN SIZE / CLASSIFICATION		REMARKS & ODORS
1							6" Asphalt		
2				Dry	Brn		Silty Sand, fine grained, poorly sorted	SM	No odor
3							Some rocks, cobbles		
4							(10, 80, 30, 0)		
5			0				@ 2' - lesser cobbles		
6							Bottom - 5.5'		
7									
8									
9									
10									

TOTAL BORING DEPTH: 5.5 PAGE NO: 1 OF 1 ESTIMATED GROUND WATER DEPTH: NA

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

CONFIDENTIAL

STATE OF CALIFORNIA DWR
WELL COMPLETION REPORT
(WELL LOGS)

REMOVED

APPENDIX B

SOIL GAS SAMPLING FIELD NOTES

BROADBENT

DAILY REPORT

Page 1 of 1

Project: BP 2112 Project No.: 06-88-616

Field Representative(s): JR Day: Thursday Date: 6-28-12

Time Onsite: From: 0800 To: 1530 ; 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 / breezy

Equipment In Use: helium, Helium kit/tester

Visitors: _____

TIME:	WORK DESCRIPTION:
0715	Arrived at home depot in Oakland to buy supplies
0800	Arrived onsite; proceeded w/ paperwork & safety meeting
0840	Finish paper work & awaiting for truck
	that is blocking our GES sampling crew to move
0900	Setup on SG-2A
	- completed sampling @ ~~SG-2A~~ 1313
1325	Setup on SG-2B
	- completed Sampling @ 1441
1530	Packed up & left site

Signature: _____

Revision: 1/24/2012

BROADBENT

DAILY REPORT

Page 1 of 1

Project: BP 2112 Project No.: 06-88-616

Field Representative(s): JR/AM Day: Friday Date: 6.29.17

Time Onsite: From: 0900 To: 1315 ; 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
- ✓ Other PPE (describe) sun block

Weather: overcast

Equipment In Use: isopropyl

Visitors: _____

TIME:	WORK DESCRIPTION:
0700	Left for Equipco to return Helium kit
0730	Arrived @ Equipco / Proceeded to Home Depot after returning equipment
815	Left Home Depot & proceeded to BP 2112
0850	Arrived on-site, started paperwork
0900	Alex arrives on site, started safety meeting
0935	Setup on SG-1A -completed sampling @1145
1150	Setup on SG-1B -completed sampling @1244
1215	Alex signs out & leave site
~~1330~~	
1315	Signed out & left site for GSO
1325	Arrived at GSO & started packing samples
1400	Sent off samples
1500	Arrived at office/unpack

Signature: _____

Table 1 - Summa Canister Soil Vapor Sampling Field Data, 28 June 2012
BP 2112, 1260 Park Street, Alameda, California

Purge 52.5 ml 1246 ~~1240~~

Sample ID	COA#(1)	Can#(2)	Static Leak Test / Shut-In Test				Purging (COA# ____ Can.# ____)					Sampling				
			Start Time	End Time	Start Vac.	End Vac.	Start Time	End Time	Elapsed	Start Vac.	End Vac.	Start Time	End Time	Elapsed	Start Vac.	End Vac.
SG-2A	A336	D050	1150	1201	16.5	16.5	1222	1222				~~1240~~	1313	27	-30	-5
												Initial	~~1240~~	21.1	Helium %	
												+1	~~1241~~	24.3	Helium %	
												+2	~~1242~~	20.7	Helium %	
												+3	~~1243~~	24.1	Helium %	
												+4	~~1243~~	28.1	Helium %	
												+5	~~1249~~	25.7	Helium %	
												+6		21.3	Helium %	
												+7		~~26~~ 26.2	Helium %	
												+8		26	Helium %	
												+9		23.3	Helium %	
												+10		22	Helium %	
												+11		24	Helium %	
												+12		23	Helium %	
												+13		21.6	Helium %	
												+14		23.2	Helium %	
												+15		22.9	Helium %	
												+16		26	Helium %	
												+17		24.4	Helium %	
												+18		28	Helium %	
												+19		25	Helium %	
												+20		22	Helium %	
												+21		19	Helium %	
												+22		22	Helium %	
												+23		21	Helium %	
												+24		22	Helium %	
												+25		21	Helium %	

26 19

27 17

Notes:
(1) COA# = Critical Orifice Assembly Number (Laboratory-supplied flow regulator; 0.0060 inch orifice, approximately 200 standard cubic centimeters per second).
(2) Can# = Laboratory-supplied 1-liter Summa canister tracking number.
(3) Vacuums measured in inches Mercury.

Table 1 - Summa Canister Soil Vapor Sampling Field Data, 28 June 2012
BP 2112, 1260 Park Street, Alameda, California

Purge 63 mL (3 casing volumes

Sample ID	COA#(1)	Can#(2)	Static Leak Test / Shut-in Test				Purging (COA# A289, Can.# B633)					Sampling				
			Start Time	End Time	Start Vac.	End Vac.	Start Time	End Time	Elapsed	Start Vac.	End Vac.	Start Time	End Time	Elapsed	Start Vac.	End Vac.
SG-2B	A289	B633	1342	1647	-5	-5	1347	1347	0	-30	-5	1350	1440	1432	-30	-5
[redacted]												Initial		21	Helium %	
												+1		19	Helium %	
												+2		16	Helium %	
												+3		23	Helium %	
												+4		19.7	Helium %	
												+5		19	Helium %	
												+6		21	Helium %	
												+7		23	Helium %	
												+8		21	Helium %	
												+9		20	Helium %	
												+10		22	Helium %	
												+11		21	Helium %	
												+12		16	Helium %	
												+13		17	Helium %	
												+14		19	Helium %	
												+15		18	Helium %	
												+16		19	Helium %	
												+17		20	Helium %	
												+18		19	Helium %	
												+19		17	Helium %	
												+20		17	Helium %	
												+21		18	Helium %	
												+22		19	Helium %	
												+23		18	Helium %	
												+24		19	Helium %	
												+25		20	Helium %	
												+26		19		
												+27		17		
												+28		17		
												+29		21		
												+30		21		
												+31				
												+32		15		

Notes:
(1) COA# = Critical Orifice Assembly Number (Laboratory-supplied flow regulator; 0.0060 inch orifice, approximately 200 standard cubic centimeters per second).
(2) Can# = Laboratory-supplied 1-liter Summa canister tracking number.
(3) Vacuums measured in inches Mercury.

Table 1 - Summa Canister Soil Vapor Sampling Field Data, 28 June 2012
BP 2112, 1260 Park Street, Alameda, California

Purge 55ml

Sample ID	COA#(1)	Can#(2)	Static Leak Test / Shut-In Test				Purging (COA# _____, Can.# _____)					Sampling				
			Start Time	End Time	Start Vac.	End Vac.	Start Time	End Time	Elapsed	Start Vac.	End Vac.	Start Time	End Time	Elapsed	Start Vac.	End Vac.
SG-1A	A115	D311	1110	1115	16	16	1109	1109				1117	1145	28	-30	-5
												Initial			Helium %	
												+1			Helium %	
												+2			Helium %	
												+3			Helium %	
												+4			Helium %	
												+5			Helium %	
												+6			Helium %	
												+7			Helium %	
												+8			Helium %	
												+9			Helium %	
												+10			Helium %	
												+11			Helium %	
												+12			Helium %	
												+13			Helium %	
												+14			Helium %	
												+15			Helium %	
												+16			Helium %	
												+17			Helium %	
												+18			Helium %	
												+19			Helium %	
												+20			Helium %	
												+21			Helium %	
												+22			Helium %	
												+23			Helium %	
												+24			Helium %	
												+25			Helium %	

Notes:
(1) COA# = Critical Orifice Assembly Number (Laboratory-supplied flow regulator; 0.0060 inch orifice, approximately 200 standard cubic centimeters per second).
(2) Can# = Laboratory-supplied 1-liter Summa canister tracking number.
(3) Vacuums measured in inches Mercury.

C:\Users\JCR\Desktop\Copy of Perozzi_VIA_FieldForm

Table 1 - Summa Canister Soil Vapor Sampling Field Data, 28 June 2012
BP 2112, 1260 Park Street, Alameda, California

A381 Purge 63mL

Sample ID	COA#(1)	Can#(2)	Static Leak Test / Shut-In Test				Purging (COA# _____, Can.# _____)					Sampling				
			Start Time	End Time	Start Vac.	End Vac.	Start Time	End Time	Elapsed	Start Vac.	End Vac.	Start Time	End Time	Elapsed	Start Vac.	End Vac.
SG-18 ~~A381~~		D669	1209	1219	15	15	1203	1203				1213	1244	31	-30	-5
[redacted]												Initial			Helium %	
												+1			Helium %	
												+2			Helium %	
												+3			Helium %	
												+4			Helium %	
												+5			Helium %	
												+6			Helium %	
												+7			Helium %	
												+8			Helium %	
												+9			Helium %	
												+10			Helium %	
												+11			Helium %	
												+12			Helium %	
												+13			Helium %	
												+14			Helium %	
												+15			Helium %	
												+16			Helium %	
												+17			Helium %	
												+18			Helium %	
												+19			Helium %	
												+20			Helium %	
												+21			Helium %	
												+22			Helium %	
												+23			Helium %	
												+24			Helium %	
												+25			Helium %	

Notes:
(1) COA# = Critical Orifice Assembly Number (Laboratory-supplied flow regulator; 0.0060 inch orifice, approximately 200 standard cubic centimeters per second).
(2) Can# = Laboratory-supplied 1-liter Summa canister tracking number.
(3) Vacuums measured in inches Mercury.

Calscience Environmental Laboratories, Inc.
7440 LINCOLN WAY
GARDEN GROVE, CA 92841-1427
TEL: (714) 895-5494 FAX: (714) 894-7501

AIR CHAIN OF CUSTODY RECORD

DATE: 6-29-2012
PAGE: ____ OF ____

LABORATORY CLIENT: Broadbent & Associates	CLIENT PROJECT NAME / NUMBER: BP 2112 / 06-88-616
ADDRESS: 1324 Mangrove Avenue	PROJECT ADDRESS: 1260 Park Street, Alameda CA
CITY: Chico STATE: CA ZIP: 95926	CITY: Alameda STATE: CA ZIP:
TEL: 530-566-1400 E-MAIL: Tvenus@broadbentinc.com	PROJECT CONTACT: Tom Venus
TURNAROUND TIME: ☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☐ 10 DAYS	SAMPLER(S): (NAME / SIGNATURE) James R [signature]

P.O.NO.:

LAB CONTACT OR QUOTE NO.:

LAB USE ONLY ☐☐-☐☐☐☐

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)
☐ EDD

SPECIAL INSTRUCTIONS: - FOR SG-2A & SG-2B HELIUM TRACER WAS USED. FOR SG-1A & SG-1B, ISOPROPYL DRENCHED TOWELS OVER FITTINGS WAS USED.
- ANALYZE SG-1B & SG-2B FIRST. IF CONCENTRATION RESULTS EXCEED ESTABLISHED ESLs, ANALYZE SG-1A & SG-2A.

REQUESTED ANALYSES

LAB USE ONLY	SAMPLE ID	FIELD ID / Point of Collection	Air Type (I) Indoor (SV) Soil Vap. (A) Ambient	Sampling Equipment: Canister ID#	Canister Size 6L or 1L	Flow Controller ID #	Start Sampling: Date	Time (24 hr clock)	Canister Pressure ("Hg)	Stop Sampling: Date	Time (24 hr clock)	Canister Pressure ("Hg)	GRO by TO-3	BTEX, MTBE, ETHANOL, TBA, DIPE, ETBE, TAME BY TO-15	O2, Argon, CO2	Helium, Isopropyl Alcohol
1	SG-1A	SG WELL	SV	D311	6	A115	6/29/12	1117	-30	6/29/12	1145	-5	X	X	X	
2	SG-1B	↓	SV	D461	6	A361	6/29/12	1213	-30	6/29/12	1244	-5	X	X	X	
3	SG-2A	↓	SV	D080	6	A336	6/29/12	1240	-30	6/29/12	1313	-5	X	X	X	
4	SG-2B	↓	SV	D633	6	A289	6/29/12	1358	-30	6/29/12	1442	-5	X	X	X	
5	AMBIENT	STORE FRONT	A	D179	6		6/29/12	1445	-30	6/29/12	1446	-5	X	X	X	
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																

Relinquished by: (Signature) [signature] 6/29/12 1700	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

12/01/11 Revision

DISTRIBUTION: White with final report, Green and Yellow to Client.
Please note that pages 1 and 2 of 2 of our T/Cs are printed on the reverse side of the Green and Yellow copies respectively.

APPENDIX C

LABORATORY ANALYTICAL REPORT
WITH
CHAIN-OF-CUSTODY DOCUMENTATION

Calscience Environmental Laboratories, Inc.

Supplemental Report 1

Additional requested analyses have been added to the original report.

CALSCIENCE

WORK ORDER NUMBER: 12-06-2065

The difference is service

AIR | SOIL | WATER | MARINE CHEMISTRY

Analytical Report For

Client: Broadbent & Associates, Inc.

Client Project Name: BP 2112

Attention: Tom Venus
1324 Mangrove Ave, Ste 212
Chico, CA 95926-2642

Approved for release on 07/24/2012 by:
Richard Villafania
Project Manager

ResultLink

Email your PM

Calscience Environmental Laboratories, Inc.

Contents

Client Project Name: BP 2112
Work Order Number: 12-06-2065

Calscience Environmental Laboratories, Inc.

Client:	Broadbent & Associates, Inc. 1324 Mangrove Ave, Ste 212 Chico, CA 95926-2642	Work Order:	12-06-2065
		Project name:	BP 2112
		Received:	06/30/12 09:20
Attn:	Tom Venus		

DETECTIONS SUMMARY

Client Sample ID Analyte	Result	Qualifiers	Reporting Limit	Units	Method	Extraction
SG-1A (12-06-2065-1)						
Carbon Dioxide	**2.00**		0.500	%v	ASTM D-1946	N/A
Oxygen + Argon	**20.0**		0.500	%v	ASTM D-1946	N/A
Benzene	**2.2**		1.6	ug/m3	EPA TO-15	N/A
Isopropanol	**140**		12	ug/m3	EPA TO-15	N/A
SG-1B (12-06-2065-2)						
Carbon Dioxide	**3.28**		0.500	%v	ASTM D-1946	N/A
Oxygen + Argon	**19.1**		0.500	%v	ASTM D-1946	N/A
Tert-Butyl Alcohol (TBA)	**11**		6.1	ug/m3	EPA TO-15	N/A
Toluene	**3.3**		1.9	ug/m3	EPA TO-15	N/A
Isopropanol	**370**		61	ug/m3	EPA TO-15	N/A
SG-2A (12-06-2065-3)						
Carbon Dioxide	**3.29**		0.500	%v	ASTM D-1946	N/A
Oxygen + Argon	**18.7**		0.500	%v	ASTM D-1946	N/A
Helium	**0.0324**		0.0100	%v	ASTM D-1946 (M)	N/A
Benzene	**1.6**		1.6	ug/m3	EPA TO-15	N/A
Ethylbenzene	**3.1**		2.2	ug/m3	EPA TO-15	N/A
Tert-Butyl Alcohol (TBA)	**36**		6.1	ug/m3	EPA TO-15	N/A
SG-2B (12-06-2065-4)						
Carbon Dioxide	**5.32**		0.500	%v	ASTM D-1946	N/A
Oxygen + Argon	**17.1**		0.500	%v	ASTM D-1946	N/A
Helium	**0.0668**		0.0100	%v	ASTM D-1946 (M)	N/A
AMBIENT (12-06-2065-5)						
Oxygen + Argon	**22.1**		0.500	%v	ASTM D-1946	N/A
Benzene	**1.7**		1.6	ug/m3	EPA TO-15	N/A
Ethanol	**16**		9.4	ug/m3	EPA TO-15	N/A
Ethylbenzene	**2.4**		2.2	ug/m3	EPA TO-15	N/A
Toluene	**11**		1.9	ug/m3	EPA TO-15	N/A

Subcontracted analyses, if any, are not included in this summary.

*MDL is shown.

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Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Broadbent & Associates, Inc.
1324 Mangrove Ave, Ste 212
Chico, CA 95926-2642

Date Received: 06/30/12
Work Order No: 12-06-2065
Preparation: N/A
Method: ASTM D-1946
Units: %v

Project: BP 2112

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SG-1A	**12-06-2065-1-A**	**06/29/12 11:45**	**Air**	**GC 34**	**N/A**	**07/17/12 15:33**	**120717L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Methane	ND	0.500	1		Oxygen + Argon	20.0	0.500	1	
Carbon Dioxide	2.00	0.500	1						

SG-1B	**12-06-2065-2-A**	**06/29/12 12:44**	**Air**	**GC 34**	**N/A**	**07/01/12 00:17**	**120630L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Methane	ND	0.500	1		Oxygen + Argon	19.1	0.500	1	
Carbon Dioxide	3.28	0.500	1						

SG-2A	**12-06-2065-3-A**	**06/28/12 13:13**	**Air**	**GC 34**	**N/A**	**07/17/12 16:08**	**120717L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Methane	ND	0.500	1		Oxygen + Argon	18.7	0.500	1	
Carbon Dioxide	3.29	0.500	1						

SG-2B	**12-06-2065-4-A**	**06/28/12 14:41**	**Air**	**GC 34**	**N/A**	**07/01/12 00:57**	**120630L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Methane	ND	0.500	1		Oxygen + Argon	17.1	0.500	1	
Carbon Dioxide	5.32	0.500	1						

AMBIENT	**12-06-2065-5-A**	**06/28/12 14:46**	**Air**	**GC 34**	**N/A**	**07/01/12 01:33**	**120630L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Methane	ND	0.500	1		Oxygen + Argon	22.1	0.500	1	
Carbon Dioxide	ND	0.500	1						

Method Blank	**099-03-002-1,588**	**N/A**	**Air**	**GC 34**	**N/A**	**06/30/12 12:17**	**120630L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Methane	ND	0.500	1		Oxygen + Argon	ND	0.500	1	
Carbon Dioxide	ND	0.500	1						

Method Blank	**099-03-002-1,598**	**N/A**	**Air**	**GC 34**	**N/A**	**07/17/12 11:00**	**120717L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Methane	ND	0.500	1		Oxygen + Argon	ND	0.500	1	
Carbon Dioxide	ND	0.500	1						

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

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Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Broadbent & Associates, Inc.
1324 Mangrove Ave, Ste 212
Chico, CA 95926-2642

Date Received: 06/30/12
Work Order No: 12-06-2065
Preparation: N/A
Method: ASTM D-1946 (M)

Project: BP 2112

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SG-1A	**12-06-2065-1-A**	**06/29/12 11:45**	**Air**	**GC 55**	**N/A**	**07/17/12 14:00**	**120717L01**

Parameter	Result	RL	DF	Qual	Units
Helium	ND	0.0100	1		%v

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SG-1B	**12-06-2065-2-A**	**06/29/12 12:44**	**Air**	**GC 55**	**N/A**	**06/30/12 14:52**	**120630L01**

Parameter	Result	RL	DF	Qual	Units
Helium	ND	0.0100	1		%v

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SG-2A	**12-06-2065-3-A**	**06/28/12 13:13**	**Air**	**GC 55**	**N/A**	**07/17/12 14:22**	**120717L01**

Parameter	Result	RL	DF	Qual	Units
Helium	0.0324	0.0100	1		%v

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SG-2B	**12-06-2065-4-A**	**06/28/12 14:41**	**Air**	**GC 55**	**N/A**	**06/30/12 13:56**	**120630L01**

Parameter	Result	RL	DF	Qual	Units
Helium	0.0668	0.0100	1		%v

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
AMBIENT	**12-06-2065-5-A**	**06/28/12 14:46**	**Air**	**GC 55**	**N/A**	**07/12/12 16:29**	**120712L01**

Parameter	Result	RL	DF	Qual	Units
Helium	ND	0.0100	1		%v

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-872-289**	**N/A**	**Air**	**GC 55**	**N/A**	**06/30/12 12:26**	**120630L01**

Parameter	Result	RL	DF	Qual	Units
Helium	ND	0.0100	1		%v

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Broadbent & Associates, Inc.
1324 Mangrove Ave, Ste 212
Chico, CA 95926-2642

Date Received: 06/30/12
Work Order No: 12-06-2065
Preparation: N/A
Method: ASTM D-1946 (M)

Project: BP 2112

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-872-292**	**N/A**	**Air**	**GC 55**	**N/A**	**07/12/12 13:31**	**120712L01**

Parameter	Result	RL	DF	Qual	Units
Helium	ND	0.0100	1		%v

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-872-294**	**N/A**	**Air**	**GC 55**	**N/A**	**07/17/12 13:00**	**120717L01**

Parameter	Result	RL	DF	Qual	Units
Helium	ND	0.0100	1		%v

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

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Broadbent & Associates, Inc.
1324 Mangrove Ave, Ste 212
Chico, CA 95926-2642

Date Received: 06/30/12
Work Order No: 12-06-2065
Preparation: N/A
Method: EPA TO-15
Units: ug/m3

Project: BP 2112

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SG-1A	**12-06-2065-1-A**	**06/29/12 11:45**	**Air**	**GC/MS HH**	**N/A**	**07/18/12 01:12**	**120717L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	2.2	1.6	1		Xylenes (total)	ND	8.7	1	
Diisopropyl Ether (DIPE)	ND	8.4	1		Tert-Amyl-Methyl Ether (TAME)	ND	8.4	1	
Ethanol	ND	9.4	1		Tert-Butyl Alcohol (TBA)	ND	6.1	1	
Ethyl-t-Butyl Ether (ETBE)	ND	8.4	1		Toluene	ND	1.9	1	
Ethylbenzene	ND	2.2	1		Isopropanol	140	12	1	
Methyl-t-Butyl Ether (MTBE)	ND	7.2	1						

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	95	57-129		1,2-Dichloroethane-d4	96	47-137	
Toluene-d8	94	78-156					

SG-1B	**12-06-2065-2-A**	**06/29/12 12:44**	**Air**	**GC/MS K**	**N/A**	**07/02/12 16:13**	**120702L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	1.6	1		Xylenes (total)	ND	8.7	1	
Diisopropyl Ether (DIPE)	ND	8.4	1		Tert-Amyl-Methyl Ether (TAME)	ND	8.4	1	
Ethanol	ND	9.4	1		Tert-Butyl Alcohol (TBA)	11	6.1	1	
Ethyl-t-Butyl Ether (ETBE)	ND	8.4	1		Toluene	3.3	1.9	1	
Ethylbenzene	ND	2.2	1		Isopropanol	370	61	5	
Methyl-t-Butyl Ether (MTBE)	ND	7.2	1						

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	92	57-129		1,2-Dichloroethane-d4	98	47-137	
Toluene-d8	111	78-156					

SG-2A	**12-06-2065-3-A**	**06/28/12 13:13**	**Air**	**GC/MS HH**	**N/A**	**07/18/12 02:04**	**120717L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	1.6	1.6	1		Xylenes (total)	ND	8.7	1	
Diisopropyl Ether (DIPE)	ND	8.4	1		Tert-Amyl-Methyl Ether (TAME)	ND	8.4	1	
Ethanol	ND	9.4	1		Tert-Butyl Alcohol (TBA)	36	6.1	1	
Ethyl-t-Butyl Ether (ETBE)	ND	8.4	1		Toluene	ND	1.9	1	
Ethylbenzene	3.1	2.2	1		Isopropanol	ND	12	1	
Methyl-t-Butyl Ether (MTBE)	ND	7.2	1						

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	98	57-129		1,2-Dichloroethane-d4	102	47-137	
Toluene-d8	97	78-156					

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Broadbent & Associates, Inc.
1324 Mangrove Ave, Ste 212
Chico, CA 95926-2642

Date Received: 06/30/12
Work Order No: 12-06-2065
Preparation: N/A
Method: EPA TO-15
Units: ug/m3

Project: BP 2112

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SG-2B	**12-06-2065-4-A**	**06/28/12 14:41**	**Air**	**GC/MS K**	**N/A**	**07/02/12 17:04**	**120702L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	1.6	1		Xylenes (total)	ND	8.7	1	
Diisopropyl Ether (DIPE)	ND	8.4	1		Tert-Amyl-Methyl Ether (TAME)	ND	8.4	1	
Ethanol	ND	9.4	1		Tert-Butyl Alcohol (TBA)	ND	6.1	1	
Ethyl-t-Butyl Ether (ETBE)	ND	8.4	1		Toluene	ND	1.9	1	
Ethylbenzene	ND	2.2	1		Isopropanol	ND	12	1	
Methyl-t-Butyl Ether (MTBE)	ND	7.2	1						

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	94	57-129		1,2-Dichloroethane-d4	90	47-137	
Toluene-d8	93	78-156					

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
AMBIENT	**12-06-2065-5-A**	**06/28/12 14:46**	**Air**	**GC/MS K**	**N/A**	**07/02/12 17:54**	**120702L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	1.7	1.6	1		Xylenes (total)	ND	8.7	1	
Diisopropyl Ether (DIPE)	ND	8.4	1		Tert-Amyl-Methyl Ether (TAME)	ND	8.4	1	
Ethanol	16	9.4	1		Tert-Butyl Alcohol (TBA)	ND	6.1	1	
Ethyl-t-Butyl Ether (ETBE)	ND	8.4	1		Toluene	11	1.9	1	
Ethylbenzene	2.4	2.2	1		Isopropanol	ND	12	1	
Methyl-t-Butyl Ether (MTBE)	ND	7.2	1						

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	93	57-129		1,2-Dichloroethane-d4	93	47-137	
Toluene-d8	93	78-156					

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**095-01-021-10,244**	**N/A**	**Air**	**GC/MS K**	**N/A**	**07/02/12 15:18**	**120702L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	1.6	1		Xylenes (total)	ND	8.7	1	
Diisopropyl Ether (DIPE)	ND	8.4	1		Tert-Amyl-Methyl Ether (TAME)	ND	8.4	1	
Ethanol	ND	9.4	1		Tert-Butyl Alcohol (TBA)	ND	6.1	1	
Ethyl-t-Butyl Ether (ETBE)	ND	8.4	1		Toluene	ND	1.9	1	
Ethylbenzene	ND	2.2	1		Isopropanol	ND	12	1	
Methyl-t-Butyl Ether (MTBE)	ND	7.2	1						

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	96	57-129		1,2-Dichloroethane-d4	89	47-137	
Toluene-d8	94	78-156					

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Broadbent & Associates, Inc.
1324 Mangrove Ave, Ste 212
Chico, CA 95926-2642

Date Received: 06/30/12
Work Order No: 12-06-2065
Preparation: N/A
Method: EPA TO-15
Units: ug/m3

Project: BP 2112

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**095-01-021-10,251**	**N/A**	**Air**	**GC/MS K**	**N/A**	**07/03/12 14:47**	**120703L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	1.6	1		Xylenes (total)	ND	8.7	1	
Diisopropyl Ether (DIPE)	ND	8.4	1		Tert-Amyl-Methyl Ether (TAME)	ND	8.4	1	
Ethanol	ND	9.4	1		Tert-Butyl Alcohol (TBA)	ND	6.1	1	
Ethyl-t-Butyl Ether (ETBE)	ND	8.4	1		Toluene	ND	1.9	1	
Ethylbenzene	ND	2.2	1		Isopropanol	ND	12	1	
Methyl-t-Butyl Ether (MTBE)	ND	7.2	1						

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	100	57-129		1,2-Dichloroethane-d4	90	47-137	
Toluene-d8	95	78-156					

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**095-01-021-10,298**	**N/A**	**Air**	**GC/MS HH**	**N/A**	**07/17/12 14:03**	**120717L01**

Parameter	Result	RL	DF	Qual	Parameter	Result	RL	DF	Qual
Benzene	ND	1.6	1		Xylenes (total)	ND	8.7	1	
Diisopropyl Ether (DIPE)	ND	8.4	1		Tert-Amyl-Methyl Ether (TAME)	ND	8.4	1	
Ethanol	ND	9.4	1		Tert-Butyl Alcohol (TBA)	ND	6.1	1	
Ethyl-t-Butyl Ether (ETBE)	ND	8.4	1		Toluene	ND	1.9	1	
Ethylbenzene	ND	2.2	1		Isopropanol	ND	12	1	
Methyl-t-Butyl Ether (MTBE)	ND	7.2	1						

Surrogates:	REC (%)	Control Limits	Qual	Surrogates:	REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	99	57-129		1,2-Dichloroethane-d4	109	47-137	
Toluene-d8	98	78-156					

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Broadbent & Associates, Inc.
1324 Mangrove Ave, Ste 212
Chico, CA 95926-2642

Date Received: 06/30/12
Work Order No: 12-06-2065
Preparation: N/A
Method: EPA TO-3M

Project: BP 2112

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SG-1A	**12-06-2065-1-A**	**06/29/12 11:45**	**Air**	**GC 38**	**N/A**	**07/17/12 16:27**	**120717L02**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	38000	1		ug/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SG-1B	**12-06-2065-2-A**	**06/29/12 12:44**	**Air**	**GC 38**	**N/A**	**06/30/12 15:13**	**120630L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	38000	1		ug/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SG-2A	**12-06-2065-3-A**	**06/28/12 13:13**	**Air**	**GC 38**	**N/A**	**07/17/12 17:14**	**120717L02**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	38000	1		ug/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
SG-2B	**12-06-2065-4-A**	**06/28/12 14:41**	**Air**	**GC 38**	**N/A**	**06/30/12 15:57**	**120630L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	38000	1		ug/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
AMBIENT	**12-06-2065-5-A**	**06/28/12 14:46**	**Air**	**GC 38**	**N/A**	**06/30/12 12:09**	**120630L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	38000	1		ug/m3

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-685-469**	**N/A**	**Air**	**GC 38**	**N/A**	**06/30/12 10:31**	**120630L01**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	38000	1		ug/m3

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

ACCREDITED IN ACCORDANCE WITH nelac

Broadbent & Associates, Inc.		Date Received:	06/30/12
1324 Mangrove Ave, Ste 212		Work Order No:	12-06-2065
Chico, CA 95926-2642		Preparation:	N/A
		Method:	EPA TO-3M

Project: BP 2112

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	**099-12-685-470**	**N/A**	**Air**	**GC 38**	**N/A**	**07/17/12 11:57**	**120717L02**

Parameter	Result	RL	DF	Qual	Units
Gasoline Range Organics (C6-C12)	ND	38000	1		ug/m3

Return to Contents

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Quality Control - Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Broadbent & Associates, Inc.
1324 Mangrove Ave, Ste 212
Chico, CA 95926-2642

Date Received: 06/30/12
Work Order No: 12-06-2065
Preparation: N/A
Method: EPA TO-3M

Project: BP 2112

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
SG-2B	**Air**	**GC 38**	**N/A**	**06/30/12**	**120630D01**

Parameter	Sample Conc	DUP Conc	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	ND	ND	NA	0-20	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Broadbent & Associates, Inc.		Date Received:	06/30/12
1324 Mangrove Ave, Ste 212		Work Order No:	12-06-2065
Chico, CA 95926-2642		Preparation:	N/A
		Method:	EPA TO-3M

Project: BP 2112

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
SG-2A	**Air**	**GC 38**	**N/A**	**07/17/12**	**120717D02**

Parameter	Sample Conc	DUP Conc	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	ND	ND	NA	0-20	

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RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Broadbent & Associates, Inc.		Date Received:	N/A
1324 Mangrove Ave, Ste 212		Work Order No:	12-06-2065
Chico, CA 95926-2642		Preparation:	N/A
		Method:	ASTM D-1946

Project: BP 2112

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-03-002-1,588	**Air**	**GC 34**	**N/A**	**06/30/12**	**120630L01**

Parameter	SPIKE ADDED	LCS CONC	LCS %REC	LCSD CONC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Methane	10.12	10.07	100	10.12	100	80-120	1	0-30	
Carbon Dioxide	10.07	10.85	108	10.94	109	80-120	1	0-30	
Oxygen + Argon	3.500	3.583	102	3.599	103	80-120	0	0-30	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Broadbent & Associates, Inc.	Date Received:	N/A
1324 Mangrove Ave, Ste 212	Work Order No:	12-06-2065
Chico, CA 95926-2642	Preparation:	N/A
	Method:	ASTM D-1946

Project: BP 2112

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-03-002-1,598	**Air**	**GC 34**	**N/A**	**07/17/12**	**120717L01**

Parameter	SPIKE ADDED	LCS CONC	LCS %REC	LCSD CONC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Methane	10.12	9.300	92	9.291	92	80-120	0	0-30	
Carbon Dioxide	10.07	9.650	96	9.629	96	80-120	0	0-30	
Oxygen + Argon	3.500	3.384	97	3.402	97	80-120	1	0-30	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Broadbent & Associates, Inc.
1324 Mangrove Ave, Ste 212
Chico, CA 95926-2642

Date Received: N/A
Work Order No: 12-06-2065
Preparation: N/A
Method: EPA TO-15

Project: BP 2112

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
095-01-021-10,244	**Air**	**GC/MS K**	**N/A**	**07/02/12**	**120702L01**

Parameter	SPIKE ADDED	LCS CONC	LCS %REC	LCSD CONC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
Benzene	79.87	81.86	102	79.44	99	60-156	44-172	3	0-40	
Diisopropyl Ether (DIPE)	104.5	96.22	92	94.91	91	50-150	33-167	1	0-35	
Ethanol	188.4	220.9	117	212.7	113	50-150	33-167	4	0-35	
Ethyl-t-Butyl Ether (ETBE)	104.5	102.5	98	100.1	96	50-150	33-167	2	0-35	
Ethylbenzene	108.6	117.3	108	106.7	98	52-154	35-171	9	0-38	
Methyl-t-Butyl Ether (MTBE)	90.13	86.30	96	86.22	96	50-150	33-167	0	0-35	
Xylenes (total)	325.7	348.7	107	315.1	97	42-156	23-175	10	0-41	
Tert-Amyl-Methyl Ether (TAME)	104.5	101.9	98	98.80	95	50-150	33-167	3	0-35	
Tert-Butyl Alcohol (TBA)	151.6	153.5	101	149.6	99	50-150	33-167	3	0-35	
Toluene	94.21	106.9	113	99.20	105	56-146	41-161	7	0-43	
Isopropanol	61.45	66.38	108	64.32	105	50-150	33-167	3	0-35	

Total number of LCS compounds : 11
Total number of ME compounds : 0
Total number of ME compounds allowed : 1
LCS ME CL validation result : Pass

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Broadbent & Associates, Inc.
1324 Mangrove Ave, Ste 212
Chico, CA 95926-2642

Date Received: N/A
Work Order No: 12-06-2065
Preparation: N/A
Method: EPA TO-15

Project: BP 2112

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
095-01-021-10,251	**Air**	**GC/MS K**	**N/A**	**07/03/12**	**120703L01**

Parameter	SPIKE ADDED	LCS CONC	LCS %REC	LCSD CONC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
Benzene	79.87	87.04	109	91.29	114	60-156	44-172	5	0-40	
Diisopropyl Ether (DIPE)	104.5	97.33	93	102.4	98	50-150	33-167	5	0-35	
Ethanol	188.4	181.3	96	186.9	99	50-150	33-167	3	0-35	
Ethyl-t-Butyl Ether (ETBE)	104.5	102.9	98	107.3	103	50-150	33-167	4	0-35	
Ethylbenzene	108.6	117.3	108	125.0	115	52-154	35-171	6	0-38	
Methyl-t-Butyl Ether (MTBE)	90.13	89.05	99	96.89	107	50-150	33-167	8	0-35	
Xylenes (total)	325.7	351.7	108	373.9	115	42-156	23-175	6	0-41	
Tert-Amyl-Methyl Ether (TAME)	104.5	99.88	96	103.9	99	50-150	33-167	4	0-35	
Tert-Butyl Alcohol (TBA)	151.6	153.6	101	156.3	103	50-150	33-167	2	0-35	
Toluene	94.21	106.5	113	115.5	123	56-146	41-161	8	0-43	
Isopropanol	61.45	66.82	109	67.97	111	50-150	33-167	2	0-35	

Total number of LCS compounds : 11
Total number of ME compounds : 0
Total number of ME compounds allowed : 1
LCS ME CL validation result : Pass

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Broadbent & Associates, Inc.
1324 Mangrove Ave, Ste 212
Chico, CA 95926-2642

Date Received: N/A
Work Order No: 12-06-2065
Preparation: N/A
Method: EPA TO-15

Project: BP 2112

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
095-01-021-10,298	**Air**	**GC/MS HH**	**N/A**	**07/17/12**	**120717L01**

Parameter	SPIKE ADDED	LCS CONC	LCS %REC	LCSD CONC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
Benzene	79.87	83.24	104	84.25	105	60-156	44-172	1	0-40	
Diisopropyl Ether (DIPE)	104.5	98.21	94	98.93	95	50-150	33-167	1	0-35	
Ethanol	188.4	206.6	110	216.9	115	50-150	33-167	5	0-35	
Ethyl-t-Butyl Ether (ETBE)	104.5	103.3	99	104.2	100	50-150	33-167	1	0-35	
Ethylbenzene	108.6	121.7	112	129.5	119	52-154	35-171	6	0-38	
Methyl-t-Butyl Ether (MTBE)	90.13	91.72	102	92.25	102	50-150	33-167	1	0-35	
Xylenes (total)	325.7	385.7	118	409.3	126	42-156	23-175	6	0-41	
Tert-Amyl-Methyl Ether (TAME)	104.5	104.1	100	104.9	100	50-150	33-167	1	0-35	
Tert-Butyl Alcohol (TBA)	151.6	165.4	109	179.2	118	50-150	33-167	8	0-35	
Toluene	94.21	103.8	110	109.9	117	56-146	41-161	6	0-43	
Isopropanol	61.45	64.60	105	70.14	114	50-150	33-167	8	0-35	

Total number of LCS compounds : 11
Total number of ME compounds : 0
Total number of ME compounds allowed : 1
LCS ME CL validation result : Pass

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Laboratory Control Sample

ACCREDITED IN ACCORDANCE WITH nelac

Broadbent & Associates, Inc.		Date Received:	N/A
1324 Mangrove Ave, Ste 212		Work Order No:	12-06-2065
Chico, CA 95926-2642		Preparation:	N/A
		Method:	EPA TO-3M

Project: BP 2112

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	Lab File ID	LCS Batch Number
099-12-685-469	**Air**	**GC 38**	**06/30/12**	**12063002**	**120630L01**

Parameter	Conc Added	Conc Recovered	LCS %Rec	%Rec CL	Qualifiers
Gasoline Range Organics (C6-C12)	382400	407200	106	80-120	

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RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Laboratory Control Sample

ACCREDITED IN ACCORDANCE WITH nelac

Broadbent & Associates, Inc.		Date Received:	N/A
1324 Mangrove Ave, Ste 212		Work Order No:	12-06-2065
Chico, CA 95926-2642		Preparation:	N/A
		Method:	EPA TO-3M

Project: BP 2112

Quality Control Sample ID	Matrix	Instrument	Date Analyzed	Lab File ID	LCS Batch Number
099-12-685-470	**Air**	**GC 38**	**07/17/12**	**12071702**	**120717L02**

Parameter	Conc Added	Conc Recovered	LCS %Rec	%Rec CL	Qualifiers
Gasoline Range Organics (C6-C12)	382400	403100	105	80-120	

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RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Broadbent & Associates, Inc.		Date Received:	N/A
1324 Mangrove Ave, Ste 212		Work Order No:	12-06-2065
Chico, CA 95926-2642		Preparation:	N/A
		Method:	ASTM D-1946 (M)

Project: BP 2112

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-872-289	**Air**	**GC 55**	**N/A**	**06/30/12**	**120630L01**

Parameter	SPIKE ADDED	LCS CONC	LCS %REC	LCSD CONC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Helium	1.000	0.9748	97	0.9915	99	80-120	2	0-30	

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RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Broadbent & Associates, Inc.		Date Received:	N/A
1324 Mangrove Ave, Ste 212		Work Order No:	12-06-2065
Chico, CA 95926-2642		Preparation:	N/A
		Method:	ASTM D-1946 (M)

Project: BP 2112

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-872-292	**Air**	**GC 55**	**N/A**	**07/12/12**	**120712L01**

Parameter	SPIKE ADDED	LCS CONC	LCS %REC	LCSD CONC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Helium	1.000	0.8254	83	0.9806	98	80-120	17	0-30	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

ACCREDITED IN ACCORDANCE WITH nelac

Broadbent & Associates, Inc.		Date Received:	N/A
1324 Mangrove Ave, Ste 212		Work Order No:	12-06-2065
Chico, CA 95926-2642		Preparation:	N/A
		Method:	ASTM D-1946 (M)

Project: BP 2112

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-872-294	**Air**	**GC 55**	**N/A**	**07/17/12**	**120717L01**

Parameter	SPIKE ADDED	LCS CONC	LCS %REC	LCSD CONC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Helium	1.000	0.9446	94	0.9754	98	80-120	3	0-30	

Return to Contents

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Summa Canister Vacuum Summary

ACCREDITED IN ACCORDANCE WITH nelac

Work Order Number: **12-06-2065**

Sample Name	Vacuum In	Vacuum Out	Equipment	Description
SG-1A	-5.00	-29.70	D311	Summa Canister 6L
SG-1B	-5.00	-29.70	D664	Summa Canister 6L
SG-2A	-5.00	-29.70	D080	Summa Canister 6L
SG-2B	-5.00	-29.70	D633	Summa Canister 6L
AMBIENT	-5.00	-29.70	D179	Summa Canister 6L

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Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 12-06-2065

Qualifier	Definition
AX	Sample too dilute to quantify surrogate.
BA	Relative percent difference out of control.
BA,AY	BA = Relative percent difference out of control. AY = Matrix interference suspected.
BB	Sample > 4x spike concentration.
BF	Reporting limits raised due to high hydrocarbon background.
BH	Reporting limits raised due to high level of non-target analytes.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
BY	Sample received at improper temperature.
BZ	Sample preserved improperly.
CL	Initial analysis within holding time but required dilution.
CQ	Analyte concentration greater than 10 times the blank concentration.
CU	Surrogate concentration diluted to not detectable during analysis.
DF	Reporting limits elevated due to matrix interferences.
DU	Insufficient sample quantity for matrix spike/dup matrix spike.
ET	Sample was extracted past end of recommended max. holding time.
ET	Sample was extracted past end of recommended maximum holding time.
EY	Result exceeds normal dynamic range; reported as a min est.
GR	Internal standard recovery is outside method recovery limit.
IB	CCV recovery abovelimit; analyte not detected.
IH	Calibrtn. verif. recov. below method CL for this analyte.
IJ	Calibrtn. verif. recov. above method CL for this analyte.
J,DX	J=EPA Flag -Estimated value; DX= Value < lowest standard (MQL), but > than MDL.
LA	Confirmatory analysis was past holding time.
LG,AY	LG= Surrogate recovery below the acceptance limit. AY= Matrix interference suspected.
LH,AY	LH= Surrogate recovery above the acceptance limit. AY= Matrix interference suspected.
LM,AY	LM= MS and/or MSD above acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LN,AY	LN= MS and/or MSD below acceptance limits. See Blank Spike (LCS). AY= Matrix interference suspected.
LQ	LCS recovery above method control limits.
LR	LCS recovery below method control limits.
LW	Quantitation of unknown hydrocarbon(s) in sample based on gasoline.
LX	Quantitation of unknown hydrocarbon(s) in sample based on diesel.
MB	Analyte present in the method blank.
ME	LCS/LCSD Recovery Percentage is within Marginal Exceedance (ME) Control Limit range.
PC	Sample taken from VOA vial with air bubble > 6mm diameter.
PI	Primary and confirm results varied by > than 40% RPD.
RB	RPD exceeded method control limit; % recoveries within limits.
SG	A silica gel cleanup procedure was performed.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.
MPN - Most Probable Number

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Calscience Environmental Laboratories, Inc.
7440 LINCOLN WAY
GARDEN GROVE, CA 92841-1427
TEL: (714) 895-5494 FAX: (714) 894-7501

AIR CHAIN OF CUSTODY RECORD

DATE: 6-29-2012
PAGE: ____ OF ____

LABORATORY CLIENT: Broadbent & Associates	CLIENT PROJECT NAME / NUMBER: BP 2112 / 06-88-616	P.O.NO.:
ADDRESS: 1324 Mangrove Avenue	PROJECT ADDRESS: 1260 Park Street, Alameda, CA	LAB CONTACT OR QUOTE NO.
CITY: Chico STATE: CA ZIP: 95926	CITY: Alameda STATE: CA ZIP:	LAB USE ONLY 12-06-2065
TEL: 530-566-1400 E-MAIL: Tvenus@broadbentinc.com	PROJECT CONTACT: Tom Venus	
TURNAROUND TIME: ☐ SAME DAY ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAYS ☐ 10 DAYS	SAMPLER(S): (NAME / SIGNATURE) James R [signature]	

SPECIAL REQUIREMENTS (ADDITIONAL COSTS MAY APPLY)
☐ EDD

SPECIAL INSTRUCTIONS:
- FOR SG-2A & SG-2B, HELIUM TRACER WAS USED. FOR SG-1A & SG-1B, ISOPROPYL DRENCHED TOWELS OVER FITTINGS WAS USED.
- ANALYZE SG-1B & SG-2B FIRST. IF CONCENTRATION RESULTS EXCEED ESTABLISHED ESL'S, ANALYZE SG-1A & SG-2A.

LAB USE ONLY	SAMPLE ID	FIELD ID / Point of Collection	Air Type (I) Indoor (SV) Soil Vap. (A) Ambient	Sampling Equipment: Canister ID#	Canister Size 6L or 1L	Flow Controller ID #	Start Sampling Information: Date	Time (24 hr clock)	Canister Pressure ("Hg)	Stop Sampling Information: Date	Time (24 hr clock)	Canister Pressure ("Hg)	GRO by TO-3	BTEX, MTBE, ETHANOL, TBA, DIPE, ETBE, TAME by TO-15	O2, Argon, CO2	CH4, Helium, Isopropyl by ASTM D-1946	
1	SG-1A	SG WELL	SV	D311	6	A115	6/29/12	1117	-30	6/29/12	1145	-5	X	X		X	
2	SG-1B		SV	D664	6	A381	6/29/12	1213	-30	6/29/12	1244	-5	X	X		X	
3	SG-2A		SV	D080	6	A336	6/28/12	1246	-30	6/28/12	1313	-5	X	X		X	
4	SG-2B		SV	D633	6	A289	6/28/12	1358	-30	6/28/12	1440	-5	X	X		X	
5	AMBIENT	STORE FRONT	A	D179	6		6/28/12	1445	-30	6/28/12	1446	-5	X	X		X	
6																	
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	

Relinquished by: (Signature) [signature] 6-29-12 1700	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature) [signature]	Date: 6/30/12	Time: 0920
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

DISTRIBUTION: White with final report, Green and Yellow to Client.
Please note that pages 1 and 2 of 2 of our T/Cs are printed on the reverse side of the Green and Yellow copies respectively.

12/01/11 Revision

Note: 07/17/12 Samples SG-1A and SG-2A are taken off HOLD for 5 day TAT per Tom Venus.

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2065

ATE 6.29.12 [redacted]

OMPANY Broadbent & Associates

DDRESS 875 Cotting Lane

DDRESS

STE/ ROOM G

ITY Vacaville CA

ZIP CODE 95688

ENDERS AME James Ramos

PHONE NUMBER 707-342-5669

OMPANY Cal Science

AME ~~Richard Villafana~~

PHONE NUMBER 714-895-5494

DDRESS 7440 Lincoln Way

DDRESS

STE/ ROOM

ITY Garden Grove

ZIP CODE 92841

OUR INTERNAL BILLING EFERENCE WILL APPEAR N YOUR INVOICE

AL UCTIONS

GSO

GOLDEN STATE OVERNIGHT

1-800-322-5555

WWW.GSO.COM

SHIPPING AIR BILL

4 PACKAGE INFORMATION

- ☐ LETTER (MAX 8 OZ)
- ☐ PACKAGE (WT) ____________
- ☐ DECLARED VALUE $____________
- ☐ COD AMOUNT $____________ (CASH NOT ACCEPTED)

5 DELIVERY SERVICE ☐ PRIORITY OVERNIGHT BY 10:30 AM ☐ EARLY PRIORITY BY 8:00 AM ☒ SATURDAY DELIVERY

*DELIVERY TIMES MAY BE LATER IN SOME AREAS • CONSULT YOUR SERVICE GUIDE OR CALL GOLDEN STATE OVERN

6 RELEASE SIGNATURE ____________ SIGN TO AUTHORIZE DELIVERY WITHOUT OBTAINING SIGNATURE

7

8 PICK UP INFORMATION ____________ TIME DRIVER # ROUTE #

107023606

PEEL OFF HERE

9 GSO TRACKING NUMBER

CKAGE BEL

Saturda Call or

6.29.12 [redacted]

PANY Broadbent & Associates

RESS 875 Cotting Lane

RESS

STE/ ROOM G

Vacaville

ZIP CODE

ERS James Ramos

PHONE NUMBER 707-342-5669

PANY Cal Science

Richard Villafana

PHONE NUMBER 714-895-~~7551~~ 5494

ESS 7440 Lincoln Way

ESS

STE/ ROOM

Garden Grove

ZIP CODE 92841

NTERNAL BILLING NCE WILL APPEAR R INVOICE

ONS

GSO

GOLDEN STATE OVERNIGHT

1-800-322-5555

WWW.GSO.COM

SHIPPING AIR BILL

4 PACKAGE INFORMATION

- ☐ LETTER (MAX 8 OZ)
- ☐ PACKAGE (WT) ____________
- ☐ DECLARED VALUE $____________
- ☐ COD AMOUNT $____________ (CASH NOT ACCEPTED)

5 DELIVERY SERVICE ☐ PRIORITY OVERNIGHT BY 10:30 AM ☐ EARLY PRIORITY BY 8:00 AM ☒ SATURDAY DELIVERY

*DELIVERY TIMES MAY BE LATER IN SOME AREAS • CONSULT YOUR SERVICE GUIDE OR CALL GOLDEN STATE OVERNIGHT.

6 RELEASE SIGNATURE ____________ SIGN TO AUTHORIZE DELIVERY WITHOUT OBTAINING SIGNATURE

7

8 PICK UP INFORMATION ____________ TIME DRIVER # ROUTE #

106745231

PEEL OFF HERE

106745231

9 GSO TRACKING NUMBER

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 12-06-2 0 6 5

SAMPLE RECEIPT FORM

Cooler 0 of 0

CLIENT: Broadbent & Associates DATE: 06/30/12

TEMPERATURE: Thermometer ID: SC2 (Criteria: 0.0 °C – 6.0 °C, not frozen)

Temperature ____•____ °C - 0.3 °C (CF) = ____•____ °C ☐ Blank ☐ Sample

☐ Sample(s) outside temperature criteria (PM/APM contacted by: _____).

☐ Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling.

☐ **Received at ambient temperature, placed on ice for transport by Courier.**

Ambient Temperature: ☑ Air ☐ Filter Initial: YC

CUSTODY SEALS INTACT:

☐ Cooler ☐_____ ☐ No (Not Intact) ☐ Not Present ☑ N/A Initial: YC

☐ Sample ☐_____ ☐ No (Not Intact) ☑ Not Present Initial: TS

SAMPLE CONDITION:	Yes	No	N/A
Chain-Of-Custody (COC) document(s) received with samples	☑	☐	☐
COC document(s) received complete	☑	☐	☐
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ No analysis requested. ☐ Not relinquished. ☐ No date/time relinquished.			
Sampler's name indicated on COC	☑	☐	☐
Sample container label(s) consistent with COC	☑	☐	☐
Sample container(s) intact and good condition	☑	☐	☐
Proper containers and sufficient volume for analyses requested	☑	☐	☐
Analyses received within holding time	☑	☐	☐
pH / Res. Chlorine / Diss. Sulfide / Diss. Oxygen received within 24 hours	☐	☐	☑
Proper preservation noted on COC or sample container	☐	☐	☑
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace	☐	☐	☑
Tedlar bag(s) free of condensation	☐	☐	☑

CONTAINER TYPE:

Solid: ☐4ozCGJ ☐8ozCGJ ☐16ozCGJ ☐Sleeve (_____) ☐EnCores® ☐TerraCores® ☐_____

Water: ☐VOA ☐VOA**h** ☐VOA**na$_2$** ☐125AGB ☐125AGB**h** ☐125AGB**p** ☐1AGB ☐1AGB**na$_2$** ☐1AGB**s**

☐500AGB ☐500AGJ ☐500AGJ**s** ☐250AGB ☐250CGB ☐250CGB**s** ☐1PB ☐1PB**na** ☐500PB

☐250PB ☐250PB**n** ☐125PB ☐125PB**znna** ☐100PJ ☐100PJ**na$_2$** ☐_____ ☐_____ ☐_____

Air: ☐Tedlar® ☑Summa® **Other:** ☐_____ **Trip Blank Lot#:**_____ **Labeled/Checked by:** TS

Container: **C:** Clear **A:** Amber **P:** Plastic **G:** Glass **J:** Jar **B:** Bottle **Z:** Ziploc/Resealable Bag **E:** Envelope **Reviewed by:**

Preservative: **h:** HCL **n:** HNO_3 **na$_2$:**$Na_2S_2O_3$ **na:** NaOH **p:** H_3PO_4 **s:** H_2SO_4 **u:** Ultra-pure **znna:** $ZnAc_2$+NaOH **f:** Filtered **Scanned by:**

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APPENDIX D

GEOTRACKER UPLOAD CONFIRMATION 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:	**T0600100083**
Facility Name:	**ARCO #2112**
File Name:	**Dwg2-SGMonitoringImplantLocationsMap.pdf**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**66.208.210.129**
Submittal Date/Time:	**8/24/2012 8:35:47 AM**
Confirmation Number:	**9343474626**

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:	**T0600100083**
Field Point:	**SG-1A**
Facility Name:	**ARCO #2112**
File Name:	**2112_GEO_BORE_SG-1A.pdf**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**66.208.210.129**
Submittal Date/Time:	**8/24/2012 9:05:31 AM**
Confirmation Number:	**1436950623**

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:	**T0600100083**
Field Point:	**SG-1B**
Facility Name:	**ARCO #2112**
File Name:	**2112_GEO_BORE_SG-1B.pdf**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**66.208.210.129**
Submittal Date/Time:	**8/24/2012 9:06:21 AM**
Confirmation Number:	**5608097851**

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:	**T0600100083**
Field Point:	**SG-2A**
Facility Name:	**ARCO #2112**
File Name:	**2112_GEO_BORE_SG-2A.pdf**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**66.208.210.129**
Submittal Date/Time:	**8/24/2012 9:07:12 AM**
Confirmation Number:	**2994887590**

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:	**T0600100083**
Field Point:	**SG-2B**
Facility Name:	**ARCO #2112**
File Name:	**2112_GEO_BORE_SG-2B.pdf**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**66.208.210.129**
Submittal Date/Time:	**8/24/2012 9:07:43 AM**
Confirmation Number:	**1144164979**

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:	**Vapor Intrusion Assesment Report**
Report Type:	**Other Report / Document**
Facility Global ID:	**T0600100083**
Facility Name:	**ARCO #2112**
File Name:	**12062065_s1.zip**
Organization Name:	**Broadbent & Associates, Inc.**
Username:	**BROADBENT-C**
IP Address:	**66.208.210.129**
Submittal Date/Time:	**8/24/2012 9:01:10 AM**
Confirmation Number:	**6533558666**

VIEW QC REPORT

VIEW DETECTIONS REPORT