

2:00 pm, Jun 19, 2009

Alameda County Environmental Health



Atlantic Richfield Company (a BP affiliated company)

P.O. Box 1257

San Ramon, CA 94583 Phone: (925) 275-3801 Fax: (925) 275-3815

17 June 2009

Re: Soil & Ground-Water Investigation Report

Former BP Station No. 11109 4280 Foothill Boulevard Oakland, California ACEH Case #RO0000426

"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:

Paul Supple

Environmental Business Manger



SOIL & GROUND-WATER INVESTIGATION REPORT

Former BP Service Station No. 11109 4280 Foothill Boulevard, Oakland, California ACEH Fuel Leak Case No. RO0000426

Prepared for:

Mr. Paul Supple Environmental Business Manager Atlantic Richfield Company P.O. Box 1257 San Ramon, California 94583

Prepared by:



1324 Mangrove Ave., Suite 212 Chico, California 95926 (530) 566-1400 www.broadbentinc.com

17 June 2009

Project No. 06-88-646



17 June 2009

Project No. 06-88-646

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

Attn.: Mr. Paul Supple

Re: Soil & Ground-Water Investigation Report, Former BP Service Station No.11109, 4280 Foothill Boulevard, Oakland, California: ACEH Case No.RO0000426

Dear Mr. Supple:

Broadbent & Associates, Inc. (BAI) is pleased to submit this *Soil & Ground-Water Investigation Report* for Former BP Service Station No.11109 (herein referred to as Station No.11109) located at 4280 Foothill Boulevard, Oakland, California (Site). This report contains a preferential pathway evaluation and the results of an on-site soil and ground-water investigation including dual-phase extraction (DPE) pilot test. The preferential pathway evaluation was prepared in accordance with the Alameda County Environmental Health (ACEH) approval letter dated 5 December 2008. The on-site soil and ground-water investigation and DPE pilot test were conducted in accordance to the *Monitoring Well Installation and Dual-Phase Extraction Pilot Testing Work Plan* (BAI, 02/03/2009) as approved by ACEH in their letter dated 19 February 2009.

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, P.E.

Robert H. Miller, P.G., C.HG.

Alub I Mall

Principal Hydrogeologist

Enclosures

cc: Mr. Paresh Khatri, Alameda County Environmental Health (Submitted via ACEH ftp site)

Ms. Shelby Lathrop, ConocoPhillips, 76 Broadway, Sacramento, California 95818

Mr. Chris Jimmerson, Delta Environmental Consultants (Submitted via ENFOS)

Electronic copy uploaded to GeoTracker

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SOIL & GROUND-WATER INVESTIGATION REPORT

Former BP Service Station No. 11109 4280 Foothill Boulevard, Oakland, California

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SOIL & GROUND-WATER INVESTIGATION REPORT

Former BP Service Station No. 11109 4280 Foothill Boulevard, Oakland, California

APPENDICES

Appendix A	Recent Regulatory Correspondence
Appendix B	Stratus Monitoring Well Installation Data Package (Includes Field Notes, Lithologic Boring and Well Construction Logs, Well Permits, Field Procedures, and Laboratory Analytical Reports with Chain-of-Custody Documentation)
Appendix C	Stratus Dual-Phase Extraction Test Data Package (Includes Field Data Sheets and Laboratory Analytical Reports with Chain-of-Custody Documentation)
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11	and Laboratory Analytical Reports with Chain-of-Custody Documentation) Stratus Dual-Phase Extraction Test Data Package (Includes Field Data Sheets Laboratory Analytical Reports with Chain-of-Custody Documentation)

SOIL & GROUND-WATER INVESTIGATION REPORT Former BP Service Station No. 11109 4280 Foothill Boulevard, Oakland, California

1.0 INTRODUCTION

On behalf of the Atlantic Richfield Company, RM - a BP affiliated company, Broadbent & Associates, Inc. (BAI) has prepared this Soil and Ground-Water Investigation Report for the Former BP Service Station No. 11109, located at 4280 Foothill Boulevard, Oakland, Alameda County, California (Site). The preferential pathway evaluation was prepared in accordance with the Alameda County Environmental Health (ACEH) approval letter dated 5 December 2008. The on-site soil and ground-water investigation and dual-phase extraction (DPE) pilot testing activities were conducted in accordance to the *Monitoring Well Installation and Dual-Phase Extraction Pilot Testing Work Plan* (BAI, 02/03/2009) as approved by ACEH in their letter dated 19 February 2009. Copies of recent regulatory correspondence are provided within Appendix A. This document includes discussions on the site background, preferential pathway evaluation, monitoring well installation activities including analytical results, DPE pilot testing activities including analytical results, conclusions and recommendations. Tables, drawings, and appendices referenced within this document are provided following the conclusion of the document's text.

2.0 SITE BACKGROUND

The Site is currently in use as an operating service station located on the north corner of Foothill Boulevard and High Street (See Drawing 1) in a mixed commercial and residential area of Oakland, California. The Site features include a station building containing three former service bays since converted into a convenience store, and four double-sided dispensers on two pump islands under a common canopy. Much of the Site is covered in asphalt pavement with the exception of a concrete hold-down slab over the tanks, and three small planters along High Street, along Foothill Boulevard, and at the corner of High Street and Foothill Boulevard. It is believed that the existing underground storage tanks (USTs) include three double-wall fiberglass gasoline tanks (10,000 gallons each) and one double-wall fiberglass waste oil tank (1,000 gallon). The three 10,000-gallon USTs store regular, plus, and super unleaded gasoline and were reportedly installed in 1991. The waste oil tank was reportedly installed in 1989 or 1990 (EMCON, 12/27/1994). The Site was operated by Mobil Oil Corporation (Mobil) as Mobil Service Station No.10-H69 since at least the early 1970's. BP acquired the station from Mobil on 1 May 1989 (BP 1990) and operated the station under the BP brand. BP sold the station in 1994 to Tosco, which was acquired by ConocoPhillips who operated a 76-branded station for some time. Currently, the station operates under the independent brand High Street Gasoline. The ACEH-assigned Fuel Leak Case number for the Site is RO0000426 / GeoTracker Global ID No. T0600100217.

A church borders the Site to the northeast. Single-family residences border the Site to the northwest. The paved recreation courts and playing field of Fremont High School are located across High Street to the southeast. A Chevron-branded gasoline service station is located across Foothill Boulevard (4265 Foothill Boulevard) to the southwest of the Site. Chevron Gasoline Station No. 9-0076 is an active leaking UST case (ACEH Fuel Leak Case No. RO0000427 / GeoTracker Global ID No. T0600100339). A former Shell-branded gasoline service station was previously located at 4411 Foothill Boulevard across Foothill Boulevard and High Street to the south of the Site. This former Shell station is an active leaking UST case also (ACEH Fuel Leak

Case No. RO0000415 / GeoTracker Global ID No. T0600101065). This southern corner of the intersection of Foothill Boulevard and High Street is presently developed into a small strip mall with shops and restaurants. An aerial photo of the Site and surrounding area is provided as Drawing 2. The reader is referred to the recently submitted *Initial Site Conceptual Model* (BAI, 11/7/2008) for a summary of Site and regional geology and hydrogeology and past environmental investigations and remediation activities conducted at the Site.

3.0 PREFERENTIAL PATHWAY EVALUATION

A preferential pathway evaluation was identified as a data gap within the *Initial Site Conceptual Model* prepared by BAI on 7 November 2008. Conducting a preferential pathway evaluation was requested in the ACEH letter dated 5 December 2008. The results of the evaluation are presented in the following sections.

3.1 Utility Survey

A preferential pathway evaluation was requested by ACEH in their letter dated 5 December 2008. Contact was made with various agencies to acquire plans, where possible, of subsurface utilities in the area of the Site. Significant delays were encountered in acquiring copies of building plans from AT&T (for underground telephone line plans), and Pacific Gas & Electric Company (PG&E – for underground electrical and natural gas pipelines). Other agencies contacted included the City of Oakland Engineering Department (for sanitary sewer and storm drain utilities) and East Bay Municipal Utility District (EBMUD – for potable water distribution pipelines) in order to evaluate underground utilities located on or near the Site that could potentially act as preferential migration pathways for contamination offsite.

In the area of the Site, storm drain drop inlets are at street grade with generally shallow invert elevations. A 24-inch diameter concrete storm drain runs past the Site to the southeast within Foothill Boulevard. The Station Building is served by a small diameter vitrified clay pipe stub running along the east side of the Site where it connects to the six-inch diameter collector pipe under the northern portion of High Street. This High Street sanitary sewer pipeline runs parallel to the 18-inch diameter main under the southern portion of High Street. An eight-inch diameter, a 12-inch diameter, and a 15-inch diameter sanitary sewer pipeline run past the Site under Foothill Boulevard. The sanitary sewer pipelines under Foothill Boulevard join with those in High Street, where they are conveyed southwest away from the Site area in parallel eight-inch diameter, 16-inch diameter, and 18-inch diameter pipelines to the City of Oakland Wastewater Treatment Plant. The Site is served potable water by an EBMUD water main running past the Site under Foothill Boulevard. The water service lateral is located in the northern portion of the Site. The information provided by EBMUD or the City of Oakland did not provide the depths of the utilities or the backfill material used to fill the trenches. Although not specified, typical construction would use uniform sand or pea gravel backfill within the sewer, storm drain, and water pipeline trenches. A Site Vicinity Map showing water, storm water and sanitary wastewater utilities is provided as Drawing 3.

Submitted communications and maps from PG&E indicated a 16-inch diameter steel gas main running past the Site under Foothill Boulevard, and southwest down High Street. Smaller diameter gas lines are also present under Foothill Boulevard and High Street. With the exception of some service laterals, PG&E does not have electrical transmission lines underground. AT&T provides several underground telecom transmission lines under Foothill Boulevard and High Street. AT&T would not provided a definite depth of their utilities or backfill material used to fill trenches due to company policy. However, AT&T stated that a standard trench should have been installed at approximately 24 inches bgs. PG&E stated that their gas service utilities are usually located at a depth of approximately 36 inches bgs, but did not provided information regarding the backfill material used to fill the gas line trenches. To the extent known, PG&E gas lines and AT&T telecom lines in the Site vicinity are shown in confidential Drawing 3A, provided under separate cover due to BAI's agreements with these utility providers.

It is unlikely migration of petroleum contaminants is occurring from the Site via utility conduits since no conduits directly intersect the MW-5 location and the likely depth of utility trenches is generally shallower than the historic high ground-water levels at the Site. However, this opinion remains somewhat inconclusive due to incomplete information and the fact that underground utilities do exist in the general area.

3.2 Well Survey

The initial stage of the well survey consisted of requesting an authorized review of well records maintained by the California Department of Water Resources (DWR). Mr. Paresh Khatri of ACEH authorized the Well Completion Report Release Agreement form which was forwarded to DWR. These well search records were not received in time to include within the *Monitoring Well Installation and Dual-Phase Extraction Pilot Testing Work Plan* by its due date of 3 February 2009 and are therefore summarized within this report.

The Well Completion Report Release Agreement forms sought records for wells within a quarter-mile of the Site address at 4280 Foothill Boulevard, Oakland, California. A site location map depicting the quarter-mile radius is provided as Drawing 1. The Site address is located within Township 2 South, Range 3 West Section 8 relative to the Mount Diablo Baseline and Meridian of Northern California. The records received from DWR were supposed to be all well records within Township 2 South, Range 3 West Section 4, 5, 8, and 9. The results of this search returned 20 monitoring wells (MON), including wells MW-1 through MW-4 associated with the Site, and one well of unidentified use within the quarter-mile search radius.

The well of unidentified use is located approximately 1,300 feet south of the Site at 4514 East 14th Street. Eight monitoring wells were identified in association with Chevron Station #9-0076 located approximately 195 feet southwest of the Site on the opposite corner of Foothill Boulevard and High Street. Three monitoring wells associated with the former Shell Station located at 4411 Foothill Boulevard were identified approximately 230 feet south of the Site. Five monitoring wells were identified in association with Grand Auto Supply located approximately 1,230 feet southwest of the Site at 4240 East 14th Street. Records on file with the DWR indicated that there were no municipal (MUN), domestic (DOM), irrigation (IRR), or industrial process (IND) water supply wells within a quarter-mile radius of the Site.

Results of the well survey do not indicate the likelihood that historic or active wells in the area are acting as preferential pathways for vertical migration of contamination from the Site.

4.0 MONITORING WELL INSTALLATION ACTIVITIES

Well installation activities were originally proposed in the *Initial Site Conceptual Model* (BAI, 11/7/2008). A more detailed outline of the proposed scope of work was later submitted in the *Monitoring Well Installation and Dual-Phase Extraction Pilot Testing Work* Plan (BAI, 2/3/2009). Monitoring well installation activities were approved by ACEH in their letter dated 19 February 2009.

4.1 Preliminary Field Activities

Prior to initiating field activities, Stratus Environmental Inc. (Stratus) obtained the necessary well drilling permits from the Alameda County Public Works Agency (See Appendix B). Stratus also prepared a site health and safety plan specific to the work scope and cleared the Site for subsurface utilities. The utility clearance included notifying Underground Service Alert of the work a minimum of 48 hours prior to initiating the field investigation, and additionally securing the services of Cruz Brothers, a private utility locating company to confirm the absence of underground utilities at the boring locations. Consistent with the safety protocols within BP's Defined Practice for Ground Disturbance, the boreholes were physically cleared to 6.5 feet below ground surface (ft bgs) using an air knife rig.

4.2 Soil Borings

Soil borings for monitoring wells MW-10, MW-11, and MW-12 (See Drawing 4) were drilled in March 2009 by Woodward Drilling, a California-licensed drilling contractor, using a BK-81 drill rig with 10-inch diameter hollow-stem augers. Each boring was advanced to a total depth of 30 ft bgs. During drilling activities, the soil borings were described by the on-site Stratus geologist using the Universal Soil Classification System (USCS). Field notes, lithologic boring logs and well construction logs are provided in Appendix B. Boring logs were uploaded to the GeoTracker AB2886 database. Copies of the upload confirmation receipts (GEO_MAP and GEO_BORE files) are provided in Appendix D.

4.3 Laboratory Analysis of Soil Samples

Once below 6.5 feet, soil samples were collected at approximately five-foot intervals during the drilling associated with the monitoring well installations. Collected soil samples were delivered under standard chain-of-custody protocol to Calscience Environmental Laboratories, Inc. (Garden Grove, California), a State of California-certified analytical laboratory. Samples were analyzed for Gasoline Range Organics (GRO, hydrocarbon chain lengths C6-12) by EPA Method 8015M; for Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX), tert-Amyl methyl ether (TAME), tert-Butyl alcohol (TBA), Di-isopropyl ether (DIPE), 1,2-Dibromomethane (EDB), 1,2-Dichloroethane (1,2-DCA), Ethyl tert-butyl ether (ETBE), and Methyl tert-butyl ether (MTBE) by EPA Method 8260B.

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The laboratory analytical reports for soil boring samples, including chain-of-custody documentation, are provided in Appendix B. Soil laboratory analytical results are also summarized in tabular format below.

Soil Boring Sample	les - Laboratory .	Analytical 1	Results (mg/kg)

Sample ID	GRO	В	T	E	X	MTBE	TBA	DIPE
MW-10 14'	420	2.4	5.1	20	84	< 0.50	< 5.0	<1.0
MW-10 20'	3,900	11	31	48	230	<1.0	<10	< 2.0
MW-10 26'	1,300	0.67	0.43	2.1	2.9	< 0.10	<1.0	< 0.20
MW-10 30'	21	0.48	0.020	0.033	0.037	< 0.0010	0.065	0.0035
MW-11 10'	55	< 0.10	< 0.10	1.6	0.21	< 0.10	<1.0	< 0.20
MW-11 16'	< 0.50	0.0014	0.0013	0.0051	0.0076	0.0028	< 0.010	< 0.0020
MW-11 24'	6,500	22	86	95	460	<2.0	<20	<4.0
MW-11 30'	15	0.58	0.44	0.69	3.1	< 0.10	<1.0	< 0.20
MW-12 10'	8.5	0.025	0.0019	0.013	0.0039	< 0.0010	0.014	< 0.0020
MW-12 16'	9.8	0.065	0.012	1.3	0.40	< 0.0010	< 0.010	< 0.0020
MW-12 22'	1,300	2.6	0.94	24	6.7	< 0.20	< 2.0	< 0.40
MW-12 30'	0.76	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	0.013	< 0.0020

Hydrocarbon concentrations detected above laboratory reporting limits are represented with bold-typed font. Concentrations of EDB, ETBE, TAME, and 1,2-DCA are not included in the above table as the results for these constituents were below their respective laboratory reporting limits. No significant irregularities were reported during laboratory analysis of the soil boring samples. From review of the tabulated data and historic depths to ground water as low as 30 ft bgs, it appears that a 20 ft thick 'smear zone' may be present. Concentrations do dramatically decrease down to the historic low ground-water level of 30.00 ft bgs (MW-5, 4/7/1994), approximately defining the vertical extent of contamination. The laboratory results for soil sample analyses were uploaded to the GeoTracker AB2886 database. Copies of the GeoTracker upload confirmation receipts (EDF) are provided within Appendix D.

4.4 Monitoring Well Construction

Monitoring wells MW-10, MW-11, and MW-12 were constructed using flush-threaded, four-inch diameter, 0.020-inch factory-slotted Schedule 40 PVC pipe. The screen interval in each well extends from 7.0 feet bgs to 30 feet bgs. The filter pack surrounding the screen intervals consists of No.2/12 silica sand from the bottom of the well boring to one foot above the screen intervals. Each wellhead was secured with a locking well cap, and protected by a traffic-rated well vault set flush with the local ground surface. Additional details of well construction are provided in the field notes, lithologic boring logs and well construction logs provided in Appendix B. Well construction information was uploaded to the GeoTracker AB2886 database. Copies of GeoTracker upload confirmation receipts are provided within Appendix D.

4.5 Well Surveying and Development

The site was resurveyed, incorporating new wells MW-10, MW-11, and MW-12, by Wood Rodgers of Sacramento, California on 13 April 2009. The data package from Wood Rodgers is provided within Appendix B. This well survey information was uploaded to the GeoTracker AB2886 database. Copies of the GeoTracker upload confirmation reports (GEO_MAP, GEO_XY, and GEO_Z files) are provided within Appendix D. A revised site layout plan is provided as Drawing 4.

Monitor wells MW-10, MW-11, and MW-12 were developed on 31 March 2009. Well development activities consisted of surging the wells with a bailer and pumping the wells with a submersible ground-water pump until relatively silt-free water was removed. Wells MW-10, MW-11 and MW-12 ran dry before the goal of purging 10 wetted casing volumes of water was achieved. Well MW-10 ran dry after approximately 30 gallons of the targeted 145 gallons were purged, well MW-11 ran dry after approximately 30 gallons of the targeted 146 gallons were purged, and well MW-12 ran dry after approximately 30 gallons of the targeted 137 gallons were purged. Each well was allowed to recharge, before an additional 20 gallons were purged for a total of approximately 50 gallons from each well. After development, the wells were left to hydraulically equilibrate prior to water level measurement and DPE pilot testing activities.

4.6 Investigation-derived Residuals Management

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

5.0 DUAL-PHASE EXTRACTION PILOT TEST

Stratus performed the field activities associated with the DPE pilot test conducted during the period between 27 April and 1 May 2009 as approved by ACEH in their letter dated 19 February 2009. Prior to initiation of DPE pilot testing activities, Stratus submitted a notification letter to the Bay Area Air Quality Management District outlining the proposed scope of work. A copy of this letter is provided in Appendix A.

Existing well MW-5 and recently installed wells MW-10, MW-11 and MW-12 were used as individual and combined extraction wells for this DPE pilot test. Selection of these extraction wells was based on well construction, laboratory analytical results, and locations on the Site. The remaining onsite wells within close proximity to the extraction wells were used as observation points to monitor any observed influence. Drawing 4 depicts the Site with associated well locations. Details of DPE event activities and results are provided below.

5.1 DPE Testing Equipment and Procedures

A trailer-mounted DPE unit with an approximate 250 standard cubic feet per minute (scfm) liquid-ring blower was mobilized to the Site to conduct the DPE pilot test. The DPE unit was used to simultaneously extract ground water and air from wells MW-5, MW-10, MW-11, and MW-12, on both an individual and combined basis, by using a "stinger" pipe which was placed down the center of each well. The stinger end was placed below the static ground-water surface table to draw down a cone of depression to the inlet of the stinger, at which point, both soil vapor and ground water were extracted/drawn into the system. The combined process stream was then directed into a water knockout system which separated the liquid and air streams. The process air was then driven through the liquid ring blower and a thermal oxidizer which destroyed hydrocarbon vapors before they were discharged to the atmosphere. Extracted water was accumulated on-site until receipt of laboratory analytical results allowed for offsite transportation and treatment.

Prior to initiating the DPE pilot test, background depth-to-water level measurements were recorded for the applicable wells associated with the Property and the initial hour meter on the DPE equipment was recorded. Field personnel then recorded on an hourly basis during each DPE episode the hour meter reading, applied vacuum in inches of mercury (in.Hg) using magnehelic gauges, air flow (scfm), liquid flow totalizer reading (gallons), and a photo-ionization detector (PID) reading of recovered vapors. Copies of recorded field data are provided in Appendix C.

During the testing periods, air and water was extracted from each extraction well with the stinger tip set approximately one or two feet above the well bottom. Extracted air and ground-water samples were collected after the first hour and at two-to-three hour intervals. Not all collected samples were submitted for laboratory analysis. Representative samples collected at one hour, the approximate mid-point, and the approximate end-point of each DPE event were submitted for certified laboratory analyses. The duration of each extraction event lasted approximately 10-12 hours.

Stratus' staff observed and recorded data hourly during each DPE event. Recorded field observations for the extraction wells are provided in Table 1 with observation well data provided in Table 2. Appendix C contains copies of field notes.

5.2 Discussion of the DPE Pilot Test

The DPE pilot test began at 9:10 am on 27 April 2009. Each extraction event continued for approximately 10 to 12 hours. The overall DPE pilot test ran for a combined total of 57.5 hours. The pilot test was terminated at approximately 6:00 am on 1 May 2009.

The DPE stinger tips were set at approximately one foot above the bottom of each well, approximately 29 to 31 ft bgs. The extraction rate during each DPE event averaged approximately 51.36 scfm with an average observed vacuum of 23.8 in.Hg. The induced vacuum remained fairly consistent throughout each extraction event.

Influent air and liquid samples were collected during testing activities to monitor mass removal. Collected samples were delivered to Calscience Environmental Laboratories, Inc. (Garden Grove, California). Samples were analyzed for GRO using EPA Method 8015B for liquids and EPA Method TO-3M for air, and BTEX and MTBE using EPA Method 8260B for liquids and EPA Methods TO-15M for air. Liquid samples were also analyzed for TBA, DIPE, ETBE, and TAME using EPA Method 8260B. Analytical results are provided in Table 3 for vapor samples and Table 4 for water samples. Estimated mass removal from ground-water extraction is provided in Table 5. Residual liquids generated during the DPE activities was stored temporarily onsite in Department of Transportation-approved 55-gallon drums pending analytical results and profiling. Following characterization and profiling, Belshire Environmental Services was scheduled to transport the residuals to an Atlantic Richfield Company-approved facility for treatment or disposal. Laboratory analytical reports with chain-of-custody documentation are provided in Appendix C.

6.0 DPE PILOT TEST OBERVATIONS AND RESULTS

6.1 DPE Pilot Test Observations

Observations recorded during each extraction event are described below including date and duration of extraction, approximate stinger depth, vapor and ground water recovery, and observed extraction influences. Field data recorded for the extraction and observation wells is provided in Tables 1 and 2. Laboratory analytical results of collected samples are provided in Tables 3 and 4.

6.1.1 MW-5 Extraction Event

The MW-5 extraction event was conducted on 27 April 2009 for approximately 10 hours. The bottom of the stinger was set at approximately 31 ft bgs (approximately two feet above the bottom of this well). The initial depth-to-water measurement prior to commencement of extraction was 9.54 feet below the top of casing measuring point. Approximately 0.01 feet of free product was observed during the initial water level gauging of well MW-5. Wells MW-3, MW-7, MW-10, MW-11, and MW-12 were used as observation wells during this event. Results of the MW-5 DPE event are summarized below:

- The influent soil vapor flow rate held steady at approximately 48 scfm with an applied vacuum that ranged between 24.0 and 25.0 in.Hg (average applied vacuum of 24.2 in.Hg).
- Approximately 130 gallons of water were extracted from MW-5 during the DPE event at an average flow rate of approximately 0.20 gallons per minute (gpm).
- No induced vacuum was observed in the observation wells during the DPE event. It must be noted that the screen intervals for wells MW-3 (20-32 ft bgs) and MW-7 (19-34 ft bgs) were submerged during this test event.

- Decreases in ground-water elevations (ranging from 0.07 to 9.03 feet) were observed in most of the observation wells, with the highest decrease in ground-water elevation observed at well MW-10, located approximately five feet from test well MW-5. Observed decreases in ground-water elevations were not observed in MW-7.
- PID readings in the influent vapor stream ranged from 261 to 888 parts per million volume (ppmv).
- Maximum concentrations from laboratory analysis of influent vapor-stream samples
 collected during this event were 780 ppmv GRO and 5.0 ppmv Benzene (Table 3).
 MTBE was not detected above the laboratory reporting limit in the influent vaporstream samples analyzed.
- Maximum concentrations from laboratory analysis of influent water samples collected during this event were 22,000 micrograms per liter (μg/l) GRO, 710 μg/l Benzene, and 74 μg/l MTBE (Table 4).
- Based on influent concentrations in the vapor stream and average flow rates, approximately 4.14 pounds (lbs) of GRO and 0.034 lbs of Benzene were extracted in soil vapor during this test event (Table 3).
- Based on the volume of ground water extracted during this event and petroleum hydrocarbon concentrations in the influent water samples, approximately 0.0136 lbs of GRO and 0.0004 lbs of Benzene were extracted from the ground water during this test event (Table 5).

6.1.2 MW-12 Extraction Event

The MW-12 extraction was conducted on 28 April 2009 for approximately 11 hours. The bottom of the stinger was set at approximately 29 ft bgs (approximately one foot above the bottom of this well). Initial depth to water prior to commencement of the event was measured at 9.93 feet below the top of casing measuring point. Wells MW-3, MW-5, MW-7, MW-10, and MW-11 were used as observation points during the event. Results of the MW-12 DPE event are summarized below:

- The influent soil vapor flow rate ranged between 36.0 and 38.0 scfm (averaging approximately 36.3 scfm) with an applied vacuum of 25 in.Hg.
- Approximately 330 gallons of water were extracted from MW-12 during the DPE event at a flow rate of approximately 0.42 gpm.
- No induced vacuum was observed in the observation wells during the DPE event. It must be noted that the screen intervals for wells MW-3 (20-32 ft bgs), MW-5 (18-33 ft bgs) and MW-7 (19-34 ft bgs) were submerged during this test event.

- Decreases in ground-water elevations (ranging from 0.37 to 1.52 feet) were observed in each of the observation wells with the highest decrease observed at well MW-5, located approximately 15 feet from well MW-12.
- PID readings in the influent vapor stream ranged from 295 to 447 ppmv.
- Maximum concentrations from laboratory analysis of influent vapor-stream samples collected during this event were 830 ppmv GRO and 9.4 ppmv Benzene (Table 3).
 MTBE was not detected above the laboratory reporting limit in the influent vaporstream samples analyzed.
- Maximum concentrations from laboratory analysis of influent water samples collected during this event were 6,400 μg/l GRO and 610 μg/l Benzene (Table 4). MTBE was not detected above the laboratory reporting limit in the influent water samples analyzed.
- Based on influent concentrations in the vapor stream and average flow rates, approximately 4.85 lbs of GRO and 0.032 lbs of Benzene were extracted in soil vapor (Table 3).
- Based on the volume of ground water extracted during this event and petroleum hydrocarbon concentrations in the influent water samples, approximately 0.0138 lbs of GRO and 0.0005 lbs of Benzene were extracted from the ground water (Table 5).

6.1.3 MW-10 Extraction Event

The MW-10 extraction event was conducted on 29 April 2009 for approximately 11 hours. The bottom of the stinger was set at approximately 29 ft bgs (approximately one foot above the bottom of this well). Initial depth to water prior to commencement of the event was measured at 8.82 feet below the top of casing measuring point. Wells MW-3, MW-5, MW-7, MW-11, and MW-12 were used as observation points during the event. Results of the MW-10 DPE event are summarized below:

- The influent soil vapor flow rate ranged between 35.0 and 46.0 scfm (averaging approximately 44.25 scfm) with an applied vacuum of 23.0 in.Hg.
- Approximately 180 gallons of water were extracted from MW-10 during the DPE event at a flow rate of approximately 0.23 gpm.
- No induced vacuum was observed in the observation wells during the DPE event. It must be noted that the screen intervals for wells MW-3 (20-32 ft bgs), MW-5 (18-33 ft bgs) and MW-7 (19-34 ft bgs) were submerged during this test event.
- Decreases in ground-water elevations (ranging from 2.56 to 9.75 feet) were observed in wells MW-11 and MW-5, with the largest decrease observed at well MW-5, located

approximately five feet from test well MW-10. Observed decreases in ground-water elevations were not observed in the remaining wells.

- PID readings in the influent vapor stream ranged from 823 to 1106 ppmv.
- Maximum concentrations from laboratory analysis of influent vapor-stream samples
 collected during this event were 2,300 ppmv GRO and 14 ppmv Benzene (Table 3).
 MTBE was not detected above the laboratory reporting limit in the influent vaporstream samples analyzed.
- Maximum concentrations from laboratory analysis of influent water samples collected during this event were 20,000 μg/l GRO and 1,000 μg/l Benzene (Table 4). MTBE was not detected above the laboratory reporting limit in the influent water samples analyzed.
- Based on influent concentrations in the vapor stream and average flow rates, approximately 17.5 lbs of GRO and 0.063 lbs of Benzene were extracted in soil vapor (Table 3).
- Based on the volume of ground water extracted during this event and petroleum hydrocarbon concentrations in the influent water samples, approximately 0.0279 lbs of GRO and 0.0003 lbs of Benzene were extracted from the ground water (Table 5).

6.1.4 MW-11 Extraction Event

The MW-11 extraction event was conducted on 30 April 2009 for approximately 11.5 hours. The bottom of the stinger was set at approximately 29 ft bgs. Initial depth to water prior to commencement of the event was measured at 8.75 feet below the top of casing measuring point. Wells MW-3, MW-5, MW-7, MW-10, and MW-12 were used as observation points during the event. Results of the MW-11 DPE event are summarized below:

- The influent soil vapor flow rate ranged between 45.0 and 49.0 scfm (averaging approximately 46.08 scfm) with an applied vacuum of 24.0 in.Hg.
- Approximately 190 gallons of water were extracted from MW-11 during the DPE event at a flow rate of approximately 0.24 gpm.
- No induced vacuum was observed in the observation wells during the DPE event. It must be noted that the screen intervals for wells MW-3 (20-32 ft bgs), MW-5 (18-33 ft bgs) and MW-7 (19-34 ft bgs) were submerged during this test event.
- Decreases in ground-water elevations (ranging from 0.05 to 0.15 feet) were observed in wells MW-3 and MW-7, with the largest decrease observed at well MW-3, located approximately 38 feet from test well MW-11. Observed decreases in ground-water elevations were not observed in the remaining wells.
- PID readings in the influent vapor stream ranged from 485 to 1108 ppmv.

- Maximum concentrations from laboratory analysis of influent vapor-stream samples
 collected during this event were 1,100 ppmv GRO and 4.5 ppmv Benzene (Table 3).
 MTBE was not detected above the laboratory reporting limit in the influent vaporstream samples analyzed.
- Maximum concentrations from laboratory analysis of influent water samples collected during this event were 4,500 μg/l GRO, 58 μg/l Benzene and 7.2 μg/l MTBE (Table 4).
- Based on influent concentrations in the vapor stream and average flow rates, approximately 8.69 lbs of GRO and 0.028 lbs of Benzene were extracted in soil vapor (Table 3).
- Based on the volume of ground water extracted during this event and petroleum hydrocarbon concentrations in the influent water samples, approximately 0.0062 lbs of GRO and 0.00008 lbs of Benzene were extracted from the ground water (Table 5).

6.1.5 Multi-Well Extraction Event

The multi-well extraction event was conducted between 30 April and 1 May 2009 for approximately 12 hours and utilized wells MW-5, MW-10, MW-11, and MW-12. The bottom of the stinger was set at approximately 31 ft bgs in well MW-5 and 29 ft bgs in wells MW-10, MW-11, and MW-12. Initial depth to water prior to commencement of the event was measured at 9.54 feet below top of casing in well MW-5, 8.82 feet below top of casing in well MW-10, 8.75 feet below top of casing in well MW-11, and 9.93 feet below top of casing in well MW-12. Wells MW-3, MW-4, MW-6, and MW-7 were used as observation points during the event. Results of the multi-well DPE event are summarized below:

- The influent soil vapor flow rate ranged between 70.0 and 80.0 scfm (averaging approximately 79.23 scfm) with an applied vacuum that was varied between 22.5 and 23.0 in.Hg (averaging approximately 22.8 in.Hg).
- Approximately 630 gallons of water were extracted during the multi-well DPE event at a flow rate of approximately 0.81 gpm.
- No induced vacuum was observed in the observation wells during the DPE event. It must be noted that the screen intervals for wells MW-3 (20-32 ft bgs), MW-4 (20-27 ft bgs), MW-6 (20-35 ft bgs), and MW-7 (19-34 ft bgs) were submerged during this test event.
- Decreases in ground-water elevations (ranging from 0.05 to 1.08 feet) were observed in each of the observation wells, with the largest decrease observed at well MW-3.
- PID readings in the influent vapor stream ranged from 1189 to 1833 ppmv.

- Maximum concentrations from laboratory analysis of influent vapor-stream samples
 collected during this event were 4,500 ppmv GRO and 14 ppmv Benzene (Table 3).
 MTBE was not detected above the laboratory reporting limit in the influent vaporstream samples analyzed.
- Maximum concentrations from laboratory analysis of influent water samples collected during this event were 46,000 μ g/l GRO and 300 μ g/l Benzene (Table 4). MTBE was not detected above the laboratory reporting limit in the influent water samples analyzed.
- Based on influent concentrations in the vapor stream and average flow rates, approximately 55.86 lbs of GRO and 0.146 lbs of Benzene were extracted in soil vapor (Table 3).
- Based on the volume of ground water extracted during this event and petroleum hydrocarbon concentrations in the influent water samples, approximately 0.2098 lbs of GRO and 0.0007 lbs of Benzene were extracted from the ground water (Table 5).

6.2 DPE Pilot Test Results

Stratus conducted four individual DPE events utilizing wells MW-5, MW-10, MW-11, and MW-12 and one multi-well DPE event utilizing each of the wells used for the individual events. The extraction events varied from approximately 10 to 12 hours. During the DPE events on individual wells, the average soil vapor extraction rate was approximately 43.66 scfm and the average applied vacuum was approximately 24.1 in.Hg while during the multi-well DPE event the average soil vapor extraction rate was approximately 79.23 scfm and the average applied system vacuum was approximately 22.8 in.Hg. Laboratory analytical results reported relatively high GRO concentrations in soil vapor extracted from well MW-10 (maximum of 2,300 ppmv GRO) and also during the multi-well DPE event (maximum of 4,500 ppmv GRO). Concentrations of hydrocarbons in the extracted ground water during the events were relatively high for samples collected from wells MW-5, MW-10, and during the multi-well DPE event (maximum of 46,000 µg/l GRO). The concentration of hydrocarbons in soil vapor generally decreased over time during extraction from well MW-5, while concentrations increased over time during extraction from wells MW-10, MW-12, and during the multi-well DPE event. The concentrations of hydrocarbons in soil vapor remained relatively constant over time during extraction from well MW-11. The concentration of hydrocarbons in ground water generally decreased over time during extraction from wells MW-5, MW-10, MW-11, and MW-12. GRO concentrations generally increased during the multi-well DPE event, while the remaining constituents generally decreased.

Approximately 1,460 gallons of ground water was extracted as a result of this DPE pilot test. Approximately 0.2713 lbs of GRO and 0.002 lbs of Benzene in ground water, and 91 lbs of GRO and 0.3028 lbs of Benzene in soil vapor were removed from the subsurface during extraction activities.

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

BAI prepared this *Soil and Ground-Water Investigation Report* for Station No.11109 following implementation of the scope of work proposed in the *Monitoring Well Installation and Dual-Phase Extraction Pilot Testing Work Plan* (BAI, 02/03/2009). BAI makes the following conclusions:

- **Preferential Pathway Evaluation** The results obtained from the utility survey portion of the preferential pathway evaluation, although not fully conclusive, reveals that the migration pathway via utility conduits is unlikely. Depths to specific utilities and backfill material used were not provided by several agencies, which makes it difficult to determine whether the underground utilities on and near the Site come into direct contact with the ground-water table. Depth to ground water at the Site has historically ranged from approximately six feet bgs to 30 feet bgs. Besides the monitoring wells for the Site and nearby UST release cases, no wells were identified in the immediate area that might vertically cross-contaminate water bearing units in the vicinity.
- Monitoring Well Installation Monitoring wells MW-10 through MW-12 were successfully installed within the southern corner of the Site in order to further characterize ground-water conditions near existing well MW-5 and potentially be utilized as recovery wells in the future. Soil results indicate petroleum contaminants as deep as 30 ft bgs, which is coincident with previous depths to ground water in 1994. This indicates the presence of a thick 'smear zone.' Based on the laboratory analytical results observed during the DPE pilot test, the elevated hydrocarbon concentrations in these wells conclude that contaminant recovery may be viable from these wells.
- **Dual-Phase Extraction Pilot Test** A significant amount of GRO (91 lbs) was removed as soil vapor during the DPE pilot testing activities. Ground-water drawdown was observed in a majority of the observation wells throughout the extraction events. Vacuum influence was not observed during the DPE pilot test. For some nearby wells, the lack of vacuum influence may be due to submerged screen intervals. However, it was surprising that vacuum influence was not observed within the new wells MW-10 through MW-12 when withdrawing from them or MW-5.

7.2 Recommendations

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

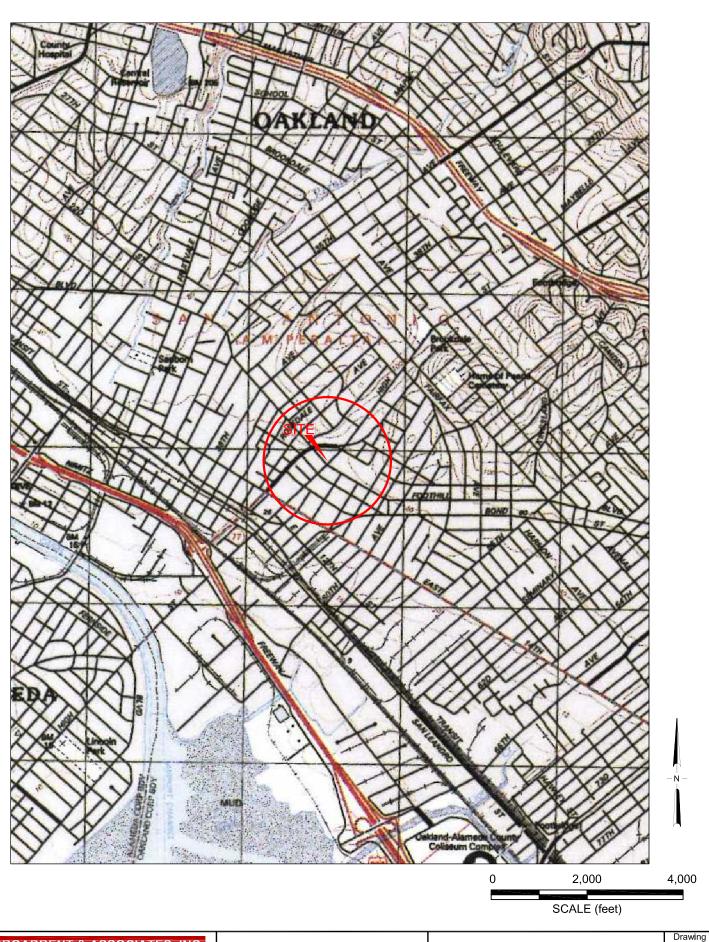
- One year of monitoring and sampling should be performed to seek trends in the contaminant concentrations from the new wells MW-10 through MW-12. These three new wells should be included within the monthly monitoring for/bailing of free product/separate phase hydrocarbons presently conducted at well MW-5.
- Develop a formal Feasibility Study and proceed with Corrective Action Design of a DPE treatment system.

8.0 CLOSURE

The findings presented in this document are based upon: observation of field personnel from previous consultants, the points investigated, and results of laboratory tests performed by various laboratories. Our services were performed in accordance with the generally accepted standard of practice at the time this document was written. No other warranty, expressed 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.

9.0 REFERENCES

- ACEH, 5 December 2008. Fuel Leak Case No.RO0000426 and Geotracker Global ID T0600100217, BP #11109, 4280 Foothill Boulevard, Oakland, CA 94601. Letter from Mr. Paresh Khatri (ACEH) to Mr. Paul Supple (Atlantic Richfield Company).
- ACEH, 19 February 2009. Fuel Leak Case No.RO0000426 and Geotracker Global ID T0600100217, BP #11109, 4280 Foothill Boulevard, Oakland, CA 94601. Letter from Mr. Paresh Khatri (ACEH) to Mr. Paul Supple (Atlantic Richfield Company).
- AT&T, 18 March 2009. Confidential plan map of underground telephone utilities in Site vicinity. Provided by Karen Brinkman (AT&T) to Sam Barkley (BAI).
- BAI, 7 November 2008. *Initial Site Conceptual Model, Former BP Station No. 11109, 4280 Foothill Boulevard, Oakland, California.* Prepared for Atlantic Richfield Company.
- BAI, 3 February 2009. Monitoring Well Installation and Dual-Phase Extraction Pilot Testing Work Plan, Former BP Station No. 11109, 4280 Foothill Boulevard, Oakland, California. Prepared for Atlantic Richfield Company.
- EBMUD, Engineering Services Division, 16 January 2009. Plan maps of water pipelines in Site vicinity. Provided by Perfy Quiachon (EBMUD) to Sam Barkley (BAI).
- EMCON, 27 December 1994. Baseline Assessment Report, BP Oil Company Service Station No. 11109, 4280 Foothill Boulevard, Oakland, California.
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- Pacific Gas & Electric Company, 2 April 2009. Confidential plan maps of underground gas and electric utilities in Site vicinity. Provided by Anthony Thompson (PG&E) to Sam Barkley (BAI).
- Stratus, 17 April 2009. Notification of 5-Day Feasibility Test, Former BP Service Station No. 11109, 4280 Foothill Boulevard, Oakland, California. Letter from Kiran Nagaraju (Stratus) to Ms. Chan (Bay Area Air Quality Management District).

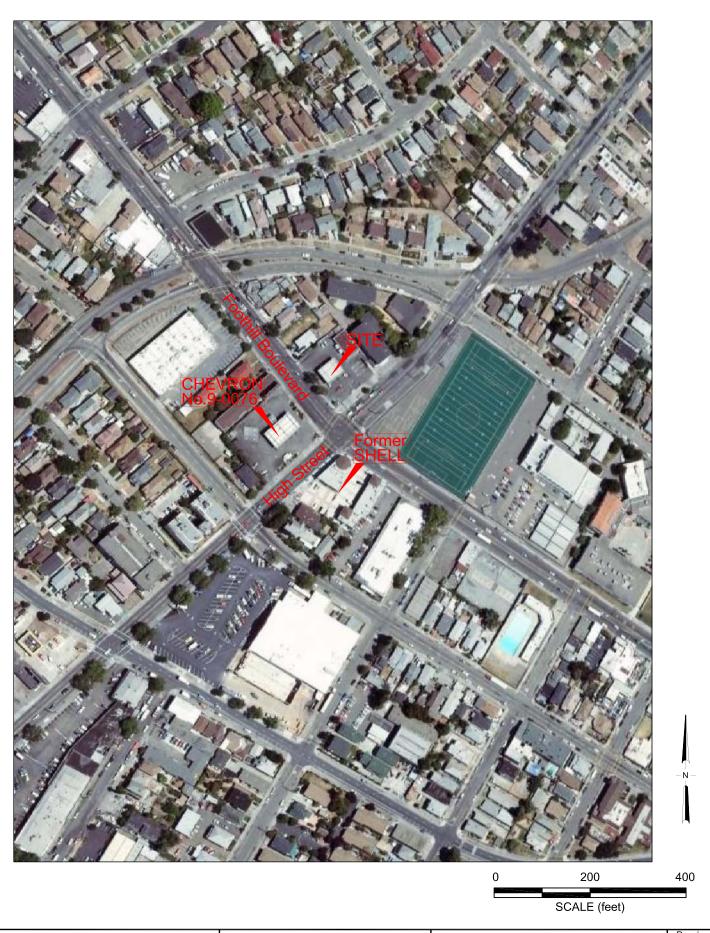


BROADBENT & ASSOCIATES, INC.

ENGINEERING, WATER RESOURCES & ENVIRONMENTAL 1324 Mangrove Ave. Suite 212, Chico, California Project No.: 06-88-646 Date: 6/1/09 Former BP Station #11109 4280 Foothill Boulevard Oakland, California

Site Location Map with Quarter-Mile Radius Well Search

Drawing



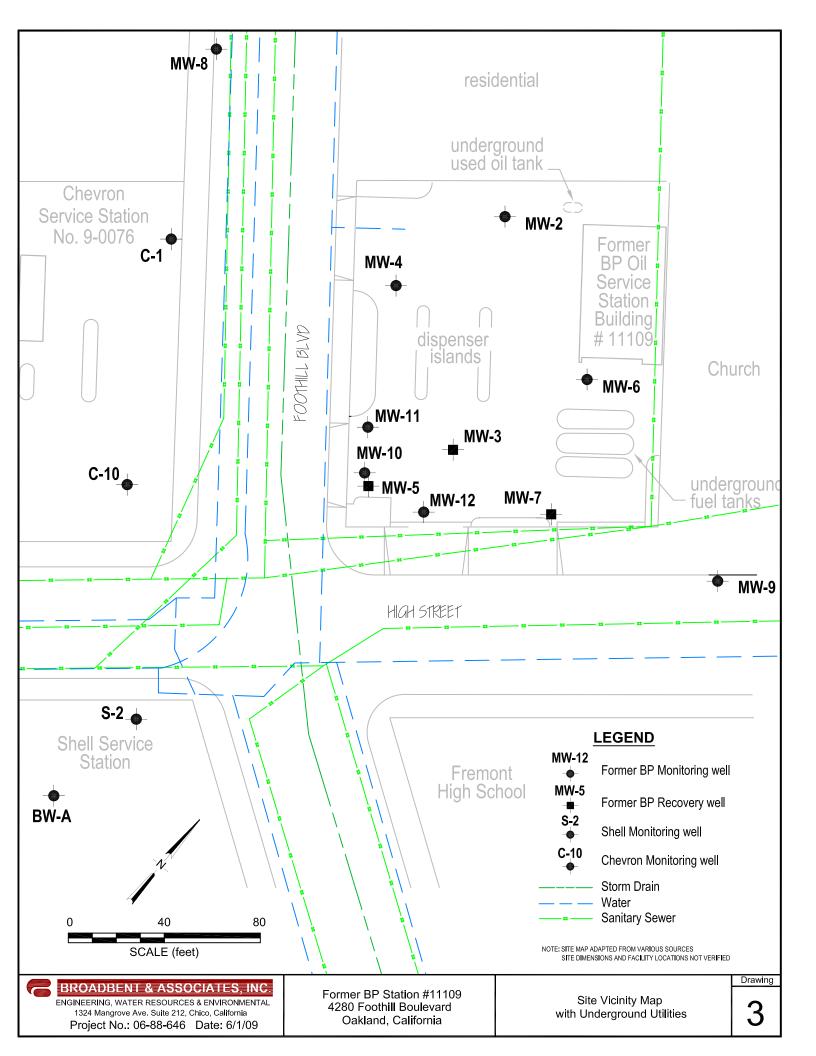
BROADBENT & ASSOCIATES, INC. ENGINEERING, WATER RESOURCES & ENVIRONMENTAL 1324 Mangrove Ave. Suite 212, Chico, California

Project No.: 06-08-646 Date: 6/1/09

Former BP Station #11109 4280 Foothill Boulevard Oakland, California

Area Development Photo

Drawing



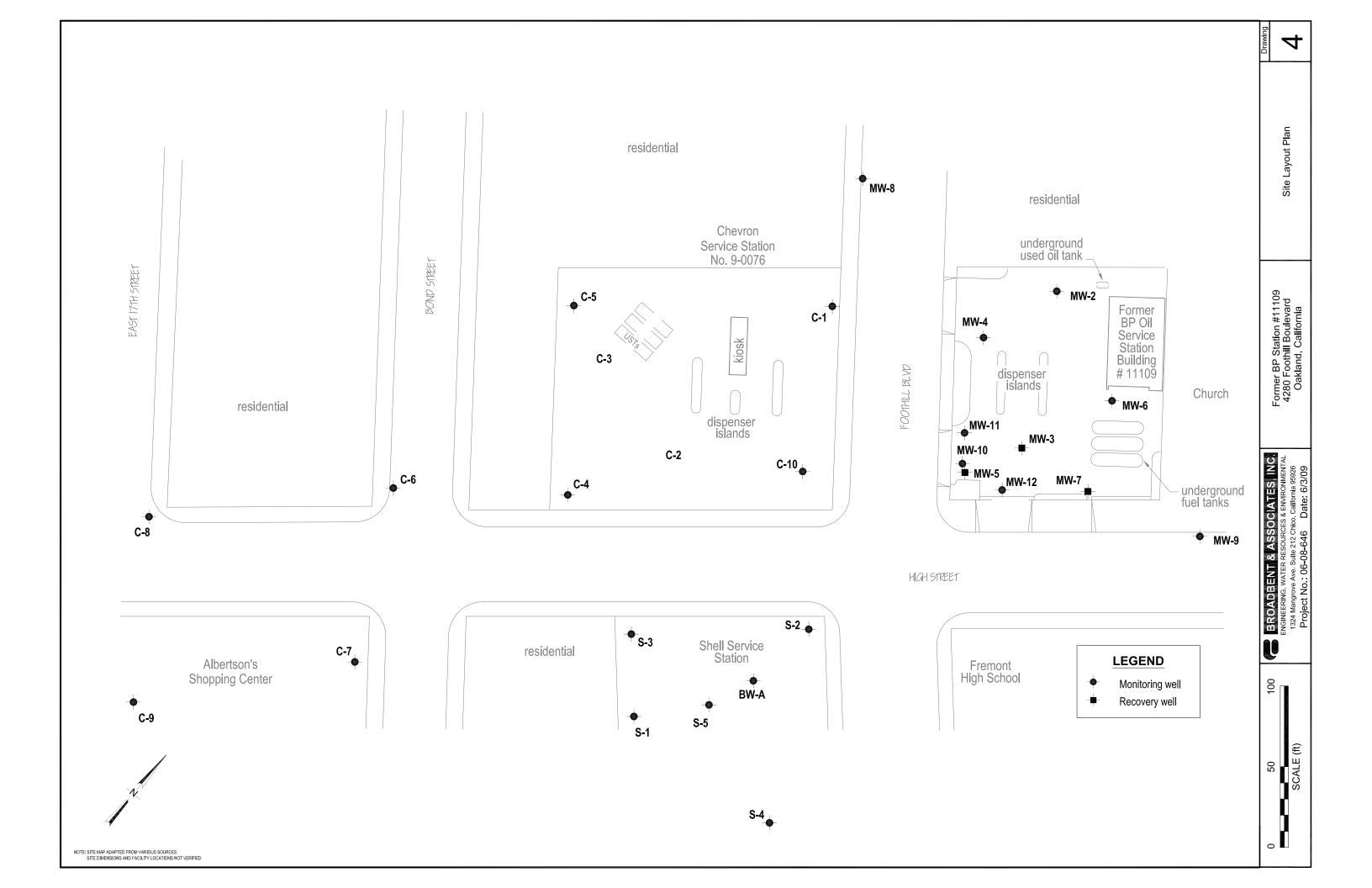


Table 1. DPE Pilot Test Extraction Well Data Former BP Service Station #11109, 4280 Foothill Boulevard, Oakland, California

Extraction Event	Cumulative Testing Time (hours)	Depth to Water (feet)	Drawdown (feet)	Applied System Vacuum (inches Hg)	Air Flow Rate (SCFM)	Volume of Water (cumulative gal)	•	PID Re Influent	Effluent
								(ppm)	(ppm)
MW-5	0	9.54				0.00	0.00		
(4/27/2009)	Startup	31.00	-21.46			0.00	0.00		
Stinger tip set approximately	1	31.00	-21.46	24.0	48.00	0.00	0.00	888	5.0
two feet above well bottom, or	2	31.00	-21.46	24.0	48.00	60.00	1.00	482	5.0
approx. 21.5 ft below water surface	3	31.00	-21.46	24.0	48.00	60.00	0.00	412	4.0
	4	31.00	-21.46	24.0	48.00	60.00	0.00	323	4.0
	5	31.00	-21.46	25.0	48.00	90.00	0.50	320	3.0
	6	31.00	-21.46	24.0	48.00	90.00	0.00	299	4.0
	7	31.00	-21.46	25.0	48.00	90.00	0.00	270	4.0
	8	31.00	-21.46	24.0	48.00	110.00	0.33	261	4.0
	9	31.00	-21.46	24.0	48.00	110.00	0.00	267	3.0
Test terminated	10	31.00	-21.46	24.0	48.00	130.00	0.33	299	4.0
MW-12	0	9.93 ¹				0.00	0.00		
(4/28/2009)	Startup	29.00	-19.07			0.00	0.00		
Stinger tip set approximately	0.5	29.00	-19.07	25.0	36.00	0.00	0.00	433	5.0
one foot above well bottom, or	1.5	29.00	-19.07	25.0	30.00	70.00	1.17	428	4.0
approx. 19 ft below water surface	2.5	29.00	-19.07	25.0	36.00	70.00	0.00	362	4.0
	3.5	29.00	-19.07	25.0	36.00	70.00	0.00	295	4.0
	4.5	29.00	-19.07	25.0	36.00	140.00	1.17	316	3.0
	5.5	29.00	-19.07	25.0	36.00	140.00	0.00	328	4.0
	6.5	29.00	-19.07	25.0	36.00	190.00	0.83	325	4.0
	7.5	29.00	-19.07	25.0	38.00	230.00	0.67	328	3.0
	8.5	29.00	-19.07	25.0	38.00	230.00	0.00	353	3.0
	9.5	29.00	-19.07	25.0	38.00	230.00	0.00	347	3.0
	10.5	29.00	-19.07	25.0	38.00	300.00	1.17	357	3.0
Test terminated	11	29.00	-19.07	25.0	38.00	330.00	0.50	447	3.0
MW-10	0	8.821				0.00	0.00		
(4/29/2009)	Startup	29.00	-20.18			0.00	0.00		
Stinger tip set approximately	0.5	29.00	-20.18	23.0	46.00	0.00	0.00	1081	7.0
one foot above well bottom, or	1.5	29.00	-20.18	23.0	35.00	0.00	0.00	1084	7.0
approx. 20 ft below water surface	2.5	29.00	-20.18	23.0	36.00	40.00	0.67	1106	7.0
approx. 20 it below water surface	3.5	29.00	-20.18	23.0	46.00	40.00	0.00	1021	1.0
	4.5	29.00	-20.18	23.0	46.00	40.00	0.00	1091	0.0
	5.5	29.00	-20.18	23.0	46.00	110.00	1.17	942	0.0
		29.00	-20.18	23.0			0.00	841	0.0
	6.5				46.00	110.00			
	7.5	29.00	-20.18	23.0	46.00	130.00	0.33	824	2.0
	8.5	29.00	-20.18	23.0	46.00	130.00	0.00	830	3.0
	9.5	29.00	-20.18	23.0	46.00	130.00	0.00	823	3.0
T44	10.5	29.00 29.00	-20.18 -20.18	23.0 23.0	46.00	130.00 180.00	0.00 0.83	843 900	3.0 3.0
Test terminated	11				46.00				
MW-11	0	8.751				0.00	0.00		
(4/30/2009)	Startup	29.00	-20.25			0.00	0.00		
Stinger tip set approximately	0.5	29.00	-20.25	24.0	46.00	0.00	0.00	562	5.0
one foot above well bottom, or	1.5	29.00	-20.25	24.0	46.00	30.00	0.50	1108	6.0
approx. 20.25 ft below water surface	2.5	29.00	-20.25	24.0	45.00	30.00	0.00	1007	3.5
	3.5	29.00	-20.25	24.0	46.00	30.00	0.00	715	4.0
									_
	4.5	29.00	-20.25	24.0	46.00	40.00	0.17	757	4.0
	4.5 5.5	29.00 29.00	-20.25 -20.25	24.0 24.0	46.00 46.00	40.00 90.00	0.83	627	2.2
	4.5 5.5 6.5	29.00 29.00 29.00	-20.25 -20.25 -20.25	24.0 24.0 24.0	46.00 46.00 45.00	40.00 90.00 110.00	0.83 0.33	627 571	2.2 2.0
	4.5 5.5 6.5 7.5	29.00 29.00 29.00 29.00	-20.25 -20.25 -20.25 -20.25	24.0 24.0 24.0 24.0	46.00 46.00 45.00 46.00	40.00 90.00 110.00 120.00	0.83 0.33 0.17	627 571 527	2.2 2.0 2.0
	4.5 5.5 6.5 7.5 8.5	29.00 29.00 29.00 29.00 29.00	-20.25 -20.25 -20.25 -20.25 -20.25	24.0 24.0 24.0 24.0 24.0 24.0	46.00 46.00 45.00 46.00 46.00	40.00 90.00 110.00 120.00 120.00	0.83 0.33 0.17 0.00	627 571 527 485	2.2 2.0 2.0 2.8
	4.5 5.5 6.5 7.5 8.5 9.5	29.00 29.00 29.00 29.00 29.00 29.00	-20.25 -20.25 -20.25 -20.25 -20.25 -20.25	24.0 24.0 24.0 24.0 24.0 24.0	46.00 46.00 45.00 46.00 46.00 46.00	40.00 90.00 110.00 120.00 120.00 120.00	0.83 0.33 0.17 0.00 0.00	627 571 527 485 525	2.2 2.0 2.0 2.8 1.7
	4.5 5.5 6.5 7.5 8.5 9.5	29.00 29.00 29.00 29.00 29.00 29.00 29.00	-20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25	24.0 24.0 24.0 24.0 24.0 24.0 24.0	46.00 46.00 45.00 46.00 46.00 46.00 49.00	40.00 90.00 110.00 120.00 120.00 120.00 120.00	0.83 0.33 0.17 0.00 0.00 0.00	627 571 527 485 525 528	2.2 2.0 2.0 2.8 1.7 8.1
Test terminated	4.5 5.5 6.5 7.5 8.5 9.5 10.5 11.5	29.00 29.00 29.00 29.00 29.00 29.00	-20.25 -20.25 -20.25 -20.25 -20.25 -20.25	24.0 24.0 24.0 24.0 24.0 24.0	46.00 46.00 45.00 46.00 46.00 46.00	40.00 90.00 110.00 120.00 120.00 120.00 120.00 190.00	0.83 0.33 0.17 0.00 0.00 0.00 1.17	627 571 527 485 525	2.2 2.0 2.0 2.8 1.7
MW-5, MW-10, MW-11 & MW-12	4.5 5.5 6.5 7.5 8.5 9.5 10.5 11.5	29.00 29.00 29.00 29.00 29.00 29.00 29.00	-20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25	24.0 24.0 24.0 24.0 24.0 24.0 24.0 24.0	46.00 46.00 45.00 46.00 46.00 46.00 49.00 46.00	40.00 90.00 110.00 120.00 120.00 120.00 190.00	0.83 0.33 0.17 0.00 0.00 0.00 1.17	627 571 527 485 525 528 520	2.2 2.0 2.0 2.8 1.7 8.1 7.0
MW-5, MW-10, MW-11 & MW-12 (4/30/2009-5/1/2009)	4.5 5.5 6.5 7.5 8.5 9.5 10.5 11.5 0 Startup	29.00 29.00 29.00 29.00 29.00 29.00 29.00 29.00 29.00	-20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25	24.0 24.0 24.0 24.0 24.0 24.0 24.0 24.0	46.00 46.00 45.00 46.00 46.00 46.00 49.00 46.00	40.00 90.00 110.00 120.00 120.00 120.00 190.00 0.00	0.83 0.33 0.17 0.00 0.00 0.00 1.17 0.00 0.00	627 571 527 485 525 528 520	2.2 2.0 2.0 2.8 1.7 8.1 7.0
MW-5, MW-10, MW-11 & MW-12 (4/30/2009-5/1/2009) Stinger tips set at various depths	4.5 5.5 6.5 7.5 8.5 9.5 10.5 11.5 0 Startup	29.00 29.00 29.00 29.00 29.00 29.00 29.00 29.00	-20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25	24.0 24.0 24.0 24.0 24.0 24.0 24.0 24.0	46.00 46.00 45.00 46.00 46.00 46.00 49.00 46.00 80.00 70.00	40.00 90.00 110.00 120.00 120.00 120.00 120.00 190.00 0.00 0.00 150.00	0.83 0.33 0.17 0.00 0.00 0.00 1.17 0.00 0.00 2.50	627 571 527 485 525 528 520 1236 1189	2.2 2.0 2.0 2.8 1.7 8.1 7.0
MW-5, MW-10, MW-11 & MW-12 (4/30/2009-5/1/2009)	4.5 5.5 6.5 7.5 8.5 9.5 10.5 11.5 0 Startup 1 2	29.00 29.00 29.00 29.00 29.00 29.00 29.00 29.00 29.00	-20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25	24.0 24.0 24.0 24.0 24.0 24.0 24.0 24.0 22.5 22.5 22.5	46.00 46.00 45.00 46.00 46.00 46.00 49.00 46.00 80.00 70.00 80.00	40.00 90.00 110.00 120.00 120.00 120.00 120.00 190.00 0.00 0.00 150.00 220.00	0.83 0.33 0.17 0.00 0.00 0.00 1.17 0.00 0.00 2.50 1.17	627 571 527 485 525 528 520 1236 1189 1328	2.2 2.0 2.0 2.8 1.7 8.1 7.0
MW-5, MW-10, MW-11 & MW-12 (4/30/2009-5/1/2009) Stinger tips set at various depths	4.5 5.5 6.5 7.5 8.5 9.5 10.5 11.5 0 Startup	29.00 29.00 29.00 29.00 29.00 29.00 29.00 29.00 29.00	-20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25	24.0 24.0 24.0 24.0 24.0 24.0 24.0 24.0	46.00 46.00 45.00 46.00 46.00 49.00 46.00 80.00 70.00 80.00 80.00	40.00 90.00 110.00 120.00 120.00 120.00 190.00 0.00 0.00 150.00 220.00	0.83 0.33 0.17 0.00 0.00 0.00 1.17 0.00 0.00 2.50 1.17 0.00	627 571 527 485 525 528 520 1236 1189 1328 1303	2.2 2.0 2.0 2.8 1.7 8.1 7.0 4.2 3.0 2.4 4.0
MW-5, MW-10, MW-11 & MW-12 (4/30/2009-5/1/2009) Stinger tips set at various depths	4.5 5.5 6.5 7.5 8.5 9.5 10.5 11.5 0 Startup 1 2	29.00 29.00 29.00 29.00 29.00 29.00 29.00 29.00	-20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25	24.0 24.0 24.0 24.0 24.0 24.0 24.0 24.0 22.5 22.5 22.5	46.00 46.00 45.00 46.00 46.00 46.00 49.00 46.00 80.00 70.00 80.00	40.00 90.00 110.00 120.00 120.00 120.00 120.00 190.00 0.00 0.00 150.00 220.00	0.83 0.33 0.17 0.00 0.00 0.00 1.17 0.00 0.00 2.50 1.17	627 571 527 485 525 528 520 1236 1189 1328	2.2 2.0 2.0 2.8 1.7 8.1 7.0 4.2 3.0 2.4
MW-5, MW-10, MW-11 & MW-12 (4/30/2009-5/1/2009) Stinger tips set at various depths	4.5 5.5 6.5 7.5 8.5 9.5 10.5 11.5 0 Startup 1 2 3	29.00 29.00 29.00 29.00 29.00 29.00 29.00 29.00	-20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25	24.0 24.0 24.0 24.0 24.0 24.0 24.0 24.0	46.00 46.00 45.00 46.00 46.00 49.00 46.00 80.00 70.00 80.00 80.00	40.00 90.00 110.00 120.00 120.00 120.00 190.00 0.00 0.00 150.00 220.00	0.83 0.33 0.17 0.00 0.00 0.00 1.17 0.00 0.00 2.50 1.17 0.00	627 571 527 485 525 528 520 1236 1189 1328 1303	2.2 2.0 2.0 2.8 1.7 8.1 7.0 4.2 3.0 2.4 4.0
MW-5, MW-10, MW-11 & MW-12 (4/30/2009-5/1/2009) Stinger tips set at various depths	4.5 5.5 6.5 7.5 8.5 9.5 10.5 11.5 0 Startup 1 2 3 4	29.00 29.00 29.00 29.00 29.00 29.00 29.00 29.00 	-20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 	24.0 24.0 24.0 24.0 24.0 24.0 24.0 24.0 24.0 22.5 22.5 22.5 22.5 22.5 22.5	46.00 46.00 45.00 46.00 46.00 49.00 49.00 70.00 80.00 80.00 80.00	40.00 90.00 110.00 120.00 120.00 120.00 190.00 0.00 0.00 150.00 220.00 220.00 290.00	0.83 0.33 0.17 0.00 0.00 0.00 1.17 0.00 0.00 2.50 1.17 0.00 1.17	627 571 527 485 525 528 520 1236 1189 1328 1303 1351	2.2 2.0 2.0 2.8 1.7 8.1 7.0 4.2 3.0 2.4 4.0 4.0
MW-5, MW-10, MW-11 & MW-12 (4/30/2009-5/1/2009) Stinger tips set at various depths	4.5 5.5 6.5 7.5 8.5 9.5 10.5 11.5 0 Startup 1 2 3 4 5	29.00 29.00 29.00 29.00 29.00 29.00 29.00 29.00	-20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25	24.0 24.0 24.0 24.0 24.0 24.0 24.0 24.0 24.0 24.0 22.5 22.5 22.5 22.5 22.5 22.5 22.5	46.00 46.00 45.00 46.00 46.00 49.00 46.00 80.00 70.00 80.00 80.00 80.00 80.00	40.00 90.00 110.00 120.00 120.00 120.00 120.00 190.00 0.00 0.00 0.00 220.00 220.00 290.00 310.00	0.83 0.33 0.17 0.00 0.00 0.00 1.17 0.00 2.50 1.17 0.00 1.17 0.33	627 571 527 485 525 528 520 	2.2 2.0 2.0 2.8 1.7 8.1 7.0 4.2 3.0 2.4 4.0 4.0
MW-5, MW-10, MW-11 & MW-12 (4/30/2009-5/1/2009) Stinger tips set at various depths	4.5 5.5 6.5 7.5 8.5 9.5 10.5 11.5 0 Startup 1 2 3 4 5 6	29.00 29.00 29.00 29.00 29.00 29.00 29.00 29.00	-20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25	24.0 24.0 24.0 24.0 24.0 24.0 24.0 24.0 24.0 22.5 22.5 22.5 22.5 22.5 22.5 22.5 23.0 23.0	46.00 46.00 45.00 46.00 46.00 49.00 46.00 80.00 70.00 80.00 80.00 80.00 80.00 80.00	40.00 90.00 110.00 120.00 120.00 120.00 120.00 190.00 0.00 0.00 150.00 220.00 220.00 290.00 310.00 380.00	0.83 0.33 0.17 0.00 0.00 0.00 1.17 0.00 2.50 1.17 0.03 1.17	627 571 527 485 525 528 520 1236 1189 1328 1303 1351 1350 1431	2.2 2.0 2.0 2.8 1.7 8.1 7.0 4.2 3.0 2.4 4.0 4.0 4.0
MW-5, MW-10, MW-11 & MW-12 (4/30/2009-5/1/2009) Stinger tips set at various depths	4.5 5.5 6.5 7.5 8.5 9.5 10.5 11.5 0 Startup 1 2 3 4 5 6 7	29.00 29.00 29.00 29.00 29.00 29.00 29.00 29.00	-20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25	24.0 24.0 24.0 24.0 24.0 24.0 24.0 24.0 22.5 22.5 22.5 22.5 22.5 22.5 23.0 23.0 23.0	46.00 46.00 45.00 46.00 46.00 49.00 46.00 80.00 70.00 80.00 80.00 80.00 80.00 80.00 80.00	40.00 90.00 110.00 120.00 120.00 120.00 190.00 0.00 0.00 150.00 220.00 220.00 290.00 310.00 380.00 450.00	0.83 0.33 0.17 0.00 0.00 0.00 1.17 0.00 2.50 1.17 0.00 1.17 0.33 1.17	627 571 527 485 525 528 520 1236 1189 1328 1303 1351 1350 1431 1426	2.2 2.0 2.0 2.8 1.7 8.1 7.0
MW-5, MW-10, MW-11 & MW-12 (4/30/2009-5/1/2009) Stinger tips set at various depths	4.5 5.5 6.5 7.5 8.5 9.5 10.5 11.5 0 Startup 1 2 3 4 5 6 7 8	29.00 29.00 29.00 29.00 29.00 29.00 29.00 29.00	-20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25	24.0 24.0 24.0 24.0 24.0 24.0 24.0 24.0 22.5 22.5 22.5 22.5 22.5 23.0 23.0 23.0	46.00 46.00 45.00 46.00 46.00 49.00 46.00 80.00 70.00 80.00 80.00 80.00 80.00 80.00 80.00	40.00 90.00 110.00 120.00 120.00 120.00 190.00 0.00 0.00 150.00 220.00 220.00 290.00 310.00 380.00 450.00	0.83 0.33 0.17 0.00 0.00 0.00 1.17 0.00 2.50 1.17 0.00 1.17 0.33 1.17 1.17	627 571 527 485 525 528 520 1236 1189 1328 1303 1351 1350 1411	2.2 2.0 2.0 2.8 1.7 8.1 7.0 4.2 3.0 2.4 4.0 4.0 4.0 3.0 3.0
MW-5, MW-10, MW-11 & MW-12 (4/30/2009-5/1/2009) Stinger tips set at various depths	4.5 5.5 6.5 7.5 8.5 9.5 10.5 11.5 0 Startup 1 2 3 4 5 6 7 8	29.00 29.00 29.00 29.00 29.00 29.00 29.00 29.00	-20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25 -20.25	24.0 24.0 24.0 24.0 24.0 24.0 24.0 24.0 24.0 22.5 22.5 22.5 22.5 22.5 22.5 23.0 23.0 23.0 23.0	46.00 46.00 45.00 46.00 46.00 49.00 49.00 80.00 70.00 80.00 80.00 80.00 80.00 80.00 80.00 80.00 80.00 80.00 80.00	40.00 90.00 110.00 120.00 120.00 120.00 120.00 190.00 0.00 0.00 220.00 220.00 220.00 310.00 380.00 450.00 520.00	0.83 0.33 0.17 0.00 0.00 0.00 1.17 0.00 0.50 1.17 0.33 1.17 0.00 1.17	627 571 527 485 525 528 520 1236 1189 1328 1303 1351 1350 1431 1426 1414 1460	2.2 2.0 2.0 2.8 1.7 8.1 7.0 4.2 3.0 2.4 4.0 4.0 4.0 3.0 3.0 3.0

Depth to water values are calculated based on the estimated depth of the stinger

^{--- -} Not Applicable
* - Estimated

 $^{^{\}rm 1}$ - Depth to water value from 4/27/2009 prior to initiation of DPE activities

Table 2. DPE Pilot Test Observation Well Data Former BP Service Station #11109, 4280 Foothill Boulevard, Oakland, California

MW-5 Extraction

					Observation	on Wells				
	MW-	-3 ^a	MW-	7^{ab}	MW-	10	MW-	11	MW-	-12
Hours	VAC	DTW	VAC	DTW	VAC	DTW	VAC	DTW	VAC	DTW
0	0.00	9.98	0.00	11.91	0.00	8.82	0.00	8.75	0.00	9.93
1	0.00	9.96	0.00	11.45	0.00	10.54	0.00	8.72	0.00	9.97
2	0.00	9.94	0.00	11.40	0.00	12.46	0.00	8.83	0.00	10.34
3	0.00	9.97	0.00	11.37	0.00	13.82	0.00	9.02	0.00	10.62
4	0.00	9.95	0.00	11.37	0.00	14.30	0.00	9.11	0.00	10.75
5	0.00	9.96	0.00	11.37	0.00	15.31	0.00	9.32	0.00	11.00
6	0.00	9.99	0.00	11.37	0.00	16.00	0.00	9.50	0.00	11.16
7	0.00	9.99	0.00	11.37	0.00	16.61	0.00	9.65	0.00	11.35
8	0.00	10.02	0.00	11.38	0.00	17.25	0.00	9.82	0.00	11.50
9	0.00	10.03	0.00	11.38	0.00	17.58	0.00	9.94	0.00	11.61
10	0.00	10.05	0.00	11.35	0.00	17.85	0.00	10.05	0.00	11.70
	Final DD: -0.07		Final DD:	0.56	Final DD:	-9.03	Final DD:	-1.30	Final DD:	-1.77
	Max. Vac:	0.00	Max. Vac:	0.00	Max. Vac:	0.00	Max. Vac:	0.00	Max. Vac:	0.00

MW-12 Extraction

					Observation	on Wells				
	MW-	-3 ^a	MW-	-5 ^a	MW-	7^{ab}	MW-	10	MW-	-11
Hours	VAC	DTW	VAC	DTW	VAC	DTW	VAC	DTW	VAC	DTW
0.5	0.00	10.40	0.00	13.00	0.00	11.43	0.00	12.30	0.00	10.12
1.5	0.00	10.40	0.00	12.92	0.00	11.44	0.00	12.17	0.00	10.10
2.5	0.00	10.40	0.00	13.06	0.00	11.50	0.00	12.22	0.00	10.11
3.5	0.00	10.42	0.00	13.28	0.00	11.58	0.00	12.35	0.00	10.15
4.5	0.00	10.49	0.00	13.53	0.00	11.70	0.00	12.51	0.00	10.20
5.5	0.00	10.55	0.00	13.24	0.00	11.80	0.00	12.67	0.00	10.24
6.5	0.00	10.65	0.00	13.90	0.00	11.92	0.00	12.80	0.00	10.28
7.5	0.00	10.75	0.00	14.05	0.00	12.00	0.00	12.93	0.00	10.32
8.5	0.00	10.86	0.00	14.20	0.00	12.10	0.00	13.06	0.00	10.36
9.5	0.00	10.96	0.00	14.30	0.00	12.16	0.00	13.16	0.00	10.39
10.5	0.00	11.02	0.00	14.41	0.00	12.24	0.00	13.27	0.00	10.44
11	0.00	11.19	0.00	14.52	0.00	12.29	0.00	13.35	0.00	10.49
	Final DD:	-0.79	Final DD:	-1.52	Final DD:	-0.86	Final DD:	-1.05	Final DD:	-0.37
	Max. Vac:	0.00	Max. Vac:	0.00	Max. Vac:	0.00	Max. Vac:	0.00	Max. Vac:	0.00

MW-10 Extraction

					Observation	on Wells				
	MW-	-3 ^a	MW	-5 ^a	MW-	7^{ab}	MW-	-11	MW-	-12
Hours	VAC	DTW	VAC	DTW	VAC	DTW	VAC	DTW	VAC	DTW
0.5	0.00	11.70	0.00	13.89	0.00	12.00	0.00	10.50	0.00	13.95
1.5	0.00	11.65	0.00	18.41	0.00	11.96	0.00	11.04	0.00	13.66
2.5	0.00	11.64	0.00	18.92	0.00	11.93	0.00	11.46	0.00	13.55
3.5	0.00	11.63	0.00	20.78	0.00	11.91	0.00	11.72	0.00	13.50
4.5	0.00	11.60	0.00	21.73	0.00	11.90	0.00	12.05	0.00	13.44
5.5	0.00	11.60	0.00	22.18	0.00	11.89	0.00	12.24	0.00	13.39
6.5	0.00	11.60	0.00	22.49	0.00	11.90	0.00	12.36	0.00	13.37
7.5	0.00	11.58	0.00	22.58	0.00	11.86	0.00	12.55	0.00	13.31
8.5	0.00	11.59	0.00	23.10	0.00	11.87	0.00	12.69	0.00	13.27
9.5	0.00	11.59	0.00	23.30	0.00	11.87	0.00	12.82	0.00	13.24
10.5	0.00	11.59	0.00	23.47	0.00	11.86	0.00	12.95	0.00	13.20
12	0.00	11.60	0.00	23.64	0.00	11.84	0.00	13.06	0.00	13.15
	Final DD:	0.10	Final DD:	-9.75	Final DD:	0.16	Final DD:	-2.56	Final DD:	0.80
1	Max. Vac:	0.00	Max. Vac:	0.00	Max. Vac:	0.00	Max. Vac:	0.00	Max. Vac:	0.00

Table 2. DPE Pilot Test Observation Well Data Former BP Service Station #11109, 4280 Foothill Boulevard, Oakland, California

MW-11 Extraction

					Observation	on Wells				
	MW-	-3 ^a	MW	-5 ^a	MW-	7 ^{ab}	MW-	10	MW-	-12
Hours	VAC	DTW	VAC	DTW	VAC	DTW	VAC	DTW	VAC	DTW
0.5	0.00	11.62	0.00	16.80	0.00	11.74	0.00	15.12	0.00	12.34
1.5	0.00	11.60	0.00	15.91	0.00	11.75	0.00	14.94	0.00	12.25
2.5	0.00	11.60	0.00	15.58	0.00	11.75	0.00	14.99	0.00	12.22
3.5	0.00	11.60	0.00	15.27	0.00	11.75	0.00	15.06	0.00	12.19
4.5	0.00	11.60	0.00	14.98	0.00	11.75	0.00	15.12	0.00	12.16
5.5	0.00	11.62	0.00	14.77	0.00	11.77	0.00	15.15	0.00	12.14
6.5	0.00	11.65	0.00	14.61	0.00	11.79	0.00	15.14	0.00	12.12
7.5	0.00	11.66	0.00	14.46	0.00	11.81	0.00	15.15	0.00	12.09
8.5	0.00	11.70	0.00	14.31	0.00	11.80	0.00	15.18	0.00	12.00
9.5	0.00	11.71	0.00	14.25	0.00	11.81	0.00	15.11	0.00	11.98
10.5	0.00	11.74	0.00	14.14	0.00	11.79	0.00	15.11	0.00	11.93
11.5	0.00	11.77	0.00	14.10	0.00	11.79	0.00	15.11	0.00	11.90
	Final DD:	-0.15	Final DD:	2.70	Final DD:	-0.05	Final DD:	0.01	Final DD:	0.44
	Max. Vac:	0.00	Max. Vac:	0.00	Max. Vac:	0.00	Max. Vac:	0.00	Max. Vac:	0.00

MW-5, MW-10, MW-11, & MW-12 Extraction

	MW-	-3 ^a	MW	-4 ^a	MW-	-6 ^a	MW-	7 ^{ab}
Hours	VAC	VAC DTW VAC		DTW	VAC	DTW	VAC	DTW
0	0.00	11.79	0.00	14.00	0.00	14.73	0.00	11.75
1	0.00	11.77	0.00	14.01	0.00	14.73	0.00	11.74
2	0.00	11.78	0.00	14.04	0.00	14.73	0.00	11.78
3	0.00	11.83	0.00	14.05	0.00	14.73	0.00	11.86
4	0.00	11.88	0.00	14.05	0.00	14.73	0.00	11.94
6	0.00	12.09	0.00	14.06	0.00	14.76	0.00	12.12
8	0.00	12.41	0.00	14.07	0.00	14.77	0.00	12.31
10	0.00	12.70	0.00	14.08	0.00	14.80	0.00	12.45
12	0.00	12.87	0.00	14.05	0.00	14.80	0.00	12.51
	Final DD:	-1.08	Final DD:	-0.05	Final DD:	-0.07	Final DD:	-0.76
	Max. Vac:	0.00						

Notes:

VAC - Vacuum (in.Hg)

DTW - Depth to Water (feet)

Final DD - Final observed drawdown at end of test (feet).

Max Vac - Maximum recorded vacuum during test (in.Hg).

^a - Observation well screen interval submerged during test.

^b - Depth to water measured from fixture not top of casing.

Table 3. Summary of DPE Vapor Data: Laboratory Analyses and Estimated Removal Former BP Station #11109, 4280 Foothill Boulevard, Oakland, California

	Influer	nt Air		Air (average)]	Influent Air	Concentrat	ions in ppm	v		Rem	oval Rate	Not	removal
Extraction Event	Sam	ple	Flow Rate	Vacuum	PID			Ethyl-				(1	bs/hr)	Net	Telliovai
	Date	Time	SCFM	in.Hg	Readings	Benzene	Toluene	benzene	Xylenes	GRO	MTBE	GRO	Benzene	GRO (lbs)	Benzene (lbs)
MW-5	4/27/2009	9:10	DPE Te	st Initiated on MW-5											
MW-5	4/27/2009	11:00	48.00	24.00	482	4.5	2.1	3.5	14	780	< 0.50	0.592	0.0027	0.641	0.0029
MW-5	4/27/2009	16:55	48.00	24.00	261	5.0	1.9	1.4	3.8	410	< 0.35	0.311	0.0030	1.710	0.0162
MW-5	4/27/2009	18:45	48.00	24.00	299	4.5	2.0	1.7	4.0	430	< 0.30	0.326	0.0027	1.794	0.0146
MW-12	4/28/2009	6:00	DPE Tes	st Initiated on MW-12											
MW-12	4/28/2009	7:35	30.00	25.00	428	9.4	1.2	2.4	3.8	680	< 0.70	0.322	0.0035	0.349	0.0038
MW-12	4/28/2009	13:35	38.00	25.00	328	5.8	1.0	3.5	6.6	690	< 0.50	0.414	0.0027	2.175	0.0142
MW-12	4/28/2009	17:15	38.00	25.00	357	6.3	1.4	5.4	11	830	< 0.56	0.498	0.0029	2.326	0.0137
MW-10	4/29/2009	6:00	DPE Tes	st Initiated on MW-10											
MW-10	4/29/2009	7:46	35.00	23.00	1084	14	12	11	36	1,900	<1.0	1.051	0.0060	1.138	0.0065
MW-10	4/29/2009	13:35	46.00	23.00	824	11	9.1	9.4	27	2,200	<1.0	1.599	0.0062	7.862	0.0306
MW-10	4/29/2009	17:30	46.00	23.00	843	9.1	7.6	8.4	23	2,300	<1.0	1.672	0.0051	8.497	0.0262
MW-11	4/30/2009	6:00	DPE Tes	st Initiated on MW-11											
MW-11	4/30/2009	7:07	46.00	24.00	1108	4.3	4.7	4.1	13	1,000	< 0.50	0.727	0.0024	0.787	0.0026
MW-11	4/30/2009	13:01	46.00	24.00	527	4.2	6.1	5.4	18	1,000	< 0.50	0.727	0.0024	3.573	0.0117
MW-11	4/30/2009	17:00	49.00	24.00	528	4.5	6.3	5.8	19	1,100	< 0.50	0.852	0.0027	4.329	0.0138
MW-5, MW-10,			DPE Test In	itiated on MW-5, MW-10,											
MW-11, & MW-12	4/30/2009	18:00	M	W-11, & MW-12											
MW-5, MW-10,															
MW-11, & MW-12	4/30/2009	19:05	70.00	22.50	1189	14	9.6	10	30	3,300	<1.6	3.650	0.0121	3.953	0.0131
MW-5, MW-10,															
MW-11, & MW-12	5/1/2009	1:00	80.00	23.00	1426	13	11	11	32	3,700	<2.0	4.677	0.0128	22.994	0.0629
MW-5, MW-10,															
MW-11, & MW-12	5/1/2009	5:00	80.00	23.00	1833	14	13	13	37	4,500	<2.0	5.688	0.0138	28.912	0.0700
Totals and Averages	for 2009 DPE	E Pilot Test	50	23.8	767.8	8.51	6.21	6.74	19.59	1742.14		1.540	0.0054	91.0	0.3028

Total Gallons Removed:	14.68	0.0488

Sample calculations:

Removal rate calculation:

 $lbs/hour = ("x" ppm/1,000,000) * ("Q" ft^3/min) * ("M.W." lb/lb-mol) * (60 min/hr) * (lb-mol/379.5 ft^3) * ($

where: "x" is influent concentration in ppmv

"Q" is the average flow rate in ft^3/min

"M.W." is the molecular weight in lb/lb-mol (100.2 for GRO, 78.1 for benzene)

gallons removed = lbs / density (density for GRO is 6.2 lbs/gallon)

Notes:

SCFM - Standard cubic feet per minute.

GRO - Total Petroleum Hydrocarbons - Gasoline Range Organics.

in.Hg - Inches of mercury.

MTBE - Methyl-tert-butyl ether

ppmv - Parts per million by volume.

Table 4. Summary of DPE Ground-Water Laboratory Analytical Data Former BP Service Station #11109, 4280 Foothill Boulevard, Oakland, California

Laboratory Analytical Results (μg/l)											
Extraction Event	Collection Date and Time	GRO	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	DIPE	ЕТВЕ	TBA	TAME
MW-5	4/27/09, 11:05	22,000	710	430	380	2,000	74	<10	<10	280	<10
MW-5	4/27/09, 17:00	4,900	110	61	53	380	10	<2.5	<2.5	200	<2.5
MW-5	4/27/09, 18:30	3,600	81	44	42	250	5.8	<2.5	<2.5	200	<2.5
MW-12	4/28/09, 7:30	6,400	610	41	100	340	<10	<10	<10	<200	<10
MW-12	4/28/09, 13:30	4,500	72	12	76	210	<2.5	<2.5	<2.5	100	< 2.5
MW-12	4/28/09, 17:40	4,900	62	13	84	260	< 5.0	< 5.0	< 5.0	100	< 5.0
MW-10	4/29/09, 7:50	19,000	1,000	780	620	2,700	<10	<10	<10	<200	<10
MW-10	4/29/09, 13:30	20,000	260	210	180	830	<10	<10	<10	< 200	<10
MW-10	4/29/09, 17:35	15,000	160	140	130	620	<10	<10	<10	<200	<10
MW-11	4/30/09, 7:05	4,500	58	61	55	290	7.2	< 2.0	<2.0	110	< 2.0
MW-11	4/30/09, 13:03	3,900	46	75	69	350	2.2	< 2.0	<2.0	140	<2.0
MW-11	4/30/09, 17:05	3,700	45	70	61	320	<2.0	< 2.0	<2.0	140	< 2.0
MW-5, MW-10, MW-11, & MW-12	4/30/09, 19:15	19,000	300	320	430	1,500	<10	<10	<10	<200	<10
MW-5, MW-10, MW-11, & MW-12	5/01/09, 01:05	46,000	120	140	190	750	<10	<10	<10	<200	<10
MW-5, MW-10, MW-11, & MW-12	5/01/09, 05:05	25,000	140	170	230	920	<10	<10	<10	<200	<10

Notes:

GRO - Total Petroleum Hydrocarbons - Gasoline Range Organics.

MTBE - Methyl-tert-butyl ether

DIPE - Di-isopropyl ether

ETBE - Ethyl ter-butyl ether

TBA - Tert-Butyl alcohol

TAME - Tert-Amyl methyl ether

Table 5. DPE Ground-Water Extraction Data and Estimated Recovery Former BP Service Station #11109, 4280 Foothill Boulevard, Oakland, California

						Influent					
Date Sampled	Extraction Event	Period		Estimated Volume Processed			Concentration, µg/L		Net Removal		
Date Sampled	Extraction Event	Start Time	Sample Time	Initial Totalizer	Final Totalizer	Gallons Pumped	GRO	Benzene	GRO	Benzene	
4/27/2009	MW-5	9:10	11:05	6,120	6,180	60	22,000	710	0.0110 lbs	0.00035469 lbs	
4/27/2009	MW-5	11:05	17:00	6,180	6,230	50	4,900	110	0.0020 lbs	0.00004579 lbs	
4/27/2009	MW-5	17:00	18:30	6,230	6,250	20	3,600	81	0.0006 lbs	0.00001349 lbs	
4/28/2009	MW-12	6:00	7:30	6,250	6,320	70	6,400	610	0.0037 lbs	0.00035552 lbs	
4/28/2009	MW-12	7:30	13:30	6,320	6,480	160	4,500	72	0.0060 lbs	0.00009592 lbs	
4/28/2009	MW-12	13:30	17:40	6,480	6,580	100	4,900	62	0.0041 lbs	0.00005162 lbs	
4/29/2009	MW-10	6:00	7:50	6,580	6,580	0	19,000	1,000	0.0000 lbs	0.00000000 lbs	
4/29/2009	MW-10	7:50	13:30	6,580	6,710	130	20,000	260	0.0216 lbs	0.00028142 lbs	
4/29/2009	MW-10	13:30	17:35	6,710	6,760	50	15,000	160	0.0062 lbs	0.00006661 lbs	
4/30/2009	MW-11	6:00	7:05	6,760	6,790	30	4,500	58	0.0011 lbs	0.00001449 lbs	
4/30/2009	MW-11	7:05	13:03	6,790	6,880	90	3,900	46	0.0029 lbs	0.00003447 lbs	
4/30/2009	MW-11	13:03	17:05	6,880	6,950	70	3,700	45	0.0022 lbs	0.00002623 lbs	
4/30/2009	MW-5, MW-10, MW- 11, & MW-12	18:00	19:15	6,950	6,950	0	19,000	300	0.0000 lbs	0.00000000 lbs	
5/1/2009	MW-5, MW-10, MW- 11, & MW-12	19:15	1:05	6,950	7,400	450	46,000	120	0.1723 lbs	0.00044960 lbs	
5/1/2009	MW-5, MW-10, MW- 11, & MW-12	1:05	5:05	7,400	7,580	180	25,000	140	0.0375 lbs	0.00020981 lbs	
Totals						1,460			0.2713 lbs	0.002000 lbs	
									0.0438 gals	0.000323 gals	

Sample calculations:

Removal rate calculation:

lbs removed = ("x" μ g/L)*(gram/1,000,000 μ g)*(lb/454 grams)*(3.78 L/gal)*(gallons pumped) where "x" is influent concentration

Gallons removal calculation (for GRO):

gallons removed = lbs * gallon/6.2 lbs (density for GRO is 6.2; density for MTBE is 6.2)

Notes:

μg/L - micrograms per liter

GRO - total petroleum hydrocarbons - gasoline range organics

MTBE - methyl tertiary butyl ether

APPENDIX A RECENT REGULATORY CORRESPONDENCE

ALAMEDA COUNTY HEALTH CARE SERVICES

DAVID J. KEARS, Agency Director

AGENCY



DEC 1 3 2008

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

December 5, 2008

Paul Supple Atlantic Richfield Company (A BP Affiliated Company) P.O. Box 1257 San Ramon, CA 94583

Terry Grayson Conoco Phillips 76 Broadway Street Sacramento, CA 95818 Steve Mahoney 30 Northwest Street Yerlington, NV 89447

Khalid & Romana Usman 3670 Ralston Avenue Hillsborough, CA 94010

Subject: Fuel Leak Case No. RO0000426 and GeoTracker Global ID T0600100217, BP #11109,

4280 Foothill Boulevard, Oakland, CA 94601

Dear Mr. Supple:

Alameda County Environmental Health (ACEH) staff has reviewed the case file for the above-referenced site including the recently submitted document entitled, "Initial Site Conceptual Model," dated November 7, 2008, which was prepared by Broadbent & Associates, Inc. (BAI) for the subject site. The report summarizes the apparent data gaps identified in the Site Conceptual Model (SCM) and proposes a scope of work to address those data gaps.

ACEH generally concurs with the BAI's recommendations and proposed scope of work. However, sufficient detail was not presented to approve the proposed well installations and subsequent pilot testing (interim remedial action). ACEH requests that you address the following technical comments, perform the proposed preferential pathway evaluation, and send us the technical reports described below.

TECHNICAL COMMENTS

1. Preferential Pathway Study – BAI proposes to conduct a preferential pathway evaluation at the site. Since free product is still present and groundwater is relatively shallow at the site, a preferential pathway evaluation appears warranted. The purpose of the preferential pathway study is to locate potential migration pathways and conduits and determine the probability of the NAPL and/or plume encountering preferential pathways and conduits that could spread contamination. We request that you perform a preferential pathway study that details the potential migration pathways and potential conduits (wells, utilities, pipelines, etc.) for vertical and lateral migration that may be present in the vicinity of the site.

Discuss your analysis and interpretation of the results of the preferential pathway study (including the detailed well survey and utility survey requested below) and report your results

Mr. Supple RO0000426 December 5, 2008, Page 2

in the Soil and Groundwater Investigation Work Plan requested below. The results of your study shall contain all information required by California Code of Regulations, Title 23, Division 3, Chapter 16, §2654(b).

a. Utility Survey

An evaluation of all utility lines and trenches (including sewers, storm drains, pipelines, trench backfill, etc.) within and near the site and plume area(s) is required as part of your study. Please include maps and cross-sections illustrating the location and depth of all utility lines and trenches within and near the site and plume areas(s) as part of your study.

b. Well Survey

The preferential pathway study shall include a well survey of all wells (monitoring and production wells: active, inactive, standby, decommissioned (sealed with concrete), abandoned (improperly decommissioned or lost); and dewatering, drainage, and cathodic protection wells) within a ¼ mile radius of the subject site. As part of your well survey, please perform a background study of the historical land uses of the site and properties in the vicinity of the site. Use the results of your background study to determine the existence of unrecorded/unknown (abandoned) wells, which can act as contaminant migration pathways at or from your site. Please review and submit copies of historical maps, such as Sanborn maps, aerial photographs, etc., when conducting the background study.

2. Soil and Groundwater Characterization & Vapor Phase and/or DPE Pilot Test — To adequately characterize the extent of free phase petroleum hydrocarbons in the vicinity of groundwater monitoring well MW-5, BAI proposes to install three groundwater monitoring wells, with the potential for future use as recovery wells, in the immediate vicinity of existing groundwater monitoring well MW-5. Although the scope of work is conceptually acceptable, sufficient detail was not presented in the SCM. The depth and screened intervals of the wells were proposed, but the diameter of the well was not mentioned nor was rationale for the selected well locations adequately detailed.

A vapor phase and/or dual-phase extraction (DPE) pilot test utilizing the existing and newly installed wells would be performed during a 5-day mobile test event. The pilot test has been referred to as an interim remedial measure, thereby precluding the preparation of a formal feasibility study (FS), which would evaluate several cleanup alternatives that would have likelihood for successfully cleaning up the site. Although ACEH encourages the preparation of an FS, it is not a requirement for an interim remedial measure. However, ACEH does require that the proposed pilot test be adequately detailed so that an evaluation can be conducted, as well as include cleanup levels and cleanup goals. At a minimum, the following should be discussed in the work plan.

- Statement of objectives
- Description of site lithology, including intrinsic permeability and soil moisture content in the unsaturated zone, and applicability of proposed remediation alternative.

- Baseline data collected during earlier investigation phases that may be relevant in describing initial conditions.
- Proposed system start-up operating procedures that will be used.
- Proposed time and duration of testing for each well or well(s) and identification of observation wells.
- Frequency of pressure and vacuum measurements taken at blowers and other above ground equipment.
- Pressure and vacuum measurements in recovery wells (before and after balancing flows and in vadose zone monitoring points, if applicable.
- Proposed number of samples to be collected and analyzed for influent and effluent groundwater and gas (vapor).
- Proposed calculations to estimate contaminant mass in the subsurface and recovered contaminant mass in water and gas streams, both total and on a wellby-well basis, if possible.
- Corrective action design in relation to site conditions.

Please prepare a scope of work to address the above-mentioned concerns and submit a work plan due by the date specified below.

NOTIFICATION OF FIELDWORK ACTIVITIES

Please schedule and complete the fieldwork activities by the date specified below and provide ACEH with at least three (3) business days notification prior to conducting the fieldwork.

TECHNICAL REPORT REQUEST

Please submit technical reports to ACEH (Attention: Paresh Khatri), according to the following schedule:

- **February 3, 2009** Interim Remedial Action Plan
- April 30, 2009 Semi-annual Monitoring Report (1st Quarter 2009)
- October 30, 2009 Semi-annual Monitoring Report (3rd Quarter 2009)

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

ELECTRONIC SUBMITTAL OF REPORTS

ACEH's Environmental Cleanup Oversight Programs (LOP and SLIC) require submission of reports in electronic form. The electronic copy replaces paper copies and is expected to be used

Mr. Supple RO0000426 December 5, 2008, Page 4

for all public information requests, regulatory review, and compliance/enforcement activities. Instructions for submission of electronic documents to the Alameda County Environmental Cleanup Oversight Program FTP site are provided on the attached "Electronic Report Upload Instructions." Submission of reports to the Alameda County FTP site is an addition to existing requirements for electronic submittal of information to the State Water Resources Control Board (SWRCB) GeoTracker website. In September 2004, the SWRCB adopted regulations that require electronic submittal of information for all groundwater cleanup programs. For several years, responsible parties for cleanup of leaks from underground storage tanks (USTs) have been required to submit groundwater analytical data, surveyed locations of monitoring wells, and other data to the GeoTracker database over the Internet. Beginning July 1, 2005, these same reporting requirements were added to Spills, Leaks, Investigations, and Cleanup (SLIC) sites. Beginning July 1, 2005, electronic submittal of a complete copy of all reports for all sites is required in GeoTracker (in PDF format). Please visit the SWRCB website for more information on these requirements (http://www.swrcb.ca.gov/ust/electronic submittal/report rqmts.shtml.

PERJURY STATEMENT

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

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6735, 6835, and 7835.1) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately registered or certified professional. For your submittal to be considered a valid technical report, you are to present site specific data, data interpretations, and recommendations prepared by an appropriately licensed professional and include the professional registration stamp, signature, and statement of professional certification. Please ensure all that all technical reports submitted for this fuel leak case meet this requirement.

UNDERGROUND STORAGE TANK CLEANUP FUND

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

AGENCY OVERSIGHT

If it appears as though significant delays are occurring or reports are not submitted as requested, we will consider referring your case to the Regional Board or other appropriate agency, including the County District Attorney, for possible enforcement actions. California Health and Safety

Mr. Supple RO0000426 December 5, 2008, Page 5

Code, Section 25299.76 authorizes enforcement including administrative action or monetary penalties of up to \$10,000 per day for each day of violation.

If you have any questions, please call me at (510) 777-2478 or send me an electronic mail message at paresh.khatri@acgov.org.

Sincerely,

Paresh C. Khatri

Hazardous Materials Specialist

Donna L. Drogos, PE

Supervising Hazardous Materials Specialist

Enclosure: ACEH Electronic Report Upload (ftp) Instructions

cc: Tom Venus, Broadbent & Associates, 1324 Mangrove Avenue, Suite 212, Chico, CA 95926 Leroy Griffin, Oakland Fire Department, 250 Frank H. Ogawa Plaza, Ste. 3341, Oakland, CA 94612-2032

Donna Drogos, ACEH Paresh Khatri, ACEH

File

ALAMEDA COUNTY **HEALTH CARE SERVICES**



DAVID J. KEARS, Agency Director



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

February 19, 2009

Paul Supple Atlantic Richfield Company (A BP Affiliated Company) P.O. Box 1257 San Ramon, CA 94583

Terry Grayson Conoco Phillips 76 Broadway Street Sacramento, CA 95818 Steve Mahoney 30 Northwest Street

Yerlington, NV 89447

Khalid & Romana Usman 3670 Ralston Avenue Hillsborough, CA 94010

Subject: Fuel Leak Case No. RO0000426 and GeoTracker Global ID T0600100217, BP #11109, 4280 Foothill Boulevard, Oakland, CA 94601

Dear Mr. Supple:

Alameda County Environmental Health (ACEH) staff has reviewed the case file for the abovereferenced site including the recently submitted document entitled, "Monitoring Well Installation and Dual-Phase Extraction Pilot Testing Work Plan," dated February 3, 2009, which was prepared by Broadbent & Associates, Inc. (BAI) for the subject site. BAI proposes to install three groundwater monitoring wells (MW-10, MW-11 and MW-12) to delineate free product detected in groundwater monitoring well MW-5, with potential use recovery wells located in the immediate vicinity of MW-5. BAI proposes to subsequently conduct dual-phase extraction (DPE) pilot testing on wells MW-5, MW-10, MW-11, and MW-12.

ACEH generally concurs with the proposed scope of work and the proposed scope of work may be implemented. Please perform the proposed work, and send us the technical reports requested below.

NOTIFICATION OF FIELDWORK ACTIVITIES

Please schedule and complete the fieldwork activities by the date specified below and provide ACEH with at least three (3) business days notification prior to conducting the fieldwork, including routine groundwater sampling.

TECHNICAL REPORT REQUEST

Please submit technical reports to ACEH (Attention: Paresh Khatri), according to the following schedule:

Responsible Parties RO0000426 February 19, 2009, Page 2

- April 30, 2009 Quarterly Monitoring Report (1st Quarter 2009)
- June 10, 2009 DPE Pilot Testing Report
- October 30, 2009 Quarterly Monitoring Report (3rd Quarter 2009)

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

ELECTRONIC SUBMITTAL OF REPORTS

ACEH's Environmental Cleanup Oversight Programs (LOP and SLIC) require submission of reports in electronic form. The electronic copy replaces paper copies and is expected to be used for all public information requests, regulatory review, and compliance/enforcement activities. Instructions for submission of electronic documents to the Alameda County Environmental Cleanup Oversight Program FTP site are provided on the attached "Electronic Report Upload Instructions." Submission of reports to the Alameda County FTP site is an addition to existing requirements for electronic submittal of information to the State Water Resources Control Board (SWRCB) GeoTracker website. In September 2004, the SWRCB adopted regulations that require electronic submittal of information for all groundwater cleanup programs. For several years, responsible parties for cleanup of leaks from underground storage tanks (USTs) have been required to submit groundwater analytical data, surveyed locations of monitoring wells, and other data to the GeoTracker database over the Internet. Beginning July 1, 2005, these same reporting requirements were added to Spills, Leaks, Investigations, and Cleanup (SLIC) sites. Beginning July 1, 2005, electronic submittal of a complete copy of all reports for all sites is required in GeoTracker (in PDF format). Please visit the SWRCB website for more information on these requirements (http://www.swrcb.ca.gov/ust/electronic_submittal/report_rgmts.shtml.

PERJURY STATEMENT

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

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6735, 6835, and 7835.1) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately registered or certified professional. For your submittal to be considered a valid technical report, you are to present site specific data, data interpretations, and recommendations prepared by an appropriately licensed professional and include the professional registration stamp, signature,

Responsible Parties RO0000426 February 19, 2009, Page 3

and statement of professional certification. Please ensure all that all technical reports submitted for this fuel leak case meet this requirement.

UNDERGROUND STORAGE TANK CLEANUP FUND

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

AGENCY OVERSIGHT

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

If you have any questions, please call me at (510) 777-2478 or send me an electronic mail message at paresh.khatri@acgov.org.

Sincerely,

Påresh C. Khatri

Hazardous Materials Specialist

Donna L. Drogos, PE

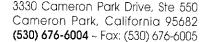
Supervising Hazardous Materials Specialist

Enclosure: ACEH Electronic Report Upload (ftp) Instructions

CC: Tom Venus, Broadbent & Associates, 1324 Mangrove Avenue, Suite 212, Chico, CA 95926
Leroy Griffin, Oakland Fire Department, 250 Frank H. Ogawa Plaza, Ste. 3341, Oakland, CA 94612-2032

Donna Drogos, ACEH Paresh Khatri, ACEH GeoTracker

File





April 17, 2009 Project No. E11109

Ms. Flora Chan Bay Area Air Quality Management District 939 Ellis Street San Francisco, CA 94109-7799

Re:

Notification of 5-Day Feasibility Test Former BP Service Station No. 11109 4280 Foothill Boulevard Oakland, California

Dear Ms. Chan:

Stratus Environmental, Inc. (Stratus), on behalf of Atlantic Richfield Company (ARCO - a BP affiliated company), has prepared this letter to notify Bay Area Air Quality Management District (BAAQMD) regarding a proposed 5-day dual phase extraction (DPE) test at Former BP Service Station No. 11109 located at 4280 Foothill Boulevard, Oakland, California (see Figure 1). The feasibility test is currently scheduled to begin on April 27, 2009. During the 5-day test period, the DPE system will be operated for approximately 12 to 14 hours each day.

Stratus proposes to use a CBA Equipment LLC (CBA) 250 cubic feet per minute (cfm) DPE system to complete the proposed feasibility testing. Petroleum hydrocarbon laden soil vapors and groundwater will be extracted from existing wells MW-5, MW-10, MW-11, and MW-12 using a liquid ring blower with a 15-horsepower (hp) motor. Soil vapors will be separated from groundwater in the 100-gallon knockout tank inbuilt on the system trailer. The separated soil vapors will then be abated in the thermal oxidizer before being discharged into the atmosphere. Groundwater from the knockout tank will be transferred to a 4,500 or a 6,500 gallon holding tank pending transportation and disposal at a waste acceptance facility. Propane will be used as a supplemental fuel to maintain operating temperature in the thermal oxidizer. Propane will also be used as a fuel source for a 49-hp rated propane generator, or similar, that will be used to energize the control panel of the DPE system. The location of the extraction wells and other pertinent site features are presented in Figure 2. A process flow diagram for the system is illustrated in Figure 3.

The thermal oxidizer is rated at 99% destruction efficiency for gasoline range organics (GRO). Manufacturer's literature for the unit is presented in Appendix A. The following parameters will be monitored during the test:

Ms. Flora Chan, BAAQMD Notification of 5-Day Feasibility Test Former BP Service Station No.11109, Oakland, CA Page 2

April 17, 2009

Jay R. Johnson

- Hour meter,
- Vapor extraction and groundwater extraction flow rate,
- Influent, operating, and effluent temperatures.
- Applied vacuum at the vapor extraction well using standard pressure gauges, and
- Photo-ionization detector (PID) measurements for influent and effluent soil vapor samples.

One set of influent and effluent air samples will be collected from the thermal oxidizer immediately after system start-up to verify system destruction efficiency. The effluent samples will be forwarded to a state certified analytical laboratory for chemical analysis on a 24-hour turnaround time, while the influent air sample will be analyzed on a standard 15-day turnaround time. The soil vapor samples will be analyzed for GRO using United States Environmental Protection Agency (USEPA) Method TO3, and for benzene, toluene, ethylbenzene, and total xylenes (BTEX compounds) and methyl tertiary butyl ether (MTBE) using USEPA Method TO15. The analytical results of the effluent air samples will be forwarded to BAAQMD via facsimile or e-mail. Additional air and water samples will be collected during the test to evaluate system performance and to monitor petroleum hydrocarbon concentrations in soil vapors.

Upon completion of the test and receipt of all analytical results, Broadbent and Associates, Inc. (Broadbent), will prepare and submit a report that documents the findings of the 5-day DPE test.

If you have any questions regarding this feasibility test notification, please call Kiran Nagaraju at (530) 676-6007.

🗷. Johnson, P.G.

Project Manager

Sincerely,

STRATUS ENVIRONMENTAL. INC.

Kiran Nagaraju Project Engineer

Figure 1 Attachments:

Site Location Map

Figure 2

Site Layout Plan

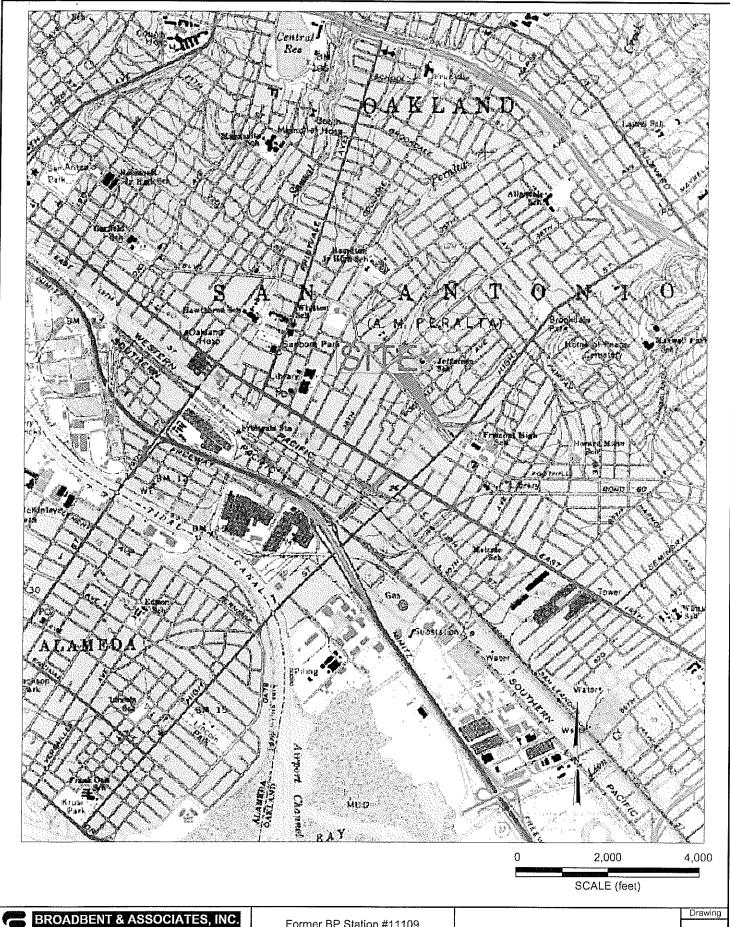
Figure 3 Appendix A Process Flow Diagram Manufacturer's Literature

cc:

Mr. Paul Supple, BP/ARCO

Mr. Paresh Khatri, Alameda County Health Care Services Division

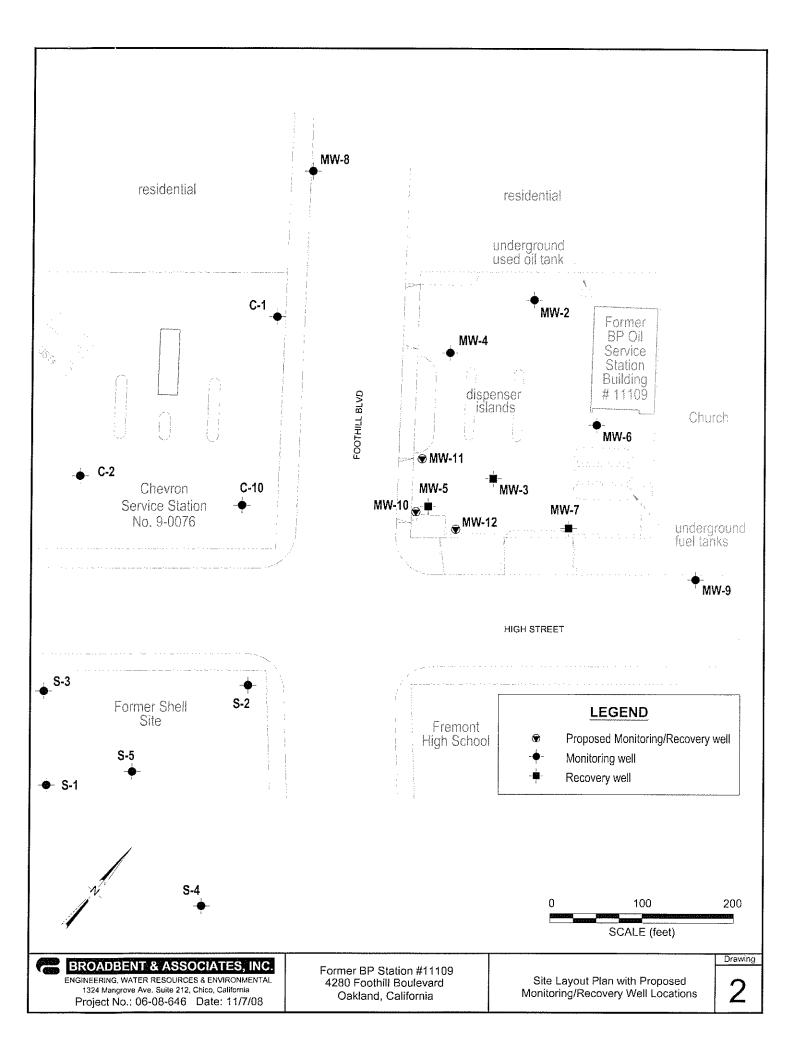
Mr. Rob Miller, Broadbent & Associates, Inc.

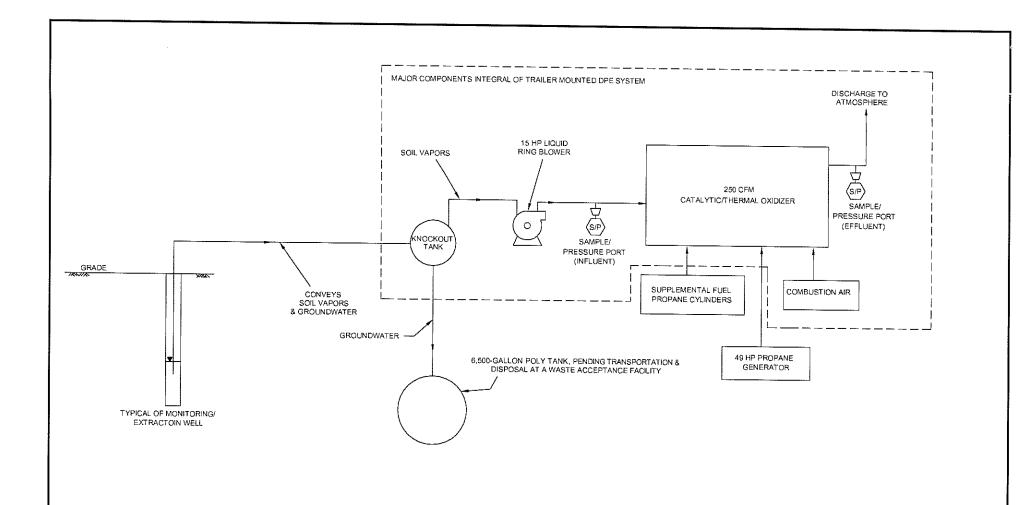


engineering, water resources & environmental. 1324 Mangrove Ave. Suite 212, Chico, California Project No.: 06-08-646 Date: 10/31/08

Former BP Station #11109 4280 Foothill Boulevard Oakland, California

Site Location Map





DUAL PHASE EXTRACTION SYSTEM

NOT TO SCALE

THIS IS A PROCESS FLOW DIAGRAM. THEREFORE, INSTRUMENTATION AND CONTROL EQUIPMENT DETAILS ARE NOT SHOWN.
INSTRUMENT FUNCTIONS AND INTERACTIONS ARE ALSO NOT SHOWN.
EQUIPMENT SIZES ARE NOT PROPORTIONAL AND ARE NOT INDICATIVE OF FINAL SIZES.

STRATUS ENVIRONMENTAL, INC. FPRMER BP SERVICE STATION NO. 11109 SACRAMENTO, CA

FIGURE

3

PROCESS FLOW DIAGRAM

PROJECT NO. E 11109

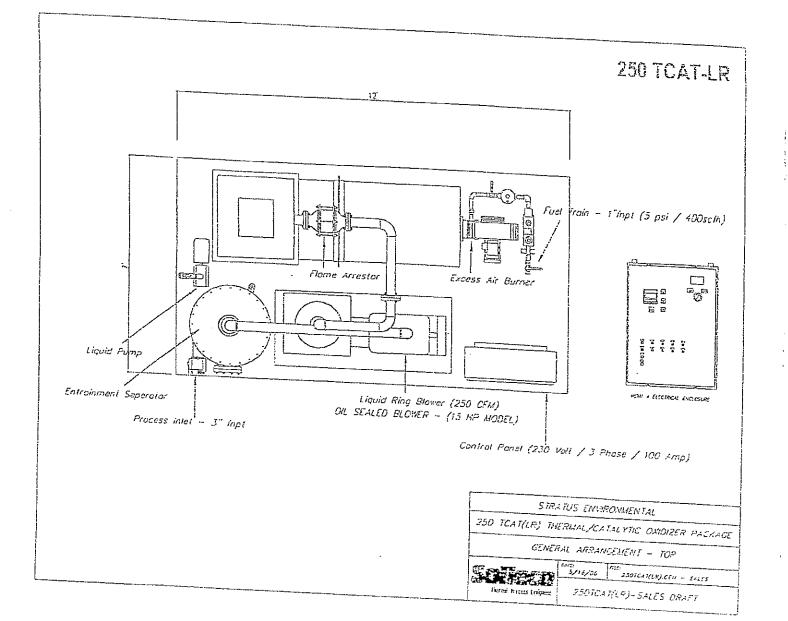
APPENDIX A

MANUFACTURER'S LITERATURE

Solleco 250 TCAT(LR) SERIAL NO. C 1172 TECHNICAL SPECIFICATIONS FOR THE 250 SCFM

WITH LIQUID RING BLOWER THERMAL / CATALYTIC OXIDIZER

Oxidiza	er Specifications
Chamber Length	10feet
Chamber Retention Time	10 feet / second
Stack Exit Velocity	15 feet / second (14" Square)
Threat Velocity	30 feet / second
Stack Discharge Height	13 feet
Overall Dimensions	9 feet wide / 16 feet long
Chamber Dimensions	30" outside / 20" inside
Chamber Internal Lining	Ceramic Fiber
Chamber Mixing Throat Diameter	17" I.D.
Destruction Efficiency	99% +
Operating Temperature "Thermal"	1400° to 2000°
Operating Temperature "Catalytic"	600° to 1200°
Maximum VOC Influent "Thermal"	' 15,000 ppmv
Normal VOC Effluent	< 50 ppmv
Blower S	Specifications
Blower Type	Oil Sealed Liquid Ring Blower
Volumetric Flow	250 ACFM
Vacuum	Up to 28" Mercury
Motor Type	15 H.P. / TEFC / 230 Volt / 3phase
Catalyst S	Specifications
Catalyst Type	Platinum Coated Metal Monolithic
Catalyst Size	19.5" O.D. x 3.0" Height
Catalyst Volume	.51 ft ³
Destruction Efficiency	99% +
Maximum VOC Influent	3500 ppmv
Normal VOC Effluent	<50 ppmv
Utility Sp	ecifications
Supplemental Fuel	Natural Gas or Propane
fuel Pressure	5 p.s.i.
uel Volume	500 sefh
lectrical Requirements	230/208 Volt / 3 Phase / 100 Amp

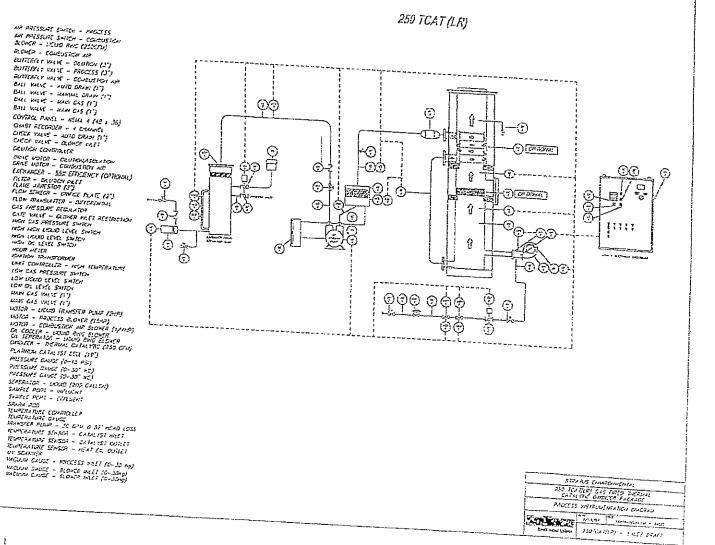


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APPENDIX B

STRATUS MONITORING WELL INSTALLATION DATA PACKAGE (Includes Field Notes, Lithologic Boring and Well Construction Logs, Well Permits, Field Procedures, and Laboratory Analytical Reports with Chain-of-Custody Documentation)



April 23, 2009

Mr. Tom Venus Broadbent & Associates, Inc. 1324 Mangrove Avenue Chico, California 95926

Re:

Monitoring Well Installation and Well Development Data Package, Former BP Service Station No. 11109, located at 4280 Foothill Boulevard, Oakland, California (field activities performed between March 12th and March 31st, 2009)

General Information

Data Submittal Prepared / Reviewed by: Collin Fischer & Scott Bittinger / Jay Johnson Phone Number: (530) 676-2062 / (530) 676-6000

Date: March 12, 2009

On-Site Supplier Representative: Collin Fischer

Scope of Work Performed: Health and safety meeting with utility locating subcontractor. Clear three boring/well locations and prepare utility location site sketch per requirements of ground disturbance permit. Mark boring locations and site for Underground Serice Alert (USA).

Variations from Work Scope: The location of well boring MW-10 was moved approximately 8 feet north-northwest of location proposed in work plan to avoid conflict with an underground electrical line. The location of well boring MW-12 was moved approximately six feet northeast of location proposed in work plan to avoid conflict with a metallic utility line.

Weather Conditions: Sunny, clear

Unusual Field Conditions: None noted

Date: March 18, 2009

On-Site Supplier Representative: Collin Fischer

Scope of Work Performed: Complete health and safety forms. Checked USA markings and update site utility location map and USA tracking sheet per ground disturbance procedure requirements. Discuss project work scope and schedule with the site store manager.

Variations from Work Scope: None noted

Weather Conditions: Sunny, clear Unusual Field Conditions: None noted

Mr. Tom Venus, Broadbent & Associates Monitoring Well Installation and Well Development Data Package Former BP Station No. 11109, Oakland, CA Page 2

April 23, 2009

Date: March 19, 2009

On-Site Supplier Representative: Collin Fischer

Scope of Work Performed: Health and safety meeting with air knife subcontractor (Woodward Drilling Company). Air knife 2 boring locations (MW-10 and MW-11) to approximately 6.5 feet below ground surface (bgs).

Variations from Work Scope: None noted

Weather Conditions: Sunny, Clear Unusual Field Conditions: None noted

Date: March 20, 2009

On-Site Supplier Representative: Collin Fischer

Scope of Work Performed: Health and safety meeting with air knife subcontractor. Air knife 1

boring location (MW-12) to 6.5 feet bgs.

Variations from Work Scope: None noted

Weather Conditions: Cloudy

Unusual Field Conditions: None noted

Date: March 23, 2009

On-Site Supplier Representative: Collin Fischer and Levi Ford

Scope of Work Performed: Health and safety meeting with drilling subcontractor (Woodward Drilling Company). Drill and install two monitoring wells (MW-10 and MW-11) to approximately 30 feet bgs.

Variations from Work Scope: None noted

Weather Conditions: Sunny, clear

Unusual Field Conditions: None noted

Date: March 24, 2009

On-Site Supplier Representative: Collin Fischer and Levi Ford

Scope of Work Performed: Health and safety meeting with drilling subcontractor. Drill and install one monitoring well (MW-12) to approximately 30 feet bgs.

Variations from Work Scope: None noted

Weather Conditions: Sunny, clear Unusual Field Conditions: None noted

Mr. Tom Venus, Broadbent & Associates Monitoring Well Installation and Well Development Data Package Former BP Station No. 11109, Oakland, CA Page 3

April 23, 2009

Date: March 31, 2009

On-Site Supplier Representative: Collin Fischer

Scope of Work Performed: Complete health and safety forms. Develop 3 monitoring wells (MW-10, MW-11, and MW-12) by surging and bailing, followed by groundwater pumping.

Variations from Work Scope: Less than 10 well casing volumes of groundwater were purged during development activities, because the wells pumped dry after evacuating approximately 30 gallons of groundwater. The wells were allowed to recharge and additional development was completed on each well, removing an additional 20 gallons of groundwater. Approximately 50 gallons of groundwater was removed from each well during development.

Weather Conditions: Sunny, clear Unusual Field Conditions: None noted

This submittal presents the tabulation of data collected in association with the installation and development of three monitoring wells. The attachments include field data sheets, boring logs, DWR well completion reports, drilling permits, site plan, standard procedures for well development work, certified analytical results, chains of custody, and utility location map. The information is being provided to BP-ARCO's Scoping Supplier for use in preparing a report for regulatory submittal. This submittal is limited to presentation of collected data and does not include data interpretation or conclusions or recommendations. Any questions concerning this submittal should be addressed to the Preparer/Reviewer identified above.

Sincerely,

STRATUS ENVIRONMENTAL, INC.

Scott G. Bittinger, P.G. Project Geologist

Attachments:

- Field Data Sheets
- Boring Logs
- DWR Well Completion Reports
- Drilling Permit
- Site Plan
- Standard Field Procedures for Well Development

K:\BP-ARCO Execute\11109\2009 Data Packages\ARCO_11109_Well_Install_and_Development_Data_Package_040709.doc

- Certified Analytical Results
- Chain-of-Custody
- Utility location map

cc: Paul Supple, BP/Arco

Jay P. Johnson

No. 5867

nnson. P.G.

Project Manager

1015 -> ONSITE, SAFETS MEETING

1030 -> START WITTED LOCATIONS, CLEAR Z'S BORGARDY
LOCATIONS TO MISCR SITE ION ALL WILLIAMS
3 SENTER ON MAP. (JE, 1/20, CMS, Rese, Comm, Seming)

1215 -> MW-10 MUST BE MOVED, MG! NW OFMW-5 TO AVOID BLECTELL LINE. MW-12 MUST BE MOVED MS-6' NE TO AVOID METAL WELLTS

1230 -> OFFSCTE

Callin Fr.
STEATUS ENV., INC.

1330 -> OHICKE, FILLOW SHOWS PAPERWORK.

1345 -> Discuss PROTECT W/ STOR MANUSCR, EFREE WILLY MANUS & MARR ON STE MAP.

1415 -> WOME USA TRACKUTS SHERT.

Strum 1200, We.

APRIO 11169 - Coller Ferencese - WWDC



0700 -> ovsite sutes unsering

0730-> SET WOOD (MW-11), SET WP EXCLUSION ZONE.

STANT FLOT WELL & BROWN JACK FLOW BORNS.

DAOD -> SWITTER TO 1/20 PRINCE OF M 4.5 FRET 205.

ELLE TO EAST DIRECTOR THAT WE THIS LITTLE TY.

0930 - FUEL DEOP, STOP FU WOR'S WINT COMPLETE.

1015 -> FUEL DEAR tome, (MW-11) CLIEBED TO 6'8" FULL ----

1045 -> STAR STEPHANNER & CLEMENTE (REW-17).

1100 -> STRONG TIC ODDE COMING FROM FORMS

1200 -> 9 55 BOS, USED FLATO COESTOS INSIDE A CLASSE MATRIX, SLOW CHEARING, THEE MUHI \$ RESILUE CLEARING (MW-10) AFTER.

1230 -5 RESIME (MW 10).

1315 -> HOLE CLEARED TO 6'7", OPEN UP TO 14" IN

1345 -> START BACKFINING & PATCH SURFACE.

1400 -> EMPS TANK (NO DRUMS

-> Cleaning Work AFEA.

1430 -> LABEL DENMS & SECURE SITE

1500 -- OFFEITE

Collection ENVO, TOICE

07-30 -> STAGE THEE FLAMMEN & CHEARING (MW-12), START
HOT WOLLE.

0930 -> @ C'E" OPEN HOLE TO 1411 DISTRICTER (MW-12)=
0950 -> FILL & PITTER HOLE, CLEANERT TANK & DELOW
1100-> 148EL DEMMS & CLEAN UP.
1145-> SECURE SWE & OPPSITE =

STRATUS ENV., WE.

:

ARCO WOO - Collar France Lan France WWDC

MASSA 3/23/09 Snung Clour

0700-> 00051781 SAPERS MURITING, SET UP ON MW-10, SET WE RECLUSION EURO
0815-> 8 EGIN DENING & (MW-10).

0845-> 0 80' 845 TD, SET WELL D 301 BGS. SCREEN 7-50 SCREEN
1130-> CRU SET D'ENTONITE IN, HOMETER BROWNITE. MW-10 4-6 3807
1145-> SET BOX, SENO 14', 20', 26' 830' SKENPLES - 0-4 CONT
1215-> INVEL
121

1530-> LAM SET, FENTONITE IN , HYDRATE. SET BOX 3 ((M) UP AMA.

1600 - SLABER DAMS & SECURE SUTE.

1630-1 OFFS CTR

alli Fri

STRATUS PUV. INC.

7.75 Delling 1.75 FLEEWATCH ARCO 1109 - Collar France
War Foxo
WWDC

Swa Cuan 3/24/09

0700 -7 OHELTE, SAPERS MEETING, SET UP ON (MW-12).

0730 -> Show Percey Line We, form we

0800 -> Brown Drulling (mw-12).

(000 -> 0 30' 875 TD, SET WELL

-> SEND SHUR BS FROM 10'(16', 22', 30')
TO (AB FUR MUNALY SIS.

SCHEN 7-20 SAHD 6-30 BENT 4-6 GROWT 0-4

New+12

1/00 -> 400 BENOWITE, VILLES FLAMIN ENSITE FOR INSPECTION

1130 -> REACT WELL

145 -> SET BOX & DECON AUGERS. LEWI OFFSITE D 1215

1230 -> CHAN OR & EMPTS PECON

1300 -> THEN Draws: # 8 Seewe SITE

1330 -> Offsore

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STREAMS BW. NC.

DRums

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M20 -> 6

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Sampled by: CF
Signature

Site Number 4	LCO 11/09	<u>{</u>
Project Number <u>E</u> (1109	
Project PM T	WEWHOTE CH	
DATE 3/3	1/09	

	V√	Valer Level I	Data				-				DATE	· _ /(*)	31/09				
		1			-	Purge	Volume Cald	culations		1	Pura	je Metho	od				
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MW-10	07-45		8.08	24.93	21.85	1 (1	2	LF3.7-	(gallons)		 		<u>'</u>	(feet)		Time	(mg/L
Mw-11	Opto Fi		8-22	30.13	21-91	Cont 11	10 CHOWS		-> DEN	<u> </u>	20 W4		00.	le le varr	R. R. lu	19 B- 701	
MW-12	10045		9-61		70-53		10 CM31H53	57 HL.		2 M.	BW	14.27 F		į į		138 TO,	40
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Multiplier $2" = 0.5 \ 3" = 1.0 \ 4" = 2.0 \ 6" = 4.4$

Please refer to groundwater sampling field procedures pH/Conductivity/temperature Meter - Oakton Model PC-10 DO Meter - Oakton 300 Series (DO is always measured before purge)

	CALIBRATION DAT	ΓE
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Conductivity		
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Client	Former BP Station 11109	Date	March 23, 2009	
Address	4280 Foothill Boulevard	Drilling Co.	Woodward Drilling rig type: BK-8	
	Oakland, CA	Driller	Dave	
Project No.	E11109	Method	Hollow Stem Auger Hole Diamete	r; 10 inches
Logged By:	Collin Fischer	Sampler:	24-inch length split spoon	
Well Pack	sand: 6 ft. to 30 ft	Well Construction	Casing Material: Schedule 40 PVC	Screen Interval: 7 ft. to 30 ft.
	bent.: 4 ft. to 6 ft.	_	Casing Diameter: 4 in.	Screen Slot Size: 0.020-in.
	grout: 0 ft. to 4 ft.	Depth to GW:	first encountered; 13' bgs.	tatic

No.	Blow Count	Time	1	1	Wel	Dep				l Ditt
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			Recove	y		··········			Comments. Strong hydrocarbon odor from surface to total depth.	
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			Sample							
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									ENVIRONMENTAL, INC.	
	1W-10 12' 1W-10 14' 1W-10 16'	1W-10 10' 20 21 36 50/5" 1W-10 12' - 27 36 42 1W-10 14' 50/5" 10 10 10 114 1W-10 16' 15 12 12 12 12 12 10 10 114 115 12 12 12 16 18	14 17 17 17 18 18 18 18 18	14		14	9 14 17 18 19 19 14 17 18 18 19 19 10 10 10 10 10 10 10 10 10 10 10 10 10	10	9 14 17 18 9 14 19 10 11 SC 11	Sc

SOIL BORING LOG

Boring No. MW-10

Sheet: 2 of 2

Client	Former BP Station 11109	Date	March 23, 2009
Address	4280 Foothill Boulevard	Drilling Co.	Woodward Drilling rig type: BK-81
	Oakland, CA	Driller	Dave
Project No.	E11109	Method	Hollow Stem Auger Hole Diameter: 10 inches
Logged By:	Collin Fischer	Sampler:	24-inch length split spoon
Well Pack	sand: 6 ft. to 30 ft	Well Construction	Casing Material: Schedule 40 PVC Screen Interval: 7 ft. to 30 ft
	bent.: 4 ft. to 6 ft.		Casing Diameter: 4 in. Screen Slot Size: 0.020-in.
	grout: 0 ft. to 4 ft.	Depth to GW:	: Virst encountered: 13' bgs. static

	Sample	Blow	Sa	mple	Well	Depth	Lithologic		PID
уре	No.	Count	Time	Recov.	Details	Scale	Column	Descriptions of Materials and Conditions	(PPN
		12 25 32				21	sc	Clayey sand with gravel, SC, dark grayish brown, wet, very dense 65% coarse grained sand, 25% clay, 15% fine gravel	176
	MW-10 22'	36 17 18	0915	75		22			70.8
	MW-10 24'	20 26 10	0920	75		24	CL	Clay, CL, dark yellowish brown, moist, hard, high plasticity 100% clay	245
		18 20				25	OL.	Sandy clay, CL, dark grayish brown, moist, hard, medium plasticity	245
<u>S</u>	MW-10 26'	22 10 18	0930	100		26 27		70% clay, 30% fine grained sand	43.2
	MW-10 28'	20 23 12	0935	100		 28	SC	Clayey sand, SC, grayish brown, moist, dense 70% very fine grained sand, 30% clay	33.8
	N. 10 001	12 15	0040	400		29	CL	Silty clay, CL, dark grayish brown, moist, hard, medium plasticity	
S	MW-10 30'	18	0940	100	[:::[===]::::	30 — — 31		60% clay, 40% silt	
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, w						₃₆			
						37 38			
						39			
						— 40			
								Comments:	

STRATUS ENVIRONMENTAL, INC.

Client	Former BP Station 11109	Date	March 23, 2009
Address	4280 Foothill Boulevard	Drilling Co.	Woodward Drilling rig type: BK-81
	Oakland, CA	Driller	Dave
Project No.	E11109	Method	Hollow Stem Auger Hole Diameter: 10 inches
Logged By:	Collin Fischer	Sampler:	24-inch length split spoon
Well Pack	sand: 6 ft. to 30 ft	Well Construction	Casing Material: Schedule 40 PVC Screen Interval: 7 ft. to 30 ft.
	bent.: 4 ft. to 6 ft,	****	Casing Diameter: 4 in. Screen Slot Size: 0.020-in.
	grout: 0 ft. to 4 ft.	Depth to GW:	V first encountered: 13'bgs. static

	Sample	Blow	Sar	nple			1				
Туре	No.	Count	Time	Recov.	1	Well etail		epth icale	Lithologic Column	Descriptions of Materials and Conditions	PID
			71110				-	1 1 2	Octuani	Cleared to 6.5' bgs. with air knife	(PPM
							// <u>-</u>	3 4 5 6	W		
		12 17					 		ML	Clayey silt with gravel, ML, dark grayish brown, moist, hard, low plasticity 60% silt, 25% clay, 15% fine gravel	155
S	MW-11 10'	20 23 16 23 29	1305	50				10 11	CL	Clay with gravel, CL, dark grayish brown, moist, hard, low plasticity 70% clay, 30% medium to coarse grained sand	118
	MW-11 12'	32 26 28 30	1315	75				12 12 13		Silty sand with gravel, SM, dark grayish brown, wet, very dense 60% medium to coarse grained sand, 25% silt, 15% medium gravel	51,3
	MW-11 14'	32 7 8 10	1320	100				_ 14 _ 15		Silty sand with gravel, SM, dark grayish brown, wet, medium dense 60% medium to coarse grained sand, 25% silt, 15% medium gravel Sandy clay, CL, dark grayish brown, moist, very stiff, medium plasticity	205
S	MW-11 16'	12 10 12 15	1330	100				16 - 17		75% clay, 25% coarse grained sand Clay with gravel, CL, dark yellowish brown, moist, hard, medium plasticity 85% clay, 15% fine to medium gravel	51.1
	MW-11 18'	18 12 13 15	1335	100				18 19		Sandy clay, CL, dark yellowish brown, moist, very stiff, medium plasticity 80% clay, 20% coarse grained sand	42,8
	MW-11 20'	16	1340	100 Recove		1		20		Comments: Strong hydrocarbon odor from surface to total depth.	
				Sample	_						
										STRATUS ENVIRONMENTAL, INC.	

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Boring No. MW-11

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Client	Former BP Station 11109	Date	March 23, 2009	
Address	4280 Foothill Boulevard	Drilling Co.	Woodward Drilling	rig type: BK-81
	Oakland, CA	Driller	Dave	
Project No.	E11109	Method	Hollow Stem Auger	Hole Diameter: 10 inches
Logged By:	Collin Fischer	Sampler:	24-inch length split spo	on
Well Pack	sand: 6 ft. to 30 ft	Well Construction	Casing Material: Sch	edule 40 PVC Screen Interval; 7 ft. to 30 ft.
	bent.: 4 ft. to 6 ft.		Casing Diameter: 4 in	Screen Slot Size; 0.020-in.
	grout: 0 ft. to 4 ft.	Depth to GW:	√first encountered: 1	3'bgs. static

;	Sample	Blow	Sa	mple	Well	Depth	Lithologic		PID
Туре	No.	Count	Time	Recov.	Details	Scale	Column	Descriptions of Materials and Conditions	(PPM
		30					CL		397
	i	32				21			
		50/4"	T *********					Clayey sand with gravel, SC, dark yellowish brown, moist, very dense	
	MW-11 22'	-	1345	100		22		65% medium graiend sand, 25% clay, 15% fine gravel	
		25]				SC		1397
		27			J:: ∃ :::	23			
		30		ļ				Clayey sand with gravel, SC, dark yellowish brown, wet, very dense	
S	MW-11 24'	32	1355	75		24		60% medium grained sand, 20% clay, 20% fine gravel	
İ	l	13							97.9
		16				25			
ļ		20						Sandy clay, CL, dark grayish brown, moist hard, medium plasticity	
	MW-11 26'	26	1400	100		26	CL	70% clay, 30% fine frained sand	
	İ	15	ļ						473
		15				27			
-		20						Clayey sand, SC, dark grayish brown, moist to wet, dense	
	MW-11 28'	21	1405	100		28	SC	60% fine grained sand, 40% clay	
İ		12							214
		18				29	<u>.</u> .		
		20					CL	Clay, CL, dark grayish brown, moist to wet, hard, medium plasticity	
S	MW-11 30'	26	1425	100		30		100% clay	
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								Comments:	

STRATUS Environmental, inc.

ARCO_11109 Boring_Log_MWY-11_032300

Client	Former BP Station 11109	Date	March 24, 2009	
Address	4280 Foothill Boulevard	Drilling Co.	Woodward Drilling rig type: BK-8	1
	Oakland, CA	Driller	Dave	
Project No.	E11109	Method	Hollow Stem Auger Hole Diameter	er: 10 inches
Logged By:	Collin Fischer	Sampler:	24-inch length split spoon	
Well Pack	sand: 6 ft. to 30 ft	Well Construction	Casing Material: Schedule 40 PVC	Screen Interval: 7 ft. to 30 ft.
	bent.: 4 ft. to 6 ft.	*****	Casing Diameter: 4 in.	Screen Slot Size: 0.020-in.
	grout: 0 ft. to 4 ft.	Depth to GW:	first encountered: 13' bgs. si	tatic

·		1	Ι				<u>-</u> -		7		
	Sample	Blow	Sample		Well			Depth			
Туре	No.	Count	Time	Recov.	ļ	etai	ls	Scale	Column	Descriptions of Materials and Conditions	PID (PPM)
						1		— .		Cleared to 6.5' bgs. with air knife	
			ļ		- 199		10 miles	1			
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						ΞĿ	:::L	8			
		10				≣!		L		Clayey silt, ML, dark grayish brown, moist, very stiff, low plasticity	
		11 14				≣[:		9		60% silt, 40% clay	
9	MW-12 10'	16	0835	50		≣∄	₩/	H ₁₀	ML		
	14144 12 10	10	-0000			≣₿		10	IVIL	Clayey silt with sand, ML, dark grayish brown, moist, hard, low plasticity	
ĺ		15				≣ŀ		⊢ 11		60% silt, 30% clay, 10% fine grained sand	
		50/6"				≣Ė	#17				
	MW-12 12'		0840	67		Ξŀ	# <u>/</u>	12			
		28				≣∄			700	Clayey sand with gravel, SC, dark grayish brown, moist, very dense	
		50/6"				≣∄	11:	13	▽sc _	65% coarse grained sand, 20% clay, 15% fine to medium gravel	
İ	MW-12 14'	-	0845	100		Ξŀ	111/	H ₁₄	annound the second		
	1010 4-12 14	12	0040			≣₿		├ '*		Clay trace gravel, CL, dark grayish brown, moist, hard, high plasticity	
		15				≣₿		 15		95% clay, 5% fine gravel	
		20				≣₿					1
S	MW-12 16	23	0850	100		≣[16			
İ		19				≣∄		L .		Clay, CL, dark brown, moist, hard, high plasticity, 100% clay	
		20 20				≣∄		— ¹⁷	CL		
	MW-12 18'	24	0900	100		≣∄		 18			
		14	3535					一"		Silty clay with sand, CL, dark yellowish brown, moist, hard, medium plasticity	
		18						19		60% clay, 25% silt, 15% fine grained sand	
		20				≣[Ľ			
	MW-12 20'	21	0905	100		<u>=</u> :	: ; :	20		W1907-	
				Recove	n,					Comments: Strong hydrocarbon odor from surface to total depth.	
				IVECOVE	ı y —					PID readings not available.	
								ŀ		v	
				Sample	_			_			
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										67701-11	
										STRATUS	
										ENVIRONMENTAL, INC.	
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SOIL BORING LOG

Boring No. MW-12

Sheet: 2 of 2

Client	Former BP Station 11109	Date	March 24, 2009	· · · · · · · · · · · · · · · · · · ·	
Address	4280 Foothill Boulevard	Drilling Co.	Woodward Drilling	rig type: BK-8	1
	Oakland, CA	Driller	Dave		
Project No.	E11109	Method	Hollow Stem Auger	Hole Diamete	er: 10 inches
Logged By:	Collin Fischer	Sampler:	24-inch length split spo	on	
Well Pack	sand: 6 ft. to 30 ft	Well Construction	Casing Material: Sch	edule 40 PVC	Screen Interval: 7 ft. to 30 ft.
	bent.: 4 ft. to 6 ft.		Casing Diameter: 4 in		Screen Slot Size: 0.020-in.
	grout: 0 ft. to 4 ft.	Depth to GW:	√ first encountered	static	V

	Campia		-	mala	1	ĺ		1					
T	Sample	Blow		mple	i	Well	Depth	Lithologic	December 1981	PID			
Туре	No.	Count 15	time	Recov.	_	etails —	Scale	Column	Descriptions of Materials and Conditions	(PPM)			
		19	<u> </u>			= ::::	21						
	NAME 40 001	20	0040	400		≣‱		00	Clayey sand with gravel, SC, dark grayish brown, wet, very dense				
5	MW-12 22'	42 15	0910	100	-[::]		22	SC	65% coarse grained sand, 25% clay, 15% fine gravel				
		20				≣ [iii]	/ - 23	1					
		30	T			=		ممور					
	MW-12 24'	32	0920	0			24						
		12 12				≣(∷	— ₂₅	CL					
		14				≣і∷			Sandy clay, CL, dark grayish brown, wet, very stiff, medium plasticity				
	MW-12 26'	17	0930	100			26		70% clay, 30% fine grained sand				
		10 10				= ::::				İ			
		17					27		Clayey sand, SC, dark grayish brown, wet, dense				
	MW-12 28'	20	0940	100		≣╠∷	28		70% very fine grained sand, 30% clay				
		17											
	<u> </u>	20 23				≣ !!!!	29	SC	Clayey sand, SC, dark grayish brown, wet, dense				
s	MW-12 30'	24	0950	100			30		60% very fine grained sand, 40% clay				
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									STRATUS				
									ENVIRONMENTAL, INC.				

ARCO_11109 Boring_Log_MW 12_032100

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

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: 03/12/2009 By jamesy Permit Numbers: W2009-0231 to W2009-0233 Permits Valid from 03/23/2009 to 03/24/2009

Application Id: 1236806107095

Site Location: 4280 Foothill Blvd, Oakland, CA

Project Start Date: 03/23/2009 Completion Date:03/24/2009

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

Applicant: Startus Environmental Inc. - Scott Bittinger

3330 Cameron Park Dr #550, Cameron Park, CA 95682

Property Owner: Conoco Phillips

PO Box 1539, Paso Robles, CA 93447

Client: ** same as Property Owner **

Total Due: \$1035.00

Phone: 530-676-2062

Phone: 925-277-2335

Work Total: \$1035.00

City of Project Site: Oakland

Receipt Number: WR2009-0098 Total Amount Paid: \$1035.00

Payer Name: Stratus Paid By: CHECK PAID IN FULL

Works Requesting Permits:

Well Construction-Monitoring-Monitoring - 3 Wells Driller: Woodward - Lic #: 710079 - Method: auger

Specifications

Permit #	Issued Date	Expire Date	Owner Well Id	Hole Diam.	Casing Diam.	Seal Depth	Max. Depth
W2009- 0231	03/12/2009	06/21/2009	MW-10	10.00 in.	4.00 in.	4.00 ft	30.00 ft
W2009-	03/12/2009	06/21/2009	MW-11	10.00 in.	4.00 in.	4.00 ft	30.00 ft
0232 W2009-	03/12/2009	06/21/2009	MW-12	10.00 in.	4.00 in.	4.00 ft	30.00 ft
0233							

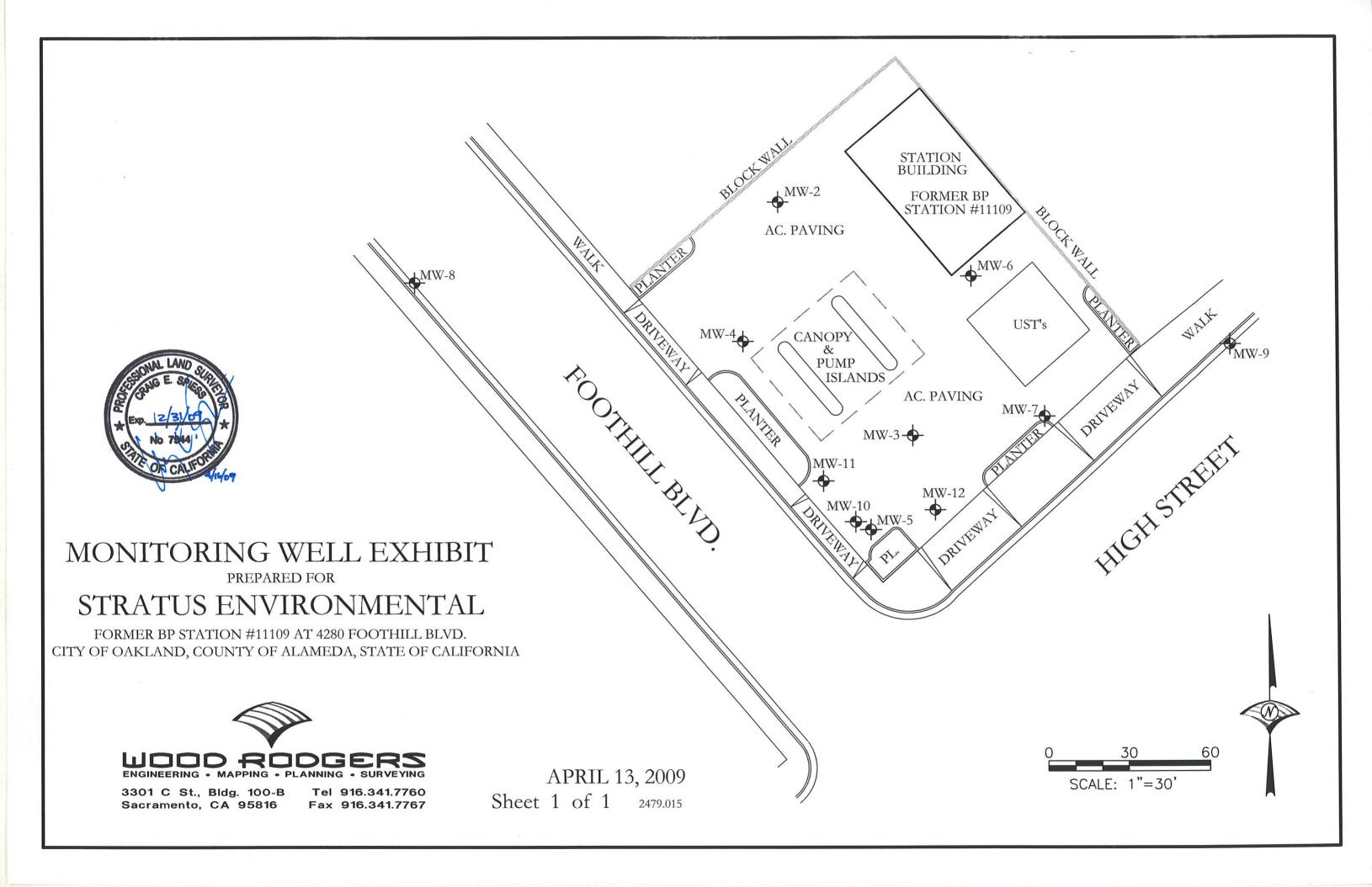
Specific Work Permit Conditions

- 1. 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.
- 2. Permitte, 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.
- 3. 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.
- 4. Compliance with the well-sealing specifications shall not exempt the well-sealing contractor from complying with

Alameda County Public Works Agency - Water Resources Well Permit

appropriate State reporting-requirements related to well construction or 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.

- 5. Applicant shall submit the copies of the approved encroachment permit to this office within 60 days.
- 6. 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.
- 7. 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.
- 8. Minimum surface seal thickness is two inches of cement grout placed by tremie
- 9. Minimum seal (Neat Cement seal) depth for monitoring wells is 5 feet below ground surface(BGS) or the maximum depth practicable or 20 feet.
- 10. 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.



GLOBAL_ID	FIELD_PT_NAME	FIELD_PT_X	Y_SURVEY LAT	TTUDE	LONGITUDE	XY_METHO	C XY_DATUM XY_ACC	_VAL XY_SURVEY_ORG	GPS_EQUIP_TY XY_SURVEY_DES
T0600100217	MW-2	MW	4/13/2009	37.7752321	-122.2119703	CGPS	NAD83	30 WOOD RODGERS PLS 7944	TR
T0600100217	MW-3	MW	4/13/2009	37.7749967	-122.2117942	CGPS	NAD83	30 WOOD RODGERS PLS 7944	TR
T0600100217	MW-4	MW	4/13/2009	37.7750895	-122.2120129	CGPS	NAD83	30 WOOD RODGERS PLS 7944	TR
T0600100217	MW-5	MW	4/13/2009	37.7749003	-122.2118454	CGPS	NAD83	30 WOOD RODGERS PLS 7944	TR
T0600100217	MW-6	MW	4/13/2009	37.7751601	-122.2117221	CGPS	NAD83	30 WOOD RODGERS PLS 7944	TR
T0600100217	MW-7	MW	4/13/2009	37.7750187	-122.2116254	CGPS	NAD83	30 WOOD RODGERS PLS 7944	TR
T0600100217	MW-8	MW	4/13/2009	37.7751434	-122.2124353	CGPS	NAD83	30 WOOD RODGERS PLS 7944	TR
T0600100217	MW-9	MW	4/13/2009	37.7750953	-122.2113883	CGPS	NAD83	30 WOOD RODGERS PLS 7944	TR
T0600100217	MW-10	MW	4/13/2009	37.7749082	-122.2118646	CGPS	NAD83	30 WOOD RODGERS PLS 7944	TR
T0600100217	MW-11	MW	4/13/2009	37.7749490	-122.2119062	CGPS	NAD83	30 WOOD RODGERS PLS 7944	TR
T0600100217	MW-12	MW	4/13/2009	37.7749216	-122.2117638	CGPS	NAD83	30 WOOD RODGERS PLS 7944	TR

GLOBAL_ID	FIELD_PT_NAMEEL	_EV_SURVEY_ELE	EVATION ELEV_M	METHOD ELEV_DATUM	ELEV_ACC_VAL ELEV_SURVEY_ORG	RISER_HT ELEV_DESC	EFF_DATE
T0600100217	MW-2	4/13/2009	41.22 DIG	LOC	30 WOOD RODGERS PLS 7944	-0.15	
T0600100217	MW-3	4/13/2009	40.13 DIG	LOC	30 WOOD RODGERS PLS 7944	-0.93	
T0600100217	MW-4	4/13/2009	40.10 DIG	LOC	30 WOOD RODGERS PLS 7944	-0.45	
T0600100217	MW-5	4/13/2009	39.14 DIG	LOC	30 WOOD RODGERS PLS 7944	-1.05	
T0600100217	MW-6	4/13/2009	41.58 DIG	LOC	30 WOOD RODGERS PLS 7944	-0.48	
T0600100217	MW-7	4/13/2009	40.40 DIG	LOC	30 WOOD RODGERS PLS 7944	-0.84	
T0600100217	MW-8	4/13/2009	38.19 DIG	LOC	30 WOOD RODGERS PLS 7944	-0.43	
T0600100217	MW-9	4/13/2009	41.25 DIG	LOC	30 WOOD RODGERS PLS 7944	-0.30	
T0600100217	MW-10	4/13/2009	39.78 DIG	LOC	30 WOOD RODGERS PLS 7944	-0.27	
T0600100217	MW-11	4/13/2009	40.04 DIG	LOC	30 WOOD RODGERS PLS 7944	-0.16	
T0600100217	MW-12	4/13/2009	40.32 DIG	LOC	30 WOOD RODGERS PLS 7944	-0.28	

ATTACHMENT FIELD PROCEDURES FOR WELL DEVELOPMENT

The procedures typically used for development of monitoring or remediation wells are contained in this appendix.

Subjective Analysis of Groundwater and Well Condition

Following installation of a monitoring or remediation well, a minimum of approximately 48 to 72 hours is allotted to allow for curing of liquid neat cement placed in the upper portion of the borehole annulus around the well casing. Upon return to the site to complete development of the well, Stratus personnel will measure depth to groundwater within the well casing and the total depth of the well. These data will be compared with well construction information recorded at the time that the well is installed. If groundwater levels and well depths correspond to construction information, well development will proceed. If the water levels and well depths differ significantly from construction information, personnel developing the well will contact the project manager to discuss the situation prior to proceeding with development activities. Using the well depth and water level measurement, the volume of water situated within the well casing is calculated.

Prior to development, a sample of groundwater is collected from the well for subjective assessment. The sample is retrieved by gently lowering a clean, disposable bailer to the air/liquid interface. The bailer is then retrieved, and the sample contained within the bailer is examined for floating liquid petroleum hydrocarbons (LPH) and the appearance of a LPH sheen. If measureable LPH is present within the well, the field representative completing the work will discuss with the project manager whether or not to proceed with development of the well.

Well Development

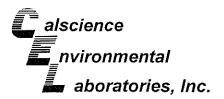
Monitoring and remediation wells are typically developed by surging and bailing, followed by groundwater pumping. Stratus personnel typically develop small diameter wells (2-inch to 4-inch) by manually raising and lowering a bailer or surge block across the screened interval of the well. Wells larger than 4-inches in diameter are typically developed using a truck mounted well development rig to complete surging and bailing activities. This well surging activity forces water movement through the filter pack sand placed around the well screen. Following surging of the well, water from the well is bailed in order to recover sediment that may have settled near the base of the well casing.

Once the surging and bailing activities have been completed, a submersible pump is placed inside of the well casing to allow for pumping of groundwater. Groundwater pumping is typically continued until the water removed from the well appears free of suspended sediment. A minimum of 10 well casing volumes are typically extracted from the well during development. However, less water may be removed from the well if insufficient recharge only allows for intermittent groundwater pumping.

Groundwater generated during development is containerized and transported off-site for disposal at an appropriate facility.

Equipment Cleaning

All reusable equipment used in well development is cleaned using phosphate-free detergents and rinsed with de-ionized water following use at each specific well.



April 03, 2009

Jay Johnson Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Subject: Calscience Work Order No.: 09-03-2183

Client Reference: ARCO 11109

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 3/25/2009 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

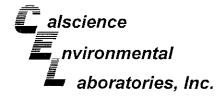
Sincerely,

Calscience Environmental

Laboratories, Inc. Richard Villafania

Project Manager

Richard Veller J.



Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

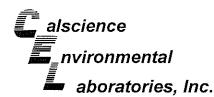
Date Received: Work Order No: Preparation: Method:

03/25/09 09-03-2183 EPA 5030B EPA 8015B (M)

Project: ARCO 11109							Pa	ige 1 of 2
Client Sample Number		Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-12 10'	When the same of t	09-03-2183-1-A	03/24/09 08:35	Solid	GC 1	03/25/09	03/25/09 19:24	090325B01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	8.5	0.50	1		mg/kg			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	141	42-126		LH,AY				
MW-12 16'		09-03-2183-2-A	03/24/09 08:50	Solid	GC 1	03/25/09	03/25/09 20:28	090325B01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Quat	<u>Units</u>			
Gasoline Range Organics (C6-C12)	9.8	0.50	1		mg/kg			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	114	42-126						
MW-12 22'		09-03-2183-3-A	03/24/09 09:10	Solid	GC 1	03/25/09	03/25/09 22:35	090325B02
Parameter	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	1300	120	250		mg/kg			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	115	42-126						
MW-12 30'	······································	09-03-2183-4-A	03/24/09 09:50	Solid	GC 1	03/25/09	03/25/09 17:17	090325B01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	0.76	0.50	1		mg/kg			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	89	42-126						



DF - Dilution Factor ,

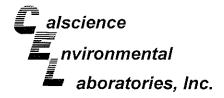


Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation: Method: 03/25/09 09-03-2183 EPA 5030B EPA 8015B (M)

Project: ARCO 11109

Page 2 of 2

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Client Sample Number		Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank		099-12-697-93	N/A	Solid	GC 1	03/25/09	03/25/09 15:09	090325B01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>			
Gasoline Range Organics (C6-C12)	ND	0.50	1		mg/kg			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	89	42-126						
Method Blank		099-12-697-94	N/A	Solid	GC 1	03/25/09	03/25/09 16:45	090325B02
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	ND	5.0	10		mg/kg			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	88	42-126						



Stratus Environmental, inc.	Date Received:	03/25/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-03-2183
Cameron Park, CA 95682-8861	Preparation:	EPA 5030B
	Method:	EPA 8260B
	Units:	mg/kg

Project: ARCO 11109

Page 1 of 2

Floject. ARCO 11109										ray	e i oi z
Client Sample Number				ab Sample Number	Date/Time Collected	Matrix	Instrumen!	Date Prepared	Date/Ti d Analyz		QC Batch ID
MW-12 10'			09-03-	2183-1-A	03/24/09 08:35	Solid	GC/MS Z	04/01/09	04/01/ 20:1		090401L01
<u>Parameter</u>	Result	<u>RL</u>	DF	Qual	<u>Parameter</u>			Result	RL	<u>DF</u>	Qual
Benzene	0.025	0.0010	1		Methyl-t-Butyl E	Ether (MTB	E)	ND	0.0010	1	
1,2-Dibromoethane	ND	0.0010	1		Tert-Butyl Alco	hol (TBA)		0.014	0.010	1	
1,2-Dichloroethane	ND	0.0010	1		Diisopropyl Eth	er (DIPE)		ND	0.0020	1	
Ethylbenzene	0.013	0.0010	1		Ethyl-t-Butyl Et	her (ETBE))	ND	0.0020	1	
Toluene	0.0019	0.0010	1		Tert-Amyl-Meth	ıyl Ether (T	AME)	ND	0.0020	1	
Xylenes (total)	0.0039	0.0010	1		•	, ,	,			•	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:			REC (%)	Control Limits		Qual
Dibromofluoromethane	92	75-141			1,2-Dichloroeth	iane-d4		124	73-151		
Toluene-d8	95	87-111			1,4-Bromofluor	obenzene		107	71-113		
MW-12 16'		·	09-03-	2183-2-A	03/24/09 08:50	Solid	GC/MS Z	04/01/09	04/01/0 20:46		090401L01
Parameter Parameter	Result	RL	DE	Qual	Parameter			Result	RL	DF	Qual
				Quai		**************************************	Ε,		-		Quai
Benzene	0.065	0.0010	1		Methyl-t-Butyl B	•	E)	ND	0.0010	1	
1,2-Dibromoethane	ND	0.0010	1		Tert-Butyl Alcol			ND	0.010	1	
1,2-Dichloroethane	ND	0.0010	1		Diisopropyl Eth			ND	0.0020	1	
Ethylbenzene	1.3	0.10	100		Ethyl-t-Butyl Et	٠,		ND	0.0020	1	
Γoluene	0.012	0.0010	1		Tert-Amyl-Meth	ıyı ⊑tner (i .	AME)	ND	0.0020	1	
Xylenes (total)	0.40	0.0010	1								
Surrogates:	<u>REC (%)</u>	Control Limits		<u>Qual</u>	Surrogates:			REC (%)	Control Limits		<u>Qual</u>
Dibromofluoromethane	84	75-141			1.2-Dichloroeth	Nh anci		128	73-151		
Toluene-d8	102	87-111			1,4-Bromofluor			105	71-113		
	102	07-111									
MW-12 22'	· · · · · · · · · · · · · · · · · · ·		09-03-2	2183-3-A	03/24/09 09:10	Solid	GC/MS Z	04/02/09	04/02/0 19:41		090402L02
Parameter	Result	<u>RL</u>	DF	Qual	<u>Parameter</u>			Result	RL	DF	Qual
Benzene	2.6	0.20	200		Methyl-t-Butyl E	Ther (MTRI	F)	ND	0.20	200	***************************************
1.2-Dibromoethane	ND	0.20	200		Tert-Butyl Alcol	•	,	ND	2.0	200	
1,2-Dichloroethane	ND	0.20	200		Diisopropyl Eth	, ,		ND	0.40	200	
Ethylbenzene	24	0.20	200		Ethyl-t-Butyl Eti	, ,	i	ND	0.40	200	
Toluene	0.94	0.20	200		Tert-Amyl-Meth	, ,		ND	0.40	200	
(videne Kylenes (total)	6.7	0.20	200		i ert-vittyl-ivieti	iyi Lulei (17	CIVIL)	(AD	0.40	200	
, ,	6.7 REC (%)	Control	200	Qual	Surrogator			DEC /0/\	Control		Ougl
<u>Surrogates;</u>	KEC (76)	Limits		Qual	Surrogates:			REC (%)	Control Limits		<u>Qual</u>
Shramafluaromathana	105				1,2-Dichloroeth	ano dit		104	Limits		
Dibromofluoromethane	105	75-141 87-111			1,4-Bromofluore				73-151		
Toluene-d8	101	01-111			1,4-01011011010010	upenzene		112	71-113		

RL - Reporting Limit , DF - Dilution Factor ,

Qual - Qualifiers





 Stratus Environmental, inc.
 Date Received:
 03/25/09

 3330 Cameron Park Drive, Suite 550
 Work Order No:
 09-03-2183

 Cameron Park, CA 95682-8861
 Preparation:
 EPA 5030B

 Method:
 EPA 8260B

 Units:
 mg/kg

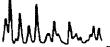
Project: ARCO 11109 Page 2 of 2

Client Sample Number				ab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Ti Analyz		QC Batch ID
MW-12 30'			09-03-	2183-4-A	03/24/09 09:50	Solid	GC/MSZ	04/01/09	04/01/0 13:31		090401L01
Parameter Parameter	<u>Result</u>	<u>RL</u>	DF	Qual	<u>Parameter</u>			Result	RL	<u>DF</u>	Qual
Benzene	ND	0.0010	1		Methyl-t-Butyl	Ether (MTBI	E)	ND	0.0010	1	
1,2-Dibromoethane	ND	0.0010	1		Tert-Butyl Alco	,	,	0.013	0.010	1	
1.2-Dichloroethane	ND	0.0010	1		Diisopropyl Eth	ner (DIPE)		ND	0.0020	1	
Ethylbenzene	ND	0.0010	1		Ethyi-t-Butyl Et	, ,		ND	0.0020	1	
Toluene	ND	0.0010	1		Tert-Amyl-Meti			ND	0.0020	1	
Xylenes (total)	ND	0.0010	1			.,,	.,		0.0020	,	
Surrogates:	REC (%)	Control Limits	,	Qual	Surrogates:			REC (%)	Control Limits		Qual
Dibromofluoromethane	99	75-141			1.2-Dichloroeth	nane-d4		122	73-151		
Foluene-d8	99	87-111			1,4-Bromofluor			93	71-113		
Method Blank		01"111	099-12	-709-120	N/A	Solid	GC/MS Z	04/01/09	04/01/0	9	090401L01
Mothod Dank				. 700 120		J			13:00		
<u>Parameter</u>	Result	<u>RL</u>	DF	Qual	<u>Parameter</u>			Result	RL	<u>DF</u>	Qual
Benzene	ND	0.0010	1		Methyl-t-Butyl I	Ether (MTBI	Ξ)	ND	0.0010	1	
I.2-Dibromoethane	ND	0.0010	1		Tert-Butyl Alco	•	•	ND	0.010	1	
1.2-Dichloroethane	ND	0.0010	1		Diisopropyl Eth	er (DIPE)		ND	0.0020	1	
Ethylbenzene	ND	0.0010	1		Ethyl-t-Butyl Et	ther (ETBE)		ND	0.0020	1	
Foluene	ND	0.0010	1		Tert-Amyl-Meth	nyl Ether (TA	AME)	ND	0.0020	1	
Kylenes (total)	ND	0.0010	1		,	` `	,			•	
Surrogates:	REC (%)	Control Limits	·	<u>Qual</u>	Surrogates:			REC (%)	Control Limits		Qual
Dibromofluoromethane	102	75-141			1,2-Dichloroeth	iane-d4		120	73-151		
Foluene-d8	101	87-111			1.4-Bromofiuor			92	71-113		
Method Blank		07-111	099-12	-709-123	N/A	Solid	GC/MS Z	04/02/09	04/02/0)9	090402L02
									16:35		
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Parameter</u>			Result	<u>RL</u>	<u>DF</u>	Qual
Benzene	ND	0.10	100		Methyl-t-Butyl E	Ether (MTB	≣)	ND	0.10	100	
.2-Dibromoethane	ND	0.10	100		Tert-Butyl Alco	hol (TBA)		ND	1,0	100	
,2-Dichloroethane	ND	0.10	100		Diisopropyl Eth	, ,		ND	0.20	100	
Ethylbenzene	ND	0.10	100		Ethyl-t-Butyl Et			ND	0.20	100	
oluene	ND	0.10	100		Tert-Amyl-Meth	. ,	AME)	ND	0.20	100	
(ylenes (total)	ND	0.10	100			,	-,				
Surrogates:	REC (%)	Control	.00	Qual	Surrogates:			REC (%)	Control		Qual
zarrogatoa.	1120 (70)			<u> </u>							
		Limits							LIMIUS		
Dibromofluoromethane	105	<u>Limits</u> 75-141			1,2-Dichloroeth	ane-d4		101	<u>Limits</u> 73-151		

RL - Reporting Limit

DF - Dilution Factor ,

Qual - Qualifiers





aboratories, Inc.

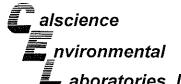
Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation: Method: 03/25/09 09-03-2183 EPA 5030B

od: EPA 8015B (M)

Project ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared		Date Analyzed	MS/MSD Batch Number
MW-12 30'	Solid	GC 1	03/25/09		03/25/09	090325801
<u>Parameter</u>	MS %REC	MSD %REC	%REC CL	<u>RPD</u>	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	114	115	42-126	0	0-25	

MPD - Reja



aboratories, Inc.

Stratus Environmental, inc.

3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation:

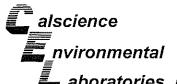
03/25/09 09-03-2183 EPA 5030B

Method:

EPA 8260B

Project ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared	l	Date Analyzed	MS/MSD Batch Number
MW-12 30'	Solid	GC/MS Z	04/01/09		04/01/09	090401801
Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	105	98	78-114	7	0-14	
Chloroform	115	116	80-120	1	0-20	
1,1-Dichloroethane	113	114	80-120	1	0-20	
1,2-Dichloroethane	129	124	80-120	4	0-20	LM,AY
1,1-Dichloroethene	110	115	73-127	4	0-21	
Ethanol	109	107	45-135	2	0-29	
Tetrachloroethene	74	71	80-120	4	0-20	
Toluene	103	94	74-116	9	0-16	
Trichloroethene	96	100	74-122	4	0-17	
Methyl-t-Butyl Ether (MTBE)	100	105	69-123	5	0-18	



aboratories, Inc.

Stratus Environmental, inc.

3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation:

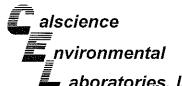
03/25/09 09-03-2183 EPA 5030B

Method:

EPA 8260B

Project ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared		Date Analyzed	MS/MSD Batch Number
09-03-2574-5	Solid	GC/MS Z	04/02/09		04/02/09	090402801
<u>Parameter</u>	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	87	78	79-115	11	0-13	LN,AY
Carbon Tetrachloride	85	84	55-139	1	0-15	
Chlorobenzene	90	83	79-115	9	0-17	
1,2-Dibromoethane	96	86	70-130	11	0-30	
1,2-Dichlorobenzene	78	78	63-123	1	0-23	
1,1-Dichloroethene	87	84	69-123	4	0-16	
Ethylbenzene	93	86	70-130	8	0-30	
Toluene	87	87	79-115	1	0-15	
Trichloroethene	84	91	66-144	8	0-14	
Vinyl Chloride	74	81	60-126	8	0-14	
Methyl-t-Butyl Ether (MTBE)	88	85	68-128	3	0-14	
Tert-Butyl Alcohol (TBA)	73	87	44-134	17	0-37	
Diisopropyl Ether (DIPE)	58	55	75-123	3	0-12	LN,AY
Ethyl-t-Butyl Ether (ETBE)	94	88	75-117	7	0-12	
Tert-Amyl-Methyl Ether (TAME)	94	87	79-115	8	0-12	
Ethanol	80	85	42-138	6	0-28	



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Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

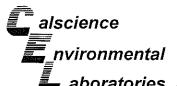
Date Received: Work Order No: Preparation: Method:

N/A 09-03-2183 **EPA 5030B** EPA 8015B (M)

Project: ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepare	ared Analyzed		LCS/LCSD Batch Number		
099-12-697-94	Solid	GC 1	03/25/09			090325B02		
Parameter	LCS	%REC LCSD	%REC	%REC CL	RPD	RPD CL	Qualifiers	
Gasoline Range Organics (C6-C12)	115	5 11	1	70-118	3	0-20		

RPD - Relative Percent Difference,



aboratories, Inc.

Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation: Method:

09-03-2183 EPA 5030B EPA 8015B (M)

N/A

Project: ARCO 11109

Quality Control Sample ID	Matrix	İnstru	Instrument		Date Prepared		ate yzed	LCS/LCSD Bate Number	ch
099-12-697-93	Solid	GC	:1	03/25/09		03/25/09		090325B01	
<u>Parameter</u>	LCS	%REC	LCSD %	REC	%RE	C CL	<u>RPD</u>	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	115	5	111		70	-118	3	0-20	





Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation: Method:

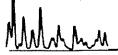
09-03-2183 EPA 5030B EPA 8260B

N/A

Project: ARCO 11109

Quality Control Sample ID	ample ID Matrix Instrument		Date Prepared	Date Analyzed			LCS/LCSD Batch Number		
099-12-709-120	Solid	GC/MS Z	04/01/09 04/01/09		/09	090401L01			
<u>Parameter</u>	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers		
Benzene	105	103	84-114	79-119	2	0-7			
Bromobenzene	113	113	80-120	73-127	0	0-20			
Bromochloromethane	105	109	80-120	73-127	4	0-20			
Bromodichloromethane	110	108	80-120	73-127	2	0-20			
Bromoform	111	115	80-120	73-127	3	0-20			
Bromomethane	119	120	80-120	73-127	1	0-20			
n-Butylbenzene	101	90	77-123	69-131	12	0-25			
sec-Butylbenzene	102	101	80-120	73-127	2	0-20			
tert-Butylbenzene	107	103	80-120	73-127	3	0-20			
Carbon Disulfide	104	108	80-120	73-127	4	0-20			
Carbon Tetrachloride	107	109	69-135	58-146	1	0-13			
Chlorobenzene	99	96	85-109	81-113	4	8-0			
Chloroethane	96	97	80-120	73-127	1	0-20			
Chloroform	107	108	80-120	73-127	2	0-20			
Chloromethane	110	109	80-120	73-127	1	0-20			
2-Chlorotoluene	100	101	80-120	73-127	1	0-20			
4-Chlorotoluene	100	100	80-120	73-127	0	0-20			
Dibromochloromethane	107	106	80-120	73-127	1	0-20			
1,2-Dibromo-3-Chloropropane	101	106	80-120	73-127	5	0-20			
1,2-Dibromoethane	100	97	80-120	73-127	3	0-20			
Dibromomethane	98	102	80-120	73-127	4	0-20			
1,2-Dichlorobenzene	104	92	80-110	75-115	13	0-10			
1,3-Dichlorobenzene	103	104	80-120	73-127	0	0-20			
1,4-Dichlorobenzene	105	106	80-120	73-127	1	0-20			
Dichlorodifluoromethane	111	118	80-120	73-127	7	0-20			
1,1-Dichloroethane	106	111	80-120	73-127	5	0-20			
1,2-Dichloroethane	114	118	80-120	73-127	4	0-20			
1,1-Dichloroethene	108	110	83-125	76-132	1	0-10			
c-1,2-Dichloroethene	91	90	80-120	73-127	1	0-20			
t-1,2-Dichloroethene	98	99	80-120	73-127	1	0-20			
1,2-Dichloropropane	101	107	79-115	73-121	6	0-25			
1,3-Dichloropropane	99	94	80-120	73-127	5	0-20			
2,2-Dichloropropane	106	108	80-120	73-127	2	0-20			
1,1-Dichloropropene	95	93	80-120	73-127	2	0-20			
c-1,3-Dichloropropene	102	100	80-120	73-127	3	0-20			
t-1,3-Dichloropropene	102	97	80-120	73-127	5	0-20			
Ethylbenzene	99	99	80-120	73-127	0	0-20			
Isopropylbenzene	105	107	80-120	73-127	1	0-20			

RPD - Relative Percent Difference,





aboratories, Inc.

Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation: Method:

09-03-2183 EPA 5030B EPA 8260B

N/A

Project: ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed 04/01/09		LCS/LCSD Numbe	
099-12-709-120	Solid	GC/MS Z	04/01/09			090401L	01
<u>Parameter</u>	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
p-!sopropyltoluene	103	101	80-120	73-127	2	0-20	
Methylene Chloride	95	99	80-120	73-127	4	0-20	
Naphthalene	88	90	80-120	73-127	3	0-20	
n-Propylbenzene	103	104	80-120	73-127	1	0-20	
Styrene	105	106	80-120	73-127	1	0-20	
Ethanol	108	115	50-134	36-148	6	0-23	
1,1,1,2-Tetrachloroethane	105	109	80-120	73-127	4	0-20	
1,1,2,2-Tetrachloroethane	102	104	80-120	73-127	2	0-20	
Tetrachloroethene	85	91	80-120	73-127	7	0-20	
Toluene	102	99	79-115	73-121	3	0-8	
1,2,3-Trichlorobenzene	108	113	80-120	73-127	4	0-20	
1,2,4-Trichlorobenzene	110	109	80-120	73-127	1	0-20	
1,1,1-Trichloroethane	98	101	80-120	73-127	3	0-20	
1,1,2-Trichloroethane	95	93	80-120	73-127	3	0-20	
Trichloroethene	103	108	87-111	83-115	5	0-7	
Trichlorofluoromethane	121	128	80-120	73-127	5	0-20	
1,2,3-Trichloropropane	101	107	80-120	73-127	5	0-20	
1,2,4-Trimethylbenzene	102	103	80-120	73-127	0	0-20	
1,3,5-Trimethylbenzene	104	106	80-120	73-127	2	0-20	
Vinyl Acetate	115	115	80-120	73-127	0	0-20	
Vinyl Chloride	99	97	72-126	63-135	2	0-10	
p/m-Xylene	101	101	80-120	73-127	0	0-20	
o-Xylene	100	100	80-120	73-127	1	0-20	
Methyl-t-Butyl Ether (MTBE)	95	97	75-129	66-138	3	0-13	
Tert-Butyl Alcohol (TBA)	94	95	66-126	56-136	2	0-24	
Diisopropyl Ether (DIPE)	106	110	77-125	69-133	3	0-13	
Ethyl-t-Butyl Ether (ETBE)	95	102	72-132	62-142	7	0-12	
Tert-Amyl-Methyl Ether (TAME)	90	93	77-125	69-133	4	0-10	

Total number of LCS compounds: 66

Total number of ME compounds: 1

Total number of ME compounds allowed: 3

LCS ME CL validation result: Pass

RPD - Relative Percent Difference,



aboratories, Inc.

Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation:

N/A 09-03-2183 EPA 5030B

Method:

EPA 8260B

Project: ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed 04/02/09		LCS/LCSD Numbe	
099-12-709-123	Solid	GC/MS Z	04/02/09			090402L02	
Parameter	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
Benzene	103	102	84-114	79-119	1	0-7	
Bromobenzene	96	93	80-120	73-127	2	0-20	
Bromochloromethane	98	86	80-120	73-127	13	0-20	
Bromodichloromethane	106	94	80-120	73-127	12	0-20	
Bromoform	94	97	80-120	73-127	3	0-20	
Bromomethane	114	86	80-120	73-127	28	0-20	
n-Butyibenzene	103	98	77-123	69-131	5	0-25	
sec-Butylbenzene	103	100	80-120	73-127	4	0-20	
lert-Butylbenzene	100	112	80-120	73-127	11	0-20	
Carbon Disulfide	103	91	80-120	73-127	12	0-20	
Carbon Tetrachloride	100	93	69-135	58-146	8	0-13	
Chlorobenzene	104	98	85-109	81-113	6	8-0	
Chloroethane	108	96	80-120	73-127	12	0-20	
Chloroform	101	88	80-120	73-127	13	0-20	
Chloromethane	96	88	80-120	73-127	9	0-20	
2-Chlorotoluene	102	100	80-120	73-127	1	0-20	
f-Chlorotoluene	100	94	80-120	73-127	6	0-20	
Dibromochloromethane	99	102	80-120	73-127	2	0-20	
1,2-Dibromo-3-Chloropropane	95	93	80-120	73-127	3	0-20	
1,2-Dibromoethane	94	93	80-120	73-127	0	0-20	
Dibromomethane	106	96	80-120	73-127	10	0-20	
1,2-Dichlorobenzene	96	93	80-110	75-115	3	0-10	
1,3-Dichlorobenzene	97	94	80-120	73-127	4	0-20	
,4-Dichlorobenzene	97	97	80-120	73-127	0	0-20	
Dichlorodifluoromethane	103	91	80-120	73-127	13	0-20	
1,1-Dichloroethane	106	93	80-120	73-127	13	0-20	
I,2-Dichloroethane	101	99	80-120	73-127	2	0-20	
1,1-Dichloroethene	107	94	83-125	76-132	13	0-10	
c-1,2-Dichloroethene	96	87	80-120	73-127	9	0-20	
-1,2-Dichloraethene	99	88	80-120	73-127	13	0-20	
,2-Díchloropropane	105	107	79-115	73-121	2	0-25	
,3-Dichloropropane	95	95	80-120	73-127	1	0-20	
,2-Dichloropropane	102	95	80-120	73-127	8	0-20	
,1-Dichloropropene	102	89	80-120	73-127	14	0-20	
:-1,3-Dichloropropene	106	96	80-120	73-127	10	0-20	
-1,3-Dichloropropene	102	99	80-120	73-127	2	0-20	
Ethylbenzene	99	99	80-120	73-127	0	0-20	
sopropylbenzene	103	104	80-120	73-127	2	0-20	

RPD - Relative Percent Difference,



Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation: Method:

09-03-2183 EPA 5030B

N/A

EPA 8260B

Project: ARCO 11109

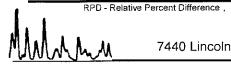
Parameter LCS %REC LCS %REC WREC CL ME CL RPD RPD CL p-Isopropyltoluene 102 101 80-120 73-127 2 0-20 Methylene Chloride 105 97 80-120 73-127 7 0-20 Naphthalene 91 92 80-120 73-127 1 0-20 n-Propylbenzene 97 96 80-120 73-127 1 0-20 Styrene 106 97 80-120 73-127 8 0-20 Ethanol 109 90 50-134 36-148 19 0-23 1,1,1,2-Tetrachloroethane 92 97 80-120 73-127 5 0-20 1,1,2,2-Tetrachloroethane 92 97 80-120 73-127 0 0-20 Tetrachloroethene 108 89 80-120 73-127 0 0-20 Toluene 105 91 79-115 73-127 20 0-20 1,2,4-Trichlo	∃atch r
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Methylene Chloride 105 97 80-120 73-127 7 0-20 Naphthalene 91 92 80-120 73-127 1 0-20 n-Propylbenzene 97 96 80-120 73-127 1 0-20 Styrene 106 97 80-120 73-127 8 0-20 Ethanol 109 90 50-134 36-148 19 0-23 1,1,2-Tetrachloroethane 92 97 80-120 73-127 5 0-20 1,2,2-Tetrachloroethane 92 92 80-120 73-127 0 0-20 Tetrachloroethene 108 89 80-120 73-127 20 0-20 Toluene 105 91 79-115 73-127 20 0-20 1,2,3-Trichlorobenzene 93 73 80-120 73-127 23 0-20 1,2,4-Trichlorobenzene 94 99 80-120 73-127 5 0-20 1,1,1-Trichloroe	Qualifiers
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1,1,1-Trichloroethane 103 93 80-120 73-127 9 0-20	
1.1.2-Trichloroethane 96 95 80-120 73-127 0 0-20	
Trichloroethene 110 102 87-111 83-115 7 0-7	
Trichlorofluoromethane 104 92 80-120 73-127 13 0-20	
1,2,3-Trichloropropane 103 104 80-120 73-127 1 0-20	
1,2,4-Trimethylbenzene 102 102 80-120 73-127 0 0-20	
1,3,5-Trimethylbenzene 107 107 80-120 73-127 0 0-20	
Vinyl Acetate 101 92 80-120 73-127 9 0-20	
Vinyl Chloride 96 90 72-126 63-135 6 0-10	
p/m-Xylene 98 102 80-120 73-127 3 0-20	
o-Xylene 107 94 80-120 73-127 13 0-20	
Methyl-t-Butyl Ether (MTBE) 102 91 75-129 66-138 11 0-13	
Tert-Butyl Aicohol (TBA) 89 91 66-126 56-136 2 0-24	
Diisopropyl Ether (DIPE) 99 90 77-125 69-133 10 0-13	
Ethyl-t-Butyl Ether (ETBE) 109 102 72-132 62-142 6 0-12	
Tert-Amyl-Methyl Ether (TAME) 97 96 77-125 69-133 1 0-10	

Total number of LCS compounds: 66

Total number of ME compounds: 0

Total number of ME compounds allowed: 3

LCS ME CL validation result: Pass





Glossary of Terms and Qualifiers



Work Order Number: 09-03-2183

Qualifier	<u>Definition</u>
AX	Sample too dilute to quantify surrogate.
AZ	Surrogate recovery outside of acceptance limits due to matrix interference.
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.
вн	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.
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.
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.

Work Order Number: 09-03-2183

Qualifier	<u>Definition</u>
LW	Quantitation of unknown hydrocarbon(s) in sample based on gasoline.
LX	Quantitation of unknown hydrocarbon(s) in sample based on diesel.
МВ	Analyte present in the method blank.
PC	Sample taken from VOA vial with air bubble > 6mm diameter.
Pl	Primary and confirm results varied by > than 40% RPD.
RA	RPD exceeds limit due to matrix interf.; % recovs. within limits.
RB	RPD exceeded method control limit; % recoveries within limits.
SG	A silica gel cleanup procedure was performed.

Atlantic Richfield Company

Laboratory Management Program LaMP Chain of Custody Record

Req Due Date (mm/dd/yy):

Ret Work Out to No.

Page <u> </u>	of L	
sh TAT: Yes	No X	

BP/ARC Project Name:

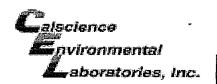
BP/ARC Facility No: APCO 11109

Req Due Date (mm/dd/yy):

Lab Work Order Number:

Rush TAT: Yes No

Lab Name: CALSCIEUCE	P/ARC Facility Address: 4280	FOOTHILL BLUD	Consultant/Contractor: STA	ATUS
Lab Address: 7440 Liucoln was CA.		-lung, CA-	Consultant/Contractor Project No:	
Lab Address: 7440 Livcoln was come acoust Lab PM: Bicturo Villa Panca	ead Regulatory Agency:	both commis	Address: 3330 CAULE ON	Duck 00 # 550
Lab Phone:	California Global ID No.: TO60		Consultant/Contractor PM:	K TOWNSON
Lab Shipping Acont:	infos Proposal No:		Phone: 530 67-6 66	000
Lab Bottle Order No:	accounting Mode: Provision	00C-BU 00C-RM	Email EDD To: CHUFF	OSTIMALS INC. NET
Other Info:	Stage: Activity:		Invoice To: BP/ARC	
BP/ARCEBM: Paul Supple	Matrix No. Containe	rs / Preservative Requ	uested Analyses	Report Type & QC Level
EBM Phone;				Standard
EBM Email: Punc. Supple DD. COM	Containers			Full Data Package
Lab No. Sample Description Date Time	Solid / Liquid apor Number of served	HCI Methanol Greo Beared # 5 045	ארו ערו s	Comments Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description.
1 Nu-12 101 3/24/09 0835	$\Theta \cup A \cup A$	1 1 + + +	7	505=7 DIPH
2 MW-12 16' 1 0850	4 11			Thruz
3 mm-12 22' 0910	K X			MIBE
4 MW-12 301 V 0950	H 1 +	VVV		RTBE
				TBA
Sampler's Name:	Relinquished By / Af		Accepted By / Affilia	ation Date Time
Sampler's Company: STPM-18	Calla-fai	Specienist 3/24/19		,
Shipment Method: G250 Ship Date: 3/24/09			Wast	al 3/3/09 1030 8
Shipment Tracking No:			1/7	
Special Instructions: 106160201				9
THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No	Temp Blank: Yes / No Cod	oler Temp on Receipt:°F/C	Trip Blank; Yes / No MS/M	ISD Sample Submitted: Yes / No



WORK ORDER #: **09-03- 2 18** of 18

raboratories, Inc. SAMPLE RECEIPT FORM Cooler ___ of ___

CLIENT: Stratus	DATE:	03125	109
TEMPERATURE: (Criteria: 0.0 °C − 6.0 °C, not frozen) Temperature	ourier.	☐ Sample ing. Initial: _	H
CUSTODY SEALS INTACT: □ Cooler □ □ No (Not Intact) □ Not Present □ Sample □ □ No (Not Intact) □ Not Present		Initial: ַ Initial: ַ	5
SAMPLE CONDITION: Chain-Of-Custody (COC) document(s) received with samples	Yes	N o □	N/A
COC document(s) received complete	. 🗹		
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels			
☐ COC not relinquished. ☐ No date relinquished. ☐ No time relinquished.	,		
Sampler's name indicated on COC	d		
Sample container label(s) consistent with COC	G'		
Sample container(s) intact and good condition			
Correct containers and volume for analyses requested			
Analyses received within holding time	IZ		
Proper preservation noted on COC or sample container	. 🗆		Ø
☐ Unpreserved vials received for Volatiles analysis			,
Volatile analysis container(s) free of headspace	. 🗆		a
Tedlar bag(s) free of condensation CONTAINER TYPE:	. 🗆		
Solid: □4ozCGJ □8ozCGJ □16ozCGJ □Sleeve □EnCores® □]TerraCore	s® □	
Water: □VOA □VOAh □VOAna₂ □125AGB □125AGBh □125A	AGBpo₄ □	1AGB □1AG	Bna₂
□1AGBs □500AGB □500AGBs □250CGB □250CGBs □1PB □	500PB □5	500PBna □2	50PB
□250PBn □125PB □125PBznna □100PBsterile □100PBna₂ □_			
Air: \Box Tedlar $^{\otimes}$ \Box Sludge/Other: \Box Sludge/Other: \Box Sludge/Other:Container:C:ClearA:AmberP:Poly/PlasticG:GlassJ:JarB:BottlePreservative:h:HCLn:HNO3na2:Na2S2O3na:NaOHpo4:H3PO4s:H2SO4znna:ZnAc2+	R	/Labeled by: _ leviewed by: _ Scanned by: _	. A

SOP T100_090 (03/13/09)



April 06, 2009

Jay Johnson Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Subject: Calscience Work Order No.:

09-03-2075

Client Reference:

ARCO 11109

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 3/24/2009 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental

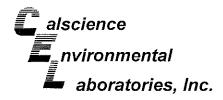
Laboratories, Inc.

Richard Villafania

Richard Vellas

Project Manager

FAX: (714) 894-7501



Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550

Date Received: Work Order No:

03/24/09 09-03-2075

Cameron Park, CA 95682-8861

Preparation: Method:

EPA 5030B EPA 8015B (M)

Project: ARCO 11109

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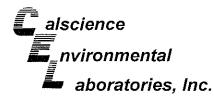
Project: ARCO 11109							Pa	ige 1 of 3
Client Sample Number		Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-10 14'		09-03-2075-1-A	03/23/09 08:50	Solid	GC 1	03/24/09	03/25/09 02:26	090324B03
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Quai	<u>Units</u>			
Gasoline Range Organics (C6-C12)	420	50	100		mg/kg			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	105	42-126						
MW-10 20'		09-03-2075-2-A	03/23/09 09:05	Solid	GC 1	03/24/09	03/25/09 02:57	090324B03
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	3900	50	100		mg/kg			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	180	42-126		LH,AY				
MW-10 26'		09-03-2075-3-A	03/23/09 09:30	Solid	GC 1	03/24/09	03/25/09 03:29	090324B03
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	1300	50	100		mg/kg			
Surrogates:	REC (%)	Control Limits		Qual				
,4-Bromofluorobenzene	118	42-126						
MW-10 30'		09-03-2075-4-A	03/23/09 09:40	Solid	GC 1	03/24/09	03/25/09 08:46	090324B03
Parameter	<u>Result</u>	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	21	5.0	10		mg/kg			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	101	42-126						

RL - Reporting Limit ,

DF - Dilution Factor ,

Qual - Qualifiers





Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation: Method:

03/24/09 09-03-2075 EPA 5030B EPA 8015B (M)

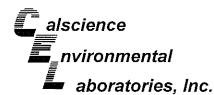
Project: ARCO 11109							Pa	nge 2 of 3
Client Sample Number		Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW-11 10'		09-03-2075-5-A	03/23/09 13:05	Solid	GC 1	03/24/09	03/25/09 09:18	090324B03
Parameter	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	55	5.0	10		mg/kg			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	112	42-126						
MW-11 16'		09-03-2075-6-A	03/23/09 13:30	Solid	GC 1	03/24/09	03/25/09 01:22	090324B02
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	ND	0.50	1		mg/kg			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	90	42-126						
MW-11 24'		09-03-2075-7-A	03/23/09 13:55	Solid	GC 1	03/24/09	03/25/09 05:05	090324B03
Parameter .	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	6500	250	500		mg/kg			
Surrogates:	REC (%)	Control Limits		Qual				
,4-Bromofluorobenzene	134	42-126		LH,AY				
MW-11 30'		09-03-2075-8-A	03/23/09 14:25	Solid	GC 1	03/24/09	03/25/09 01:54	090324B02
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	15	0.50	1		mg/kg			
Surrogates:	REC (%)	Control Limits		Qual				
1.4-Bromofluorobenzene	129	42-126		LH,AY				



DF - Dilution Factor ,

Qual - Qualifiers





Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation: Method:

09-03-2075 EPA 5030B EPA 8015B (M)

03/24/09

Project: ARCO 11109

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Project. ARCO 11109							Pa	ige 3 of 3
Client Sample Number		Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank		099-12-697-91	N/A	Solid	GC 1	03/24/09	03/24/09 21:39	090324B02
<u>Parameter</u>	Result	RL	<u>DF</u>	<u>Quaí</u>	<u>Units</u>			
Gasoline Range Organics (C6-C12)	ND	0.50	1		mg/kg			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	87	42-126						
Method Blank		099-12-697-92	N/A	Solid	GC 1	03/24/09	03/25/09 23:15	090324B03
<u>Parameter</u>	<u>Result</u>	RL	<u>DF</u>	<u>Qual</u>	<u>Units</u>			
Gasoline Range Organics (C6-C12)	ND	5.0	10		mg/kg			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	89	42-126						



Stratus Environmental, inc.	Date Received:	03/24/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-03-2075
Cameron Park, CA 95682-8861	Preparation:	EPA 5030B
	Method:	EPA 8260B
	Units:	mg/kg

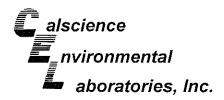
Project: ARCO 11109

Page 1 of 4

Project. ANCO Trios										ıay	1014
Client Sample Number				ıb Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Ti d Analyz		QC Batch ID
MW-10 14'			09-03-2	2075-1-A	03/23/09 08:50	Solid	GC/MS Z	04/01/09	04/01/ 15:3		090401L02
<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	Qual	<u>Parameter</u>			Result	<u>RL</u>	<u>DF</u>	Qual
Benzene	2.4	0.50	500		Methyl-t-Butyi I	Ether (MTB	E)	ND	0.50	500)
1,2-Dibromoethane	ND	0.50	500		Tert-Butyl Alco	hol (TBA)		ND	5.0	500)
1,2-Dichloroethane	ND	0.50	500		Diisopropyl Eth	er (DIPE)		ND	1.0	500)
Ethylbenzene	20	0.50	500		Ethyl-t-Butyl Et	lher (ETBE))	ND	1.0	500)
Toluene	5.1	0.50	500		Tert-Amyl-Metl	hyl Ether (T	AME)	ND	1.0	500)
Kylenes (total)	84	0.50	500								
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:			REC (%)	Control Limits		Qual
Dibromofluoromethane	100	75-141			1,2-Dichloroeth	nane-d4		118	73-151		
Toluene-d8	100	87-111			1,4-Bromofluor	obenzene		102	71-113		
MW-10 20'			09-03-2	2075-2-A	03/23/09 09:05	Solid	GC/MS Z	04/01/09	04/01/0 16:06		090401L02
<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Parameter</u>			Result	<u>RL</u>	<u>DF</u>	<u>Qual</u>
Benzene	11	1.0	1000		Methyl-t-Butyl 8		E)	ND	1.0	100	0
,2-Dibromoethane	ND	1.0	1000		Tert-Butyl Alco	hol (TBA)		ND	10	100	0
,2-Dichloroethane	ND	1.0	1000		Diisopropyl Eth	• /		ND	2.0	100	0
Ethylbenzene	48	1.0	1000		Ethyl-t-Butyl Et			ND	2.0	100	0
l'oluene	31	1.0	1000		Tert-Amyl-Meth	nyl Ether (T.	AME)	ND	2.0	100	0
(ylenes (total)	230	1.0	1000								
Surrogates:	<u>REC (%)</u>	Control Limits		<u>Qual</u>	Surrogates:			REC (%)	Control Limits		<u>Qual</u>
Dibromofluoromethane	106	75-141			1,2-Dichloroeth	nane-d4		120	73-151		
^oluene-d8	103	87-111			1,4-Bromofluor	obenzene		106	71-113		
MW-10 26'			09-03-2	2075-3-A	03/23/09 09:30	Solid	GC/MS Z	04/01/09	04/01/0 16:37		090401L02
Porameter	Result	<u>RL</u>	DF	Qual	Parameter			Result	RL	DE	Qual
<u>Parameter</u>				Quai			Ε\	· ·			
Benzene	0.67	0.10	100		Methyl-t-Butyl 8	,	⊏)	ND	0.10	100	
,2-Dibromoethane	ND	0.10	100		Tert-Butyl Alco			ND	1.0	100	
,2-Dichloroethane	ND	0.10	100		Diisopropyl Eth	• /		ND	0.20	100	
thylbenzene	2.1	0.10	100		Ethyl-t-Butyl Et	,		ND	0.20	100	
oluene	0.43	0.10	100		Tert-Amyl-Meth	nyı ⊑tner (i .	AME)	ND	0.20	100)
(ylenes (total)	2.9	0.10	100					DEO M	0		0 1
Surrogates:	REC (%)	Control		Qual	Surrogates:			REC (%)	Control Limits		<u>Qual</u>
Cibron of kinsomothono	104	<u>Limits</u> 75-141			1.2-Dichloroeth	None-da		122	73-151		
Dibromofluoromethane	104	75-141 87-111			1,4-Bromofluor			111	73-151		
Foluene-d8	107	0/-111			1,4-DIOIIIUIIUI	ODENZENE		111	11-113		



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



Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation: Method: Units:

Diisopropyl Ether (DIPE)

1,2-Dichloroethane-d4

Surrogates:

Ethyl-t-Butyl Ether (ETBE)

Tert-Amyl-Methyl Ether (TAME)

ND

ND

ND

REC (%)

120

0.20

0.20

0.20

Control

<u>Limits</u>

73-151

100

100

100

Qual

09-03-2075 EPA 5030B EPA 8260B mg/kg

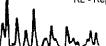
03/24/09

Page 2 d

Project: ARCO 11109

Project: ARCO 11109										Pa	ge 2 of 4
Client Sample Number				b Sample Number	Date/Time Collected	Matrix	Instrumen	Date Prepared	Date/ Analy		QC Batch ID
MW-10 30'			09-03-2	2075-4-A	03/23/09 09:40	Solid	GC/MS Z	04/01/09	04/01 17:0		090401L01
Parameter	<u>Result</u>	<u>RL</u>	<u>DF</u>	Qual	<u>Parameter</u>			Result	RL	DF	Qual
Benzene	0.48	0.10	100		Methyl-t-Butyl 8	Ether (MTB	E)	ND	0.0010	1	
1,2-Dibromoethane	ND	0.0010	1		Tert-Butyl Alcol	hol (TBA)		0.065	0.010	1	
1,2-Dichloroethane	ND	0.0010	1		Diisopropyl Eth	er (DIPE)		0.0035	0.0020	1	
Ethylbenzene	0.033	0.0010	1		Ethyl-t-Butyl Et	her (ETBE)	ND	0.0020	1	
Toluene	0.020	0.0010	1		Tert-Amyl-Meth	ıyl Ether (T	AME)	ND	0.0020	1	
Xylenes (total)	0.037	0.0010	1								
Surrogates:	REC (%)	Control Limits		<u>Qual</u>	Surrogates:			REC (%)	Control Limits		<u>Qual</u>
Dibromofluoromethane	90	75-141			1,2-Dichloroeth	ane-d4		123	73-151		
Toluene-d8	104	87-111			1,4-Bromofluor	obenzene		100	71-113		
MW-11 10'			09-03-2	2075-5-A	03/23/09 13:05	Solid	GC/MS Z	04/01/09	04/01 17:3		090401L02
<u>Parameter</u>	Result	RL	<u>DF</u>	Qual	<u>Parameter</u>			Result	RL	DF	Qual
Benzene	ND	0,10	100		Methyl-t-Butyl E	ther (MTB	E)	ND	0.10	10	0
1,2-Dibromoethane	ND	0.10	100		Tert-Butyl Alcol	hol (TBA)	•	ND	1.0	10	0

Toluene-d8	101	87-111			1,4-Bromofluor			98	71-113		
MW-11 16'			09-03-	2075-6-A	03/23/09 13:30	Solid	GC/MS Z	04/01/09	04/01/ 18:1		090401L01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Parameter</u>			Result	RL	<u>DF</u>	Qual
Benzene	0.0014	0.0010	1		Methyl-t-Butyl I	Ether (MTB	E)	0.0028	0.0010	1	
1,2-Dibromoethane	ND	0.0010	1		Tert-Butyl Alco	hol (TBA)		ND	0.010	1	
1,2-Dichloroethane	ND	0.0010	1		Diisopropyl Eth	ner (DIPE)		ND	0.0020	1	
Ethylbenzene	0.0051	0.0010	1		Ethyl-t-Butyl Et	ther (ETBE))	ND	0.0020	1	
Toluene	0.0013	0.0010	1		Tert-Amyl-Metl	hyl Ether (T.	AME)	ND	0.0020	1	
Xylenes (total)	0.0076	0.0010	1								
Surrogates:	<u>REC (%)</u>	Control Limits		Qual	Surrogates:			REC (%)	Control Limits		Qual
Dibromofluoromethane	84	75-141			1,2-Dichloroeth	nane-d4		124	73-151		
Toluene-d8	100	87-111			1,4-Bromofluor	robenzene		95	71-113		



1,2-Dichloroethane

Dibromofluoromethane

Ethylbenzene

Xylenes (total)

Surrogates:

Toluene

RL - Reporting Limit , DF - Dilution Factor

ND

1.6

ND

0.21

96

REC (%)

0.10

0.10

0.10

0.10

<u>Control</u>

<u>Limits</u>

75-141

100

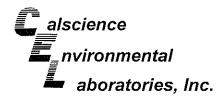
100

100

100

Qual

Qual - Qualifiers



Stratus Environmental, inc.	Date Received:	03/24/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-03-2075
Cameron Park, CA 95682-8861	Preparation:	EPA 5030B
	Method:	EPA 8260B
	Units:	ma/ka

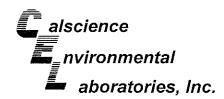
Project: ARCO 11109 Page 3 of 4

Troject: 711too 171too										. 4	, , , , , , , , , , , , , , , , , , ,
Client Sample Number				b Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/T d Analya		QC Batch ID
MW-11 24'			09-03-2	2075-7-A	03/23/09 13:55	Solid	GC/MSZ	04/01/09	04/01 18:4		090401L02
Parameter	Result	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Parameter</u>			Result	<u>RL</u>	DF	Qual
Benzene	22	2.0	2000		Methyl-t-Butyl [Ether (MTB	≣)	ND	2.0	200	00
1,2-Dibromoethane	ND	2.0	2000		Tert-Butyl Alco	hol (TBA)		ND	20	200	00
1,2-Dichloroethane	ND	2.0	2000		Diisopropyl Eth	er (DIPE)		ND	4.0	200	00
Ethylbenzene	95	2.0	2000		Ethyl-t-Butyl Et	her (ETBE)		ND	4.0	200	00
Toluene	86	2.0	2000		Tert-Amyi-Meth	nyl Ether (TA	AME)	ND	4.0	200	00
Xylenes (total)	460	2.0	2000								
Surrogates:	REC (%)	Control Limits		<u>Qual</u>	Surrogates:			REC (%)	Control Limits		Qual
Dibromofluoromethane	105	75-141			1,2-Dichloroeth	ane-d4		121	73-151		
Toluene-d8	98	87-111			1,4-Bromofluor	obenzene		101	71-113		
MW-11 30'			09-03-2	2075-8-A	03/23/09 14:25	Solid	GC/MS Z	04/01/09	04/01/ 19:1		090401L02
Parameter	Result	RL	<u>DF</u>	Qual	<u>Parameter</u>			Result	<u>RL</u>	DF	Qual
Benzene	0.58	0.10	100		Methyl-t-Butyl E	Ether (MTBE	Ε)	ND	0.10	10	0
1,2-Dibromoethane	ND	0.10	100		Tert-Butyl Alcol	•	•	ND	1.0	10	
1,2-Dichloroethane	ND	0.10	100		Diisopropyl Eth			ND	0.20	10	
Ethylbenzene	0.69	0.10	100		Ethyl-t-Butyl Et	her (ETBE)		ND	0.20	10	
Foluene	0.44	0.10	100		Tert-Amyl-Meth		ME)	ND	0.20	10	
(total)	3.1	0.10	100		-	•					
Surrogates:	REC (%)	Control		Qual	Surrogates:			REC (%)	Control		Qual
<u></u>	· · · · · · · · · · · · · · · · · · ·	Limits							Limits		
Dibromofluoromethane	98	75-141			1,2-Dichloroeth	ane-d4		116	73-151		
Foluene-d8	98	87-111			1,4-Bromofluor	obenzene		100	71-113		
Method Blank			099-12-	709-120	N/A	Solid	GC/MS Z	04/01/09	04/01/ 13:0		090401L01
Parameter	Result	RL	DF	Qual	Parameter			Result	RL	DF	Qual
Benzene	ND	0.0010	<u> </u>		Methyl-t-Butyl 8	Ether (MTBF	3	ND	0.0010	1	_
.2-Dibromoethane	ND	0.0010	1		Tert-Butyl Alcol	•	-,	ND	0.010	1	
,2-Distribution	ND	0.0010	1		Diisopropyl Eth	, ,		ND	0.0020	1	
thylbenzene	ND	0.0010	1		Ethyl-t-Butyl Et	, ,		ND	0.0020	1	
oluene	ND	0.0010	1		Tert-Amyl-Meth	, ,	ME)	ND	0.0020	1	
(ylenes (total)	ND	0.0010	1		. o.c. any mon	.,. = (17	,		0.0020	1	
Surrogates:	REC (%)	Control		Qual	Surrogates:			REC (%)	Control		Qual
эшнодакса.	11-01/01	Limits		Guu	Carrogates.			17-0/1/01	Limits		SCICII
Dibromofluoromethane	102	75-141			1.2-Dichloroeth	ane-d4		120	73-151		
Toluene-d8	101	87-111			1,4-Bromofluor			92	71-113		
					,				· · · · ·		

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RL - Reporting Limit , DF - Dilution Factor ,

Qual - Qualifiers



Stratus Environmental, inc.
3330 Cameron Park Drive, Suite 550
Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation: Method:

Units:

03/24/09 09-03-2075 EPA 5030B

d: EPA 8260B mg/kg

Project: ARCO 11109

Page 4 of 4

Client Sample Number				b Sample Jumber	Date/Time Collected	Matrix	Instrumen	Date t Prepared	Date/Time I Analyzed	
Method Blank			099-12-	709-121	N/A	Solid	GC/MS Z	04/01/09	04/01/09 12:28	090401L02
Parameter	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Parameter</u>			Result	<u>RL</u>	DF Qual
Benzene	ND	0.10	100		Methyl-t-Butyl 8	Ether (MTE	E)	ND	0.10	100
1,2-Dibromoethane	ND	0.10	100		Tert-Butyl Alco	hol (TBA)	•	ND	1.0	100
1,2-Dichloroethane	ND	0.10	100		Diisopropyl Eth	er (DIPE)		ND	0.20	100
Ethylbenzene	ND	0.10	100		Ethyl-t-Butyl Et	her (ETBE)	ND	0.20	100
Toluene	ND	0.10	100		Tert-Amyl-Meth	yl Ether (T	AME)	ND	0.20	100
Xyienes (total)	ND	0.10	100							
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:			REC (%)	<u>Control</u> Limits	Qual
Dibromofluoromethane	98	75-141			1,2-Dichloroeth	ane-d4		116	73-151	
Toluene-d8	100	87-111			1,4-Bromofluor	obenzene		100	71-113	
Method Blank			099-12-	709-123	N/A	Solid	GC/MS Z	04/02/09	04/02/09 16:35	090402L02
Parameter	Result	<u>RL</u>	DF	Qual	Parameter			Result	RL [DF Qual
Benzene	ND	0.10	100		Methyi-t-Butyl E	ther (MTB	E)	ND	0.10	100
1,2-Dibromoethane	ND	0.10	100		Tert-Butyl Alcol	•	_,	ND		100
1,2-Dichloroethane	ND	0.10	100		Diisopropyl Eth	er (DIPE)		ND	' - '	100
Ethylbenzene	ND	0.10	100		Ethyl-t-Butyl Etl)	ND		100
Foluene	ND	0.10	100		Tert-Amyl-Meth	yl Ether (T	AME)	ND		100
(ylenes (total)	ND	0.10	100		•	•	,			
Surrogates:	<u>REC (%)</u>	Control Limits		Qual	Surrogates:			REC (%)	Control Limits	Qual
Dibromofluoromethane	105	75-141			1,2-Dichloroeth	ane-d4		101	73-151	
Foluene-d8	98	87-111			1.4-Bromofluore	benzene		94	71-113	

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Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550

Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation:

Method:

03/24/09 09-03-2075 EPA 5030B EPA 8015B (M)

Project ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed		MS/MSD Batch Number			
09-03-2074-1	Solid	GC 1	03/24/09		03/25/09	090324S02			
<u>Parameter</u>	MS %REC	MSD %REC	%REC CL	<u>RPD</u>	RPD CL	Qualifiers			
Gasoline Range Organics (C6-C12)	96	93	42-126	2	0-25				

MMAMA



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Stratus Environmental, inc.

3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No:

03/24/09 09-03-2075

Preparation:

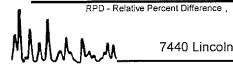
EPA 5030B

Method:

EPA 8260B

Project ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared		Date Analyzed	MS/MSD Batch Number
09-03-2183-4	Solid	GC/MS Z	04/01/09		04/01/09	090401S01
<u>Parameter</u>	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	105	98	78-114	7	0-14	
Chloroform	115	116	80-120	1	0-20	
1,1-Dichloroethane	113	114	80-120	1	0-20	
1,2-Dichloroethane	129	124	80-120	4	0-20	LM,AY
1,1-Dichloroethene	110	115	73-127	4	0-21	
Ethanol	109	107	45-135	2	0-29	
Tetrachloroethene	74	71	80-120	4	0-20	
Toluene	103	94	74-116	9	0-16	
Trichloroethene	96	100	74-122	4	0-17	
Methyl-t-Butyl Ether (MTBE)	100	105	69-123	5	0-18	





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Stratus Environmental, inc.

3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation:

Method:

03/24/09 09-03-2075 EPA 5030B EPA 8260B

Project ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared 04/02/09		Date Analyzed	MS/MSD Batch Number
09-03-2574-5	Solid	GC/MS Z			04/02/09	090402S01
<u>Parameter</u>	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	87	78	79-115	11	0-13	LN,AY
Carbon Tetrachloride	85	84	55-139	1	0-15	
Chlorobenzene	90	83	79-115	9	0-17	
1,2-Dibromoethane	96	86	70-130	11	0-30	
1,2-Dichlorobenzene	78	78	63-123	1	0-23	
1,1-Dichloroethene	87	84	69-123	4	0-16	
Ethylbenzene	93	86	70-130	8	0-30	
Toluene	87	87	79-115	1	0-15	
Trichloroethene	84	91	66-144	8	0-14	
Vinyl Chloride	74	81	60-126	8	0-14	
Methyl-t-Butyl Ether (MTBE)	88	85	68-128	3	0-14	
Tert-Butyl Alcohol (TBA)	73	87	44-134	17	0-37	
Diisopropyl Ether (DIPE)	58	55	75-123	3	0-12	LN,AY
Ethyl-t-Butyl Ether (ETBE)	94	88	75-117	7	0-12	
Tert-Amyl-Methyl Ether (TAME)	94	87	79-115	8	0-12	

85

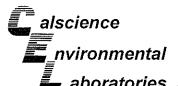
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0-28

80

MMuma

Ethanol



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Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation: Method:

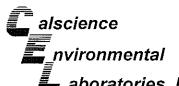
09-03-2075 **EPA 5030B** EPA 8015B (M)

N/A

Project: ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date ment Prepared		te yzed	LCS/LCSD Bate Number	h
099-12-697-92	Solid	GC 1	03/24/09	03/24	/09	090324B03	
<u>Parameter</u>	LCS	<u> 6REC LCSD</u>	%REC S	%REC CL	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	111	110)	70-118	0	0-20	





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Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

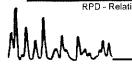
Date Received: Work Order No: Preparation: Method:

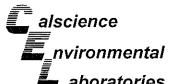
09-03-2075 EPA 5030B EPA 8015B (M)

N/A

Project: ARCO 11109

Quality Control Sample ID 099-12-697-91	Matrix	Instrument	Date Prepared	Date Analyzed		LCS/LCSD Batc Number	n
	Solid	GC 1	03/24/09	03/24/	09	090324B02	
<u>Parameter</u>	LCS	4REC LCSD	<u>%REC</u>	REC CL	<u>RPD</u>	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	111	110		70-118	0	0-20	





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Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550

Cameron Park, CA 95682-8861

Date Received:

Work Order No: Preparation:

N/A 09-03-2075

EPA 5030B

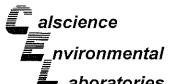
Method:

EPA 8260B

Project: ARCO 11109

Quality Control Sample ID	Matrix	Instrument GC/MS Z LCSD %REC	Date Prepared	Date Analyzed 04/01/09		LCS/LCSD Batch Number 090401L01	
099-12-709-120 Parameter	Solid LCS %REC		04/01/09 %REC CL				
				ME_CL	RPD	RPD CL	Qualifiers
Benzene	105	103	84-114	79-119	2	0-7	
Bromobenzene	113	113	80-120	73-127	0	0-20	
Bromochloromethane	105	109	80-120	73-127	4	0-20	
Bromodichloromethane	110	108	80-120	73-127	2	0-20	
Bromoform	111	115	80-120	73-127	3	0-20	
Bromomethane	119	120	80-120	73-127	1	0-20	
n-Butylbenzene	101	90	77-123	69-131	12	0-25	
sec-Butylbenzene	102	101	80-120	73-127	2	0-20	
tert-Butylbenzene	107	103	80-120	73-127	3	0-20	
Carbon Disulfide	104	108	80-120	73-127	4	0-20	
Carbon Tetrachloride	107	109	69-135	58-146	1	0-13	
Chlorobenzene	99	96	85-109	81-113	4	0-8	
Chloroethane	96	97	80-120	73-127	1	0-20	
Chloroform	107	108	80-120	73-127	2	0-20	
Chloromethane	110	109	80-120	73-127	1	0-20	
2-Chlorotoluene	100	101	80-120	73-127	1	0-20	
4-Chlorotoluene	100	100	80-120	73-127	0	0-20	
Dibromochloromethane	107	106	80-120	73-127	1	0-20	
1,2-Dibromo-3-Chloropropane	101	106	80-120	73-127	5	0-20	
1,2-Dibromoethane	100	97	80-120	73-127	3	0-20	
Dibromomethane	98	102	80-120	73-127	4	0-20	
1,2-Dichlorobenzene	104	92	80-110	75-115	13	0-10	
1,3-Dichlorobenzene	103	104	80-120	73-127	0	0-20	
1,4-Dichlorobenzene	105	106	80-120	73-127	1	0-20	
Dichlorodifluoromethane	111	118	80-120	73-127	7	0-20	
1,1-Dichloroethane	106	111	80-120	73-127	5	0-20	
1,2-Dichloroethane	114	118	80-120	73-127	4	0-20	
1,1-Dichloroethene	108	110	83-125	76-132	1	0-10	
c-1,2-Dichloroethene	91	90	80-120	73-127	1	0-20	
t-1,2-Dichloroethene	98	99	80-120	73-127	1	0-20	
1,2-Dichloropropane	101	107	79-115	73-121	6	0-25	
1,3-Dichloropropane	99	94	80-120	73-127	5	0-20	
2,2-Dichloropropane	106	108	80-120	73-127	2	0-20	
1,1-Dichloropropene	95	93	80-120	73-127	2	0-20	
c-1,3-Dichloropropene	102	100	80-120	73-127	3	0-20	
t-1,3-Dichloropropene	102	97	80-120	73-127	5	0-20	
Ethylbenzene	99	99	80-120	73-127	0	0-20	
Isopropylbenzene	105	107	80-120	73-127	1	0-20	

RPD - Relative Percent Difference,



aboratories, Inc.

Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation: Method:

09-03-2075 EPA 5030B EPA 8260B

N/A

Project: ARCO 11109

Quality Control Sample ID	Matrix	Instrument GC/MS Z LCSD %REC	Date Prepared 04/01/09 %REC CL	Date Analyzed 04/01/09		LCS/LCSD Batch Number	
099-12-709-120 Parameter	Solid LCS %REC					090401L	01
				ME_CL	RPD	RPD CL	Qualifiers
p-Isopropyitoluene	103	101	80-120	73-127	2	0-20	
Methylene Chloride	95	99	80-120	73-127	4	0-20	
Naphthalene	88	90	80-120	73-127	3	0-20	
n-Propylbenzene	103	104	80-120	73-127	1	0-20	
Styrene	105	106	80-120	73-127	1	0-20	
Ethanol	108	115	50-134	36-148	6	0-23	
1,1,1,2-Tetrachloroethane	105	109	80-120	73-127	4	0-20	
1,1,2,2-Tetrachloroethane	102	104	80-120	73-127	2	0-20	
Tetrachloroethene	85	91	80-120	73-127	7	0-20	
Toluene	102	99	79-115	73-121	3	0-8	
1,2,3-Trichlorobenzene	108	113	80-120	73-127	4	0-20	
1,2,4-Trichlorobenzene	110	109	80-120	73-127	1	0-20	
1,1,1-Trichloroethane	98	101	80-120	73-127	3	0-20	
1,1,2-Trichloroethane	95	93	80-120	73-127	3	0-20	
Trichloroethene	103	108	87-111	83-115	5	0-7	
Trichlorofluoromethane	121	128	80-120	73-127	5	0-20	
1,2,3-Trichloropropane	101	107	80-120	73-127	5	0-20	
1,2,4-Trimethylbenzene	102	103	80-120	73-127	0	0-20	
1,3,5-Trimethylbenzene	104	106	80-120	73-127	2	0-20	
Vinyl Acetate	115	115	80-120	73-127	0	0-20	
Vinyl Chloride	99	97	72-126	63-135	2	0-10	
p/m-Xylene	101	101	80-120	73-127	0	0-20	
o-Xylene	100	100	80-120	73-127	1	0-20	
Methyl-t-Butyl Ether (MTBE)	95	97	75-129	66-138	3	0-13	
Tert-Butyl Alcohol (TBA)	94	95	66-126	56-136	2	0-24	
Diisopropyl Ether (DIPE)	106	110	77-125	69-133	3	0-13	
Ethyl-t-Butyl Ether (ETBE)	95	102	72-132	62-142	7	0-12	
Tert-Amyl-Methyl Ether (TAME)	90	93	77-125	69-133	4	0-10	

Total number of LCS compounds: 66

Total number of ME compounds: 1

Total number of ME compounds allowed: 3

LCS ME CL validation result: Pass

RPD - Relative Percent Difference,





Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation:

09-03-2075 EPA 5030B

N/A

Method:

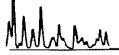
EPA 8260B

Project: ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Da Anal	ate yzed	LCS/LCSD Batch Number		
099-12-709-121	Solid	GC/MS Z	04/01/09	04/01	/09	090401L	02	
Parameter	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers	
Benzene	105	103	84-114	79-119	2	0-7		
Bromobenzene	113	113	80-120	73-127	0	0-20		
Bromochloromethane	105	109	80-120	73-127	4	0-20		
Bromodichloromethane	110	108	80-120	73-127	2	0-20		
Bromoform	111	115	80-120	73-127	3	0-20		
Bromomethane	119	120	80-120	73-127	1	0-20		
n-Butylbenzene	101	90	77-123	69-131	12	0-25		
sec-Butylbenzene	102	101	80-120	73-127	2	0-20		
tert-Butylbenzene	107	103	80-120	73-127	3	0-20		
Carbon Disulfide	104	108	80-120	73-127	4	0-20		
Carbon Tetrachloride	107	109	69-135	58-146	1	0-13		
Chlorobenzene	99	96	85-109	81-113	4	0-8		
Chloroethane	96	97	80-120	73-127	1	0-20		
Chloroform	107	108	80-120	73-127	2	0-20		
Chioromethane	110	109	80-120	73-127	1	0-20		
2-Chlorotoluene	100	101	80-120	73-127	1	0-20		
4-Chlorotoluene	100	100	80-120	73-127	0	0-20		
Dibromochloromethane	107	106	80-120	73-127	1	0-20		
1,2-Dibromo-3-Chloropropane	101	106	80-120	73-127 5		0-20		
1,2-Dibromoethane	100	97	80-120	73-127	3	0-20		
Dibromomethane	98	102	80-120	73-127	4	0-20		
1,2-Dichlorobenzene	104	92	80-110	75-115	13	0-10		
1,3-Dichlorobenzene	103	104	80-120	73-127	0	0-20		
1,4-Dichlorobenzene	105	106	80-120	73-127	1	0-20		
Dichtorodifluoromethane	111	118	80-120	73-127	7	0-20		
1,1-Dichloroethane	106	111	80-120	73-127	5	0-20		
1,2-Dichloroethane	114	118	80-120	73-127	4	0-20		
1,1-Dichloroethene	108	110	83-125	76-132	1	0-10		
c-1,2-Dichloroethene	91	90	80-120	73-127	1	0-20		
t-1,2-Dichloroethene	98	99	80-120	73-127	1	0-20		
1,2-Dichloropropane	101	107	79-115	73-121	6	0-25		
1,3-Dichloropropane	99	94	80-120	73-127	5	0-20		
2,2-Dichloropropane	106	108	80-120	73-127	2	0-20		
1,1-Dichloropropene	95	93	80-120	73-127	2	0-20		
c-1,3-Dichloropropene	102	100	80-120	73-127	3	0-20		
t-1,3-Dichloropropene	102	97	80-120	73-127	5	0-20		
Ethylbenzene	99	99	80-120	73-127	0	0-20		
Isopropylbenzene	105	107	80-120	73-127	1	0-20		

RPD - Relative Percent Difference ,

CL - Control Limit





aboratories, Inc.

Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation:

09-03-2075 **EPA 5030B**

N/A

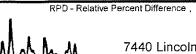
Method:

EPA 8260B

Project: ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared		ate yzed	LCS/LCSD Numbe	
099-12-709-121	Solid	GC/MS Z	04/01/09	04/01	/09	090401L	02
<u>Parameter</u>	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
p-Isopropyltoluene	103	101	80-120	73-127	2	0-20	
Methylene Chloride	95	99	80-120	73-127	4	0-20	
Naphthalene	88	90	80-120	73-127	3	0-20	
n-Propylbenzene	103	104	80-120	73-127	1	0-20	
Styrene	105	106	80-120	73-127	1	0-20	
Ethanol	108	115	50-134	36-148	6	0-23	
1,1,1,2-Tetrachloroethane	105	109	80-120	73-127	4	0-20	
1,1,2,2-Tetrachloroethane	102	104	80-120	73-127	2	0-20	
Tetrachloroethene	85	91	80-120	73-127	7	0-20	
Toluene	102	99	79-115	73-121	3	0-8	
1,2,3-Trichlorobenzene	108	113	80-120	73-127	4	0-20	
1,2,4-Trichlorobenzene	110	109	80-120	73-127	1	0-20	
1,1,1-Trichloroethane	98	101	80-120	73-127	3	0-20	
1,1,2-Trichloroethane	95	93	80-120	73-127	3	0-20	
Trichloroethene	103	108	87-111	83-115	5	0-7	
Trichlorofluoromethane	121	128	80-120	73-127	5	0-20	
1,2,3-Trichloropropane	101	107	80-120	73-127	5	0-20	
1,2,4-Trimethylbenzene	102	103	80-120	73-127	0	0-20	
1,3,5-Trimethylbenzene	104	106	80-120	73-127	2	0-20	
Vinyl Acetate	115	115	80-120	73-127	0	0-20	
Vinyi Chloride	99	97	72-126	63-135	2	0-10	
p/m-Xylene	101	101	80-120	73-127	0	0-20	
o-Xylene	100	100	80-120	73-127	1	0-20	
Methyl-t-Butyl Ether (MTBE)	95	97	75-129	66-138	3	0-13	
Tert-Butyl Alcohol (TBA)	94	95	66-126	56-136	2	0-24	
Diisopropyl Ether (DIPE)	106	110	77-125	69-133	3	0-13	
Ethyl-t-Butyl Ether (ETBE)	95	102	72-132	62-142	7	0-12	
Tert-Amyl-Methyl Ether (TAME)	90	93	77-125	69-133	4	0-10	

Total number of LCS compounds: 66 Total number of ME compounds: 1 Total number of ME compounds allowed: LCS ME CL validation result: Pass





aboratories, Inc.

Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550

Cameron Park, CA 95682-8861

Date Received:

Work Order No:

Preparation:

Method:

N/A

09-03-2075 **EPA 5030B**

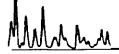
EPA 8260B

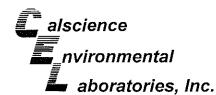
Project: ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Da Anai		LCS/LCSD Numbe		
099-12-709-123	Solid	GC/MS Z	04/02/09	04/02	/09	090402L02		
<u>Parameter</u>	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers	
Benzene	103	102	84-114	79-119	1	0-7		
Bromobenzene	96	93	80-120	73-127	2	0-20		
Bromochloromethane	98	86	80-120	73-127	13	0-20		
Bromodich!oromethane	106	94	80-120	73-127	12	0-20		
Bromoform	94	97	80-120	73-127	3	0-20		
Bromomethane	114	86	80-120	73-127	28	0-20		
n-Butylbenzene	103	98	77-123	69-131	5	0-25		
sec-Butylbenzene	103	100	80-120	73-127	4	0-20		
tert-Butylbenzene	100	112	80-120	73-127	11	0-20		
Carbon Disulfide	103	91	80-120	73-127	12	0-20		
Carbon Tetrachloride	100	93	69-135	58-146	8	0-13		
Chiorobenzene	104	98	85-109	81-113	6	0-8		
Chloroethane	108	96	80-120	73-127	12	0-20		
Chloroform	101	88	80-120	73-127	13	0-20		
Chloromethane	96	88	80-120	73-127	9	0-20		
2-Chlorotoluene	102	100	80-120	73-127	1	0-20		
-Chlorotoluene	100	94	80-120	73-127	6	0-20		
Dibromochloromethane	99	102	80-120	73-127	2	0-20		
,2-Dibromo-3-Chloropropane	95	93	80-120	73-127	3	0-20		
,2-Dibromoethane	94	93	80-120	73-127	0	0-20		
Dibromomethane	106	96	80-120	73-127	10	0-20		
,2-Dichlorobenzene	96	93	80-110	75-115	3	0-10		
,3-Dichtorobenzene	97	94	80-120	73-127	4	0-20		
,4-Dichlorobenzene	97	97	80-120	73-127	0	0-20		
Dichlorodifluoromethane	103	91	80-120	73-127	13	0-20		
,1-Dichloroethane	106	93	80-120	73-127	13	0-20		
,2-Dichloroethane	101	99	80-120	73-127	2	0-20		
,1-Dichloroethene	107	94	83-125	76-132	13	0-10		
:-1,2-Dichloroethene	96	87	80-120	73-127	9	0-20		
-1,2-Dichloroethene	99	88	80-120	73-127	13	0-20		
,2-Dichloropropane	105	107	79-115	73-121	2	0-25		
,3-Dichloropropane	95	95	80-120	73-127	1	0-20		
,2-Dichloropropane	102	95	80-120	73-127	8	0-20		
,1-Dichloropropene	102	89	80-120	73-127	14	0-20		
-1,3-Dichloropropene	106	96	80-120	73-127	10	0-20		
-1,3-Dichloropropene	102	99	80-120	73-127	2	0-20		
Ethylbenzene	99	99	80-120	73-127	0	0-20		
sopropylbenzene	103	104	80-120	73-127	2	0-20		

RPD - Relative Percent Difference,

CL - Control Limit





Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation:

09-03-2075 **EPA 5030B**

N/A

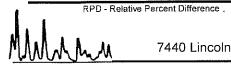
Method:

EPA 8260B

Project: ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared		ate lyzed	LCS/LCSD Numbe	
099-12-709-123	Solid	GC/MS Z	04/02/09	04/02	/09	090402L	02
<u>Parameter</u>	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
p-Isopropyltoluene	102	101	80-120	73-127	2	0-20	
Methylene Chloride	105	97	80-120	73-127	7	0-20	
Naphthalene	91	92	80-120	73-127	1	0-20	
n-Propylbenzene	97	96	80-120	73-127	1	0-20	
Styrene	106	97	80-120	73-127	8	0-20	
Ethanol	109	90	50-134	36-148	19	0-23	
1,1,1,2-Tetrachloroethane	92	97	80-120	73-127	5	0-20	
1,1,2,2-Tetrachloroethane	92	92	80-120	73-127	0	0-20	
Tetrachloroethene	108	89	80-120	73-127	20	0-20	
Toluene	105	91	79-115	73-121	14	8-0	RB
1,2,3-Trichlorobenzene	93	73	80-120	73-127	23	0-20	
1,2,4-Trichlorobenzene	94	99	80-120	73-127	5	0-20	
1,1,1-Trichloroethane	103	93	80-120	73-127	9	0-20	
1,1,2-Trichloroethane	96	95	80-120	73-127	0	0-20	
Trichloroethene	110	102	87-111	83-115	7	0-7	
Trichlorofluoromethane	104	92	80-120	73-127	13	0-20	
1,2,3-Trichloropropane	103	104	80-120	73-127	1	0-20	
1,2,4-Trimethylbenzene	102	102	80-120	73-127	0	0-20	
1,3,5-Trimethylbenzene	107	107	80-120	73-127	0	0-20	
Vinyl Acetate	101	92	80-120	73-127	9	0-20	
Vinyl Chloride	96	90	72-126	63-135	6	0-10	
p/m-Xylene	98	102	80-120	73-127	3	0-20	
o-Xylene	107	94	80-120	73-127	13	0-20	
Methyl-t-Butyl Ether (MTBE)	102	91	75-129	66-138	11	0-13	
Tert-Butyl Alcohol (TBA)	89	91	66-126	56-136	2	0-24	
Dilsopropyl Ether (DIPE)	99	90	77-125	69-133	10	0-13	
Ethyl-t-Butyl Ether (ETBE)	109	102	72-132	62-142	6	0-12	
Tert-Amyl-Methyl Ether (TAME)	97	96	77-125	69-133	1	0-10	

Total number of LCS compounds: 66 Total number of ME compounds: 0 Total number of ME compounds allowed: LCS ME CL validation result: Pass





Glossary of Terms and Qualifiers

Work Order Number: 09-03-2075

Qualifier	<u>Definition</u>
AX	Sample too dilute to quantify surrogate.
AZ	Surrogate recovery outside of acceptance limits due to matrix interference.
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.
вн	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.
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.
ΕT	Sample was extracted past end of recommended max. 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.

Work Order Number: 09-03-2075

Qualifier	<u>Definition</u>
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.
PC	Sample taken from VOA vial with air bubble > 6mm diameter.
PI	Primary and confirm results varied by > than 40% RPD.
RA	RPD exceeds limit due to matrix interf.; % recovs. within limits.
RB	RPD exceeded method control limit; % recoveries within limits.
SG	A silica gel cleanup procedure was performed.

Allantic Richfield company

Laboratory Management Program LaMP Chain of Custody Record

BP/ARC Project Name:

Req Due Date (mm/dd/yy).

BP/ARC Facility No:

A 1.00

Lab Work Order Number:

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ipler's Company	* .7 (Lawrent Nation &	Re'inc						N-10	Dat		Gm		· · · · · · · · · · · · · · · · · · ·	^д ссер а	d Ly La	VIII ia no	ga a na gasan ayan dalah kala dalah B	a	1
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ment Tracking No:	0616020			********************************							Ti Tiday pilati ja jaja saras s					<u> </u>	val		<u>ط</u>	7. S. Marie	3/24/09	10
THIS LINE - LAB USE ONLY Custo	dv Seals In Ptac	a. Var i bla				APPEND T. PROC. 1844	···		V) 4 P3 = #/(L		tan entrake anala	********	* *** *** ***	********	levyskaugo a	THE ALCOHOL: ELTHAL	Firms of the best bar	mada da da esta de esta de esta de esta de esta de esta de esta de esta de esta de esta de esta de esta de est		- Her seem on Heer an Hear	AN MODEL OF MARKET	
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Calscience
Environmental
Laboratories, Inc.

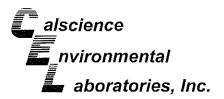
WORK ORDER #: **09-03-** 2 6 7 5

SAMPLE RECEIPT FORM

Cooler 1 of 1

CLIENT: STRATUS ENV'L.	DATE:	3 12	4/09
TEMPERATURE: (Criteria: 0.0 °C − 6.0 °C, not frozen) Temperature °C − 0.2 °C (CF) = •9 °C	rler.	-	ole
Ambient Temperature. Li Aii Li Filter Li Motais Omy Li 7 000 On	ily #/	Mua	II: <u>~~</u>
CUSTODY SEALS INTACT: □ Cooler □ □ No (Not Intact) ☑ Not Present □ Sample □ □ No (Not Intact) ☑ Not Present			al: <u>WB</u> al: <u>W-S</u> <u>C</u>
	es	No	N/A
Chain-Of-Custody (COC) document(s) received with samples			
COC document(s) received complete			
\square Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ COC not relinquished. ☐ No date relinquished. ☐ No time relinquished.			
Sampler's name indicated on COC	3 ^		
Sample container label(s) consistent with COC			
Sample container(s) intact and good condition			
Correct containers and volume for analyses requested			
Analyses received within holding time			
Proper preservation noted on COC or sample container			
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace]		Ø
Tedlar bag(s) free of condensation	Ì		Ø
Solid: □4ozCGJ □8ozCGJ □16ozCGJ □Sleeve □EnCores® □Te	arraCore:	s® □	
Water: □VOA □VOAh □VOAha₂ □125AGB □125AGBh □125AGE			
□1AGBs □500AGB □500AGBs □250CGB □250CGBs □1PB □500			
□250PBn □125PB □125PBznna □100PBsterile □100PBna₂ □	□		
Air: ☐Tedlar® ☐Summa® ☐ Sludge/Other: ☐ Container: C:Clear A:Amber P:Poly/Plastic G:Glass J:Jar B:Bottle Preservative: h:HCL n:HNO3 na2:Na2S2O3 na:NaOH po4:H3PO4 s:H2SO4 znna:ZnAc2+NaO	Checked/	Labeled by:	2)3C

SOP T100_090 (03/13/09)





April 03, 2009

Jay Johnson Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Subject: Calscience Work Order No.: 09-03-2074

Client Reference: **ARCO 11109**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 3/24/2009 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental

Laboratories, Inc. Richard Villafania

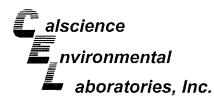
Project Manager

Richard Vellar)

NELAP ID: 03220CA

CSDLAC ID: 10109

SCAQMD ID: 93LA0830



Analytical Report

Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation: Method: 03/24/09 09-03-2074 EPA 3050B EPA 6010B

Project: ARCO 11109

Page 1 of 1

Client Sample Number		Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
swc		09-03-2074-1-A	03/23/09 15:15	Solid	ICP 5300	04/01/09	04/02/09 11:08	090401L01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Lead	2.39	0.500	1		mg/kg			
Method Blank		097-01-002-12,161	N/A	Solid	ICP 5300	04/01/09	04/02/09 10:31	090401L01
<u>Parameter</u>	Result	<u>RL</u>	DF	<u>Qual</u>	<u>Units</u>			
Lead	ND	0.500	1		mg/kg			



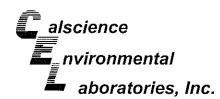
Analytical Report

Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation: Method: 03/24/09 09-03-2074 EPA 5030B EPA 8015B (M)

Project: ARCO 11109

Page 1 of 1

							1 0	igo i oi i
Client Sample Number		Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
swc		09-03-2074-1-A	03/23/09 15:15	Solid	GC 1	03/24/09	03/25/09 23:47	090324B02
<u>Parameter</u>	<u>Result</u>	<u>RL</u>	DF	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	1.9	0.50	1		mg/kg			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	92	42-126						
Method Blank		099-12-697-91	N/A	Solid	GC 1	03/24/09	03/24/09 21:39	090324B02
Parameter Parameter	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	ND	0.50	1		mg/kg			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	87	42-126						



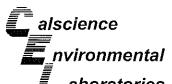
Analytical Report

Stratus Environmental, inc.	Date Received:	03/24/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-03-2074
Cameron Park, CA 95682-8861	Preparation:	EPA 5030B
	Method:	EPA 8260B
	Units:	mg/kg

Project: ARCO 11109

Page 1 of 1

Client Sample Number				ab Sample Number	Date/Time Collected	Matrix	Instrumen	Date t Prepared	Date/T d Analyz		QC Batch IC
swc			09-03-	2074-1-A	03/23/09 15:15	Solid	GC/MS Z	04/01/09	04/01/ 19:4		090401L01
Parameter	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Parameter</u>			Result	RL	DF	Qual
Benzene	0.0051	0.0010	1		Xylenes (total)			0.031	0.0010	1	
Ethylbenzene	ND	0.0010	1		Methyl-I-Butyl E	ther (MTBE	:)	ND	0.0010	1	
Toluene	0.0020	0.0010	1								
Surrogates:	REC (%)	Control Limits		<u>Qual</u>	Surrogates:			REC (%)	Control Limits		<u>Qual</u>
Dibromofluoromethane	104	75-141			1,2-Dichloroeth	ane-d4		121	73-151		
Toluene-d8	91	87-111			1,4-Bromofluoro	obenzene		101	71-113		
Method Blank			099-12	-709-120	N/A	Solid	GC/MS Z	04/01/09	04/01/ 13:0		090401L01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Parameter</u>			Result	<u>RL</u>	<u>DF</u>	Qual
Benzene	ND	0.0010	1		Xylenes (total)			ND	0.0010	1	
Ethylbenzene	ND	0.0010	1		Methyl-t-Butyl E	ther (MTBE	3)	ND	0.0010	1	
Toluene	ND	0.0010	1								
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:			REC (%)	Control Limits		Qual
Dibromofluoromethane	102	75-141			1,2-Dichloroetha	ane-d4		120	73-151		
Toluene-d8	101	87-111			1,4-Bromofluoro	benzene		92	71-113		



Quality Control - Spike/Spike Duplicate

aboratories, Inc.

Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation: Method: 03/24/09 09-03-2074 EPA 3050B EPA 6010B

Project ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared		Date Analyzed	MS/MSD Batch Number 090401S01	
09-03-2429-3	Solid	ICP 5300	04/01/09		04/02/09		
<u>Parameter</u>	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers	
Lead	104	104	75-125	0	0-20		

MAMM



Quality Control - PDS / PDSD

Stratus Environmental, inc.

3330 Cameron Park Drive, Suite 550

Cameron Park, CA 95682-8861

Date Received

Work Order No:

No: 09-03-2074

Preparation: Method:

EPA 3050B EPA 6010B

03/24/09

Project: ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analy	yzed I	PDS/PDSD Batch Number	
09-03-2429-3 Parameter	Solid	ICP 5300	04/01/09	04/02/09		090401S01	
	PDS %REC	PDSD %REC	%REC CL	<u>RPD</u>	RPD CL	Qualifiers	
Lead	92	95	75-125	2	0-20		



Quality Control - Spike/Spike Duplicate

Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation: Method: 03/24/09 09-03-2074 EPA 5030B EPA 8015B (M)

Project ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared		Date Analyzed	MS/MSD Batch Number	
swc	Solid	GC 1	03/24/09		03/25/09	090324S02	
<u>Parameter</u>	MS %REC	MSD %REC	%REC CL	<u>RPD</u>	RPD CL	Qualifiers	
Gasoline Range Organics (C6-C12)	96	93	42-126	2	0-25		

And the second s



Quality Control - Spike/Spike Duplicate

aboratories, Inc.

Stratus Environmental, inc.

3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No:

09-03-2074 EPA 5030B

03/24/09

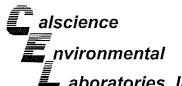
Preparation: Method:

EPA 8260B

Project ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared		Date Analyzed	MS/MSD Batch Number	
09-03-2183-4	Solid	GC/MS Z	04/01/09		04/01/09	090401801	
<u>Parameter</u>	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers	
Benzene	105	98	78-114	7	0-14		
Chloroform	115	116	80-120	1	0-20		
1,1-Dichloroethane	113	114	80-120	1	0-20		
1,2-Dichloroethane	129	124	80-120	4	0-20	LM,A	
1,1-Dichloroethene	110	115	73-127	4	0-21		
Ethanol	109	107	45-135	2	0-29		
Tetrachioroethene	74	71	80-120	4	0-20	LN,A	
Toluene	103	94	74-116	9	0-16		
Trichloroethene	96	100	74-122	4	0-17		
Methyl-t-Butyl Ether (MTBE)	100	105	69-123	5	0-18		

RPD - Relative Percent Difference,



■ aboratories, Inc.

Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation:

09-03-2074 **EPA 3050B**

N/A

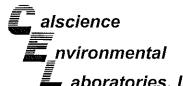
Method:

EPA 6010B

Project: ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepare		ate lyzed	LCS/LCSD Bate Number	ch
097-01-002-12,161	Solid	ICP 5300	04/01/0	9 04/02/09		090401L01	
<u>Parameter</u>	LCS 9	<u>6REC LCSE</u>	%REC	%REC CL	RPD	RPD CL	Qualifiers
Lead	106	10	5	80-120	1	0-20	





aboratories, Inc.

Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation:

09-03-2074 EPA 5030B

N/A

Method:

EPA 8015B (M)

Project: ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Bate Number	h
099-12-697-91	Solid	GC 1	03/24/09	03/24/09	090324B02	
<u>Parameter</u>	LCS	6REC LCSD	<u>%REC</u>	REC CL RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	111	110) 7	0-118 0	0-20	





Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550

Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation:

Method:

09-03-2074 EPA 5030B

N/A

EPA 8260B

Project: ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Da Analy		LCS/LCSD Batch Number		
099-12-709-120	Solid	GC/MS Z	04/01/09	04/01/	09	090401L0	01	
Parameter	LCS %REC	LCSD %REC	%REC CL	ME CL	RPD	RPD CL	Qualifiers	
Benzene	105	103	84-114	79-119	2	0-7		
Bromobenzene	113	113	80-120	73-127	0	0-20		
Bromochioromethane	105	109	80-120	73-127	4	0-20		
Bromodichioromethane	110	108	80-120	73-127	2	0-20		
Bromoform	111	115	80-120	73-127	3	0-20		
Bromomethane	119	120	80-120	73-127	1	0-20		
n-Butylbenzene	101	90	77-123	69-131	12	0-25		
sec-Butylbenzene	102	101	80-120	73-127	2	0-20		
ert-Butylbenzene	107	103	80-120	73-127	3	0-20		
Carbon Disulfide	104	108	80-120	73-127	4	0-20		
Carbon Tetrachloride	107	109	69-135	58-146	1	0-13		
Chlorobenzene	99	96	85-109	81-113	4	0-8		
Chloroethane	96	97	80-120	73-127	1	0-20		
Chloroform	107	108	80-120	73-127	2	0-20		
Chloromethane	110	109	80-120	73-127	1	0-20		
2-Chlorotoluene	100	101	80-120	73-127	1	0-20		
1-Chlorotoluene	100	100	80-120	73-127	0	0-20		
Dibromochloromethane	107	106	80-120	73-127	1	0-20		
1,2-Dibromo-3-Chforopropane	101	106	80-120	73-127	5	0-20		
1,2-Dibromoethane	100	97	80-120	73-127	3	0-20		
Dibromomethane	98	102	80-120	73-127	4	0-20		
1,2-Dichlorobenzene	104	92	80-110	75-115	13	0-10	RB	
1,3-Dichlorobenzene	103	104	80-120	73-127	0	0-20		
,4-Dichlorobenzene	105	106	80-120	73-127	1	0-20		
Dichlorodifluoromethane	111	118	80-120	73-127	7	0-20		
I,1-Dìchloroethane	106	111	80-120	73-127	5	0-20		
I,2-Dichloroethane	114	118	80-120	73-127	4	0-20		
1,1-Dichloroethene	108	110	83-125	76-132	1	0-10		
:-1,2-Dichloroethene	91	90	80-120	73-127	1	0-20		
-1,2-Dichloroethene	98	99	80-120	73-127	1	0-20		
,2-Dichloropropane	101	107	79-115	73-121	6	0-25		
,3-Dichloropropane	99	94	80-120	73-127	5	0-20		
.2-Dichloropropane	106	108	80-120	73-127	2	0-20		
,1-Dichloropropene	95	93	80-120	73-127	2	0-20		
-1,3-Dichloropropene	102	100	80-120	73-127	3	0-20		
-1,3-Dichloropropene	102	97	80-120	73-127	5	0-20		
Ethylbenzene	99	99	80-120	73-127	0	0-20		
sopropylbenzene	105	107	80-120	73-127	1	0-20		

RPD - Relative Percent Difference,

CL - Control Limit



Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation: Method:

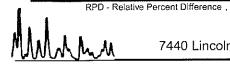
09-03-2074 **EPA 5030B EPA 8260B**

N/A

Project: ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed		LCS/LCSD I Numbe	
099-12-709-120	Solid	GC/MS Z	04/01/09	04/01/	09	090401L	01
<u>Parameter</u>	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
p-Isopropyltoluene	103	101	80-120	73-127	2	0-20	
Methylene Chloride	95	99	80-120	73-127	4	0-20	
Naphthalene	88	90	80-120	73-127	3	0-20	
n-Propylbenzene	103	104	80-120	73-127	1	0-20	
Styrene	105	106	80-120	73-127	1	0-20	
Ethanoi	108	115	50-134	36-148	6	0-23	
1,1,1,2-Tetrachloroethane	105	109	80-120	73-127	4	0-20	
1,1,2,2-Tetrachloroethane	102	104	80-120	73-127	2	0-20	
Tetrachloroethene	85	91	80-120	73-127	7	0-20	
Toluene	102	99	79-115	73-121	3	0-8	
1,2,3-Trichlorobenzene	108	113	80-120	73-127	4	0-20	
1,2,4-Trichlorobenzene	110	109	80-120	73-127	1	0-20	
1,1,1-Trichloroethane	98	101	80-120	73-127 3		0-20	
1,1,2-Trichloroethane	95	93	80-120	73-127 3		0-20	
Trichloroethene	103	108	87-111	83-115 5		0-7	
Trichlorofluoromethane	121	128	80-120	73-127	5	0-20	LQ
1,2,3-Trichloropropane	101	107	80-120	73-127	5	0-20	
1,2,4-Trimethylbenzene	102	103	80-120	73-127	0	0-20	
1,3,5-Trimethylbenzene	104	106	80-120	73-127	2	0-20	
Vinyl Acetate	115	115	80-120	73-127	0	0-20	
Vinyl Chloride	99	97	72-126	63-135	2	0-10	
p/m-Xylene	101	101	80-120	73-127	0	0-20	
o-Xylene	100	100	80-120	73-127	1	0-20	
Methyl-t-Butyl Ether (MTBE)	95	97	75-129	66-138	3	0-13	
Tert-Butyl Alcohol (TBA)	94	95	66-126	56-136	2	0-24	
Diisopropyl Ether (DIPE)	106	110			3	0-13	
Ethyl-t-Butyl Ether (ETBE)	95	102	72-132	62-142	7	0-12	
Tert-Amyl-Methyl Ether (TAME)	90	93	77-125	69-133	4	0-10	

Total number of LCS compounds: 66 Total number of ME compounds: 1 Total number of ME compounds allowed: LCS ME CL validation result: Pass





Glossary of Terms and Qualifiers

Work Order Number: 09-03-2074

<u>Qualifier</u>	<u>Definition</u>
AX	Sample too dilute to quantify surrogate.
ΑZ	Surrogate recovery outside of acceptance limits due to matrix interference.
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.
вн	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.
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.
EY	Result exceeds normal dynamic range; reported as a min est.
GR	Internal standard recovery is outside method recovery limit.
ΙB	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.

Work Order Number: 09-03-2074

Qualifier	<u>Definition</u>
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.
PC	Sample taken from VOA vial with air bubble > 6mm diameter.
Pl	Primary and confirm results varied by > than 40% RPD.
RA	RPD exceeds limit due to matrix interf.; % recovs. within limits.
RB	RPD exceeded method control limit; % recoveries within limits.
SG	A silica gel cleanup procedure was performed.

Atlantic Richfield Company

Laboratory Management Program LaMP Chain of Custody Record

		- Tamil of Odolody Record	/	Page of
BP/ARC Project Name:		Red Due Data (moddding)	15077 /	5 5 ·
BP/ARC Facility No:	4460 111.44	Req Due Date (mm/dd/yy):		Rush TAT: Yes No
or mito racinty No.	HUCO MOA	Lab Work Order Number:		

										2 AACI	K OIL	iet M	umber:						
Lab Name: CAISCIENCE ENVI. LABS	BP/AR	C Facility	/ Addres	s:	280	> Fe	275-) y ₃ 3 £	<i>€</i>	lup			Consultant/Co	ntracto	Y: C>-0				
Lab Address: 7440 LINCOLN WY GROVEN	City, St	ate, ZIP	Code:					C		(O)	<u></u>		Consultant/Co						
LADPM: FICTIARD VILLA FANIA	Lead R	egulator	y Agenc		<u> </u>	-C MY	121		<u>+ - </u>				Consultant/Contractor Project No: E oq						
Lab Phone:	Californ	ia Globa	i ID No.		<u> </u>	~c. 1	C~1	<u> </u>	٦				Address: 3330 CANNOW PACK UR \$550						
Lab Shipping Acent: 9255	Enfos F	roposal	No:		<u>U</u>	00	<u> </u>	سارر ا	4				Consultant/Contractor PM: TV3 Totcuson						
Lab Bottle Order No:		ting Mod		Pro	wieion	V		C DI .					Phone;						
Other Info:	Stage:							C-BU		JC-RM			Email EDD To	<u>اس : (با</u>	MFF	D STRAT	よびでくし	£.T	
BP/ARCEBM: Paul Sneple			Т		ctivity:		***************************************						Invoice To:		P/ARC 🛧	Contr	actor		
EBM Phone:	I	atrix	 	o. Co.	ntain	ers/	res	ervative		· · · · · · · · · · · · · · · · · · ·	1	Requ	ested Analy	ses		Repor	t Type & QC	Level	
EBM Email: PAUL, SUMPLE WB1-COM			ontainers									S. L.				Full Dat	Standard	_	
Lab No. Sample Description Date Time	Soil / Solid Water / Liquid	Air / Vapor	Total Number of Containers	Unpreserved	H ₂ SO ₄	HNO ₃	HCI	Methanol	6.40	BIEA	IMTBE	COTAC !				Sample" in corr	Comments not collected, indi ments and single reprinted sample	strike out	
5UC 3923/09 1515	1		1	X			ĺ		4	4	7	1			 		- January Barripie	acauripiion,	
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Sampler's Name: Collin Figures		L L	nquisi	od B	<u>ν/Λ</u>	ffilia ti			 -										
Sampler's Company: SIPA+45		-//		2.	9.00	(1111611		·		ite	Tin		Ac	cepte	d By / Affi	liation	Date	Time	
Shipment Method: 6750 Ship Date: 2/23/04		1	- Janes P.	1	<i>!</i>	?			7.	61	180	0						Эад	
Shipment Tracking No: 650100160200	ļ								<u> </u>				w	<u>vat</u>	In Ci	<u> </u>	3/24/09	1000	
Special Instructions:						· · · · ·			<u> </u>	i							•	15 of	
THIS LINE - LAB USE ONLY: Custody Seals in Place: Yes / No																		f 1	
Gustouy Gears III I race, Tes / No	ı emp	Blank;	Yes / No)	Со	oler Te	mp o	n Receipt			°F/C		Trip Blank: Y	'es / No	MS MS	/MSD Sample S	Submitted: Yes	/ No	



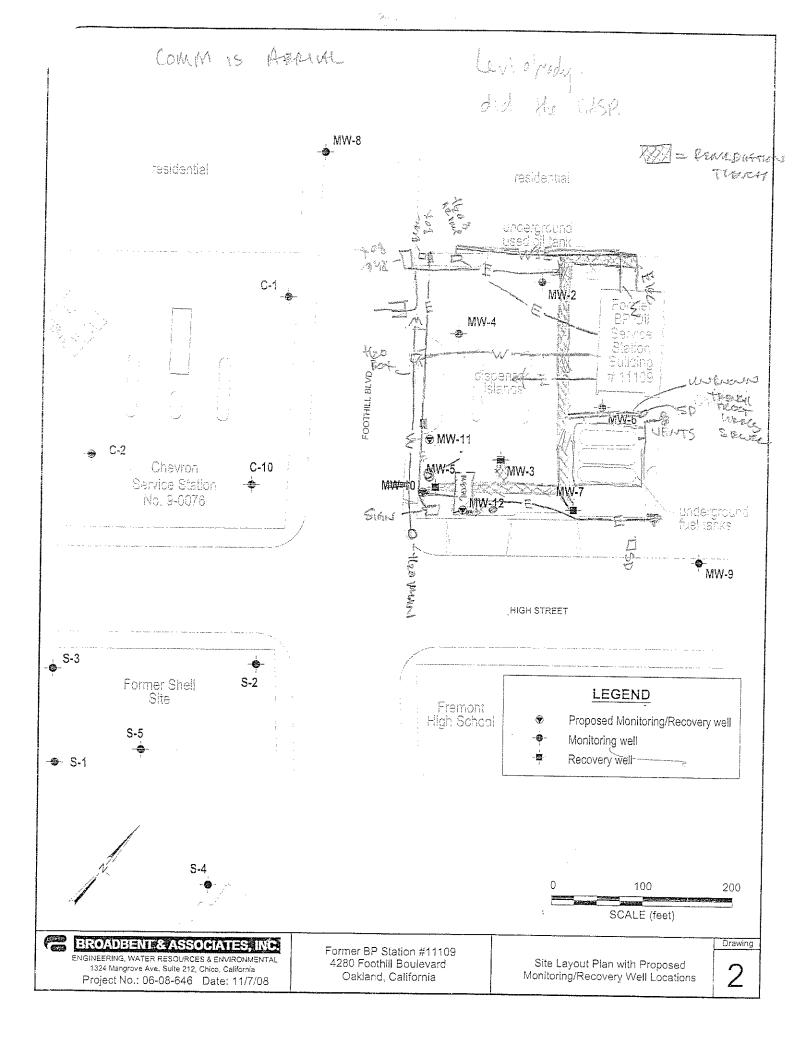
WORK ORDER #: **09-03-** 2 3 4 4

SAMPLE RECEIPT FORM

Cooler <u>\</u> of <u>\</u>

CLIENT: STRATUS ENV'L. DATE	: <u>3 12</u>	4/09
TEMPERATURE: (Criteria: 0.0 °C - 6.0 °C, not frozen) Temperature	npling.	ple al: <u>WB</u>
CUSTODY SEALS INTACT: □ Cooler □ □ No (Not Intact) □ Not Present □ N/ □ Sample □ □ No (Not Intact) □ Not Present		ial: WB
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.		
☐ COC not relinquished. ☐ No date relinquished. ☐ No time relinquished.		
Sampler's name indicated on COC		
Sample container label(s) consistent with COC		
Sample container(s) intact and good condition		
Correct containers and volume for analyses requested		
Analyses received within holding time		
Proper preservation noted on COC or sample container		ø
☐ Unpreserved vials received for Volatiles analysis		
Volatile analysis container(s) free of headspace □		Ø
Tedlar bag(s) free of condensation		M
Solid: □4ozCGJ □8ozCGJ □16ozCGJ ☑Sleeve □EnCores® □TerraCo	ores [®] □	
Water: □VOA □VOAh □VOAna₂ □125AGB □125AGBh □125AGBpo₄	□1AGB □	1AGBna₂
□1AGBs □500AGB □500AGBs □250CGB □250CGBs □1PB □500PB	□500PBna	□250PB
□250PBn □125PB □125PBznna □100PBsterile □100PBna₂ □ I]
Air: ☐Tedlar® ☐Summa® ☐ Sludge/Other: ☐ Check Container: C:Clear A:Amber P:Poly/Plastic G:Glass J:Jar B:Bottle Preservative: h:HCL n:HNO₃ na₂:Na₂S₂O₃ na:NaOH po₄:H₃PO₄ s:H₂SO₄ znna:ZnAc₂+NaOH	ed/Labeled by Reviewed by Scanned by	y: 1/2

SOP T100_090 (03/13/09)



APPENDIX C

STRATUS DUAL-PHASE EXTRACTION TEST DATA PACKAGE (Includes Field Data Sheets and Laboratory Analytical Reports with Chain-of-Custody Documentation)



May 22, 2009

Mr. Rob Miller Broadbent & Associates, Inc. 2000 Kirman Avenue Reno, Nevada 89502

Re: Dual Phase Extraction Test Data Package, Former ARCO Service Station No. 11109, located at 4280 Foothill Boulevard, Oakland, California.

General Information

Data Submittal Prepared / Reviewed by: Sonia Nandi and Kiran Nagaraju / Jay Johnson

Phone Number: (530) 676-6007 / (530) 676-6000

On-Site Supplier Representative: Chris Hill, Vince Zalutka, and Collin Fischer

Scope of Work Performed: Conducted a DPE test between April 27, 2009 and May 1, 2009 in accordance with Monitoring Well Installation and Dual-Phase Extrcation Pilot Testing Work Plan (dated February 3, 2009). Individual well tests and a combined well test were each conducted for approximately 12 hours. A notification letter regarding the DPE event was submitted to the Bay Area Air Quality Management District (BAAQMD) on April 17, 2009. The wellheads of the test wells were temporarily modified to facilitate the installation of a stinger. In addition, the observation wellheads were also temporarily modified to measure induced vacuum levels.

During the DPE event, air and water samples were collected in accordance with frequency identified in the work plan. The following table summarizes the samples that were submitted to the laboratory for chemical analyses:

Test Well ID	System Influent Air	Influent Water
MW-5	1 st hour, 8 th hour, and 10 th hour	2 nd hour, 8 th hour, and 10 th hour
MW-12	2 nd hour, 8 th hour, and 11 th hour	1 st hour, 7 th hour, and 12 th hour
MW-10	2 nd hour, 8 th hour, and 11 th hour	1 st hour, 6 th hour, and 11 th hour
MW-11	1 st hour, 7 th hour, and 11 th hour	1 st hour, 7 th hour, and 11 th hour
MW-5, MW-10, MW-11, & MW-12	2 nd hour, 8 th hour, and 11 th hour	2 nd hour, 8 th hour, and 12 th hour

In addition, an effluent air sample was also collected on the first day of the test.

Variations from Work Scope: None.

The attachments include field data sheets, chain-of-custody documentation, certified analytical results, and the non-hazardous waste manifest. The information is being provided to BP-ARCO's Scoping Supplier for use in preparing a report for regulatory submittal. This submittal is limited to presentation of collected data and does not include data interpretation or conclusions or recommendations. Any questions concerning this submittal should be addressed to the Preparer/Reviewer identified above.

Sincerely,

STRATUS ENVIRONMENTAL, INC.

Kiran Nagaraju Project Engineer

Attachments:

- Field Data Sheets
- Chain of Custody Documentation
- Certfied Analytical Results
- Non-Hazardous Waste Manifest

cc: Mr. Paul Supple, BP/ARCO

Site Name & Former ARCO No. 11109
Address

4280 Foothill Blvd, Oakland, CA

Date
Operators

4.27.09 CHILL

Test Well ID Baseline

CI CEGINAL

The contract				Baselin	e Vacuum	("WC) and	d Depth to	Water (feet	bgs) Meas	arements			
Date & Time	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-10	MW-11	MW-12				
	Vac	Vac	Vac	Vac	Vac	Vac	Vac	Vac	Vac				
+2789M	easure DT	W and vacu	um level pi	rior to comn	nencement	of test and a	lso the total	depth of te	st wells (M)	V-5 MW	10 MW 11	P- NAW 100	
0500	4	0	82	1		T		T	· · · · · · · · · · · · · · · · · · ·	5, 141 44	10, 101 00-11	1 & IVI W-12	· .
0 00 0		-	<u> </u>	0_	8-	#	0	0	0				
Dot- 8 251	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-10	MW-11	MW-12				
Date & Time	DTW	DTW	DEN						177 44 - 12				
0500	- 1 m	DTW	DTW	9.53 V	DTW	DTW	DTW	DTW	DTW				
0500	VZY	4.98	13.73	9,53° 9,54W	14.25	B.B	8182	8-75	9.93				
						1095							1
					1	11.91							
						1							
					 								
						Casiny	/						
						Fixture							
DT15				3210			30.0	30,30	30.20				
			***************************************				-	/ 0 , / 0	10,00		<u> </u>		<u> </u>

Site Name & Address

Former ARCO No. 11109

MW-5

Test Well ID

4280 Foothill Blvd, Oakland, CA

Test Operators
ONGINAL

Date

Equipment Model and Serial Nos.

CHTZ ZWTCATLR Mini RAZ

PID Model

Date & Time	Hour Meter Reading	Applied Vacuum	Sys Inf Air Flow Rate ¹	Dilution Air Flow Rate ²	Dilution Air	Flow totalizer	Sys Inf Air	Control	Effluent Air	System	Effluent	6120 Total 1200 stat
127.09	hrs			fpm/cfm	Temp deg F	(DPE unit) gallons	Temp	Temp	Temp	Influent	PID	Comments/Notes
8910/1000	7533	24	3000	600	55	6120	deg F	1473	750	ppmv	ppmv	
1100	7534	24	3000	600	55	6180	100		950	888 40-7	165	SUMP A CAN THE TOWN TO STATE
		24	3000	600	55	6180	100	1534	957	% 乙 リロ	5	11109 A SKS INF MW 5 11000 11109 A EFF 1065 11109 W INF MW 5 1109
	7536	I	3000	600	57	10180	100		901	323	4	1109
1400	7537		3000	600	55	(1210	1017		900	320	3	11109 A 545 IN F MANN 1355
	7538	24	3000	600	60	6210	100	1568	920	299	- Н	11109 A SYS INF MAN 1395
. 0	7539	25	3000	600	58	6210	100	1542		270	4	
	7540			600		6230	100	1544	965	261	И	11109 A 595 INF 0445 163
	7541	24		600		6230	100	1547	971	267	3	11109 W INF mw5 1700
1900	7542	24	3000	600	55	6250	100	1547	968	299	4	
CALLED .												11109 A STS INF MAN 18
												10
	<u></u>					130 GAL:						

Diameter of the system influent air flow pipe is 2 inches

Diameter of the dilution air flow pipe is_

Site Name & Address

Former ARCO No. 11109

4280 Foothill Blvd, Oakland, CA

Test Well ID MW-5

Operators OHILL

Date

	Wellhead/Induced Vacuum/Depth To Water															
Date & Time		V-5	М	W-3	M	W-7		V-10		W-11		W-12				
42709	Wellhead Vacuum, 'Hg/"WC	Depth,	Vac, "WC	DTW, feet bgs	Vac, "WC	DTW,**	Vac, ''WC	DTW, feet bgs	Vac, "WC	DTW, feet bgs	Vac,	DTW, feet bgs				
1000	18	3/	0-	9.96	Ð	11.49	0	10,54	Ĥ	8.72	4	9,47				
1100	18	31'	0-	91.94	8	11.40	8	12.46	19	8183	(*)	10.34	***			
1200	190	31'	12	9.97	_ V	11.37	0	13.82	8	9.02	ħ	10.62	1,544		 	
1300	18	31	8	9.95		11.37	Đ	14.30	8	9.16		10.75	. , , , , , , , , , , , , , , , , , , ,			
1400	18	31	A	9.96	<u> D</u>	11.37	<u> </u>	15.31	82	9.32	D	11.00				
1500	19	3/'	<u>&</u>	9.99	<u> 8</u>	11.37	89	16.00	O	9.50	· · · · · · · · · · · · · · · · · · ·	11.10				
1600	19	31	<u>\$</u>	9,99	2	11.37	8	16.61	0	9.65	47	11.35				
100	19	31'	10-	10.02	<u>D</u>	11.38	9-	17.25	8	9,82	A	11.50	***			
1600	19	31 '		10.03	8	11.38	0	17,58	<u>8</u>	9.94	O	16.61	***			
1900	19_	31'	8	10.05	0	11.35	-0-	7.85	B-	10.05	D	11.70				
ZULGLERAGE							<u>-</u> -		·		76.1				,	
791															, , , , , , , , , , , , , , , , , , ,	
										<u></u>	···		-			
140 . /		L 194.	. 5.11	West for		- 011										

^{*} Sample Port At well Heme open To Allow water Flows

* Have To Add Dilvtion Air system VAL will max out

* Not much Recharge of well

^{*} Measured from fixture and not top of casing

Site Name & Address Former ARCO No. 11109

4280 Foothill Blvd, Oakland, CA

Equipment Model and Serial Nos.

PID Model

M.M. RAE

	4200 Footilii Bivd, Oakland, CA
Test Well ID	MW-12

Date & Time 0600 42809			Rate ¹	-	Dilution Air Temp deg F	Flow totalizer (DPE unit) gallons	Sys Inf Air Temp	Control Temp deg F	Effluent Air Temp deg F	1 .	Effluent P1D ppmv	Comments/Notes
0730	7543 7544 7545	25	2200	700 700	5Z 55	6250	90	1490	880 894	433	5 4	11109 A 543 FOR MUIZO135
0930	7546	25	2500 2500	700	62	6320	100	1568 1573	943 982	362 295	4	1109 W INF MW 12 0730
1130	7547 7548	25	2500		58 60	6390	100	1583 1580	960	316 328	3	11109 A SYS INF 1030 H
1330	7549 7550	25	2500 ZV00	700	65	6440	105	1584 1585	994	325 328	4	11109 A SKS INF 1335 1409 W INF 1330
1530	7552	25	2000	700	65	6480 6480	100	1585 ^L 1584	971 958	353 347	3	11(09 W LN (- 1330
	1553 1554	29° 29°	2600 2400			6550 6580		1		357 447	<u>3</u>	11109 A SYS IMF 1715 11109 W FMF 1740
ameter of the system						330 64						

Diameter of the system influent air flow pipe is	Z	inches
processing and from pripe is		inches

Diameter of the dilution air flow pipe is _____ inches

Site Name &

Former ARCO No. 11109

Address

4280 Foothill Blvd, Oakland, CA

Test Well ID

MW-12

Date 42809

Operators CHILL

ÓI ORIGINAL

MW					- IN A 1-10	T T T T T T T T T T T T T T T T T T T	induced vac	uum wept	h To Water						
		M	W-3	M	W-5	M	W-7	MV	W-10	M	W-11	,			
Wellhead Vacuum, 'Hg/''WC	Stinger Depth, feet bgs	Vac, "WC	DTW, feet bgs	Vac, "WC	DTW, feet bgs	Vac, "WC	DTW,*	Vac, "WC	DTW, feet bgs	Vac,	DTW, feet bgs	,			
19	•	8	10.40	<i>\theta</i> -	子级	8	11.43	0	12.30	Û	10.12				+-
20		8	1240	<u>&</u>		Ø	11.44	8	12.17	4	10.10				-
		<u> </u>	10:40	2	13.00	4	11.50	B	12,22	4	<u> </u>				+
				<u>&</u>	13.28	Q	11.58	8	12.35	0	10-19	, , , , , , , , , , , , , , , , , , ,			
·			, T		13.53	0	11.70	8	12.51	Ð	10.20				
					13.74		I I	8	12.67	8	10.24				
	~/		· i		13.90		T		12.80	Q	10.28				
			. ""	<u> </u>	14.05	****	<u> </u>		12.93	<u> </u>	10.32				
					14.195	-				0	10.36	· · · · · · · · · · · · · · · · · · ·			
51			1				, , , , , , , , , , , , , , , , , , ,			0-					<u> </u>
	-/-				14.41										<u> </u>
	-/	<u></u>			14.52	&	12.27	T	1 3.35	0	0,49				
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rul At	nell H	end T	o Allow		pru		* M	بمدس	ed fr	m fi	sture	-, nut	= Jun	n top	d
	Vacuum, Hg/"WC 19 20 20 20 20 21 21 21 21 21 21	Vacuum, Depth, feet bgs 19 29' 20 29' 20 29' 20 29' 20 29' 20 29' 20 29' 20 29' 21 29' 21 29' 21 29'	Vacuum, Depth, Feet bgs "WC feet bgs "WC feet bgs "WC feet bgs "WC 29" & 20	Vacuum, Depth, feet bgs 19 29 & 10.40 20 29' & 10.40 20 29' & 10.40 20 29' & 10.40 20 29' & 10.40 20 29' & 10.42 20 29' & 10.42 20 29' & 10.55 21 29' & 10.65 21 29' & 10.65 21 29' & 10.65 21 29' & 10.65 21 29' & 10.65 21 29' & 10.65 21 29' & 10.65 21 29' & 10.65 21 29' & 10.65 21 29' & 10.65 21 29' & 10.65 21 29' & 10.65 21 10.75	Vacuum, Hey"WC Depth, feet bgs Vac, feet bgs DTW, feet bgs Vac, feet bgs "WC 19 29° 2 0.40 5 20 29° 2 0.40 5 20 29° 4 0.40 5 20 29° 10.40 6 20 29° 10.40 6 20 29° 10.40 6 20 29° 10.40 6 20 29° 8 0.49 6 21 29° 8 0.55 6 21 29° 8 0.55 6 21 9 0.65 6 21 9 0.45 6 21 9 0.40 8 21 9 0.40 8 21 9 0.40 8 21 9 0.40 8 21 9 0.40 8 21 9 0.40 8 21 10.40 10.40 20 10.40	Vacuum, Depth, feet bgs "WC feet bgs "IZ.75" 2.0 29' & 10.40 & 12.75 & 13.87 2.0 29' & 10.49 & 13.53 2.0 29' & 10.49 & 13.53 2.0 29' & 10.49 & 13.53 2.0 29' & 10.49 & 13.67 2.1 29' & 10.65 & 13.6	Vacuum, Depth, Wac, 10TW, feet bgs "WC feet	Vacuum, Depth, feet bgs "WC fee	Vacuum, fight we feet bgs Vac, feet bgs DTW, feet bgs WC feet bgs WC feet bgs DTW, feet bgs Vac, feet bgs DTW, feet bgs WC feet bgs II.44 QC f	Vacuum, Helimore feet bgs Depth, Feet bgs Vac, feet bgs DTW, feet bgs WC feet bgs WC feet bgs WC feet bgs DTW, feet bgs WC feet bgs WC feet bgs WC feet bgs DTW, feet bgs WC feet bgs II.49 WII.49 WII.49 WII.49 WII.49	Vacuum, Depth, field by Vac, feet bgs DTW, feet bgs Vac, feet bgs DTW, feet bgs Vac, feet bgs DTW, feet bgs Vac, feet bgs WC feet bgs	Vacuum, Bepth, WC feet bgs "FC feet bgs "WC feet bgs "FC feet bgs "WC feet bgs "FC feet bgs "WC feet bgs "FC feet bgs feet bgs "WC feet bgs "FC feet bgs feet b	Vacuum, Depth, Feet bgs WC Feet bgs WC	Vacuum, Bepth, Feet bgs "WC for lateral for lateral for lateral for lateral for lateral for lateral for lateral for latera	Vacuum, Bepth, Wac, BTW, Vac, BTW, Feet bgs "WC feet bgs" "JC JC JC JC JC JC JC JC JC JC JC JC JC J

Site Nal. & Address

Former ARCO No. 11109

4280 Foothill Blvd, Oakland, CA

Date 🔪 Test Operators

Equipment Model and Serial Nos. 250TCAT LR CITZ

PID Model Muni RW

Test Well ID

MW-10

Data & Tr	Hour Meter	Applied	Sys Inf Air Flow	1	Dilution Air	Flow totalizer	Sys Inf Air	Control	Effluent Air	1 ~	Effluent	
Date & Time	Reading	Vacuum	Rate	Rate ²	Temp	(DPE unit)	Temp	Temp	Temp	Influent	PlD	Comments/Notes
		"Hg	[pm/cfm	fpin/cfm	deg F	gallons	deg F	deg F	deg F	ppmv		
0630	7554	23	3000	700	45	6580	80	1482		1081	Ppmv_	
0730	7556	23	2500	750	50	6580	100	1591	800	1084	7	11109 W INF 0150
0830	7557	23	2500		52	6620	100	······································		/-		11109 A SYS INFOR
0930	7558	23	3000	700	60	6620	105	1597	326	1106	7	
1030	7559	23	3000	750	62	6620	105	1615	970	1021		THOU IN EACTOR
1130	7560	23	3,000	750	60	6690		1616		1091		11109 H 545 INT-1038
1230	7561	23	3,000	700	68	6690	105		1010		82	
1330	7962		3000	700	60	6710	105	1627	1029	841	۵	511.00 14 51 12 235
1430	7563	, miles	3000	700			110			DZY	_ て	11109 A 945 INF 1335 11109 W INF 1330
	7564		7 1			6710	10	1628	1037	830	3	
			3000	700	64	6710	105	1424	1048	823	3	
			3000		62	4710	105	1633	1025	943	3	11109 A 545 INF 17 11109 W INF 1735
1800	7566	23	3100	200	60	6160	100	المنتا		900	3	14189 W INF 1735
									M			

Diameter of the system in	nfluent air flow pipe	is_2_	inches

180 GALS

Diameter of the dilution air flow pipe is _____ inches

Site Name &

Former ARCO No. 11132

Address

3201 35th Avenue, Oakland

Test Well ID MW-10

Date Operators CHILL

10112					~ 360 <i>6</i> 38		Lar	v.							
							Wellhead/I	Induced Vac	uum/Dept	h To Water			×- ×		
Date & Time		V-10	M	W-3	M	W-5		W-7		W-11		V-12			
42909	Wellhead Yacuum, 'Hg/"WC	Depth, feet bgs	vac, "WC	DTW, feet bgs	Vac, "WC	DTW, feet bgs	Vac, "WC	DTW,	Vac, "WC	DTW, feet bgs	Vac, ''WC	DTW, feet bgs			
0630	15	29'	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	11.7	8	13.55	B	12.0	92	10.50	8	13.95			
0730	(7		8	11.65	8	18.41	X	11.96	\$	11.04	₩ Z	13.66			
0830	7		8	11:64	82	18.63	Ø	11.93	Ò	11.46	8	13.55			
6930	17		8	11.63	6	25.49	OK	11.91	8	11.72	8	13.50	****		
1030	17		8	11.60	\$	21.48	X	11.90	8	12.05	8	13-44			
1130	17		&	11-60	8	21.78 21.73 21.74 22.18 22.27 22.49 22.49 22.85 23.10	B	11.89	be`	12.24	\$	i3.39			
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1330	17		8	11.58	8	27.85	9	11.86	8	12.55	A	13.31			
1430	\ \ \ \ \ \	-(-	<i>P</i>	11.59	0	23,10	\$	11.87	82	12.69	77	(3,27			
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1430	1/	-	0	16.79	8	23.42	82	11.86	8	12.95	A	13,20	110		
1800	17		18	11.60	4	23,42	\$	11.84	8	13.06	8	13.15			
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* Heasund from fixture, not top of casing

Site Name & Address Former ARCO No. 11109

4280 Foothill Blvd, Oakland, CA

Date Test Operators H3009 CHILL Vine

Equipment Model and Serial Nos. 2501 C647 LR

Test Well ID

MW-11

PID Model

Min Rhe

Hour Meter Applied Air Flow Air Fl													-	
0730 7567 24 3000 700 50 6790 100 1529 699 1108 6 11109 A 545 Im 0930 7568 24 3000 750 50 6790 100 1544 730 1007 3.5 0930 7569 24 3000 700 55 6790 105 1541 720 715 4.0 1300 1570 24 3000 700 60 6800 105 1546 732 757 4.0 11109 A 545 Im 1230 7572 24 3000 700 65 6850 105 1554 950 627 2.2 1230 7572 14 3000 750 65 6870 105 1555 1009 571 2.0 1330 7573 24 3000 700 65 6880 105 1555 940 527 2.0 1430 7573 24 3000 700 65 6880 105 1555 940 527 2.0 1430 7575 24 3000 700 65 6880 105 1555 940 527 2.0 1430 7575 24 3000 700 65 6880 105 1555 940 527 2.0 1530 7575 24 3000 700 68 6880 105 1555 940 527 2.0 1530 7575 24 3000 700 68 6880 105 1555 875 525 1.7	Comments/No	on,	PID	System Influent	Air Temp	Temp	Air Temp deg F	totalizer (DPE unit) gallons	Air Temp deg F	Air Flow Rate ² (pm/cfm	Air Flow Rate ¹ (pm/cfm	Vacuum "Hg	Meter Reading hrs	0600 4309
7568 24 3000 750 50 6790 100 1544 730 1007 3.5 0930 7569 24 3000 700 55 6790 105 1541 720 715 4.0 1030 7570 24 3000 700 60 6800 105 1541 720 715 4.0 1130 7571 24 3000 700 65 6850 105 1554 950 627 2.2 1230 7572 24 3000 750 65 6870 105 1555 1009 571 2.0 1330 7573 24 3000 700 65 6880 105 1555 1009 571 2.0 1430 7574 24 3000 700 65 6880 105 1555 940 527 2.0 11109 4 545 1570 1570 7575 24 3000 700 68 6880 105 1575 930 485 2.8 1670 7577 24 3000 700 68 6880 115 1575 875 526 81 1109 4 577 July	11109 A SUS IV											-		0730
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T3++ 29 3000 700 70 6950 110 1585 960 320 7.0	11109 W INF	- HILLY W						/*	70		3000	24	7577	

Diameter of the	system i	nfluent ai	r flow pipe is	2	inches	
Diometer C.1			7			

190 GALS

Diameter of the dilution air flow pipe is _____ inches

Site Name & Address

Former ARCO No. 11109

4280 Foothill Blvd, Oakland, CA

Test Well ID

MW-11

Date

Operators CHIL

, ,					100000			·						
ı	- · · · · · · · · · · · · · · · · · · ·			T	,	Wellhead/	Induced Vac	uum/Dept	th To Water					
Date & Time	MW-11		1W-3	⊩ ~ MV	v-5 16.77		W-7		W-10		W-12		T	
43009	Wellhead Stin Vacuum, Dep 'Hg/"WC feet	1 1133777	DTW, feet bgs	Vac, ''WC	DTW, feet bgs	Vac, "WC	DTW,	Vac, "WC	DTW,	Vac,	DTW,	***************************************		
0630	1	9' &	11.62		11.72	T	11.74	9-	feet bgs	"WC	feet bgs			
0730	15) <u>&</u>	11.60		15.91		11.75	B	14.94	\(\mathbb{Z}\).	12.25			
0930	15	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	11.60	\$ D	15.57 15.58 15.25 15.27	&	11.75	<u> &</u>	14,99	Q	12.22			
1030	15	X	11:60	Ø	14.97	D	11.75	80	15.06		12.19			
1130	14	N D	11.42	R	14.77	<u>X</u>	11.77	K	15.15	X	12.16			
1330	14	1 8	11.65	\mathcal{X}	14.45	<u>Z</u>	11.81	故	15,14	<u>X</u>	12.12			
1430	16	<i>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</i>	11.70	D	4.28	Ø	11.60	Ø	15.15	<u>&</u>	12.09	·—···		
	jb /	8	11,71	0	14.23	& \Q	18.11	Ø	15-11	Q	11.98			
1730	lb }	Ø	11.77	8	14.12 14.14 14.08 4.10		11.79	Ø	15.11	Ø.	11.43			
					7.00				13.11	<u> </u>	11.90	·····		1
					DIE									

Site Name & Address

Former ARCO No. 11109

4280 Foothill Blvd, Oakland, CA

Date **Test Operators** C-4,11

Equipment Model 250 TCAT LR and Serial Nos.

PID Model

M.n. RAE

Test Well ID

MW-5, MW-10, MW-11, & MW-12

C-FISHER

Data 6 Tr	Hour Meter	Applied	2 X 22 X 10 YF	Air Flow	Dilution Air	Flow totalizer	Sys Inf Air	Control	Effluent Air	System	Effluent	
Date & Time	Reading hrs	Vacuum	Rate	Rate ²	Temp	(DPE unit)	Temp	Temp	Тетр	Influent	PID	Comments/Notes
		"Hg	fpm/cfm	fpm/cfm	deg F	gallons	deg F	deg F	deg F	ppmv	ppmv	
1800		22.5	4000	0	71	6950	115	1670	11/0	1236	42	
1900	7579	22.5	3500	10	IF	7100	110	1671	8011	1189	3.0	11109 A SYS INT 1919 11109 W IN F 1919
2000		U.5			67	7170	118	1662	990	1328	2.4	11109 W INF 1915
2100	7581	" "	4000	10	62	7170	105	1647	1062		4.0	
		-	4000	か		7240	108	1640	1050	1351	4.0	11109 HS45 ING 214 11109 WINF 2150
		23	4000	Vocanian,	***************************************	7240	105	1632	765	1350	4	11109 WINE 2150
	1584		4000			7330	105	1631	1020	1431	<u>'</u>	
	7585	23	4000	\	-	7400	100	1646	1105	1426	\	IIIOA A SYS FAR ON
	7586	23	4000			7400	100				3	11109 H 345 FAR 0105
	7587	23	4000	<u></u>		7470			976	1414		
0460	7588	23	4000	_	·	7470		1	4115	1460	3	11109 A 545 FNF 05
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0600	7590		4000	٤			100	1646		1820 1817	5	

Diameter of the system	influent	air	flow	pipe	is
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inches

Diameter of the dilution air flow pipe is

inches

Site Name & Address

Former ARCO No. 11109

4280 Foothill Blvd, Oakland, CA

Test Well ID

11/09

MW-5, MW-10, MW-11, & MW-12

Date 4/20/09

Operators CAUL

C. FISCHER

ÓI ORIGINAL

			1	·····	Ψ		Wellhead/In	duced Vac	uum/De	pth To Wa	ter			· · · · · · · · · · · · · · · · · · ·	<u> </u>		****
Date & Time	MV		MW	'-10	MW		MW]	W-3		W-4	MV	V-6	М	W-7	
04/30/09	Wellhead Vacuum, "Hgy"WC	Stinger Depth, feet bgs	Wellhead Vacuum, "Hg/j"WC	Stinger Depth, feet bgs	Wellhead Vacuum, "Hg/"WC	Stinger Depth, feet bgs	Wellhead Vacuum, "Hg/"WC	Stinger Depth, feet bgs	Vac,	DTW, feet bgs	Vac, "WC	DTW,	Vac, ''WC	DTW,	Vac,	DTW,	,
7800	17	31	8	29	8	29	12	29	B	11.79	Ø	14.00	D	14.73	<u> </u>	11.75	
1900	17-		8		8		14		Ø	14.77	Ø	14.01		14.73	Ø	11.74	
2000	17	. Waller .	8		3		M		0	11.48	X	14.04		14.73	B	11.78	****
2/60	17	7 10 0.3 14.5 0 14.73 0														11.86	
2400	17		,		9		15	_	4	11.88	Ð	14.05		14.73	Ø	11.94	·····
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0400	17		10		9		19		8	12146	9	14.07		14.77		12.3)	
0600	(7		10		à		15			12.70	0	14.08		14.80		1245	
		A ANGLES AND A STATE OF THE STA					<u> </u>		0	10.01	0	170)	82_	14.80	6	12.51	····

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		-												VVI			
	<u> </u>			V		V		V		- Annual Control					~		

* Heavied from finture, not top of casing.

BP/ARC Project Name: ARCO 11109 - Assessment

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Req Due Date (mm/dd/yy): Eff 24hrs&othersSTD_Rush TAT: Yes_x_No BP/ARC Facility No: 11109 Lab Work Order Number: Calscience Environmental Laboratories, Inc. Lab Name: BP/ARC Facility Address: 4280 Foothills Blvd Consultant/Contractor: Stratus Environmental, Inc. Lab Address: 7440 Lincoln Way, Garden Grove, CA 92841 City, State, ZIP Code: Oakland, California Consultant/Contractor Project No: E11109-01 Lab PM; Richard Villafania Lead Regulatory Agency: Alameda County Health Care Services Address: 3330 Cameron Park Dr., Suite 550, Cameron Park, CA 95682 Lab Phone: 714-895-5494 California Global ID No.: T0600100217 Consultant/Contractor PM: Jay Johnson Lab Shipping Acent: 9255 Enfos Proposal No: 000GK-0006 530-676-6000 Lab Bottle Order No: Accounting Mode: OOC-RM Provision x OOC-BU Email EDD To: chuff@stratusinc.net Other Info: Stage: Select Activity: Feasibility Study nvoice To: BP/ARC_x_ Contractor ___ BP/ARC EBM: Paul Supple Matrix No. Containers / Preservative Requested Analyses **Turnaround Time** Report Type & QC Level EBM Phone: 925-275-3801 of Containers Standard __x_ EBM Email: paul.supple@bp.com Full Data Package ____ Lab Water / Liquid Total Number Unpreserved Sample Description Date Time Soil / Solid Air / Vapor No. Comments Staridard 24-hours Methan HN Note: If sample not collected, indicate "No MTBE BTEX GRO 꼬 Sample" in comments and single-strike out and initial any preprinted sample description. 11109 A SYSINF MY 4 2709 1100 11109A EFF 6-oxys include MTBE, TBA, TAME. Z LIDG ASYSINF DIPE, & ETBE. 7 11109 A S45 INF 6 7 8 9 10 Chris Hil Sampler's Name: Relinguished By / Affiliation Date Time Accepted By / Affiliation Date Time Sampler's Company Stratus Environmental, Inc. 42704 ca 1030 Shipment Method: Ship Date: 42709 Shipment Tracking No-Special Instructions: Please cc results to bped@broadbentinc.com Jy Seals In Place: Yes / No. Temp Blank: Yes / No Cooler Temp on Receipt: 106193555 °F/C Trip Blank: Yes / No. MS/MSD Sample Submitted: Yes / No

Atlantic Richfield Company	1
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,» (Richfield ompany	BP/ARC P	roject Name:			1110					L.dIV	112	una	ın										e de la companya de l	Page	_ of
	O A BP affliated company	BP/ARC Fa			109	-								•	Lat	y Du Wo	e Date rk On	e (mi der N	n/dd/yy) lumber:	: . <u>Ef</u>	f 24h	irs&o	thers	STD Rush T	AT: Yes_	K No
Lab Na	ame: Calscience Environmental	Laboratories, Inc.		ВР	YAR(C Faci	lity Ad	ddres:		428	0 Foo	thills F	3lvd	-				4011						4-25		
Lab Ad	ldress: 7440 Lincoln Way, Garder	Grove, CA 9284	 			ate, Z					dand,		-						Consult					itus Environment	al, inc.	
Lab Pl	I: Richard Villafania	,		-		egulat			- · ·				y Healtl	h C-					Consult					_ !'		
Lab Pl	ione: 714-895-5494					ia Glo	-				00100		y theath	- Ga	ile Ser	vices								Ori, Suite 550, C	ameron Park,	CA 9568
_ab St	ipping Acent: 9255			┪		ropos				 GK-00									Consulta	ant/Cor	itracto	r PM:	Jay	Johnson		*
_ab Bo	ttle Order No;			-		ling M		-					20.00						Phone:		-676-					
Other I	nfo:			-		Sele							DC-BU		_ 00	C-RA	A		Email El	DD To:	ch	uff@s	stratu	sinc.net		*********
3P/AR	CEBM; Paul Supple			-		atrix		NI.					Study						Invoice	o:	В	P/ARC	_ <u>_x</u> _	Contra	ctor	·
EBM P	hone: 925-275-3801			╀	T	auix	_	iNC), Ç.O	ntair	iers /	Pres	servati	ve	 	Requ	ueste	d An	alyses	Tu	rnard	ound	Time	Report	Type & QC	Level
ЕВМ Е	mail: <u>paul.supple@bp.com</u>			_				Containers								-								li.	Standard _x Package	
Lab No.	Sample Description	Date	Time	Soil / Solid	Water / Liquid	Air / Vapor	77.1	Total Number of Co	Unpreserved	H ₂ SO,	HNO3	HCI	Methanoi		GRO	BTEX	MTBE	5-oxys	Ethanol	24-hours	Standard		777000	Note: If sample n Sample" in comm	ents and single	-sláke out
1	11109 ASYS INF 19	42889	0735	1		又		ユ		-	-					<u>m</u>	∑ X	ည်	ឃី	24	-	-		and initial any pre	printed sample	descriptio
2	1109 AS93 INF	42809	U7356			X		Z		_						_				\vdash	X	/	<i></i>	6-oxys include N	ATBE, TBA, T	AME,
3	1109ASYS INF	42704	1845	1		K		フ					-		X	.,,					it	714		DIPE, & ETBE.		
4	1109AS45INF	142609		1		N		Z							兌	X	文义			╀╾	义文					
5	1109A SYS INF	42809		1		X	7	2							$\frac{1}{\lambda}$	<u>/</u>				-						
6													-	\dashv						-	\triangle			<u> </u>		
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												. ح		,	-		r/C		Trip Blan	k: Yes	/ No		MS/N	ISD Sample Sul	mitted: Yes /	

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f 24hrs&olhersSTD	Rush TAT: Yes v No	

Còmpany	BPIARC Pro	ject Name:	AR	RCO 11	1109 -	· Asse	ssme	ent					Do.	a Duc	Dot		1-1-11 1			(2			age	_ Oi <u>/ _</u>
A BP affiliated company	BP/ARC Fac	ility No:	111										Lat	i Moi i nac	rk Ori	≇ (miii der N	n/aa/yy) lumber:	: <u>E</u>	24h	ігѕ&о	thers	SSTD Rush TA	T: Yesx	< No
Lab Name: Calscience Environmental L	Laboratories, Inc.		BP/	/ARC Fa	acility	Addres	ss:	428	30 Foot	thills (Pilvd						Т							
Lab Address: 7440 Lincoln Way, Garden	Grove, CA 92841			, State,					kland, (Consult					atus Environmental,	, Inc.	
Lab PM; Richard Villafania				d Regu			v:		meda (Ith Co		- :!			Consulta							
Lab Phone: 714-895-5494				ifornia (··	00100		y ricu	- Ca	Te Ser	vices			9					Dr., Suite 550, Carr	ieron Park,	CA 95682
Lab Shipping Acent: 9255			-	os Prop				GK-00		411					 -		1				Jay	Johnson		
Lab Bottle Order No:	<u></u> <u>u.,</u>			counting								1					Phone:		-676-		 			
Other Info:				ge; S					n <u>x</u> r: Feas					·C-RM			1					usinc.net		
BP/ARC EBM; Paul Supple			+	Matr		TN							т				Invoice i				C_x_		or	
EBM Phone: 925-275-3801			╁╌		<u>~</u>	+"	T	Titani	ners /	Pres	serva	tive	 '	Requ	ested	d Ana	alyses	Tui	rnard	ound	Time	Report T	ype & QC	Level
EBM Email: paul.supple@bp.com	<u> </u>		-			ners																SI	tandardx	_
			1			Containers																Full Data Pa	ackage	_
Lab No. Sample Description	Date	Time	Soil / Solid	-	Air / Vapor	Total Number of	Unpreserved	H ₂ SO,	HNO3	HCI	Methanoi		GRO	BTEX	MTBE	s-oxys	Ethanol	24-hours	Standard		, m, t	Co Note: If sample not Sample" in commer	nts and single.	-cirika aut
11 10 1 11 11 11 11 11 11 11 11	72704	07461			<u> </u>	Z							入	1	L			十	又	+	1	6-oxys include MT		
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111011101	14 2704	1335		<u> </u>		Z							X	X	X			1	X		1-1			
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D OOL ONE 1. Costo	dy Seals in Place:	Yes / No	Te	emp Bla	ank: Ye	es / No		Cor	oler Te	emp o	n Rec	eipt:_			°F/C		Trip Blar	ık: Yes	/ No		MS/	; MSD Sample Subn	nitted: Yes /	' No



BP/ARC Project Name: ARCO 11109 - Assessment

of Custody Record		Page	<u> </u>	ıf
Req Due Date (mm/dd/yy):	Eff 24hrs&othersSTD			

Ó	A BP affiliated company	BP/ARC Fac	cility No:	11109										Lab	Worl	k Ord	ler N	umber:									
Lab Nam	ne: Calscience Environmental La	boratories, Inc.		BP/	ARC	Facili	ty Ad	ldress	i;	4280	Footl	nills B	lvd						Consulta	nt/Con	tractor	:	Strat	tus Envi	ronmenta	I, Inc.	
Lab Add	ress: 7440 Lincoln Way, Garden G	rove, CA 92841		City	, Stat	te, ZIf	Co.	de:		Oakl	and, 0	Califor	nia						Consulta	nt/Con	tractor	Proje	ct No:	E	11109-01		
Lab PM:	Richard Villafania			Lea	d Re	gulato	ry Ag	gency	:	Alam	neda C	ounty	Healt	h Car	e Serv	rices			Address:	3330	Cam	eron l	Park D	r., Suite	550, Ca	meron Park, C	A 95682
Lab Pho	ne: 714-895-5494			Cali	fornia	a Glob	al ID	No.:		T060	001002	217					****		Consulta	nt/Con	tractor	РМ:	Jay J	Johnson			
Lab Ship	pping Accnt: 9255			Enfo	os Pr	oposa	al No:		0000	3K-00	06								Phone:	530-	676-6	000		•			
Lab Bott	le Order No:			Acc	ounti	ng Mo	ode:		Pro	vision	<u> </u>	oc	C-BU		00	C-RM			Email ED	D To:	<u>c</u> hu	ıff@s	tratu	sinc.ne	<u></u>		
Other Inf	fo:			Stag	ge:	Sele	ct		A	ctivity:	Feas	ibility	Study						Invoice T	o:	BF	P/ARC	:_x	_	Contrac	tor	
BP/ARC	EBM: Paul Supple				Ma	ıtrix		No	o. Co	ntain	iers /	Pres	ervat	ive		Requ	ested	d Ana	alyses	Tu	rnaro	und	Time		Report	Type & QC I	_evel
EBM Pho	one; 925-275-3801							çs.																	;	Standardx_	-
EBM Em	nail: paul.supple@bp.com							tainer																F	ull Data	Package	_
Lab No.	Sample Description	Date	Time	am hater / Líquid ir / Vapor ir / Vapor preserved preserved NO ₃ SO ₄ CI CI CI Solid and of Continues and										sample no	omments of collected, indi ents and single- printed sample o	strike out											
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Sampler's Name: (N, 1, 5 H, 1 C) Sampler's Company: Stratus Environmental, Inc.									/		*		Da		Tir			Acc	epte	d By	/ Affil	liation		Date	Time		
	s Company: Stratus Environm	<u> </u>	30-11	1	fr.	-11	1			2	tori	Y	<u> </u>		430	104	180	10		111102				nnuu			
	t Method: GSO	Ship Date	3009																1000		~						
	t Tracking No:	to broad@b	16 1																								
•	Instructions: Please cc results	-		1 .					ï									ī							0,		
	"HIS LINE - LAB USE ONLY: Custo	e: Yes / No		(emp	Blan	k: Ye	es / No	0	C	ooler "	Temp	on Red	ceipt:			_°F/C		Trip Bla	ınk: Ye	s / No		MS:	/MSD S	ample Su	bmitted: Yes /	'No	



BP/ARC Project Name: ARCO 11109 - Assessment

Page	_ /	of	1
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Req Due Date (mm/dd/yy): Eff 24hrs&othersSTD_Rush TAT: Yes x No **BP/ARC Facility No:** 11109 Lab Work Order Number: Lab Name: Calscience Environmental Laboratories, Inc. BP/ARC Facility Address: 4280 Foothills Blvd Consultant/Contractor: Stratus Environmental, Inc. Lab Address: 7440 Lincoln Way, Garden Grove, CA 92841 City, State, ZIP Code: Oakland, California Consultant/Contractor Project No: E11109-01 Lab PM: Richard Villafania Lead Regulatory Agency: Alameda County Health Care Services Address: 3330 Cameron Park Dr., Suite 550, Cameron Park, CA 95682 Lab Phone: 714-895-5494 California Global ID No.: T0600100217 Consultant/Contractor PM: Jay Johnson Lab Shipping Accnt: 9255 Enfos Proposal No: 000GK-0006 Phone: 530-676-6000 Lab Bottle Order No: Accounting Mode: Provision x OOC-BU OOC-RM Email EDD To: chuff@stratusinc.net Other Info: Stage: Select Activity: Feasibility Study Invoice To: BP/ARC_x Contractor BP/ARC EBM: Paul Supple Matrix No. Containers / Preservative Requested Analyses **Turnaround Time** Report Type & QC Level EBM Phone: 925-275-3801 Standard __x_ Containers paul.supple@bp.com EBM Email: Fuli Data Package ____ ö Water / Liquíd Total Number Lab Unpreserved Sample Description Date Time Soil / Solid Air / Vapor No. Comments Methanol Standard 24-hours HNO3 Note: If sample not collected, indicate "No 5-oxys BTEX GRO 걸 Sample* in comments and single-strike out and initial any preprinted sample description. 2 6-oxys include MTBE, TBA, TAME, 2 DIPE, & ETBE. 6 7 8 9 10 Sampler's Name: Resinguished By / Affiliation Date Time Accepted By / Affiliation Date Time Sampler's Company Stratus Environmental, Inc. Ship Date: 5 1176 Shipment Method: GSO Shipment Tracking No: Special Instructions: Please cc results to bpedf@broadbentinc.com THIS LINE - LAB USE ONLY: Custody Seals in Place: Yes / No. Temp Blank: Yes / No. Cooler Temp on Receipt °F/C Trip Blank: Yes / No MS/MSD Sample Submitted: Yes / No

Atlantic Richfield Company

Laboratory Management Program LaMP Chain of Custody Record

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Pageof	

BP/ARC Project Name: ARCO 11109 - Assessment Req Due Date (mm/dd/yy): Eff 24hrs&othersSTD Rush TAT: Yes x No_ **BP/ARC Facility No:** O A BP affiliated company 11109 Lab Work Order Number: Lab Name: Calscience Environmental Laboratories, Inc. 8P/ARC Facility Address: 4280 Foothills Blvd Consultant/Contractor: Stratus Environmental, Inc. Lab Address: 7440 Lincoln Way, Garden Grove, CA 92841 City, State, ZIP Code: Oakland, California Consultant/Contractor Project No: E11109-01 Lab PM: Richard Villafania Lead Regulatory Agency: Alameda County Health Care Services 3330 Cameron Park Dr., Suite 550, Cameron Park, CA 95682 Lab Phone: 714-895-5494 California Global ID No.: T0600100217 Consultant/Contractor PM; Jay Johnson Lab Shipping Acent: 9255 Enfos Proposal No: 000GK-0006 530-676-6000 Lab Bottle Order No: Accounting Mode: Provision X OOC-BU OOC-RM Email EDD To: chuff@stratusinc.net Other Info: Stage: Select Activity: Feasibility Study nvoice Ta: BP/ARC_ x Contractor___ BP/ARC EBM: Paul Supple Matrix No. Containers / Preservative Requested Analyses **Turnaround Time** Report Type & QC Level EBM Phone: 925-275-3801 Standard __x_ EBM Email: paul.supple@bp.com Full Data Package ___ ō Lab Water / Liquid Total Number Sample Description Date Time No. Soil / Solid Air / Vapor Methanol Comments Unprese Standard ĘŅ. Note: If sample not collected, indicate "No 오 Sample" in comments and single-strike out and initial any preprinted sample description. 1109WINFMUS 42709 1105 6-oxys include MTBE, TBA, TAME, 11109 WINF MUS 42709 1400 DIPE, & ETBE. 1109 W INFmas 1109 W INF MUS 42709 1830 1109 W INF MWIZ 42509 X Sampler's Name: Relinquished By / Affiliation Date Time Accepted By / Affiliation Date Time Sampler's Company: Stratus Environmental, Inc. 42904 1800 Shipment Method: Ship Date: 4 29 00 K130/09 11 030 Shipment Tracking No: 105748990 Special Instructions: ாங்கள்மீட் results to opedi@ addbenting.com THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No Temp Blank: Yes / No Cooler Temp on Receipt: °F/C Trip Blank, Yes / No MS/MSD Sample Submitted: Yes / No

Atlantic Richfield Company

Laboratory Management Program LaMP Chain of Custody Record

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BP/ARC Project Name:	ARCO 11109 - Assessment	Poe Due Detail	raye raye
BP/ARC Facility No:		Red Due Date (mm/dd/yy):	Eff 24hrs&othersSTD Rush TAT: Yes x No
Di mito i acility No.	11109		

Lab Name: Calscience Environmental Laboratories, Inc.	BP/ARC Facility Address: 4280 Foothills Blvd	
Lab Address: 7440 Lincoln Way, Garden Grove, CA 92841		Consultant/Contractor: Stratus Environmental, Inc.
.ab PM: Richard Villafania		Consultant/Contractor Project No: E11109-01
.ab Phone: 714-895-5494	Lead Regulatory Agency: Alameda County Health Care Services	Address: 3330 Cameron Park Dr., Suite 550, Cameron Park, CA 95682
ab Shipping Accnt: 9255	10600100217	Consultant/Contractor PM: Jay Johnson
.ab Bottle Order No:	Enfos Proposal No: 000GK-0006	Phone: 530-676-6000
Other Info:	Accounting Mode: Provision X OOC-BU OOC-RM	mail EDD To: chuff@stratusinc.net
	Stage: Select Activity Expellition Stage	nvoice To: BP/ARC x Contractor
P/ARC EBM: Paul Supple	Matrix No. Containers / Preservative Requested Anal	
BM Phone: 925-275-3801	un la la la la la la la la la la la la la	
BM Email: <u>paul.supple@bp.com</u>	Containers	Standard _x_
		Full Data Package
ab Sample Description Date Time	nid d d d	
No. Sample Description Date Time	Soil / Solid Water / Liquid Air / Vapor Total Number of Unpreserved H2SO4 HNO3 HNO3 TCI RO RO RO Oxys	Comments
	Soil / Solid Water / Liq Air / Vapor Air / Vapor Total Numt H ₂ SO ₄ HNO ₃ HCI Methanol Methanol TTEX TTEE	Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description
1 /1109 W INF H2909 1330		Note: If sample not collected, indicate "No Sample" in comments and single-strike out and initial any preprinted sample description
2 101-0-19	X G X X X X X X X X X X X X X X X X X X	6-oxys include MTBE, TBA, TAME,
3 11109 W INF 42909 1735 3 11109 W INF 43009 0705		DIPE, & ETBE.
	4 6 X XXXX	
11100	- - - - - - - - - - - - - - - - - - - 	Hold
		C X
11109 10 500 1705	6 XXXXX	
1109 10 3517 13009 1913	X 6 X AXXXX	
1110 1 10 40 1 47/84 2150	X 6 X	Hold
1101 10 201 5 109 0103		,
11101 10 4101 10 109 10505	X 6 2 200	
mpler's Name: Chuis Hill	Relinguished By / Affiliation Date Time	Accepted By / Arriver
mpler's Company. Stratus Environmental, Inc.	July Strong & Miles 11,000	Accepted by / Affiliation Date Time
	12/10/1000	
ipment Tracking No:		
ecial Instructions: Please cc results to bpedf@broadbentinc.com		
THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No	Temp Blank: Yes / No Cooler Temp on Receipt: °F/C	r .
	Cooler Temp on Receipt:°F/C	Trip Blank: Yes / No MS/MSD Sample Submitted: Yes / No



Supplemental Report 1

April 29, 2009

The original report has been revised/corrected.

Jay Johnson Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Subject:

Calscience Work Order No.:

Client Reference:

09-04-2453

ARCO 11109 Assessment

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 4/28/2009 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental

Laboratories, Inc.

Richard Villafania

Richard Vellas.

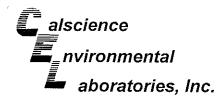
Project Manager

CA-ELAP ID: 1230

NELAP ID: 03220CA

CSDLAC ID: 10109

SCAQMD ID: 93LA0830



Stratus Environmental, inc.	Date Received:	04/28/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-04-2453
Cameron Park, CA 95682-8861	Preparation:	N/A
	Method:	EPA TO-15
	Units:	mg/m3

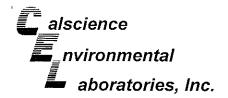
Project: ARCO 11109 Assessment

Page 1 of 1

Client Sample Number				ab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/T d Analyz		QC Batch ID
11109ASYSINFMW5		*****	09-04-	2453-1-A	04/27/09 11:00	Air	GC/MS DD	N/A	04/28/ 15:2		090428L01
<u>Parameter</u>	Result	RL	<u>DF</u>	<u>Qual</u>	<u>Parameter</u>			Result	RL	DF	Qual
Benzene	14	0.40	250		Xylenes (total)			62	2.2	25	0
Toluene	7.9	0.47	250		Methyl-t-Butyl i	Ether (MTE	BE)	ND	1.8	25	0
Ethylbenzene	15	0,54	250								
Surrogates:	<u>REC (%)</u>	Control		<u>Qual</u>	Surrogates:		<u> </u>	REC (%)	Control		Qual
1.4-Bromofluorobenzene	99	<u>Limits</u>			4.0 Dialia				<u>Limits</u>		
Toluene-d8	101	57-129 78-156			1,2-Dichloroeth	iane-d4		92	47-137		
	101	70-100									
11109AEFF			09-04-	2453-2-A	04/27/09 10:55	Air	GC/MS DD	N/A	04/28/0 16:18		090428L01
<u>Parameter</u>	Result	RL	<u>DF</u>	Qual	<u>Parameter</u>			Result	RL	DF	Qual
Benzene	ND	0.0016	1		Xylenes (total)			ND	0.0087	1	
Toluene	0.0034	0.0019	1		Methyl-t-Butyl B	Ether (MTE	BE)	ND	0.0072	1	
Ethylbenzene	ND	0.0022	1		, ,	,	,		U,, _	,	
Surrogates:	REC (%)	Control Limits		<u>Qual</u>	Surrogates:		E	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	81	57-129			1,2-Dichloroeth	ane-d4		75	47-137		
Toluene-d8	98	78-156									
11109ASYSINF			09-04-2	2453-4-A	04/27/09 16:55	Air	GC/MS DD	N/A	04/28/0 17:07		090428L01
Parameter	Result	RL	DF	Qual	Parameter			Result	RL	DF	Qual
Benzene	16	0.28	175		Xylenes (total)			17	1.5	175	
Toluene	7.3	0.33	175		Methyl-t-Butyl E	ther (MTB	ÆΊ	ND	1.3	175	
Ethylbenzene	6.2	0.38	175		, ,		_,		1.0	116	,
Surrogates:	<u>REC (%)</u>	Control Limits		Qual	Surrogates:		E	EC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	84	57-129			1,2-Dichloroeth	ane-d4		77	47-137		
Toluene-d8	101	78-156									
Method Blank			097-09	-002-8,477	N/A	Air	GC/MS DD	N/A	04/28/0 14:39		090428L01
Parameter	Result	RL	<u>DF</u>	Qual	Parameter			Result	RL	DF	Qual
Benzene	ND	0.0016	1		Xylenes (total)				0.0087	1	
Toluene	ND	0.0019	1		Methyl-t-Butyl E	ther (MTB			0.0072	1	
Ethylbenzene	ND	0.0022	1			,	•		· -	•	
	ND	0.00	•								
Surrogates:	REC (%)	Control	•	Qual	Surrogates:		<u>R</u>	EC (%)	Control		Qual
	REC (%)	Control Limits	·		•				Control Limits		<u>Quai</u>
Surrogates: 1,4-Bromofluorobenzene Toluene-d8		Control	·		Surrogates: 1,2-Dichloroetha	ane-d4					<u>Quai</u>



RL - Reporting Limit , DF - Dilution Factor ,



Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation:

04/28/09 09-04-2453 N/A

Method:

EPA TO-3M

Project: ARCO 11109 Assessment

Page 1 of 1

Client Sample Number		Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11109ASYSINFMW5		09-04-2453-1-A	04/27/09 11:00	Air -	GC 38	N/A	04/28/09 13:26	090428L01
<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>			
Gasoline Range Organics (C6-C12)	3000	96	2.5		mg/m3			
11109AEFF		09-04-2453-2-A	04/27/09 10:55	Air	GC 38	N/A	04/28/09 12:42	090428L01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	ND	38	1		mg/m3			
11109ASYSINF		09-04-2453-4-A	04/27/09 16:55	Air	GC 38	N/A	04/28/09 14:42	090428L01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	1600	96	2.5		mg/m3			
Method Blank		099-12-685-132	N/A	Air	GC 38	N/A	04/28/09 08:49	090428L01
Parameter	<u>Result</u>	<u>RL</u>	DF	<u>Qual</u>	<u>Units</u>			
Gasoline Range Organics (C6-C12)	ND	38	1		mg/m3			



Quality Control - Duplicate

Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation: Method:

04/28/09 09-04-2453 N/A EPA TO-3M

Project: ARCO 11109 Assessment

Quality Control Sample !D	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
11109ASYSINFMW5	Air	GC 38	N/A	04/28/09	090428D01
Parameter	Sample Conc	DUP Conc	<u>RPD</u>	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	3000	2500	17	0-20	



Quality Control - LCS/LCS Duplicate

Stratus Environmental, inc.

3330 Cameron Park Drive, Suite 550

Cameron Park, CA 95682-8861

Date Received:

Work Order No:

N/A

09-04-2453

Preparation:

N/A

Method:

EPA TO-15

Project: ARCO 11109 Assessment

Quality Control Sample ID	Matrix	Inst	rument	Date Prepare	Da d Anal		LCS/LCSD Bate Number	h
097-09-002-8,477	Air	GC/I	VIS DD	N/A	04/28	3/09	090428L01	
<u>Parameter</u>	LCS	%REC	LCSD %	<u>REC</u>	%REC CL	RPD	RPD CL	Qualifiers
Benzene	99		104		60-156	5	0-40	
Toluene	101	l	106		56-146	5	0-43	
Ethylbenzene	106	6	109		52-154	2	0-38	
p/m-Xylene	103	3	100		42-156	3	0-41	
o-Xylene	106	3	104		52-148	2	0-38	



Glossary of Terms and Qualifiers

Work Order Number: 09-04-2453

O11:6:	
<u>Qualifier</u>	<u>Definition</u>
AX	Sample too dilute to quantify surrogate.
AZ	Surrogate recovery outside of acceptance limits due to matrix interference.
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.
ВН	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.
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.
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.
1H	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.

Work Order Number: 09-04-2453

Qualifier	<u>Definition</u>
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.
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.

BP/ARC Project Name: ARCO 11109 - Assessment

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Req Due Date (mm/dd/yy): Eff 24hrs&othersSTD_Rush TAT: Yes x No BP/ARC Facility No: 11109 Lab Work Order Number: Calscience Environmental Laboratories, Inc. Lab Name: BP/ARC Facility Address: 4280 Foothills Blvd Consultant/Contractor: Stratus Environmental, Inc. Lab Address: 7440 Lincoln Way, Garden Grove, CA 92841 City, State, ZIP Code: Oakland, California Consultant/Contractor Project No: E11109-01 Lab PM: Richard Villafania Lead Regulatory Agency: Alameda County Health Care Services Address: 3330 Cameron Park Dr., Suite 550, Cameron Park, CA 95682 Lab Phone: 714-895-5494 California Global ID No.: T0600100217 Consultant/Contractor PM: Jay Johnson Lab Shipping Acent: 9255 Enfos Proposal No: 000GK-0006 Phone: 530-676-6000 Lab Bottle Order No: Accounting Mode: Provision x OOC-BU OOC-RM Email EDD To: chuff@stratusinc.net Other Info: Stage: Select Activity: Feasibility Study Invoice To: BP/ARC_x_ Contractor_ BP/ARC EBM; Paul Supple Matrix No. Containers / Preservative Requested Analyses **Turnaround Time** Report Type & QC Level EBM Phone: 925-275-3801 Standard __x_ EBM Email: paul.supple@bp.com Full Data Package ____ Lab Water / Liquid Total Number Unpreserved Sample Description Soil / Solid Date No. Time Air / Vapor Methanol Comments Standard 24-hours HNO MTBE Note: If sample not collected, indicate "No BTEX GRO 모 Sample" in comments and single-strike out and initial any preprinted sample description. 11109AS4SINF "4 H 2709 Z 6-oxys include MTBE, TBA, TAME, DIPE, & ETBE. 11109 AS4SINF Hola 11109 A S45 INF 4 2704 1655 5 6 7 8 9 10 Sampler's Name: Beinguished By / Affiliation Date Time Accepted By / Affiliation Date Time Sampler's Company. Stratus Environmental, Inc. 42704 1600 042800 1030 ca Shipment Method: GSO Ship Date: H 2709 Shipment Tracking No: Special Instructions: Please cc results to bpedf@broadbentinc.com dy Seals In Place: Yes / No. Temp Blank: Yes / No Cooler Temp on Receipt: °F/C Trip Blank: Yes / No 106193555 MS/MSD Sample Submitted: Yes / No



WORK ORDER #: **09-04- 2 4 5 3**

Laboratories, Inc. SAMPLE RECEIPT FORM

Box Cooler (of /

CLIENT: Stratus DATE:	04128109
TEMPERATURE: (Criteria: 0.0 °C − 6.0 °C, not frozen) Temperature °C − 0.2 °C (CF) = °C □ Blank □ 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 □ Metals Only □ PCBs Only	□ Sample ng. Initial:
CUSTODY SEALS INTACT: Cooler	Initial: <u>M</u> Initial: <u>M</u>
SAMPLE CONDITION: 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 N/A
□ COC not relinquished. □ No date relinquished. □ No time relinquished. Sampler's name indicated on COC. □ Sample container label(s) consistent with COC. □ Sample container(s) intact and good condition. □	
Correct containers and volume for analyses requested. Analyses received within holding time. Proper preservation noted on COC or sample container.	
Volatile analysis container(s) free of headspace Tedlar bag(s) free of condensation CONTAINER TYPE:	
Solid: □4ozCGJ □8ozCGJ □16ozCGJ □Sleeve □EnCores® □TerraCores Water: □VOA □VOAh □VOAna₂ □125AGB □125AGBh □125AGBp □1AGB □ □500AGB □500AGJ □500AGJs □250AGB □250CGBs □1PB □ □250PB □250PBn □125PB □125PBznna □100PB □100PBna₂ □ □ □ Air: □1edlar® □Summa® □ Other: □ Checked/L Container: C: Clear A: Amber P: Plastic G: Glass J: Jar (Wide-mouth) B: Bottle (Narrow-mouth) Re	11AGBna₂ □1AGBs 1500PB □500PBna

SOP T100_090 (03/13/09)



May 04, 2009

Jay Johnson Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Subject:

Calscience Work Order No.:

09-04-2536

Client Reference:

ARCO 11109 - Assessment

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 4/29/2009 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental

Laboratories, Inc.

Richard Villafania

Richard Villar.

Project Manager



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Stratus Environmental, inc.	Date Received:	04/29/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-04 - 2536
Cameron Park, CA 95682-8861	Preparation:	N/A
	Method:	EPA TO-15
	Units:	mg/m3

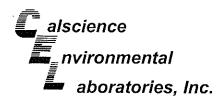
Project: ARCO 11109 - Assessment

Project: ARCO 1110	9 - Assessm	ent							F	age 1 of 2
Client Sample Number			La	ab Sample Number	Date/Time Collected	Matrix	Instrumen	Date Prepared	Date/Tim d Analyze	00 0-1-1-10
11109ASYSINFMW12			09-04-	2536-1-A	04/28/09 07:35	Air	GC/MS DE) N/A	04/29/09 17:37	9 090429L01
Parameter	<u>Result</u>	<u>RL</u>	<u>DF</u>	Qual	Parameter			Result	RL	DF Qual
Benzene	30	0.56	350		Xylenes (total)			17	3.0	350
Toluene	4.4	0.66	350		Methyi-t-Butyl I	Ether (MT	BE)	ND	2.5	350
Ethylbenzene	11	0.76	350							
Surrogates:	<u>REC (%)</u>	Control		Qual	Surrogates:			REC (%)	Control	Qual
1,4-Bromofluorobenzene Toluene-d8	84 95	<u>Limits</u> 57-129 78-156			1,2-Dichloroeth	ane-d4		67	<u>Limits</u> 47-137	
11109ASYSINF	- 50	70-130	09-04-	2536-3-A	04/27/09	Air	GC/MS DE	N/A	04/29/09	090429L01
					18:45				15:12	000 120201
Parameter	Result	RL	DF	Qual	Parameter			Result	RL	DF Qual
Benzene	14	0.24	150		Xylenes (total)			18	1.3	150
Toluene	7.4	0.28	150		Methyl-t-Butyl E	Ether (MTI	BE)	ND		150
Ethylbenzene	7.2	0.33	150		mounty, c Daty, c	-4101 (14111	50,	ND	1, 1	130
Surrogates:	REC (%)	Control Limits	100	Qual	Surrogates:			REC (%)	Control	<u>Qual</u>
1,4-Bromofluorobenzene	93	57-129			1,2-Dichloroeth	ono d4		74	<u>Limits</u>	
Toluene-d8	96	78-156			1,2-01611010601	ane-u4		74	47-137	
11109ASYSINF			00-04-	2536-4-A	04/28/09	Air	GC/MS DD	N/A	04/29/09	000400104
THOSAGTON			09-04-2	2030-4-A	13:35	All	GC/MS DD	N/A	16:01	090429L01
Parameter	Result	<u>RL</u>	DF	Qual	<u>Parameter</u>			Result	RL	DF Qual
Benzene	18	0.40	250		Xylenes (total)			29		250
Toluene	3.8	0.47	250		Methyl-t-Butyl E	ther (MT	3E)	ND		250
Ethylbenzene	15	0.54	250				•			
Surrogates:	<u>REC (%)</u>	Control Limits		Qual	Surrogates:			REC (%)	Control Limits	<u>Qual</u>
1,4-Bromofluorobenzene	87	57-129			1,2-Dichloroeth	ane-d4		70	47-137	
Toluene-d8	97	78-156								
11109ASYSINF			09-04-2	2536-5-A	04/28/09 17:15	Air	GC/MS DD	N/A	04/29/09 16:49	090429L01
S	. .	D:								
<u>Parameter</u>	<u>Result</u>	RL	<u>DF</u>	Qual	<u>Parameter</u>			<u>Result</u>	<u>RL</u>	<u>OF</u> Qual
Benzene 	20	0.45	280		Xylenes (total)			47		280
Foluene	5.5	0.53	280		Methyl-t-Butyl E	ther (MTE	3E)	ND	2.0	280
Ethylbenzene	23	0.61	280		_					
Surrogates:	<u>REC (%)</u>	Control Limits		<u>Qual</u>	Surrogates:		į	REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	90	57-129			1,2-Dichloroetha	ane-d4		69	47-137	
Foluene-d8	94	78-156								

RL - Reporting Limit

DF - Dilution Factor ,

Qual - Qualifiers



Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation: Method: Units:

04/29/09 09-04-2536 N/A

EPA TO-15 mg/m3

Project: ARCO 11109 - Assessment

Page 2 of 2

Client Sample Number				ab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepare	Date/T d Analya		QC Batch ID
Method Blank			097-09	0-002-8,479	N/A	Air	GC/MS DD	N/A	04/29 12:4		090429L01
Parameter	Result	<u>RL</u>	DF	Qual	<u>Parameter</u>			Result	RL	DF	Qual
Benzene	ND	0.0016	1		Xylenes (total)			ND	0.0087		***************************************
Toluene	ND	0.0019	1		Methyl-t-Butyl E	ther (MTE	BE)	ND	0.0072	1	
Ethylbenzene	ND	0.0022	1			•	,				
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:]	REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene Toluene-d8	92 95	57-129 78-156			1,2-Dichloroeth	ane-d4		88	47-137		



Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation: Method:

09-04-2536 N/A EPA TO-3M

04/29/09

Project: ARCO 11109 - Assessment

Page 1 of 1

Client Sample Number		Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11109ASYSINFMW12		09-04-2536-1-A	04/28/09 07:35	Air	GC 38	N/A	04/29/09 10:44	090429L01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	2600	120	2.5		mg/m3	·		
11109ASYSINF		09-04-2536-3-A	04/27/09 18:45	Air	GC 38	N/A	04/29/09 11:26	090429L01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	1700	120	2.5		mg/m3			
11109ASYSINF		09-04-2536-4-A	04/28/09 13:35	Air	GC 38	N/A	04/29/09 12:06	090429L01
Parameter	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	2600	120	2.5		mg/m3			
11109ASYSINF		09-04-2536-5-A	04/28/09 17:15	Air	GC 38	N/A	04/29/09 12:47	090429L01
Parameter	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	3200	120	2.5		mg/m3			
Method Blank		099-12-693-152	N/A	Air	GC 38	N/A	04/29/09 08:40	090429L01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>			
Gasoline Range Organics (C6-C12)	ND	50	1		mg/m3			



Quality Control - Duplicate

Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation: Method: 04/29/09 09-04-2536 N/A EPA TO-3M

Project: ARCO 11109 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
11109ASYSINF	Air	GC 38	N/A	04/29/09	090429D01
<u>Parameter</u>	Sample Conc	DUP Conc	<u>RPD</u>	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	3200	2900	8	0-20	



Quality Control - LCS/LCS Duplicate

aboratories, Inc.

Stratus Environmental, inc.

3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received:

Work Order No:

N/A 09-04-2536

Preparation:

N/A

Method:

EPA TO-15

Project: ARCO 11109 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared		ate lyzed	LCS/LCSD Bat Number	ch
097-09-002-8,479	Air	GC/MS DD	N/A	04/2	9/09	090429L01	
<u>Parameter</u>	LCS 9	6REC LCS	O %REC	%REC CL	<u>RPD</u>	RPD CL	Qualifiers
Benzene	93	g	8	60-156	5	0-40	
Toluene	91	9	7	56-146	7	0-43	
Ethylbenzene	95	11	02	52-154	7	0-38	
p/m-Xylene	90	g	6	42-156	7	0-41	
o-Xylene	91	g	7	52-148	6	0-38	



Glossary of Terms and Qualifiers

Work Order Number: 09-04-2536

Qualifier	<u>Definition</u>
AX	Sample too dilute to quantify surrogate.
AZ	Surrogate recovery outside of acceptance limits due to matrix interference.
ВА	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.
ВН	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.
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.
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.

Work Order Number: 09-04-2536

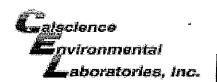
<u>Qualifier</u>	<u>Definition</u>
LR	LCS recovery below method control limits.
LW	Quantitation of unknown hydrocarbon(s) in sample based on gasoline.
LX	Quantitation of unknown hydrocarbon(s) in sample based on diesel.
MB	Analyte present in the method blank.
PC	Sample taken from VOA vial with air bubble > 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.

Atlantic Richfield

Laboratory Management Program LaMP Chain of Custody Record

Richfield		itory ma								_alv	ηP	Cha	iin												Page		of 1
Company		oject Name:				09 - ,	Asses	ssme	ent	-·			_	Re	q Du	e Dat	e (mn	n/dd/y	y): .	Eff	24h	rs&o	thers	STD RE	ish TAT: Y	∕es x	No.
C A BP affiliated company	BP/ARC Fa	cility No:	11	1109									_	Lai	b Wo	rk Or	der N	umbe	r: _		_(00	1-0	24-2	536)		
Lab Name: Calscience Environmental L			BF	P/ARC	Fac	ility A	ddres	s:	428	0 Foo	thills E	Blvd						Consi	₄ltant∕⊩	Cont				11	mental, Inc.		
Lab Address: 7440 Lincoln Way, Garden	Grove, CA 92841		Cit	ty, St	ate, Z	IP Co	ode:		Oak	dand,	Califo	rnia						Const	ultant/	Cont	racto	r Proje	ect No	11	109-01		
Lab PM: Richard Villafania			Lead Regulatory Agency									 			— <u>-</u> —			i.	50, Cameron								
Lab Phone: 714-895-5494	-		Ca	liforn	ia Glo	obal II	D No.:	:	T06	00100	J217							1						Johnson			JA 95682
Lab Shipping Accent: 9255			Enfos Proposal No: 000GK-0006								Phone			376-6		- Jay	I:										
Lab Bottle Order No:	Bottle Order No:				ting M	lode:		Pro	ovision	n X	00	OC-BU	 I	00	C-RN	A		 						1			
Other Info:			Sta	age:	Sel	ect						/ Study				·				10:				usinc.net			
BP/ARC EBM: Paul Supple			┪	M	atrix		No					serva		7	Rogi	ineto	d A n.	Invoic Llyses				**********	<u>x</u> _	11	ontractor		
EBM Phone: 925-275-3801			╁	T	Τ	T		Π	T	T	T	30114	l ve	-	Teg	Teste	u Ana	nyses	_	Tur	naro	und	Time	Re	port Type	& QC I	_evel
EBM Email: <u>paul.supple@bp.com</u>			1		-		ners												I						Standa	ard <u>x</u>	_
			-				Containers																	Full	Data Packaç	ge	_
Lab No. Sample Description	Date	Time	Soil / Solid	Water / Liquid	Air / Vapor		Total Number of C	Unpreserved	H ₂ SO ₄	HNO ₃	HCI	Methanol		GRO	втех	MTBE	5-oxys	Elhanol		24-hours	Standard			Sample" in	Commo	cled, indic	etrika oud
1 11109 ASKS INF MU	42889	0735			又		ユ		┢	┢		┪		$\frac{1}{}$	\v_	<u>≥</u>	ίĊ	ш		54				and initial a	any preprinted s	sample d	lescription.
2 11109 AS93 INF	42809	07356	1	1	X		Z		_		<u> </u>	<u> </u>		\vdash		/_			-		人	7.	/	 	lude MTBE,	TBA, TA	AME,
3 11109ASYS INF	42709	1845	\top		X		こス			_	_			X	X				-	\dashv	ÌΨ¢	rlU		DIPE, & E	ГВЕ. ———		
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10			\vdash	-				- $+$										_		_ _							
Sampler's Name: Chvis Hill		·	一	<u>ا</u>	/1 R	<u> </u>	uish	ed B	ν/Δ1	ffiliat									丄					!			
Sampler's Company: Stratus Environm	ental, Inc.		70	12	- [1] - [1]	hu	_		n Yz		-			Da		Tin 127		<u></u>	A	cce	pted	By/	Affili	ation	D	Pate	Tim b
Shipment Method: GSO	Ship Date: 🗸	2809	4		11	- 4		JIV	nte	<u> </u>			_	428	19	Por			Z_{ℓ}	4	€U	isc		LEC	04:	2909	1008
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pecial Instructions: Please cc results		entinc.com	<u> </u>														L										- 오
THIS LINE - LAB USE ONLY: Custo			7	Tor	Die 1			<u> </u>																			
	, and and	. rearing		emp	ciani	K: Yes	/ No		Cod	oler T	emp o	n Rece	eipt:			°F/C	ĺ	Trip Bi	ank: Y	es/	No		MS/N	MSD Samo	le Suhmittad		

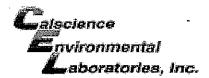
BPIARC LAMP COC Rev & 01/04/2000



SAMPLE RECEIPT FORM

Box -Cooler____ of ____

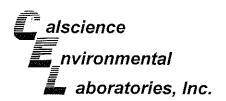
CLIENT: Stratus	DATE:	04/29/09
TEMPERATURE: (Criteria: 0.0 °C – 6.0 °C, not frozen)		
Temperature°C - 0.2°C (CF) =°C	Blank	☐ Sample
☐ Sample(s) outside temperature criteria (PM/APM contacted by:).		
☐ Sample(s) outside temperature criteria but received on ice/chilled on same da	ıy of sampli	ing.
□ Received at ambient temperature, placed on ice for transport by Coເ		<u>.</u>
Ambient Temperature: ☑ Air ☐ Filter ☐ Metals Only ☐ PCBs O		Initial: NC
CUSTODY SEALS INTACT:		
□ Cooler □ □ No (Not Intact) ☑ Not Present	□ N/A	Initial: _ K
□ Sample □ □ □ No (Not Intact) □ Not Present		Initial: <u>M</u>
SAMPLE CONDITION:	/ ₊ _	NI- NI/A
Chain-Of-Custody (COC) document(s) received with samples	es /	No N/A
COC document(s) received complete	/	
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.	k.	
☐ COC not relinquished. ☐ No date relinquished. ☐ No time relinquished.		
· · · · · · · · · · · · · · · · · · ·		
Sample container label(s) consistent with COC	_	
Sample container(s) intact and good condition		
Correct containers and volume for analyses requested		
Analyses received within holding time	_	
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	<u> </u>	
CONTAINER TYPE:		
Solid: □4ozCGJ □8ozCGJ □16ozCGJ □Sleeve □EnCores® □1	TerraCore	s® □
Water: □VOA □VOAh □VOAna₂ □125AGB □125AGBh □125AGBp □	□1AGB [∃1AGB na₂ □1AGBs
□500AGB □500AGJ □500AGJs □250AGB □250CGBs	□1PB []500PB
□250PB □250PBn □125PB □125PBznna □100PB □100PBna ₂ □		
Air: □Tedlar® □Summa® □ Other: □	Checked	/Labeled by: NC
Container: C: Clear A: Amber P: Plastic G: Glass J: Jar (Wide-mouth) B: Bottle (Narrow-mouth	h) R	leviewed by:



Laboratories, Inc. SAMPLE ANOMALY FORM

SAMPLE	S - CONTAIN	IERS & LA	BELS:		Comi	nents:		
□ Sampl □ Sampl □ Holdir □ Insuffi □ Impro □ No pre □ Sampl □ Sampl □ Sampl □ H □ P □ H □ Sampl □ L □ P □ L □ D □ L □ Cther:	les NOT RECI les received b ing time expire cient quantiti per container eservative not e labels illegi e labels do no ample ID Date and/or Ti roject Inform of containers e containers eaking broken Without Labels imple contain lat ery low in voi eaking (trans eaking (trans	EIVED but libut NOT LIS out NOT LIS od — list samples for analy (s)/preservated on COC ble — note te ot match CO me collecte ation s compromis ers compro	fy lab		ion time pe	ur label 10:30		
Sample #	Container ID(s)	# of Vials Received	Sample #	Container ID(s)	# of Vials Received	Sample #	Container ID(s)	# of RSK or CO ₂ or DO Received
Comments:								
*Transferred	at Client's requ	ıest.				Initial / Da	te	- 4/29/09

SOP T100_090 (03/13/09)



May 11, 2009

Jay Johnson Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Subject:

Calscience Work Order No.:

09-04-2681

Client Reference:

ARCO 11109 - Assessment

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 4/30/2009 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental

Laboratories, Inc.

Richard Villafania

Richard Vellas

Project Manager

04/30/09



Stratus Environmental, inc.

Analytical Report

Date Received:

	,				Date Neo	CIVCU.				04/00/03
3330 Cameron Park Drive, Suite 550				Work Order No:			09-04-2681			
Cameron Park, CA 95682-8861					Preparation:			N/A		
	+++.				Method:	0 11.			,	
									l	EPA TO-15
					Units:					mg/m3
Project: ARCO 11109	- Assessm	ent							F	Page 1 of 1
Client Sample Number				ib Sample Number	Date/Time Collected	Matrix	instrument	Date Prepared	Date/Tir I Analyze	000
11109ASYSINF (07:46)			09-04-	2681-1-A	04/29/09 07:46	Air	GC/MS K	N/A	04/30/0 16:12	9 090430L0
Parameter	Result	<u>RL</u>	DF	Qual	Parameter			Result	RL	DF Qual
Benzene	44	0.80	500		Xylenes (total)			160	4.3	500
Toluene	46	0.94	500		Methyl-t-Butyl E	ther (MTB	E)	ND	3.6	500
Ethylbenzene	47	1.1	500				·			
Surrogates:	<u>REC (%)</u>	<u>Control</u>		<u>Qual</u>	Surrogates:			REC (%)	Control	<u>Qual</u>
1.4 Duamashuanahamana	400	<u>Limits</u>			4.0.00:				<u>Limits</u>	
1,4-Bromofluorobenzene Toluene-d8	108 98	57-129 78-156			1,2-Dichloroeth	ane-d4		94	47-137	
11109ASYSINF (13:35)			09-04-2	2681-3-A	04/29/09 13:35	Air	GC/MS K	N/A	04/30/0 16:59	9 090430L0
<u>Parameter</u>	Result	<u>RL</u>	DF	Qual	Parameter			Result	RL	DF Qual
Benzene	34	0.80	500		Xylenes (total)			120	4.3	500
Toluene	34	0.94	500		Methyl-t-Butyl E	ther (MTB	E)	ND	3.6	500
Ethylbenzene	41	1.1	500		•	,	,			
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:			REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	110	57-129			1,2-Dichloroetha	ane-d4		94	47-137	
Toluene-d8	95	78-156				***************************************				
11109ASYSINF (17:30)			09-04-2	681-4-A	04/29/09 17:30	Air	GC/MS K	N/A	04/30/09 17:46	090430L0

1,4-Bromofluorobenzene Toluene-d8	112 95	57-129 78-156			1,2-Dichloroetl	nane-d4		93	47-137		
Method Blank			097-09	-002-8,483	N/A	Air	GC/MS K	N/A	04/30 13:3		090430L01
<u>Parameter</u>	Result	<u>RL</u>	DF	Qual	<u>Parameter</u>			Result	RL	<u>DF</u>	Qual
Benzene	ND	0.0016	1		Xylenes (total)			ND	0.0087	1	
Toluene	ND	0.0019	1		Methyl-t-Butyl I	Ether (MTBE	:)	ND	0.0072	1	
Ethylbenzene	ND	0.0022	1								
Surrogates:	<u>REC (%)</u>	Control Limits		<u>Qual</u>	Surrogates:			REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	93	57-129			1,2-Dichloroeth	nane-d4		97	47-137		

<u>Parameter</u>

Surrogates:

Xylenes (total)

Methyl-t-Butyl Ether (MTBE)

RL - Reporting Limit ,

DF - Dilution Factor

92

<u>Result</u>

29

29

36

REC (%)

Qual - Qualifiers

<u>DF</u>

500

500

500

<u>Qual</u>

<u>Qual</u>

RL

Control

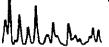
Limits

78-156

0.80

0.94

1.1



Toluene-d8

<u>Parameter</u>

Ethylbenzene

Surrogates:

Benzene

Toluene

Result

REC (%)

98

ND

RL

Control

Limits

4.3

3.6

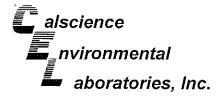
DF

500

500

Qual

<u>Qual</u>



Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation: Method: 04/30/09 09-04-2681 N/A

ЕРА ТО-3М

Project: ARCO 11109 - Assessment

Page 1 of 1

Client Sample Number		Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch II
11109ASYSINF (07:46)		09-04-2681-1-A	04/29/09 07:46	Air	GC 38	N/A	04/30/09 14:14	090430L01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qua!	<u>Units</u>			
Gasoline Range Organics (C6-C12)	7200	250	5		mg/m3			
11109ASYSINF (13:35)		09-04-2681-3-A	04/29/09 13:35	Air	GC 38	N/A	04/30/09 14:54	090430L01
Parameter	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	8600	250	5		mg/m3			
11109ASYSINF (17:30)		09-04-2681-4-A	04/29/09 17:30	Air	GC 38	N/A	04/30/09 15:32	090430L01
<u>Parameter</u>	Result	RL	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	8700	250	5		mg/m3			
Method Blank		099-12-693-151	N/A	Air	GC 38	N/A	04/30/09 08:45	090430L01
<u>Parameter</u>	Result	<u>RL</u>	DF	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	ND	50	1		mg/m3			



Quality Control - Duplicate

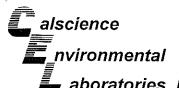
Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation: Method:

04/30/09 09-04-2681 N/A EPA TO-3M

Project: ARCO 11109 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
09-04-2683-2	Air	GC 38	N/A	04/30/09	090430D01
Parameter	Sample Conc	DUP Conc	<u>RPD</u>	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	1700	1800	2	0-20	



Quality Control - LCS/LCS Duplicate

aboratories, Inc.

Stratus Environmental, inc.

3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received:

Work Order No:

N/A 09-04-2681

Preparation:

N/A

Method:

EPA TO-15

Project: ARCO 11109 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Da Anal		LCS/LCSD Bate Number	ch
097-09-002-8,483	Air	GC/MS K	N/A	04/30	/09	090430L01	
<u>Parameter</u>	LCS %	REC LCSD	<u>%REC</u> %	SREC CL	RPD	RPD CL	Qualifiers
Benzene	107	113	i	60-156	5	0-40	
Toluene	117	117		56-146	0	0-43	
Ethylbenzene	130	131		52-154	0	0-38	
p/m-Xylene	127	128		42-156	0	0-41	
o-Xylene	129	129		52-148	0	0-38	



Glossary of Terms and Qualifiers

Work Order Number: 09-04-2681

Qualifier	Definition
AX	Sample too dilute to quantify surrogate.
AZ	Surrogate recovery outside of acceptance limits due to matrix interference.
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.
ВН	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.
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.
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.
ΙH	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.

Work Order Number: 09-04-2681

Qualifier	<u>Definition</u>
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.
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.

Laboratory Management Program LaMP Chain of Custody Record

(2681)	Pageo
4hrs&othersSTD	Ruch TAT: Vos

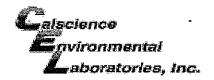
BP/ARC Project Name: ARCO 11109 - Assessment Req Due Date (mm/dd/yy): Eff 24 BP/ARC Facility No: 11109 Lab Work Order Number: Lab Name: Calscience Environmental Laboratories, Inc. BP/ARC Facility Address: 4280 Foothills Blvd Consultant/Contractor: Stratus Environmental, Inc. Lab Address: 7440 Lincoln Way, Garden Grove, CA 92841 City, State, ZIP Code: Oakland, California Consultant/Contractor Project No: E11109-01 Lab PM: Richard Villafania Lead Regulatory Agency: Alameda County Health Care Services Address: 3330 Cameron Park Dr., Suite 550, Cameron Park, CA 95682 Lab Phone: 714-895-5494 California Global ID No.: T0600100217 Consultant/Contractor PM; Jay Johnson Lab Shipping Acent: Enfos Proposal No: 000GK-0006 530-676-6000 Lab Bottle Order No: Accounting Mode: Provision X OOC-BU OOC-RM Email EDD To: chuff@stratusinc.net Other Info: Stage: Select Activity: Feasibility Study Invoice To: BP/ARC x Contractor____ BP/ARC EBM: Paul Supple Matrix No. Containers / Preservative Requested Analyses **Turnaround Time** Report Type & QC Level EBM Phone: 925-275-3801 Standard __x_ EBM Email: paul.supple@bp.com Full Data Package ____ ₽ Lab Water / Liquid Total Number Unpreserved Sample Description Date No. Time Sail / Solid Air / Vapor Comments 24-hours Standard Note: If sample not collected, indicate "No GRO 딮 Sample" in comments and single-strike out and initial any preprinted sample description. 6-oxys include MTBE, TBA, TAME, 2 DIPE, & ETBE. 1109 ASYS JNF 42909 フ 5 6 7 8 9 10 Sampler's Name: Refined By / Affiliation Date Time Accepted By / Affiliation Time Sampler's Company: Stratus Environmental, Inc. Shipment Method: Ship Date: 4 29.09 4/30/09 GSO Shipment Tracking NGS0105748989 ∞ Special Instructions: Please cc results to bpedf@broadbentinc.com THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No Temp Blank: Yes / No

Cooler Temp on Receipt:

°F/C

Trip Blank: Yes / No

MS/MSD Sample Submitted: Yes / No



WORK ORDER #: **09-** ☐ ☐ - ☐ [8] [8] [7]

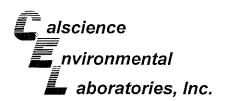
SAMPLE RECEIPT FORM

Bo⊁ Gooler / of /

CLIENT: STRATUS	DATE: <u>04</u>	7 1 30 109
TEMPERATURE: (Criteria: 0.0 °C – 6.0 °C, not frozen)		
00 000	□ Blank	☐ Sample
☐ Sample(s) outside temperature criteria (PM/APM contacted by:).		-
	lay of sampling	I.
TEMPERATURE: (Criteria: 0.0 °C - 6.0 °C, not frozen) Temperature °C - 0.2 °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 amblent temperature, placed on ice for transport by Courier. Ambient Temperature:		
		-
· ,	- 11/A	<i>D</i> C
		*
☐ Sample ☐ ☐ ☐ NO (NOT III.act) ☑ NOT Fleseit		Initial: <u>بد</u>
SAMPLE CONDITION:	Yes	No N/A
Chain-Of-Custody (COC) document(s) received with samples		
COC document(s) received complete	. Д	
	,	
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,	/	
	•	
·	•	
	,	
☐ Unpreserved vials received for Volatiles analysis		
·	/	
Solid: □4ozCGJ □8ozCGJ □16ozCGJ □Sleeve □EnCores® □]TerraCores®	
Water: □VOA □VOAh □VOAna₂ □125AGB □125AGBh □125AGBp	□1AGB □1/	AGB na₂ □1AGBs
□250PB □250PBn □125PB □125PB znna □100PB □100PB na₂ □		🗆
Air: / Tedlar Summa Other: C: Clear A: Amber P: Plastic G: Glass J: Jar (Wide-mouth) B: Bottle (Narrow-mouth)	Checked/La	beled by: YL
Container: C: Clear A: Amber P: Plastic G: Glass J: Jar (Wide-mouth) B: Bottle (Narrow-mout Preservative: h: HCL n: HNO3 na ₂ :Na ₂ S ₂ O ₃ Na: NaOH p: H ₃ PO ₄ s: H ₂ SO ₄ znna: ZnAc ₂ +NaOH f: F	th) Revi	newed by: W.S.C.

The state of the s

SOP T100_090 (03/13/09)



May 11, 2009

Jay Johnson Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Subject: Calscience Work Order No.:

09-05-0074

Client Reference:

ARCO 11109 - Assessment

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 5/1/2009 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

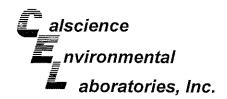
Calscience Environmental

Laboratories, Inc.

Richard Villafania

Richard Veller).

Project Manager



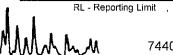
Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation: Method: Units: 05/01/09 09-05-0074 N/A

EPA TO-15M mg/m3

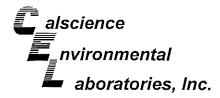
Project: ARCO 11109 - Assessment

Page 1 of 1

Troject. ANCO TITO:	7,0000011	Ont								Page 1 of 1
Client Sample Number				ab Sample Number	Date/Time Collected	Matrix	Instrumen	Date Prepared	Date/Tin	0000000
11109ASYSINF (07:07)			09-05-	0074-1-A	04/30/09 07:07	Air	GC/MS ZZ	. N/A	05/01/0 15:45	
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Parameter</u>			Result	RL	DF Qual
Benzene	14	0.40	250		Xylenes (total)			57	2.2	250
Toluene	18	0.47	250		Methyl-t-Butyl I	Ether (MTI	BE)	ND	1.8	250
Ethylbenzene	18	0.54	250			,	•			200
Surrogates:	<u>REC (%)</u>	Control Limits		<u>Qual</u>	Surrogates:			REC (%)	Control Limits	<u>Qual</u>
1,4-Bromofluorobenzene	106	57-129			1,2-Dichloroeth	nane-d4		105	47-137	
Toluene-d8	102	78-156								
11109ASYSINF (13:01)			09-05-0	0074-3-A	04/30/09 13:01	Air	GC/MS ZZ	N/A	05/01/0 16:29	9 090501L01
<u>Parameter</u>	Result	RL	DF	Qual	Parameter			Result	<u>RL</u>	DF Qual
Benzene	13	0.40	250		Xylenes (total)			78	2.2	250
Toluene	23	0.47	250		Methyl-t-Butyl E	Ether (MTE	3F)	ND	1.8	250
Ethylbenzene	23	0.54	250				,		1.0	200
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:			REC (%)	Control Limits	Qual
1,4-Bromofluorobenzene	100	57-129			1.2-Dichloroeth	ane-d4		90	47-137	
Foluene-d8	95	78-156			.,			00	47-107	
11109ASYSINF (17:00)			09-05-0	074-4-A	04/30/09 17:00	Air	GC/MS ZZ	N/A	05/01/09 17:12	9 090501L01
Parameter	Result	RL	DF	Qual	Parameter			Result	RL	DF Qual
Benzene	14	0.40	250		Xyienes (total)				2.2	250
Foluene -	24	0.47	250		Methyl-t-Butyl E	ther (MTF	RF)		1.8	250
Ethylbenzene	25	0.54	250				,	110	1.0	250
Surrogates:	REC (%)	Control Limits	200	<u>Qual</u>	Surrogates:			REC (%)	Control Limits	Qual
,4-Bromofluorobenzene	101	57-129			1,2-Dichloroeth	ane-d4		86	47-137	
Toluene-d8	93	78-156								
Method Blank			097-09	-002-8,487	N/A	Air	GC/MS ZZ	N/A	05/01/09 14:45	090501L01
Parameter	Result	RL	DF	Qual	Parameter			Result	RL	DF Qual
Benzene	ND	0.0016	1	Mari	Xylenes (total)					
oluene	ND	0.0019	1		Methyl-t-Butyl E	thor (NATE)E)		0.0087	1
Ethylbenzene	ND ND	0.0019	1		Medial-t-Dutal E	.u i e i (ivi i)L)	ND	0.0072	1
Surrogates:	REC (%)	Control	ı	Qual	Surrogates:			DEC (9/)	Cantral	O t
2011.030.03.	1150 (70)	Limits		<u>-xuai</u>	ourrogates.		1	REC (%)	Control Limits	<u>Quai</u>
,4-Bromofluorobenzene foluene-d8	98 100	57-129 78-156			1,2-Dichloroeth	ane-d4		110	47-137	
		.0 100								



DF - Dilution Factor ,



Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation: Method: 05/01/09 09-05-0074 N/A

EPA TO-3M

Project: ARCO 11109 - Assessment

Page 1 of 1

Client Sample Number		Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11109ASYSINF (07:07)		09-05-0074-1-A	04/30/09 07:07	Air	GC 38	N/A	05/01/09 14:53	090501L01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	3900	250	5		mg/m3			
11109ASYSINF (13:01)		09-05-0074-3-A	04/30/09 13:01	Air	GC 38	N/A	05/01/09 15:32	090501L01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	4000	250	5		mg/m3			
11109ASYSINF (17:00)		09-05-0074-4-A	04/30/09 17:00	Air	GC 38	N/A	05/01/09 16:12	090501L01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	4300	250	5		mg/m3			
Method Blank		099-12-693-153	N/A	Air	GC 38	N/A	05/01/09 08:54	090501L01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	ND	50	1		mg/m3			



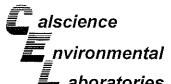
Quality Control - Duplicate

Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation: Method: 05/01/09 09-05-0074 N/A EPA TO-3M

Project: ARCO 11109 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
11109ASYSINF (17:00)	Air	· GC 38	N/A	05/01/09	090501D01
<u>Parameter</u>	Sample Conc	DUP Conc	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	4300	4200	3	0-20	

RPD - Relative Percent Difference , CL - Control Limit



aboratories, Inc.

Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation: Method: N/A 09-05-0074 N/A EPA TO-15M

Project: ARCO 11109 - Assessment

Quality Control Sample ID	Matrix	Instrum	Date nstrument Prepare			ate lyzed	LCS/LCSD Batc Number	n
097-09-002-8,487	Air	GC/MS	ZZ I	N/A	05/0	1/09	090501L01	
Parameter	LCS %	<u>6REC</u> <u>I</u>	CSD %REC	<u>%F</u>	REC CL	<u>RPD</u>	RPD CL	Qualifiers
Benzene	107	•	101	6	0-156	6	0-40	
Toluene	108		98	5	6-146	9	0-43	
Ethylbenzene	115		105	5	2-154	9	0-38	
p/m-Xylene	117		106	4	2-156	10	0-41	
o-Xylene	120		109	5	2-148	10	0-38	



Glossary of Terms and Qualifiers

Work Order Number: 09-05-0074

Qualifier	<u>Definition</u>
AX	Sample too dilute to quantify surrogate.
AZ	Surrogate recovery outside of acceptance limits due to matrix interference.
ВА	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.
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.
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.

Work Order Number: 09-05-0074

Qualifier	<u>Definition</u>
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.
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.



THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No

Laboratory Management Program LaMP Chain of Custody P

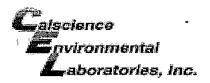
Richfield	_40010	cory mai	iay	CIII	CIIL	LIU	yı d.	III L	divi	<i> </i> \	JIId!	111	or C	us	toa	ук	ecor	Ci .				Р	age	_ of
Company	BP/ARC Pro	oject Name:	AR	CO 1	1109	- Asses	ssme	nt					Req	Due	Date	(mn	1/dd/yy):	Eff	24hr	s&ot	hers	STD_Rush TA		
O A BP affiliated company	BP/ARC Fa	cility No:	111	09			··						Lab	Wor	k Ord	ier N	umber:		\overline{C}			-0074	')	110_
ab Name: Calscience Environmental	Laboratories, Inc.		BP/	ARC .	Facility	Addres	s:	4280	Foot	thills B	lvd	_		····		_	Consulta	ı⊓t/Con	tractor			tus Environmental	Inc	
ab Address: 7440 Lincoln Way, Garder	n Grove, CA 92841		City	, Stat	e, ZIP	Code:		Oakl	and, (Califor	nia						Consulta						·	
ab PM: Richard Villafania	Richard Villafania				julatory	Agency	<i>y</i> ;	Alam	neda (County	/ Healti	h Car	e Sen	vices			·					Or., Suite 550, Can		CA OFCO
ab Phone: 714-895-5494			Cali	fomia	Globa	I ID No.:		T060	00100	217							Consulta						- Croff ark,	
ab Shipping Acent: 9255			Enf	os Pro	posal	No:	0000	3K-00	06								Phone:		676-6		,,			
ab Bottle Order No:		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Acc	ountir	ng Mod	e:	Pro	vision	X	00	C-BU		00	C-RM			Email E				tratú	sinc.net		
Other Info;			Sta	ge:	Select						Study					-	Invoice 1			7/ARC				
BP/ARC EBM: Paul Supple		· · · · · · · · · · · · · · · · · · ·	T	Ma	trix	N	o. Co	ntain	ers /	Pres	ervati	ive]	Regu	este	d An	alyses	_		und '			ype & QC	Lavel
EBM Phone: 925-275-3801			\vdash						Γ				\vdash	Ţ,				+	1	I	T	† — — — — — — — — — — — — — — — — — — —		
BM Email: <u>paul.supple@bp.com</u>]					Containers																!	Standard <u>x</u> Sackage	•
Lab No. Sample Description	Date	Time	Soil / Solid	Water / Liquid	Air / Vapor	Total Number of Co	Unpreserved	H ₂ SO,	HNO3	HCI	Methanol		GRO	втех	мтве	5-axys	Ethanoi	24-hours	Standard			Co Note: If sample no Sample* in comme and initial any prep	ents and single	-strike out
1 11109 AS45 IN		0707			X	2							人	7	义				V			6-oxys include M		
2 11109 A S45 IN	F 43064	1001			X	2	Ī											N	01	7	,	DIPE, & ETBE.		
3 11109 A 545 IN	F 43009	1301	Π		æ	12							X	X	K			//	V					
4 11109 A SYS INF	43004	1700			X	2							\searrow	×					L					
5															-			 		_				
6																		1		<u> </u>				
7																		\dagger		<u> </u>		<u>- </u>		·
8																		T		 				
9																	_	1-						
10							l -		<u> </u>									-		-		<u></u>		
ampler's Name: CNV15	16(Kej	inquis	hed I	3y / A	ffilia	tion			Da	ite	Tin	ne			epted	d Bv	/ Afřil	liation	Date	T -:-
ampler's Company: Stratus Enviro	nmental, Inc.		1	In	Till.	1	<i></i>			Fi	<u></u>		430	104	180	20			in					Time
nipment Method: GSO	Ship Date	3004		<i>-</i>	1-1/5	<u>.</u>		/_ _	se-				1//		100			-1/0	-w				050/09	103
hipment Tracking No:		<u> </u>	Γ			77800															· ·			
pecial Instructions: Please co resu	its to bpedf@broad	fbentinc.com	_										<u> </u>	!									1	<u> </u>

Cooler Temp on Receipt:

Temp Blank: Yes / No

MS/MSD Sample Submitted: Yes / No

Trip Blank: Yes / No



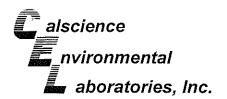
WORK ORDER #: **09-05-** □ □ □ □ □ □

Laboratories, Inc. SAMPLE RECEIPT FORM @

P Cooler O of O

CLIENT:	DATE: \(\frac{1}{2} \)	15/01	1 09
TEMPERATURE: (Criteria: 0.0 °C – 6.0 °C, not frozen)			
Temperature°C - 0.2°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 da	ay of sampli	ng.	
☐ Received at ambient temperature, placed on ice for transport by Co	-	·	
Ambient Temperature: ☑ Air ☐ Filter ☐ Metals Only ☐ PCBs C	Only	Initial: _	W
	-		
CUSTODY SEALS INTACT:			x /
☐ Cooler ☐ ☐ No (Not Intact) ☑ Not Present	□ N/A	Initial: _	M
□ Sample □ □ No (Not Intact) ☑ Not Present		Initial: _	
SAMPLE CONDITION:	Yes	No 1	ν 1/ Λ
Chain-Of-Custody (COC) document(s) received with samples	/	INO I	N/A □
COC document(s) received complete			_
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.		L	
☐ COC not relinquished. ☐ No date relinquished. ☐ No time relinquished. Sampler's name indicated on COC		_	
Sample container label(s) consistent with COC			
Sample container(s) intact and good condition	_		
Correct containers and volume for analyses requested			
· ·			
Proper preserved viols received for Veletiles analysis			
☐ Unpreserved vials received for Volatiles analysis Volatile analysis container(s) free of headspace		Г	_/
Tedlar bag(s) free of condensation			
CONTAINER TYPE:	- ^	@ <u>_</u>	
Solid:			
Water: □VOA □VOAh □VOAna₂ □125AGB □125AGBh □125AGBp		-	
□500AGB □500AGJ □500AGJs □250AGB □250CGBs □250CGBs			PBna
□250PB □250PBn □125PB □125PBznna □100PB □100PBna ₂ □			<u> </u>
Air: Tedlar® Summa® □ Other: □			175
Container: C: Clear A: Amber P: Plastic G: Glass J: Jar (Wide-mouth) B: Bottle (Narrow-moul Preservative: h: HCL n: HNO3 na ₂ :Na ₂ S ₂ O ₃ Na: NaOH p: H ₃ PO ₄ s: H ₂ SO ₄ znna: ZnAc ₂ +NaOH f: l	•	eviewed by: Scanned by:	1

SOP T100_090 (03/13/09)



May 11, 2009

Jay Johnson Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Subject:

Calscience Work Order No.:

Client Reference:

09-05-0121

ARCO 11109 - Assessment

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 5/2/2009 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

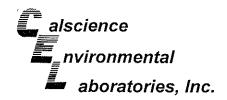
Calscience Environmental

Laboratories, Inc.

Richard Villafania

Richard Vellas

Project Manager



Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

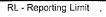
Date Received: Work Order No: Preparation: Method: Units: 05/02/09 09-05-0121 N/A

EPA TO-15M mg/m3

Project: ARCO 11109 - Assessment

Page 1 of 1

										. 49	CIOII
Client Sample Number				b Sample Number	Date/Time Collected	Matrix	Instrumen	Date t Prepared	Date/Ti i Analyz		QC Batch IE
11109ASYSINF (4/30 @ 19:05)			09-05-0)121-1-A	04/30/09 19:05	Air	GC/MS V	N/A	05/02/0 13:20		090502L01
Parameter	Result	<u>RL</u>	<u>DF</u>	Qual	Parameter			Result	RL	DF	Qual
Benzene	45	1.3	800		Xylenes (total)			130	6.9	800	
Toluene	36	1.5	800		Methyl-t-Butyl E	Ether (MTBI	E)	ND	5.8	800	
Ethylbenzene	44	1.7	800			•	•				
Surrogates:	REC (%)	Control Limits		<u>Qual</u>	Surrogates:			REC (%)	Control Limits		Quai
1,4-Bromofluorobenzene	103	57-129			1,2-Dichloroeth	ane-d4		101	47-137		
Toluene-d8	102	78-156									
11109ASYSINF (5/01 @ 01:00)			09-05-0	121-3-A	05/01/09 01:00	Air	GC/MS V	N/A	05/02/0 14:10		090502L01
Parameter	Result	RL	DF	Qual	Parameter			Result	RL	DF	Qual
Benzene	41	1.6	1000		Xylenes (total)			140	8.7	1000	
Toluene	42	1.9	1000		Methyl-t-Butyl E	ther /MTR	=1	ND	7.2	1000	
Ethylbenzene	49	2.2	1000		cary, c outyr c			110	1.2	1000	,
Surrogates:	REC (%)	Control Limits	1000	Qual	Surrogates:			REC (%)	Control Limits		Qual
1,4-Bromofluorobenzene	104	57-129			1.2-Dichloroeth	ane_d4		100	47-137		
Foluene-d8	104	78-156			.,			100	71-101		
11109ASYSINF (5/01 @ 05:00)			09-05-0	121-4-A	05/01/09 05:00	Air	GC/MS V	N/A	05/02/0 15:01		90502L01
Parameter	Result	RL	DF	Qual	Parameter			Resuit	<u>RL</u>	DF	Oursl
Benzene	46	_		Quai							<u>Qual</u>
Foluene	48	1.6 1.9	1000 1000		Xylenes (total)	Thee (MITTE		160 ND	8.7	1000	
Ethylbenzene	56	2.2	1000		Methyl-t-Butyl E	mier (IMT DE	=)	ND	7.2	1000	ı
Surrogates:	REC (%)	<u>Control</u>	1000	Qual	Surrogates:			REC (%)	Control		<u>Qual</u>
,4-Bromofluorobenzene	103	<u>Limits</u> 57-129			1,2-Dichloroeth	one dd		0.0	<u>Limits</u>		
oluene-d8	105	78-156			1,2*Dichioroeth	ane-u4		98	47-137		
Method Blank			097-09-	002-8,490	N/A	Air	GC/MS V	N/A	05/02/0 10:48		90502L01
Parameter	Result	RL	DF	Oual	Doromotor			D#	- Di		
Benzene	ND			<u>Qual</u>	Parameter Vulgaria (total)			Result	<u>RL</u>	<u>DF</u>	<u>Qual</u>
oluene Toluene	ND ND	0.0016	1		Xylenes (total)	ikas (NATOO	-\		0.0087	1	
	ND ND	0.0019	1		Methyl-t-Butyl E	aner (MTBE	-)	ND	0.0072	1	
thylbenzene		0.0022	1	Ougl	Cuero and			DEA (III)	a		
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:			REC (%)	Control		<u>Qual</u>
,4-Bromofluorobenzene	95	57-129			1.2-Dichloroetha	ano_d4		101	<u>Limits</u>		
oluene-d8	103	78-156			1,4-0101101081116	ai 16-04		101	47-137		
	.00	10 150									



DF - Dilution Factor ,



Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation:

Method:

05/02/09 09-05-0121 N/A

EPA TO-3M

Project: ARCO 11109 - Assessment

Page 1 of 1

	Lab Sample	Date/Time					
	Number	Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
	09-05-0121-1-A	04/30/09 19:05	Air	GC 38	N/A	05/02/09 11:57	090502L01
<u>sult</u>	RL	<u>DF</u>	Qual	<u>Units</u>			
000	250	5		mg/m3			
	09-05-0121-3-A	05/01/09 01:00	Air	GC 38	N/A	05/02/09 12:35	090502L01
<u>sult</u>	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
000	250	5		mg/m3			
	09-05-0121-4-A	05/01/09 05:00	Air	GC 38	N/A	05/02/09 13:54	090502L01
<u>sult</u>	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
000	500	10		mg/m3			
	099-12-693-154	N/A	Air	GC 38	N/A	05/02/09 10:38	090502L01
sult	<u>RL</u>	<u>DF</u>	Quai	<u>Units</u>			
)	50	1		mg/m3			
	sult cooo	09-05-0121-1-A Sult RL 3000 250 09-05-0121-3-A Sult RL 000 250 09-05-0121-4-A Sult RL 000 500 099-12-693-154 Sult RL	09-05-0121-1-A 04/30/09 19:05 19:05 DE 2000 250 5 09-05-0121-3-A 05/01/09 01:00 Sult RL DE 000 250 5 09-05-0121-4-A 05/01/09 05:00 Sult RL DE 000 500 10 099-12-693-154 N/A Sult RL DE	09-05-0121-1-A 04/30/09 19:05 Air esult RL DE Qual 0000 250 5 09-05-0121-3-A 05/01/09 01:00 Air sult RL DE Qual 000 250 5 09-05-0121-4-A 05/01/09 05:00 Air sult RL DE Qual 000 500 10 099-12-693-154 N/A Air sult RL DE Qual	09-05-0121-1-A 04/30/09 19:05 Air GC 38 esult RL DF Qual Units 0000 250 5 mg/m3 09-05-0121-3-A 05/01/09 01:00 Air GC 38 sult RL DF Qual Units 000 250 5 mg/m3 09-05-0121-4-A 05/01/09 05:00 Air GC 38 sult RL DF Qual Units 000 500 10 mg/m3 099-12-693-154 N/A Air GC 38 sult RL DF Qual Units sult RL DF Qual Units	09-05-0121-1-A 04/30/09 19:05 Air GC 38 N/A sult RL DF Qual Units mg/m3 0000 250 5 mg/m3 09-05-0121-3-A 05/01/09 01:00 Air GC 38 N/A sult RL DF Qual Units mg/m3 000 250 5 mg/m3 09-05-0121-4-A 05/01/09 05:00 Air GC 38 N/A sult RL DF Qual Units mg/m3 000 500 10 mg/m3 N/A sult RL DF Qual Units sult RL DF Qual Units sult RL DF Qual Units	09-05-0121-1-A



Quality Control - Duplicate

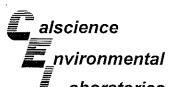
Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation: Method:

05/02/09 09-05-0121 N/A

EPA TO-3M

Project: ARCO 11109 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared:	Date Analyzed:	Duplicate Batch Number
11109ASYSINF (5/01 @ 05:00)	Air	GC 38	N/A	05/02/09	090502D01
Parameter	Sample Conc	DUP Conc	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	17000	16000	5	0-20	



aboratories, Inc.

Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation: Method:

N/A 09-05-0121 N/A EPA TO-15M

Project: ARCO 11109 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Instrument Prepared				>h
097-09-002-8,490	Air	GC/MS V	N/A	05/02	2/09	090502L01	
<u>Parameter</u>	LCS %	REC LCSD	%REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	105	10	3	60-156	2	0-40	
Toluene	103	10	3	56-146	0	0-43	
Ethylbenzene	110	11	0	52-154	0	0-38	
p/m-Xylene	112	11.	2	42-156	0	0-41	
o-Xylene	112	11.	2	52-148	0	0-38	



Glossary of Terms and Qualifiers

Work Order Number: 09-05-0121

Qualifier	<u>Definition</u>
AX	Sample too dilute to quantify surrogate.
AZ	Surrogate recovery outside of acceptance limits due to matrix interference.
ВА	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.
ВН	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.
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.
EY	Result exceeds normal dynamic range; reported as a min est.
GR	Internal standard recovery is outside method recovery limit.
ΙΒ	CCV recovery abovelimit; analyte not detected.
ΙΗ	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.

Work Order Number: 09-05-0121

Qualifier	<u>Definition</u>
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.
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.



Laboratory Management Program LaMP Chain of Custody Record

BP/ARC Project Name: ARCO 11109 - Assessment

	F	3
Page		of

Req Due Date (mm/dd/yy): Eff 2 hrs&othersSTD_Rush TAT: Yes_x_No

BP/ARC Facility No: 11109 Lab Work Order Number: A BP affiliated company 4280 Foothills Blvd Stratus Environmental, Inc. BP/ARC Facility Address: Consultant/Contractor: Calscience Environmental Laboratories, Inc. Lab Name: Oakland, California Lab Address: 7440 Lincoln Way, Garden Grove, CA 92841 City, State, ZIP Code: Consultant/Contractor Project No: E11109-01 Lead Regulatory Agency: Alameda County Health Care Services Address: 3330 Cameron Park Dr., Suite 550, Cameron Park, CA 95682 Richard Villafania Lab PM: T0600100217 Consultant/Contractor PM; Jay Johnson 714-895-5494 California Global ID No.: Lab Phone: 9255 Enfos Proposal No: 000GK-0006 530-676-6000 Lab Shipping Acent: OOC-RM Email EDD To: chuff@stratusinc.net OOC-BU Lab Bottle Order No: Accounting Mode: Provision X Activity: Feasibility Study Stage: Select BP/ARC x Contractor___ Other Info: Requested Analyses No. Containers / Preservative **Turnaround Time** Report Type & QC Level BPIARC EBM: Paul Supple Matrix EBM Phone: 925-275-3801 Standard __x_ of Containers paul.supple@bp.com Full Data Package _____ EBM Email: Water / Liquid Total Number Unpreserved Lab Soil / Solid Comments Sample Description Date Time Air / Vapor Methanol No. 24-hours Standard Ethanol Note: If sample not collected, indicate "No H,SO. MTBE BTEX GRO Sample" in comments and single-strike out Ξ and initial any preprinted sample description. 2 6-oxys include MTBE, TBA, TAME, 2 DIPE, & ETBE. 2 2 5 6 7 8 9 10 Resingatished By / Affiliation Time Accepted By / Affiliation Date 11/16 Time Sampler's Name: Sampler's Company: Stratus Environmental, Inc. Ship Date: 5/17/ Shipment Method: Shipment Tracking No: Please cc results to bpedf@broadbentinc.com Special Instructions: °F/C Temp Blank: Yes / No Trip Blank: Yes / No. MS/MSD Sample Submitted: Yes / No THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No Coaler Temp on Receipt:



WORK ORDER #: **09-05-** 回置置

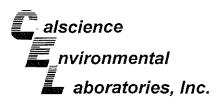
SAMPLE RECEIPT FORM

Box
Cooler / of /

CLIENT: Stratus	DATE: _	05/02	<u>-109</u>
TEMPERATURE: (Criteria: 0.0 °C – 6.0 °C, not frozen)			
T	☐ Blank	☐ Sample	Δ
☐ Sample(s) outside temperature criteria (PM/APM contacted by:).	— —	<u> </u>	-
☐ Sample(s) outside temperature criteria but received on ice/chilled on same da	lav of sampli	na	
☐ Received at ambient temperature, placed on ice for transport by Co		ıy.	
Ambient Temperature: ☐ Air ☐ Filter ☐ Metals Only ☐ PCBs C		Initial:	**

CUSTODY SEALS INTACT:			1
☐ Cooler ☐ ☐ No (Not Intact) ☐ Not Present	□ N/A	Initial:	8
☐ Sample ☐ ☐ No (Not Intact) ☐ Not Present		lnitial:	MISC
SAMPLE CONDITION:	V	N.L.	F 11 V
Chain-Of-Custody (COC) document(s) received with samples	Yes r⁄i	No	N/A
COC document(s) received complete	•		
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels.			
☐ COC not relinquished. ☐ No date relinquished. ☐ No time relinquished.	i		
Sample container label(s) consistent with COC			
Sample container label(s) consistent with COC			
Sample container(s) intact and good condition.			
Correct containers and volume for analyses requested			
Analyses received within holding time.			
Proper preservation noted on COC or sample container			Ø
☐ Unpreserved vials received for Volatiles analysis			
Volatile analysis container(s) free of headspace			Z
Tedlar bag(s) free of condensation	Ø		
CONTAINER TYPE:			
Solid: □4ozCGJ □8ozCGJ □16ozCGJ □Sleeve □EnCores® □			
Water: □VOA □VOAh □VOAna₂ □125AGB □125AGBh □125AGBp			
□500AGB □500AGJ □500AGJs □250AGB □250CGBs			
□250PB □250PBn □125PB □125PBznna □100PB □100PBna₂ □			
Air: ZÎTedlar® □Summa® □ Other: □	Checked/L	Labeled by: _ eviewed by: _	W.S.C
Container: C: Clear A: Amber P: Plastic G: Glass J: Jar (Wide-mouth) B: Bottle (Narrow-mouth) Preservative: h: HCL n: HNO3 na ₂ :Na ₂ S ₂ O ₃ Na: NaOH p: H ₃ PO ₄ s: H ₂ SO ₄ znna: ZnAc ₂ +NaOH f: F	h) Re	viewed by: _	<u>80</u> W.S.C.

The transfer of the second of



May 12, 2009

Jay Johnson Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Subject: Calscience Work Order No.:

09-04-2664

Client Reference:

ARCO 11109

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 4/30/2009 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental

Laboratories, Inc. Richard Villafania Project Manager

Richard Vellar.

NELAP ID: 03220CA

CSDLAC ID: 10109

SCAQMD ID: 93LA0830

FAX: (714) 894-7501



Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation:

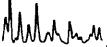
Method:

09-04-2664 EPA 5030B EPA 8015B (M)

04/30/09

Project: ARCO 11109							Pa	ige 1 of 2
Client Sample Number		Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11109WINF MW5		09-04-2664-1-E	04/27/09 11:05	Aqueous	GC 4	05/08/09	05/08/09 23:25	090508B01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	22000	1000	20		ug/L			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	113	38-134						
11109WINF MW5		09-04-2664-3-E	04/27/09 17:00	Aqueous	GC 4	05/08/09	05/08/09 23:58	090508B01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>			
Gasoline Range Organics (C6-C12)	4900	1000	20		ug/L			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	107	38-134						
11109WINF MW5		09-04-2664-4-E	04/27/09 18:30	Aqueous	GC 4	05/08/09	05/09/09 00:31	090508B01
<u>Parameter</u>	Result	<u>RL</u>	DF	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	3600	1000	20		ug/L			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	101	38-134						
11109WINF MW12		09-04-2664-5-E	04/28/09 07:30	Aqueous	GC 4	05/08/09	05/09/09 01:04	090508B01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	6400	1000	20		ug/L			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	110	38-134						

DF - Dilution Factor ,





Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation:

Method:

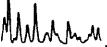
09-04-2664 EPA 5030B EPA 8015B (M)

04/30/09

Project: ARCO 11109							Pa	age 2 of 2
Client Sample Number		Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11109WINF		09-04-2664-7-E	04/28/09 13:30	Aqueous	GC 4	05/08/09	05/09/09 01:37	090508B01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	4500	1000	20		ug/L			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	107	38-134						
11109WINF		09-04-2664-8-E	04/28/09 17:40	Aqueous	GC 4	05/08/09	05/09/09 08:56	090508B01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	4900	1000	20		ug/L			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	119	38-134						
11109WINF		09-04-2664-9-E	04/29/09 07:50	Aqueous	GC 4	05/08/09	05/09/09 09:28	090508B01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	19000	1000	20		ug/L			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	106	38-134						
Method Blank		099-12-695-532	N/A	Aqueous	GC 4	05/08/09	05/08/09 13:31	090508B01
Parameter Parameter	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	ND	50	1		ug/L			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	95	38-134						

RL - Reporting Limit ,

DF - Dílution Factor ,





Stratus Environmental, inc.
3330 Cameron Park Drive, Suite 550
Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation: Method: Units:

09-04-2664 EPA 5030B EPA 8260B

04/30/09

EPA 8260B ug/L

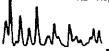
Project: ARCO 11109

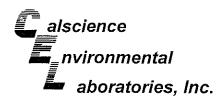
Page 1 of 4

Project: ARCO 11109										Pag	ge 1 of 4
Client Sample Number				ib Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepare	Date/1 d Analy		QC Batch ID
11109WINF MW5			09-04-	2664-1-A	04/27/09 11:05	Aqueous	GC/MS BE	05/05/09	05/06 07:0		090505L02
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Parameter</u>			Result	RL	<u>DF</u>	Qual
Benzene	710	10	20		Tert-Butyl Alc	ohol (TBA)		280	200	20	
Ethylbenzene	380	10	20		Diisopropyl Et			ND	10	20	
Toluene	430	10	20		Ethyl-t-Butyl E	ther (ETBE)		ND	10	20	
Xylenes (total)	2000	25	20		Tert-Amyl-Me	thyl Ether (T	AME)	ND	10	20	
Methyl-t-Butyl Ether (MTBE)	74	10	20		Ethanol	,	,	ND	6000	20	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:			REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	99	73-145			Dibromofluoro	methane		103	81-135		
Toluene-d8	99	83-119			1,4-Bromofluo	robenzene		98	74-110		
11109WINF MW5			09-04-2	2664-3-B	04/27/09 17:00	Aqueous	GC/MS BB	05/06/09	05/06 20:2		090506L01
Parameter	Result	<u>RL</u>	<u>DF</u>	Qual	Parameter			Result	RL	DF	Qual
Benzene	110	2.5	5		Tert-Butyl Alco	ohol (TBA)		200	50	- 5	
Ethylbenzene	53	2.5	5		Diisopropyl Etl	her (DIPE)		ND	2.5	5	
Toluene	61	2.5	5		Ethyl-t-Butyl E	, ,		ND	2.5	5	
Xylenes (total)	380	2.5	5		Tert-Amyl-Met	, ,	AME)	ND	2.5	5	
Methyl-t-Butyl Ether (MTBE)	10	2.5	5		Ethanol	,	_,	ND	1500	5	
Surrogates:	REC (%)	Control Limits	_	<u>Quai</u>	Surrogates:		İ	REC (%)	Control Limits	Ü	Qual
1.2-Dichloroethane-d4	97	73-145			Dibromofluoro	methane		95	81-135		
Toluene-d8	98	83-119			1,4-Bromofluo			110	74-110		
11109WINF MW5			09-04-2	2664-4-B	04/27/09 18:30		GC/MS BB		05/06 20:5		090506L01
Parameter	Result	RL	<u>DF</u>	Quai	<u>Parameter</u>			Result	RL	<u>DF</u>	Qual
Benzene	81	2.5	5		Tert-Butyl Alco	ohol (TBA)		200	50	 5	
Ethylbenzene	42	2.5	5		Diisopropyl Eth			ND	2.5	5	
Toluene	44	2.5	5		Ethyl-t-Butyl E			ND	2.5	5	
Xylenes (total)	250	2.5	5		Tert-Amyl-Met	. ,	AME)	ND	2.5	5	
Methyl-t-Butyl Ether (MTBE)	5.8	2.5	5		Ethanol	- (**	,	ND	1500	5	
Surrogates:	REC (%)	Control Limits	_	Qual	Surrogates:		<u> </u>	REC (%)	Control Limits	3	Qual
1,2-Dichtoroethane-d4	90	73-145			Dibromofluoro	methane		91	81-135		
Toluene-d8	94	83-119			1,4-Bromofluor	robenzene		88	74-110		



DF - Dilution Factor ,





Stratus Environmental, inc.	Date Received:	04/30/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-04-2664
Cameron Park, CA 95682-8861	Preparation:	EPA 5030B
	Method:	EPA 8260B
	Units:	ua/L

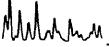
Project: ARCO 11109

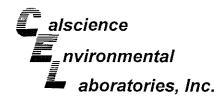
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										1 45	JC Z UI 4
Client Sample Number			L	ab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/T d Analy		QC Batch ID
11109WINF MW12			09-04	-2664-5-A	04/28/09 07:30	Aqueous	GC/MS BB	05/05/09	05/06 08:3		090505L02
<u>Parameter</u>	<u>Result</u>	RL	<u>DF</u>	Qual	Parameter			Result	RL	DF	Qual
Benzene	610	10	20		Tert-Butyl Aid	cohol (TBA)		ND	200	20	
Ethylbenzene	100	10	20		Diisopropyi E			ND	10	20	
Toluene	41	10	20		Ethyl-t-Butyl F)	ND	10	20	
Xylenes (total)	340	10	20		Tert-Amyl-Me	thyl Ether (T	AME)	ND	10	20	
Methyl-t-Butyl Ether (MTBE)	ND	10	20		Ethanol	· ·	,	ND	6000	20	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:		<u> </u>	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	97	73-145			Dibromofluoro	nmethane		102	81-135		
Toluene-d8	99	83-119			1.4-Bromofiuo			93	74-110		
11109WINF			09-04-	2664-7-B	04/28/09 13:30	·	GC/MS BB		05/06/ 21:2		090506L01
Parameter	Result	RL	DF	Qual	Parameter			Result	RL.	DF	Qual
Benzene	72	2.5	-5		Tert-Butyl Alc	obel (TRA)		100	<u>50</u>		Quui
Ethylbenzene	76	2.5	5		Diisopropyl Et	, ,		ND	2.5	5 5	
Toluene	12	2.5	5		Ethyl-t-Butyl E	• /		ND	2.5	5 5	
Xylenes (total)	210	2.5	5		Tert-Amyl-Me	,		ND	2.5	5	
Methyl-t-Butyl Ether (MT8E)	ND	2.5	5		Ethanol	aryr =arcr (1)	(1415)	ND	1500	5	
Surrogates:	REC (%)	Control	3	Qual	Surrogates:		<u> </u>	REC (%)	<u>Control</u>	5	Qual
1,2-Dichloroethane-d4	87	<u>Limits</u> 73-145			Dibromofluoro			00	<u>Limits</u>		
Toluene-d8	95	73-145 83-119			1,4-Bromofluo			90	81-135		
	ອບ	03-118			1,4-61011101100	***************************************		93	74-110		
11109WINF			09-04-	2664-8-B	04/28/09 17:40	Aqueous	GC/MS BB	05/06/09	05/06/ 21:5		090506L01
Parameter Parameter	Result	RL	<u>DF</u>	Qual	Parameter		2	Result	RL	DF	Qual
Benzene	62	5.0	10	<u> </u>	Tert-Butyl Alco	ohol (TRA)		100	100		Guar
Ethylbenzene	84	5.0	10		Diisopropyl Et	, ,		ND	5.0	10	
Toluene	13	5.0	10		Ethyl-t-Butyl E	, ,		ND	5.0 5.0	10 10	
Xylenes (total)	260	5.0	10		Tert-Amyl-Met	, ,	OME)	ND	5.0 5.0	10	
Methyl-t-Butyl Ether (MTBE)	ND	5.0	10		Ethanol	aryr Eurior (17	ivie.	ND	3000		
Surrogates:	REC (%)	Control	10	<u>Qual</u>	Surrogates:		E	REC (%)	Control	10	Qual
1,2-Dichloroethane-d4	89	<u>Limits</u> 73-145			Dibromofluoro	methane		92	<u>Limits</u> 81-135		
Toluene-d8	95	83-119			1.4-Bromofluo				74-110		
		50-113			i, rabioinondo	ODENZENE		<i>3</i> 0	74-11U		

RL - Reporting Limit

DF - Dilution Factor ,





Stratus Environmental, inc.	Date Received:	04/30/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-04-2664
Cameron Park, CA 95682-8861	Preparation:	EPA 5030B
	Method:	EPA 8260B
	Units:	ug/L

Project: ARCO 11109

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Troject. ARCO Trios										Paç	JE 3 01 4
Client Sample Number				ab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/≀ d Anaiy		QC Batch ID
11109WINF			09-04-	2664-9-A	04/29/09 07:50	Aqueous	GC/MS BB	05/05/09	05/06 04:2		090505L02
Parameter	Result	<u>RL</u>	DF	Qual	<u>Parameter</u>			Result	RL	DF	Qual
Benzene	1000	50	100		Tert-Butyl Alc	ohol (TBA)		ND	200	20	
Ethylbenzene	620	10	20		Diisopropyl El	ther (DIPE)		ND	10	20	
Toluene	780	10	20		Ethyl-t-Butyl E			ND	10	20	
Xylenes (total)	2700	50	20		Tert-Amyi-Me	thyl Ether (T.	AME)	ND	10	20	
Methyl-t-Butyl Ether (MTBE)	ND	10	20		Ethanol	• ,	•	ND	6000	20	
Surrogates:	REC (%)	Control		Qual	Surrogates:			REC (%)	Control		Qual
		Limits					•	,	Límits		
1,2-Dichloroethane-d4	98	73-145			Dibromofluoro	methane		100	81-135		
Toluene-d8	99	83-119			1,4-Bromofluc	probenzene		94	74-110		
Method Blank			099-12	2-703-864	N/A	Aqueous	GC/MS BB	05/06/09	05/06 13:0		090506L01
_											
<u>Parameter</u>	<u>Result</u>	<u>RL</u>	DF	<u>Qual</u>	<u>Parameter</u>			Result	<u>RL</u>	<u>DF</u>	<u>Qual</u>
Benzene	ND	0.50	1		Tert-Butyl Alc			ND	10	1	
Ethylbenzene	ND	0.50	1		Diisopropyl Et	her (DIPE)		ND	0.50	1	
Toluene	ND	0.50	1		Ethyl-t-Butyl E	ther (ETBE)		ND	0.50	1	
Xylenes (total)	ND	0.50	1		Tert-Amyl-Me	thyl Ether (T	AME)	ND	0.50	1	
Methyl-t-Butyl Ether (MTBE)	ND	0.50	1		Ethanol			ND	300	1	
Surrogates:	REC (%)	Control		<u>Qual</u>	Surrogates:		1	REC (%)	<u>Control</u>		<u>Qual</u>
		<u>Limits</u>							<u>Limits</u>		
1,2-Dichloroethane-d4	95	73-145			Dibromofluoro				81-135		
Toluene-d8	96	83-119			1,4-Bromofluo	robenzene		77	74-110		
Method Blank			099-12	-703-865	N/A	Aqueous	GC/MS BB	05/05/09	05/06/ 02:1		090505L02
Paramete <u>r</u>	Result	RL	DF	Qual	Parameter			Result	<u>RL</u>	DE	Qual
Benzene	ND	0.50		Gua	·	obol (TDA)					<u>Wuai</u>
			1		Tert-Butyl Alco	, ,		ND	10	1	
Ethylbenzene Column	ND ND	0.50	1		Diisopropyl Eti			ND	0.50	1	
Toluene		0.50	1		Ethyl-t-Butyl E	, ,	A B 41"")	ND	0.50	1	
(ylenes (total)	ND	0.50	1		Tert-Amyl-Met	ınyı Ether (TA	AME)	ND	0.50	1	
Methyl-t-Butyl Ether (MTBE)	ND	0.50	1	O	Ethanol				300	1	
Surrogates:	<u>REC (%)</u>	Control Limits		Qual	Surrogates:		<u> </u>	REC (%)	Control		<u>Qual</u>
.2-Dichloroethane-d4	100	Limits			Dibromeflus	mothers		00	<u>Limits</u>		
r,2-Dichloroethane-04 Foluene-d8	98	73-145 83-119			Dibromofluoro				81-135		
oldene-ud	30	00-119			1,4-Bromofluo	ODENZENE		79	74-110		

DF - Dilution Factor ,



Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation: Method: Units: 04/30/09 09-04-2664 EPA 5030B EPA 8260B

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Project: ARCO 11109

Client Sample Number				ab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepare	Date/T d Analyz		QC Batch ID
Method Blank			099-12	-703-866	N/A	Aqueous	GC/MS BB	05/06/09	05/07/ 01:3		090506L02
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Parameter</u>			Result	RL	<u>DF</u>	Qual
Benzene	ND	0.50	1	•	Tert-Butyl Alc	ohol (TBA)		ND	10	1	
Ethylbenzene	ND	0.50	1		Diisopropyl Et	her (DIPE)		ND	0.50	1	
Toluene	ND	0.50	1		Ethyl-t-Butyl E	ther (ETBE)		ND	0.50	1	
Xylenes (total)	ND	0.50	1		Tert-Amyl-Met	hyl Ether (Ta	AME)	ND	0.50	1	
Methyl-t-Butyl Ether (MTBE)	ND	0.50	1		Ethanol			ND	300	1	
Surrogates:	<u>REC (%)</u>	Control Limits		Qual	Surrogates:			REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	97	73-145			Dibromofluoro	methane		95	81-135		
Toluene-d8	96	83-119			1,4-Bromofluo	robenzene		84	74-110		



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Stratus Environmental, inc.

3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation: Method:

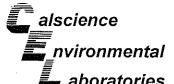
04/30/09 09-04-2664 EPA 5030B EPA 8015B (M)

Project ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared		Date Analyzed	MS/MSD Batch Number
09-05-0718-5	Aqueous	GC 4	05/08/09		05/08/09	090508\$01
<u>Parameter</u>	MS %REC	MSD %REC	%REC CL	<u>RPD</u>	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	99	104	38-134	5	0-25	

RPD - Relative Percent Difference ,

CL - Control Limit



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3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation:

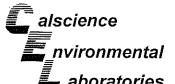
04/30/09 09-04-2664 EPA 5030B

Method:

EPA 8260B

Project ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared		Date Analyzed	MS/MSD Batch Number
09-05-0228-9	Aqueous	GC/MS BB	05/05/09		05/06/09	090505802
Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	104	105	86-122	1	0-8	
Carbon Tetrachloride	101	102	78-138	1	0-9	
Chlorobenzene	106	109	90-120	3	0-9	
1,2-Dibromoethane	101	105	70-130	3	0-30	
1,2-Dichlorobenzene	102	104	89-119	1	0-10	
1,1-Dichloroethene	97	97	52-142	0	0-23	
Ethylbenzene	105	105	70-130	0	0-30	
Toluene	101	109	85-127	8	0-12	
Trichloroethene	99	100	78-126	1	0-10	
Vinyl Chloride	92	97	56-140	6	0-21	
Methyl-t-Butyl Ether (MT8E)	91	93	64-136	1	0-28	
Tert-Butyl Alcohol (TBA)	103	104	27-183	1	0-60	
Diisopropyl Ether (DIPE)	93	93	78-126	0	0-16	
Ethyl-t-Butyl Ether (ETBE)	90	90	67-133	0	0-21	
Tert-Amyl-Methyl Ether (TAME)	90	89	63-141	1	0-21	
Ethanol	96	93	11-167	3	0-64	



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Stratus Environmental, inc.

3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No:

04/30/09 09-04-2664

Preparation:

EPA 5030B

Method:

EPA 8260B

Project ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared		Date Analyzed	MS/MSD Batch Number
09-05-0225-1	Aqueous	GC/MS BB	05/06/09		05/06/09	090506801
						-
<u>Parameter</u>	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	97	94	86-122	3	0-8	
Carbon Tetrachloride	87	87	78-138	1	0-9	
Chlorobenzene	92	92	90-120	1	0-9	
1,2-Dibromoethane	91	93	70-130	2	0-30	
1,2-Dichlorobenzene	95	95	89-119	0	0-10	
1,1-Dichloroethene	82	81	52-142	1	0-23	
Ethylbenzene	85	89	70-130	5	0-30	
Toluene	92	89	85-127	3	0-12	
Trichloroethene	93	89	78-126	3	0-10	
Vinyl Chloride	79	81	56-140	2	0-21	
Methyl-t-Butyl Ether (MTBE)	72	74	64-136	1	0-28	
Tert-Butyl Alcohol (TBA)	114	107	27-183	6	0-60	
Diisopropyl Ether (DIPE)	80	78	78-126	2	0-16	
Ethyl-t-Butyl Ether (ETBE)	77	77	67-133	0	0-21	
Tert-Amyl-Methyl Ether (TAME)	82	81	63-141	1	0-21	
Ethanol	96	93	11-167	4	0-64	



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Stratus Environmental, inc.

3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received:

Work Order No: Preparation:

09-04-2664 EPA 5030B

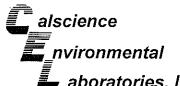
04/30/09

Method:

EPA 8260B

Project ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared		Date Analyzed	MS/MSD Batch Number
09-05-0209-1	Aqueou	s GC/MS BB	05/06/09		05/07/09	090506S02
<u>Parameter</u>	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	95	95	86-122	0	0-8	
Carbon Tetrachloride	86	90	78-138	4	0-9	
Chlorobenzene	92	98	90-120	7	0-9	
1,2-Dibromoethane	90	87	70-130	4	0-30	
1,2-Dichlorobenzene	94	95	89-119	1	0-10	
1,1-Dichloroethene	59	54	52-142	9	0-23	
Ethylbenzene	84	85	70-130	1	0-30	
Toluene	86	85	85-127	1	0-12	
Trichloroethene	89	90	78-126	1	0-10	
Vinyl Chloride	77	80	56-140	4	0-21	
Methyl-t-Butyl Ether (MTBE)	74	80	64-136	4	0-28	
Tert-Butyl Alcohol (TBA)	90	94	27-183	4	0-60	
Diisopropyl Ether (DIPE)	76	80	78-126	5	0-16	LN,AY
Ethyl-t-Butyl Ether (ETBE)	75	78	67-133	4	0-21	
Tert-Amyl-Methyl Ether (TAME)	79	80	63-141	1	0-21	
Ethanol	95	94	11-167	2	0-64	



aboratories, Inc.

Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550

Cameron Park, CA 95682-8861

Date Received: Work Order No:

N/A 09-04-2664

Preparation: **EPA 5030B** Method:

EPA 8015B (M)

Project: ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Da Prep		Da Anal		LCS/LCSD Batc Number	h
099-12-695-532	Aqueous	GC 4	05/08	3/09	05/08/09		090508B01	
<u>Parameter</u>	LCS %	GREC LCS	D %REC	%RE	C CL	RPD	RPD CL	Qualifiers
Gasoline Range Organics (C6-C12)	108	. 1	06	78-	120	1	0-20	



Stratus Environmental, inc.

3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received:

Work Order No:

N/A 09-04-2664

Preparation:

EPA 5030B

Method:

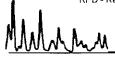
EPA 8260B

Project: ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Da Anal		LCS/LCSD Numbe	
099-12-703-865	Aqueous	GC/MS BB	05/05/09	05/06	/09	090505L	02
<u>Parameter</u>	LCS %REC	LCSD %REC	%REC CL	ME CL	RPD	RPD CL	Qualifiers
Benzene	94	94	87-117	82-122	0	0-7	
Carbon Tetrachloride	90	90	78-132	69-141	0	8-0	
Chlorobenzene	102	96	88-118	83-123	6	0-8	
1,2-Dibromoethane	96	95	80-120	73-127	1	0-20	
1,2-Dichlorobenzene	96	97	88-118	83-123	0	0-8	
1,1-Dichloroethene	88	86	71-131	61-141	3	0-14	
Ethylbenzene	98	97	80-120	73-127	1	0-20	
Toluene	91	90	85-127	78-134	1	0-7	
Trichloroethene	102	105	85-121	79-127	3	0-11	
Vinyl Chloride	87	88	64-136	52-148	1	0-10	
Methyl-t-Butyl Ether (MTBE)	83	84	67-133	56-144	0	0-16	
Tert-Butyl Alcohol (TBA)	91	93	34-154	14-174	2	0-19	
Diisopropyl Ether (DIPE)	83	83	80-122	73-129	0	8-0	
Ethyl-t-Butyl Ether (ETBE)	82	82	73-127	64-136	1	0-11	
Tert-Amyl-Methyl Ether (TAME)	84	85	69-135	58-146	1	0-12	
Ethanol	85	93	34-124	19-139	10	0-44	

Total number of LCS compounds: 16 Total number of ME compounds: 0 Total number of ME compounds allowed: 1

LCS ME CL validation result: Pass





Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation:

09-04-2664 EPA 5030B

N/A

Method:

EPA 8260B

Project: ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Dat Analy		LCS/LCSD E Number	
099-12-703-864	Aqueous	GC/MS BB	05/06/09	05/06/09		090506L0)1
<u>Parameter</u>	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
Benzene	93	94	87-117	82-122	2	0-7	
Carbon Tetrachloride	88	91	78-132	69-141	4	0-8	
Chlorobenzene	99	98	88-118	83-123	1	0-8	
1,2-Dibromoethane	88	97	80-120	73-127	10	0-20	
1,2-Dichlorobenzene	96	97	88-118	83-123	1	8-0	
1,1-Dichloroethene	84	87	71-131	61-141	3	0-14	
Ethylbenzene	96	98	80-120	73-127	2	0-20	
Toluene	91	93	85-127	78-134	3	0-7	
Trichloroethene	92	95	85-121	79-127	3	0-11	
Vinyl Chloride	83	86	64-136	52-148	4	0-10	
Methyl-t-Butyl Ether (MTBE)	80	86	67-133	56-144	8	0-16	
Tert-Butyl Alcohol (TBA)	90	91	34-154	14-174	1	0-19	
Diisopropyl Ether (DIPE)	77	84	80-122	73-129	8	0-8	LR
Ethyl-t-Butyl Ether (ETBE)	78	83	73-127	64-136	7	0-11	
Tert-Amyl-Methyl Ether (TAME)	82	88	69-135	58-146	7	0-12	
Ethanol	91	89	34-124	19-139	2	0-44	

Total number of LCS compounds: 16

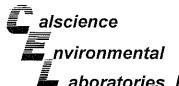
Total number of ME compounds: 1

Total number of ME compounds allowed:

LCS ME CL validation result: Pass



CL - Control Limit



aboratories, Inc.

Stratus Environmental, inc.

3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received:

Work Order No:

N/A 09-04-2664

EPA 5030B

Preparation: Method:

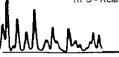
EPA 8260B

Project: ARCO 11109

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Da Analy		LCS/LCSD Numbe	
099-12-703-866	Aqueous	GC/MS BB	05/06/09	05/06/	09	090506L	02
Parameter	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
Benzene	90	94	87-117	82-122	4	0-7	
Carbon Tetrachloride	85	89	78-132	69-141	4	0-8	
Chlorobenzene	96	100	88-118	83-123	3	0-8	
1,2-Dibromoethane	86	94	80-120	73-127	9	0-20	
1,2-Dichlorobenzene	94	98	88-118	83-123	4	0-8	
1,1-Dichloroethene	82	87	71-131	61-141	5	0-14	
Ethylbenzene	94	96	80-120	73-127	2	0-20	
Toluene	90	92	85-127	78-134	3	0-7	
Trichloroethene	103	104	85-121	79-127	1	0-11	
Vinyl Chloride	88	89	64-136	52-148	1	0-10	
Methyl-t-Butyl Ether (MTBE)	81	85	67-133	56-144	5	0-16	
Tert-Butyl Alcohol (TBA)	89	90	34-154	14-174	1	0-19	
Diisopropyl Ether (DIPE)	79	83	80-122	73-129	5	0-8	LR
Ethyl-t-Butyl Ether (ETBE)	78	83	73-127	64-136	6	0-11	
Tert-Amyl-Methyl Ether (TAME)	83	85	69-135	58-146	3	0-12	
Ethanol	88	82	34-124	19-139	7	0-44	

Total number of LCS compounds: 16 Total number of ME compounds: 1 Total number of ME compounds allowed:

LCS ME CL validation result: Pass





Glossary of Terms and Qualifiers

Work Order Number: 09-04-2664

Qualifier	<u>Definition</u>
AX	Sample too dilute to quantify surrogate.
AZ	Surrogate recovery outside of acceptance limits due to matrix interference.
ВА	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.
ВН	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.
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.
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.

Work Order Number: 09-04-2664

<u>Qualifier</u>	<u>Definition</u>
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.
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.



Laboratory Management Program LaMP Chain of Custody Record

BP/ARC Project Name: ARCO 11109 - Assessment

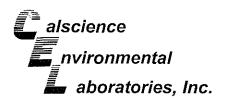
Req Due Date (mm/dd/yy): Eff 24hrs&othersSTD Rush TAT: Yes _x No O A BP affiliated company BP/ARC Facility No: 11109 Lab Work Order Number: Lab Name: Calscience Environmental Laboratories, Inc. BP/ARC Facility Address: 4280 Foothills Blvd Consultant/Contractor: Stratus Environmental, Inc. Lab Address: 7440 Lincoln Way, Garden Grove, CA 92841 City, State, ZIP Code: Oakland, California Consultant/Contractor Project No: E11109-01 Lab PM; Richard Villafania Lead Regulatory Agency: Alameda County Health Care Services Address: 3330 Cameron Park Dr., Suite 550, Cameron Park, CA 95682 Lab Phone: 714-895-5494 California Global ID No.: T0600100217 Consultant/Contractor PM: Jay Johnson Lab Shipping Acent: Enfos Proposal No: 000GK-0006 Phone: 530-676-6000 Lab Bottle Order No: Accounting Mode: Provision x OOC-BU OOC-RM Email EDD To: chuff@stratusinc.net Other Info: Stage: Select Activity: Feasibility Study Invoice To: BP/ARC_ x Contractor BP/ARC EBM: Paul Supple Matrix No. Containers / Preservative Requested Analyses **Turnaround Time** Report Type & QC Level EBM Phone: 925-275-3801 Standard __x_ EBM Email: paul.supple@bp.com Full Data Package _____ õ Lab Water / Liquid Total Number Unpreserved Sample Description Date Time No. Soil / Solid Air / Vapor Comments Methanol Standard Note: if sample not collected, indicate "No Ξ Sample" in comments and single-strike out and initial any preprinted sample description. 09WINFMU5 42709 6-oxys include MTBE, TBA, TAME. 109 WINF MUS 42709 DIPE, & ETBE. 1109 W INF MAS 42704 X 1109 W INF Mus 42709 42509 X X ሂ 父 Sampler's Name: Relinquished By / Affiliation Date Time Accepted By / Affiliation Time Date Sampler's Company Stratus Environmental, Inc. 42909 1800 Ö Shipment Method: Ship Date: 4 29 09 4/30/09 Shipment Tracking No: 105748990 0 Special Instructions: ாங்கையீட் results to opeoi@அம்adbenting com 9 THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No Temp Blank: Yes / No. Cooler Temp on Receipt: °F/C Trip Blank: Yes / No MS/MSD Sample Submitted Yes / No

-gişclence nvironmental

SAMPLE RECEIPT FORM | Cooler 1 of /

CLIENT: Stratus	DATE:	4 130109
TEMPERATURE: (Criteria: 0.0 °C − 6.0 °C, not frozen) Temperature 3 • 3 °C − 0.2 °C (CF) = 3 • 1 °C □ Sample(s) outside temperature criteria (PM/APM contacted by:). □ Sample(s) outside temperature criteria but received on ice/chilled on same of the contacted at ambient temperature, placed on ice for transport by Contacted at ambient temperature, placed on ice for transport by Contacted at ambient temperature, placed on ice for transport by Contacted at ambient temperature, placed on ice for transport by Contacted at ambient temperature, placed on ice for transport by Contacted at ambient temperature, placed on ice for transport by Contacted at ambient temperature, placed on ice for transport by Contacted at ambient temperature.		☐ Sample ing.
Ambient Temperature: ☐ Air ☐ Filter ☐ Metals Only ☐ PCBs		Initial:
CUSTODY SEALS INTACT: □ Cooler □ □ □ No (Not Intact) ✓ Not Present □ Sample □ □ No (Not Intact) ✓ Not Present		Initial: 2/ Initial: 7,/
SAMPLE CONDITION:	Yes	No N/A
Chain-Of-Custody (COC) document(s) received with samples	🗹	
COC document(s) received complete	Ø	
☐ Collection date/time, matrix, and/or # of containers logged in based on sample labels	i.	
☐ COC not relinquished. ☐ No date relinquished. ☐ No time relinquished.		
Sampler's name indicated on COC	. 🗷	
Sample container label(s) consistent with COC	. ø	
Sample container(s) intact and good condition	Ø	
Correct containers and volume for analyses requested	Ø	
Analyses received within holding time	Ø	
Proper preservation noted on COC or sample container	. 🛮	
☐ Unpreserved vials received for Volatiles analysis		
Volatile analysis container(s) free of headspace	. d	
Tedlar bag(s) free of condensation	. 🗆	
CONTAINER TYPE:		
Solid:	∃TerraCore	s [®] □
Water: □VOA ☑VÖ́Ah □VOAna₂ □125AGB □125AGBh □125AGBp	□1AGB [□1AGBna₂ □1AGBs
□500AGB □500AGJ □500AGJs □250AGB □250CGB □250CGBs		
□250PB □250PBn □125PB □125PBznna □100PB □100PBna ₂ □_		
Air: □Tedlar [®] □Summa [®] □ Other: □	Checked	/Labeled by: ワル
Container: C: Clear A: Amber P: Plastic G: Glass J: Jar (Wide-mouth) B: Bottle (Narrow-mo	uth)" R	eviewed by:
Preservative: h: HCL n: HNO3 na2:Na2S2O3 Na: NaOH p: H3PO4 s: H2SO4 znna: ZnAc2+NaOH f	: Field-filtered	Scanned by: ブン

The state of the s



May 14, 2009

Jay Johnson Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Subject: Calscience Work Order No.:

09-05-0124

Client Reference:

ARCO 11109 - Assessment

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 5/2/2009 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

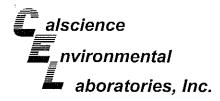
Calscience Environmental

Laboratories, Inc.

Richard Villafania

Richard Vellas.

Project Manager



Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation: Method:

09-05-0124 EPA 5030B EPA 8015B (M)

05/02/09

Project: ARCO 11109 - Ass					Pa	age 1 of 3		
Client Sample Number		Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11109WINF (13:30)		09-05-0124-1-E	04/29/09 13:30	Aqueous	GC 4	05/12/09	05/13/09 01:31	090512B01
<u>Parameter</u>	Result	RL	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	20000	1000	20		ug/L			
Surrogates:	REC (%)	Control Limits		<u>Qual</u>				
1,4-Bromofluorobenzene	107	38-134						
11109WINF (17:35)		09-05-0124-2-E	04/29/09 17:35	Aqueous	GC 4	05/12/09	05/13/09 02:04	090512B01
<u>Parameter</u>	Result	<u>RL</u>	DF	<u>Qual</u>	<u>Units</u>			
Gasoline Range Organics (C6-C12)	15000	1000	20		ug/L			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	116	38-134						
11109WINF (07:05)		09-05-0124-3-E	04/30/09 07:05	Aqueous	GC 4	05/12/09	05/13/09 02:37	090512B01
Parameter	Result	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>			
Gasoline Range Organics (C6-C12)	4500	1000	20		ug/L			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	102	38-134						
11109WINF (13:03)		09-05-0124-5-E	04/30/09 13:03	Aqueous	GC 4	05/12/09	05/13/09 03:43	090512B01
Parameter	Result	RL.	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	3900	1000	20		ug/L			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	105	38-134						



DF - Dilution Factor ,



Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation: Method:

05/02/09 09-05-0124 **EPA 5030B** EPA 8015B (M)

Project: ARCO 11109 - Ass	essment						Pa	ige 2 of 3
Client Sample Number		Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
11109WINF (17:05)		09-05-0124-6-E	04/30/09 17:05	Aqueous	GC 4	05/12/09	05/13/09 04:16	090512B01
<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	3700	1000	20		ug/L			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	92	38-134						
11109WINF (19:15)		∙09-05-0124-7-E	04/30/09 19:15	Aqueous	GC 4	05/12/09	05/13/09 04:49	090512B01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	19000	1000	20		ug/L			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	106	38-134						
11109WINF (01:05)		09-05-0124-9-E	05/01/09 01:05	Aqueous	GC 4	05/12/09	05/13/09 05:21	090512B01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	<u>Quai</u>	<u>Units</u>			
Gasoline Range Organics (C6-C12)	46000	1000	20		ug/L			
Surrogates:	REC (%)	Control Limits		<u>Qual</u>				
1,4-Bromofiuorobenzene	129	38-134						
11109WINF (05:05)		09-05-0124-10-E	05/01/09 05:05	Aqueous	GC 4	05/12/09	05/13/09 05:54	090512B01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Units</u>			
Gasoline Range Organics (C6-C12)	25000	1000	20		ug/L			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	90	38-134						

RL - Reporting Limit ,

DF - Dilution Factor ,

Qual - Qualifiers





Stratus Environmental, inc.

3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received:

Work Order No:

Preparation: Method:

05/02/09

09-05-0124 EPA 5030B

EPA 8015B (M)

Project: ARCO 11109 - Assessment

Page 3 of 3

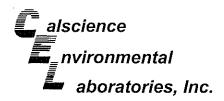
Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID	
Method Blank		099-12-695-535	N/A	Aqueous	GC 4	05/12/09	05/12/09 18:23	090512B01
Parameter	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Units</u>			
Gasoline Range Organics (C6-C12)	ND	50	1		ug/L			
Surrogates:	REC (%)	Control Limits		Qual				
1,4-Bromofluorobenzene	97	38-134						



Stratus Environmental, inc.	Date Received:	05/02/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-05-0124
Cameron Park, CA 95682-8861	Preparation:	EPA 5030B
	Method:	EPA 8260B
	Units:	ug/L
Project: APCO 11100 Assessment		D 4 64

Ρ	age	1	of	4

Project: ARCO 11109	- 400600111	CIIL								ıας	je 1 of 4
Client Sample Number				ab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/T i Analy:		QC Batch ID
11109WINF (13:30)			09-05-	0124-1-B	04/29/09 13:30	Aqueous	GC/MS BB	05/09/09	05/09 17:1		090509L01
Parameter	Result	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Parameter</u>			Result	RL	DF	Qual
Benzene	260	10	20		Tert-Butyl Alco	ohol (TBA)		ND	200	20	
Ethylbenzene	180	10	20		Diisopropyl Etl			ND	10	20	
Toluene	210	10	20		Ethyl-t-Butyl E			ND	10	20	
Xylenes (total)	830	10	20		Tert-Amyl-Met	hyl Ether (T	AME)	ND	10	20	
Methyl-t-Butyl Ether (MTBE)	ND	10	20		Ethanol	•	•	ND	6000	20	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:			REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	93	73-145			Dibromofluoro	methane		100	81-135		
Toluene-d8	97	83-119			1,4-Bromofluo	robenzene		95	74-110		
11109WINF (17:35)			09-05-	0124-2-B	04/29/09 17:35	Aqueous	GC/MS BB	05/09/09	05/09/ 17:5		090509L01
Parameter	<u>Result</u>	<u>RL</u>	DF	Qual	<u>Parameter</u>			Result	RL	DF	Qual
Benzene	160	10	20		Tert-Butyl Alco	ohol (TBA)		ND	200	20	
Ethylbenzene	130	10	20		Diisopropyl Eth	, ,		ND	10	20	
Toluene	140	10	20		Ethyl-t-Butyl E	ther (ETBE)		ND	10	20	
Xylenes (total)	620	10	20		Tert-Amyl-Met	, ,		ND	10	20	
Methyl-t-Butyl Ether (MTBE)	ND	10	20		Ethanol	,	,	ND	6000	20	
Surrogates:	REC (%)	Control Limits		<u>Qual</u>	Surrogates:		1	REC (%)	Control Limits	20	Qual
1,2-Dichloroethane-d4	90	73-145			Dibromofluoro	methane		100	81-135		
Toluene-d8	94	83-119			1,4-Bromofluoi	robenzene		98	74-110		
11109WINF (07:05)			09-05-0)124-3-A	04/30/09 07:05	Aqueous	GC/MS BB	05/08/09	05/09/ 08:2		090508L02
<u>Parameter</u>	Result	<u>RL</u>	DF	Qual	<u>Parameter</u>			Result	RL	DF	Qual
Benzene	58	2.0	4		Tert-Butyl Alco	hol (TBA)		110	40	4	
Ethylbenzene	55	2.0	4		Diisopropyl Eth	ner (DIPE)		ND	2.0	4	
Гоluene	61	2.0	4		Ethyl-t-Butyl El	ther (ETBE)		ND	2.0	4	
Kylenes (total)	290	2.0	4		Tert-Amyi-Metl	hyl Ether (T/	AME)	ND	2.0	4	
Methyl-t-Butyl Ether (MTBE)	7.2	2.0	4		Ethanol	•	•	ND	1200	4	
Surrogates:	REC (%)	Control Limits		<u>Qual</u>	Surrogates:		<u> </u>	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	99	73-145			Dibromofluoror	methane		103	81-135		



Stratus Environmental, inc.
3330 Cameron Park Drive, Suite 550
Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation:

05/02/09 09-05-0124 EPA 5030B

Method: Units:

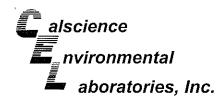
EPA 8260B ug/L

Project: ARCO 11109	- Assessm	ent								Pag	e 2 of 4
Client Sample Number	,			ab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/1		QC Batch ID
11109WINF (13:03)	***************************************		09-05-	-0124-5-A	04/30/09 13:03	Aqueous	GC/MS BB	05/08/09	05/09 08:5		090508L02
<u>Parameter</u>	Result	RL	<u>DF</u>	Qual	Parameter			Result	<u>RL</u>	<u>DF</u>	Qual
Benzene	46	2.0	4		Tert-Butyl Alc	ohol (TBA)		140	40	4	
Ethylbenzene	69	2.0	4		Diisopropyl Et	her (DIPE)		ND	2.0	4	
Toluene	75	2.0	4		Ethyl-t-Butyl E	ther (ETBE)	}	ND	2.0	4	
Xylenes (total)	350	2.0	4		Tert-Amyl-Me	thyl Ether (T	AME)	ND	2.0	4	
Methyl-t-Butyl Ether (MTBE)	2.2	2.0	4		Ethanol			ND	1200	4	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:			REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	98	73-145			Dibromofluoro	methane		102	81-135		
Toluene-d8	96	83-119			1,4-Bromofluo	robenzene		95	74-110		
11109WINF (17:05)		***************************************	09-05-	0124-6-A	04/30/09 17:05	Aqueous	GC/MS BB	05/09/09	05/09 18:2		090509L01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	<u>Qual</u>	Parameter			Result	<u>RL</u>	DF	Qual
Benzene	45	2.0	4		Tert-Butyl Alco	ohol (TBA)		140	40	4	
Ethylbenzene	61	2.0	4		Diisopropyl Et	her (DIPE)		ND	2.0	4	
Toluene	70	2.0	4		Ethyl-t-Butyl E	ther (ETBE)		ND	2.0	4	
Xylenes (total)	320	2.0	4		Tert-Amyl-Met	thyl Ether (Ta	AME)	ND	2.0	4	
Methyl-t-Butyl Ether (MTBE)	ND	2.0	4		Ethanol			ND	1200	4	
Surrogates:	REC (%)	Control		Qual	Surrogates:		ļ	<u>REC (%)</u>	Control		<u>Qual</u>
		<u>Limits</u>							<u>Limits</u>		
1,2-Dichloroethane-d4	93	73-145			Dibromofluoro			101	81-135		
Toluene-d8	96	83-119			1,4-Bromofluo	robenzene		93	74-110		
11109WINF (19:15)			09-05-	0124-7-A	04/30/09 19:15	Aqueous	GC/MS BB	05/09/09	05/09/ 18:5		090509L01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	<u>Qual</u>	<u>Parameter</u>			Result	<u>RL</u>	<u>DF</u>	Qual
Benzene	300	10	20		Tert-Butyl Alco	ohol (TBA)		ND	200	20	
Ethylbenzene	430	10	20		Diisopropyl Eth	ner (DIPE)		ND	10	20	
Toluene	320	10	20		Ethyl-t-Butyl E	ther (ETBE)		ND	10	20	
Xylenes (total)	1500	10	20		Tert-Amyl-Met	hyl Ether (TA	AME)	ND	10	20	
Methyl-t-Butyl Ether (MTBE)	ND	10	20		Ethanol	•	-	ND	6000	20	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:		Ī	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	94	73-145			Dibromofluoro	methane		103	81-135		
Toluene-d8	97	83-119			1,4-Bromofluor			94	74-110		
					.,. = . 5				, , , , , , , , , , , , , , , , , , , 		



DF - Dilution Factor ,





Stratus Environmental, inc.	Date Received:	05/02/09
3330 Cameron Park Drive, Suite 550	Work Order No:	09-05-0124
Cameron Park, CA 95682-8861	Preparation:	EPA 5030B
	Method:	EPA 8260B
	Units:	ua/l

Project: ARCO 11109 - Assessment

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Project: ARCO 11109	- Assessm	ent								Pag	e 3 of 4
Client Sample Number				ab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Ti d Analyz		QC Batch (C
11109WINF (01:05)			09-05-	0124-9-B	05/01/09 01:05	Aqueous	GC/MS BB	05/11/09	05/11/0 15:36		090511L01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	<u>Parameter</u>			Result	RL	<u>DF</u>	Qual
Benzene	120	10	20		Tert-Butyl Alc	ohol (TBA)		ND	200	20	
Ethylbenzene	190	10	20		Diisopropyl Et	ther (DIPE)		ND	10	20	
Toluene	140	10	20		Ethyl-t-Butyl E	ther (ETBE))	ND	10	20	
Xylenes (total)	750	10	20		Tert-Amyl-Me	thy! Ether (T	AME)	ND	10	20	
Methyl-t-Butyl Ether (MTBE)	ND	10	20		Ethanol		,	ND	6000	20	
Surrogates:	REC (%)	Control Limits		Qual	Surrogates:			REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	86	73-145			Dibromofluoro	methane		91	81-135		
Toluene-d8	96	83-119			1,4-Bromofluo	robenzene		91	74-110		
11109WINF (05:05)		·	09-05-	0124-10-B	05/01/09 05:05	Aqueous	GC/MS BB	05/11/09	05/11/0 16:08		090511L01
Parameter	Result	RL	DF	Qual	<u>Parameter</u>			Result	<u>RL</u>	DF	Qual
Benzene	140	10	20		Tert-Butyl Aice	chol (TBA)		ND	200	20	
Ethylbenzene	230	10	20		Diisopropyl Et	her (DIPE)		ND	10	20	
Toluene	170	10	20		Ethyl-t-Butyl E	ther (ETBE)	i	ND	10	20	
Xylenes (total)	920	10	20		Tert-Amyl-Met	thyl Ether (T/	AME)	ND	10	20	
Methyl-t-Butyl Ether (MTBE)	ND	10	20		Ethanol	• •	·	ND	6000	20	
Surrogates:	<u>REC (%)</u>	Control Limits		Qual	Surrogates:		1	REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	84	73-145			Dibromofluoro	methane		90	81-135		
Toluene-d8	95	83-119			1,4-Bromofluo	robenzene		91	74-110		
Method Blank			099-12	-703-870	N/A	Aqueous	GC/MS BB	05/08/09	05/09/0 02:36		090508L02
Parameler	Result	<u>RL</u>	DF	Qual	Parameter			Result	RL	DF	Qual
Benzene	ND	0.50	1		Tert-Butyl Alco	ohol (TBA)		ND ND	10	1	
Ethylbenzene	ND	0.50	1		Diisopropyl Et	, ,		ND	0.50	1	
Toluene	ND	0.50	1		Ethyl-t-Butyl E	, ,		ND	0.50	1	
Kylenes (total)	ND	0.50	1		Tert-Amyl-Met	, ,		ND	0.50	1	
Methyl-t-Butyl Ether (MTBE)	ND	0.50	1		Ethanol		,	ND	300	1	
Surrogates:	REC (%)	Control Limits	,	Qual	Surrogates:		!	REC (%)	Control Limits	,	<u>Qual</u>
1,2-Dichloroethane-d4	97	73-145			Dibromofluoro	methane		93	81-135		
Foluene-d8	97	83-119			1,4-Bromofluo			95	74-110		

RL - Reporting Limit

DF - Dilution Factor

Qual - Qualifier





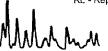
Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861 Date Received: Work Order No: Preparation: 05/02/09 09-05-0124 EPA 5030B

Method: Units: EPA 8260B ug/L

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Client Sample Number				b Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Ti d Analyz		QC Batch ID
Method Blank			099-12	-703-871	N/A	Aqueous	GC/MS BE	05/09/09	05/09/ 13:0		090509L01
<u>Parameter</u>	Result	<u>RL</u>	<u>DF</u>	Qual	Parameter			Result	RL	DF	Qual
Benzene	ND	0.50	1		Tert-Butyl Alc	ohol (TBA)		ND	10	1	
Ethylbenzene	ND	0.50	1		Diisopropyl Et	ther (DIPE)		ND	0.50	1	
Toluene	ND	0.50	1		Ethyl-t-Butyl E	Ether (ETBE)		ND	0.50	1	
Xylenes (total)	ND	0.50	1		Tert-Amyl-Me	thyl Ether (TA	AME)	ND	0.50	1	
Methyl-t-Butyl Ether (MTBE)	ND	0.50	1		Ethanol			ND	300	1	
Surrogates:	REC (%)	<u>Control</u>		Qual	Surrogates:			REC (%)	Control		Qual
		Limits							<u>Limits</u>		
1,2-Dichloroethane-d4	90	73-145			Dibromofluoro			95	81-135		
Toluene-d8	96	83-119			1,4-Bromofluo	probenzene		92	74-110		
Method Blank			099-12	-703-874	N/A	Aqueous	GC/MS BE	05/11/09	05/11/ 14:32		090511L01
Parameter	Result	RL	DF	Qual	<u>Parameter</u>			Result	RL	DF	Qual
Benzene	ND	0.50	1		Tert-Butyl Alc	ohol (TBA)		ND	10	1	
Ethylbenzene	ND	0.50	1		Diisopropyl Et	her (DIPE)		ND	0.50	1	
Foluene	ND	0.50	1		Ethyl-t-Butyl E	ther (ETBE)		ND	0.50	1	
Kylenes (total)	ND	0.50	1		Tert-Amyl-Me	thyl Ether (TA	AME)	ND	0.50	1	
Methyl-t-Butyl Ether (MTBE)	ND	0.50	1		Ethanol			ND	300	1	
<u>Surrogates:</u>	REC (%)	Control Limits		Qual	Surrogates:			REC (%)	Control Limits		Qual
1,2-Dichloroethane-d4	87	73-145			Dibromofluora	methane		93	81-135		
Toluene-d8	96	83-119			1,4-Bromofluo	robenzene		89	74-110		





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Method:

05/02/09 09-05-0124 EPA 5030B EPA 8015B (M)

0-25

Project ARCO 11109 - Assessment

Gasoline Range Organics (C6-C12)

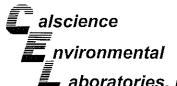
Quality Control Sample ID	Matrix	Instrument	Date Prepared		Date Analyzed	MS/MSD Batch Number
09-05-0118-1	Aqueous	GC 4	05/12/09		05/12/09	090512801
<u>Parameter</u>	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers

115

38-134

110





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Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550

Cameron Park, CA 95682-8861

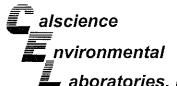
Date Received: Work Order No: Preparation: Method:

05/02/09 09-05-0124

EPA 5030B EPA 8260B

Project ARCO 11109 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared		Date Analyzed	MS/MSD Batch Number	
09-05-0209-13	Aqueou	ıs GC/MS BB	05/08/09		05/09/09	090508S02	
Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers	
Benzene	99	101	86-122	2	8-0		
Carbon Tetrachloride	102	100	78-138	2	0-9		
Chlorobenzene	100	101	90-120	1	0-9		
1,2-Dibromoethane	99	98	70-130	1	0-30		
1,2-Dichlorobenzene	100	101	89-119	1	0-10		
1,1-Dichloroethene	91	86	52-142	6	0-23		
Ethylbenzene	93	93	70-130	0	0-30		
Toluene	97	97	85-127	0	0-12		
Trichloroethene	99	100	78-126	1	0-10		
Vinyl Chloride	97	95	56-140	2	0-21		
Methyl-t-Butyl Ether (MTBE)	95	93	64-136	2	0-28		
Tert-Butyl Alcohol (TBA)	100	105	27-183	5	0-60		
Diisopropyl Ether (DIPE)	95	94	78-126	1	0-16		
Ethyl-t-Butyl Ether (ETBE)	94	90	67-133	4	0-21		
Tert-Amyl-Methyl Ether (TAME)	88	88	63-141	0	0-21		
Ethanol	116	116	11-167	0	0-64		



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Date Received: Work Order No: Preparation:

05/02/09 09-05-0124 **EPA 5030B**

Method:

EPA 8260B

Project ARCO 11109 - Assessment

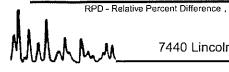
Quality Control Sample ID	Matrix	Instrument	Date Prepared		Date Analyzed	MS/MSD Batch Number	
09-05-0209-15	Aqueo	ıs GC/MS BB	05/09/09		05/09/09	090509801	
<u>Parameter</u>	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers	
Benzene	94	95	86-122	1	0-8		
Carbon Tetrachloride	94	94	78-138	0	0-9		
Chlorobenzene	98	98	90-120	1	0-9		
1,2-Dibromoethane	99	99	70-130	0	0-30		
1,2-Dichlorobenzene	96	97	89-119	2	0-10		
1,1-Dichlorcethene	92	92	52-142	1	0-23		
Ethylbenzene	95	93	70-130	2	0-30		
Toluene	96	97	85-127	2	0-12		
Trichloroethene	98	97	78-126	1	0-10		
Vinyl Chloride	90	92	56-140	3	0-21		
Methyl-t-Butyl Ether (MTBE)	89	89	64-136	0	0-28		
Tert-Butyl Alcohol (TBA)	95	102	27-183	4	0-60		
Diisopropyl Ether (DIPE)	81	82	78-126	0	0-16		
Ethyl-t-Butyl Ether (ETBE)	81	83	67-133	2	0-21		
Tert-Amyl-Methyl Ether (TAME)	86	88	63-141	1	0-21		

102

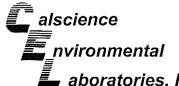
11-167

0-64

93



Ethanol



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Cameron Park, CA 95682-8861

Date Received: Work Order No: Preparation:

Method:

05/02/09 09-05-0124 EPA 5030B

EPA 8260B

Project ARCO 11109 - Assessment

Aqueous	GC/MS BB	05/11/09	05/11/09	090511S01
EC MS	SD %REC %RE	EC CL RPD	RPD CL	Qualifiers
	•			

<u>Parameter</u>	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Benzene	95	95	86-122	0	0-8	
Carbon Tetrachloride	89	91	78-138	2	0-9	
Chlorobenzene	102	103	90-120	1	0-9	
1,2-Dibromoethane	98	96	70-130	2	0-30	
1,2-Dichlorobenzene	100	101	89-119	1	0-10	
1,1-Dichloroethene	90	87	52-142	4	0-23	
Ethylbenzene	97	97	70-130	0	0-30	
Totuene	97	97	85-127	0	0-12	
Trichloroethene	98	98	78-126	0	0-10	
Vinyl Chloride	85	82	56-140	3	0-21	
Methyl-t-Butyl Ether (MTBE)	71	68	64-136	1	0-28	
Tert-Butyl Alcohol (TBA)	95	92	27-183	1	0-60	
Diisopropyl Ether (DIPE)	80	79	78-126	1	0-16	
Ethyl-t-Butyl Ether (ETBE)	81	81	67-133	0	0-21	
Tert-Amyl-Methyl Ether (TAME)	82	84	63-141	1	0-21	
Ethanol	105	98	11-167	6	0-64	



Stratus Environmental, inc.

3330 Cameron Park Drive, Suite 550 Cameron Park, CA 95682-8861

Date Received:

78-120

Work Order No: Preparation:

N/A 09-05-0124

EPA 5030B

0-20

Method:

EPA 8015B (M)

Project: ARCO 11109 - Assessment

Gasoline Range Organics (C6-C12)

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batcl Number	h
099-12-695-535	Aqueous	GC 4	05/12/09	05/12/09	090512B01	
<u>Parameter</u>	LCS %	GREC LCSD	<u>%REC</u>	EC CL RPD	RPD CL	Qualifiers

117

116





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Date Received:

Work Order No:

N/A 09-05-0124

Preparation:

EPA 5030B

Method:

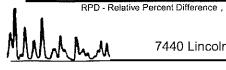
EPA 8260B

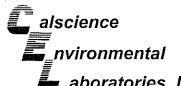
Project: ARCO 11109 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	ed Analyzed		LCS/LCSD Numbe	
099-12-703-870	Aqueous	GC/MS BB	05/08/09			090508L	02
Parameter	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
Benzene	100	99	87-117	82-122	0	0-7	
Carbon Tetrachloride	102	102	78-132	69-141	1	0-8	
Chlorobenzene	102	102	88-118	83-123	0	8-0	
1,2-Dibromoethane	106	104	80-120	73-127	1	0-20	
1,2-Dichlorobenzene	101	101	88-118	83-123	0	0-8	
1,1-Dichloroethene	99	99	71-131	61-141	0	0-14	
Ethylbenzene	98	98	80-120	73-127	0	0-20	
Toluene	100	100	85-127	78-134	1	0-7	
Trichloroethene	112	103	85-121	79-127	9	0-11	
Vinyl Chloride	104	101	64-136	52-148	4	0-10	
Methyl-t-Butyl Ether (MTBE)	98	95	67-133	56-144	4	0-16	
Tert-Butyl Alcohol (TBA)	98	96	34-154	14-174	1	0-19	
Diisopropyl Ether (DIPE)	95	93	80-122	73-129	2	0-8	
Ethyl-t-Butyl Ether (ETBE)	96	92	73-127	64-136	4	0-11	
Tert-Amyl-Methyl Ether (TAME)	93	92	69-135	58-146	1	0-12	
Ethanol	100	99	34-124	19-139	1	0-44	

Total number of LCS compounds: 16 Total number of ME compounds: 0 Total number of ME compounds allowed:

LCS ME CL validation result: Pass





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Date Received:

Work Order No:

Preparation: Method:

N/A

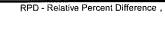
09-05-0124 **EPA 5030B**

EPA 8260B

Project: ARCO 11109 - Assessment

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed 05/09/09		LCS/LCSD Numbe	
099-12-703-871	Aqueous	GC/MS BB	05/09/09			090509L	01
Parameter	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
Benzene	94	99	87-117	82-122	6	0-7	
Carbon Tetrachloride	94	97	78-132	69-141	3	0-8	
Chlorobenzene	97	102	88-118	83-123	5	0-8	
1,2-Dibromoethane	99	103	80-120	73-127	4	0-20	
1,2-Dichlorobenzene	97	102	88-118	83-123	5	0-8	
1,1-Dichloroethene	92	95	71-131	61-141	3	0-14	
Ethylbenzene	94	98	80-120	73-127	4	0-20	
Toluene	95	101	85-127	78-134	6	0-7	
Trichloroethene	96	103	85-121	79-127	7	0-11	
Vinyl Chloride	93	97	64-136	52-148	4	0-10	
Methyl-t-Butyl Ether (MTBE)	88	92	67-133	56-144	5	0-16	
Tert-Butyl Alcohol (TBA)	92	91	34-154	14-174	1	0-19	
Diisopropyl Ether (DIPE)	85	90	80-122	73-129	5	0-8	
Ethyl-t-Butyl Ether (ETBE)	86	91	73-127	64-136	6	0-11	
Tert-Amyl-Methyl Ether (TAME)	87	93	69-135	58-146	6	0-12	
Ethanol	89	96	34-124	19-139	8	0-44	

Total number of LCS compounds: 16 Total number of ME compounds: 0 Total number of ME compounds allowed: LCS ME CL validation result: Pass





Stratus Environmental, inc. 3330 Cameron Park Drive, Suite 550

Cameron Park, CA 95682-8861

Date Received:

N/A

550

Work Order No: Preparation:

09-05-0124 EPA 5030B

Method:

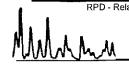
EPA 8260B

Project: ARCO 11109 - Assessment

Quality Control Sample ID	mple ID Matrix		Date Prepared	Date Analyzed		LCS/LCSD Numbe	
099-12-703-874	Aqueous	GC/MS BB	05/11/09	05/11/09		090511L	01
<u>Parameter</u>	LCS %REC	LCSD %REC	%REC CL	ME_CL	RPD	RPD CL	Qualifiers
Benzene	94	96	87-117	82-122	2	0-7	
Carbon Tetrachloride	93	94	78-132	69-141	1	0-8	
Chlorobenzene	101	101	88-118	83-123	0	0-8	
1,2-Dibromoethane	97	101	80-120	73-127	4	0-20	
1,2-Dichlorobenzene	103	101	88-118	83-123	2	8-0	
1,1-Dichtoroethene	88	87	71-131	61-141	1	0-14	
Ethylbenzene	92	93	80-120	73-127	1	0-20	
Toluene	98	99	85-127	78-134	1	0-7	
Trichloroethene	101	105	85-121	79-127	4	0-11	
Vinyl Chloride	85	85	64-136	52-148	1	0-10	
Methyl-t-Butyl Ether (MTBE)	82	87	67-133	56-144	6	0-16	
Tert-Butyl Alcohol (TBA)	98	96	34-154	14-174	2	0-19	
Diisopropyl Ether (DIPE)	77	79	80-122	73-129	2	8-0	LR
Ethyl-t-Butyl Ether (ETBE)	80	82	73-127	64-136	2	0-11	
Tert-Amyl-Methyl Ether (TAME)	85	89	69-135	58-146	5	0-12	
Ethanol	100	91	34-124	19-139	10	0-44	

Total number of LCS compounds: 16
Total number of ME compounds: 1
Total number of ME compounds allowed:

LCS ME CL validation result: Pass





Glossary of Terms and Qualifiers

Work Order Number: 09-05-0124

<u>Qualifier</u>	<u>Definition</u>
AX	Sample too dilute to quantify surrogate.
AZ	Surrogate recovery outside of acceptance limits due to matrix interference.
ВА	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.
вн	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.
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.
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.

Work Order Number: 09-05-0124

<u>Qualifier</u>	<u>Definition</u>		
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.			
МВ	Analyte present in the method blank.		
PC	Sample taken from VOA vial with air bubble > 6mm diameter.		
ΡI	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.		

Laboratory Management Program LaMP Chain of Custody Record

BP/ARC Project Name: ARCO 11109 - Assessment

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Page	<u> </u>	of	

Req Due Date (mm/dd/yy): Eff 24hrs&othersSTD Rush TAT: Yes x No BP/ARC Facility No: 11109 Lab Work Order Number: Catscience Environmental Laboratories, Inc. .ab Name: BP/ARC Facility Address: 4280 Foothills Blvd Consultant/Contractor: Stratus Environmental, Inc. Lab Address: 7440 Lincoln Way, Garden Grove, CA 92841 City, State, ZIP Code: Oakland, California Consultant/Contractor Project No: E11109-01 Lab PM; Richard Villafania Lead Regulatory Agency: Alameda County Health Care Services Address: 3330 Cameron Park Dr., Suite 550, Cameron Park, CA 95682 Lab Phone: 714-895-5494 California Global ID No.: T0600100217 Consultant/Contractor PM: Jay Johnson Lab Shipping Acent: . 9255 Enfos Proposal No: 000GK-0008 Phone: 530-676-6000 Lab Bottle Order No: Accounting Mode: Provision X OOC-BU OOC-RM Email EDD To: chuff@stratusinc.net Other Info: Stage: Select Activity: Feasibility Study Invoice To: BP/ARC_x Contractor_ BP/ARC EBM: Paul Supple Matrix No. Containers / Preservative Requested Analyses **Turnaround Time** Report Type & QC Level EBM Phone: 925-275-3801 Standard __x_ EBM Email: paul.supple@bp.com Fuli Data Package ____ ö Water / Liquid Lab Total Number Unpreserved Sample Description Date Time Soil / Solid No. Air / Vapor Methanol Comments 24-hours Standard Note: If sample not collected, indicate "No MTBE GRO 오 Sample" in comments and single-strike out and initial any preprinted sample description. 6-oxys include MTBE, TBA, TAME, DIPE, & ETBE. 6 Sampler's Name: Relifiquished By / Affiliation Date Time Accepted By / Affiliation Date Time Sampler's Company: Stratus Environmental, Inc. ō Shipment Method: Ship Date: 5 Shipment Tracking No: Special Instructions: Please cc results to bpedf@broadbentinc.com THIS LINE - LAB USE ONLY: Custody Seals In Place: Yes / No Temp Blank: Yes / No Cooler Temp on Receipt: 'F/C Trip Blank: Yes / No MS/MSD Sample Submitted: Yes / No



work order #: **09-05-**回置置值

saboratories, Inc. SAMPLE RECEIPT FORM Cooler 1 of 1

CLIENT: Stratus	DATE: <u></u>	<u>25100</u>	109				
TEMPERATURE: (Criteria: 0.0 °C - 6.0 °C, not frozen) Temperature							
☐ Received at ambient temperature, placed on ice for transport by Courier. Ambient Temperature: ☐ Air ☐ Filter ☐ Metals Only ☐ PCBs Only Initial:							
CUSTODY SEALS INTACT: Cooler	□ N/A	Initial: _	<i>M</i>				
	Yes		N/A				
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.							
☐ COC not relinquished. ☐ No date relinquished. ☐ No time relinquished.		_					
Sampler's name indicated on COC							
Sample container label(s) consistent with COC	•						
Sample container(s) intact and good condition	•						
Correct containers and volume for analyses requested							
Analyses received within holding time							
Proper preservation noted on COC or sample container	2						
☐ Unpreserved vials received for Volatiles analysis	_						
Volatile analysis container(s) free of headspace	4						
Tedlar bag(s) free of condensation							
CONTAINER TYPE:							
Solid: □4ozCGJ □8ozCGJ □16ozCGJ □Sleeve □EnCores® □							
Water: □VOA □VOAna2 □125AGB □125AGBh □125AGBp 1	□1AGB □	1AGBna₂ 🗆 1	1AGB s				
□500AGB □500AGJ □500AGJs □250AGB □250CGB □250CGBs	□1PB □	500PB □500)PB na				
□250PB □250PBn □125PB □125PBznna □100PB □100PBna₂ □ □ □ □ □							
Air: □Tedlar [®] □Summa [®] □ Other: □	Checked/L	.abeled by: _	\$0				
Container: C: Clear A: Amber P: Plastic G: Glass J: Jar (Wide-mouth) B: Bottle (Narrow-mouth)		viewed by: __	45C				

1 3

SOP T100_090 (03/13/09)

From: 7073744312 Page: 2/2

Date: 5/7/2009 3:18:01 PM

NO. 667113

NON-HAZARDOUS WASTE DATA FORM

		GENERATOR:		2	ALE:	EPA I D. NO	NOT REOLIR	En.
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,		ADDRESS PO FOR 902/	40	A	280 Foothill	PROPILE NO	, , , , , , , , , , , , , , , , , , ,	
	GENERALOR	CITY, STATE, ZIPRANCHO	9268		•	94601 1600 C)
,	E E	CONTAINER	7	<i></i>	VÕLUME			
į	3	TYPE; II TANK	☐ TAUCK	MURO 🗀	È 🔲 CARTONS	OTHER		
	2	WASTE DESCRIPTION OF LAND COMPONENTS OF W	AZARDOUS	achter	er de	NERATING PROCESS COMPONENTS	OF WASTE	РРМ %
A.	#	1- WATER	29-100	₩ 	· · · · · · · · · · · · · · · · · · ·	5	·	Mary 1
		2TPH		/	<u> </u>	6		
L	TO BE COMPLETED	3				7BESI# 16	6038	
ŀ	2	PROPERTIES: 7-ED	☐ soulo	CO LIQUID	C stribes C	8,OTHER		
		HANDLING INSTRUCTIONS;	WEAR ALL	APPROP	RIATE PROTEC	TIVE-CLOTHING	· · · · · · · · · · · · · · · · · · ·	
		THE GENERATOR CERT WASTE AS DESCRI NON-HAZARDOUS.	TIFIES THAT THE BED IS 100%	L _{TVPEB}	OF PRINTED FULL NAME	I SON GENERATO	1	ÚAIĘ [—] ——
 DC	<u> </u>	NAME W GOMES EX	CAVATION_	***************************************	A 844	CPA I D NO.		
	5	ADDRESS 551 ATREOF	TRD			<u></u> \$6	FRVICE CROOK NO REST.	8509319
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		NAME IMPETRAL SM	<u> </u>			ip. NO.	DIBPOBAL	MUTHOD
		ADDRESS 1165 AVRPO	8 <u>7 RD #C</u> .	····	· · · · · · · · · ·		🗖 LANDPILL 🗋 OTHER	
		CITY, GTATE, ZIP RIO VIRI	A. CA 94571	181	- N. A. A. A. A. A. A. A. A. A. A. A. A. A.		_1600 g.	alc.
		PHONE NO. 570-759-11	329	_				
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:		TRANS	S					
		C/Q	AT/Q		NONE	DISCREPANCY		

APPENDIX D GEOTRACKER UPLOAD CONFIRMATION RECEIPTS

GEOTRACKER ESI

UPLOADING A GEO_MAP FILE

SUCCESS

Your GEO_MAP file has been successfully submitted!

Submittal Type:GEO_MAPFacility Global ID:T0600100217Facility Name:BP #11109

<u>File Name:</u> 4280 Foothill Blvd 4-13-09.pdf <u>Username:</u> Broadbent & Associates, Inc.

Username: BROADBENT-C
IP Address: 67.118.40.90

<u>Submittal Date/Time:</u> 5/26/2009 11:37:41 AM

Confirmation Number: 8805818855

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1 of 1 5/26/2009 11:38 AM

GEOTRACKER ESI

UPLOADING A GEO_BORE FILE

SUCCESS

Your GEO_BORE file has been successfully submitted!

Submittal Type: GEO_BORE
Facility Global ID: T0600100217

<u>Field Point:</u> MW-10 <u>Facility Name:</u> BP #11109

File Name: GEO_BORE MW-10.pdf

<u>Username:</u> Broadbent & Associates, Inc.

<u>Username:</u> BROADBENT-C

Username: BROADBENT-C
IP Address: 67.118.40.90

Submittal Date/Time: 5/26/2009 11:57:24 AM

Confirmation Number: 7975963771

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GEOTRACKER ESI

UPLOADING A GEO_BORE FILE

SUCCESS

Your GEO_BORE file has been successfully submitted!

Submittal Type: GEO_BORE
Facility Global ID: T0600100217

<u>Field Point:</u> MW-11 <u>Facility Name:</u> BP #11109

<u>File Name:</u> GEO_BORE MW-11.pdf
<u>Username:</u> Broadbent & Associates, Inc.

Username: BROADBENT-C IP Address: 67.118.40.90

Submittal Date/Time: 5/26/2009 11:57:51 AM

Confirmation Number: 3396288216

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UPLOADING A GEO_BORE FILE

SUCCESS

Your GEO_BORE file has been successfully submitted!

Submittal Type: GEO_BORE
Facility Global ID: T0600100217

<u>Field Point:</u> MW-12 <u>Facility Name:</u> BP #11109

<u>File Name:</u> GEO_BORE MW-12.pdf
<u>Username:</u> Broadbent & Associates, Inc.

Username: BROADBENT-C IP Address: 67.118.40.90

<u>Submittal Date/Time:</u> 5/26/2009 11:58:07 AM

Confirmation Number: 4000710606

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UPLOADING A GEO_XY FILE

SUCCESS

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

Submittal Type: GEO_XY

Submittal Title: GEO_XY MW-2 to 12

Facility Global ID: T0600100217
Facility Name: BP #11109
File Name: GEO_XY.zip

Organization Name: Broadbent & Associates, Inc.

Username: BROADBENT-C IP Address: 67.118.40.90

Submittal Date/Time: 5/26/2009 11:32:38 AM

Confirmation Number: 2255770027

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UPLOADING A GEO_Z FILE

SUCCESS

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

Submittal Type: GEO_Z

Submittal Title: GEO_Z MW-2 to 12

 Facility Global ID:
 T0600100217

 Facility Name:
 BP #11109

 File Name:
 GEO_Z.zip

Organization Name: Broadbent & Associates, Inc.

Username: BROADBENT-C IP Address: 67.118.40.90

Submittal Date/Time: 5/26/2009 11:36:32 AM

Confirmation Number: 5738436043

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UPLOADING A EDF FILE

SUCCESS

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

Submittal Type: EDF - Other Report / Document

Submittal Title: Drilling Soil Sample 0309 1

Facility Global ID: T0600100217
Facility Name: BP #11109

File Name: 09032075 fix.zip

Organization Name: Broadbent & Associates, Inc.

Username: BROADBENT-C IP Address: 67.118.40.90

Submittal Date/Time: 6/1/2009 3:13:49 PM

Confirmation Number: 5721306920

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UPLOADING A EDF FILE

SUCCESS

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

Submittal Type: EDF - Other Report / Document

Submittal Title: Drilling Soil Sample 0309 2

Facility Global ID: T0600100217
Facility Name: BP #11109

File Name: 09032183 fix.zip

Organization Name: Broadbent & Associates, Inc.

Username: BROADBENT-C IP Address: 67.118.40.90

Submittal Date/Time: 6/1/2009 3:18:53 PM

Confirmation Number: 8782198250

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UPLOADING A EDF FILE

SUCCESS

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

Submittal Type: EDF - Other Report / Document

 Submittal Title:
 SWC 0309

 Facility Global ID:
 T0600100217

 Facility Name:
 BP #11109

 File Name:
 09032074.zip

Organization Name: Broadbent & Associates, Inc.

Username: BROADBENT-C IP Address: 67.118.40.90

Submittal Date/Time: 6/1/2009 3:04:05 PM

Confirmation Number: 3318010628

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SUCCESS

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Submittal Type: EDF - Pilot Study/ Treatability Report

Submittal Title: DPE MW-5 AIR 0409

 Facility Global ID:
 T0600100217

 Facility Name:
 BP #11109

 File Name:
 09042453b.zip

Organization Name: Broadbent & Associates, Inc.

Username: BROADBENT-C IP Address: 67.118.40.90

Submittal Date/Time: 6/2/2009 4:44:30 PM

Confirmation Number: 6612947762

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UPLOADING A EDF FILE

SUCCESS

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

Submittal Type: EDF - Pilot Study/ Treatability Report

Submittal Title: DPE MW-10 AIR 0409

 Facility Global ID:
 T0600100217

 Facility Name:
 BP #11109

 File Name:
 09042681a.zip

Organization Name: Broadbent & Associates, Inc.

Username: BROADBENT-C IP Address: 67.118.40.90

Submittal Date/Time: 6/2/2009 4:46:13 PM

Confirmation Number: 4768280506

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UPLOADING A EDF FILE

SUCCESS

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

Submittal Type: EDF - Pilot Study/ Treatability Report

Submittal Title: DPE MW-11 AIR 0409

 Facility Global ID:
 T0600100217

 Facility Name:
 BP #11109

 File Name:
 09050074a.zip

Organization Name: Broadbent & Associates, Inc.

Username: BROADBENT-C IP Address: 67.118.40.90

Submittal Date/Time: 6/2/2009 4:46:45 PM

Confirmation Number: 7353463292

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GEOTRACKER ESI

UPLOADING A EDF FILE

SUCCESS

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

Submittal Type: EDF - Pilot Study/ Treatability Report

Submittal Title: DPE MW-12 AIR 0409

 Facility Global ID:
 T0600100217

 Facility Name:
 BP #11109

 File Name:
 09042536a.zip

Organization Name: Broadbent & Associates, Inc.

Username: BROADBENT-C IP Address: 67.118.40.90

Submittal Date/Time: 6/2/2009 4:45:30 PM

Confirmation Number: 9165558338

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GEOTRACKER ESI

UPLOADING A EDF FILE

SUCCESS

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

Submittal Type: EDF - Pilot Study/ Treatability Report

Submittal Title: DPE MW-5, 10, 11, 12 AIR 0409

 Facility Global ID:
 T0600100217

 Facility Name:
 BP #11109

 File Name:
 09050121a.zip

Organization Name: Broadbent & Associates, Inc.

Username: BROADBENT-C IP Address: 67.118.40.90

Submittal Date/Time: 6/2/2009 4:47:12 PM

Confirmation Number: 3711183845

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GEOTRACKER ESI

UPLOADING A EDF FILE

SUCCESS

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

<u>Submittal Type:</u> EDF - Pilot Study/ Treatability Report <u>Submittal Title:</u> DPE MW-5, 10, 11, 12 Liquid 0409 1

 Facility Global ID:
 T0600100217

 Facility Name:
 BP #11109

 File Name:
 09042664.zip

Organization Name: Broadbent & Associates, Inc.

Username: BROADBENT-C IP Address: 67.118.40.90

Submittal Date/Time: 6/1/2009 3:39:16 PM

Confirmation Number: 9492712736

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1 of 1 6/1/2009 3:42 PM

GEOTRACKER ESI

UPLOADING A EDF FILE

SUCCESS

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

<u>Submittal Type:</u> EDF - Pilot Study/ Treatability Report <u>Submittal Title:</u> DPE MW-5, 10, 11, 12 Liquid 0409 2

 Facility Global ID:
 T0600100217

 Facility Name:
 BP #11109

 File Name:
 09050124.zip

Organization Name: Broadbent & Associates, Inc.

Username: BROADBENT-C IP Address: 67.118.40.90

Submittal Date/Time: 6/1/2009 3:39:37 PM

Confirmation Number: 5635319590

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