

July 16, 2002

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Mr. Paul Supple Atlantic Richfield Company P.O. Box 6549 Moraga, California 94570

JUL 1 9 2002

Subject: Results of a Dual Phase Extraction Pilot Test

ARCO Service Station No. 2111

1156 Davis Street
San Leandro, California
Delta Project No. D000-306

Dear Mr. Supple:

This letter, prepared by Delta Environmental Consultants, Inc. (Delta) on behalf of Atlantic Richfield Company, presents the results of the events conducted during the dual phase extraction (DPE) pilot test at the above referenced site (Figure 1). The purpose of the testing was performed to evaluate DPE as a potentially applicable technology for source area removal of petroleum hydrocarbon impacted soils and groundwater at the subject site. The pilot test set-up and results are described below.

System Set-up

On January 7, 2002, a three-day DPE pilot test was performed on vapor well V-2. Following the three-day test, limited pilot tests were conducted on monitoring wells MW-2 and MW-7. The DPE system utilized a 20 horsepower, 350 cubic feet per minute (cfm) liquid ring pump to remove both groundwater and soil vapor simultaneously utilizing a down-hole pipe ("stinger") connected to the monitoring well. As the groundwater and soil vapor was removed from the subsurface, it was partitioned through an above ground air/water separator (knockout tank). The groundwater and soil vapor were then processed for separate treatment. The groundwater was transferred through a transfer pump to a temporary storage tank for later disposal. Hydrocarbons in the vapor stream were abated by a thermal oxidizer unit, which was also mounted to the mobile unit.

Air Discharge & Water Disposal Permitting

Before the pilot test, all required permits were obtained for operation of the mobile DPE unit. Use of the thermal oxidizer unit was permitted through the Bay Area Air Quality Management District. All water collected at the site was stored in a temporary storage tank and later transferred to an Atlantic Richfield Company's contracted vacuum truck for off-site disposal.

DPE Pilot Test Description

Field data was collected from the extraction unit and from selected wells to assess influence from the system. Well caps fitted with a magnehelic gauge were placed on selected monitoring wells to collect vacuum data during the pilot test. Prior to the start of each pilot test, depth to groundwater measurements were collected in all of the monitoring wells (MW-1 through MW-7) and vacuum

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readings were taken from monitoring wells MW-1, MW-2, MW-7, and vapor wells V-1 through V-3. Figure 2 presents the existing remediation piping layout and the location of all the wells.

The following data were recorded periodically on field activity sheets during each pilot test:

- Total system influent airflow and groundwater recovery rates in cfm and gallons per minute (gpm), respectively.
- Total influent system and well head vacuums in inches of mercury (Hg) and inches of water column (IWC), respectively.
- Influent hydrocarbon vapor concentrations in parts per million by volume (ppmv).
- Vacuum readings from selected monitoring and test wells in IWC.
- Depth to water (DTW) and product thickness (PT) of liquid phase hydrocarbons (LPH) in selected wells in feet (ft).

Additionally, at selected intervals during each pilot test, the water meter was checked and both vapor and groundwater grab samples were collected for submittal to the laboratory. Submitted samples were analyzed for benzene, toluene, ethyl-benzene, xylenes (BTEX), methyl tertiary butyl ether (MTBE) and total petroleum hydrocarbons as gasoline (TPHg) by DHS LUFT approved methods. A summary of the air analytical results from samples collected during each pilot test is tabulated in Table 1. A summary of the groundwater analytical results from samples collected during each pilot test is tabulated in Table 2.

DPE Pilot Test on Vapor Well V-2

The DPE pilot test was performed by extracting soil vapors and total fluids with a stinger placed inside of vapor well V-2 at an approximate depth of 19 feet below surface grade (bsg). This well is a 2-inch diameter well installed east of the southern dispenser island (Figure 2). The well is screened from approximately 5 to 20 feet bsg. During the pilot test on V-2, monitoring wells MW-1, MW-2 and MW-7 and vapor wells V-1 and V-3 were monitored. The test was started on January 7, 2002 and completed on January 10, 2002. Based on field conditions, the following tasks were completed as close as practical:

- Depth to groundwater, PT, vacuum, and Flame Ionization Detector (FID) readings on MW-1, MW-2, MW-7, V-1 and V-3 were to be measured and recorded every 15 minutes for first half-hour and then every 30 minutes for first hour of test; hourly for next seven hours; then daily (at 8:00 AM) thereafter for the remainder of the test.
- Daily DTWs were to be measured and recorded in all wells (with the exception of V-2 since it was the test well, and MW-5 which could not be located).
- Groundwater (GW) and soil vapor influent samples were to be collected at the beginning of the
 test; 8 hours after startup; and then daily (at 8:00 AM) every day thereafter. The samples were to
 be analyzed for BTEX and MTBE by EPA Method 8020 and TPHg by EPA Method 8015M.
 The presence of MTBE was to be confirmed by EPA Method 8260.
- Influent GW and SVE flow rates, influent non-methane hydrocarbon FID readings and vacuums at test equipment and vacuums on the test wellhead were to be measured and recorded.
- Prior to shut down of the test on V-2, DTWs were to be measured and recorded in all wells.
- At the end of the test, DTW in V-2 was to be measured every minute for 10 minutes, after 15 minutes, after 30 minutes, and once after 60 minutes.

Results and Discussion for DPE Pilot Test on Vapor Well V-2

During the test, total vapor flow rates ranged from 224 to 274 cfm with an average total vapor flow rate of 248 cfm (Tables 3 and 4). At an average wellhead vacuum of 248 IWC, vacuum influence was observed in only three monitoring wells, MW-1, MW-2 and MW-7 (Table 4). These wells are located approximately 101, 24 and 40 feet, respectively, from V-2 (Figure 1). Based on the laboratory results, the influent TPHg vapor concentrations ranged from 25 to 210 ppmv (Tables 1 and 3). The TPHg extraction rates ranged from 4.32 lbs/day (0.18 lbs/hour) to 17.76 lbs/day (0.74 lbs/hour) with a time weighted average of 11.6 lbs/day. Based on the FID measurements, the non-methane hydrocarbon influent concentrations ranged from 60 to 1,087 ppmv. The non-methane hydrocarbon extraction rates ranged from 8.88 lbs/day (0.37 lbs/hour) to 104.64 lbs/day (4.36 lbs/hour) with a time weighted average of 39.3 lbs/day. The discrepancy between the FID and laboratory hydrocarbon data is more than likely due to the laboratory reporting only C6 hydrocarbon compounds and above while the FID was reporting C2 hydrocarbon compounds and above. The TPHg and non-methane hydrocarbon extraction rates are presented in Table 3. During the pilot test, a total groundwater volume of 7,120 gallons was recovered with an average recovery rate of 1.5 gpm. A hydraulic influence was observed across the groundwater table on site, with a noticeable drawdown occurring in the wells immediately adjacent to the extraction point. Based on the groundwater analytical results, dissolved petroleum hydrocarbons showed a decreasing trend throughout the test (Table 2). In addition, no LPH was observed during the test. Table 4 presents the summary of field data collected during the pilot test. Copies of the DPE system field data sheets are presented in Appendix A. Copies of all analytical reports are provided in Appendix B. The results from the pilot test are summarized below:

V-2 PII	OT	TEST	RESIL	TS	SUMMARY
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Total hours Operated Continuous (hours)	Water	Average Water Flowrate (gpm)	DTW	Average Total Vapor Flowrate (cfm)	Total TPHg Vapor Extracted (lbs)	FID Non- Methane Hydrocarbon Vapor Extracted (lbs)	Total TPHg Vapor Extraction (gallons)		Average TPHg	Average FID Non- Methane Hydrocarbon Vapor Extraction Rates (lbs/day)
78.75	7,120	1.51	5.52	255	38.0	129.0	6.2	21.1	11.6	39.3

Observed Vacuum Radius of Influence for Vapor Well V-2

Based on EPA guidance documentation, as a rule of thumb, a vacuum of 0.1" H₂O is used as the minimum vacuum level required for effective radial influence. Monitoring well MW-2 was the only well to show a vacuum influence above 0.1" H2O. However, vacuum readings were noted in wells MW-1 and MW-7, located approximately 101 feet and 40 feet, respectively, from V-2.

Mathematical Radius of Influence for Vapor Well V-2

Using a mathematical equation developed by Johnson et al (1990), the "zero vacuum" ROI was calculated to determine the distance at which the vacuum achieved in the subsurface would be equal to zero under ideally homogeneous conditions. Using the measured vacuum for well MW-7 at a distance of 40.2 feet, the calculations yields a maximum "zero vacuum" ROI of 40.21 feet. A printout of the excel calculation sheet is provided in Appendix C.

Effective Radius of Influence for Vapor Well V-2

The effective radial influence is determined to be the point at which observed vacuums are 1 percent of the applied vacuum. The 1 percent value is an arbitrary yet conservative estimate of the projected vacuum needed to provide adequate site coverage. The effective ROI is estimated by preparing a graph of normalized vacuum versus the radial distance from the extraction well. The slope of the best-fit line is used to estimate the effective ROI at the point where the line crosses the log value of 1 percent of the applied vacuum. This method of data evaluation yielded an effective ROI of 17 feet, which is illustrated on Figure 3. A printout of the excel calculation sheet is provided in Appendix C.

Permeability to Air Flow for Vapor Well V-2

Using the test data, an average permeability to airflow of 3.98 x 10⁻⁸ cm² (3.98 Darcy) was calculated for V-2. This permeability value is representative of silty sand. A printout of the excel calculation sheet is provided in Appendix C.

Groundwater Level Influence for Vapor Well V-2

Groundwater level influence was measured as far out to monitoring well MW-1 with a maximum draw down of 0.21 feet. However, since similar drawdown values were measured in most of the onsite wells regardless of their distance from V-2, the decrease may have been influenced by natural fluctuations in the aquifer (see Table 4).

Groundwater Level Recovery Rate for Vapor Well V-2

Groundwater levels in Vapor well V-2 were measured at the end of the test as described earlier the text. It was noted that the groundwater levels recovered to greater than 95% with in one hour.

<u>Limited DPE Pilot Test Performed on Monitoring Well MW-7</u>

On January 10, 2002, the DPE unit was connected to MW-7. Monitoring well MW-7 is a two-inch diameter well located at the southwest corner of the existing tank field. The well is screened from 12 to 26.9 feet bsg. Soil vapors and total fluids were extracted from the well with a down-hole stinger. Monitoring wells MW-1 and MW-2 and vapor wells V-1 through V-3 were monitored during the 20-hour pilot test.

Results and Discussion for Limited DPE Pilot Test on Monitoring Well MW-7

During the test, the total vapor flow rate was measured to be 250 cfm at a vacuum of 240 IWC (Tables 3 and 4). Due to an apparent problem with the field FID, hydrocarbon extraction rates were based solely on laboratory results from a soil vapor sample collected on January 11, 2002. Table 1 presents the air analytical results. The laboratory results indicated a low hydrocarbon removal rate of 7.32 lb/day. In addition, during the test, no significant groundwater influence was noticed in surrounding wells. This more than likely was due to the fine-grained soils in the subsurface and the short test period (20 hours). A total of 1,900 gallons of impacted groundwater was recovered during the test. No LPH was encountered during the test. A groundwater sample was collected near the completion of the test and the results are presented in Table 2. Table 3 presents the vapor extraction data. Table 4 presents the summary of field data collected during the event. Copies of the DPE system field data sheets are presented in Appendix A. Copies of all analytical reports are provided in Appendix B. Results from the limited DPE test are summarized below:

MW-7 PILOT TEST RESULTS SUMMARY

Total hours Operated Continuous (hours)	Total Water Flow (gallons)	Average Water Flowrate (gpm)	Total DTW Increase (feet)	Average Total Vapor Flowrate (cfm)	Total TPHg Vapor Extracted (lbs)	Total TPHg Vapor Extraction (gallons)	Average TPHg Vapor Extraction Rates (lbs/day)
20	1,900	1.58	0.26	250	6.1	1.0	7.32

Limited DPE Pilot Test Performed on Monitoring Well MW-2

In an effort to remove residual hydrocarbon vapors, LPH, and dissolved petroleum hydrocarbons in and/or near monitoring well MW-2, on January 11, 2002, the DPE unit was connected to MW-2. Monitoring well MW-2 is a two-inch diameter well installed east of the southern dispenser island, screened from 12 to 26 feet below surface grade (bsg). Soil vapors and total fluids were extracted from MW-2 for approximately 5 hours with a down-hole stinger. Monitoring wells MW-1 and MW-7 and vapor wells V-1 through V-3 were monitored during the limited pilot test.

Results and Discussion for Limited DPE Pilot Test on Monitoring Well MW-2

During the limited pilot test, total vapor flow rates ranged from 292 to 342 cfm with an average total vapor flow rate of 317 cfm (Tables 3 and 4). The wellhead vacuum was measured to be 150 IWC (Table 4). Initially, high concentrations of non-methane hydrocarbons were detected by the FID in the influent vapor stream, but quickly decreased as the test proceeded. The influent vapor concentrations started at 10,176 ppmv and ended at 351 ppmv. The average FID non-methane hydrocarbon vapor extraction rate was calculated to be 84.5 lbs/day. No groundwater or vapor samples were collected from MW-2 for laboratory analyses since the monitoring well had already been previously tested. Vapor extraction data are shown in Table 3. During the limited test on MW-2, a slight hydraulic influence was observed in local wells. As expected, though, MW-2 produced a high groundwater flow rate (approximately 20 gpm). A total of 5,960 gallons of groundwater was recovered during the test. Table 4 presents the summary of field data collected during the event. Copies of the DPE system field data sheets are presented in Appendix A. Results from the Limited DPE pilot test are summarized below:

MW-2 PILOT TEST RESULTS SUMMARY

							Average FID
			-		FID Non-	FID Non-	Non-Methane
					Methane	Methane	Hydrocarbon
Total hours		Average		Average	Hydrocarbon	Hydrocarbon	Vapor
Operated	Total Water	Water	Total DTW	Total Vapor	Vapor	Vapor	Extraction
Continuous	Flow	Flowrate	Increase	Flowrate	Extracted	Extracted	Rates
(hours)	(gallons)	(gpm)	(feet)	(cfm)	(lbs)	(gallons)	(lbs/day)
5	5,960	19.87	0.19	292	17.6	2.9	84.5

Conclusions

In conclusion, the test results indicate that limited DPE is possible at the site. Even though, in the short term, it appears that DPE is limited in its inability to quickly lower groundwater levels to expose impacted soils for SVE, given enough time of system operation, it is reasonable to expect that groundwater levels could be adequately lowered. This is supported by the fact that the decreasing groundwater levels measured in the surrounding wells never reached steady state prior to the end of the three day test on vapor well V-2. Furthermore, based on experience, the relatively high well vacuums encountered along with the low groundwater production rates from V-2 indicate that dewatering of the soils could be possible over an extended period of time. Though significant hydrocarbon vapor recovery rates may not be reasonably expected from DPE due to the fine grained soils on site, the overall effect of reducing the groundwater levels in itself would allow the soils to be exposed to atmospheric oxygen from SVE, which in turn would enhance the natural attenuation of the impacted soils and groundwater. In addition, the direct removal of impacted groundwater would be an added benefit of petroleum hydrocarbon removal, though it would be limited due to the inherent low hydrocarbon mass recovery rates of groundwater extraction in general. The test also indicates that only those wells completed in finer grain materials on site would be effective in a DPE system, whereas, monitoring well MW-2, as expected, would not serve as a practical DPE well due to its excessive groundwater production rates. Using a vacuum ROI of approximately 32 feet, which is based on the average of the three previously calculated values 40, 40.21, and 17 feet, the existing vapor and monitoring wells that have remediation piping stubbed to them would provide adequate SVE coverage for the impacted area near the dispenser islands and tank field.

Remarks and Signatures

The interpretations contained in this report represent our professional opinions and are based, in part, on information supplied by the client. These opinions are based on currently available information and are arrived at in the accordance with currently accepted hydrogeologic and engineering practices at this time and location. Other than this, no warranty is implied or intended.

If you have any questions regarding this project, please contact Steven Meeks at (916) 536-2613.

Sincerely,

DELTA ENVIRONMENTAL CONSULTANTS, INC.

tovor L. Atkinson, P.E.

Project Engineer

Steven W. Meeks, P.E.

Project Manager

California Registered Civil Engineer No. C057461

cc: Amir Gholami, ACHCSA

Robert Cave, BAAQMD

Scott Robinson, URS

Enclosures

TABLE 1
PILOT TEST AIR ANALYTICAL DATA

Sample I.D.	Date Sampled	Time	Benzene (ppmv)	Toluene (ppmv)	Ethyl- benzene (ppmv)	Total Xylenes (ppmv)	TPHg (ppmv)	MTBE (8020) (ppmv)	MTBE (8260) (ppmv)
VW-2 (V-2)	01/07/02	10:45	4.1	0.82	1.8	4.5	55ª	84	84
1-7-02 (V-2)	01/07/02	16:00	2.1	0.34	0.68	1.5	25	NA	64
1-8-02 (V-2)	01/08/02	8:00	2.9	1.0	1.3	2.2	97	NA	209
1-9-02 (V-2)	01/09/02	8:00	5.5	2.3	2.1	3.8	210	NA	179
1-10-02 (V-2)	01/10/02	8:00	3.9	1.3	1.9	4.2	190	53	95
1-11-02 (MW-7)	01/11/02	9:00	2.0	2.3	0.85	2.3	80	72	128

^a = Hydrocarbon pattern is present in the requested fuel quantitation but does not resemble the pattern of the requested fuel.

TPH = Total Petroleum Hydrocarbons

MTBE = Methyl tertiary butyl ether analyzed by EPA Method 8021B unless otherwise noted

μg/L = Micrograms per liter

NA = Not analyzed

TABLE 2
PILOT TEST WATER ANALYTICAL DATA

Sample I.D.	Date Sampled	Time	Benzene (µg/L)	Toluene (μg/L	Ethyl- benzene (µg/L)	Total Xylenes (μg/L)	TPH (μg/L)	MTBE (8020) (μg/L)	MTBE (8260) (μg/L)
VW-2 (V-2)	01/07/02	10:50	860	<500	<500	1,400	<50,000	160,000	180,000
1-7-02 (V-2)	01/07/02	16:00	240	51	93	280	18,000ª	NA	98,000
1-8-02 (V-2)	01/08/02	8:00	42	11	<0.5	53	1,800	NA	16,000
1-9-02 (V-2)	01/09/02	8:00	46	45	81	360	6,600	NA	8,100
1-10-02 (V-2)	01/10/02	8:00	28	<20	25	71	<2,000	6,300	5,600
1-11-02 (MW-7)	01/11/02	9:00	<20	23	<20	52	<2,000	6,800	5,800

^{* =} Hydrocarbon pattern is present in the requested fuel quantitation but does not resemble the pattern of the requested fuel.

TPH = Total Petroleum Hydrocarbons

MTBE = Methyl tertiary butyl ether analyzed by EPA Method 8021B unless otherwise noted

μg/L = Micrograms per liter

NA = Not analyzed

TABLE 3

DUAL PHASE EXTRACTION PILOT TEST VAPOR RESULTS TABLE

V-2 PILOT TEST VAPOR EXTRACTION RESULTS - 2002

Date & Time Sampled	Influent Flowrate (ft³/min)	Laboratory TPHg Influent (ppmv)	Influent Non- methane Hydrocarbons by FID (ppmv)	Laboratory Benzene Influent (ppmv)	TPH Extraction Rate (lbs/hour)	Non- Methane Hydrocarbons by FID (lbs/hour)	Benzene Extraction Rate (lbs/hour)	Cumulative Volume of Processed Air (cubic feet)	Cumulative Laboratory TPHg Extraction (lbs)	FID Non- Methane Hydrocarbon Extraction (lbs)	Total Hours Operated	Change in Hours of Operation
1/7/02 9:00	236	NA	260	NA	NC	0.82	NC	0	NÇ	0.0	0.00	0.00
1/7/02 9:30	236	NA	260	NA	NC	0.94	NC	7,080	NC	0.4	0.50	0.50
1/7/02 9:45	226	NA	262	NA	NC	0.91	NC	10,470	NC	0.7	0.75	0.25
1/7/02 10:00	226	NA	216	NA	NC	0.75	NC	13,860	NC	0.9	1.00	0.25
1/7/02 10:30	247	NA	112	NA	NC	0.42	NC	21,270	NC	1.2	1.50	0.50
1/7/02 10:45	247	55	112	4.1	0.18	0.37	0.34	24,975	0.3	1.3	1.75	0.25
1/7/02 12:00	238	NA	197	NA	NC	0.72	NC	42,825	NC	2.0	3.00	1.25
1/7/02 16:00	260	25	884	2.1	0.09	3.06	0.18	105,225	1.0	9.5	7.00	4.00
1/7/02 17:00	263	NΑ	808	NA	NC	3.26	NC	121,005	NC	12.7	8.00	1.00
1/7/02 18:00	261	NA	1,087	NA	NC	4.36	NC	136,665	NC	16.5	9.00	1.00
1/8/02 8:00	274	97	381	2.9	0.35	1.39	0.27	366,825	4.5	56.7	23.00	14.00
1/9/02 8:00	263	210	417	5.5	0.74	1.46	0.48	745,545	17.6	91.0	47.00	24.00
1/10/02 8:00	224	190	381	3.9	0.57	1.14	0.29	1,068,105	33.3	122.1	71.00	24.00
1/10/02 15:45	261	190*	185	3.9*	0.66	0.64	0.34	1,189,470	38.0	129.0	78.75	7.75

TPHg = Total petroleum hydrocarbons as gasoline.

ppmv = Parts per million by volume.

NC = Not Calculated

NA = Not Analyzed

Gallons of Vapor Equivalent Gasoline Removed: 6.2
Average Vapor Gallons Removed per Minute: 0.001

Cumulative

^{* =} assumed to be same as previous sample results

TABLE 3 DUAL PHASE EXTRACTION PILOT TEST VAPOR RESULTS TABLE

ARCO Service Station No. 2111 1156 Davis Street San Leandro, California

MW-7 PILOT TEST VAPOR EXTRACTION RESULTS - 2002

Date & Time Sampled	Influent Flowrate (ft³/min)		Influent Non- methane Hydrocarbons by FID (ppmv)	Laboratory Benzene Influent (ppmv)	Laboratory TPHg Extraction Rate (lbs/hour)	Non- Methane Hydrocarbons by FID (lbs/hour)	Benzene Extraction Rate (lbs/hour)	Cumulative Volume of Processed Air (cubic feet)	Cumulative Laboratory TPHg Extraction (lbs)	Cumulative FID Non- Methane Hydrocarbon Extraction (lbs)	Total Hours Operated	Change in Hours of Operation
1/10/02 16:00	NM	NA	NM	NA	NC	NC	NC	0	0.0	NC	0.00	0.00
1/10/02 17:00	NM	NΑ	NM	NA	NC	NC	NC	15,000	0.3	NC	1.00	1.00
1/11/02 9:00	250	80	NM	2	0.31	NC	0.17	255,000	5.2	NC	17.00	16.00
1/11/02 10:00	NM	NA	NM	NA	NC	NC	NC	270,000	5.5	NC	18.00	1.00
1/11/02 11:00	NM	NA	NM	NA	NC	NC	NC	285,000	5.8	NC	19.00	1.00
1/11/02 12:00	NM	NA	NM	NA	NC	NC	NC	300,000	6.1	NC	20.00	1.00

TPHg = Total petroleum hydrocarbons as gasoline.

ppmv = Parts per million by volume.

Gallons of Vapor Equivalent Gasoline Removed:
Average Vapor Gallons Removed per Minute:

1.0 0.001

Note: Laboratory results and flow rates are assumed to be consistant for entire event on MW-7. FID did not function properly during test on MW-7 therefore, no recordings were made.

NC = Not Calculated

NA = Not Analyzed

TABLE 3 DUAL PHASE EXTRACTION PILOT TEST VAPOR RESULTS TABLE

ARCO Service Station No. 2111 1156 Davis Street San Leandro, California

MW-2 PILOT TEST VAPOR EXTRACTION RESULTS - 2002

Date & Time Sampled	Influent Flowrate (ft³/min)		Influent Non- methane Hydrocarbons by FID (ppmv)	Laboratory Benzene Influent (ppmv)	Laboratory TPHg Extraction Rate (lbs/hour)	Non- Methane Hydrocarbons by FID (Ibs/hour)	Benzene Extraction Rate (Ibs/hour)	Cumulative Volume of Processed Air (cubic feet)	Cumulative Laboratory TPHg Extraction (lbs)	Cumulative FID Non- Methane Hydrocarbon Extraction (lbs)	Total Hours Operated	Change in Hours of Operation
1/11/02 12:00	292	NA	10,176	NA	NC	45.65	NC	0	NC	0.0	0.00	0.00
1/11/02 12:15	NM	NA	2,406	NA	NC	10.79	NC	4,380	NC	7.1	0.25	0.25
1/11/02 12:30	NM	NA	971	NA	NC	4.36	NC	8,760	NC	8.9	0.50	0.25
1/11/02 13:00	NM	NA	690	NA	NC	3.09	NC	17,520	NC	10.8	1.00	0.50
1/11/02 14:00	NM	NA	300	NA	NC	1.35	NC	35,040	NC	13.0	2.00	1.00
1/11/02 15:00	NM	NA	351	NA	NC	1.58	NC	52,560	NC	14.5	3.00	1.00
1/11/02 17:00	NM	NA	351	NA	NC	1.58	NC	87,600	NC	17.6	5.00	2.00

TPHg = Total petroleum hydrocarbons as gasoline.

ppmv = Parts per million by volume.

NC = Not Calculated

NA = Not Analyzed

Gallons of Vapor Equivalent Gasoline Removed: 2.9
Average Vapor Gallons Removed per Minute: 0.016

TABLE 4

DUAL PHASE EXTRACTION SYSTEM FIELD DATA

Pilot Test on V-2	lot Test on V-2 System Readings				V	-2	M\	N-2	MV	V-7	٧	-1	V	-3	MV	N-1		
Date	Time	System Vacuum ("Hg)	System Conc (ppmv)	System Flowrate (ft ³ /min)	Water Meter (galions)	Total Discharge (gpm)	Vacuum Reading ("H₂O)	Depth to Water (Feet)	Vacuum Reading ("H₂O)	Depth to Water (Feet)	Vacuum Reading ("H₂O)	Depth to Water (Feet)	Vacuum Reading ("H ₂ O)	Depth to Water (Feet)	Vacuum Reading ("H _z O)	Depth to Water (Feet)	Vacuum Reading ("H₂O)	-
1/7/02 9:00	9:00	24	260.3	236	NM	NC	NM	13.48	NM	13.20	ИМ	13.60	NM	14.14	NM	12.99	NM	15.09
1/7/02 9:30	9:30	24	260.3	236	2,552,890	NC	265	NM	0.10	13.22	0.00	13.62	0.00	14.12	0.00	13.00	0.00	15.12
1/7/02 9:45	9:45	24	261.7	226	NM	NC	265	NM	0.10	13.21	0.00	13.61	0.00	14.14	0.00	13.00	0.00	15.11
1/7/02 10:00	10:00	24	216.4	NM	2,552,980	3.00	NM	NM	0.05	13.24	0.01	13.60	0.00	14.16	0.00	13.01	0.02	15.13
1/7/02 10:30	10:30	24	112.4	247	NM	NC	265	NM	0.05	13.25	0.01	13.60	0.00	14.16	0.00	13.01	0.02	15.14
1/7/02 11:00	11:00	24	60,3	224	NM	NC	NM	NM	0.05	13.24	0.01	13.60	0.00	14.25	0.00	13.00	0.02	15.14
1/7/02 12:00	12:00	20	196.7	238	NM	NC	220	NM	0.05	13.25	0.01	13.60	0.00	14.15	0.00	13.00	0.02	15.14
1/7/02 13:00	13:00	22	320.4	247	2,553,140	0.89	230	NM	0.05	13.25	0.01	13.60	0.00	14.16	0.00	13.01	0.02	15.14
1/7/02 14:00	14:00	22	387.4	263	NM	NC	230	NM	0.05	13.25	0.01	13.60	0.00	14.16	0.00	13.01	0.02	15.14
1/7/02 15:00	15:00	NM	System D	OWN	NM	NC	NM	NM	NM	NM	NM	NM						
1/7/02 16:00	16:00	NM	883.7	260	NM	NC	NM	NM	0.05	13.24	0.01	13.60	0.00	14.15	0.00	13.00	0.02	15.14
1/7/02 17:00	17:00	22	807.6	263	2,553,250	0.46	230	NM	0.05	13.25	0.01	13.60	0.00	14.15	0.00	13.01	0.02	15.14
1/7/02 18:00	18:00	24	1087	261	NM	NC	265	NM	0.05	13.25	0.01	13.61	0.00	14.15	0.00	13.01	0.02	15.14
1/8/02 8:00	8:00	24	380.7	274	2,554,700	1.61	265	15+	NM	13.31	NM	13.64	NM	14.24	NM	13.04	. NM	15.17
1/9/02 8:00	8:00	24	416.6	263	2,557,220	1.75	265	19+	0,08	13.35	0.00	13.68	0.00	14.25	0.00	13.11	0.02	15.25
1/10/02 8;00	8:00	24	380.7	224	2,559,570	1.63	240	NM	0.22	13.39	0.00	13.69	0.00	14.29	0.00	13.16	0.03	15.27
1/10/02 15:45	15:45	24	184.7	261	2,560,010	0.95	240	19+	0.22	13.46	0.00	13.70	0.00	14.36	0.00	13.20	0.02	15.30
Totals/Avg:	4725	23.3	388.6	248.2	7,120	1.51	248.3	5.52		0.26		0.10		0.22	*	0.21		0.21

ppmv = parts per million by volume.

"Hg = inches of Mercury

"H₂O = inches of water collumn

NM = Not Measured

TABLE 4

DUAL PHASE EXTRACTION SYSTEM FIELD DATA

ARCO Service Station No. 2111 1156 Davis Street San Leandro, California

Pilot Test on MV	ot Test on MW-7			System F	teadings		V	-2	MV	N-2	MV	V-7	v	-1	v	-3	MV	V-1
Date	Time	System Vacuum ("Hg)	System Conc (ppmv)	System Flowrate (ft ³ /min)	Water Meter (gallons)	Total Discharge (gpm)	Vacuum Reading ("H₂O)	Depth to Water (Feet)	Vacuum Reading ("H₂O)	Depth to Water (Feet)	Vacuum Reading ("H ₂ O)	Depth to Water (Feet)	Vacuum Reading ("H ₂ O)		Vacuum Reading ("H ₂ O)		Vacuum Reading ("H ₂ O)	Depth to Water (Feet)
1/10/02 16:00	16:00	24	NM	250	2,560,010	NC	NM	13.69	NM	13.45	240.00	13.77	NM	14.35	NM	13.20	NM	15.32
1/11/02 12:00	12:00	24	NM	250	2,561,910	1.58	NM	13.67	NM	13.50	240.00	13.89	NM	14.37	NM	13.20	NM	15.35
Totals/Avg:	1200			250	1,900	1.58		-0.02		0,05	240.0	0.12		0.02		0.00	•	0.03

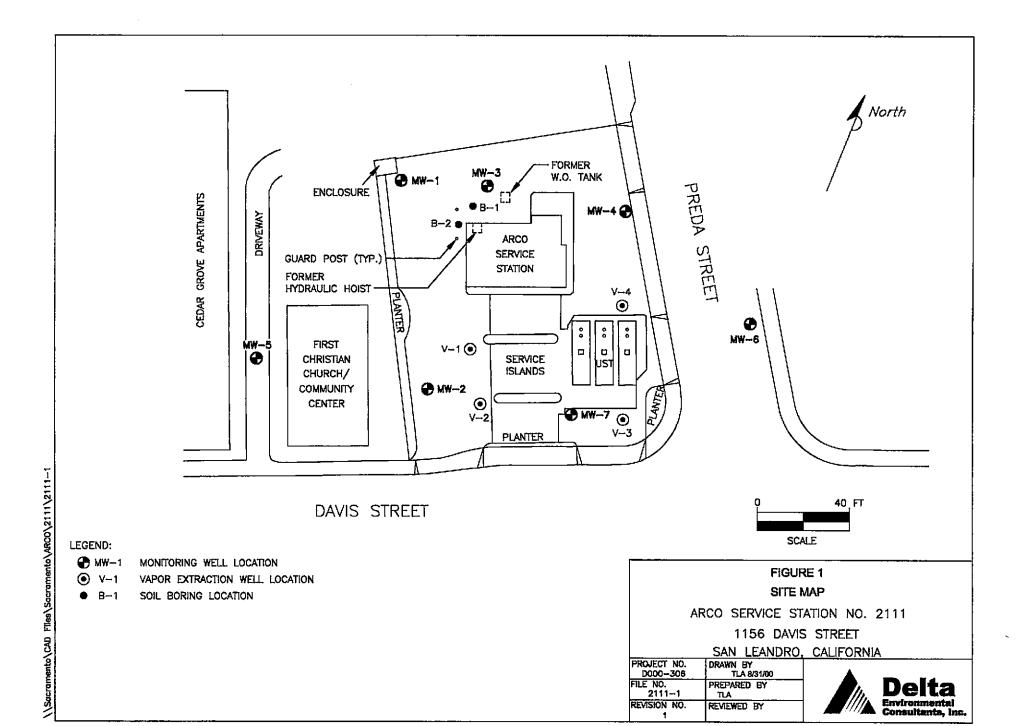
Pilot Test on MV	ilot Test on MW-2			System R	eadings		ν	-2	MV	V-2	MV	V-7	v	-1	V-	-3	MV	N-1
Date	Time	System Vacuum ("Hg)	System Conc (ppmv)	System Flowrate (ft ³ /min)	Water Meter (gallons)	Total Discharge (gpm)	Vacuum Reading ("H ₂ O)	Water	Vacuum Reading ("H₂O)		Vacuum Reading ("H ₂ O)	Water	Vacuum Reading ("H ₂ O)		Vacuum Reading ("H ₂ O)		Vacuum Reading ("H₂O)	Depth to Water (Feet)
1/11/02 12:00 1/11/02 17:00	12:00 17:00	18 18	10,176 351,4	342 292	2,561,910 2,567,870	NC 19.87	NM NM	13.67 13.71	NM 150.00	13.50 13.69	NM NM	13.80 13.87	NM NM	14.37 14.38	NM NM	13.21 13.20	NM NM	15.35 15.35
Totals/Avg:	300			317	5,960	19.87		0.04	150.0	0.19		0.07		0.01	1111	-0.01	14141	0.00

ppmv = parts per million by volume.

"Hg = inches of Mercury

"H_ZO = inches of water collumn

NM = Not Measured



→ MW-1 MONITORING WELL LOCATION

V-1 VAPOR EXTRACTION WELL LOCATION

B-1 SOIL BORING LOCATION

■ V-4 DESTROYED WELL LOCATION

FIGURE 2 SITE LAYOUT MAP

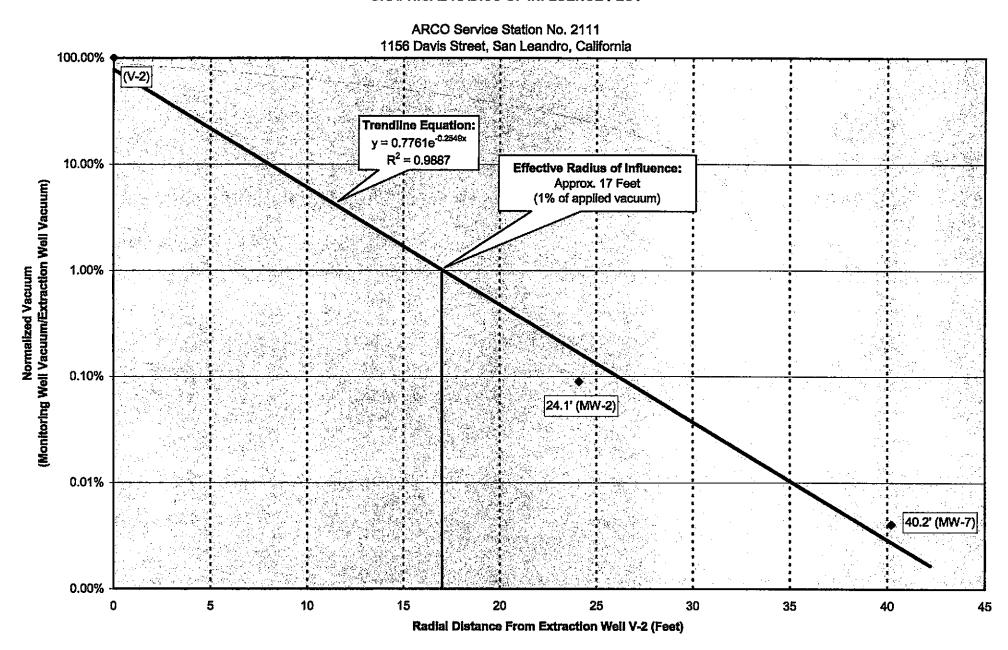
ARCO SERVICE STATION NO. 2111 1156 DAVIS STREET SAN LEANDRO, CALIFORNIA

PROJECT NO.	DRAWN BY
D000-306	TLA 6/8/02
FILE NO.	PREPARED BY
2111-1	TLA
REVISION NO.	REVIEWED BY



FIGURE 3

DUAL PHASE PILOT TEST GRAPHICAL RADIUS OF INFLUENCE PLOT



ENCLOSURE A

Field Notes Collected During Pilot Test

FRO	M :SOLLECO			FAX NO. :	7145750026	.	Jan.	14 2002	10:53AM P
		1		_ :			: :	. •	
:				; ; ;					ولمدرذ بيور
٠	1-7-02		MWZ	MW3 MU	vy mws	MWG	nwr u		- 00,5
	4:00 A	m 11 1509	1320	1452 17	14 /310	1202	1359	1414 13	44 1299
		Sygnem			11 head				Tora L
	980 AM	Mer 2	MW7		W3 M				
	! Drw	/322	13.62			172	2552		260.3 114
	FUT	50000	-0	•	_	9 :	:	•	
•	IN 07 120	10	0	- ·	-	0 <u>2</u> ·	CF	4 234	
•		Systen		4" Hay mel	- 4	265 " H	20	: :	:
	84/5 AM	MWZ	אנשיץ.	ושל :	VW3	mwi 			
: ,	DNU	1321	1341	1414	•	1511	FIR	20%	7
` ∕لا:	3M 31F 1120	.10				.07		224	· · ·
	En	50,000+	. 4	. D	, U . ,	Ð	i ;		
)	10:00 4-1	nw2	mw7	VWI	•	MWI	1.18 = 2	- MERK	FiD
•	DTW		13.60				: i	<u> </u>	
: _	A #20	3.74	,01	14.14	•	1573	47 7	2980	2/2.4
	7.20	.05	1 • 1	ļ 🤷 .	.0	07	!· ; ;	1 .	·
: ;	1000	50,0001	6	. 5	O I			: :	
	10:30Am	, i fi		· •	well here	•	1 : ;	: ;	امخد
, ,	on.	1325	1360	14.16	1901	15.14	FID	112.4	(FM)
:	111 05 420	195	01	$\boldsymbol{\theta}$	•	.02		, i	247.
	FID	50,000+	10	Ð	#	· .	;		
; [11:00 AM		·					; ;	; ; ; ;
1	Drew	/3.24	13.60	1425		1	FID	60.3	CFM
	IN OF HED	.05	0/	· • • • • • • • • • • • • • • • • • • •	0	.02		:	224
. !	FID	31,000+	, , O , .	. 0		0			, , , ,
		System	VAL 20	Ha	well head	1 220"	120	• :	
i	12:04	•		,		•	· · ·		! ; ; ; , , , ; ;
!	arw.	/325	1340	14.15	13,0	0 . 1544	with	THE MOTHER.	· CFM
• •	IN OF NAO	.05	.01	4	0	.02	-		238
	FID.	50,000+	. 0	. +	Ø	Ð	FID	114.7	
		System 1	Ac 22	H4	well	head 2	30 N N2	. v :	'
	100			: /	. !				
:	DTW :	13.25	1366	ol initial	130	I ISIV	FID	320.4	CFM
. !	1104 1120	.05	10.	1 1	Ð	:	1 1	- Mariene	247
į	FID	10,000+	•	., • 0	Đ	Ð		3140	
;		System V	1	ltg		ed 250			;
	2100	ישון ושאן ופין ש		77	VVILL TIP	· • • • • • • • • • • • • • • • • • • •			. .
	DW	13.25	136	क प्र	: !/ : !!	। ।ऽत्रेय	FIO	200 0	(FW
	m . P H 20	.05	6.	• •	1 t			An live	263
:	F-10	50,000+		PG	1	.0.Z.			4.03
	-	3 4,000 6		.	; /		, ,		

FROM	: SOLLEC	D			FAX NO.	:7145750020	5	Jan. 14	2002 10:54AM P4
		Mw.	a.	MW	VW1	VW3	mini		
	soo Drw		Syste	in de	in B	mental a	ו אים ו	iolding	Power
•	nv of Hz	4	• :		•	been a		•	• • •
ុំ៛	Sip		DM	the w	MANY.				
}	100	•	ا ا	. 11		• • • • •	•		
. 7	10 0		Cal	rill-c	R up a	ind : fun	ring at		
			Serm	to be	fine Ger	vera for	was the	nged	and
;		1.wz		mw	YWI	VW3	Hw.I		
: `	00	•	*						
7	of HTO	324		1324	1415	•		FID D	erm
FI	نہ اہا	50,000		49	-0	: :0− E2.	10°L	883:1	260
: <u>;</u>		5	estem	Vac 22	"lle "w	rell bread	230" H	20	
i i	00	1325				. !			
01	W N20	1325		13.60	1415	So:		WATERM	
F1	-1	50,0004	· · · !	4	\$	0 :	. 12 - D	2553254 FID 80	1 7 7 7 7
•							: - 1		
: "	70 ·	. .	Katen	~ Vac 2	4"64	well he	ed 265	H20	
# # E V	7 0	1325		13.61	1415"	1307	1514		C1=m
	10	50,000	.	.DI		9	,02	-11) 109	241
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1-8	.02	MWI		ez men	3 MW4	MWS A	nw 4 Ma	7 W1	unz unz
	10 Am	!!		3/ 145	1315	7 . 1	203 126	4 1654	13.04
t	1	F10							
•	HIER	1	•	15470	. :	system 1	he 24	" Hg	
	m.	' ' '	! !	:	· ; ; ; (well head	VAL 26	rn Hzu	
,						. !			
wi	مهزار	4		4	in	11/1		لمؤانز	المسارات
	9-02					ws mwg	MW7	Pall Vu	12 UN3
1	IT W	15.25	13.35	1470	/3.28	12:12	13.68	14.25	9' 1211
i Ity	of Him	.DZ .	.08	.0	.0 . () 0	. 0.		
• • •	10	;		f T	U	· •	.	15.7	
	orki /			7774	!	/ Esa	263	System	n vac zemy
	IN TER	METER	235	72 23		(FM	. · · ·	well h	end 765 H20



3941 EAST LA PALMA AVENUE ANAHEIM, CA 92807

FAX **714 / 632-9218**

POWER TRANSMISSION

1-9-01	MWZ STARTING	to show	mfluence
9:00 Am	10 H20 47,137 PM		
10:00 Aus	.16" H20 32,463 PPM		
11:00 AM	.17" HZO 29,742 PPH		
12:00	20" HZO 17,146 PPM		FM = 2
/:00	.20" HZO 13,178 120" HZO		
2:00	11,642 ZO# HZO		System 1 well head
3:00 4:00	11,559 122" HZ O 10,136		
1.10.02 8:00 An	.22# H20 3487		

System Mc



3941 EAST LA PALMA AVENUE ANAHEIM, CA 92807

714 / 632-8895 FAX 714 / 632-9218

PNEUMATICS - POWER TRANSMISSION EQUIPMENT - BEARINGS

			***	171101111			-141	DEAN	MACAS	
8:004m	MW!	MWZ	MW3	MWY	Mars	MNG	14w7	Uwl	Uw	VILIZ
o comm		•								
1-10-02			• •	••	•	• ;	:			
Drw In of Azo	15.27	.22	14.74 0	1335	?	12.18	1369	14.Z.9 O	· : · · · · · · · · · · · · · · · ·	13.16
FID	()	3687	D	6		<i>0</i>	0	P		0 -
		· · .		. •		•	: .	į i	• •	

System Une 24" Ha Well head was 240" Hzw CF

CFM 274

WHEN EIN 2005



3941 EAST LA PALMA AVENUE ANAHEIM, CA 92807

714 / 632-8895

FAX 714 / 632-9218

. PNE	UMATIC	S - POWE!	TRANSMI	SSION EQUI	PMENT -	BEARIN	IGS
3:45	MWI	MWZ WW	3 MW4 1	has mal	MW7 PW	1. VW2	UN3
DTW IN of 1720		13.96° 147.	5 /239	7 1770	1370 14 0 6	36	1320
FID System is	i	•	٠	CFM	241		
system vi und heed	Vac ·	240 " HZO	••	MWZ	2612	PIM	FID
1-10-07	2	Awz	- Rech	ige "	•1		
	•	4:00 PM	16:25		. •		
	•		16.01 15.77 15.42				
•			15.07 14.83				

13.86 13.69



3941 EAST LA PALMA AVENUE ANAHEIM, CA 92807

FAX **714 / 632-9218**

MW7 PNEUMATICS - POWER TRANSMISSION EQUIPMENT - BEARINGS

1:16.	: Mw1.	mwz.	MWZ	MWY	11th 5"	MWG.	MW7.	VWI	wi	Her;
1-10-03	15.32	1345	. 1480	1340	7.	12,25	13:77	1475	1368	132
5:00	9:00 Am 15:33	1345 1346	1480	1340 <i>1340</i>	· 2	12.24	1379		13.49 1349	132
IN OF 1/20		0	0	Ð	•	ti.	\$2.60			-6
9:00	15.34 15.34	13.47	1481	14 3 9 14 3 9	. 7	12.23	1386.	1434		
1100	15.34	1349	1481	1428	7	1223	1388	1936	1348	131
12:00	15,35 WATERINE TE	1350 R 256	1481 1910	13.30	•	12.72	13.89	1437.	1347	132

Verbal control to the well

707 - 202-3654



Thompson Industrial Supply Inc.

3941 EAST LA PALMA AVENUE ANAHEIM, CA 92807

714 / 632-8895

FAX **714 / 632-9218**

PNEUMATICS - POWER TRANSMISSION EQUIPMENT - BEARINGS

1-11-	0 2	mw/	MWZ A	ing. w	WY MWS	nwe	MUT	uni	www	a de
DTW		15,35	1350	1481 134	39 ?	12.22	1380	14.37	1367	13.21
	Systi	em trac	! 18" Hg		self heart			• • •	•	i :
· · · · · · · · · · · · · · · · · · ·	CFM	342	,		Piloteon			, .	•	
12100	Tota	•			Br. d	·	WAT	AMETA LOSE	P. 25C	1910
12:30	Inte	T FID	2,406		Syste	m vac 192	18."Hg.	Well A	cart the	150
7:00 7:00 3:00	Invert Invest Inver	10	200.1 300.4				•	.1		
	·		·			:		·		
5100	Miss	i mu	7 Mus 3	MWY	mws m	auc m	w7 11	vi in	r weer	
DTW	1535	1368	14.81	13.39	7 /	2.20	1387	438 13	71 /3	,20

LAST WATER METER NO ASING

2567870

ENCLOSURE B

Analytical Laboratory Reports



21 January, 2002

Steven Meeks Delta Environmental Consultants (Rancho Cordova) 3164 Gold Camp Drive Ste. 200 Rancho Cordova, CA 95670

RE: ARCO 2111, San Leandro, CA Sequoia Report: S201100

Enclosed are the results of analyses for samples received by the laboratory on 01/07/02 14:35. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ron Chew

Client Services Representative

Lito Diaz

Laboratory Director

CA ELAP Certificate #1624



819 Striker Avenue, Suite 8 Sacramento, CA 95834 (916) 921-9600 FAX (916) 921-0100 www.sequoialabs.com

Delta Environmental Consultants (Rancho Cordova

3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number. 2111, San Leandro, CA

Project Manager. Steven Meeks

Reported:

01/21/02 13:51

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
VW-2	S201100-01	Air	01/07/02 10:45	01/07/02 14:35





3164 Gold Camp Drive Ste. 200

Rancho Cordova CA, 95670

Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/21/02 13:51

Total Purgeable Hydrocarbons, BTEX and MTBE in Air by DHS LUFT Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VW-2 (S201100-01) Air Sampled:	: 01/07/02 10:45 Red	:eived: 01/0	7/02 14:35						
Purgeable Hydrocarbons	230	100	mg/m³ Air	10	2010193	01/11/02	01/11/02	DHS LUFT	HC-12
Benzene	13	0.50	*	н	н	u	**	79	
Toluene	3.1	0.50	**	*	н	77	π	#	
Ethylbenzene	7.9	0.50	n	n	н	π	π	₩	
Xylenes (total)	19	0.50	*	н	н	π	Ħ	#	
Methyl tert-butyl ether	300	5.0	**	**	н	*	#	*	
Surrogate: a,a,a-Trifluorotoluene		71.0 %	60-1	40	H	#	*	"	





3164 Gold Camp Drive Ste. 200

Rancho Cordova CA, 95670

Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported: 01/21/02 13:51

Total Purgeable Hydrocarbons, BTEX and MTBE in Air (ppmv) by DHS LUFT

Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
·	oled: 01/07/02 10:45 Re	eceived: 01/07	//02 14:35						
Purgeable Hydrocarbons	55	28	ppmv	10	2010193	01/11/02	01/11/02	DHS LUFT	HC-12
Benzene	4.1	0,16	и	Ħ	п	n	**	n	
Toluene	0.82	0.13	п	**	н	н	**	₩	
Ethylbenzene	1.8	0.12	н	**	н	н	11	Ħ	
Xylenes (total)	4.5	0.12	n	**	н	н	"	**	
Methyl tert-butyl ether	84	1.4	н	н	н	n	#	'n	
Surrogate: a.a.a-Trifluorotoluene	,	71.0 %	60-	140	n	"	"	*	





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/21/02 13:51

MTBE Confirmation by EPA Method 8260B

Sequoia Analytical - Sacramento

Analytė	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VW-2 (S201100-01) Air Sampled	: 01/07/02 10:45 Red	eived: 01/07	/02 14:35	<u> </u>					<u></u>
Methyl tert-butyl ether	300	1.0	ug/l	5	2010242	01/18/02	01/18/02	EPA 8260B	
Surrogate: 1,2-DCA-d4		92.4 %	60-	140	п	#	"	и	



3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/21/02 13:51

Total Purgeable Hydrocarbons, BTEX and MTBE in Air by DHS LUFT - Quality Control Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2010193 - EPA 5030B (P/T)										
Blank (2010193-BLK1)				Prepared .	& Analyze	ed: 01/11/0	02			
Purgeable Hydrocarbons	ND	10	mg/m³ Air							
Benzene	ND	0.050	**							
Toluene	ND	0.050	**							
Ethylbenzene	ND	0.050	n							
Xylenes (total)	ND	0.050	11							
Methyl tert-butyl ether	ND	0.50	Ħ							
Surrogate: a,a,a-Trifluorotoluene	1.74		"	2.00		87.0	60-140			
LCS (2010193-BS1)				Prepared	& Analyza	ed: 01/11/0	02			
Benzene	1.85	0.050	mg/m³ Air	2.00		92.5	70-130			
Toluene	1.94	0.050	н	2.00		97.0	70-130			
Ethylbenzene	1.98	0.050	H	2.00		99.0	70-130	•		
Xylenes (total)	5.52	0.050	**	6.00		92.0	70-130	•		
Methyl tert-butyl ether	2.05	0.50	91	2.00		102	70-130		•	
Surrogate: a,a,a-Trifluorotoluene	1.97		"	2.00		98.5	60-140			
LCS Dup (2010193-BSD1)				Prepared	& Analyzo	ed: 01/11/	02			
Benzene	1.77	0.050	mg/m³ Air	2.00		88.5	70-130	4.42	25	
Toluene	1.89	0.050	*	2.00		94.5	70-130	2.61	25	
Ethylbenzene	1.89	0,050	"	2.00		94.5	70-130	4.65	25	
Xylenes (total)	5.37	0.050	Ħ	6.00		89.5	70-130	2.75	25	
Methyl tert-butyl ether	1.98	0.50	p	2.00		99.0	70-130	3.47	25	
Surrogate: a,a,a-Trifluorotoluene	1.68		н	2.00		84.0	60-140			



3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number. 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported: 01/21/02 13:51

Total Purgeable Hydrocarbons, BTEX and MTBE in Air (ppmv) by DHS LUFT - Quality Control Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2010193 - EPA 5030B (P/T)										
Blank (2010193-BLK1)				Prepared	& Analyze	ed: 01/13/0	02			,
Purgeable Hydrocarbons	ND	2.8	ppmv							
Benzene	ND	0.016	H							
Toluene	ND	0.013	н							
Ethylbenzene	ND	0.012	77							
Xylenes (total)	ND	0.012	π							
Methyl tert-butyl ether	ND	0.14	77							
Surrogate: a,a,a-Trifluorotoluene	0.291		,,	0.335	· · · · · ·	86.9	60-140			
LCS (2010193-BS1)				Prepared	& Analyze	ed: 01/11/	02			
Surrogate: a,a,a-Trifluorotoluene	0.330		ppmv	0.335		98.5	60-140			
LCS Dup (2010193-BSD1)				Prepared	& Analyze	ed: 01/11/	02			·
Surrogate: a,a,a-Trifluorotoluene	0.281		ppmv	0.335		83.9	60-140			



3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported: 01/21/02 13:51

MTBE Confirmation by EPA Method 8260B - Quality Control Sequoia Analytical - Sacramento

		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Levei	Result	%REC	Limits	RPD	Limit	Notes
Batch 2010242 - EPA 5030B [P/T]	, ,,,, ,,,									 -
Blank (2010242-BLK1)				Prepared	& Analyz	ed: 01/18/	02			
Methyl tert-butyl ether	ND	0.20	ug/l							
Surrogate: 1,2-DCA-d4	9.49		#	10.0		94.9	60-140			
LCS (2010242-BS1)				Prepared	& Analyz	ed: 01/18/0	02			
Methyl tert-butyl ether	9.00	0.20	ug/l	10.0		90.0	70-130			
Surrogate: 1,2-DCA-d4	10.2		"	10.0		102	60-140			
LCS Dup (2010242-BSD1)				Prepared	& Analyz	ed: 01/18/	02			
Methyl tert-butyl ether	10.1	0.20	ug/l	10.0		101	70-130	11.5	25	
Surrogate: 1,2-DCA-d4	10.6		"	10.0		106	60-140			



819 Striker Avenue, Suite 8 Sacramento, CA 95834 (916) 921-9600 FAX (916) 921-0100 www.sequoialabs.com

Delta Environmental Consultants (Rancho Cordova

3164 Gold Camp Drive Ste. 200

Rancho Cordova CA, 95670

Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/21/02 13:51

Notes and Definitions

HC-12 Hydrocarbon pattern is present in the requested fuel quantitation range but does not resemble the pattern of the requested fuel.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

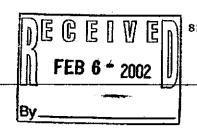
NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

RCO Faci	ly no2	1/1	············	pany d	ty molity 5	Ans	7		rder No.	Project	ranen t	J /	<u>42米</u> サニ	18			· · ·			<u>'</u>		١	Chain of Custo
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Samplo I.D.	Lab no.	Conteiner no	Soil	Water	Other	lce	Acid	Sempling date	Sampling lima	BTEX 608/EPA BIZD	BTEXTPH EPA MEZZ 50204016	TPH Modied 8815 Gas Diesei	Ož and Gresse - 413.1 D 413.2 □	TPH EPA 418. WSUSQSE	EPA 601/8010	EPA 624/8240	EPA 025/8270	TCLP Sanf. Metal YOAD YOAD	CAN NEW SER BOUNDS	Lead On JOHS CI Lead EPA 74207421 CI	斯赛 8%		الرز
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819 Striker Avenue, Suite 8 Sacramento, CA 95834 (916) 921-9600 FAX (916) 921-0100 www.sequoialabs.com

January 23, 2002

Steven Meeks
Delta Environmental Consultants (Rancho Cordova)
3164 Gold Camp Drive Ste. 200
Rancho Cordova, CA 95670
RE: ARCO 2111, San Leandro, CA / S201166

Enclosed are the results of analyses for samples received by the laboratory on 01/09/02. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ron Chew Client Services Representative

CA ELAP Certificate Number 1624

Lito Diaz

Laboratory Director





3164 Gold Camp Drive Ste. 200

Rancho Cordova CA, 95670

Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/23/02 17:07

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
1-7-02	S201166-01	Аіг	01/07/02 16:00	01/09/02 18:00
1-8-02	S201166-02	Air	01/08/02 08:00	01/09/02 18:00
1-9-02	S201166-03	Air	01/09/02 08:00	01/09/02 18:00





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/23/02 17:07

Total Purgeable Hydrocarbons and BTEX in Air by DHS LUFT Sequoia Analytical - Sacramento

<u> </u>		D							
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
1-7-02 (S201166-01) Air	Sampled: 01/07/02 16:00	Received: 01/	09/02 18:0	0					
Purgeable Hydrocarbons	100	50	mg/m³ Air	5	2010201	01/14/02	01/14/02	DHS LUFT	
Benzene	6.5	0.25	"	91	11	**	n	H	
Toluene	1.3	0.25	•		н	•	н	н	
Ethylbenzene	2.9	0.25	*	u	11	**	н .	"	
Xylenes (total)	6.4	0.25	H	Щ	11	H	н	н	
Surrogate: a,a,a-Trifluoroi	toluene	91.5 %	60-1	40	"	"	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	H	
1-8-02 (S201166-02) Air	Sampled: 01/08/02 08:00	Received: 01/	09/02 18:0	0					
Purgeable Hydrocarbons	400	100	mg/m³ Air	10	2010215	01/15/02	01/15/02	DHS LUFT	
Benzene	9.1	0.50	#1	**	**		"	H	
Toluene	3.8	0.50	11	**	n	**	**	н	
Ethylbenzene	5.5	0.50	Ħ	**			*	H	
Xylenes (total)	9.7	0.50	н	***	'n	H	н	rt	
Surrogate: a,a,a-Trifluoroi	toluene	92.5 %	60-1	40	п	p	"	ri	
1-9-02 (S201166-03) Air	Sampled: 01/09/02 08:00	Received: 01/	09/02 18:00)					
Purgeable Hydrocarbons	850	100	mg/m³ Air	10	2010215	01/15/02	01/15/02	DHS LUFT	
Benzene	18	0.50	- "	H	*	n	н	11	
Toluene	8.6	0.50	а	"	n	p	#	ij	
Ethylbenzene	9.1	0.50	"	*	*	n	*	н	
Xylenes (total)	17	0.50	**	**	"	n	••	11	
Surrogate: a,a,a-Trifluoroi	toluene	101 %	60-1	40	. "	"	rr	,,	

Sequoia Analytical - Sacramento





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/23/02 17:07

Total Purgeable Hydrocarbons and BTEX in Air (ppmv) by DHS LUFT Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
1-7-02 (S201166-01) Air	Sampled: 01/07/02 16:00	Received: 01/0	9/02 18:0	0					
Purgeable Hydrocarbons	25	14	ppmv	5	2010201	01/14/02	01/14/02	DHS LUFT	
Benzene	2.1	0.080	н	**	н	n	Ħ	**	
Toluene	0.34	0.065	11	**	H	n	н	*1	
Ethylbenzene	0.68	0.060	н	**	н	n	11	t)	
Xylenes (total)	1.5	0.060	r	*	11	"	н	n	
Surrogate: a,a,a-Trifluoro	toluene	91.3 %	60-	140	#	,,	#	я	
1-8-02 (S201166-02) Air	Sampled: 01/08/02 08:00	Received: 01/0	9/02 18:0	0					
Purgeable Hydrocarbons	97	28	ppmv	10	2010215	01/15/02	01/15/02	DHS LUFT	
Benzene	2.9	0.16	H	71	н	H	11	Ħ	
Toluene	1.0	0.13	11	**	ù	n	11	**	
Ethylbenzene	1.3	0.12	h	**	н	17	#	**	
Xylenes (total)	2.2	0.12	H	**	11	It	11	#	
Surrogate: a,a,a-Trifluoroi	toluene	92.5 %	60-	140	"	#	,,	π	
1-9-02 (S201166-03) Air	Sampled: 01/09/02 08:00	Received: 01/0	9/02 18:0	0					
Purgeable Hydrocarbons	210	28	ppmv	10	2010215	01/15/02	01/15/02	DHS LUFT	
Benzene	5.5	0.16	н			п	t)	•	
Toluene	2.3	0.13	**	и	n	H	n	*	
Ethylbenzene	2.1	0.12	н	**	H	IF	h	**	
Xylenes (total)	3.8	. 0.12	Ħ		н	lt	**	**	
Surrogate: a,a,a-Trifluoroi	toluene	101 %	60-	140	"	"	"	"	





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/23/02 17:07

MTBE by EPA Method 8260B Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
1-7-02 (S201166-01) Air	Sampled: 01/07/02 16:00	Received: 01/0	09/02 18:00	D					
Methyl tert-butyl ether	230	0.0062	mg/m³ Air	12.5	2010247	01/21/02	01/21/02	EPA 8260B	
Surrogate: 1,2-DCA-d4		99.1 %	60-1	40	"	n	Ħ	n	
1-8-02 (S201166-02) Air	Sampled: 01/08/02 08:00	Received: 01/0	09/02 18:00	0					
Methyl tert-butyl ether	750	0.012	mg/m³ Air	25	2010247	01/21/02	01/21/02	EPA 8260B	
Surrogate: 1,2-DCA-d4		102 %	60-1	40	"	Ħ	,	n	
1-9-02 (S201166-03) Air	Sampled: 01/09/02 08:00	Received: 01/0	09/02 18:00	D					
Methyl tert-butyl ether	640	0.012	mg/m³ Air	25	2010247	01/21/02	01/21/02	EPA 8260B	
Surrogate: 1,2-DCA-d4		96.7 %	60-1	40	v	"	n	*	





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/23/02 17:07

Total Purgeable Hydrocarbons and BTEX in Air by DHS LUFT - Quality Control Sequoia Analytical - Sacramento

Analysis	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Analyte	Kesuit	- LIMIL	Onits	LEVC1	resmt	/gitist	Links			7,000
Batch 2010201 - EPA 5030B (P/T)	<u> </u>									
Blank (2010201-BLK1)				Prepared	& Analyze	d: 01/14/	02			
Purgeable Hydrocarbons	ND	10	mg/m³ Air							
Benzene	ND	0.050	**							
Toluene	ND	0.050	•							
Ethylbenzene	ND	0.050								
Xylenes (total)	ND	0.050	**							
Surrogate: a,a,a-Trifluorotoluene	1.64		rt	2.00		82.0	60-140			
LCS (2010201-BS1)				Prepared:	01/14/02	Analyzed	l: 01/15/02			
Benzene	1.89	0.050	mg/m³ Air	2.00		94.5	70-130			
Toluene	1.95	0.050	**	2.00		97.5	70-130			-
Ethylbenzene	1.98	0.050	*	2.00		99.0	70-130			
Xylenes (total)	5.47	0.050	**	6.00		91.2	70-130			
Surrogate: a,a,a-Trifluorotoluene	1.75		"	2.00		87.5	60-140			
LCS Dup (2010201-BSD1)				Prepared:	01/14/02	Analyzed	l: 01/15/02			
Benzene	1.92	0.050	mg/m³ Air	2.00		96.0	70-130	1.57	25	
Toluene	1.97	0.050	•	2.00		98.5	70-130	1.02	25	
Ethylbenzene	1.98	0.050	•	2.00		99.0	70-130	0.00	25	
Xylenes (total)	5.45	0.050	11	6.00		90.8	70-130	0.366	25	
Surrogate: a,a,a-Trifluorotoluene	1.74		"	2.00		87.0	60-140			
Batch 2010215 - EPA 5030B (P/T)										_
Blank (2010215-BLK1)				Prepared	& Analyze	ed: 01/15/	02			
Purgeable Hydrocarbons	ND	10	mg/m³ Air							
Benzene	ND	0.050	11							
Toluene	· ND	0.050	11							
Ethylbenzene	ND	0.050	H							
Xylenes (total)	ND	0.050	"							
Surrogate: a,a,a-Trifluorotoluene	1.72		"	2.00		86.0	60-140			





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Reported: 01/23/02 17:07

CA, 95670 Project Manager: Steven Meeks

Total Purgeable Hydrocarbons and BTEX in Air by DHS LUFT - Quality Control Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2010215 - EPA 5030B (P/T)									·	
LCS (2010215-BS1)				Prepared	& Analyze	ed: 01/15/	02			
Benzene	1.88	0.050	mg/m³ Air	2.00		94.0	70-130			
Toluene	1.96	0.050	н	2.00		98.0	70-130			
Ethylbenzene	1.98	0.050	н	2.00		99.0	70-130			
Xylenes (total)	5.48	0.050	н	6.00		91.3	70-130			
Surrogate: a,a,a-Trifluorotoluene	1.84		"	2.00		92.0	60-140			
LCS Dup (2010215-BSD1)				Prepared	& Analyze	ed: 01/15/	02			
Benzene	2.02	0.050	mg/m³ Air	2.00		101	70-130	7.18	25	
Toluene	2.13	0.050	"	2.00		106	70-130	8.31	25	
Ethylbenzene	2.13	0.050	"	2.00		106	70-130	7.30	25	
Xylenes (total)	5.97	0.050	"	6.00		99.5	70-130	8.56	25	
Surrogate: a,a,a-Trifluorotoluene	1.75		"	2.00		87.5	60-140			





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/23/02 17:07

Total Purgeable Hydrocarbons and BTEX in Air (ppmv) by DHS LUFT - Quality Control Sequoia Analytical - Sacramento

•		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2010201 - EPA 5030B (P/T)										
Blank (2010201-BLK1)				Prepared	& Analyze	ed: 01/14/	02			
Purgeable Hydrocarbons	ND	2.8	ppmv							
Benzene	ND	0.016	"							
Toluene	ND	0.013	•							
Ethylbenzene	ND	0.012	π							
Xylenes (total)	ND	0.012	*							
Surrogate: a,a,a-Trifluorotoluene	0.275		'n	0.335	_	82.1	60-140			
LCS (2010201-BS1)				Prepared:	01/14/02	Analyzed	l: 01/15/0 2			
Surrogate: a,a,a-Trifluorotoluene	0.292		ppmv	0.335		87.2	60-140			
LCS Dup (2010201-BSD1)				Prepared:	01/14/02	Analyzed	1: 01/15/02			
Surrogate: a,a,a-Trifluorotoluene	0.291		ppmv	0.335		86.9	60-140			
Batch 2010215 - EPA 5030B (P/T)	····									
Błank (2010215-BLK1)				Prepared	& Analyzo	ed: 01/15/	02			
Purgeable Hydrocarbons	ND	2.8	ppmv							
Benzene	ND	0.016	••							
Toluene	ND	0.013	11							
Ethylbenzene	ND	0.012	н							
Xylenes (total)	ND	0.012	n						•	
Surrogate: a,a,a-Trifluorotoluene	0.288		"	0.335		86.0	60-140			-
LCS (2010215-BS1)				Prepared	& Analyz	ed: 01/15/	02			
Surrogate: a,a,a-Trifluorotoluene	0.308		ppmv	0.335		91.9	60-140			
LCS Dup (2010215-BSD1)				Prepared	& Analyze	ed: 01/15/	02			
Surrogate: a,a,a-Trifluorotoluene	0.293		ppmv	0.335		87.5	60-140			





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/23/02 17:07

MTBE by EPA Method 8260B - Quality Control Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2010247 - EPA 5030B [P/T]				<u> </u>						
Blank (2010247-BLK1)				Prepared	& Analyze	d: 01/21/	02			
Methyl tert-butyl ether	ND	0.00050 mg	z/m³ Air							
Surrogate: 1,2-DCA-d4	9.47		"	10.0		94.7	60-140			
LCS (2010247-BS1)				Prepared	& Analyze	d: 01/2 <u>1/</u>	02			
Methyl tert-butyl ether	9.75	0.00050 mg	z/m³ Air	10.0		97.5	70-130			
Surrogate: 1,2-DCA-d4	9.79	,	rr	10.0		97.9	60-140			
LCS Dup (2010247-BSD1)				Prepared	& Analyze	d: 01/21/	02	, <u></u>		
Methyl tert-butyl ether	8.57	0.00050 mg	z/m³ Air	10.0		85.7	70-130	12.9	25	
Surrogate: 1,2-DCA-d4	9.59		Ħ	10.0		95.9	60-140			





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/23/02 17:07

Notes and Definitions

DET

Analyte DETECTED

ND

Analyte NOT DETECTED at or above the reporting limit

NR

Not Reported

dry

Sample results reported on a dry weight basis

RPD

Relative Percent Difference

ARCO	Pro	ducts	Com -Richfield	pany :	�			Task O	rder No.				-							,		C	chain of Custody
ARCO Facil	у по.			C (F	ity acility) 4	AN LO	ANALL	All	co 2111	(Const	manaç ıltant)	- 51	EVE?	N H	IEE	CS T	<i>:</i>			•	·		Laboratory name
ARCO engli	neer						Telephor (ARCO)	е по.		Teleph (Consu	one no.	9/6	. 85	4-73	72	Fai (Co	x no. onsultar	nt) <i>9/</i>	6-6	38.1	73 83		Segvola Anglytica Contract number
Consultant	Arne	GNUI	rome	utal	,			Address (Consulta		-										· ·			Contract nutribei
				Matrix		Prese	rvation				Sign	5) K				Jag	0000]	3		Method of shipment
Sample I.D.	Lab no.	Container no.	Soil	Water	Other AIR	Ice	Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas □ Diesel□	Oil and Grease 413.1 □ 413.2 □	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Semi MetalsD VOAD VOAD	CAM NETALS EPA 601	Lead Org./OHS Lead EPA 7420/7421	MTBE 8260	7.74	
1-7.02 4:00 PM		1			X			1-7-02	4:00 14		Х				520						χ	X	Special detection Limit/reporting
1-9-02 Pith Ant		1			X				Singan		X)a			X	χ	
1-9-02- Ping And 1-9-02- 4:00 4m					X			1-9-02			X							23			Χ	X	
																							Special QA/QC
				<u>.</u>																			
,																							Remarks
											·												
													,										
																							·
											-:-												Lab number
																		,					Turnaround time
								:															Priority Rush 1 Business Day
Condition of										Tempe	rature	receive	d:	·				<u> </u>	·				Rush 2 Business Days
Reindulshe	i Wysian	2/	~~	<u> </u>			Date	162	Time	Recei	ved by	\mathcal{A}	⊃>>	S) .						·	
Relinquished	财			$\overline{}$	· · · · · ·		Date	0	Time	Recei	44 pt	/V	<u>- ·</u>	1	<u> </u>								Expedited 5 Business Days
Relinquishe		JOX	2000 -				Date	9	Time		ved by		2Z	San	00.		Date (<u>05-</u>		Time	00		Standard 10 Business Days
Distribution:	/ White	conv — I	ahorato	rv: Cari	ary pony	— ARCO	Environm	nental Engine	erina: Pink			uc <i>C</i>		PYK	SIN	νį	<u> 141</u>	Och		18			





819 Striker Avenue, Suite 8 Sacramento, CA 95834 (916) 921-9600 FAX (916) 921-0100 www.sequolalabs.com

January 23, 2002

Steven Meeks
Delta Environmental Consultants (Rancho Cordova)
3164 Gold Camp Drive Ste. 200
Rancho Cordova, CA 95670
RE: ARCO 2111, San Leandro, CA / S201206

Enclosed are the results of analyses for samples received by the laboratory on 01/11/02. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ron Chew

Client Services Representative

Lito Diaz

Laboratory Director

CA ELAP Certificate Number 1624





Project: ARCO 2111, San Leandro, CA

P

Project Number: 2111, San Leandro, CA

Reported:

Rancho Cordova CA, 95670

3164 Gold Camp Drive Ste. 200

Project Manager: Steven Meeks

01/23/02 17:14

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
1-10-02 8:00 am	S201206-01	Air	01/10/02 08:00	01/11/02 19:00
1-11-02 9:00 am	S201206-02	Air	01/11/02 09:00	01/11/02 19:00







3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Reported: 01/23/02 17:14

Total Purgeable Hydrocarbons, BTEX and MTBE in Air by DHS LUFT Sequoia Analytical - Sacramento

Project Manager: Steven Meeks

		4014 111		Dutin					
Analyte	Result	Reporting Limit		Dilution	Batch	Prepared	Analyzed	Method	Note
1-10-02 8:00 am (S201206-01) Air	Sampled: 01/10/02 ()8:00 Rec	eived: 01/1	1/02 19:0	0	·		· · · · · <u>-</u> · ·	****
Purgeable Hydrocarbons	770	50	mg/m³ Air	5	2010215	01/15/02	01/15/02	DHS LUFT	
Benzene	13	0.25	"	11	"	**	*	11	
Toluene	4.9	0.25	n	**	"	n	10	u u	
Ethylbenzene	8.4	0.25	77	31	H.	n	**	**	
Xylenes (total)	18	0.25	*	**	Ħ	Ħ	"	#	
Methyl tert-butyl ether	190	2.5	*	**	11	41	11	*	
Surrogate: a,a,a-Trifluorotoluene		103 %	60-1	40	"	,,	Ħ	11	
1-11-02 9:00 am (S201206-02) Air	Sampled: 01/11/02 0	9:00 Rec	eived: 01/1	1/02 19:0	0				
Purgeable Hydrocarbons	330	100	mg/m³ Air	10	2010215	01/15/02	01/15/02	DHS LUFT	
Benzene	6.3	0.50	W .	"	"	н	11	91	
Toluene	8.7	0.50	H		Ħ	*	11	"	
Ethylbenzene	3.7	0.50		4	H	H	11	n	
Xylenes (total)	9.8	0.50	**	n	If	11	и	**	
Methyl tert-butyl ether	260	5.0	"	*	11	"		₩	
Surrogate: a,a,a-Trifluorotoluene		90.0 %	60-1	40	"	"	rr rr	н	





3164 Gold Camp Drive Ste. 200

Rancho Cordova CA, 95670

Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/23/02 17:14

Total Purgeable Hydrocarbons, BTEX and MTBE in Air (ppmv) by DHS LUFT Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Note:
1-10-02 8:00 am (S201206-01) Air	Sampled: 01/10/02	08:00 Rece	ived: 01/	11/02 19:0	0	·			
Purgeable Hydrocarbons	190	14	ppmv	5	2010215	01/15/02	01/15/02	DHS LUFT	
Benzene	3.9	0.080	11	**	**	*	••	Ħ	
Toluene	1.3	0.065	Ħ	#	**	**	**	44	
Ethylbenzene	1.9	0.060	Ħ	**	11		H	#	
Xylenes (total)	4.2	0.060	**	#	"	11	#	**	
Methyl tert-butyl ether	53	0.70	"	**	**		H	π	
Surrogate: a,a,a-Trifluorotoluene		103 %	60-	140	"	n	Ħ	*	
1-11-02 9:00 am (S201206-02) Air	Sampled: 01/11/02	09:00 Rece	ived: 01/	11/02 19:0	0				
Purgeable Hydrocarbons	80	28	ppmv	10	2010215	01/15/02	01/15/02	DHS LUFT	
Benzene	2.0	0.16			"	₩	и	69	
Toluene	2.3	0.13	11		**	**	н	π-	
Ethylbenzene	0.85	0.12	Ħ	**	**	**	n	**	
Xylenes (total)	2.3	0.12	Ħ	H	**	77	н	u	
Methyl tert-butyl ether	72	1.4	**	n	₩	•	н		
Surrogate: a,a,a-Trifluorotoluene		90.1 %	60-	140	n	"	p	п	





3164 Gold Camp Drive Ste. 200

Rancho Cordova CA, 95670

Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported: 01/23/02 17:14

Volatile Organic Compounds by EPA Method 8260B

Sequoia Analytical - Sacramento

Sequoia Analyticai - Sacramento												
Analyte	Result	orting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes			
1-10-02 8:00 am (S201206-01) Air	Sampled: 01/10/02 08:00	Rece	ived: 01/1	1/02 19:00	0							
Benzene	11	10	mg/m³ Air	5	2010247	01/21/02	01/21/02	EPA 8260B				
Bromobenzene	ND	10	"	#	**	n	#	**				
Bromochloromethane	ND	10	**	**	**	17	н	**				
Bromodichloromethane	ND	10	H	п	.,	Ħ	**	II .				
Bromoform	ND	10	"	"	**	IF	н	Ħ				
Bromomethane	ND	25	H	**	**	и	n	**				
n-Butylbenzene	ND	10	Ħ		**	n	н	**				
sec-Butylbenzene	ND	10	Н	n	19	#	н	•				
tert-Butylbenzene	ND	10	н	**	,,	Ħ	н	77				
Carbon tetrachloride	ND	10	#		17	Ħ	н	55				
Chlorobenzene	ND	10	11		w	n	Ħ	**				
Chloroethane	ND	25	**	n	"	11	н	Ħ				
Chloroform	ND	10	**	**	m	Ħ	11					
Chloromethane	ND	25	"	**	**	"	11	**				
2-Chlorotoluene	ND	10	**	*	**	**	Ħ	He .				
4-Chlorotoluene	ND	10	**	**	H	**	u	P				
Dibromochloromethane	ND	10	ч	**	ìr			н				
1,2-Dibromoethane	ND	10		**	H	**	••	**				
Dibromomethane	ND	10		**	н		**	H				
1,2-Dibromo-3-chloropropane	ND	25	44	*	н	н		н				
1,2-Dichlorobenzene	ND	10		**	**	и		n				
1,3-Dichlorobenzene	ND	10	"	**	H		**	p				
1,4-Dichlorobenzene	ND	10		**	n	,,		H				
Dichlorodifluoromethane	ND	25		17	e	IJ	n	Ħ				
1,1-Dichloroethane	ND	10	11		н	**	u	н				
1,2-Dichloroethane	ND	10		**	н	**	11	rt				
1,1-Dichloroethene	ND	10	**		н	**	**	+1				
cis-1,2-Dichloroethene	ND	10	**	н	n	ft	**	11				
trans-1,2-Dichloroethene	ND	10	**	,,	41	*	**	11				
1,2-Dichloropropane	ND	10		**	11	**	77	**				
1,3-Dichloropropane	ND	10	77	**),i	**	π	. #				
2,2-Dichloropropane	ND	10	**	19	11	77	*	т				
1,1-Dichloropropene	ND ND	10			ır		*	11				
· -	ND ND	10	**		11	**	*	11				
Ethylbenzene Havaahlarahutadiana		10		P	11	**	*	11				
Hexachlorobutadiene	ND		*		11	**	*	н				
Isopropylbenzene	ND	10	,,		11			· «				
p-Isopropyltoluene	ND	10	**		" n	,,			A-01			
Methylene chloride	57	25	*	.,	n n		 #		A-01			
Methyl tert-butyl ether	340	10	π π	,,	11	**	"	**				
Naphthalene	ND	25	"	**	.,	.,	"	**				

Sequoia Analytical - Sacramento







3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported: 01/23/02 17:14

Volatile Organic Compounds by EPA Method 8260B

Sequoia Analytical - Sacramento

		eporting			D	D 1	A	Math-J	Notes
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
1-10-02 8:00 am (S201206-01) Air	Sampled: 01/10/02 08:0	0 Rece	ived: 01/1	1/02 19:0	0				
n-Propylbenzene	ND		mg/m³ Air	5	2010247	01/21/02	01/21/02	EPA 8260B	
Styrene	ND	10	н	•	"	P	"		
1,1,1,2-Tetrachloroethane	ND	10	н	**	**	lt .	**	4	
1,1,2,2-Tetrachloroethane	ND	10	н		#	19	#	11	
Tetrachloroethene	ND	10	н	. **	*		#	Ħ	
Toluene	ND	10	, n	*	7	*	· 17	"	
1,2,3-Trichlorobenzene	ND	10	n	**		*	**	n	
1,2,4-Trichlorobenzene	ND	10	H	,	11	77	**	п	
1,1,1-Trichloroethane	ND	10		**	"	**	и	Ħ	
1,1,2-Trichloroethane	ND	10	**	Ħ	"	**	n	н	
Trichloroethene	ND	10	н	11	11	11	н	H	
Trichlorofluoromethane	ND	25	•	и	n	e	*1	**	
1,2,3-Trichloropropane	ND	10	*	41	#	ч		*	
1,2,4-Trimethylbenzene	ND	10	₩	*	11	"	11	•	
1,3,5-Trimethylbenzene	ND	10	**	н	Ħ	#	н		
Vinyl chloride	ND	10	**	π	н	*1	н	10	
Total Xylenes	13	10		r	H	11	н		
Surrogate: Dibromofluoromethane		91.7 %	70-1	30	,,	"	#	n	
Surrogate: 1,2-DCA-d4		99.2 %	70-1		**	#	#	m	
Surrogate: Toluene-d8		98.6 %	70-1		Ħ	**	"	rr ·	
Surrogate: 4-BFB		95.8 %	70-1		II .	#	n	**	
1-11-02 9:00 am (S201206-02) Air	Sampled: 01/11/02 09:0	in Rece	eived: 01/1	1/02 19:0	0				
	ND			10	2010247	01/21/02	01/21/02	EPA 8260B	
Benzene	ND	20	mg/m³ Air	#	# #	01/21/02 #	"	"	
Bromobenzene	-	20	н		n	**	e	11	
Bromochloromethane	ND ND	20	н	**	*	,	*	11	
Bromodichloromethane		20	н	*	₩	**	17	**	
Bromoform	ND	50	ų	н	el	*	17	R	
Bromomethane	ND	20		11	**	11	n	и	
n-Butylbenzene	ND		n	91	11	11		n	
sec-Butylbenzene	ND	20		#	n	"	"	H	
tert-Butylbenzene	ND	20	17	"	 Tr	**	n	H	
Carbon tetrachloride	ND	20	#	"	" #	"	n	н	
Chlorobenzene	ND	20		,,	"	"	"		
Chloroethane	ND	50	**		"	" "	" "		
	ND	20		"	"	11	"		
Chloroform						11	н	**	
Chloromethane	ND	50	**	.#					
	ND ND	20	n		"	**	(t	*	
Chloromethane	ND						(f 14	# #	

Sequoia Analytical - Sacramento







3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/23/02 17:14

Volatile Organic Compounds by EPA Method 8260B

Sequoia Analytical - Sacramento

Analyte	Rep Result	orting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
1-11-02 9:00 am (S201206-02) Air	Sampled: 01/11/02 09:00	Rece	ived: 01/1	1/02 19:00		<u> </u>			
	ND		mg/m³ Air	10	2010247	01/21/02	01/21/02	EPA 8260B	
1,2-Dibromoethane	ND ND	20	mg/m² Air "	"	10247	U1/21/U2 "	V1/21/02 #	H N	
Dibromomethane	ND ND	50	**		11	ti		Pr .	
1,2-Dibromo-3-chloropropane	ND ND	20	**	**	n	+		11	
1,2-Dichlorobenzene	ND ND	20			Ħ	*	,	**	
1,3-Dichlorobenzene	ND ND	20	н	11	**	π		,	
1,4-Dichlorobenzene			n.	n	H	n		**	
Dichlorodifluoromethane	ND -	50		#	,,	n	н	Ħ	
1,1-Dichloroethane	ND	20	,,		**	H		*	
1,2-Dichloroethane	ND	20		11	н	 H		19	
1,1-Dichloroethene	ND	20	 H	"					
cis-1,2-Dichloroethene	ND	20	"		,,	"			
trans-1,2-Dichloroethene	ND	20		11		" P	,		
1,2-Dichloropropane	ND	20	**	н	"	,	,,		
1,3-Dichloropropane	ND	20	•	n	••	,	"	-	•
2,2-Dichloropropane	ND	20	#	e	17		"	-	
1,1-Dichloropropene	ND	20	**	н	"			"	
Ethylbenzene	ND	20	*	n .	"	H	11	•	
Hexachlorobutadiene	ND	20	n	"	*		11	*	
Isopropylbenzene	ND	20	н	ii.	*	**	н	T	
p-Isopropyltoluene	ND	20	**	11	**	**	н	•	
Methylene chloride	120	50	**	"	**	*	H	•	A-01
Methyl tert-butyl ether	460	20	u	**		•	н	**	
Naphthalene	ND	50	**	10		*	FF FF	**	
n-Propylbenzene	ND	20	"	44	•	10	Ħ	"	
Styrene	ND	20	Ħ	**	11		19	11	
1,1,1,2-Tetrachloroethane	ND	20	11	**	a	Ħ	11	Ħ	
1,1,2,2-Tetrachloroethane	ND	20	Ħ	**	**	*		н	
Tetrachloroethene	ND	20	н	*	**	**	••	н	
Toluene	ND	20	+	**	**	*		н	
1,2,3-Trichlorobenzene	ND	20	n	•	**	11	**	H	
1,2,4-Trichlorobenzene	ND	20	н	**	**	11	**	H	
1,1,1-Trichloroethane	ND	20	*	**	**	n	*	n	
1,1,2-Trichloroethane	ND	20	"		14	tt	**	**	
Trichloroethene	ND	20		9	n	н	н	Ħ	
Trichlorofluoromethane	ND	50		**	н	II .	**	n	
1,2,3-Trichloropropane	ND	20		11	н	н		,	
1,2,4-Trimethylbenzene	ND	20	17	19	H	Ħ	u	**	
1,3,5-Trimethylbenzene	ND	20	*	н	H	H	**	**	
Vinyl chloride	ND	20	*	11	**	rt .	**	₩	
Total Xylenes	ND ND	20		H	n	**	11	17	

Sequoia Analytical - Sacramento







Project: ARCO 2111, San Leandro, CA

3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/23/02 17:14

Volatile Organic Compounds by EPA Method 8260B

Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
1-11-02 9:00 am (S201206-02) Air	Sampled: 01/11/02 09:	00 Recei	ived: 01/1	1/02 19:0	0				<u></u>
Surrogate: Dibromofluoromethane		104 %	70-1	30	2010247	01/21/02	01/21/02	EPA 8260B	
Surrogate: 1,2-DCA-d4		108 %	70-1	30	"	"	,,	"	
Surrogate: Toluene-d8		107 %	70-1	30	н	n	*	m	
Surrogate: 4-BFB		95.8 %	70-1	30	#	H	H	Ħ	





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/23/02 17:14

Total Purgeable Hydrocarbons, BTEX and MTBE in Air by DHS LUFT - Quality Control Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2010215 - EPA 5030B (P/T)										
Blank (2010215-BLK1)				Prepared	& Analyze	ed: 01/15/0	02			
Purgeable Hydrocarbons	ND	10	mg/m³ Air							
Benzene	ND	0.050	**							
Toluene	ND	0.050	н							
Ethylbenzene	ND	0.050	н							
Xylenes (total)	ND	0.050	n							
Methyl tert-butyl ether	ND	0.50	n							
Surrogate: a,a,a-Trifluorotoluene	1.72		"	2.00		86.0	60-140			
LCS (2010215-BS1)				Prepared	& Analyze	ed: 01/15/	02			
Веплете	1.88	0.050	mg/m³ Air	2.00		94.0	70-130			
Toluene	1.96	0.050	,,	2.00		98.0	70-130			
Ethylbenzene	1.98	0.050	H	2.00		99.0	70-130			
Xylenes (total)	5.48	0.050	H	6.00		91.3	70-130			
Methyl tert-butyl ether	2.15	0.50	"	2.00		108	70-130			
Surrogate: a,a,a-Trìfluorotoluene	1.84		п	2.00		92.0	60-140			
LCS Dup (2010215-BSD1)				Prepared	& Analyze	ed: 01/15/0	02			
Benzene	2.02	0.050	mg/m³ Air	2.00		101	70-130	7.18	25	
Toluene	2.13	0.050	n	2.00		106	70-130	8.31	25	
Ethylbenzene	2.13	0.050	n	2.00		106	70-130	7.30	25	
Xylenes (total)	5.97	0.050	, n	6.00		99.5	70-130	8.56	25	
Methyl tert-butyl ether	2.09	0.50	H	2.00		104	70-130	2.83	25	
Surrogate: a,a,a-Trifluorotoluene	1.75		"	2.00		87.5	60-140			





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Reported:

01/23/02 17:14

Total Purgeable Hydrocarbons, BTEX and MTBE in Air (ppmv) by DHS LUFT - Quality Control Sequoia Analytical - Sacramento

Project Manager: Steven Meeks

Analista	Panula	Reporting	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes	
Analyte	Result	Limit	Units	Level	Resuit	76KEC	Lillius	KID	Lann	110405	
Batch 2010215 - EPA 5030B (P/T)											
Blank (2010215-BLK1)	Prepared & Analyzed: 01/15/02										
Purgeable Hydrocarbons	ND	2.8	ppmv								
Benzene	ND	0.016	Ħ								
Toluene	ND	0.013	н								
Ethylbenzene	ND	0.012	#								
Xylenes (total)	ND	0.012	"								
Methyl tert-butyl ether	ND	0.14	17								
Surrogate: a,a,a-Trifluorotoluene	0.288		n	0.335		86.0	60-140				
LCS (2010215-BS1)				Prepared o	& Analyze	d: 01/15/0	02				
Surrogate: a,a,a-Trifluorotoluene	0.308		ppmv	0.335		91.9	60-140				
LCS Dup (2010215-BSD1)				Prepared	& Analyze	d: 01/15/0	02				
Surrogate: a,a,a-Trifluorotoluene	0.293		ppmv	0.335		87.5	60-140				





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA Project Manager: Steven Meeks Reported:

01/23/02 17:14

Volatile Organic Compounds by EPA Method 8260B - Quality Control Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2010247 - EPA 5030B [P/T]				-						

Batch 2010247 - EPA 5030B [P/T]			
Blank (2010247-BLK1)		Prepared & Analyzed: 01/21/02	
Benzene	ND	2.0 mg/m² Air	
Bromobenzene	ND	2.0 "	
Bromochloromethane	ND	2.0 "	
Bromodichloromethane	ND	2.0 "	
Bromoform	ND	2.0	
Bromomethane	ND	5.0 "	
n-Butylbenzene	ND	2.0 "	
sec-Butylbenzene	ND	2.0 "	
tert-Butylbenzene	ND	2.0 "	
Carbon tetrachloride	ND	2.0 "	
Chlorobenzene	ND	2.0 "	
Chloroethane	ND	5.0 "	
Chloroform	ND	2.0 "	
Chloromethane	ND	5.0 "	
2-Chlorotoluene	ND	2.0 "	
4-Chlorotoluene	ND	2.0 "	
Dibromochloromethane	ND	2.0 "	
1,2-Dibromoethane	ND	2.0 "	
Dibromomethane	ND	2.0	
1,2-Dibromo-3-chloropropane	ND	5.0 "	
1,2-Dichlorobenzene	ND	2.0 "	
1,3-Dichlorobenzene	ND	2.0 "	
1,4-Dichlorobenzene	ND	2.0 "	
Dichlorodifluoromethane	ND	5.0 "	
1,1-Dichloroethane	ND	2.0 "	
1,2-Dichloroethane	ND	2.0 "	
1,1-Dichloroethene	ND	2.0 "	
cis-1,2-Dichloroethene	ND	2.0 "	
trans-1,2-Dichloroethene	ND	2.0 "	
1,2-Dichloropropane	ND	2.0 "	
1,3-Dichloropropane	ND	2.0 "	
2,2-Dichloropropane	ND	2.0 "	
1,1-Dichloropropene	ND	2.0 "	
Ethylbenzene	ND	2.0 "	
Hexachlorobutadiene	ND	2.0 "	
Isopropylbenzene	ND	2.0 "	

Sequoia Analytical - Sacramento





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/23/02 17:14

Volatile Organic Compounds by EPA Method 8260B - Quality Control Sequoia Analytical - Sacramento

		Reporting		Spike	Source		%REC		RPD	.
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2010247 - EPA 5030B [P/T]										
Blank (2010247-BLK1)				Prepared	& Analyze	d: 01/21/0)2			
p-Isopropyltoluene	ND	2.0	mg/m³ Air	-						
Methylene chloride	ND	5.0	**							
Methyl tert-butyl ether	ND	2.0	-							
Naphthaleле	ND	5.0	*							
n-Propylbenzene	ND	2.0	**							
Styrene	ND	2.0	n							
1,1,1,2-Tetrachloroethane	ND	2.0	n							
1,1,2,2-Tetrachloroethane	ND	2.0	н							
Tetrachloroethene	ND	2.0								
l'oluene	ND	2.0	"							
1,2,3-Trichlorobenzene	ND	2.0	a							
1,2,4-Trichlorobenzene	ND	2.0	"							
,1,1-Trichloroethane	ND	2.0	"							
1,1,2-Trichloroethane	ND	2.0	••							
Frichloroethene	ND	2.0	"							
Frichlorofluoromethane	ND	5.0	11							
,2,3-Trichloropropane	ND	2.0	71							
,2,4-Trimethylbenzene	ND	2.0	"							
,3,5-Trimethylbenzene	ND	2.0	Ħ							
Vinyl chloride	ND	2.0	н							
Total Xylenes	ND	2.0	Ħ							
Surrogate: Dibromofluoromethane	9.21	_	"	10.0		92. I	70-130			
Surrogate: 1,2-DCA-d4	9.47		rt	10.0		94.7	70-130			
Surrogate: Toluene-d8	10.7		n	10.0		107	70-130			
Surrogate: 4-BFB	9.69		H	10.0		96.9	70-130			
LCS (2010247-BS1)				Prepared	& Analyz	ed: 01/21/0)2			
Веплете	11.1	2.0	mg/m³ Air	10.0		111	70-130			
Chlorobenzene	10.9	2.0		10.0		109	70-130			
1,1-Dichloroethene	10.2	2.0		10.0		102	70-130			
Toluene	11.3	2.0		10.0		113	70-130			
Trichloroethene	9.43	2.0	*	10.0		94.3	70-130	_		
Surrogate: Dibromofluoromethane	9.41		п	10.0		94.1	70-130			
Surrogate: 1,2-DCA-d4	9.79		"	10.0		97.9	70-130			
Surrogate: Toluene-d8	10.1		rr	10.0		101	70-130			
Surrogate: 4-BFB	9.61		rt	10.0		96.1	70-130			

Sequoia Analytical - Sacramento





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/23/02 17:14

Volatile Organic Compounds by EPA Method 8260B - Quality Control Sequoia Analytical - Sacramento

Anałyte	Result	Reporting Limit		Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2010247 - EPA 5030B [P/T]										
LCS Dup (2010247-BSD1)				Prepared	& Analyzo	ed: 01/21/	02			
Benzene	10.8	2.0	mg/m³ Air	10.0		108	70-130	2.74	25	
Chlorobenzene	10.9	2.0		10.0		109	70-130	0.00	25	
1,1-Dichloroethene	9.86	2.0	ír	10.0		98.6	70-130	3.39	25	
Toluene	11.4	2.0	*	10.0		114	70-130	0.881	25	
Trichloroethene	9.24	2.0		10.0		92.4	70-130	2.04	25	
Surrogate: Dibromofluoromethane	9.49		H	10.0		94.9	70-130			
Surrogate: 1,2-DCA-d4	9.59		n	10.0		95.9	70-130			
Surrogate: Toluene-d8	10.4		n	10.0		104	70-130			
Surrogate: 4-BFB	9.48		it	10.0		94.8	70-130			





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/23/02 17:14

Notes and Definitions

A-01 This is a suspected laboratory contaminant.

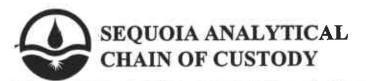
DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference



Camp De State: CA

E-mail Address:

Fax #:

Company Name:

Mailing Address:

Telephone: 916

☐ 1455 McDowell Blvd ☐ 819 Striker Ave., Su ☐ 1551 Industrial Road	, Suite D. • P ite 8 • Sacrar i • San Carlo	A 95037 + (408) 776-96 etaluma, CA 94954 + (90) mento, CA 95834 + (90) s, CA 94070 + (650) 23 ek, CA 94598 + (925) 9	(707) 792-1865 • FAX 16) 921-9600 • FAX 32-9600 • FAX (650)	X (707) 792-0342 (916) 921-0100 232-9612
164	Project:	Arev #2111	(San / tau	dro (A)
E 200	Billing Add	ress (if different):	10.00	
Zip Code: 95670				
638 8385	P.O. #:			
	QC Data:	Level II (standa	ard) 🔲 Level III	☐ Level IV
ilts Required:	50	Sequoia's Work (Order#	
MANDATORY: SDWA (Drinking Water) CWA (Waste Water) RCRA (Hazardous Water) Other		ANALYSES RE	QUESTED (Please	Comments/
Sample #	19/7			Temp.(If required)
Aller	XX	1	520	1206-01
Tedlar				-02

Sampler: B. Den H	artal De	ate / Time Resul	ts Required:		Sequoia's Work Order #						
	rking Days Days Days	72 Hours 48 Hours 24 Hours 2-8 Hours	SD SD	OATORY: IWA (Drinking Wate VA (Waste Water) RA (Hazardous Wa her	53		LYSES REQUE	STED (Pleas	provide meth	od)	
Client Sample I.D.	Date / Time Sampled	Matrix # of Desc. Cont.	Contain	Sample #	187	V.C.	in the second			mments/ (if required)	
1.1-10-02 9:30 Au	1-10-02 9000		della	A	XX	1		520	1206-0	1	
2/-11-02 9:00401	1-11-02 9:00		Tedlar			N N			-06	3	
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Relinquished By:	CIXXV	10/		REMARKS		700	,	Date / Ti		100/1	
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Relinquished By: Relinquished By:	-//	//		Received By:	1 BY WC	n Grups	77(Date / Ti			
i tomiquionou by:				The second secon							

White: Sequola

Yellow: Sequola

Were Samples Received in Good Condition? ☐ Yes ☐ No Samples on Ice? ☐ Yes ☐ No Method of Shipment;

Pink: Client

Page__



21 January, 2002

Steven Meeks Delta Environmental Consultants (Rancho Cordova) 3164 Gold Camp Drive Ste. 200 Rancho Cordova, CA 95670

RE: ARCO 2111, San Leandro, CA Sequoia Report: S201110

Enclosed are the results of analyses for samples received by the laboratory on 01/07/02 14:35. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ron Chew

Client Services Representative

Lito Diaz

Laboratory Director

CA ELAP Certificate #1624



819 Striker Avenue, Suite 8 Sacramento, CA 95834 (916) 921-9600 FAX (916) 921-0100 www.sequoialabs.com

Delta Environmental Consultants (Rancho Cordova

3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager. Steven Meeks

Reported: 01/21/02 14:02

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
VW-2	S201110-01	Water	01/07/02 10:50	01/07/02 14:35

Sequoia Analytical - Sacramento





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA Project Manager: Steven Meeks Reported: 01/21/02 14:02

Total Purgeable Hydrocarbon, BTEX and MTBE by DHS LUFT

Sequoia Analytical - Sacramento

			-						
Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VW-2 (S201110-01) Water	Sampled: 01/07/02 10:50	Received: 01	/07/02 1	4:35			<u>.</u>		
Purgeable Hydrocarbons	ND	50000	ug/l	1000	2010192	01/15/02	01/15/02	DHS LUFT	
Benzene	860	500	Ħ			п	**	10	
Toluene	ND	500		n	п	#		*	
Ethylbenzene	ND	500	*	77	n	P	*	**	
Xylenes (total)	1400	500	Ħ	π	Ħ	**	n	"	
Methyl tert-butyl ether	160000	2500	77	н	**	n	11	*	
Surrogate: a,a,a-Trifluorotolu	iene	94.0 %	60-	-140	*	"	H	"	





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/21/02 14:02

MTBE Confirmation by EPA Method 8260B

Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
VW-2 (S201110-01) Water	Sampled: 01/07/02 10:50	Received: 01	/07/02 1	4:35					
Methyl tert-butyl ether	180000	1000	ug/l	2000	2010224	01/18/02	01/18/02	EPA 8260B	
Surrogate: 1,2-DCA-d4		103 %	60-	-140	"	"	n	п	



3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA Project Manager: Steven Meeks Reported: 01/21/02 14:02

Total Purgeable Hydrocarbon, BTEX and MTBE by DHS LUFT - Quality Control Sequoia Analytical - Sacramento

		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2010192 - EPA 5030B (P/T)										
Blank (2010192-BLK1)			•	Prepared	& Analyza	ed: 01/15/0	02			
Purgeable Hydrocarbons	ND	50	ug/l					_		
Benzene	ND	0.50	**							
Toluene	ND	0.50	0							
Ethylbenzene	ND	0.50	п							
Xylenes (total)	ND	0.50								
Methyl tert-butyl ether	ND	2.5	17							
Surrogate: a,a,a-Trifluorotoluene	9.08	•	" "	10.0		90.8	60-140			
LCS (2010192-BS1)				Prepared	& Analyze	ed: 01/15/0	02			
Benzene	9.68	0.50	ug/l	10.0		96.8	70-130			
Toluene	9.60	0.50	*	10.0		96.0	70-130			
Ethylbenzene	9.18	0.50	•	10.0		91.8	70-130			
Xylenes (total)	28.2	0.50	17	30.0		94.0	70-130			
Methyl tert-butyl ether	8.02	2.5	77	10.0		80.2	70-130			
Surrogate: a,a,a-Trifluorotoluene	9.92		"	10.0		99.2	60-140			
Matrix Spike (2010192-MS1)	Sou	rce: S20109	9-05	Prepared	& Analyze	ed: 01/15/0	02			
Benzene	9.32	0.50	ug/l	10.0	ND	93.2	60-140			
Foluene	9.22	0.50	**	10.0	ND	92.2	60-140			
Ethylbenzene	8.89	0.50	19	10.0	ND	88.9	60-140			
Xylenes (total)	27.4	0.50	#	30.0	ND	91.3	60-140			
Methyl tert-butyl ether	8.45	2.5	н	10.0	ND	84.5	60-140			
Surrogate: a,a,a-Trifluorotoluene	9.06		"	10.0		90.6	60-140			
Matrix Spike Dup (2010192-MSD1)	Sou	rce: S20109	9-05	Prepared	& Analyze	ed: 01/15/0	02			
Benzene	10.5	0.50	ug/l	10.0	ND	105	60-140	11.9	25	
Toluene	10.3	0.50	n	10.0	ND	103	60-140	11.1	25	
Ethylbenzene	10.0	0.50	н	10.0	ND	100	60-140	11.8	25	
Xylenes (total)	31.0	0.50	•	30.0	ND	103	60-140	12.3	25	
Methyl tert-butyl ether	9.10	2.5	н	10.0	ND	91.0	60-140	7.41	25	
Surrogate: a,a,a-Trifluorotoluene	9.83		н	10.0		98.3	60-140	_		



3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported: 01/21/02 14:02

MTBE Confirmation by EPA Method 8260B - Quality Control Sequoia Analytical - Sacramento

		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2010224 - EPA 5030B [P/T]										
Blank (2010224-BLK1)				Prepared	& Analyz	ed: 01/18/	02			
Methyl tert-butyl ether	ND	0.50	ug/l	•	•	- -				"
Surrogate: 1,2-DCA-d4	23.7		n'	25.0		94.8	60-140			
LCS (2010224-BS1)				Prepared	& Analyzo	ed: 01/18/	02			
Methyl tert-butyl ether	22.5	0.50	ug/l	25.0	•	90.0	70-130			
Surrogate: 1,2-DCA-d4	25.5		H	25.0		102	60-140			
Matrix Spike (2010224-MS1)	Sou	rce: S20115	55-01	Prepared	& Analyza	ed: 01/18/	02			
Methyl tert-butyl ether	21.6	0,50	ug/l	25.0	ND	86.4	60-140			
Surrogate: 1,2-DCA-d4	24.6		n	25.0		98.4	60-140			
Matrix Spike Dup (2010224-MSD1)	Sou	rce: S20115	55-01	Prepared	& Analyz	ed: 01/18/	02			
Methyl tert-butyl ether	19.3	0.50	ug/I	25.0	ND	77.2	60-140	11.2	25	
Surrogate: 1,2-DCA-d4	25.2		"	25.0		101	60-140			



819 Striker Avenue, Suite 8 Sacramento, CA 95834 (916) 921-9600 FAX (916) 921-0100 www.sequoialabs.com

Delta Environmental Consultants (Rancho Cordova

3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported: 01/21/02 14:02

Notes and Definitions

DET

Analyte DETECTED

ND

Analyte NOT DETECTED at or above the reporting limit

NR

Not Reported

dry

Sample results reported on a dry weight basis

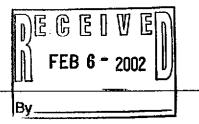
RPD

Relative Percent Difference

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Sample I.D.	Lab no.	Container no.	Soil	Water	Other	kce -	, Acid	Sampling date	Samping time	BTEX GOZEPÁ BOZO	BIEXTPH EPA MODEROZOB	TPH Modfed 2015 Gast T Diesel C	Of end Grense	TPH EPA 418.17SMSQ3E	EPA spivano	EPA B24/8240	EPA RES/BZTD	TOUP Surri	TROU SHOOT	Leed Org ADHS CI Lead EPA 74207421 CI	MYBL 8020	•	
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Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering: Pink copy — Consultant APC-3292 (2-91)





819 Striker Avenue, Suite 8 Sacramento, CA 95834 (916) 921-9600 FAX (916) 921-0100 www.sequoialabs.com

January 23, 2002

Steven Meeks
Delta Environmental Consultants (Rancho Cordova)
3164 Gold Camp Drive Ste. 200
Rancho Cordova, CA 95670
RE: ARCO 2111, San Leandro, CA / S201165

Enclosed are the results of analyses for samples received by the laboratory on 01/09/02. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ron Chew Client Services Representative

CA ELAP Certificate Number 1624

Lito Diaz

Laboratory Director





Project: ARCO 2111, San Leandro, CA

3164 Gold Camp Drive Ste. 200

Project Number: 2111, San Leandro, CA

Reported:

Rancho Cordova CA, 95670

Project Manager: Steven Meeks

01/23/02 16:52

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
1-7-02	S201165-01	Water	01/07/02 16:00	01/09/02 18:00
1-8-02	S201165-02	Water	01/08/02 08:00	01/09/02 18:00
1-9-02	S201165-03	Water	01/09/02 08:00	01/09/02 18:00





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/23/02 16:52

Total Purgeable Hydrocarbons and BTEX by DHS LUFT

Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
1-7-02 (S201165-01) Water	Sampled: 01/07/02 16:00	Received: 0	1/09/02 1	18:00				··-	
Purgeable Hydrocarbons	18000	1000	ug/l	20	2010223	01/16/02	01/16/02	DHS LUFT	HC-12
Benzene	240	10	n	*	(t	#	**	•	
Toluene	51	10	H	*	H	π	۳.	Tr.	
Ethylbenzene	93	10	H	**	H	**	н	•	
Xylenes (total)	280	10	**	"	n		**		
Surrogate: a,a,a-Trifluorotoli	iene	64.2 %	60	-140	"	n	п	н	
1-8-02 (S201165-02) Water	Sampled: 01/08/02 08:00	Received: 0	1/09/02	8:00					
Purgeable Hydrocarbons	1800	50	ug/l	1	2010223	01/16/02	01/16/02	DHS LUFT	HC-12
Benzene	42	0.50	"	11	H	T		17	
Toluene	11	0.50	•	**	**	" '	**	**	
Ethylbenzene	ND	0.50	w	#	н	**	**	**	
Xylenes (total)	53	0.50	н	19	n	*1		*	
Surrogate: a,a,a-Trifluorotoli	iene	101 %	60	-140	rr .	~	"	n	
1-9-02 (S201165-03) Water	Sampled: 01/09/02 08:00	Received: 0	1/09/02	18:00					
Purgeable Hydrocarbons	6600	2000	ug/l	40	2010223	01/16/02	01/16/02	DHS LUFT	HC-12
Benzene	46	20	77	н		**	n	n	
Toluene	45	20	**	н	**	**	#	47	
Ethylbenzene	81	20	77	H	*	"	11	P.	
Xylenes (total)	360	20		n	17	**			
Surrogate: a,a,a-Trifluorotoli	iono	80.8 %	60	-140	#	n	,,	**	





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/23/02 16:52

MTBE by EPA Method 8260B

Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
1-7-02 (S201165-01) Water	Sampled: 01/07/02 16:00	Received: 0	1/09/02 1	8:00					
Methyl tert-butyl ether	98000	500	ug/l	1000	2010244	01/21/02	01/21/02	EPA 8260B	
Surrogate: 1,2-DCA-d4		102 %	60-	140	"	*	*	"	
1-8-02 (S201165-02) Water	Sampled: 01/08/02 08:00	Received: 0	1/09/02 1	8:00					
Methyl tert-butyl ether	16000	100	ug/l	200	2010244	01/21/02	01/21/02	EPA 8260B	
Surrogate: 1,2-DCA-d4	.,	106 %	60-	140	π	m	*	•	
1-9-02 (S201165-03) Water	Sampled: 01/09/02 08:00	Received: 0	1/09/02 1	8:00					
Methyl tert-butyl ether	8100	50	ug/l	100	2010277	01/22/02	01/23/02	EPA 8260B	
Surrogate: 1,2-DCA-d4		104 %	60-	140	"	"	"	"	





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported: 01/23/02 16:52

Total Purgeable Hydrocarbons and BTEX by DHS LUFT - Quality Control Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2010223 - EPA 5030B (P/T)										
Blank (2010223-BLK1)				Prepared	& Analyz	ed: 01/16/	02			
Purgeable Hydrocarbons	ND	50	ug/l							
Benzene	ND	0.50	**							
Toluene	ND	0.50	*							
Ethylbenzene	ND	0.50	**							
Xylenes (total)	ND	0.50		•	_					
Surrogate: a,a,a-Trifluorotoluene	8.82		"	10.0		88.2	60-140			
LCS (2010223-BS1)				Prepared	& Analyz	ed: 01/16/	02			
Benzene	9.68	0.50	ug/l	10.0	-	96.8	70-130			
Toluene	9.21	0.50	**	10.0		92.1	70-130			
Ethylbenzene	8.23	0.50	12	10.0		82.3	70-130			
Xylenes (total)	25.5	0.50	н	30.0		85.0	70-130			
Surrogate: a,a,a-Trifluorotoluene	8.32		"	10.0		83.2	60-140			
Matrix Spike (2010223-MS1)	Son	ırce: S20115	1-16	Prepared	& Analyz	ed: 01/16/	02			
Benzene	9.61	0.50	ug/l	10.0	ND	96.1	60-140			
Toluene	9.24	0.50	**	10.0	ND	92.4	60-140			
Ethylbenzene	8.39	0.50	**	10.0	ND	83.9	60-140			
Xylenes (total)	25.6	0.50	*	30.0	ND	85.3	60-140			
Surrogate: a,a,a-Trifluorotoluene	8.10		"	10.0		81.0	60-140			
Matrix Spike Dup (2010223-MSD1)	Sou	arce: S20115	1-16	Prepared	& Analyz	ed: 01/16/	02			
Benzene	10.4	0.50	ug/l	10.0	ND	104	60-140	7.90	25	
Toluene	10.1	0.50	н	10.0	ND	. 101	60-140	8.89	25	
Ethylbenzene	9.54	0.50	rt	10.0	ND	95.4	60-140	12.8	25	
Xylenes (total)	29.3	0.50	н	30.0	ND	97.7	60-140	13.5	25	
Surrogate: a,a,a-Trifluorotoluene	8.61		"	10.0		86.1	60-140			





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/23/02 16:52

MTBE by EPA Method 8260B - Quality Control

Sequoia Analytical - Sacramento

		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2010244 - EPA 5030B [P/T]						<u> </u>				
Blank (2010244-BLK1)				Prepared	& Analyze	ed: 01/21/	02	<u></u>		
Methyl tert-butyl ether	ND	0.50	ug/l	,						
Surrogate: 1,2-DCA-d4	23.7		н	25.0		94.8	60-140			
LCS (2010244-BS1)				Prepared	& Analyzo	ed: 01/21/	02			
Methyl tert-butyl ether	24.4	0.50	ug/l	25.0		97.6	70-130			
Surrogate: 1,2-DCA-d4	24.5		п	25.0		98.0	60-140			
Matrix Spike (2010244-MS1)	Sou	ırce: S20115	1-08	Prepared	& Analyze	ed: 01/21/	02			
Methyl tert-butyl ether	22.5	0.50	ug/l	25.0	ND	90.0	60-140			
Surrogate: 1,2-DCA-d4	24.4		#	25.0		97.6	60-140			
Matrix Spike Dup (2010244-MSD1)	Sou	ırce: S20115	1-08	Prepared	& Analyze	ed: 01/21/	02			
Methyl tert-butyl ether	20.7	0.50	ug/l	25.0	ND	82.8	60-140	8.33	25	
Surrogate: 1,2-DCA-d4	24.6		"	25.0	•	98.4	60-140			
Batch 2010277 - EPA 5030B [P/T]										
Blank (2010277-BLK1)				Prepared	& Analyze	ed: 01/22/	02			
Methyl tert-butyl ether	ND	0.50	ug/l		• "					
Surrogate: 1,2-DCA-d4	20.7		**	25.0		82.8	60-140			
LCS (2010277-BS1)				Prepared	& Analyze	ed: 01/22/	02			
Methyl tert-butyl ether	27.6	0.50	ug/l	25.0		110	70-130			
Surrogate: 1,2-DCA-d4	24.6		n	25.0		98.4	60-140			
Matrix Spike (2010277-MS1)	Sou	rce: S20115	1-09	Prepared	& Analyzo	ed: 01/22/	02			
Methyl tert-butyl ether	21.6	0.50	u g/l	25.0	ND	86.4	60-140			
Surrogate: 1,2-DCA-d4	21.7		H	25.0		86.8	60-140			





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/23/02 16:52

MTBE by EPA Method 8260B - Quality Control Sequoia Analytical - Sacramento

		Reporting		Spike	Source		%REC		RPD	:
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Batch 2010277 - EPA 5030B [P/T]

Matrix Spike Dup (2010277-MSD1)	Sour	ce: S20115	1-09	Prepared a	& Analyz	ed: 01/22/	02		
Methyl tert-butyl ether	23.6	0.50	ug/I	25.0	ND	94.4	60-140	8.85	25
Surrogate: 1,2-DCA-d4	23.0		*	25.0		92.0	60-140		



819 Striker Avenue, Suite 8 Sacramento, CA 95834 (916) 921-9600 FAX (916) 921-0100 www.sequoialabs.com

Delta Environmental Consultants (Rancho Cordova

3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/23/02 16:52

Notes and Definitions

HC-12 Hydrocarbon pattern is present in the requested fuel quantitation range but does not resemble the pattern of the requested fuel.

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

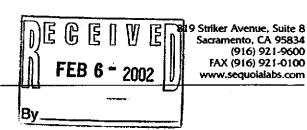
dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

ARCO	Prod Division	UCTS of Atlantic	↓O Mj •Richfield (pany (Company	(>			Task Or	der No.													C	hain of Cus	tody
ARCO Facil	ty no.		,			an Lea	Telephon (ARCO)	4100 7	2111	Project (Consu Telepho (Consu	ltant)		TEV	en 1·73	ME V2	Fab (Co	no.	o 91	lo -6	3 8 . (738	<u> </u>	Laboratory name Sequora Contract number	Analyt
Consultant	ame	Ut force	enta 1		STEVIE	N MEE		Address (Consultar)d	Com	<i>a</i> 1)	•	svit	₹ #	70	ð	<u></u>				Congact number	*
				Matrix			rvation	<u>o</u>			_							.EVOA	002/000	٥	1723	·	Method of shipment	
Sample I.D.	Lab no.	Container no.	Soil	Water	Other	Ice	Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602 (120/8015	TPH Modified 8015 Gas □ Diesel □	Oil and Grease 413.1 □ 413.2 □	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Semi Metals□ vOA⊡ vOA□	CAM METALSEPA & TTLC STLC D	Lead Org./DHS Lead EPA 7420/7421	MTBE	黑	Courses	
		6		X		X	X	1-7-02	4:00 PM		X				S						X	X	Special detection Limit/reporting	
		6		X		X	X		- 9:00Am	t	X							02			X	X		·
). 	6	<u> </u>	X		X	X	1-9-02	9:004w		X					. '		23			X	X		
							,												<u> </u>				Special QA/QC	<u>-</u>
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										<u></u>	<u> </u>	<u> </u>											1 Business Day	
Condition of		1/. 1	1				In.a. /		Time	Temp	ereture	Peceive	d: Y.C.O	الأع	<u></u>								Rush 2 Business Days	
Relinquished			{		· · · · · ·		Date	1 (/(5/4/ Time	Recei	X	b	N	<u> 2</u>)						<u>.</u>		Expedited 5 Business Days	
Relinquished	d by	1	A	V	<u></u>		Date	9 19	√3U Time	LON.	ved by			7,00		m	Date (ala	<u>.</u>	Time	00	<u></u>	Standard 10 Business Days	
/ Vistribution:	White	omr — I	aborata	20	TOV CODY	— ABCO	Environm	ental Engine	erina: Pink		Dγ - Con		<u>ما</u>	Ŋ C	1			4 <u>0</u>	<u>~</u> /					

Distribution: White APC-3292 (2-91)





January 28, 2002

Steven Meeks
Delta Environmental Consultants (Rancho Cordova)
3164 Gold Camp Drive Ste. 200
Rancho Cordova, CA 95670
RE: ARCO 2111, San Leandro, CA / S201207

Enclosed are the results of analyses for samples received by the laboratory on 01/11/02. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ron Chew Client Services Representative Lito Diaz Laboratory Director

CA ELAP Certificate Number 1624





3164 Gold Camp Drive Ste. 200

Rancho Cordova CA, 95670

Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/28/02 13:52

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
1-10-02 8:00	S201207-01	Water	01/10/02 08:00	01/11/02 19:00
1-11-02 9:00	S201207-02	Water	01/11/02 09:00	01/11/02 19:00







3164 Gold Camp Drive Ste. 200

Rancho Cordova CA, 95670

Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Reported: 01/28/02 13:52

Project Manager: Steven Meeks

Total Purgeable Hydrocarbon, BTEX and MTBE by DHS LUFT Sequoia Analytical - Sacramento

Analyte	Result	eporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
1-10-02 8:00 (S201207-01) Water	Sampled: 01/10/02 08:00	Recei	ved: 01/1	1/02 19:00)				
Purgeable Hydrocarbons	ND	2000	ug/l	40	2010282	01/18/02	01/18/02	DHS LUFT	
Benzene	28	20	n	"	n	п	n	"	
Toluene	ND	20	n	41		Ħ	19	H.	
Ethylbenzene	25	20	**	n	**	11	н		
Xylenes (total)	71	20	11	н	**	**	и	*	
Methyl tert-butyl ether	6300	100	н	н	ਜ	H	rt		
Surrogate: a,a,a-Trifluorotoluene		100 %	60-	140	**	"	10	rt .	
1-11-02 9:00 (S201207-02) Water	Sampled: 01/11/02 09:00	Recei	ved: 01/1	1/02 19:00					
Purgeable Hydrocarbons	ND	2000	ug/l	40	2010282	01/18/02	01/18/02	DHS LUFT	
Benzene	ND	20	n		"	*	**	"	
Toluene	23	20	н	*	11	v	*	**	
Ethylbenzene	ND	20	Ħ		11	**	*	17	
Xylenes (total)	52	20		7	п	**	n	н .	
Methyl tert-butyl ether	6800	100	**		н	1+	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	н	
Surrogate: a,a,a-Trifluorotoluene		97.5 %	60-	140	n	π	"	<i>#</i>	





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported: 01/28/02 13:52

Volatile Organic Compounds by EPA Method 8260B

Sequoia Analytical - Sacramento

			пунсат	- Sacra	шени				
Analyte	Re Result	porting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
1-10-02 8:00 (S201207-01) Water	Sampled: 01/10/02 08:00	Recei	ved: 01/1	1/02 19:00)			<u></u>	
Benzene	ND	50	ug/l	50	2010293	01/24/02	01/24/02	EPA 8260B	
Bromobenzene	ND	50		*	**	**	17	n	
Bromochloromethane	ND	50	"	11	11	**	17	н	
Bromodichloromethane	ND	50	н	Ħ	11	"	**	II	
Bromoform	ND	50	tı	**	n	11	"	п	
Bromomethane	ND	120	н	"	n		"	H	
n-Butylbenzene	ND	50	н	"	hr	**	**	n	
sec-Butylbenzene	ND	50	н	**	n	it	**	"	
tert-Butylbenzene	ND	50	n	**	"	n	"	. "	
Carbon tetrachloride	ND	50	H	**	**	**	11	li .	
Chlorobenzene	ND	50	H	19	10	н	**	n	
Chloroethane	ND	120	n	11	17	"	11	**	
Chloroform	ND	50	rr .	19		**	Ħ	*	
Chloromethane	ND	120	**	п		**	ır	**	
2-Chlorotoluene	ND	50	**	H	•		н	99	
4-Chlorotoluene	ND	50	**	17	**	**	н	77	
Dibromochloromethane	ND	50	*	**	**	*	**	n	
1,2-Dibromoethane	ND	50	**	**	•	77		11	
Dibromomethane	ND	50	n	11	п	tr.	D	**	
1,2-Dibromo-3-chloropropane	ND	120			**	**	**	Ħ	
1,2-Dichlorobenzene	ND	50	*	N		**		" .	
1,3-Dichlorobenzene	ND	50		**	н	n	•	n	
1,4-Dichlorobenzene	ND	50	**	н	"	11	***	**	
Dichlorodifluoromethane	ND	120	**	**	. "	н	***	11	
1.1-Dichloroethane	ND	50	19	**	11	"	**	n	
1,2-Dichloroethane	ND ND	50	Ħ	**	11	11	11	n	
1,1-Dichloroethene	ND	50	н		н	n		n	
cis-1,2-Dichloroethene	ND ND	50	н	,,	0	19	**	pi.	
•	ND ND	50	н		H	Ħ	••	н	
trans-1,2-Dichloroethene	ND	50	н		tt	н	**	n	
1,2-Dichloropropane	ND ND	50		n		11	n		
1,3-Dichloropropane		50 50	,,	11		"	11		
2,2-Dichloropropane	ND ND			н			n	и	
1,1-Dichloropropene	ND	50			17		и	**	
Ethylbenzene	ND	50	*		**	#	н	. 11	
Hexachlorobutadiene	ND	50	,,	"	,,	**	H	Ħ	
Isopropylbenzene	ND	50	**		n	**	"	**	
p-Isopropyltoluene	ND	50		"	"	**	IF.	41	
Methylene chloride	ND	120		*	"	#			
Methyl tert-butyl ether	5600	50		.,				"	
Naphthalene	ND	120	**	17	"	•	**	**	

Sequoia Analytical - Sacramento







3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported: 01/28/02 13:52

Volatile Organic Compounds by EPA Method 8260B

Sequoia Analytical - Sacramento

Analyte	Result	porting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Note
1-10-02 8:00 (S201207-01) Water	Sampled: 01/10/02 08:00	Recei	ved: 01/1	1/02 19:00	<u></u>				
n-Propylbenzene	ND	50	ug/l	50	2010293	01/24/02	01/24/02	EPA 8260B	
Styrene	ND	50	" "	*		"	*	н .	
1,1,1,2-Tetrachloroethane	ND	50	11	#	**	*	17	•	
1,1,2,2-Tetrachloroethane	ND	50	11	и	,,	**	47	H	
Tetrachloroethene	ND	50	**	77	*	*1		"	
Tetrachioroethene Toluene	ND ND	50	н		#	71	•	n	
	ND ND	50	H	in	#	11	**	**	
1,2,3-Trichlorobenzene		50 50	H	#	#	"	**	•	
1,2,4-Trichlorobenzene	ND		**	,,		"	**	77	
1,1,1-Trichloroethane	ND	50	 	п	**	11	н	n	
1,1,2-Trichloroethane	ND	50			н	n	#	"	
Trichloroethene	ND	50		" H	п	и	н		
Trichlorofluoromethane	ND	120	**		,	,,			
1,2,3-Trichloropropane	ND	50	**	н	и	"	,,		
1,2,4-Trimethylbenzene	ND	50	**	P			"	"	
1,3,5-Trimethylbenzene	ND	50	п	*	н	н	**	19	
Vinyl chloride	ND	50	•	**	H	n		11	
Total Xylenes	ND	50			*				<u>.</u>
Surrogate: Dibromofluoromethane	!	97.6%	70-	130	Ħ	"	"	"	
Surrogate: 1,2-DCA-d4		106 %	70-	130	#	Π	"	,	
Surrogate: Toluene-d8		103 %	70-	130	rr .	"	. "	"	
Surrogate: 4-BFB	!	95.2 %	7 0 -	130	"	"	r	n	
1-11-02 9:00 (S201207-02) Water	Sampled: 01/11/02 09:00	Recei	ved: 01/1	1/02 19:00)	_			
Benzene	ND	50	ug/l	50	2010311	01/25/02	01/25/02	EPA 8260B	
Bromobenzene	ND	50	**	11	"	**	**	,,	
Bromochloromethane	ND	50		II .	11	11	**	π	
Bromodichloromethane	ND	50	• .	n	и	н	11	U	
Вготоботп	ND	50	**	*	IT	H	IT.	*	
Bromomethane	ND	120	Ħ	n	u	**	Ħ	**	
n-Butylbenzene	ND	50	π	н	Ħ	It	H	n	
sec-Butylbenzene	ND	50		**	n			n	
tert-Butylbenzene	ND	50	**	₩	*	**	**	н	
Carbon tetrachloride	ND	50	**	#		*	**	**	
	ND	50	11		**	**	n	H	
Chlorobenzene		120	11		"		π	н	
Chloroethane	ND		н	**	и	**			
Chloroform	ND	50	 PI	11		11	**	**	
Chloromethane	ND	120	,,	"	"	11	11	Ħ	
2-Chlorotoluene	ND	50		"	"	11	11	п	
4-Chlorotoluene	ND	50	**	"	"				
Dibromochloromethane	ND	50	**	II .	19	It		"	

Sequoia Analytical - Sacramento







3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/28/02 13:52

Volatile Organic Compounds by EPA Method 8260B

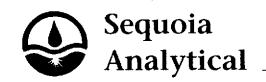
Sequoia Analytical - Sacramento

	Sequoia	porting	-5	-	псио		···		
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
1-11-02 9:00 (S201207-02) Water	Sampled: 01/11/02 09:00	Recei	ved: 01/1	1/02 19:00					
1,2-Dibromoethane	ND	50	ug/l	50	2010311	01/25/02	01/25/02	EPA 8260B	
Dibromomethane	ND	50	*		"	. **	•	н	
1,2-Dibromo-3-chloropropane	ND	120	*	4	11	n	#	,,	
1,2-Dichlorobenzene	ND	50	*	11	*	н	44	n	
1,3-Dichlorobenzene	ND	50	π	11	71	н	**	**	
1,4-Dichlorobenzene	ND	50	**	11	"		•	**	
Dichlorodifluoromethane	ND	120	*	#	и	49	••	**	
1,1-Dichloroethane	ND	50	**	H	11	и	**		
1,2-Dichloroethane	ND	50	H	н		"	**	**	
1.1-Dichloroethene	ND	50	n	n	**	**	**	•	
cis-1,2-Dichloroethene	ND	50	,,	н	"	11	**	**	
trans-1,2-Dichloroethene	ND	50	**	*	11	11	**	11	
1,2-Dichloropropane	ND	50	**	H	11	17		rr ·	
1,3-Dichloropropane	ND	50	**	n	11	11	"	**	
2,2-Dichloropropane	ND	50	**	H	. 11	H	**	77	
1,1-Dichloropropene	ND	50	11	*	н	"	"	n	
Ethylbenzene	ND	50	11		**	Ħ	n	**	
Hexachlorobutadiene	ND	50	н	,,	**	**	11	"	
Isopropylbenzene	ND	50	н	н	н	H)+	**	
p-Isopropyltoluene	ND	50	14	"	11	"	н	n	
Methylene chloride	ND	120	n	**	14	**	н	**	
Methyl tert-butyl ether	5800	50	n	**	н	••	н	11	
Naphthalene	ND	120	н	*	17	.,	rt ·	н	
n-Propylbenzene	ND	50		77		**	te .	ti	
Styrene	ND	50	н	*		**	**	11	
1,1,1,2-Tetrachloroethane	ND	50	n	*	**	. *		41	
1,1,2,2-Tetrachloroethane	ND	50	н	11	**	10	**	n	
Tetrachloroethene	ND	50	11			77	н	н.	
Toluene	ND	50	n		**	**		n	
1,2,3-Trichlorobenzene	ND	50		*	19	**	IT	#	
1,2,4-Trichlorobenzene	ND	50	**	#	н	**	**	н	
1,1,1-Trichloroethane	ND	50	**	**	#		77	n	
	ND	50	17	**	,,	**	₩	**	
1,1,2-Trichloroethane	ND ND	50	19	11	"	**	**		
Trichloroethene	ND ND	120	#	Ħ	**	п	n	"	
Trichlorofluoromethane	ND ND	50	.,	ıt	**	**		•	
1,2,3-Trichloropropane	ND ND		.,		11	н	,	м	
1,2,4-Trimethylbenzene		50			11	11	**	**	
1,3,5-Trimethylbenzene	ND	50	,,	,,		n	11	,,	
Vinyl chloride	ND	50	"	,,	n	H*	tt .		
Total Xylenes	ND ND	50							

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Project: ARCO 2111, San Leandro, CA

3164 Gold Camp Drive Ste. 200

Project Number: 2111, San Leandro, CA

Reported:

Rancho Cordova CA, 95670

Project Manager: Steven Meeks

01/28/02 13:52

Volatile Organic Compounds by EPA Method 8260B

Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
1-11-02 9:00 (S201207-02) Water	Sampled: 01/11/02 0	9:00 Recei	ved: 01/11	/02 19:00)		·		
Surrogate: Dibromofluoromethane	· · · · · · · · · · · · · · · · · · ·	95.6 %	70-13	30	2010311	01/25/02	01/25/02	EPA 8260B	
Surrogate: 1,2-DCA-d4		97.2 %	70-13	30	**	"	"	н	
Surrogate: Toluene-d8		102 %	70-1.	30	n	"	**	•	
Surrogate: 4-BFB		96.0 %	70-1.	30	17	n	,,	"	





3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA Project Manager: Steven Meeks Reported:

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Total Purgeable Hydrocarbon, BTEX and MTBE by DHS LUFT - Quality Control Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2010282 - EPA 5030B (P/T)				—— 1 7						
Blank (2010282-BLK1)	,			Prepared .	& Analyze	d: 01/18/	02			
Purgeable Hydrocarbons	ND	50	ug/l							
Benzene	ND	0.50	"							
Foluene	ND	0.50	**							
Ethylbenzene	ND:	0.50	11							
(ylenes (total)	ND	0.50	**							
fethyl tert-butyl ether	ND	2.5	**							
urrogate: a,a,a-Trifluorotoluene	9.21		"	10.0		92.1	60-140			
LCS (2010282-BS1)				Prepared	& Analyze	ed: 01/18/	02			
Benzene	10.3	0.50	ug/l	10.0		103	70-130			
Toluene	10.3	0.50	**	10.0		103	70-130			
thylbenzene	10.0	0.50	**	10.0		100	70-130			
(ylenes (total)	31.4	0.50	**	30.0		105	70-130			
Methyl tert-butyl ether	10.5	2.5	**	10.0		105	70-130			
urrogate: a,a,a-Trifluorotoluene	10.2		11	10.0		102	60-140			
Matrix Spike (2010282-MS1)	So	arce: S20122	8-10	Prepared	& Analyze	d: 01/18/	02			
Benzene	9.77	0.50	ug/l	10.0	ND	97.7	60-140			
Coluene	9.74	0.50	π	10.0	ND	97.4	60-140			
Ethylbenzene	9.46	0.50	Ħ	10.0	ND	94.6	60-140			
Kylenes (total)	29.5	0.50		30.0	ND	98.3	60-140			
Methyl tert-butyl ether	9.48	2.5	•	10.0	ND	94.8	60-140			
Surrogate: a,a,a-Trifluorotoluene	9.67		*	10.0		96.7	60-140			
Matrix Spike Dup (2010282-MSD1)	So	arce: S20122	8-10	Prepared	& Analyze	d: 01/18/	02			
Benzene	10.8	0.50	ug/l	10.0	ND	108	60-140	10.0	25	
'oluene	10.8	0.50	*1	10.0	ND	108	60-140	10.3	25	
Ethylbenzene	10.5	0.50	**	10.0	ND	105	60-140	10.4	25	
Kylenes (total)	32.4	0.50	11	30.0	ND	108	60-140	9.37	25	
Methyl tert-butyl ether	10.0	2.5	11	10.0	ND	100	60-140	5.34	25	
Surrogate: a,a,a-Trifluorotoluene	10.2		"	10.0		102	60-140			



3164 Gold Camp Drive Ste. 200

Rancho Cordova CA, 95670

Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

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Volatile Organic Compounds by EPA Method 8260B - Quality Control Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2010293 - EPA 5030B [P/T]			·		···		<u>.</u>			
Blank (2010293-BLK1)				Prepared	& Analyze	d: 01/24/0)2			
Benzene	ND	1.0	ug/l	··						
Bromobenzene	ND	1.0	*							
Bromochloromethane	ND	1.0	*							
Bromodichloromethane	ND	1.0	-							
Bromoform	ND	1.0	77							
Bromomethane	ND	2.5	**							
n-Butyfbenzene	ND	1.0	n							
sec-Butylbenzene	ND	1.0	н							
tert-Butylbenzene	ND	1.0	"							
Carbon tetrachloride	ND	1.0	w							
Chlorobenzene	ND	1.0	n							
Chloroethane	ND	2.5	**							
Chloroform	ND	1.0	19							
Chloromethane	ND	2.5	#							
2-Chlorotoluene	ND	1.0	п							
1-Chlorotoluene	ND	1.0	n							
Dibromochloromethane	ND	1.0	н							
1,2-Dibromoethane	ND	1.0	n							
Dibromomethane	ND	1.0	н							
1,2-Dibromo-3-chloropropane	ND	2.5	**							
1,2-Dichlorobenzene	ND	1.0	H							
1,3-Dichlorobenzene	ND	1.0	**							
1,4-Dichlorobenzene	ND	1.0								
Dichlorodifluoromethane	ND	2.5								
1,1-Dichloroethane	ND	1.0								
1,2-Dichloroethane	ND	1.0							•	
1,1-Dichloroethene	ND	1.0	19							
cis-1,2-Dichloroethene	ND	1.0	**							
trans-1,2-Dichloroethene	ND	1.0	*							
1,2-Dichloropropane	ND	1.0	w							
1,3-Dichloropropane	ND	1.0	U							
2,2-Dichloropropane	ND	1.0	"							
1,1-Dichloropropene	ND	1.0	**							
Ethylbenzene	ND	1.0	**							
Hexachlorobutadiene	ND	1.0	**							
Isopropylbenzene	ND	1.0	11							

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3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA Project Manager: Steven Meeks Reported: 01/28/02 13:52

Volatile Organic Compounds by EPA Method 8260B - Quality Control Sequoia Analytical - Sacramento

		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Analyte	Result	Limit	Units	Level	Result	%REC	Limits	KPD	Tann	Notes
Batch 2010293 - EPA 5030B [P/T]						<u></u>				·
Blank (2010293-BLK1)				Prepared o	& Analyze	ed: 01/24/0	02			
p-lsopropyltoluene	ND	1.0	ug/l							
Methylene chloride	ND	2.5	11							
Methyl tert-butyl ether	ND	1.0	**							
Naphthalene	ND	2.5	***							
n-Propylbenzene	ND	1.0	*							
Styrene	ND	1.0	•							
1,1,1,2-Tetrachloroethane	ND	1.0	**							
,1,2,2-Tetrachloroethane	ND	1.0	W							
Tetrachloroethene	ND	1.0	"							
Foluene	ND	1.0	**							
1,2,3-Trichlorobenzene	ND	1.0	Ħ							
1,2,4-Trichlorobenzene	ND	1.0	н							
1,1,1-Trichloroethane	ND	1.0	n							
1,1,2-Trichloroethane	ND	1.0	"							
Trichloroethene	ND	1.0	*							
Trichlorofluoromethane	ND	2.5	#							
1,2,3-Trichloropropane	ND	1.0	**							
1,2,4-Trimethylbenzene	ND	1.0	**							
1,3,5-Trimethylbenzene	ND	1.0	н							
Vinyl chloride	ND	1.0	"							
Total Xylenes	ND	1.0	#							
Surrogate: Dibromofluoromethane	25.3		"	25.0		101	70-130			
Surrogate: 1,2-DCA-d4	25.8		H	25.0		103	70-130			
Surrogate: Toluene-d8	26.6		#	25.0		106	70-130			
Surrogate: 4-BFB	24.5		*	25.0		98.0	70-130			
LCS (2010293-BS1)				Prepared	& Analyz	ed: 01/24/				
Benzene	27.5	1.0	ug/l	25.0		110	70-130			•
Chlorobenzene	27.4	1.0	**	25.0		110	70-130			
1,1-Dichloroethene	26.3	1.0	"	25.0		105	70-130			
Toluene	28.1	1.0	**	25.0		112	70-130			
Trichloroethene	23.8	1.0	**	25.0		95.2	70-130			
Surrogate: Dibromofluoromethane	24.7		н	25.0		98.8	70-130			
Surrogate: 1,2-DCA-d4	25.9		#	25.0		104	70-130			
Surrogate: Toluene-d8	25.2		"	25.0		101	70-130			
Surrogate: 4-BFB	23.5		n	25.0		94.0	70-130			

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3164 Gold Camp Drive Ste. 200

Rancho Cordova CA, 95670

Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA Project Manager: Steven Meeks

Reported:

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Volatile Organic Compounds by EPA Method 8260B - Quality Control Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 2010293 - EPA 5030B [P/T]		C20418	n 11	n	& Analyze		·02			
Matrix Spike (2010293-MS1)	27.2	rce: S20117		25.0	ND	109	60-140			
Benzene	26.9	1.0	ug/l	25.0	ND	103	60-140			
Chlorobenzene		1.0	**	25.0	ND	106	60-140			
,1-Dichloroethene	26.5		**	25.0	ND	111	60-140			
Toluene	27.7	1.0 1.0		25.0	ND	97.2	60-140			
Frichloroethene	24.3	1.0								
Surrogate: Dibromofluoromethane	23.3		"	25.0		93.2	70-130			
Surrogate: 1,2-DCA-d4	24.4		"	25.0		97.6	70-130			
Surrogate: Toluene-d8	23.4		"	25.0		93.6	70-130			
Surrogate: 4-BFB	21.9		"	25.0		87. 6	70-130			
Matrix Spike Dup (2010293-MSD1)	Sor	arce: S20117	8-11	Prepared	& Analyze	ed: 01/24/	02		·	
Benzene	27.1	1.0	ug/l	25.0	ND	108	60-140	0.368	25	
Chlorobenzene	27.7	1.0	n	25.0	ND	111	60-140	2.93	25	
,1-Dichloroethene	24.7	1.0	n	25.0	ND	98.8	60-140	7.03	25	
l'oluene	28.4	1.0	"	25.0	ND	114	60-140	2.50	25	
Trichloroethene	23.1	1.0	••	25.0	ND	92.4	60-140	5.06	25	
Surrogate: Dibromofluoromethane	23.5	· · ·	11	25.0		94.0	70-130			
Surrogate: 1,2-DCA-d4	23.7		**	25.0		94.8	70-130			
Surrogate: Toluene-d8	26.0		,,,	25.0		104	70-130			
Surrogate: 4-BFB	23.9		п	25.0		95.6	70-130			
Batch 2010311 - EPA 5030B [P/T]										
Blank (2010311-BLK1)				Prepared	& Analyzo	ed: 01/25/	02			
Benzene	ND	1.0	ug/l							
Bromobenzene	ND	1.0	11							
Bromochloromethane	ND	1.0	n							
Bromodichloromethane	ND	1.0	п							
Вготобогт	ND	1.0	н							
Bromomethane	ND	2.5	н							
n-Butylbenzene	ND	1.0	Ħ							
sec-Butylbenzene	ND	1.0	н							
ert-Butylbenzene	ND	1.0								
Carbon tetrachloride	ND	1.0	••							
Chlorobenzene	ND	1.0	**							
Chloroethane	ND	2.5	*							

Sequoia Analytical - Sacramento





Reported:



Delta Environmental Consultants (Rancho Cordova

3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks 01/28/02 13:52

Volatile Organic Compounds by EPA Method 8260B - Quality Control Sequoia Analytical - Sacramento

		Reporting		Spike	Source		%REC		RPD	
Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes

Blank (2010311-BLK1)				Prepared & Analyzed: 01/25/02
Chloroform	ND	1.0	ug/l	
Thloromethane	ND	2.5	**	
-Chlorotoluene	ND	1.0		
-Chlorotoluene	ND	1.0	"	
Dibromochloromethane	ND	1.0	u	
,2-Dibromoethane	ND	1.0	.,	
Dibromomethane	ND	1.0	11	
,2-Dibromo-3-chloropropane	ND	2.5	Ħ	
,2-Dichlorobenzene	ND	1.0	#	
,3-Dichlorobenzene	ND	1.0		
,4-Dichlorobenzene	ND	1.0	н	
pichlorodifluoromethane	ND	2.5	Ħ	
,1-Dichloroethane	ND	1.0	H	
,2-Dichloroethane	ND	1.0	"	
,1-Dichloroethene	ND	1.0	Ħ	
is-1,2-Dichloroethene	ND	1.0	Ħ	
ans-1,2-Dichloroethene	ND	1.0	**	
2-Dichloropropane	ND	1.0	**	
3-Dichloropropane	ND	1.0	#	
2-Dichloropropane	ND	1.0	17	
,1-Dichloropropene	ND	1.0	**	
thylbenzene	ND	1.0	Ħ	
Hexachlorobutadiene	ND	1.0	*	
sopropylbenzene	ND	1.0	**	
-Isopropyltoluene	ND	1.0	н	
lethylene chloride	ND	2.5	"	
lethyl tert-butyl ether	ND	1.0	"	
laphthalene	ND	2.5	Ħ	
-Propylbenzene	ND	1.0	n	
Styrene	ND	1.0	u	
,1,1,2-Tetrachloroethane	ND	1.0	н	
,1,2,2-Tetrachloroethane	ND	1.0	н	
Tetrachloroethene	ND	1.0	*	
Toluene	ND	1.0	н	
,2,3-Trichlorobenzene	ND	1.0		
,2,4-Trichlorobenzene	ND	1.0	#	

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3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported: 01/28/02 13:52

Volatile Organic Compounds by EPA Method 8260B - Quality Control Sequoia Analytical - Sacramento

	n. 1	Reporting	T factor	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Analyte	Result	Limit	Units	Level	Result	78KEC	LIMINS	14.0	24,	
Batch 2010311 - EPA 5030B [P/T]						<u></u>				<u>.</u>
Blank (2010311-BLK1)				Prepared	& Analyze	ed: 01/25/0	02			
1,1,1-Trichloroethane	ND	1.0	ug/l							
1,1,2-Trichloroethane	ND	1.0	**							
Trichloroethene	ND	1.0	*							
Trichlorofluoromethane	ND	2.5	"							
1,2,3-Trichloropropane	ND	1.0	**							
1,2,4-Trimethylbenzene	ND	1.0	17							
1,3,5-Trimethylbenzene	ND	1.0	19							
Vinyl chloride	ND	1.0	н							
Total Xylenes	ND	1.0	н					.=		
Surrogate: Dibromofluoromethane	22.3		H	25.0		89.2	70-130			
Surrogate: 1,2-DCA-d4	23.0		*	25.0		92.0	70-130			
Surrogate: Toluene-d8	26.7		"	25.0		107	70-130			
Surrogate: 4-BFB	23.8		"	25.0		95.2	70-130			
LCS (2010311-BS1)				Prepared	& Analyz	ed: 0 <u>1/25/</u>	02			
Benzene	27.7	1.0	ug/l	25.0		111	70-130			
Chlorobenzene	27.4	1.0	11	25.0		110	70-130			
1,1-Dichloroethene	25.9	1.0	n	25.0		104	70-130			
Toluene	27.9	1.0	**	25.0		112	70-130			
Trichloroethene	23.3	1.0	н	25.0		93.2	70-130			
Surrogate: Dibromofluoromethane	24.0	<u>-</u>	,,	25.0		96.0	70-130			
Surrogate: 1,2-DCA-d4	25.0		rt	25.0		100	70-130			
Surrogate: Toluene-d8	25.3		rr	25.0		101	70-130			
Surrogate: 4-BFB	24.0		"	25.0		96.0	70-130			
Matrix Spike (2010311-MS1)	Sou	rce: S20119	3-01	Prepared	& Analyz	ed: 01/25/	02			
Benzene	28.6	1.0	ug/l	25.0	ND	114	60-140			
Chlorobenzene	27.6	1.0	11	25.0	ND	110	60-140			
1,1-Dichloroethene	23.5	1.0	11	25.0	ND	94.0	60-140			
Toluene	28.0	1.0	H	25.0	ND	112	60-140			
Trichloroethene	23.6	1.0	*	25.0	ND	94.4	60-140			
Surrogate: Dibromofluoromethane	23.6		н	25.0		94.4	70-130			
Surrogate: 1,2-DCA-d4	23.3		n	25.0		93.2	70-130			
Surrogate: Toluene-d8	25.1		Ħ	25.0		100	70-130			
Surrogate: 4-BFB	24.0		"	25.0		96.0	70-130			

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3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Spike

Source

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

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RPD

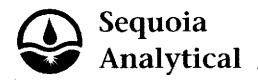
%REC

Volatile Organic Compounds by EPA Method 8260B - Quality Control

Sequoia Analytical - Sacramento

Reporting

Analyte	Result	Limit	Units	Level	Result	%REC	Limits	RPD	Limit	Notes
Batch 2010311 - EPA 5030B [P/T]										
Matrix Spike Dup (2010311-MSD1)	Sour	ce: S20119	3-01	Prepared	& Analyzo	ed: 01/25/	02			
Benzene	28.4	1.0	ug/l	25.0	ND	114	60-140	0.702	25	
Chlorobenzene	28.0	1.0	и	25.0	ND	112	60-140	1.44	25	
1,1-Dichloroethene	27.0	1.0	н	25.0	ND	108	60-140	13.9	25	
Toluene	28.8	1.0	n	25.0	ND	115	60-140	2.82	25	
Trichloroethene	24.3	1.0	н	25.0	ND	97.2	60-140	2.92	25	
Surrogate: Dibromofluoromethane	24.3		"	25.0		97.2	70-130			
Surrogate: 1,2-DCA-d4	25.7		12	25.0		103	70-130			
Surrogate: Toluene-d8	25.6		rr	25.0	•	102	70-130			
Surrogate: 4-BFB	23.8		rr .	25.0		95.2	70-130			



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Delta Environmental Consultants (Rancho Cordova

3164 Gold Camp Drive Ste. 200 Rancho Cordova CA, 95670 Project: ARCO 2111, San Leandro, CA

Project Number: 2111, San Leandro, CA

Project Manager: Steven Meeks

Reported:

01/28/02 13:52

Notes and Definitions

DET Analyte DETECTED

ND Analyte NOT DETECTED at or above the reporting limit

NR Not Reported

dry Sample results reported on a dry weight basis

RPD Relative Percent Difference

SEQUOIA ANALYTICAL
CHAIN OF CUSTODY

(Standard TAT)

Date / Time

Sampled

1-10-02 9:00

7 Working Days 5 Working Days

21-11-02 9:00 1-11-02 9:00

Environzas

State: CA Fax #: 9/6

☐ 72 Hours

Matrix

Desc.

☐ Yes ☐ No

of

Cont

48 Hours

24 Hours
 2-8 Hours

E-mail Address: Date / Time Res

Company Name:

Mailing Address:

Report To:

Client

Sample I.D.

1. 1-10-02 9:00

Sampler: 3.

Time:

3.

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Relinquished By:

Relinquished By:

	Project:	Areo	2111	- (San	Legno	100	CA)
	Billing Add	ress (if di	fferent):	(,
Code: 95670								
8 8385	P.O. #:							
	QC Data:		evel II (stand		□ Lev	rel III	C) Le	vel IV
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CWA (Waste W.	ater)	/ /	/ 37	/		/	/	/
RCRA (Hazardo	us Waste)		1.2	/	/	/		/ /
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Method of Shipment:

White: Sequola

Were Samples Received in Good Condition?

Yellow: Sequoia

Received By: Youruca

Received By:

Samples on Ice? ☐ Yes ☐ No

Pink: Client

Page_

_of__

Date / Time:

Date / Time:

ENCLOSURE C

Printout of Excel Calculation Sheet

Radial Influence Calculations:

	VW-2	MW-2	MW-1	MW-7
Vacuum Reading("H2O):	248.33	0.22	0.02	0.01
Pw(atm):	0.3896	0.3896	0.3896	0.3896
Pr(atm):		0.9995	1.0000	1.0000
Patm(atm):		1 .	1	1
Radius of Extraction well(ft):	1 inches	0.083	0.083	0.083
distance(ft):	0	24.1	101	40.2
Radius of Influence(ft):	Ri:	24.27	101.08	40.21

Permeability Calculations:

	VW-2	MW-2	
Q(cfm)=	248.2	248.2	
Q(cm ³ /s)=	117,137	117,137	
H(screen(feet))=	14	1.71	
H(screen(cm))=	426.72	52.1208	
u(g/cm*s²)=	0.000177	0.000177	
Pw(g/cm*s ²)=	394,767	394,767	
Patm(g/cm*s2)=	1,013,000	1,012,702	
Rw(cm)=	2.54	2.54	
Ri(cm)=	739.7	739.9	
Q/H=	274.51	2247.42	
1-(Patm/Pw)2=	-5.58	-5.58	
In(Rw/Ri)=	-5.67	-5.67	
*Pw*pi=	1,240,197	1,240,197	
=	1,220,650	1,219,760	
k (cm2)=	3.9805E-08	3.261E-07	
k (darcy) =	3.98	32.61	