SELF-MONITORING REPORT – THIRD QUARTER 2009 NPDES PERMIT NO. CAG912002

GROUNDWATER REMEDIATION AT CITY OF OAKLAND MUNICIPAL SERVICES CENTER 7101 EDGEWATER DRIVE OAKLAND, CALIFORNIA

Prepared for

City of Oakland
Public Works Agency
Environmental Services Division
250 Frank H. Ogawa Plaza, Suite 5301
Oakland, CA94612

October 23, 2009

Prepared by

OTG
EnviroEngineering Solutions, Inc.

7700 Edgewater Drive, Suite 260
Oakland, CA 94621

under a subcontract to

LFR an ARCADIS company

1900 Powell Street, 12th Floor
Emeryville, CA 94608

Oakland
All-America City
1993

CITY OF OAKLAND

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Public Works Agency
Environmental Services

FAX (510) 238-7286
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October 23, 2009

Ms. Lourdes Gonzales
Regional Water Quality Control Board –
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Reference: RWQCB Order No. R2-2006-0075, NPDES Permit #CAG912002

Subject: Self-Monitoring Report – Third Quarter 2009
Groundwater Remediation at 7101 Edgewater Drive, Oakland, California

Dear Ms. Gonzales:

The City of Oakland is pleased to submit this Self-Monitoring Report, Third Quarter 2009, for the groundwater extraction, treatment, and discharge system at the City of Oakland Municipal Services Center located at 7101 Edgewater Drive, Oakland, California. The report has been prepared by LFR Inc. and OTG EnviroEngineering Solutions, Inc. under a consultant service contract with the City of Oakland. No violations of RWQCB Order No. R2-2006-0075 or NPDES Permit #CAG912002 were identified during this reporting period.

Certification

I certify under penalty of law that this document and attachments are prepared under my direction or supervision in accordance with the system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing the violations.

Please contact me at (510)238-6361 if you have questions or comments.

Sincerely

Gopakumar Nair
Environmental Program Specialist

OTG EnviroEngineering Solutions, Inc.

October 23, 2009

Mr. Gopal Nair
Environmental Program Specialist
City of Oakland – PWA/ESD
250 Frank H. Ogawa Plaza, Suite 5301
Oakland, CA 94612

Reference: RWQCB Order No. R2-2006-0075, NPDES Permit #CAG912002

Subject: Self-Monitoring Report – Third Quarter 2009
Groundwater Remediation at 7101 Edgewater Drive, Oakland, CA

Dear Mr. Nair:

OTG EnviroEngineering Solutions, Inc. (OTG) is pleased to submit this Self-Monitoring Report, Third Quarter 2009, for the groundwater extraction, treatment, and discharge system at the City of Oakland Municipal Services Center located at 7101 Edgewater Drive, Oakland, California. OTG conducted the work under a subcontract to LFR Inc. No violations of RWQCB Order No. R2-2006-0075 or NPDES Permit #CAG912002 were identified during this reporting period.

Certification

I certify under penalty of law that this document and all attachments are prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Please contact the undersigned at (510) 465-8982 if you have questions or comments.

Sincerely,
OTG EnviroEngineering Solutions, Inc.

Xinggang Tong, PhD, PE
Project Manager

cc: Mr. Charles Pardini, P.G., LFR Inc.

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1 INTRODUCTION

The City of Oakland Municipal Services Center (MSC) is located at 7101 Edgewater Drive in Oakland, California (the Site; Figure 1). The approximately 17-acre site was originally part of a waterfront tidal marsh complex that was filled between 1950 and 1971. The City of Oakland (the City) leased the land from the Port of Oakland and constructed the MSC around 1972. Bordering the MSC site to the west and the north is the Martin Luther King Regional Shoreline Park, which is also owned by the Port of Oakland. Damon Slough, which runs through the park, is located to the north, and commercial developments are located to the east and south.

The Site has been the subject of numerous environmental investigations beginning in about 1989. The suspected sources of on-site contamination include releases from underground storage tanks (USTs), gasoline and diesel fuel hydrant systems, and the floor drain waste collection pits formerly located adjacent to Building No. 5. At one time there were 14 petroleum USTs at the site. In addition, some or all of the material used to fill the Site may have been composed of waste material or contaminated fill. A comprehensive investigation conducted by Baseline Environmental Consulting (Baseline) in 2000 identified the existence of free-phase petroleum hydrocarbon product in four separate areas of the Site. These four areas are labeled Plumes A through D on Figure 2. Baseline's investigation is documented in its *Site History and Characterization* Report (Baseline, January 2001).

Groundwater monitoring was conducted quarterly from the fourth quarter of 1989 through the third quarter of 2002, and then semi-annually to the present. Shallow groundwater levels vary between approximately 2 and 10 feet below ground surface (bgs), and are partially subject to tidal influence. Throughout much of the Site, shallow groundwater flows to the southwest - to the nearest shoreline along San Leandro Bay. In the northern portion of the Site, groundwater flows in a more northerly direction toward the curving shoreline and Damon Slough.

Pilot-scale groundwater/soil vapor dual-phase extraction (DPE) tests were conducted in 2002 to assess enhancing the removal of free-phase petroleum product from Plumes A through D (Cambria Environmental Technology, August 13, 2002 and URS Corporation, August 29, 2002). Extracted groundwater was treated on-site through two 2,000-lb granular activated carbon units connected in series and discharged to the on-site storm drain in accordance with a National Pollutant Discharge Elimination System (NPDES) permit granted by the San Francisco Bay Regional Water Quality Control Board (NPDES Permit No. CAG912002). Based on the pilot test results, the City retained Cambria in May 2003 to design a full-scale product recovery and DPE system for Plumes C and D. Cambria's design was revised in October 2005 by Groundwater and Environmental Services (GES) to focus the first phase of product removal on Plume D. The final design drawings were included in Appendix A of the Startup Report (OTG, June 2006). Chemical oxidation and enhanced bioremediation through periodic injections of hydrogen peroxide have been implemented at Plumes A, B and C since July 2004.

In March 2006, the City retained URS Corporation and its subcontractor ERRG to construct GES' redesigned product recovery and DPE system in the Plume D area (first phase). A plan view of the system is presented in Figure 3. Construction was completed in early May 2006. Seven wells within Plume D area (RW-D1 through RW-D5, TBW-5, and RW-1) were connected to the extraction system. On May 22, 2006, the product recovery and groundwater extraction portion of the remediation system (pneumatic pumps) was turned on. On May 14, 2007, the DPE portion of the remediation system was turned on. The second phase included installation of six additional extraction wells (RW-D6 through RW-D11) within the Plume D area in March 2007 (URS, May 2007). They were connected to the DPE system and extraction from these wells commenced on June 11, 2007.

In March 2009, the City initiated the third phase of product removal by retaining LFR Inc. and its subcontractor All Chem Inc. to expand the DPE extraction to Plume C. Six of the eight wells in the Plume C area (RW-C2, RW-C4 through RW-C7, and OB-C1, Figure 3) were connected to the DPE system and extraction from these wells commenced on May 26, 2009.

2. DESCRIPTION OF REMEDIATION SYSTEM

The remediation system consists of extracting liquid (free-phase product and groundwater) and soil vapor from 13 wells in the Plume D area and six wells in the Plume C area, separation of free-phase product from groundwater, treatment of groundwater by activated carbon, discharge of treated water to the local storm drain in accordance with the NPDES permit, treatment of soil vapor, and discharge of treated vapor to the atmosphere in accordance with an air discharge permit. A process and instrumentation diagram of the remediation system is illustrated on Figure 4. Design details were included in Appendix A of the Startup Report (OTG, June 2006).

As described above, a total of 19 wells were connected to the remediation system in three phases: the first phase included seven wells in Plume D area (RW-D1 through RW-D5, TBW-5, and RW-1) and commenced extraction on May 22, 2006; the second phase included six additional wells in Plume D area (RW-D6 through RW-D11), which joined extraction on June 11, 2007; and the third phase included six wells in Plume C area (RW-C2, RW-C4 through RW-C7, and OB-C1), which joined extraction on May 26, 2009. Well locations are shown on Figure 3.

Wells RW-C1 through RW-C7 and RW-D1 through RW-D5 were constructed in December 2001 and wells RW-D6 through RW-D11 were constructed in March 2007, specifically for remediation purposes. Wells RW-1 and TBW-5 were installed during backfilling of the excavation of former fuel hydrant lines in the early 1990s. The first phase wells were equipped with both total fluid recovery pneumatic pumps specifically designed for viscous petroleum product recovery and vacuum lines for liquid and soil vapor extraction (dual-phase extraction, DPE). The pneumatic pumps were manufactured by Clean Environment Equipment in Oakland (Model # AP-Custom). An Ingersoll-Rand air compressor (model # SSR UP6-10) provides compressed air to the pneumatic pumps. The second and the third phase wells were connected only to the DPE system. A Dekker liquid-ring vacuum pump (model #VMX0553K) that can generate up to 28 inches of mercury vacuum and up to 550 actual cubic feet per minute

(ACFM) vapor flow provides necessary vacuum for the DPE system. The pneumatic pumps and the DPE extraction can be operated independently.

The liquid extracted by the pneumatic pumps and the DPE is pumped into an oil/water separator (Model # AGM-3SS-90V, Hydro Quip, Inc.). Recovered oil is contained in 55-gallon drums, which are sent to an off-site oil recycling facility. Groundwater is treated through three (3) granular activated carbon (GAC) units connected in series (Model #ASC-2000, U.S.Filter/Westates Carbons) before been discharged into local storm drain. Each GAC unit contains 2,000 pounds (lbs) of GAC. Figure 5 illustrates the groundwater treatment portion of the remediation system and identifies sampling ports. The groundwater treatment and discharge system is operated under the NPDES permit number CAG912002.

The soil vapor extracted from the 19 wells is abated by a thermal oxidizer, which is operated between 1,400 and 1,650 degrees Fahrenheit. At low vapor organic concentrations, the thermal oxidizer can be converted to a catalytic oxidizer. Activated carbon can also be used for vapor abatement at low organic concentrations. The vapor abatement system is operated under the permit number 16622 issued by the Bay Area Air Quality Management District (BAAQMD).

3 OPERATIONS AND MAINTENANCE

On May 22, 2006, the pneumatic pumps were turned on to initiate the remediation process. The vacuum extraction portion remained off line. Because the free-phase product appears to be a mixture of gasoline, diesel, and some other highly viscous organics (petroleum tank bottom or coal tar-like material), the vacuum extraction, if turned on, will vaporize gasoline and a portion of the diesel and will make the removal of the viscous product even more difficult. Therefore, the remediation scheme includes first using the pneumatic pumps to remove the free-phase product as much as is practical and achievable, and then using the vacuum extraction system to enhance the removal of the remaining petroleum hydrocarbons.

The volume of free-phase product recovered by the pneumatic pumps decreased steadily from the startup in May 2006 through April 2007. On May 14, 2007, RW-D2, RW-D4 and RW-D5 were switched to vacuum DPE operation, while RW-D1, RW-D3, TBW-5 and RW-1 remained under pneumatic pump extraction. On June 11, 2007, the six newly installed wells (RW-D6 through RW-D11) and the remaining pneumatic extraction wells (RW-D1, RW-D3, TBW-5, and RW-D5) were brought on-line under DPE operations. The pneumatic extraction portion of the remediation system was discontinued. On May 26, 2009, the six extraction wells from Plume C area (RW-C2, RW-C4 through RW-C7, and OB-C1) were also brought on-line under DPE operations.

The remediation system was operated intermittently during the second quarter 2009 due to extensive maintenance requirements. The highly viscous organic material extracted by the DPE system has progressively clogged various parts of the extraction piping and control system. The radiator was replaced in December 2008, the oil/vapor separation unit was changed in March 2009, and the oil level sensors and the vapor pressure switch were replaced

in April 2009. Routine operations and maintenance (O&M) of the system includes the following tasks:

- a daily check of the liquid level sensors and function of pumps;
- adjusting individual extraction wells to optimize the extraction rate of soil vapor and groundwater within the equipment design range;
- checking and removing oil from the oil/water separator;
- lubricating pumps;
- monitoring system performance;
- and other tasks necessary for maintaining proper functioning of the remediation system.

Monthly, quarterly, semi-annual, and annual groundwater and air samples were collected and analyzed from the system per the NPDES permit and the air permit requirement. Figure 5 shows sampling ports for groundwater sample collection. Air samples were collected from the exhaust and the inlet of the DPE system. Extracted groundwater was measured monthly on-site at the influent (prior to the carbon treatment) and at the effluent (after the carbon treatment) for temperature, pH, and electric conductivity using an Oakton pH/Con 10 meter (Serial #311648) and for turbidity using an Oakton T-100 meter (Serial #316738). Before measurement, the pH probe was calibrated with standard solutions of pH 4.00, 7.00, and 10.00; the electric conductivity probe was calibrated with 1413 ug/cm standard solution; and the turbidity meter was calibrated with standard solutions of 0.02, 20.0, 100, and 800 nephelometric turbidity units (NTUs).

Groundwater samples were analyzed by Curtis & Tompkins, Ltd of Berkeley, California, and air samples were analyzed by Torrent Laboratory, Inc., of Milpitas, California. Groundwater analytical methods are listed in Table 1. The laboratory data were found to be of acceptable quality, with qualifications as noted in the laboratory reports.

4 DISCHARGE MONITORING – THIRD QUARTER 2009

Field measured data and laboratory analysis results are summarized in the following tables:

- Table 1 – Laboratory Analytical Procedures;
- Table 2 – Operational Data and Field Measured Parameters;
- Table 3 – Petroleum Hydrocarbon Analytical Data;
- Table 4 – Inorganic Constituents Analytical Data & Fish Bioassay Results;
- Table 5 – Organic Constituents Analytical Data;
- Table 6 – Dual-Phase Extraction Vapor Monitoring Data;
- Table 7 – Petroleum Hydrocarbons Removed through Soil Vapor Extraction; and
- Table 8 – TPH removed through Groundwater Extraction, Floating Product Recovery, and Soil Vapor Extraction.

Significant Results for the Third Quarter 2009

- Groundwater extracted from the remediation wells for this reporting period (July 1 through September 30, 2009) totaled 136,990 gallons, which was treated and discharged into the local storm drain, resulting in an average monthly flow rate of 0.71 gallons per minute (gpm) in July 1.898 gpm in August, and 0.607 gpm in September (Table 2).
- Separate-phase floating product was not recovered during this quarter. Approximately 13 lbs of total petroleum hydrocarbons (TPH, gasoline plus diesel) was removed through the extracted groundwater (dissolved in groundwater), and 2,268 lbs of TPH was removed through soil vapor (Table 8). The total weight of TPH removed this quarter was 2,281 lbs, of which 99% was removed by the DPE through soil vapor extracted and 1% was removed through the groundwater. Since the remediation system started in May 2006, a total of 60,725 lbs, or approximately 8,579 gallons, of TPH (plus unknown) has been removed from Plumes C and D (Table 8). The recovered floating product was highly viscous and black in color. Its appearance does not resemble gasoline or diesel.
- Monthly and quarterly monitoring was conducted on July 24, August 13, and September 25, respectively. Monthly monitoring results are summarized in Tables 2 and 3; quarterly and annual monitoring results are presented in Tables 4 and 5.
- Effluent (treated groundwater) had pH values between 7.1 and 7.25, temperatures between 21.7 and 24.6 °C, conductivities between 9.05 and 12.58 mS/cm, and turbidities between 2.0 and 3.0 NTU (Table 2).
- TPHg; TPHd; TPHmo; benzene, toluene, ethylbenzene, and xylenes (BTEX); and methyl tertiary-butyl ether (MTBE) in the monthly effluent samples were all below their respective reporting limits. The reporting limits were 0.5 micrograms per liter (ug/L) for the BTEX constituents, 2.0 ug/L for MTBE, 50 ug/L for TPHg and TPHd, and 300 ug/L for TPHmo (Table 3).
- Polycyclic aromatic hydrocarbons (PAHs by EPA Method 8310) in the quarterly effluent sample were below their respective reporting limits, which was 0.1 ug/L for many of the PAHs (Table 5).
- The average concentrations for the influent (after the oil/water separator, but before the carbon treatment) for the second quarter 2009 were 0.51 milligrams per liter (mg/L) TPHg, 9.8 mg/L TPHd, 1.69 mg/L TPHmo, and 0.0067 mg/L benzene. These concentrations are significantly below their respective concentrations in 2006 and 2007 (Table 3).

5 REFERENCES

Baseline Environmental Consulting, Site *History and Characterization*, January 2001

Cambria Environmental Technology, Inc. *TPE Pilot Test and Feasibility Report*, August 13, 2002.

California Regional Water Quality Control Board – San Francisco Bay Region, *Notice of General Permit Coverage for Discharge from the City of Oakland Municipal Service Center located at 7101 Edgewater Drive, Oakland, Alameda County, CA 94621, under the Requirements of Order No. R2-2006-0075, NPDES Permit No. CAG912002 (Fuel General Permit),* March 12, 2007.

California Regional Water Quality Control Board – San Francisco Bay Region, *Authorization to Discharge Treated Groundwater Under the Requirements of Order No. 01-100, NPDES Permit No. CAG 912002*, April 23, 2002.

OTG EnviroEngineering Solutions, Inc. *Startup Report, Groundwater Remediation at City of Oakland Municipal Services Center*, June 2006

URS Corporation, *Results of Dual-Phase Extraction Pilot Test for Plumes A & B, City of Oakland Municipal Services Center*, August 29, 2002.

URS Corporation, Extraction Well Installation – City of Oakland Municipal Services Center Site – Plume D, May 9, 2007.

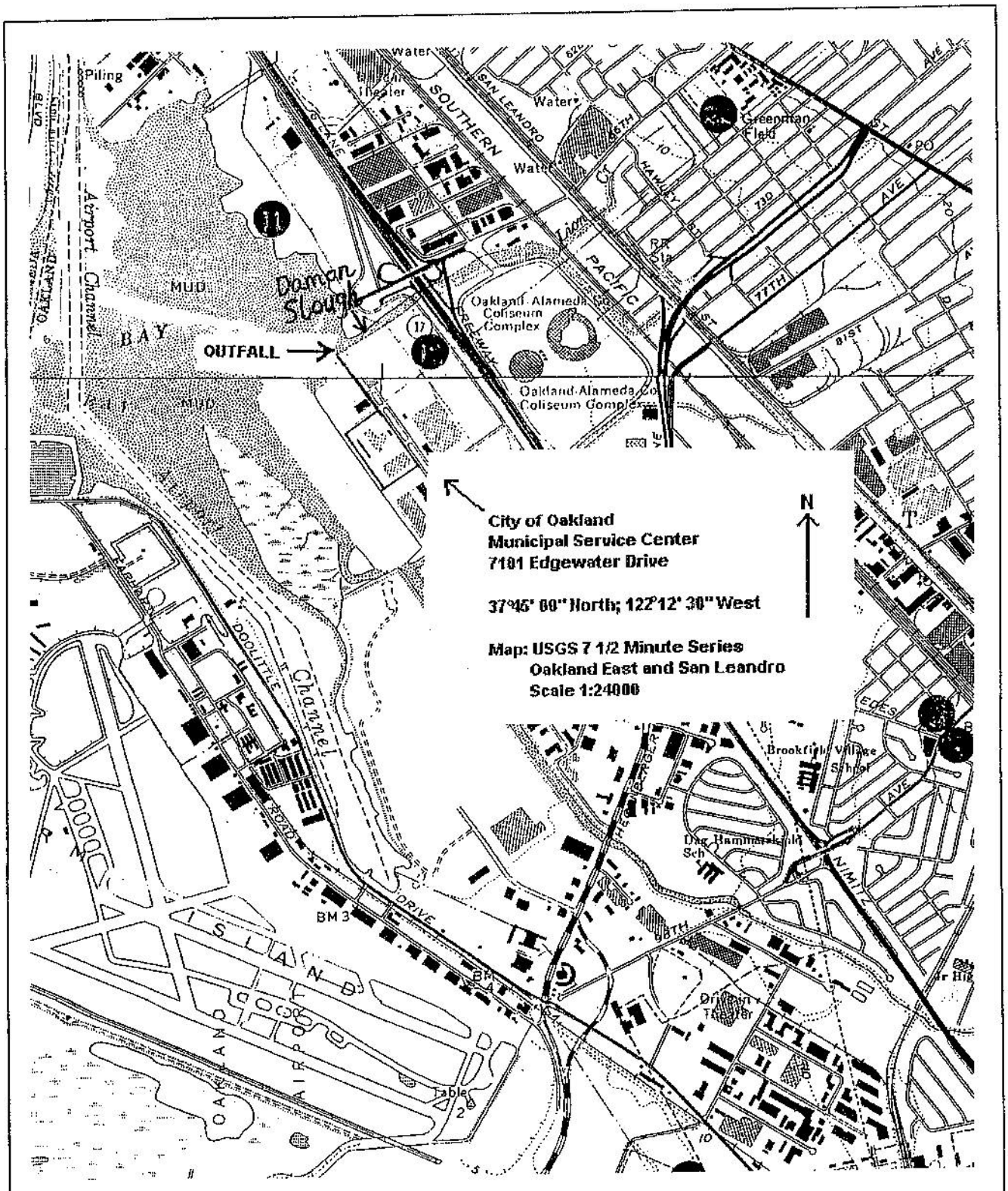


FIGURE 1 SITE LOCATION AND DISCHARGE LOCATION

EnviroEngineering Solutions, Inc.	City of Oakland Municipal Service Center 7101 EdgeWater Drive, Oakland, CA

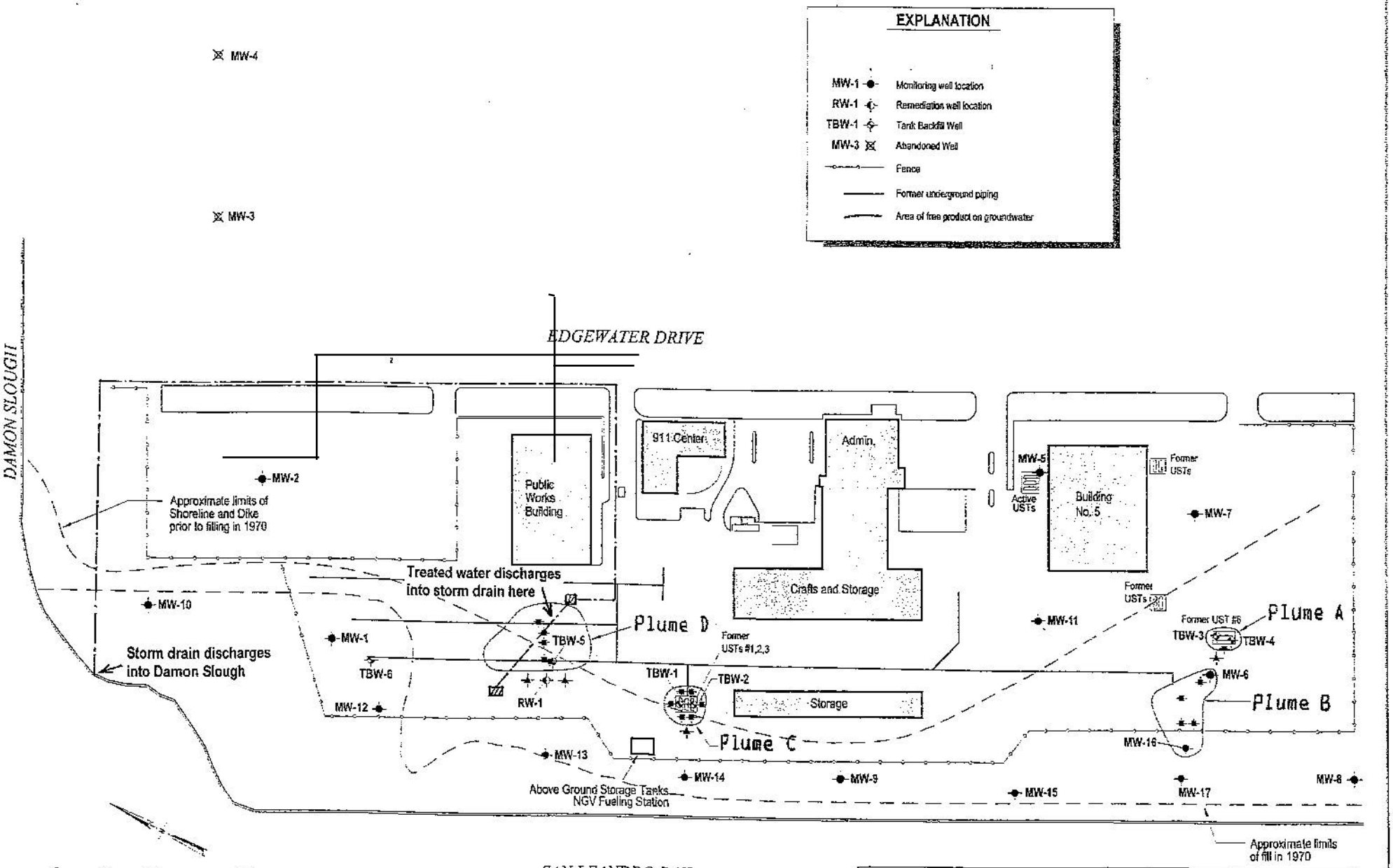


FIGURE 2 Identification of Free-Phase Petroleum Product Locations

EnviroEngineering Solutions, Inc.

City of Oakland Municipal Services Center
7101 Edgewater Drive, Oakland, CA

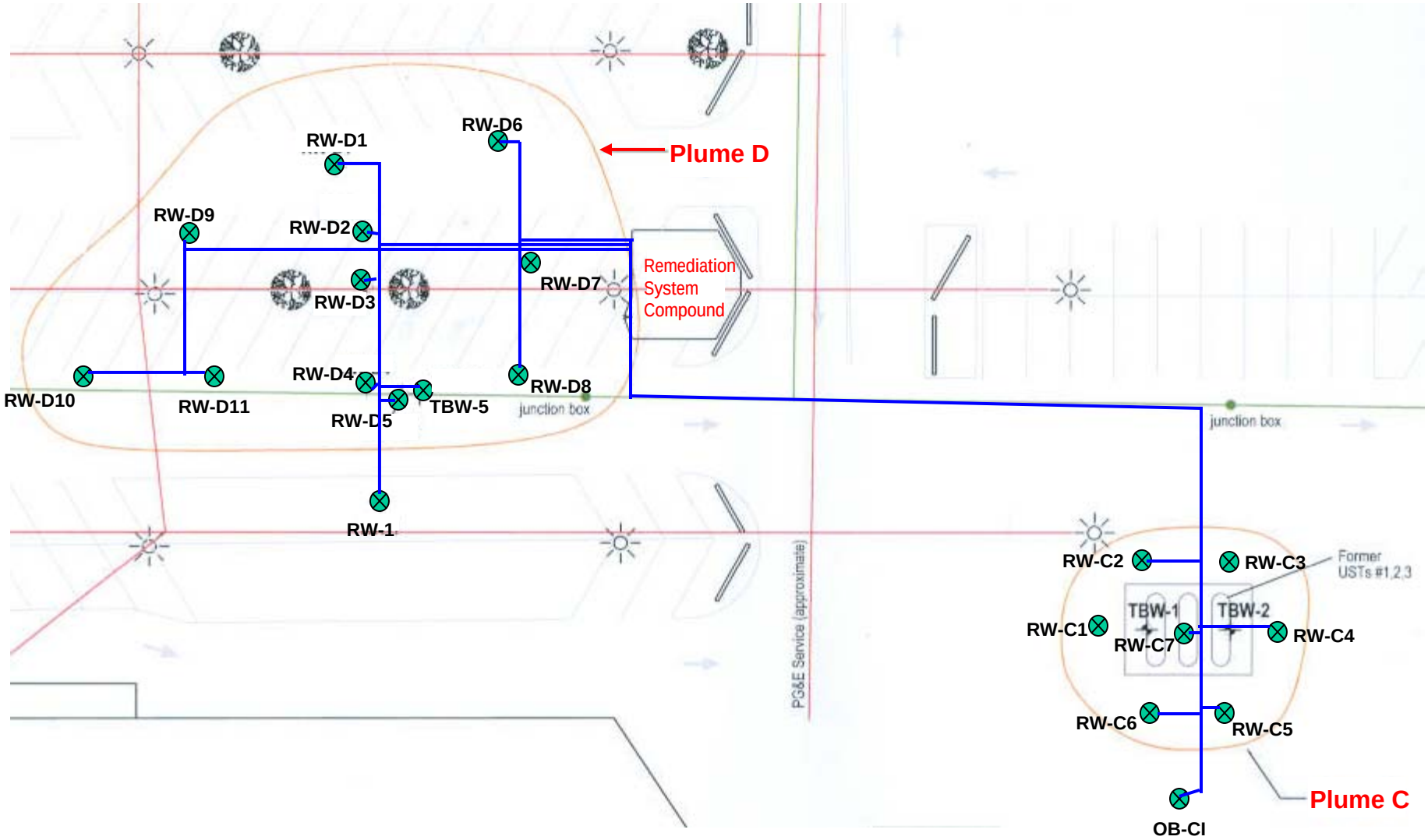
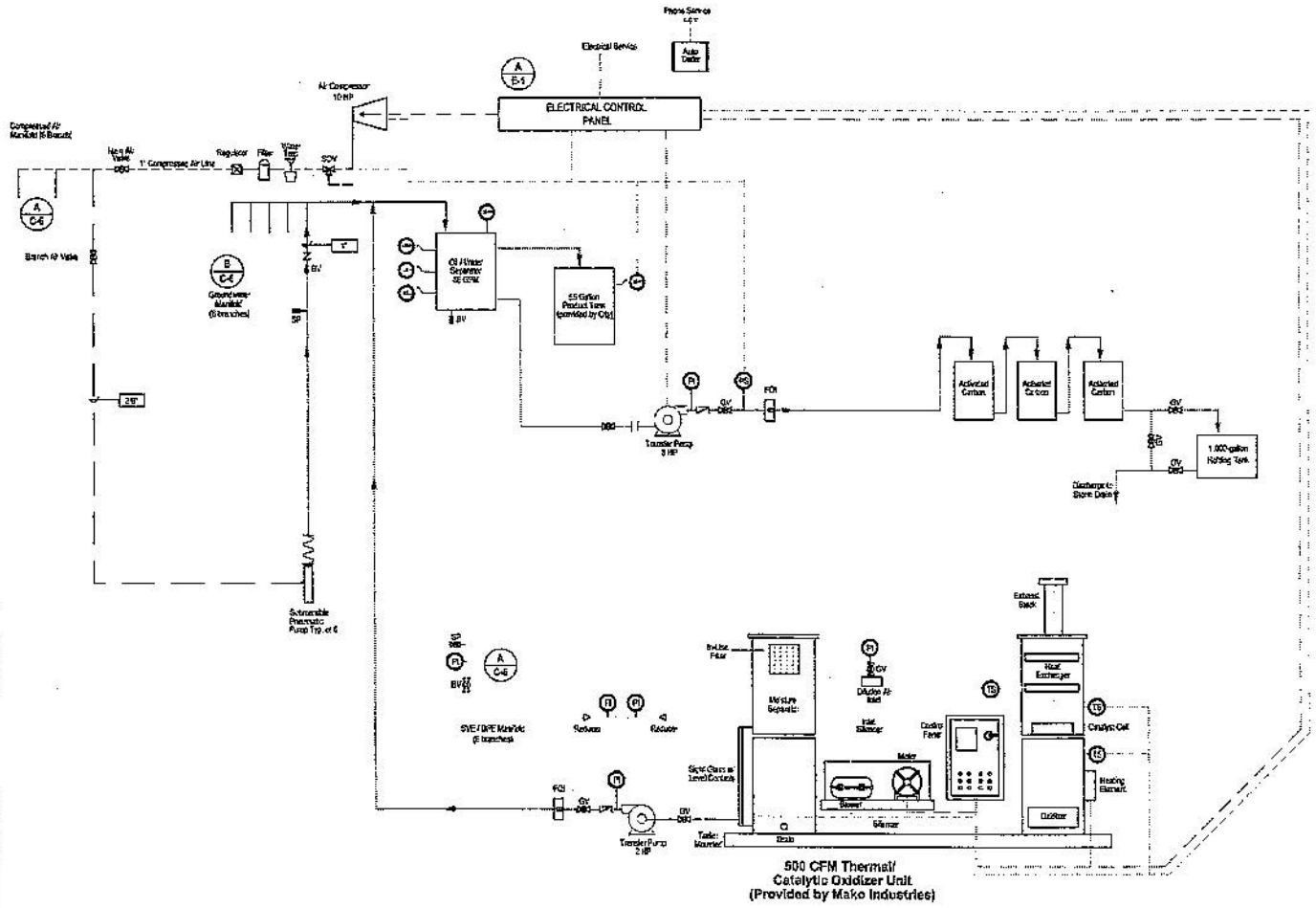


FIGURE 3 Identification of Extraction Wells & Trench Layout

EnviroEngineering Solutions, Inc.

City of Oakland Municipal Services Center
7101 Edgewater Drive, Oakland, CA

July 2009



EXPLANATION

- Flowmeter/Indicator
- BV = Ball Valve
- GV = Gate Valve
- Sample Port
- Flexible Hose
- Pressure Transmitting Switch
- Flow Indicator
- Temperature Sensor
- Pressure Indicator
- Missing or Needs Replacement On Existing Equipment
- Vacuum Breaker
- Quick Disconnect
- Check Valve
- Solenoid Valve
- SVE Piping
- Electrical Control Wiring
- Electrical Power Wiring
- Compressed Air Line
- Groundwater Piping

FIGURE 4 Remediation System Process & Instrumentation Diagram

EnviroEngineering Solutions, Inc.

City of Oakland Municipal Services Center
7101 Edgewater Drive, Oakland, CA

DRAFTED BY: CEB (CA)	PROCESS AND INSTRUMENTATION DIAGRAM
CHECKED BY: GMH	MUNICIPAL SERVICE CENTER 7101 EDGEWATER DRIVE OAKLAND, CALIFORNIA
REVIEWED BY:	
NORTH	Groundwater & Environmental Services, Inc. 333 VINCENT ROAD, SUITE 222, PLEASANT HILL, CA 94523
NOT TO SCALE	DATE: 11-02-05 / FIGURE: M-1

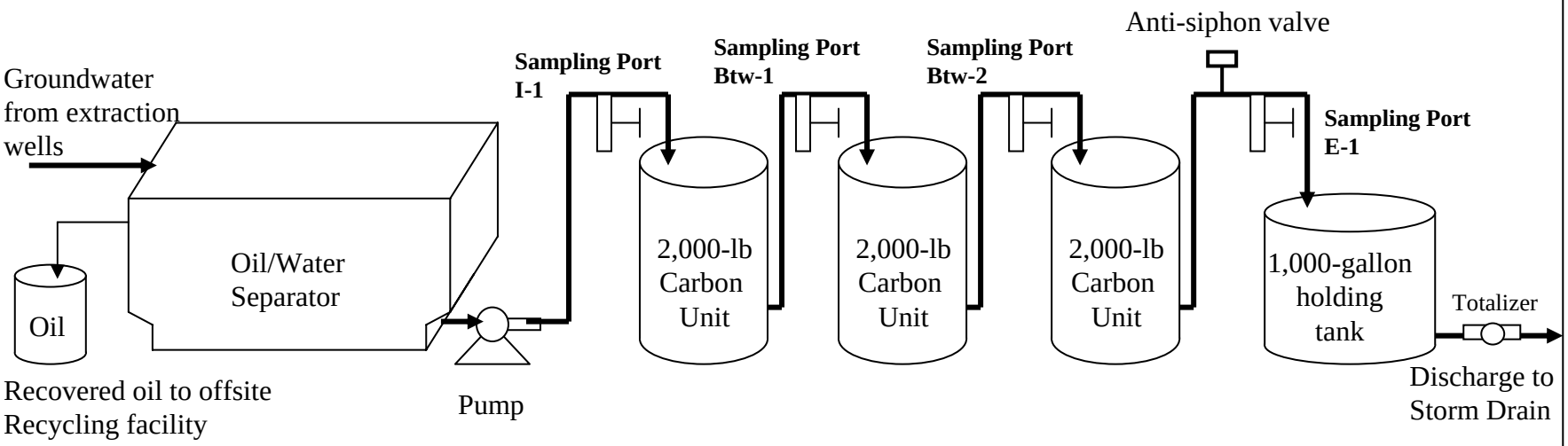


FIGURE 5 Schematic of Groundwater Treatment System and Sampling Locations

June 2006

EnviroEngineering Solutions, Inc.

City of Oakland Municipal Services Center
7101 Edgewater Drive, Oakland, CA

Table 1 - Laboratory Analytical Procedures
City of Oakland Municipal Services Center Groundwater Remediation Project

	5/22/06	5/30/06	6/26/06	7/25/06 & 8/11/06	9/5/06	10/4/06 & 12/6/06	11/8/06	1/19/07 & 2/22/07	3/14/07	4/24/07 5/17 & 6/21	7/27/07
Flow rate	on-site totalizer	on-site totalizer	on-site totalizer	on-site totalizer	on-site totalizer	on-site totalizer	on-site totalizer	on-site totalizer	on-site totalizer	on-site totalizer	on-site totalizer
Turbidity	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site	--
pH	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site
Temperature	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site
E. conductivity	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site
Fish bioassay			EPA/821/R-02/012		EPA/821/R-02/012		EPA/821/R-02/012		EPA/821/R-02/012		
Benzene	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8260B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8260B	EPA 8021B	EPA 8021B
Toluene	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8260B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8260B	EPA 8021B	EPA 8021B
Ethylbenzene	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8260B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8260B	EPA 8021B	EPA 8021B
Total xylenes	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8260B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8260B	EPA 8021B	EPA 8021B
MTBE	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8260B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8260B	EPA 8021B	EPA 8021B
TPHg & TPHd	EPA 8015B	EPA 8015B	EPA 8015B	EPA 8015B	EPA 8015B	EPA 8015B	EPA 8015B	EPA 8015B	EPA 8015B	EPA 8015B	EPA 8015B
EDB	--	EPA 8260B	--	--	EPA 8260B	--	--	--	EPA 8260B	--	--
VOCs	--	EPA 8260B	--	--	EPA 8260B	--	--	--	EPA 8260B	--	--
TAME	--	EPA 8260B	--	--	EPA 8260B	--	--	--	EPA 8260B	--	--
DIPE	--	EPA 8260B	--	--	EPA 8260B	--	--	--	EPA 8260B	--	--
ETBE	--	EPA 8260B	--	--	EPA 8260B	--	--	--	EPA 8260B	--	--
TBA	--	EPA 8260B	--	--	EPA 8260B	--	--	--	EPA 8260B	--	--
Ethanol	--	EPA 8015B	--	--	EPA 8260B	--	--	--	EPA 8015B	--	--
Methanol	--	EPA 8015B	--	--	EPA 8015B	--	--	--	EPA 8015B	--	--
SVOCs	--	EPA 625	--	--	EPA 8270C	--	--	--	EPA 8270C	--	--
PAHs	--	EPA 610	--	--	EPA 8310	--	--	--	EPA 8310	--	--
Hardness	SM 2340B	SM 2340B	SM 2340B	--	SM 2340B	--	SM 2340B	--	SM 2340B	--	--
Antimony	EPA 200.8	EPA 200.8	EPA 6020	--	EPA 6020	--	EPA 6020	--	EPA 6020	--	--
Arsenic	EPA 200.8	EPA 200.8	EPA 6020	--	EPA 6020	--	EPA 6020	--	EPA 6020	--	--
Beryllium	EPA 200.8	EPA 200.8	EPA 6020	--	EPA 6020	--	EPA 6020	--	EPA 6020	--	--
Cadmium	EPA 200.8	EPA 200.8	EPA 6020	--	EPA 6020	--	EPA 6020	--	EPA 6020	--	--
Chromium	EPA 200.8	EPA 200.8	EPA 6020	--	EPA 6020	--	EPA 6020	--	EPA 6020	--	--
Cr +6	EPA 7196	EPA 7196	EPA 7199	--	EPA 7199	--	EPA 7199	--	EPA 7199	--	--
Copper	EPA 200.8	EPA 200.8	EPA 6020	--	EPA 6020	--	EPA 6020	--	EPA 6020	--	--
Cyanide	EPA 335.2	EPA 335.2	EPA 335.2	--	EPA 335.2	--	EPA 335.2	--	EPA 335.2	--	--
Lead	EPA 200.8	EPA 200.8	EPA 6020	--	EPA 6020	--	EPA 6020	--	EPA 6020	--	--
Mercury	EPA 245.1	EPA 245.1	EPA 7470A	--	EPA 7470A	--	EPA 7470A	--	EPA 7470A	--	--
Nickel	EPA 200.8	EPA 200.8	EPA 6020	--	EPA 6020	--	EPA 6020	--	EPA 6020	--	--
Selenium	EPA 200.8	EPA 200.8	EPA 6020	--	EPA 6020	--	EPA 6020	--	EPA 6020	--	--
Silver	EPA 200.8	EPA 200.8	EPA 6020	--	EPA 6020	--	EPA 6020	--	EPA 6020	--	--
Thallium	EPA 200.8	EPA 200.8	EPA 6020	--	EPA 6020	--	EPA 6020	--	EPA 6020	--	--
Zinc	EPA 200.8	EPA 200.8	EPA 6020	--	EPA 6020	--	EPA 6020	--	EPA 6020	--	--

Notes:

1. pH, conductivity, and temperature were measured on site using an Oakton pH/Con 10 meter, serial #311648, calibrated daily before use.
2. Turbidity was measured on site using an Oakton T-100 meter, serial #316738, calibrated daily before use.
3. Monthly air samples are analyzed for TPHg and BTEX.

Abbreviations:

BTEX = benzene, toluene, ethylbenzene, and total xylenes
Cr +6 = chromium-VI
DIPE = diisopropyl ether
EDB = ethylene dibromide
EPA = U.S. Environmental Protection Agency
ETBE = ethyl tertiary butyl ether
MTBE = methyl tertiary butyl ether
PAHs = polycyclic aromatic hydrocarbons
SM = Standard Method
SVOCs = semivolatile organic compounds
TAME = tertiary amyl ether
TBA = tertiary butyl alcohol
TPHd = total petroleum hydrocarbons quantified as diesel
TPHg = total petroleum hydrocarbons quantified as gasoline
VOCs = volatile organic compounds

Table 1 - Laboratory Analytical Procedures
City of Oakland Municipal Services Center Groundwater Remediation Project

	8/28/07	09/19/07	10/24/07	11/21/07	12/20/07	1/21/08	2/20/08	3/18/08	4/23/08	5/20 & 6/16/08 & 7/22/08	8/21/08
Flow rate	on-site totalizer	on-site totalizer	on-site totalizer	on-site totalizer	on-site totalizer	on-site totalizer	on-site totalizer	on-site totalizer	on-site totalizer	on-site totalizer	on-site totalizer
Turbidity	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site
pH	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site
Temperature	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site
E. conductivity	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site	on-site
Fish bioassay							EPA/821/R-02/012				
Benzene	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8260B	EPA 8021B	EPA 8260B
Toluene	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8260B	EPA 8021B	EPA 8260B
Ethylbenzene	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8260B	EPA 8021B	EPA 8260B
Total xylenes	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8260B	EPA 8021B	EPA 8260B
MTBE	EPA 8021B	EPA 8260B	EPA 8021B	EPA 8260B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8260B	EPA 8021B	EPA 8260B
TPHg & TPHd	EPA 8015B	EPA 8015B	EPA 8015B	EPA 8015B	EPA 8015B	EPA 8015B	EPA 8015B	EPA 8015B	EPA 8015B	EPA 8015B	EPA 8015B
EDB	EPA 8260B	EPA 8260B	--	--	--	--	--	--	--	--	EPA 8260B
VOCs	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8260B	--	--	--	EPA 8260B
TAME	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8260B	--	--	--	EPA 8260B
DIPE	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8260B	--	--	--	EPA 8260B
ETBE	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8260B	--	--	--	EPA 8260B
TBA	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8260B	--	--	--	EPA 8260B
Ethanol	EPA 8260B	--	--	--	--	--	EPA 8015B	--	--	--	EPA 8015B
Methanol	EPA 8015B	--	--	--	--	--	EPA 8015B	--	--	--	EPA 8015B
SVOCs	EPA 8270C	--	--	--	--	--	EPA 8270C	--	--	--	EPA 8270C
PAHs	EPA 8310	--	--	--	--	--	EPA 8310	--	--	--	EPA 8310
Hardness	--	--	--	--	--	--	SM 2340B	--	--	--	--
Antimony	--	--	--	--	--	--	EPA 6020	--	--	--	--
Arsenic	--	--	--	--	--	--	EPA 6020	--	--	--	--
Beryllium	--	--	--	--	--	--	EPA 6020	--	--	--	--
Cadmium	--	--	--	--	--	--	EPA 6020	--	--	--	--
Chromium	--	--	--	--	--	--	EPA 6020	--	--	--	--
Cr +6	--	--	--	--	--	--	EPA 7199	--	--	--	--
Copper	--	--	--	--	--	--	EPA 6020	--	--	--	--
Cyanide	--	--	--	--	--	--	SM4500CN-E	--	--	--	--
Lead	--	--	--	--	--	--	EPA 6020	--	--	--	--
Mercury	--	--	--	--	--	--	EPA 7470A	--	--	--	--
Nickel	--	--	--	--	--	--	EPA 6020	--	--	--	--
Selenium	--	--	--	--	--	--	EPA 6020	--	--	--	--
Silver	--	--	--	--	--	--	EPA 6020	--	--	--	--
Thallium	--	--	--	--	--	--	EPA 6020	--	--	--	--
Zinc	--	--	--	--	--	--	EPA 6020	--	--	--	--

Table 1 - Laboratory Analytical Procedures
City of Oakland Municipal Services Center Groundwater Remediation Project

	9/26/08	10/24/08 & 11/14/08	2/9/09	4/24/09 & 5/13/09	6/10/09	7/24/09 & 8/13/09	9/25/09
Flow rate	on-site totalizer	on-site totalizer	on-site totalizer	on-site totalizer	on-site totalizer	on-site totalizer	on-site totalizer
Turbidity	on-site	on-site	on-site	on-site	on-site	on-site	on-site
pH	on-site	on-site	on-site	on-site	on-site	on-site	on-site
Temperature	on-site	on-site	on-site	on-site	on-site	on-site	on-site
E. conductivity	on-site	on-site	on-site	on-site	on-site	on-site	on-site
Fish bioassay			EPA/821/R-02/012				
Benzene	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B
Toluene	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B
Ethylbenzene	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B
Total xylenes	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B
MTBE	EPA 8260B	EPA 8260B	EPA 8260B	EPA 8021B	EPA 8021B	EPA 8021B	EPA 8021B
TPHg & TPHd	EPA 8015B	EPA 8015B	EPA 8015B	EPA 8015B	EPA 8015B	EPA 8015B	EPA 8015B
EDB	EPA 8260B	EPA 8260B	EPA 8260B	--	--	--	--
VOCs	EPA 8260B	EPA 8260B	EPA 8260B	--	--	--	--
TAME	EPA 8260B	EPA 8260B	EPA 8260B	--	--	--	--
DIPE	EPA 8260B	EPA 8260B	EPA 8260B	--	--	--	--
ETBE	EPA 8260B	EPA 8260B	EPA 8260B	--	--	--	--
TBA	EPA 8260B	EPA 8260B	EPA 8260B	--	--	--	--
Ethanol	--	--	EPA 8015B	--	--	--	--
Methanol	--	--	EPA 8015B	--	--	--	--
SVOCs	--	--	EPA 8270C	--	--	--	--
PAHs	--	--	EPA 8310	--	EPA8310	--	EPA8310
Hardness	--	--		--	--	--	--
Antimony	--	--	EPA 6020	--	--	--	--
Arsenic	--	--	EPA 6020	--	--	--	--
Beryllium	--	--	EPA 6020	--	--	--	--
Cadmium	--	--	EPA 6020	--	--	--	--
Chromium	--	--	EPA 6020	--	--	--	--
Cr +6	--	--	EPA 7199	--	--	--	--
Copper	--	--	EPA 6020	--	--	--	--
Cyanide	--	--	SM4500CN-E	--	--	--	--
Lead	--	--	EPA 6020	--	--	--	--
Mercury	--	--	EPA 7470A	--	--	--	--
Nickel	--	--	EPA 6020	--	--	--	--
Selenium	--	--	EPA 6020	--	--	--	--
Silver	--	--	EPA 6020	--	--	--	--
Thallium	--	--	EPA 6020	--	--	--	--
Zinc	--	--	EPA 6020	--	--	--	--

Table 2 - Operational Data and Field-Measured Parameters
City of Oakland Municipal Services Center Groundwater Remediation Project

Date	Time	Effluent (E-1)				Influent (I-1)			Btw-1	Btw-2	Totalizer Reading (gallons)	Monthly Treated (gallons)	Monthly Ave. Rate (gpm)	Cumulative Floating Product Recovered (gallons)	Notes
		pH	Temp. (ºC)	E. cond. (mS/cm)	Turbidity (NTU)	pH	Temp. (ºC)	E. cond. (mS/cm)							
5/22/2006	7:00	--	--	--	--	--	--	--	--	--	1,389	--	--	--	Before turn on system
5/22/2006	11:25	8.30	20.4	8.81	0.20	7.12	21.4	10.20	sampled	--	2,050	--	--	--	treated water held in tank
5/22/2006	14:15	--	--	--	--	--	--	--	--	--	2,414	--	--	--	stopped, waiting for analy data
5/24/2006	13:00	--	--	--	--	--	--	--	--	--	2,414	--	--	--	system on, start discharge
5/30/2006	12:30	7.48	19.4	8.25	0.04	6.98	23.1	8.32	sampled	--	14,230	--	--	20	
5/31/2006	10:00	--	--	--	--	--	--	--	--	--	18,980	17,591	1.705	--	
6/2/2006	16:30	--	--	--	--	--	--	--	sampled	sampled	31,080	--	--	--	
6/9/2006	8:30	--	--	--	--	--	--	--	--	--	48,610	--	--	--	
6/16/2006	10:20	--	--	--	--	--	--	--	--	--	67,755	--	--	--	
6/19/2006	9:40	--	--	--	--	--	--	--	--	--	74,670	--	--	--	
6/22/2006	11:00	--	--	--	--	--	--	--	--	--	90,480	--	--	--	
6/26/2006	9:00	7.32	22.3	13.00	0.10	7.37	23.3	13.40	sampled	sampled	106,950	--	--	--	Monthly monitoring
6/30/2006	9:00	--	--	--	--	--	--	--	--	--	122,860	103,880	2.405	100	
7/5/2006	10:00	--	--	--	--	--	--	--	--	--	140,500	--	--	--	Two full drums of product
7/12/2006	9:30	--	--	--	--	--	--	--	sampled	sampled	163,230	--	--	--	
7/19/2006	9:30	--	--	--	--	--	--	--	--	--	182,740	--	--	--	
7/25/2006	9:30	7.35	23.6	12.50	0.04	7.40	24.2	13.10	sampled	--	197,030	--	--	--	Monthly monitoring
7/31/2006	19:30	--	--	--	--	--	--	--	--	--	212,010	89,150	1.997	155	
8/2/2006	19:30	--	--	--	--	--	--	--	--	--	216,790	--	--	165	Three full drums of product
8/9/2006	9:00	--	--	--	--	--	--	--	--	--	233,260	--	--	--	Morgan removed 3 drums product
8/11/2006	9:30	6.95	21.5	12.80	0.10	7.25	22.3	12.60	sampled	sampled	238,380	--	--	--	Monthly monitoring
8/14/2006	8:00	--	--	--	--	--	--	--	--	--	246,180	--	--	--	Lowered pumps in wells
8/17/2006	11:30	--	--	--	--	--	--	--	--	--	255,030	--	--	--	
8/28/2006	11:30	--	--	--	--	--	--	--	--	--	283,080	--	--	--	
9/1/2006	18:30	--	--	--	--	--	--	--	--	--	294,910	82,900	1.801	220	One full drum of product on site
9/5/2006	11:00	7.00	19.7	12.30	0.10	7.10	22.8	11.50	sampled	sampled	301,450	--	--	--	Monthly & Qtrly monitoring
9/9/2006	18:00	--	--	--	--	--	--	--	--	--	310,750	--	--	--	
9/17/2006	13:00	--	--	--	--	--	--	--	--	--	333,310	--	--	--	
9/22/2006	13:30	--	--	--	--	--	--	--	--	--	349,210	--	--	--	
9/27/2006	10:00	--	--	--	--	--	--	--	--	--	364,350	--	--	--	
9/29/2006	15:00	--	--	--	--	--	--	--	--	--	371,290	--	--	--	
10/2/2006	14:30	--	--	--	--	--	--	--	--	--	380,360	85,450	1.925	245	
10/4/2006	11:00	7.10	19.4	12.67	0.04	7.30	21.5	12.22	sampled	sampled	386,160	--	--	--	Monthly monitoring
10/9/2006	13:00	--	--	--	--	--	--	--	--	--	402,090	--	--	--	
10/16/2006	11:00	--	--	--	--	--	--	--	--	--	417,310	--	--	--	
10/23/2006	17:00	--	--	--	--	--	--	--	--	--	436,170	--	--	--	
10/27/2006	18:30	--	--	--	--	--	--	--	--	--	443,640	--	--	--	
10/30/2006	11:00	--	--	--	--	--	--	--	--	--	448,220	--	--	275	Two full drums of product
11/1/2006	10:30	--	--	--	--	--	--	--	--	--	453,340	72,980	1.689	--	
11/8/2006	11:00	7.35	18.6	10.03	0.10	7.03	21.7	10.79	sampled	sampled	461,210	--	--	--	Monthly & quarterly monitoring
11/14/2006	12:30	--	--	--	--	--	--	--	--	--	483,660	--	--	--	
11/20/2006	10:30	--	--	--	--	--	--	--	--	--	487,970	--	--	--	

Table 2 - Operational Data and Field-Measured Parameters
City of Oakland Municipal Services Center Groundwater Remediation Project

Date	Time	Effluent (E-1)				Influent (I-1)			Btw-1	Btw-2	Totalizer Reading (gallons)	Monthly Treated (gallons)	Monthly Ave. Rate (gpm)	Cumulative Floating Product Recovered (gallons)	Notes
		pH	Temp. (ºC)	E. cond. (mS/cm)	Turbidity (NTU)	pH	Temp. (ºC)	E. cond. (mS/cm)							
12/1/2006	11:30	--	--	--	--	--	--	--	--	--	499,540	46,200	1.069	295	
12/6/2006	11:00	7.10	12.3	15.40	0.08	8.45	14.8	17.70	sampled	sampled	504,500	--	--	--	Monthly monitoring
12/15/2006	10:00	--	--	--	--	--	--	--	--	--	513,050	--	--	--	
12/22/2006	14:30	--	--	--	--	--	--	--	--	--	533,130	--	--	--	
12/27/2006	10:00	--	--	--	--	--	--	--	--	--	540,340	--	--	315	2 full drums plus 40 gal product
1/2/2007	9:00	--	--	--	--	--	--	--	--	--	548,820	49,280	1.073	--	
1/10/2007	11:00	--	--	--	--	--	--	--	--	--	559,230	--	--	--	
1/19/2007	10:00	7.15	9.4	19.90	0.04	8.00	13.5	19.50	sampled	sampled	569,740	--	--	--	Monthly monitoring
1/30/2007	10:00	--	--	--	--	--	--	--	--	--	592,780	--	--	330	3 full drums product on site
2/2/2007	10:00	--	--	--	--	--	--	--	--	--	607,920	59,100	1.322	--	
2/8/2007	16:30	--	--	--	--	--	--	--	--	--	615,000	--	--	--	
2/22/2007	10:00	7.12	13.8	15.50	0.04	7.67	15.2	19.13	sampled	sampled	672,610	--	--	--	Monthly monitoring
2/28/2007	10:30	--	--	--	--	--	--	--	--	--	693,430	85,510	2.282	343	
3/9/2007	10:00	--	--	--	--	--	--	--	--	--	729,160	--	--	--	
3/14/2007	11:30	7.25	17.6	13.34	0.04	7.28	18.2	13.05	sampled	sampled	748,440	--	--	--	Monthly & quarterly monitoring
3/21/2007	12:00	--	--	--	--	--	--	--	--	--	776,540	--	--	--	
3/30/2007	10:00	--	--	--	--	--	--	--	--	--	809,690	116,260	2.693	355	3 full drums+25 gal prod on site
4/2/2007	10:00	--	--	--	--	--	--	--	--	--	819,750	--	--	--	
4/13/2007	10:00	--	--	--	--	--	--	--	--	--	849,540	--	--	--	
4/24/2007	10:00	7.45	15.7	7.10	0.08	7.30	18.6	6.90	sampled	sampled	866,110	--	--	--	
4/30/2007	19:00	--	--	--	--	--	--	--	--	--	875,415	65,725	1.455	360	3 full drums+30 gal prod on site
5/4/2007	10:30	--	--	--	--	--	--	--	--	--	880,280	--	--	--	
5/14/2007	12:00	--	--	--	--	--	--	--	--	--	--	--	--	--	DPE online with D2,D4,D5 wells
5/14/2007	18:00	--	--	--	--	--	--	--	--	--	--	--	--	--	DPE in & out vapor sampling
5/17/2007	11:30	7.22	18.0	14.15	0.04	7.55	19.8	14.54	sampled	sampled	907,175	--	--	--	Monthly monitoring
5/22/2007	11:15	--	--	--	--	--	--	--	--	--	952,055	--	--	--	DPE down for Phase II tie-in
5/31/2007	11:00	--	--	--	--	--	--	--	--	--	954,120	78,705	1.782	364	3 full drums+34 gal prod on site
6/11/2007	10:00	--	--	--	--	--	--	--	--	--	954,920	--	--	--	DPE restart with all wells
6/14/2007	10:00	--	--	--	--	--	--	--	--	--	973,900	--	--	--	
6/21/2007	10:00	7.38	19.2	15.13	0.04	7.45	20.1	15.24	sampled	sampled	991,590	--	--	--	Monthly monitoring
6/26/2007	18:40	--	--	--	--	--	--	--	--	--	1,028,960	--	--	--	DPE in & out vapor sampling
6/29/2007	18:30	--	--	--	--	--	--	--	--	--	1,047,840	93,720	2.220	368	3 full drums+38 gal prod on site
7/3/2007	11:30	--	--	--	--	--	--	--	--	--	1,051,974	--	--	--	DPE down, knockout pump fail
7/11/2007	15:00	--	--	--	--	--	--	--	--	--	1,053,090	--	--	--	Changed knockout tank pump
7/16/2007	8:15	--	--	--	--	--	--	--	--	--	1,095,560	--	--	--	DPE down, insulation worn out
7/19/2007	10:00	--	--	--	--	--	--	--	--	--	1,096,110	--	--	--	DPE unit to factory for repair
7/23/2007	11:00	--	--	--	--	--	--	--	--	--	1,096,610	--	--	--	Removed 6 gal oil fr o/w septr
7/27/2007	9:30	7.16	21.0	11.79	--	7.07	19.4	19.57	sampled	sampled	1,096,780	--	--	--	Monthly monitoring
7/31/2007	13:00	--	--	--	--	--	--	--	--	--	1,097,310	49,470	1.081	374	Re-installed DPE, started at 11a
8/7/2007	19:30	--	--	--	--	--	--	--	--	--	1,118,930	--	--	--	Removed 5 gal oily sludge fr DPE
8/17/2007	10:00	--	--	--	--	--	--	--	--	--	1,147,080	--	--	--	Morgan removed 4 drums product
8/28/2007	11:36	7.08	25.9	18.64	4.60	7.13	25.6	18.55	sampled	sampled	1,198,870	--	--	--	Monthly monitoring

Table 2 - Operational Data and Field-Measured Parameters
City of Oakland Municipal Services Center Groundwater Remediation Project

Date	Time	Effluent (E-1)				Influent (I-1)			Btw-1	Btw-2	Totalizer Reading (gallons)	Monthly Treated (gallons)	Monthly Ave. Rate (gpm)	Cumulative Floating Product Recovered (gallons)	Notes
		pH	Temp. (ºC)	E. cond. (mS/cm)	Turbidity (NTU)	pH	Temp. (ºC)	E. cond. (mS/cm)							
8/31/2007	10:30	--	--	--	--	--	--	--	--	--	1,216,800	119,490	2.686	379	
9/7/2007	9:30	--	--	--	--	--	--	--	--	--	1,263,270	--	--	--	
9/14/2007	11:30	--	--	--	--	--	--	--	--	--	1,309,960	--	--	--	Display meter blinks
9/19/2007	10:50	6.96	19.8	18.64	6.92	7.08	20.8	18.65	sampled	sampled	1,340,410	--	--	--	Monthly monitoring
9/26/2007	10:20	--	--	--	--	--	--	--	--	--	1,352,170	--	--	--	Shutdown DPE, T sensor pblm
9/28/2007	12:00	--	--	--	--	--	--	--	--	--	1,352,690	135,890	3.363	379	only pneumatic pumps on
10/2/2007	12:00	--	--	--	--	--	--	--	--	--	1,353,380	--	--	--	
10/8/2007	17:30	--	--	--	--	--	--	--	--	--	1,354,020	--	--	--	DPE on at 4:30 pm
10/17/2007	11:00	--	--	--	--	--	--	--	--	--	1,394,995	--	--	--	
10/24/2007	14:13	7.08	25.5	14.32	0.66	7.19	29.6	14.23	sampled	sampled	1,406,110	--	--	--	Monthly monitoring
10/31/2007	10:30	--	--	--	--	--	--	--	--	--	1,418,260	65,570	1.382	379	
11/7/2007	11:00	--	--	--	--	--	--	--	--	--	1,427,640	--	--	--	
11/16/2007	10:30	--	--	--	--	--	--	--	--	--	1,500,460	--	--	--	
11/21/2007	10:21	7.10	20.5	OR	0.30	7.04	20.1	OR	sampled	sampled	1,537,150	--	--	--	Monthly monitoring
11/30/2007	9:30	--	--	--	--	--	--	--	--	--	1,584,070	165,810	3.844	379	
12/7/2007	10:30	--	--	--	--	--	--	--	--	--	1,621,980	--	--	--	
12/13/2007	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Shutdown for carbon change
12/14/2007	13:00	--	--	--	--	--	--	--	--	--	--	--	--	--	DPE on at 1:00 pm
12/17/2007	11:15	--	--	--	--	--	--	--	--	--	1,643,760	--	--	--	
12/20/2007	18:30	7.20	15.1	23.50	0.10	7.20	13.7	25.20	sampled	sampled	1,658,560	--	--	--	Monthly monitoring
12/31/2007	9:00	--	--	--	--	--	--	--	--	--	1,685,340	101,270	2.270	379	
1/4/2008	14:30	--	--	--	--	--	--	--	--	--	1,701,860	--	--	--	
1/15/2008	13:00	--	--	--	--	--	--	--	--	--	1,725,190	--	--	--	
1/21/2008	9:30	--	--	--	--	--	--	--	sampled	sampled	1,742,110	--	--	--	Monthly monitoring
1/30/2008	11:30	--	--	--	--	--	--	--	--	--	1,791,840	106,500	2.457	379	
2/1/2008	15:30	--	--	--	--	--	--	--	--	--	1,799,660	--	--	--	
2/11/2008	11:00	--	--	--	--	--	--	--	--	--	1,826,520	--	--	--	
2/20/2008	11:18	6.95	17.4	12.85	1.15	6.99	20.1	12.71	sampled	sampled	1,844,380	--	--	--	Monthly/Annual Monitoring
2/29/2008	10:30	--	--	--	--	--	--	--	--	--	1,862,840	71,000	1.646	379	
3/3/2008	11:30	--	--	--	--	--	--	--	--	--	1,868,500	--	--	--	
3/14/2008	11:00	--	--	--	--	--	--	--	--	--	1,906,770	--	--	--	
3/18/2008	10:25	7.02	18.4	14.01	2.32	6.99	19.1	12.34	sampled	sampled	1,928,330	--	--	--	Monthly monitoring
3/20/2008	11:00	--	--	--	--	--	--	--	--	--	1,939,430	--	--	--	
3/31/2008	9:00	--	--	--	--	--	--	--	--	--	1,990,150	127,310	2.858	379	
4/7/2008	9:00	--	--	--	--	--	--	--	--	--	2,019,060	--	--	--	
4/14/2008	10:00	--	--	--	--	--	--	--	--	--	2,044,990	--	--	--	
4/18/2008	11:00	--	--	--	--	--	--	--	--	--	2,058,850	--	--	--	
4/23/2008	10:35	7.00	18.6	19.62	1.58	7.03	20.0	19.38	sampled	sampled	2,075,700	--	--	--	Monthly monitoring
4/30/2008	10:00	--	--	--	--	--	--	--	--	--	2,082,390	92,240	2.132	379	
5/15/2008	11:00	--	--	--	--	--	--	--	--	--	2,082,540	--	--	--	
5/20/2008	10:45	7.09	20.4	18.87	6.42	7.10	21.2	18.70	sampled	sampled	2,117,920	--	--	--	Monthly monitoring
5/29/2008	10:30	--	--	--	--	--	--	--	--	--	2,135,490	53,100	1.271	379	

Table 2 - Operational Data and Field-Measured Parameters
City of Oakland Municipal Services Center Groundwater Remediation Project

Date	Time	Effluent (E-1)				Influent (I-1)			Btw-1	Btw-2	Totalizer Reading (gallons)	Monthly Treated (gallons)	Monthly Ave. Rate (gpm)	Cumulative Floating Product Recovered (gallons)	Notes
		pH	Temp. (ºC)	E. cond. (mS/cm)	Turbidity (NTU)	pH	Temp. (ºC)	E. cond. (mS/cm)							
6/2/2008	10:30	--	--	--	--	--	--	--	--	--	2,153,070	--	--	--	
6/9/2008	10:30	--	--	--	--	--	--	--	--	--	2,167,260	--	--	--	
6/16/2008	10:45	7.08	17.5	19.69	1.37	7.15	19.1	19.33	sampled	sampled	2,190,790	--	--	--	Monthly monitoring
6/30/2008	10:30	--	--	--	--	--	--	--	--	--	2,197,580	62,090	1.347	379	
7/8/2008	10:00										2,211,120				
7/16/2008	11:00										2,222,440				
7/22/2008	15:30	7.11	22.3	17.61	0.50	7.16	27.7	19.92	sampled	sampled	2,235,190				monthly monitoring
7/31/2008	19:00										2,251,160	53,580	1.187	379	
8/11/2008	10:00										2,266,510				
8/21/2008	12:45	7.20	23.9	14.63	1.00	7.24	25.4	15.26	sampled	sampled	2,282,900				monthly monitoring
8/29/2008	11:00										2,286,920	35,760	0.866	379	
9/11/2008	11:00										2,288,400				
9/26/2008	12:20	7.07	23.5	11.49	3.00	7.12	27.3	11.85	sampled	sampled	2,308,430				monthly monitoring
9/30/2008	19:30										2,325,280	38,360	0.823	379	
10/6/2008	11:00										2,325,310				
10/13/2008	17:45										2,339,300				
10/24/2008	13:00	7.05	22.1	11.75	4.00	7.10	25.8	12.22		sampled	2,365,580				monthly monitoring
10/31/2008	18:00										2,375,580	50,300	1.129	379	
11/10/2008	16:30										2,379,380				
11/14/2008	15:00	7.10	20.4	11.55	4.00	7.15	22.6	12.10	sampled	sampled	2,387,290				shutdown aft sampling for overhaul
11/28/2008	10:00										2,387,290	11,710	0.294	379	
12/31/2008	10:00										2,387,290	0	0.000	379	no operation in Dec 08
1/2/2009	15:00										2,387,290				changed 2nd & 3rd carbon vessels
1/20/2009	12:00										2,387,290	0	0.000	379	no operation in Jan 09, repair
2/2/2009	11:30										2,391,110				
2/9/2009	15:30	7.05	13.0	14.62	1.80	7.10	18.9	14.01	sampled	sampled	2,449,360				annual monitoring
2/19/2009	6:15										2,465,280	77,990	1.934	379	shutdown due to fire
3/23/2009	10:00										2,465,280	0	0.000	379	no operation in March, except testing eq
4/6/2009	14:00										2,490,430				restarted on 4/1
4/20/2009	11:30										2,491,360				
4/24/2009	14:00	7.02	20.6	12.08	2.00	7.06	21.9	12.51		sampled	2,506,510				monthly monitoring
5/1/2009	19:00										2,520,290	55,010	1.232	379	
5/6/2009	19:30										2,532,070				
5/13/2009	12:30	7.30	23.8	14.05	2.50	7.70	25.4	13.86		sampled	2,564,550				monthly monitoring
5/19/2009	18:20										2,581,890				
5/29/2009	19:00										2,600,493	80,203	1.989	379	start extraction fr plume C on 5/26
6/8/2009	19:00										2,603,180				
6/10/2009	15:30	7.25	22.1	10.30	3.00	7.70	24.1	8.76		sampled	2,613,255				quarterly monitoring
6/22/2009	10:30										2,615,200				
6/30/2009	19:00										2,635,730	35,237	0.765	379	
7/6/2009	19:30										2,644,590				
7/21/2009	14:45										2,654,240				

Table 2 - Operational Data and Field-Measured Parameters
City of Oakland Municipal Services Center Groundwater Remediation Project

Date	Time	Effluent (E-1)				Influent (I-1)			Btw-1	Btw-2	Totalizer Reading (gallons)	Monthly Treated (gallons)	Monthly Ave. Rate (gpm)	Cumulative Floating Product Recovered (gallons)	Notes
		pH	Temp. (ºC)	E. cond. (mS/cm)	Turbidity (NTU)	pH	Temp. (ºC)	E. cond. (mS/cm)							
7/24/2009	14:30	7.20	21.7	11.23	2.00	7.70	24.0	9.23		sampled	2,661,790				monthly monitoring
7/31/2009	10:30										2,667,070	31,340	0.710	379	
8/7/2009	11:30										2,682,960				
8/13/2009	15:30	7.25	24.6	9.05	2.50	7.50	26.7	9.12	sampled	sampled	2,708,000				monthly monitoring
8/21/2009	10:00										2,726,490				
8/28/2009	10:00										2,743,530	76,460	1.898	379	
9/14/2009	19:00										2,744,430				removed 5-gal oily sludge fr knockout tank
9/25/2009	13:45	7.10	23.8	12.58	3.00	7.70	25.8	12.69		sampled	2,755,770				quarterly monitoring
9/30/2009	19:00										2,772,720	29,190	0.607	379	
10/2/2009	10:30										2,775,660				

Abbreviations:
"--" indicates no value obtained for given field
^{o}C = degree Celsius
DPE = dual-phase extraction
gpm = gallon(s) per minute
mS/cm = milliSiemen(s) per centimeter
NTU = nephelometric turbidity unit
OR = sample was out of range (>19.99 mS/cm)

Table 3 - Petroleum Hydrocarbon Analytical Data
City of Oakland Municipal Services Center Groundwater Remediation Project

Date	Effluent (E-1)								Influent (I-1)							
	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
	(µg/L)	(µg/L)	(ug/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Eff. Limit	50	50	50	5	5	5	5	5								
5/22/06	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**52,000**	**25,000 (h,l)**	--	**6,100**	**5,200**	**1,200**	**6,100**	ND (100)
5/30/06	ND (50)	**130 (y, a1)**	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	**57,000**	**9,200 (l,y)**	--	**4,900**	**5,300**	**1,100**	**7,100**	ND (36)
6/2/06	--	ND (50)	--	--	--	--	--	--	--	--	--	--	--	--	--	--
6/26/06	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**50,000**	**10,000 (h,l,y)**	--	**4,800**	**6,900**	**1,100**	**7,200**	ND (50)
7/12/06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7/25/06	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**60,000**	**4,000 (l,y)**	--	**5,800**	**8,800**	**1,100**	**9,000**	ND (80)
8/11/06	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	**4.6 (a1a)**	**59,000**	**4,100 (l,y)**	--	**4,900**	**7,300**	**930**	**7,000**	ND (100)
9/5/06	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**44,000**	**4,800 (l,y)**	--	**4,700**	**4,800**	**1,200**	**5,400**	ND (50)
10/4/06	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**42,000**	**9,100 (h,l,y)**	--	**5,100**	**7,300**	**1,400**	**6,700**	ND (100)
11/8/06	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**32,000**	**7,800 (h,l,y)**	--	**3,100**	**3,800**	**590**	**2,880**	ND (50)
12/6/06	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**55,000**	**7,600 (h,l,y)**	--	**5,800**	**8,600**	**820**	**6,600**	ND (50)
1/19/07	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**49,000**	**3,600 (l,y)**	--	**3,900**	**5,400**	**390**	**5,900**	ND (50)
2/22/07	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**38,000**	**7,900 (l,y)**	--	**4,100**	**4,500**	**250**	**5,200**	ND (40)
3/14/07	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	**32,000**	**7,800 (h,l,y)**	--	**2,700**	**2,900**	**310**	**4,100**	ND (13)
4/24/07	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**11,000**	**6,200 (h,l)**	**1,500 (l)**	**930**	**110**	**26**	**760**	ND (10)
5/17/07	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**84,000**	**180,000 (h,l,y)**	**27,000 (l)**	**1,100**	**3,100**	**1,200**	**8,800**	ND (100)
6/21/07	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**8,900**	**7,700 (h,l,y)**	**2,900 (l)**	**460**	**520**	**34**	**1,060**	ND (2.0)
7/27/07	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**16,000**	**9,100 (h,l,y)**	--	**250**	**770**	ND (2.5)	**2,390**	ND (10)
8/28/07	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	**5,100**	**8,100 (h,l)**	--	**130**	**110**	**11**	**620**	ND (2.0)
9/19/07	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	**3,000**	**12,000 (h,l)**	**6,100 (h,l)**	**78**	**68**	**13**	**230**	ND (0.5)
10/24/07	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**1,900**	**12,000 (y)**	**2,500**	**22**	**10**	**4.3**	**144**	ND (2.0)
11/21/07	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	**3,600**	**9,000**	**2,700**	**120**	**150**	**2.8**	**440**	--
12/20/07	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**5,100**	**25,000**	**2,200 (y)**	**160**	**330**	**43**	**750**	ND (2.0)
1/21/08	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**14,000**	**14,000 (y)**	**1,100**	**100**	**360**	**22**	**2,250**	ND (10)
2/20/08	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND(0.5)	ND (50)	**6,100**	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
3/18/08	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**2,300**	**9,000**	**2,300**	**43**	**120**	**25**	**430**	ND (2.0)
4/23/08	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	**2,300**	**14,000**	**7,000**	**19**	**66**	**9.7**	**470**	ND (0.5)
5/20/08	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**2,900**	**20,000**	**2,500**	**23**	**70**	**11**	**390**	ND (2.0)
6/16/08	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**1,400**	**6,700**	**1,100**	**9**	**23**	**9.3**	**159**	ND (2.0)
7/22/08	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**2,300**	**9,400 (y)**	**6,300**	**16**	**37**	**5.6**	**280**	ND (2.0)
8/21/08	ND (50)	ND (50)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	**1,300**	**12,000**	--	**10**	**15**	**2.2**	**137**	ND (2.0)
9/26/08	ND (50)	ND (50)	ND (300)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	**1,400**	**14,000**	**5,900**	**18**	**21**	**4.4**	**168**	ND (0.5)
10/24/08	ND (50)	ND (50)	ND (300)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	**1,000**	**10,000**	**6,800**	**14**	**14**	**4.6**	**134**	ND (0.5)
11/14/08	ND (50)	ND (50)	ND (300)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	**1,000**	**8,100**	**3,400**	**15**	**15**	**3**	**155**	ND (0.5)
2/9/09	ND (50)	ND (50)	ND (300)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	**1,400**	**11,000**	**2,000**	**18**	**26**	**7.6**	**240**	ND (0.5)
4/24/09	ND (50)	ND (50)	ND (300)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**1,200**	**13,000**	**1,800**	**22**	**24**	**7.7**	**167**	ND (2.0)
5/13/09	ND (50)	ND (50)	ND (300)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**1,100**	**17,000**	**1,400**	**7.2**	**14**	**3.9**	**135**	ND (2.0)
6/10/09	ND (50)	ND (50)	ND (300)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**980**	**11,000**	**2,200**	**19**	**3.1**	**1.5**	**35**	ND (2.0)
7/24/09	ND (50)	ND (50)	ND (300)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**560**	**13,000**	**2,200**	**2.7**	**2.5**	**1.1**	**14**	ND (2.0)
8/13/09	ND (50)	ND (50)	ND (300)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**530**	**12,000**	**2,400**	**7.7**	**2**	**2**	**26**	ND (2.0)
9/25/09	ND (50)	ND (50)	ND (300)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	**440**	**4,400**	**480**	**9.7**	**2.1**	**2.1**	**19**	ND (2.0)

Table 3 - Petroleum Hydrocarbon Analytical Data
City of Oakland Municipal Services Center Groundwater Remediation Project

Date	After 1st Carbon Unit (Btw-1)								After 2nd Carbon Unit (Btw-2)							
	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	TPHg	TPHd	TPHmo	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
	(µg/L)	(µg/L)	(ug/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(ug/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)
Eff. Limit	50	50		5	5	5	5	5	50	50		5	5	5	5	5
5/22/06	**57 (y)**	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	--	--		--	--	--	--	--
5/30/06	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--		--	--	--	--	--
6/2/06	ND (50)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--	ND (50)		--	--	--	--	--
6/26/06	ND (50)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)
7/12/06	ND (50)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	**3.9 (a2)**
7/25/06	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	**2.7**	--	--		--	--	--	--	--
8/11/06	ND (50)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	**5.1 (a2a)**	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	**5.4 (a2a)**
9/5/06	ND (50)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	--	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)
10/4/06	ND (50)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)
11/8/06	ND (50)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)
12/6/06	ND (50)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)
1/19/07	ND (50)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)
2/22/07	ND (50)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)
3/14/07	ND (50)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	**3.9**	--	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
4/24/07	ND (50)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)
5/17/07	ND (50)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)
6/21/07	ND (50)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)
7/27/07	ND (50)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)
8/28/07	ND (50)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	**5.6 (a)**	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)
9/19/07	ND (50)	ND (50)*		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	**6.7**	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
10/24/07	ND (50)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	**7.6**	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)
11/21/07	ND (50)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--
12/20/07	ND (50)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)
1/21/08	**60 (y)**	**84 (y)**		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)
2/20/08	ND (50)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	--	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
3/18/08	ND (50)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)
4/23/08	ND (50)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
5/20/08	ND (50)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND(2.0)	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)
6/16/08	ND (50)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND(2.0)	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)
7/22/08	92 (y,z)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND(2.0)	78 (y,z)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)
8/21/08	55 (y)	ND (50)		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND(2.0)	ND (50)	--		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
9/26/08	--	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	76 (y,z)	ND (50)	ND (300)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
10/24/08	--	--	--	--	--	--	--	--	ND (50)	ND (50)	ND (300)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
11/14/08	--	ND (50)	ND (300)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	74 (y,z)	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
2/9/09	--	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (50)	ND (50)	ND (300)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
4/24/09	--	--	--	--	--	--	--	--	ND (50)	ND (50)	ND (300)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)
5/13/09	--	--	--	--	--	--	--	--	ND (50)	ND (50)	ND (300)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)
6/10/09	--	--	--	--	--	--	--	--	ND (50)	ND (50)	ND (300)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)
7/24/09	--	--	--	--	--	--	--	--	ND (50)	ND (50)	ND (300)	ND (0.5)	ND (0.5)	ND (0.5)	0.62	ND (2.0)
8/13/09	ND (50)	ND (50)	ND (300)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	ND (50)	ND (50)	ND (300)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)
9/25/09	--	--	--	--	--	--	--	--	ND (50)	ND (50)	ND (300)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)

Table 3 - Petroleum Hydrocarbon Analytical Data
City of Oakland Municipal Services Center Groundwater Remediation Project

Notes:
(a1) - false positive detection, confirmed ND on 6/2/06 with samples at E-1, Btw-1, and Btw-2
(a) - Presence confirmed, but RPD between columns exceeds 40 percent
(a2) - false positive detection, confirmed ND after the first carbon unit
(a2a) - false positive detection, confirmed ND with 9/5/06 sample
(h) - heavier hydrocarbons contributed to the quantitation
(l) - lighter hydrocarbons contributed to the quantitation
(y) - sample exhibits chromatographic pattern that does not resemble standard
(z) - sample exhibits unknown single peak or peaks
* - Sample analyitical result for TPHd was erroneously switched between Btw-1 and Btw-2 in the laboratory report, due to mislabeling in the field.

Abbreviations:
"--" indicates not analyzed for constituent indicated
MTBE = methyl tertiary butyl ether
µg/L = microgram(s) per liter
ND ( ) = non-detected lab values
TPHd = total petroleum hydrocarbons quantifed as diesel
TPHg = total petroleum hydrocarbon quantified as gasoline
TPHmo = total petroleum hydrocarbon quantified as motor oil

Table 4 - Inorganic Constituents Analytical Data and Fish Bioassay Results
City of Oakland Municipal Services Center Groundwater Remediation Project

Constituent	Unit	Eff Limit	Effluent (E-1)								
		(<10 gpm)	5/22/06	5/30/06	6/26/06	9/5/06	11/8/06	3/14/07	8/28/07	2/20/2008	2/9/2009
Antimony	µg/L	6	2.30	1.80	0.12	0.13	0.35	0.15	--	0.47 J	1.70
	g/day	3	0.02137	0.01672	0.00157	0.00138	0.00243	0.00163	--	0.004216	
Arsenic	µg/L	10	36.00	24.00	7.00	3.00	4.30	1.60	--	4.40	10.00
	g/day	1	0.33444	0.22296	0.09170	0.03177	0.02980	0.01736	--	0.039468	
Beryllium	µg/L	1	ND (0.35)	ND (0.5)	ND (0.055)	ND (0.12)	ND (0.12)	ND (0.17)	--	ND (1.0)	ND (0.1)
	g/day	3	--	--	--	--	--	--	--	--	
Cadmium	µg/L	0.07	1.00	0.50	ND (0.14)	ND (0.17)	ND (0.17)	0.12	--	0.26 J	0.66 (J)
	g/day	1	0.00929	0.00465	--	--	--	0.00130	--	0.002332	
Total Cr	µg/L	11	3.10	ND (0.5)	0.62	0.86	0.78	0.61	--	0.25 J	0.28 (J)
	g/day	2	0.02880	--	0.00812	0.00911	0.00541	0.00662	--	0.002243	
Cr +6	µg/L	11	ND (1.0)	ND (10)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
	g/day	2	--	--	--	--	--	--	--	--	
Copper	µg/L	3.1	1.30	0.90	1.30	1.50	1.20	ND (0.28)	--	0.70 J	40
	g/day	3	0.01208	0.00836	0.01703	0.01589	0.00832	--	--	0.006279	
Lead	µg/L	2	ND (0.1)	ND (0.25)	0.26	0.30	0.30	0.75	--	1.70	5.50
	g/day	5	--	--	0.00341	0.00318	0.00208	0.00814	--	0.015249	
Mercury	µg/L	0.025	ND(0.008)	ND(0.2)	ND (0.2)	ND (0.06)	ND (0.02)	0.06	--	ND (0.2)	0.14 (J)
	g/day	0.01	--	--	--	--	--	0.00068	--	--	
Nickel	µg/L	8.2	11.00	67.00	15.00	9.60	2.90	1.50	--	8.10	7.20
	g/day	5	0.10219	0.62243	0.19650	0.10166	0.02010	0.01628	--	0.072657	
Selenium	µg/L	5	3.00	3.00	1.20	ND (0.35)	1.20	ND (0.27)	--	ND (1.0)	0.17 (J)
	g/day	2	0.02787	0.02787	0.01572	--	0.00832	--	--	--	
Silver	µg/L	1.9	ND (0.02)	ND (0.1)	ND (0.041)	ND (0.07)	ND (0.07)	ND (0.079)	--	ND (1.0)	0.23 (J)
	g/day	1	--	--	--	--	--	--	--	--	
Thallium	µg/L	0.1	0.06	ND (0.1)	0.21	ND (0.03)	ND (0.03)	ND (0.3)	--	ND (1.0)	ND (0.03)
	g/day	3	0.00056	--	0.00275	--	--	--	--	--	
Zinc	µg/L	35	2.00	ND (10)	44.00	11.00	1.90	10.00	--	6.40	4.3 (J)
	g/day	10	0.01858		0.57640	0.11649	0.01317	0.10850	--	0.057408	
Cyanide	µg/L	1	ND (0.8)	ND (3)	ND (10)	ND (10)	ND (10)	ND (10)	--	0.08	ND (10)
	g/day		--	--	--	--	--	--	--	0.000718	
Hardness	mg/L $CaCO_3$		560	960	1,100	1,100	1,500	1,400	--	1,800	
Fish Bioassay -											
% Survival of Rainbow Trout			--	--	100%	100%	100%	100%	--	100%	95%

Table 4 - Inorganic Constituents Analytical Data and Fish Bioassay Results
City of Oakland Municipal Services Center Groundwater Remediation Project

Constituent	Unit	Eff Limit	Influent (I-1)								
		(<10 gpm)	5/22/06	5/30/06	6/26/06	9/5/06	11/8/06	3/14/07	8/28/07	2/20/08	2/9/09
Antimony	µg/L		ND (60)	ND (1)	--	--	--	1.10	--	0.74 J	1.9
	g/day	3	--	--	--	--	--	0.01194	--	0.006279	
Arsenic	µg/L		7.20	8.50	--	--	--	5.40	--	6.1	13
	g/day	1	0.06689	0.07897	--	--	--	0.05859	--	0.054717	
Beryllium	µg/L		ND (2)	ND (1)	--	--	--	ND (0.17)	--	ND (1.0)	ND (0.1)
	g/day	3	--	--	--	--	--	--	--	--	
Cadmium	µg/L		34.00	10.00	--	--	--	0.33	--	1.6	41
	g/day	1	0.31586	0.09290	--	--	--	0.00358	--	0.014352	
Total Cr	µg/L		ND (10)	ND (1)	--	--	--	0.91	--	0.72 J	0.89 (J)
	g/day	2	--	--	--	--	--	0.00987	--	0.006279	
Cr +6	µg/L		ND (0.5)	ND (0.5)	--	--	--	ND (0.5)	--	ND (0.5)	ND (0.5)
	g/day	2	--	--	--	--	--	--	--	--	
Copper	µg/L		250.00	25.00	--	--	--	ND (0.28)	--	9.2	830
	g/day	3	2.32250	0.23225	--	--	--	--	--	0.082524	
Lead	µg/L		28.00	21.00	--	--	--	8.10	--	18	150
	g/day	5	0.26012	0.19509	--	--	--	0.08789	--	0.16146	
Mercury	µg/L		ND (0.2)	ND (0.2)	--	--	--	0.05	--	ND (0.2)	0.25
	g/day	0.01	--	--	--	--	--	0.00051	--	--	
Nickel	µg/L		68.00	19.00	--	--	--	2.80	--	6.4	130
	g/day	5	0.63172	0.17651	--	--	--	0.03038	--	0.057408	
Selenium	µg/L		9.40	ND (1)	--	--	--	0.31	--	0.34 J	0.60 (J)
	g/day	2	0.08733	--	--	--	--	0.00336	--	0.006279	
Silver	µg/L		ND (5)	ND (1)	--	--	--	ND (0.079)	--	ND (1.0)	1.6
	g/day	1	--	--	--	--	--	--	--	--	
Thallium	µg/L		25.00	ND (1)	--	--	--	ND (0.30)	--	ND (1.0)	ND (0.03)
	g/day	3	0.23225	--	--	--	--	--	--	--	
Zinc	µg/L		31.00	57.00	--	--	--	23.00	--	37	51
	g/day	10	0.28799	0.52953	--	--	--	0.24955	--	0.33189	
Cyanide	µg/L		10.00	10.00	--	--	20.00	30.00	--	0.8	ND (10)
	g/day		0.09290	0.09290	--	--	--	0.32550	--	0.007176	

Abbreviations:

"--" indicates no value obtained for given field

Cr +6 = chromium-VI

g/day = grams per day

gpm = gallon(s) per minute

J = Estimated value, below reporting limit, but above method detection limit

mg/L $CaCO_3$ = milligram(s) per liter of calcium carbonate

µg/L= microgram(s) per liter

ND ( ) = non-detected lab value

Table 5 - Organic Constituents Analytical Data
City of Oakland Municipal Services Center Groundwater Remediation Project

	Effluent (E-1)																					
	Max Daily Effluent Limit	5/30/06	9/5/06	3/14/07	8/28/07	9/19/07	10/24/07	11/21/07	12/20/07	1/21/08	2/20/08	3/18/08	4/23/08	5/20/08	6/16/08	8/21/08	9/26/08	10/24/08	11/14/08	2/9/09	6/10/09	9/25/09
VOCs	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(ug/L)	(ug/L)	(ug/L)
Benzene	5	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Carbon tetrachloride	5	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	--	--	ND (0.5)	--	--
Chloroform	5	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	--	--	ND (0.5)	--	--
1,1-Dichloroethane	5	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	--	--	ND (0.5)	--	--
1,2-Dichloroethane	5	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--
1,1-Dichloroethene	5	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	--	--	ND (0.5)	--	--
Ethylbenzene	5	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Methylene chloride	5	ND (0.5)	ND (0.5)	ND (10)	ND (10)	--	--	--	--	--	ND (10)	--	--	--	--	ND (10)	ND (10)	--	--	ND (10)	--	--
Tetrachloroethene	5	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	--	--	ND (0.5)	--	--
Toluene	5	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
c-1,2-Dichloroethene	5	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	--	--	ND (0.5)	--	--
t-1,2-Dichloroethene	5	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	--	--	ND (0.5)	--	--
1,1,1-Trichloroethane	5	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	--	--	ND (0.5)	--	--
1,1,2-Trichloroethane	5	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	--	--	ND (0.5)	--	--
Trichloroethene	5	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	--	--	ND (0.5)	--	--
Vinyl chloride	1	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	--	--	ND (0.5)	--	--
Total xylenes	5	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
MTBE	5	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	ND (2.0)	ND (0.5)	ND(2.0)	ND (0.5)	ND (2.0)	ND (2.0)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	ND (2.0)
Ethylene dibromide	5	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--
Trichlorotrifluoroethane	5	ND (5)	ND (5)	ND (5)	ND (1.0)	--	--	--	--	--	--	--	--	--	--	ND (2.0)	ND (2.0)	--	--	ND (5)	--	--
TPHg	50	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
TPHd	50	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)
TAME		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--
DIPE		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--
ETBE		ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--
TBA		ND (10)	ND (10)	ND (10)	**140**	**140**	**160**	**160**	ND (10)	ND (10)	ND (10)	--	--	--	--	**130**	**87**	**120**	**92**	ND (10)	--	--
Ethanol		ND (1,000)	ND (1,000)	ND (1,000)	ND (1,000)	--	--	--	--	--	ND (1,000)	--	--	--	--	ND(1,000)		--	--	ND(1,000)	--	--
Methanol		ND (1,000)	ND (1,000)	ND (1,000)	ND (1,000)	--	--	--	--	--	ND (1,000)	--	--	--	--	ND 1,000)		--	--	ND 1,000)	--	--
PAHs (EPA 8310 or 610)																						
All analytes		ND (1.0)	ND (0.1)	ND (0.1)	ND (0.1)	--	--	--	--	--	ND (0.1)	--	--	--	--	ND (0.09)		--	--	ND (0.1)	ND (0.1)	ND (0.1)
SVOCs (EPA 8270C or 625)																						
All analytes		ND (5.0)	ND (9.4)	ND (9.6)	ND (9.7)	--	ND (0.5)	ND (0.5)	ND (0.5)	--	ND (9.4)	--	--	--	--	ND (9.4)		--	--	ND (9.6)	--	--

Table 5 - Organic Constituents Analytical Data
City of Oakland Municipal Services Center Groundwater Remediation Project

	Influent (I-1)																					
	5/30/06	9/5/06	3/14/07	8/28/07	9/19/07	10/24/07	11/21/07	12/20/07	1/21/08	2/20/08	3/18/08	4/23/08	5/20/08	6/16/08	8/21/08	9/26/08	10/24/08	11/14/08	2/9/09	6/10/09	9/25/09
VOCs	(µg/L)		(µg/L)		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)		(µg/L)	(µg/L)	(µg/L)	(ug/L)	(ug/L)	(ug/L)
Benzene	**4,900**	**--**	**2,700**	--	**78**	**22**	**120**	**160**	**100**	ND (0.5)	**43**	**19**	**23**	**9**	--	**18**	**14**	**15**	**18**	**19**	**9.7**
Carbon tetrachloride	ND (36)	**--**	ND (13)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--	ND (0.5)	--	--
Chloroform	ND (36)	**--**	ND (13)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--	ND (0.5)	--	--
1,1-Dichloroethane	ND (36)	**--**	ND (13)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--	ND (0.5)	--	--
1,2-Dichloroethane	ND (36)	**--**	ND (13)	--	**2.2**	--	--	--	--	ND (0.5)	--	--	--	--	--	ND (0.5)	**0.6**	ND (0.5)	**0.7**	--	--
1,1-Dichloroethene	ND (36)	**--**	ND (13)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--	ND (0.5)	--	--
Ethylbenzene	**1,100**	**--**	**310**	--	**13**	**4.3**	**2.8**	**43**	**22**	ND (0.5)	**25**	**9.7**	**11**	**9.3**	--	**4.4**	**4.6**	**3**	**7.6**	**1.5**	**2.1**
Methylene chloride	ND (36)	**--**	ND (250)	--	--	--	--	--	--	ND (10)	--	--	--	--	--	ND (10)	--	--	ND (10)	--	--
Tetrachloroethene	ND (36)	**--**	ND (13)	--	--	--	--	--	--	ND (0.5)	**--**	**--**	**--**	**--**	--	ND (0.5)	--	--	ND (0.5)	--	--
Toluene	**5,300**	**--**	**2,900**	--	**68**	**10**	**150**	**330**	**360**	ND (0.5)	**120**	**66**	**70**	**23**	--	**21**	**14**	**15**	**26**	**3.1**	**2.1**
c-1,2-Dichloroethene	ND (36)	**--**	ND (13)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--	ND (0.5)	--	--
t-1,2-Dichloroethene	ND (36)	**--**	ND (13)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--	ND (0.5)	--	--
1,1,1-Trichloroethane	ND (36)	**--**	ND (13)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--	ND (0.5)	--	--
1,1,2-Trichloroethane	ND (36)	**--**	ND (13)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--	ND (0.5)	--	--
Trichloroethene	ND (36)	**--**	ND (13)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--	ND (0.5)	--	--
Vinyl chloride	ND (36)	**--**	ND (13)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--	ND (0.5)	--	--
Total xylenes	**7,100**	**--**	**4,100**	--	**230**	**144**	**440**	**750**	**2,250**	ND (0.5)	**430**	**470**	**390**	**159**	--	**168**	**134**	**155**	**240**	**35**	**19**
MTBE	ND (36)	**--**	ND (13)	--	ND (0.5)	ND (2.0)	--	ND (2.0)	ND (10)	ND (0.5)	ND (2.0)	ND (0.5)	ND (2.0)	ND (2.0)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (2.0)	ND (2.0)
Ethylene dibromide	ND (36)	**--**	ND (13)	--	ND (0.5)	--	--	--	--	--	--	--	--	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--
Trichlorotrifluoroethane	ND (360)	**--**	ND (13)	--	--	--	--	--	--	--	--	--	--	--	--	ND (2.0)	--	--	ND (5)	--	--
TPHg	**57,000**	**--**	**32,000**	--	**3,000**	**1,900**	**3,600**	**5,100**	**14,000**	ND (50)	**2,300**	**2,300**	**2,900**	**1,400**	--	**1,400**	**1,000**	**1,000**	**1,400**	**980**	**440**
TPHd	**9,200**	**--**	**7,800**	--	**12,000 (h,l)**	**12,000 (y)**	**9,000**	**25,000**	**14,000**	**6,100**	**9,000**	**14,000**	**20,000**	**6,700**	--	**14,000**	**10,000**	**8,100**	**11,000**	**11,000**	**4,400**
TAME	ND (36)	**--**	ND (13)	--	ND (0.5)	--	--	--	--	ND (0.5)	--	--	--	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--
DIPE	ND (36)	**--**	ND (13)	--	ND (0.5)	--	--	--	--	ND (0.5)	--	--	--	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--
ETBE	ND (36)	**--**	ND (13)	--	ND (0.5)	--	--	--	--	ND (0.5)	--	--	--	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	--
TBA	ND (710)	**--**	ND (25)	--	**40**	--	--	--	--	**71**	--	--	--	--	--	**59**	**58**	**53**	**81**	--	--
Ethanol	ND(1,000)	**--**	ND(1,000)	--	--	--	--	--	--	ND (1,000)	--	--	--	--	--		--	--	ND(1,000)	--	--
Methanol	ND(1,000)	**--**	ND(1,000)	--	--	--	--	--	--	ND (1,000)	--	--	--	--	--		--	--	ND(1,000)	--	--
Isopropylbenzene	**40**	**--**	**16**	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	ND (0.5)			**0.7**	--	--
Propylbenzene	**120**	**--**	**36**	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	**0.7**			**1.1**	--	--
1,3,5-Trimethylbenzene	**410**	**--**	**270**	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	**36**			**58**	--	--
1,2,4-Trimethylbenzene	**1,500**	**--**	**960**	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	**60**			**86**	--	--
Naphthalene	**370**	**--**	**260**	--	--	--	--	--	--	ND (2.0)	--	--	--	--	--	**16**			**22**	--	--
PAHs (EPA 8310 or 610)																					
Benzo(a)anthracene	**1.7**	**--**	**0.14**	--	--	--	--	--	--	ND (0.1)	--	--	--	--	--				ND (0.09)	**0.1**	**0.22**
Benzo(a)pyrene	**1.6**	**--**	**0.12**	--	--	--	--	--	--	**0.15**	--	--	--	--	--				ND (0.09)	ND (0.09)	**0.2**
Benzo(g,h,i)perylene	ND (1.0)	**--**	**0.21**	--	--	--	--	--	--	**0.44**	--	--	--	--	--				ND (0.19)	ND (0.19)	**0.34**
Chrysene	**2.6**	**--**	**0.17**	--	--	--	--	--	--	**0.13**	--	--	--	--	--				ND (0.09)	**0.2**	**0.25**
Fluoranthene	**3.8**	**--**	**0.63**	--	--	--	--	--	--	ND (0.2)	--	--	--	--	--				ND (0.19)	ND (0.19)	**0.68**
Naphthalene	**130**	**--**	**230**	--	--	--	--	--	--	ND (0.98)	--	--	--	--	--				**13**	ND (0.94)	**1.3**
Pyrene	**3.3**	**--**	**0.56**	--	--	--	--	--	--	**0.28**	--	--	--	--	--				**0.11**	**0.45**	**0.83**
Acenaphthene	ND (1.0)	**--**	**130**	--	--	--	--	--	--	ND (0.98)	--	--	--	--	--				**33**	ND (0.94)	ND (0.95)
Acenaphthylene	ND (1.0)	**--**	**58**	--	--	--	--	--	--	ND (2.0)	--	--	--	--	--				ND (1.9)	ND (1.9)	ND (1.9)
Fluorene	ND (1.0)	**--**	**6.4**	--	--	--	--	--	--	ND (0.2)	--	--	--	--	--				**0.72**	ND (0.19)	**0.38**
Phenanthrene	ND (1.0)	**--**	**1.6**	--	--	--	--	--	--	ND (0.1)	--	--	--	--	--				ND (0.09)	ND (0.09)	ND (0.10)
Anthracene	ND (1.0)	**--**	**0.13**	--	--	--	--	--	--	ND (0.1)	--	--	--	--	--				ND (0.09)	ND (0.09)	ND (0.10)
SVOCs (EPA 8270C or 625)																					
Dimethylphthalate	**28**	--	ND (97)	--	--	--	--	--	--	ND (.94)	--	--	--	--	--				ND (48)	--	--
bis(2-Ethylhexyl)phthalate	**12**	--	ND (97)	--	--	--	--	--	--	ND (.94)	--	--	--	--	--				ND (48)	--	--
Naphthalene	**290**	--	**160**	--	--	--	--	--	--	ND (.94)	--	--	--	--	--				ND (48)	--	--
Phenol	**13**	--	**270**	--	--	--	--	--	--	ND (.94)	--	--	--	--	--				ND (48)	--	--
All other SVOCs	ND (5)	--	ND (97)	--	--	--	--	--	--	ND (.94)	--	--	--	--	--				ND (48)	--	--

Table 5 - Organic Constituents Analytical Data
City of Oakland Municipal Services Center Groundwater Remediation Project

	After First Carbon Unit (Btw-1)																					
	Max Daily Effluent Limit	5/30/06	9/5/06	3/14/07	8/28/07	9/19/07	10/24/07	11/21/07	12/20/07	1/21/08	2/20/08	3/18/08	4/23/08	5/20/08	6/16/08	8/21/08	9/26/08	10/24/08	11/14/08	2/9/09		
VOCs	(µg/L)	(µg/L)	(µg/L)			(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(ug/L)	(µg/L)	(ug/L)	(µg/L)	(ug/L)		
Benzene	5	ND (0.5)	ND (0.5)	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	ND (0.5)	--	ND (0.5)	ND (0.5)		
Carbon tetrachloride	5	ND (0.5)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	--	ND (0.5)		
Chloroform	5	ND (0.5)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	--	ND (0.5)		
1,1-Dichloroethane	5	ND (0.5)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	--	ND (0.5)		
1,2-Dichloroethane	5	ND (0.5)	--	--	--	ND (0.5)	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	ND (0.5)	ND (0.5)		
1,1-Dichloroethene	5	ND (0.5)	--	--	--		--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	--	ND (0.5)		
Ethylbenzene	5	ND (0.5)	ND (0.5)	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	ND (0.5)	--	ND (0.5)	ND (0.5)		
Methylene chloride	5	ND (0.5)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND (10)	--	--	ND (10)		
Tetrachloroethene	5	ND (0.5)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	--	ND (0.5)		
Toluene	5	ND (0.5)	ND (0.5)	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	ND (0.5)	--	ND (0.5)	ND (0.5)		
c-1,2-Dichloroethene	5	ND (0.5)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	--	ND (0.5)		
t-1,2-Dichloroethene	5	ND (0.5)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	--	ND (0.5)		
1,1,1-Trichloroethane	5	ND (0.5)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	--	ND (0.5)		
1,1,2-Trichloroethane	5	ND (0.5)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	--	ND (0.5)		
Trichloroethylene	5	ND (0.5)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	--	ND (0.5)		
Vinyl chloride	5	ND (0.5)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	--	ND (0.5)		
Total xylenes	5	ND (0.5)	ND (0.5)	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	--	ND (0.5)	--	ND (0.5)	ND (0.5)		
MTBE	13	ND (0.5)	ND (2)	--	--	**6.7**	**7.6**	--	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)	ND (0.5)	ND (2.0)	ND (2.0)	--	ND (0.5)	--	ND (0.5)	ND (0.5)		
Ethylene dibromide	5	ND (0.5)	--	--	--	ND (0.5)	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	ND (0.5)	ND (0.5)		
Trichlorotrifluoroethane	5	ND (5)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND (2.0)	--	--	ND (5)		
TPHg	50	ND (50)	ND (50)	--	--	ND (50)	ND (50)	ND (50)	ND (50)	**60 (y)**	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	--	--	--	--	--		
TPHd	50	ND (50)	ND (50)	--	--	ND (50)*	ND (50)	ND (50)	ND (50)	**84 (y)**	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	--	--	--	ND (50)	--		
TAME		ND (0.5)	--	--	--	ND (0.5)	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	ND (0.5)	ND (0.5)		
DIPE		ND (0.5)	--	--	--	ND (0.5)	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	ND (0.5)	ND (0.5)		
ETBE		ND (0.5)	--	--	--	ND (0.5)	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	ND (0.5)	ND (0.5)		
TBA		ND (10)	--	--	--	**86**	--	--	--	--	**--**	--	--	--	--	--	**70**	--	**53**	**67**		
Ethanol		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		--	--			
Methanol		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		--	--			
PAHs (EPA 8310 or 610)		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		--				
SVOCs (EPA 8270C or 625)		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		--				

Table 5 - Organic Constituents Analytical Data
City of Oakland Municipal Services Center Groundwater Remediation Project

After Second Carbon Unit (Btw-2)																					
	Max Daily Effluent Limit	5/30/06	9/5/06	3/14/07	8/28/07	9/19/07	10/24/07	11/21/07	12/20/07	1/21/08	2/20/08	3/18/08	4/23/08	5/20/08	6/16/08	8/21/08	9/26/08	10/24/08	11/14/08	2/9/2009	
VOCs	(µg/L)		(µg/L)	(µg/L)		(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(µg/L)	(ug/L)	
Benzene	5	--	ND (0.5)	ND (0.5)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	
Carbon tetrachloride	5	--	ND (0.5)	ND (0.5)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	--	--	ND (0.5)	
Chloroform	5	--	ND (0.5)	ND (0.5)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	--	--	ND (0.5)	
1,1-Dichloroethane	5	--	ND (0.5)	ND (0.5)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	--	--	ND (0.5)	
1,2-Dichloroethane	5	--	ND (0.5)	ND (0.5)	--	ND (0.5)	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	
1,1-Dichloroethene	5	--	ND (0.5)	ND (0.5)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	--	--	ND (0.5)	
Ethylbenzene	5	--	ND (0.5)	ND (0.5)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	
Methylene chloride	5	--	ND (0.5)	ND (10)	--	--	--	--	--	--	ND (10)	--	--	--	--	ND (10)	ND (10)	--	--	ND (10)	
Tetrachloroethene	5	--	ND (0.5)	ND (0.5)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	--	--	ND (0.5)	
Toluene	5	--	ND (0.5)	ND (0.5)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	
c-1,2-Dichloroethene	5	--	ND (0.5)	ND (0.5)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	--	--	ND (0.5)	
t-1,2-Dichloroethene	5	--	ND (0.5)	ND (0.5)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	--	--	ND (0.5)	
1,1,1-Trichloroethane	5	--	ND (0.5)	ND (0.5)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	--	--	ND (0.5)	
1,1,2-Trichloroethane	5	--	ND (0.5)	ND (0.5)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	--	--	ND (0.5)	
Trichloroethene	5	--	ND (0.5)	ND (0.5)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	--	--	ND (0.5)	
Vinyl chloride	5	--	ND (0.5)	ND (0.5)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	--	--	ND (0.5)	
Total xylenes	5	--	ND (0.5)	ND (0.5)	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	
MTBE	13	--	ND (0.5)	ND (0.5)	--	ND (0.5)	ND (2.0)	--	ND (2.0)	ND (2.0)	ND (0.5)	ND (2.0)	ND (0.5)	ND (2.0)	ND (2.0)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	
Ethylene dibromide	5	--	ND (0.5)	ND (0.5)	--	ND (0.5)	--	--	--	--	--	--	--	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	
Trichlorotrifluoroethane	5	--	ND (5)	ND (5)	--	--	--	--	--	--	--	--	--	--	--	ND (2.0)	ND (2.0)	--	--	ND (5)	
TPHg	50	--	--	--	--	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	--	ND (50)	ND (50)	ND (50)	ND (50)	ND (50)	76 (y,z)	ND (50)	74 (y,z)	ND (50)	
TPHd	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND (50)	ND (50)	ND (50)	--	ND (50)	
TAME		--	ND (0.5)	ND (0.5)	--	ND (0.5)	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	
DIPE		--	ND (0.5)	ND (0.5)	--	ND (0.5)	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	
ETBE		--	ND (0.5)	ND (0.5)	--	ND (0.5)	--	--	--	--	ND (0.5)	--	--	--	--	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	
TBA		--	ND (10)	**110**	--	**130**	--	--	--	--	**22**	--	--	--	--	**140**	**100**	**99**	**74**	ND (10)	
Ethanol		--	ND(1,000)	--	--	--	--	--	--	--	--	--	--	--	--			--	--		
Methanol		--	--	--	--	--	--	--	--	--	--	--	--	--	--			--	--		
PAHs (EPA 8310 or 610)		--	--	--	--	--	--	--	--	--	--	--	--	--	--						
SVOCs (EPA 8270C or 625)		--	--	--	--	--	--	--	--	--	--	--	--	--	--			--			

Notes:

(h) - heavier hydrocarbons contributed to the quantitation

(l) - lighter hydrocarbons contributed to the quantitation

(y) - sample exhibits chromatographic pattern which does not resemble standard

* - Sample analytical results for TPH-d were erroneously switched between Btw-1 and Btw-2 in the laboratory analytical reports due to mislabeling in the field.

Abbreviations:

"--" indicates not analyzed for constituent indicated

DIPE = diisopropyl ether

EPA = U.S. Environmental Protection Agency

ETBE = ethyl tertiary butyl ether

µg/L = microgram(s) per liter

MTBE = methyl tertiary butyl ether

ND ( ) = non-detected lab value

PAHs = polycyclic aromatic hydrocarbons

SVOCs = semivolatile organic compounds

TAME = tertiary amyl ether

TBA = tertiary butyl alcohol

TPHd = total petroleum hydrocarbons quantified as diesel

TPHg = total petroleum hydrocarbons quantified as gasoline

VOCs = volatile organic compounds

Table 6 - Dual-Phase Extraction Vapor Monitoring Data
City of Oakland Municipal Services Center Groundwater Remediation Project

Date	Time	DPE Run-time Meter Reading (cumulative hr)	Vapor Flow Rate (1) (acfm)	Thermo Oxidizer Temp. (ºF)	Vacuum Pump		A-2 Exhaust (Effluent)					A-2 Inlet (Influent)					Notes
					Vacuum (inch Hg)	Discharge Temp (ºF)	POC (2) (ppmv)	Benzene (ppmv)	Toluene (ppmv)	Ethylbenzene (ppmv)	Total Xylenes (ppmv)	POC (2) (ppmv)	Benzene (ppmv)	Toluene (ppmv)	Ethylbenzene (ppmv)	Total Xylenes (ppmv)	
5/14/07	12:00	12.5	275	1440	15	160	1.10	0.042	0.028	0.0059	0.021	2000	18.0	21	6.5	21.4	DPE startup
5/17/07	11:25	83.9	276	1448	15	160	--	--	--	--	--	--	--	--	--	--	NPDES sampling
5/22/07	11:15	203.7	284	1551	15	160	--	--	--	--	--	--	--	--	--	--	shutdown @11:30 PhII tie-in
5/31/07	11:00	203.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
6/11/07	10:00	204	235	1438	16.5	165	--	--	--	--	--	--	--	--	--	--	re-start with all wells
6/14/07	10:00	276.5	280	1455	15	170	--	--	--	--	--	--	--	--	--	--	
6/18/07	19:00	276.7	280	1460	11.5	160	--	--	--	--	--	--	--	--	--	--	
6/21/07	10:00	328.8	276	1450	15	165	--	--	--	--	--	--	--	--	--	--	NPDES sampling
6/26/07	18:40	446.7	288	1454	11.5	160	2.76	0.063	0.060	0.0023	0.018	2410	25.0	35	4.6	28.7	
6/29/07	18:30	518.5	294	1479	14	160	--	--	--	--	--	--	--	--	--	--	
7/3/07	11:30	536.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	knockout tank pump down
7/11/07	15:00	536.9	227	1449	17	160	--	--	--	--	--	--	--	--	--	--	changed knockout tank pump
7/16/07	8:15	630	304	1435	13	160	--	--	--	--	--	--	--	--	--	--	DPE down, insulation worn
7/19/07	10:00	630	--	--	--	--	--	--	--	--	--	--	--	--	--	--	DPE unit to factory for repair
7/23/07	11:00	630	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
7/27/07	9:30	630	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
7/31/07	13:00	633.3	289	1460	14	160	--	--	--	--	--	--	--	--	--	--	re-installed DPE, on at 11am
8/7/07	19:30	669.5	307	1506	13.5	160	--	--	--	--	--	--	--	--	--	--	removed 5 gal oily sludge
8/17/07	10:00	719.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	DPE down, cleaned vac unit
8/28/07	10:00	895.5	297	1518	14	160	1.00	0.046	0.011	0.0008	0.005	3820	27.0	24	3.1	25.4	NPDES & vapor monitoring
8/31/07	10:30	968	298	1465	13.5	160	--	--	--	--	--	--	--	--	--	--	
9/7/07	9:30	1135	302	1520	13.5	160	--	--	--	--	--	--	--	--	--	--	
9/14/07	11:30	1305	289	1467	13	160	--	--	--	--	--	--	--	--	--	--	
9/19/07	10:00	1423.5	Note (3)	1485	10	160	1.40	0.021	0.015	0.0012	0.010	2460	6.6	8.6	1.0	7.5	NPDES & vapor monitoring
9/26/07	10:20	1591.3	--	1446	15	160	--	--	--	--	--	--	--	--	--	--	DPE down, T sensor pblm
9/28/07	12:00	1591.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	only pneumatic pumps on
10/2/07	12:00	1591.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	fixed T sensor
10/8/07	17:30	1592.9	--	1490	15	160	--	--	--	--	--	--	--	--	--	--	fixed data recorder
10/17/07	11:00	1757.3	--	1486	15	160	--	--	--	--	--	--	--	--	--	--	
10/24/07	14:00	1928	--	1479	15	160	2.40	0.038	0.023	ND (0.00005)	0.011	3700	4.4	ND (0.0005)	ND (0.0005)	1.8	NPDES & vapor monitoring
10/31/07	10:30	2092.1	--	1460	15	160	--	--	--	--	--	--	--	--	--	--	
11/7/07	11:00	2261.5	--	1458	15	160	--	--	--	--	--	--	--	--	--	--	
11/16/07	10:30	2476.9	--	1482	15	160	--	--	--	--	--	--	--	--	--	--	
11/21/07	10:09	2596.4	--	1492	15	160	1.40	0.038	0.040	0.0032	0.020	2500	13.0	35	3.2	24.1	NPDES & vapor monitoring
11/30/07	9:30	2811.8	--	1459	15	160	--	--	--	--	--	--	--	--	--	--	
12/7/07	10:30	2980.8	--	1512	15	160	--	--	--	--	--	--	--	--	--	--	
12/13/07	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	System shut down for carbon change
12/14/07	13:00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	DPE on line 1:00 pm
12/17/07	11:15	3105.8	--	1466	15	160	--	--	--	--	--	--	--	--	--	--	
12/20/07	11:00	3184.9	--	1503	15	160	3.11	0.110	0.086	0.0087	0.063	6018	33.0	69	8.6	83.0	NPDES & vapor monitoring
12/31/07	9:00	3439.3	--	1450	15	160	--	--	--	--	--	--	--	--	--	--	
1/4/08	14:30	3540.8	--	1452	15	160	--	--	--	--	--	--	--	--	--	--	
1/15/08	13:00	3753.5	--	1452	15	160	--	--	--	--	--	--	--	--	--	--	down on 1/11, restarted
1/21/08	9:30	3894	--	1458	15	160	6.86	0.091	0.190	0.0230	0.282	317	11.0	52	8.5	126.0	NPDES & vapor monitoring
1/30/08	11:30	4112	--	1459	15	160	--	--	--	--	--	--	--	--	--	--	D9 & D11 open only
2/1/08	15:30	4164	--	1460	16	160	--	--	--	--	--	--	--	--	--	--	
2/11/08	11:00	4399.5	--	1460	15	160	--	--	--	--	--	--	--	--	--	--	D10 & D11 open only
2/20/08	11:30	4616	--	1455	15	160	0.73	0.022	0.011	ND (0.00005)	0.007	273	0.5	ND (0.0005)	ND (0.0005)	0.5	NPDES & vapor monitoring
2/29/08	10:30	4831	--	1460	15	160	--	--	--	--	--	--	--	--	--	--	

Table 6 - Dual-Phase Extraction Vapor Monitoring Data
City of Oakland Municipal Services Center Groundwater Remediation Project

Date	Time	DPE Run-time Meter Reading (cumulative hr)	Vapor Flow Rate (1) (acfm)	Thermo Oxidizer Temp. (ºF)	Vacuum Pump		A-2 Exhaust (Effluent)					A-2 Inlet (Influent)					Notes
					Vacuum (inch Hg)	Discharge Temp (ºF)	POC (2) (ppmv)	Benzene (ppmv)	Toluene (ppmv)	Ethylbenzene (ppmv)	Total Xylenes (ppmv)	POC (2) (ppmv)	Benzene (ppmv)	Toluene (ppmv)	Ethylbenzene (ppmv)	Total Xylenes (ppmv)	
3/3/08	11:30	4904	--	1462	15	160	--	--	--	--	--	--	--	--	--	--	
3/14/08	11:00	5166.5	--	1455	15	160	--	--	--	--	--	--	--	--	--	--	D2 & D4 open only
3/18/08	10:00	5261.5	--	1460	15	160	2.00	0.062	0.064	0.0059	0.093	450	5.8	12	1.7	31.9	NPDES & vapor monitoring
3/20/08	11:00	5310.5	--	1462	15	160	--	--	--	--	--	--	--	--	--	--	D2, D4 & D7 open
3/31/08	9:00	5572.5	--	1460	15	160	--	--	--	--	--	--	--	--	--	--	
4/7/08	9:00	5740.5	--	1455	15	160	--	--	--	--	--	--	--	--	--	--	
4/14/08	10:00	5909.5	--	1452	15	160	--	--	--	--	--	--	--	--	--	--	
4/18/08	11:00	6006.5	--	1445	15	160	--	--	--	--	--	--	--	--	--	--	
4/24/08	10:30	6126	--	1455	15	160	2.12	0.057	0.055	0.0040	0.109	1280	2.4	10	1.0	42.0	
4/30/08	10:00	6174	--	--	--	--	--	--	--	--	--	--	--	--	--	--	down for maintenance
5/15/08	11:00	6175	--	1460	15	200	--	--	--	--	--	--	--	--	--	--	
5/20/08	10:31	6294.5	--	1460	15.5	180	2.10	0.045	0.043	0.0031	0.091	1200	3.0	9.3	ND (0.0005)	40.0	
5/29/08	10:30	6350.5	--	1461	15	180	--	--	--	--	--	--	--	--	--	--	
6/2/08	10:30	6446.5	--	1452	15	180	--	--	--	--	--	--	--	--	--	--	
6/9/08	10:30	6552.2	--	1470	15	160	--	--	--	--	--	--	--	--	--	--	
6/16/08	10:45	6720.2	--	1463	15	180	2.30	0.026	0.030	0.0023	0.071	790	1.1	3.5	ND (0.0005)	16.4	
6/30/08	10:30	6768.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	down for repair
7/8/08	10:00	6791.3		1450	16	170											frequent overheating
7/16/08	11:00	6805.8		1471	16	160											
7/22/08	15:30	6828.8		1467	17	180	0.61	0.0083	0.011	ND (0.002)	0.031	490	0.65	1.3	0.61	9.1	
7/31/08	19:00	6879.4		1462	17	180											
8/11/08	10:00	6939.3		1471	16	170											
8/21/08	12:45	6972.8		1463	15	170	0.74	0.014	0.0073	ND (0.001)	0.023	430	0.95	1.6	ND (0.1)	9.1	
8/29/08	11:00	6977.4															down for repair
9/11/08	11:00	6978.5		1474	16.5	180											radiator clogged by viscous tar
9/26/08	12:20	7007.6		1460	17	160											
9/30/08	19:30	7035.1															down for repair
10/6/08	11:00	7035.2		1463	16	160											
10/13/08	17:45	7063.3		1475	17	160											
10/24/08	13:00	7112.9		1464	16	160	1.4	0.021	0.01	ND (0.005)	0.03	370	1.2	0.88	ND (0.25)	4.7	
10/31/08	18:00	7130.8															down, oil leak from radiator
11/10/08	16:30	7137.1		1460	17.5	170											
11/14/08	15:00	7147.2		1465	17	180											shutdown aft sampling for overhaul
11/28/08	10:00	7147.2															
12/31/08	10:00	7147.2															
1/2/09	15:00	7147.2															changed 2nd & 3rd gw carbon
1/20/09	12:00	7147.2															
2/2/09	11:30	7150.8		1467	20	170											
2/9/09	15:30	7289.9		1467	18.5	165	0.85	0.016	0.011	0.0008	0.017	540	1.6	1.8	ND (0.25)	9.0	
2/19/09	6:15	7318.65															down due to fire
3/25/09	14:45	7334.5		1466	17.5	170	0.68	0.013	0.010	ND(0.001)	0.015	250	1.1	0.9	0.13	4.5	testing after repair
4/6/09	14:00	7353.5		1462	18	180											
4/20/09	11:30	7354		1464	18	180											
4/24/09	14:00	7374.9		1468	18.5	170											
5/1/09	19:00	7392.3		1464	22	160											
5/6/09	19:30	7409.2		1466	21	170											
5/13/09	12:30	7483.2		1465	22	180	0.99	0.024	0.019	0.0018	0.040	370	1.1	1.3	0.25	6.1	vapor sampling
5/19/09	18:20	7518.7		1465	21.5	180											
5/29/09	19:00	7591.7		1459	21	170											start extraction fr plume C, 5/26
6/8/09	19:00	7599.5		1462	20	170											
6/10/09	15:30	7644.2		1464	20	175	2.50	0.035	0.018	ND (0.005)	0.025	790	3.9	0.8	ND (0.25)	6.2	vapor sampling

Table 6 - Dual-Phase Extraction Vapor Monitoring Data
City of Oakland Municipal Services Center Groundwater Remediation Project

Date	Time	DPE Run-time Meter Reading (cumulative hr)	Vapor Flow Rate (1) (acfm)	Thermo Oxidizer Temp. (ºF)	Vacuum Pump		A-2 Exhaust (Effluent)					A-2 Inlet (Influent)					Notes
					Vacuum (inch Hg)	Discharge Temp (ºF)	POC (2) (ppmv)	Benzene (ppmv)	Toluene (ppmv)	Ethylbenzene (ppmv)	Total Xylenes (ppmv)	POC (2) (ppmv)	Benzene (ppmv)	Toluene (ppmv)	Ethylbenzene (ppmv)	Total Xylenes (ppmv)	
6/22/09	10:30	7665.5		1459	21	175											
6/30/09	19:00	7747.6															down when arrive on site
7/6/09	19:30	7765.1		1463	20.5	170											
7/21/09	14:45	7862.4		1464	20	170											replaced low oil level sensor
7/24/09	14:30	7933.9		1466	20	170											
7/31/09	10:30	8031.4		1466	20.5	170											
8/7/09	11:30	8200.4		1464	20	180											
8/13/09	15:30	8348.4		1460	20	180	4.60	0.060	0.031	ND (0.005)	0.050	860	3.0	ND (0.25)	ND (0.25)	6.5	vapor sampling
8/21/09	10:00	8535		1467	20	175											
8/28/09	10:00	8702.8		1463	20	190											shutdown for oil replacement
9/14/09	19:00	8707.2		1462	20	175											
9/25/09	13:45	8739		1465	19.5	180											
9/30/09	19:00	8864.3		1465	20	175											
10/2/09	10:30	8903.8		1464	20	180											

Notes:
Note (1) - Measured at the discharge side of the vacuum pump, the pressure is approximately 1.05 atm.
Note (2) - POC = precursor organic compound measured as TPH volatiles in vapor.
Note (3) - The flow sensor was coated with highly viscous material and resulted in inaccurate readings; vaccuum readings were much more stable and accurate.

Abbreviations:
"--" indicates no value obtained for given field
acfm = actual cubic foot per minute
atm = standard atmosphere
DPE = dual-phase extraction
°F = degree Fahrenheit
Hg = mercury
ND ( ) = non-detected lab value
ppmv = parts per million volume

Table 7 - Petroleum Hydrocarbons Removed through Soil Vapor Extraction
City of Oakland Municipal Services Center Groundwater Remediation Project

Month	DPE Run Time (hr)	Ave Flow (acfm)	Flow Pressure (atm)	Flow Temp. (^{o}F)	Ave Flow (scfm)	Total Volume (std m^3)	TPHg (ppmv)	TPHg (mg/m^3)	TPHg Removed (lb)	Influent Benzene Conc. (ppmv)	Influent Benzene Conc. (mg/m^3)	Benzene Removed (lb)
May-07	191.2	278	1.05	160	249	80,756	2,000	7,033	1,252	18	58	10
Jun-07	314.8	276	1.05	165	245	130,948	2,410	8,475	2,447	25	81	23
Jul-07	114.8	273	1.05	160	244	47,616	--	10,738	1,127	--	85	9
Aug-07	334.7	301	1.05	160	269	153,062	3,820	13,000	4,387	27	88	30
Sep-07	623.7	530	0.46	75	241	255,000	2,460	8,700	4,891	6.6	21	12
Oct-07	500.4	535	0.5	75	264	224,477	3,700	13,000	6,433	4.4	14	7
Nov-07	719.7	535	0.5	75	264	322,853	2,500	8,750	6,228	13	41	29
Dec-07	627.5	535	0.5	75	264	281,493	6,018	21,200	13,156	33	110	68
Jan-08	672.7	535	0.5	75	264	301,769	3,170	11,140	7,411	11	34	23
Feb-08	719	535	0.5	75	264	322,539	273	960	683	0.46	1.5	1
Mar-08	741.5	535	0.5	75	264	332,633	450	1,600	1,173	5.8	18	13
Apr-08	601.5	535	0.5	75	264	269,830	1,280	4,500	2,677	2.4	7.7	5
May-08	176.5	535	0.5	75	264	79,177	1,200	4,200	733	3	9.5	1.7
Jun-08	417.8	535	0.5	75	264	187,423	790	2,800	1,157	1.1	3.6	1.5
Jul-08	111.1	540	0.45	75	240	45,274	490	1,700	170	0.7	2.1	0.2
Aug-08	98	540	0.45	75	240	39,936	430	1,500	132	1.0	3.1	0.3
Sep-08	57.7	540	0.45	75	240	23,513	430	1,500	78	1.0	3.1	0.2
Oct-08	95.7	550	0.45	75	244	39,721	370	1,300	114	1.2	3.7	0.3
Nov-08	16.4	550	0.43	75	233	6,504	370	1,300	19	1.2	3.7	0.1
Dec-08	0	0	0	75	0	0	0	0	0	0.0	0.0	0.0
Jan-09	0	0	0	75	0	0	0	0	0	0.0	0.0	0.0
Feb-09	171.45	550	0.37	75	201	58,510	540	1,900	245	1.6	5.0	0.6
Mar-09	15.85	550	0.42	75	228	6,140	250	880	12	1.1	3.4	0.0
Apr-09	57.8	545	0.38	75	204	20,074	321	1,130	50	1.1	3.5	0.2
May-09	199.4	550	0.28	75	152	51,496	370	1,300	148	1.1	3.5	0.4
Jun-09	155.9	550	0.33	75	179	47,452	790	2,800	293	3.9	12.0	1.3
Jul-09	283.8	550	0.33	75	179	86,381	825	2,904	553	3.5	11.2	2.1
Aug-09	671.4	550	0.33	75	179	204,356	860	3,027	1,364	3.0	9.6	4.3
Sep-09	161.5	550	0.34	75	185	50,646	860	3,027	338	3.0	9.6	1.1

Notes:
Flow rates from May through August 2007 were recorded by the flow meter at the vacuum discharge side.
Flow rates after August 2007 were based on pump vacuum reading and pump performance chart for acfm.

Abbreviations

"--" indicates not analyzed for constituent indicated
acfm = actual cubic foot per minute
atm = standard atmosphere
DPE = dual-phase extraction
^{o}F = degree Fahrenheit
hr = hours(s)
lb = pound(s)
m^3 = cubic meter
mg/m^3 = milligram(s) per cubic meter
ppmv = parts per million volume
scfm = standard cubic foot per minute
TPHg = total petroleum hydrocarbons quantified as gasoline

Table 8 - TPH Removed through Groundwater Extraction, Floating Product Recovery, and Soil Vapor Extraction
City of Oakland Municipal Services Center Groundwater Remediation Project

Month	Groundwater	TPHg	TPHd	Mass Removed through Groundwater Extraction			Floating Product	TPH Removed	Total Monthly	Total Monthly	Cumulative Product Removed	
	Removed	Influent	Influent	As TPHg	As TPHd	Combined	Recovered	By Vapor	Removal	Removal	(floating + dissolved + vapor)	
	(gallons)	(mg/L)	(mg/L)	(lb)	(lb)	(lb)	(gallons)	(lb)	(gallons)	(lb)	(gallons)	(lb)
May-06	17,591	54.5	17.1	7.98	2.50	10.49	20	0	21.48	152	21.48	152
Jun-06	103,880	50	10	43.25	8.65	51.90	80	0	87.33	618	108.81	770
Jul-06	89,150	60	4	44.54	2.97	47.51	65	0	71.71	508	180.53	1,278
Aug-06	82,900	59	4.1	40.73	2.83	43.56	55	0	61.15	433	241.68	1,711
Sep-06	85,450	44	4.8	31.31	3.42	34.72	25	0	29.91	212	271.59	1,922
Oct-06	72,980	42	9.1	25.52	5.53	31.05	30	0	34.39	243	305.97	2,166
Nov-06	46,200	32	7.8	12.31	3.00	15.31	20	0	22.16	157	328.14	2,323
Dec-06	49,280	55	7.6	22.57	3.12	25.69	20	0	23.63	167	351.77	2,490
Jan-07	59,100	49	3.6	24.11	1.77	25.89	15	0	18.66	132	370.42	2,622
Feb-07	85,510	38	7.9	27.06	5.63	32.68	13	0	17.62	125	388.04	2,747
Mar-07	116,260	32	7.8	30.98	7.55	38.53	12	0	17.44	123	405.49	2,870
Apr-07	65,725	11	6.2	6.02	3.39	9.41	5	0	6.33	45	411.82	2,915
May-07	78,705	84	180	55.05	117.97	173.02	4	1,252	205.35	1,453	617.16	4,368
Jun-07	93,720	8.9	7.7	6.95	6.01	12.95	4	2,447	351.50	2,488	968.66	6,856
Jul-07	49,470	16	9.1	6.59	3.75	10.34	6	1,127	166.71	1,180	1,135.37	8,036
Aug-07	119,490	5.1	8.1	5.07	8.06	13.13	5	4,387	626.62	4,435	1,761.99	12,471
Sep-07	135,890	3	12	3.39	13.58	16.97	0	4,891	693.42	4,908	2,455.41	17,379
Oct-07	65,570	1.9	12	1.04	6.55	7.59	0	6,433	909.95	6,441	3,365.36	23,820
Nov-07	165,810	3.6	9	4.97	12.43	17.40	0	6,228	882.37	6,245	4,247.73	30,065
Dec-07	101,270	5.1	25	4.30	21.08	25.38	0	13,156	1862.32	13,181	6,110.05	43,247
Jan-08	106,500	14	14	12.42	12.42	24.83	0	7,411	1050.56	7,436	7,160.61	50,682
Feb-08	71,000	ND (50)	6.1	0.00	3.61	3.61	0	683	97.01	687	7,257.62	51,369
Mar-08	127,310	2.3	9	2.44	9.54	11.98	0	1,173	167.42	1,185	7,425.04	52,554
Apr-08	92,240	2.3	14	1.77	10.75	12.52	0	2,677	379.97	2,689	7,805.01	55,243
May-08	53,100	2.9	20	1.28	8.84	10.13	0	733	105.01	743	7,910.02	55,987
Jun-08	62,092	1.4	6.7	0.72	3.46	4.19	0	1,157	164.05	1,161	8,074.06	57,148
Jul-08	53,580	2.3	9.4	1.03	4.19	5.22	0	170	24.71	175	8,098.77	57,323
Aug-08	35,760	1.3	12	0.39	3.57	3.96	0	132	19.22	136	8,117.99	57,459
Sep-08	38,360	1.4	14	0.45	4.47	4.92	0	78	11.68	83	8,129.67	57,541
Oct-08	50,300	1	10	0.42	4.19	4.61	0	114	16.73	118	8,146.41	57,660
Nov-08	11,710	1	8.1	0.10	0.79	0.89	0	19	2.76	20	8,149.17	57,679
Dec-08	0	0	0	0.00	0.00	0.00	0	0	0.00	0	8,149.17	57,679
Jan-09	0	0	0	0.00	0.00	0.00	0	0	0.00	0	8,149.17	57,679
Feb-09	77,990	1.4	11	0.91	7.14	8.05	0	245	35.76	253	8,184.93	57,933
Mar-09	0	0	0	0.00	0.00	0.00	0	12	1.68	12	8,186.61	57,944
Apr-09	55,010	1.2	13	0.55	5.95	6.50	0	50	7.98	57	8,194.60	58,001
May-09	80,203	1.1	17	0.73	11.35	12.09	0	148	22.56	160	8,217.16	58,161
Jun-09	35,237	0.98	11	0.29	3.23	3.52	0	293	41.88	296	8,259.04	58,457
Jul-09	31,340	0.56	13	0.15	3.39	3.54	0	553	78.63	557	8,337.67	59,014
Aug-09	76,460	0.53	12	0.34	7.64	7.98	0	1,364	193.81	1,372	8,531.48	60,385
Sep-09	29,190	0.44	4.4	0.11	1.07	1.18	0	338	47.92	339	8,579.40	60,725

Table 8 - TPH Removed through Groundwater Extraction, Floating Product Recovery, and Soil Vapor Extraction
City of Oakland Municipal Services Center Groundwater Remediation Project

Note: Morgan Environmental disposed of three 55-gallon drums of recovered product on 8/9/06 and four 55-gallon dums of product on 8/17/07.
Non-detected lab values were reported as half the reporting limit in equations.

Abbreviations:
lb = pounds(s)
mg/L = milligram(s) per liter
TPH = total petroleum hydrocarbons TPHg= total petroleum hydrocarbons quantified as gasoline TPHd= total petroleum hydrocarbons quantified as diesel

APPENDIX A

Laboratory Analytical Reports for Groundwater Samples

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 213749
ANALYTICAL REPORT

OTG Enviroengineering Solutions, Inc	Project : 09OAK06.1000
7700 Edgewater Drive	Location : MSC Remediation
Oakland, CA 94621	Level : II

Sample ID	Lab ID
E-1	213749-001
BTW-2	213749-002
I-1	213749-003

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: _____ Date: 07/31/2009
Project Manager

NELAP # 01107CA

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**213749**
Client:	**OTG Enviroengineering Solutions, Inc**
Project:	**09OAK06.1000**
Location:	**MSC Remediation**
Request Date:	**07/24/09**
Samples Received:	**07/24/09**

This data package contains sample and QC results for three water samples, requested for the above referenced project on 07/24/09. The samples were received cold and intact.

TPH-Purgeables and/or BTXE by GC (EPA 8015B and EPA 8021B):
No analytical problems were encountered.

TPH-Extractables by GC (EPA 8015B):
No analytical problems were encountered.

Curtis & Tompkins, Ltd.
Analytical Laboratory Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510) 486-0900 Phone
(510) 486-0532 Fax

CHAIN OF CUSTODY

C & T LOGIN #: 213249

Sampler: Xinggang Tong

Project No.: 090AK06.1000

Report To: X Tong

Project Name: MSC Remediation

Company: OTG Envirolngineering Solutions

Project P.O.:

Telephone: 510/465-8982

Turnaround Time: 5-day

Fax: email Xtong@otgenv.com

Lab No.	Sample ID.	Sampling Date Time	Matrix: Soil	Water	Waste		# of Containers	Preservative: HCL	H_2SO_4	HNO_3	ICE		Analysis: TPHgas, BTEX & MTBE	TPHdiesel w/ mo w/ Silica gel cleanup		TPHdiesel w/ mo							
	E-1	7/24/09, 13:50		x			4	x			x		x	x									
	BTW-2	7/24/09, 14:05		x			4	x			x		x	x									
	I-1	7/24/09, 14:15			x		4	x			x		x			x							

Notes:
email EDF for GeoTracker upload
Global ID: T0600100375
LogCode: OTGO

SAMPLE RECEIPT
Intact Cold
On Ice Ambient
Preservative Correct?
Yes No N/A

RELINQUISHED BY:
SIGNATURE — 7/24/09, 3:24 PM DATE / TIME
DATE / TIME
DATE / TIME

RECEIVED BY:
SIGNATURE — 7/27/09 3:24 DATE / TIME
DATE / TIME
DATE / TIME

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 213719 Date Received 7/24/09 Number of coolers 1
Client DTG Project MSC REMEDIATION

Date Opened 7/24/09 By (print) M. VILLANUEVA (sign)
Date Logged in 7/27/09 By (print) SEVAS (sign)

1. Did cooler come with a shipping slip (airbill, etc) _____ YES NO
   Shipping info _____

2A. Were custody seals present? ... ☐ YES (circle) on cooler on samples ☐ NO
   How many _____ Name _____ Date _____
2B. Were custody seals intact upon arrival? _____ YES NO N/A
3. Were custody papers dry and intact when received? _____ YES NO
4. Were custody papers filled out properly (ink, signed, etc)? _____ YES NO
5. Is the project identifiable from custody papers? (If so fill out top of form) ___ YES NO
6. Indicate the packing in cooler: (if other, describe) _____

☑ Bubble Wrap ☑ Foam blocks ☐ Bags ☐ None
☐ Cloth material ☐ Cardboard ☐ Styrofoam ☐ Paper towels

7. Temperature documentation:

Type of ice used: ☑ Wet ☐ Blue/Gel ☐ None Temp(°C) 5.9

☐ Samples Received on ice & cold without a temperature blank

☐ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? _____ YES NO
   If YES, what time were they transferred to freezer? _____
9. Did all bottles arrive unbroken/unopened? _____ YES NO
10. Are samples in the appropriate containers for indicated tests? _____ YES NO
11. Are sample labels present, in good condition and complete? _____ YES NO
12. Do the sample labels agree with custody papers? _____ YES NO
13. Was sufficient amount of sample sent for tests requested? _____ YES NO
14. Are the samples appropriately preserved? _____ YES NO N/A
15. Are bubbles > 6mm absent in VOA samples? _____ YES NO N/A
16. Was the client contacted concerning this sample delivery? _____ YES NO
   If YES, Who was called? _____ By _____ Date: _____

COMMENTS

_____

_____

_____

_____

_____

_____

_____

_____

Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	213749	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	09OAK06.1000		
Matrix:	Water	Sampled:	07/24/09
Units:	ug/L	Received:	07/24/09
Diln Fac:	1.000	Analyzed:	07/27/09
Batch#:	153258		

Field ID: E-1 Lab ID: 213749-001
Type: SAMPLE

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015B
MTBE	ND	2.0	EPA 8021B
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	99	63-146	EPA 8015B
Bromofluorobenzene (FID)	100	70-140	EPA 8015B
Trifluorotoluene (PID)	90	50-140	EPA 8021B
Bromofluorobenzene (PID)	93	56-132	EPA 8021B

Field ID: BTW-2 Lab ID: 213749-002
Type: SAMPLE

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015B
MTBE	ND	2.0	EPA 8021B
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
m,p-Xylenes	0.62	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	99	63-146	EPA 8015B
Bromofluorobenzene (FID)	101	70-140	EPA 8015B
Trifluorotoluene (PID)	91	50-140	EPA 8021B
Bromofluorobenzene (PID)	94	56-132	EPA 8021B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	213749	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	09OAK06.1000		
Matrix:	Water	Sampled:	07/24/09
Units:	ug/L	Received:	07/24/09
Diln Fac:	1.000	Analyzed:	07/27/09
Batch#:	153258		

Field ID: I-1 Lab ID: 213749-003
Type: SAMPLE

Analyte	Result	RL	Analysis
Gasoline C7-C12	560	50	EPA 8015B
MTBE	ND	2.0	EPA 8021B
Benzene	2.7	0.50	EPA 8021B
Toluene	2.5	0.50	EPA 8021B
Ethylbenzene	1.1	0.50	EPA 8021B
m,p-Xylenes	5.2	0.50	EPA 8021B
o-Xylene	9.2	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	112	63-146	EPA 8015B
Bromofluorobenzene (FID)	102	70-140	EPA 8015B
Trifluorotoluene (PID)	95	50-140	EPA 8021B
Bromofluorobenzene (PID)	94	56-132	EPA 8021B

Type: BLANK Lab ID: QC505077

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015B
MTBE	ND	2.0	EPA 8021B
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	100	63-146	EPA 8015B
Bromofluorobenzene (FID)	93	70-140	EPA 8015B
Trifluorotoluene (PID)	92	50-140	EPA 8021B
Bromofluorobenzene (PID)	85	56-132	EPA 8021B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	213749	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	09OAK06.1000	Analysis:	EPA 8021B
Matrix:	Water	Batch#:	153258
Units:	ug/L	Analyzed:	07/27/09
Diln Fac:	1.000		

Type: BS Lab ID: QC505078

Analyte	Spiked	Result	%REC	Limits
MTBE	10.00	8.600	86	53-152
Benzene	10.00	8.962	90	79-120
Toluene	10.00	9.114	91	76-122
Ethylbenzene	10.00	9.750	97	77-125
m,p-Xylenes	10.00	9.108	91	76-126
o-Xylene	10.00	8.973	90	77-126

Surrogate	%REC	Limits
Trifluorotoluene (PID)	93	50-140
Bromofluorobenzene (PID)	93	56-132

Type: BSD Lab ID: QC505079

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	10.00	8.678	87	53-152	1	37
Benzene	10.00	8.896	89	79-120	1	20
Toluene	10.00	9.005	90	76-122	1	21
Ethylbenzene	10.00	9.188	92	77-125	6	21
m,p-Xylenes	10.00	9.163	92	76-126	1	23
o-Xylene	10.00	8.818	88	77-126	2	21

Surrogate	%REC	Limits
Trifluorotoluene (PID)	95	50-140
Bromofluorobenzene (PID)	95	56-132

RPD= Relative Percent Difference

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	213749	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	09OAK06.1000	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC505080	Batch#:	153258
Matrix:	Water	Analyzed:	07/27/09
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	963.6	96	76-121

Surrogate	%REC	Limits
Trifluorotoluene (FID)	125	63-146
Bromofluorobenzene (FID)	105	70-140

Curtis & Tompkins, Ltd.

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	213749	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	09OAK06.1000	Analysis:	EPA 8015B
Field ID:	E-1	Batch#:	153258
MSS Lab ID:	213749-001	Sampled:	07/24/09
Matrix:	Water	Received:	07/24/09
Units:	ug/L	Analyzed:	07/27/09
Diln Fac:	1.000		

Type: MS Lab ID: QC505081

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	9.356	2,000	2,176	108	66-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	143	63-146
Bromofluorobenzene (FID)	105	70-140

Type: MSD Lab ID: QC505082

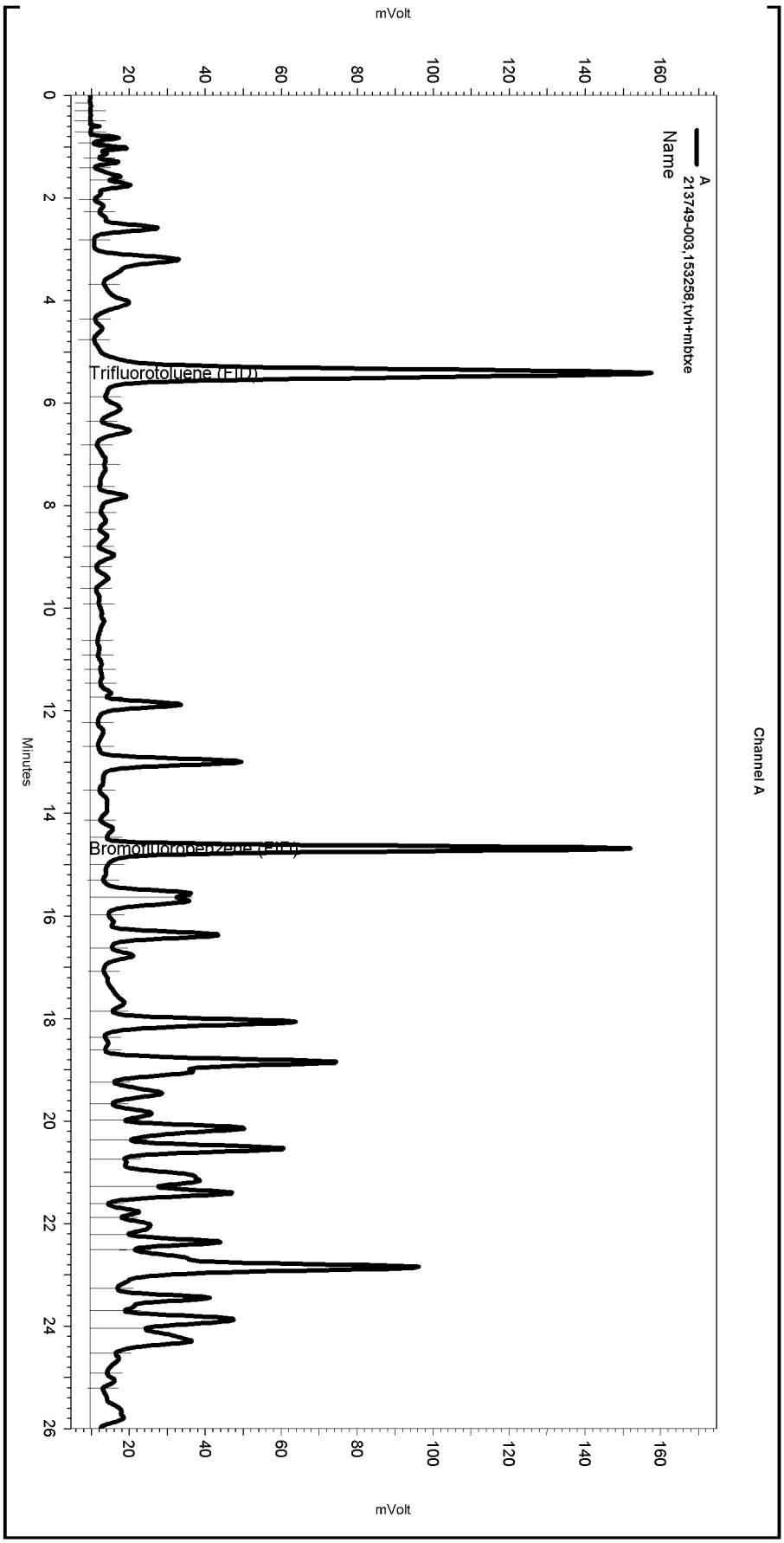
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	2,118	105	66-120	3	20

Surrogate	%REC	Limits
Trifluorotoluene (FID)	139	63-146
Bromofluorobenzene (FID)	104	70-140

RPD= Relative Percent Difference

Sequence File: **\\Lims\gdrive\ezchrom\Projects\GC07\Sequence\208.seq**
Sample Name: **213749-003,153258,tvh+mbtxe**
Data File: **\\Lims\gdrive\ezchrom\Projects\GC07\Data\208_013**
Instrument: GC07 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)
Method Name: \\Lims\gdrive\ezchrom\Projects\GC07\Method\tvhbtxe194.met

Software Version 3.1.7
Run Date: 7/27/2009 6:24:12 PM
Analysis Date: 7/28/2009 12:42:44 PM
Sample Amount: 5 Multiplier: 5
Vial & pH or Core ID: a1.3



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No items selected for this section

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Integration Events

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Width	0	0	0.2
Yes	Threshold	0	0	50

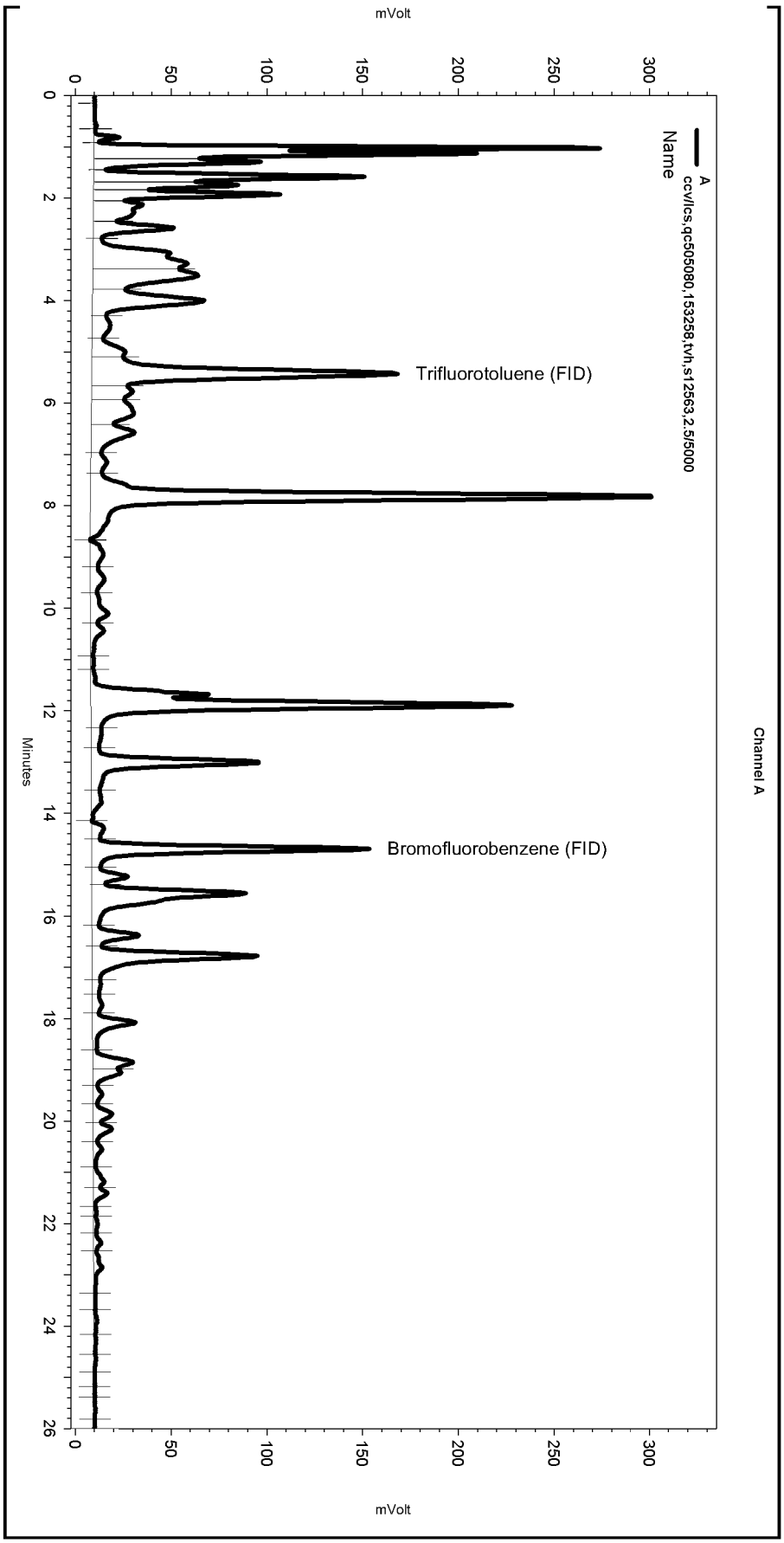
Manual Integration Fixes

Data File: \\Lims\gdrive\ezchrom\Projects\GC07\Data\208_013

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Lowest Point Horizontal Baseli	0	26.017	0
Yes	Split Peak	15	0	0

Sequence File: **\\Lims\gdrive\ezchrom\Projects\GC07\Sequence\208.seq**
Sample Name: **ccv/lcs,qc505080,153258,tvh,s12563,2.5/5000**
Data File: **\\Lims\gdrive\ezchrom\Projects\GC07\Data\208_004**
Instrument: GC07 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)
Method Name: \\Lims\gdrive\ezchrom\Projects\GC07\Method\tvhbtxe194.met

Software Version 3.1.7
Run Date: 7/27/2009 9:54:00 AM
Analysis Date: 7/28/2009 11:45:47 AM
Sample Amount: 5 Multiplier: 5
Vial & pH or Core ID: {Data Description}



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No items selected for this section

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No items selected for this section

Integration Events

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Width	0	0	0.2
Yes	Threshold	0	0	50

Manual Integration Fixes

Data File: \\Lims\gdrive\ezchrom\Projects\GC07\Data\208_004

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
None				

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	213749	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 3520C
Project#:	09OAK06.1000	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	07/24/09
Units:	ug/L	Received:	07/24/09
Diln Fac:	1.000	Prepared:	07/28/09
Batch#:	153314		

Field ID: E-1 Analyzed: 07/30/09
Type: SAMPLE Cleanup Method: EPA 3630C
Lab ID: 213749-001

Analyte	Result	RL
Diesel C10-C24	ND	50
Motor Oil C24-C36	ND	300

Surrogate	%REC	Limits
o-Terphenyl	85	61-127

Field ID: BTW-2 Analyzed: 07/30/09
Type: SAMPLE Cleanup Method: EPA 3630C
Lab ID: 213749-002

Analyte	Result	RL
Diesel C10-C24	ND	50
Motor Oil C24-C36	ND	300

Surrogate	%REC	Limits
o-Terphenyl	109	61-127

Field ID: I-1 Lab ID: 213749-003
Type: SAMPLE Analyzed: 07/30/09

Analyte	Result	RL
Diesel C10-C24	13,000	50
Motor Oil C24-C36	2,200	300

Surrogate	%REC	Limits
o-Terphenyl	98	61-127

Type: BLANK Analyzed: 07/29/09
Lab ID: QC505312

Analyte	Result	RL
Diesel C10-C24	ND	50
Motor Oil C24-C36	ND	300

Surrogate	%REC	Limits
o-Terphenyl	108	61-127

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Total Extractable Hydrocarbons

Lab #:	213749	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 3520C
Project#:	09OAK06.1000	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	153314
Units:	ug/L	Prepared:	07/28/09
Diln Fac:	1.000	Analyzed:	07/29/09

Type: BS Cleanup Method: EPA 3630C
Lab ID: QC505313

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,531	101	50-120

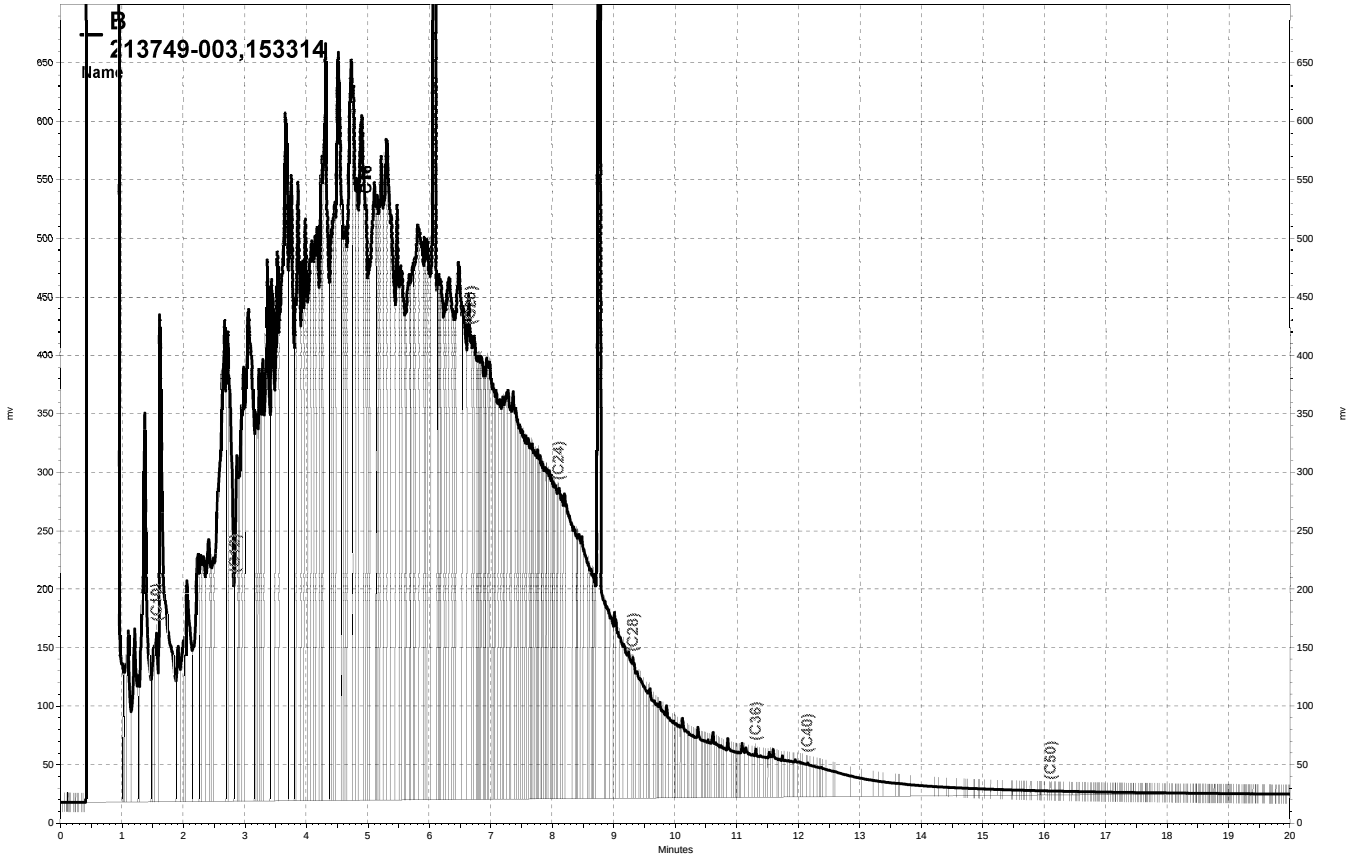
Surrogate	%REC	Limits
o-Terphenyl	101	61-127

Type: BSD Cleanup Method: EPA 3630C
Lab ID: QC505314

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	2,812	112	50-120	11	37

Surrogate	%REC	Limits
o-Terphenyl	112	61-127

RPD= Relative Percent Difference



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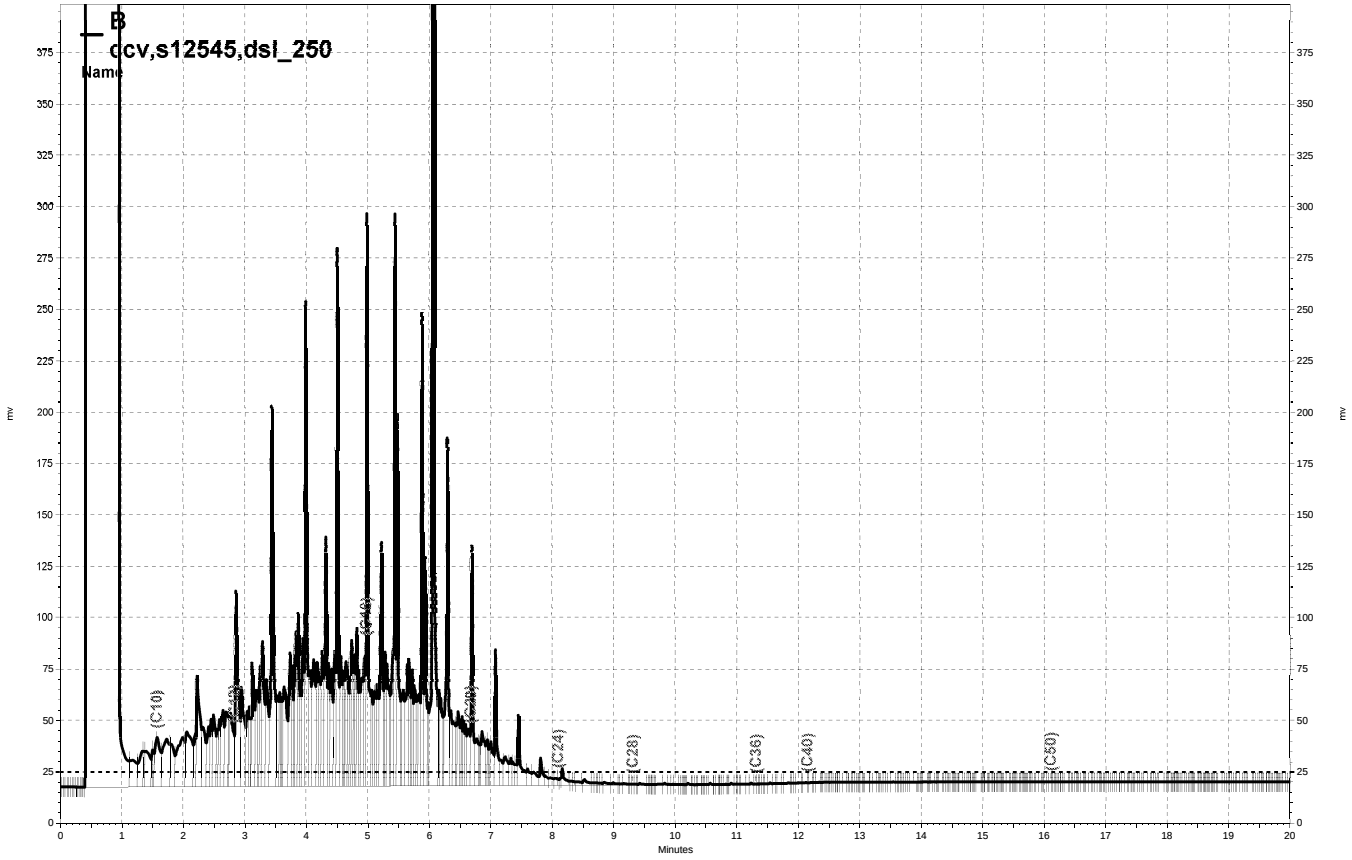

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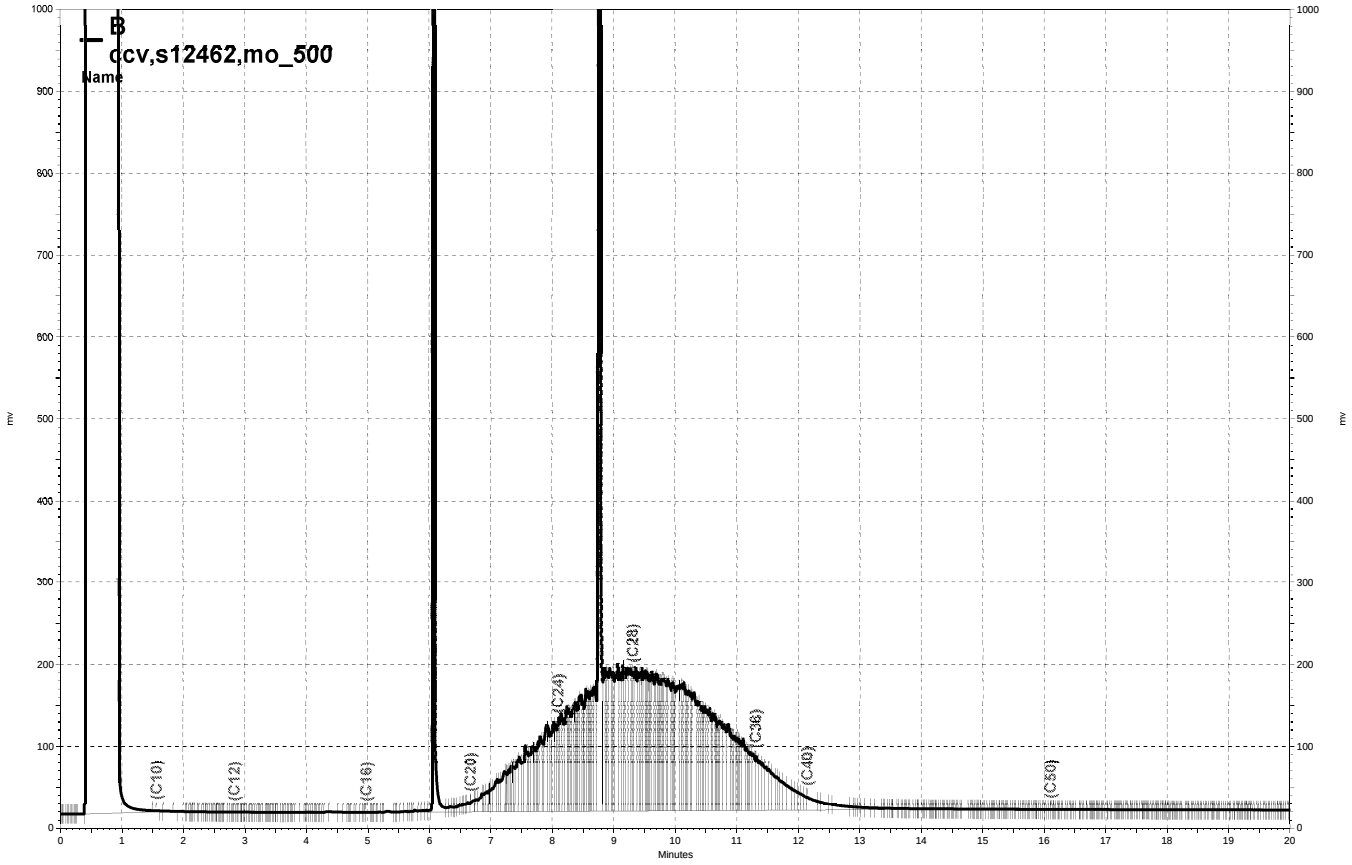

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Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 214183
ANALYTICAL REPORT

OTG Enviroengineering Solutions, Inc	Project : 09OAK06.1000
7700 Edgewater Drive	Location : MSC Remediation
Oakland, CA 94621	Level : II

Sample ID	Lab ID
E-1	214183-001
BTW-2	214183-002
BTW-1	214183-003
I-1	214183-004

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: _____ Date: 08/21/2009
Project Manager

NELAP # 01107CA

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**214183**
Client:	**OTG Enviroengineering Solutions, Inc**
Project:	**09OAK06.1000**
Location:	**MSC Remediation**
Request Date:	**08/13/09**
Samples Received:	**08/13/09**

This data package contains sample and QC results for four water samples, requested for the above referenced project on 08/13/09. The samples were received cold and intact.

TPH-Purgeables and/or BTXE by GC (EPA 8015B and EPA 8021B):
High response was observed for m,p-xylenes in the CCV analyzed 08/14/09 11:26; affected data was qualified with "b". High response was observed for benzene in the CCV analyzed 08/17/09 10:56; affected data was qualified with "b". No other analytical problems were encountered.

TPH-Extractables by GC (EPA 8015B):
I-1 (lab # 214183-004) was diluted due to the dark and viscous nature of the sample extract. No other analytical problems were encountered.

Curtis & Tompkins, Ltd.
Analytical Laboratory Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510) 486-0900 Phone
(510) 486-0532 Fax

CHAIN OF CUSTODY

C & T LOGIN #: 214183

Project No.: 090AK06.1000
Project Name: MSC Remediation
Project P.O.:
Turnaround Time: 5-day

Sampler: Xinggang Tong
Report To: Xinggang Tong
Company: OTG Environ Engineering Solutions
Telephone: (510)465-8982
~~Fax:~~ email: xtong@otgenv.com

Lab No.	Sample ID.	Sampling Date Time	Matrix: Soil	Water	Waste	# of Containers	Preservative: HCL	H_2SO_4	HNO_3	ICE	Analysis: TPHgas, BTEX & MTBE	TPHdiesel & mo w/ SilicaGel Cleanup	TPHdiesel & mo
1	E-1	8/13/09, 1455		x		4	✓			✓	x	x	
2	BtW-2	8/13/09 15:05		x		4	✓			✓	x	x	
3	BtW-1	8/13/09 15:15		x		3	✓			✓	x		
4	I-1	8/13/09 11:20			x	4	✓			✓	x		x

Notes:
email EDF for GeoTracker upload
Global ID: T0600100375
LogCode: OTGO

SAMPLE RECEIPT
☒ Intact ☒ Cold
☒ On Ice ☐ Ambient
Preservative Correct?
☐ Yes ☐ No ☐ N/A

RELINQUISHED BY:
SIGNATURE — 8/13/09 4:58 PM DATE / TIME
DATE / TIME
DATE / TIME

RECEIVED BY:
Pat Dougherty 8/13/09 4:58 DATE / TIME
DATE / TIME
DATE / TIME

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 214183 Date Received 8/13/09 Number of coolers 1
Client CTG Project MSC RADIATION

Date Opened 8/13/09 By (print) M. VILLANUEVA (sign)
Date Logged in ↓ By (print) ↓ (sign) ↓

1. Did cooler come with a shipping slip (airbill, etc) ____ YES ~~NO~~
   Shipping info ____

2A. Were custody seals present? ... ☐ YES (circle) on cooler on samples ☐ ~~NO~~
   How many ____ Name ____ Date ____
2B. Were custody seals intact upon arrival? ____ YES NO ~~N/A~~
3. Were custody papers dry and intact when received? ____ YES NO
4. Were custody papers filled out properly (ink, signed, etc)? ____ YES NO
5. Is the project identifiable from custody papers? (If so fill out top of form) ____ YES NO
6. Indicate the packing in cooler: (if other, describe) ____

☑ Bubble Wrap ☑ Foam blocks ☐ Bags ☐ None
☐ Cloth material ☐ Cardboard ☐ Styrofoam ☐ Paper towels

7. Temperature documentation:

   Type of ice used: ☑ Wet ☐ Blue/Gel ☐ None Temp(°C) 3.2

   ☐ Samples Received on ice & cold without a temperature blank

   ☐ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? ____ YES ~~NO~~
   If YES, what time were they transferred to freezer? ____
9. Did all bottles arrive unbroken/unopened? ____ YES NO
10. Are samples in the appropriate containers for indicated tests? ____ YES NO
11. Are sample labels present, in good condition and complete? ____ YES NO
12. Do the sample labels agree with custody papers? ____ YES NO
13. Was sufficient amount of sample sent for tests requested? ____ YES NO
14. Are the samples appropriately preserved? ____ YES NO N/A
15. Are bubbles > 6mm absent in VOA samples? ____ YES NO N/A
16. Was the client contacted concerning this sample delivery? ____ YES NO
   If YES, Who was called? ____ By ____ Date: ____

COMMENTS

Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	214183	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	09OAK06.1000		
Matrix:	Water	Sampled:	08/13/09
Units:	ug/L	Received:	08/13/09
Diln Fac:	1.000		

Field ID:	E-1	Batch#:	153893
Type:	SAMPLE	Analyzed:	08/14/09
Lab ID:	214183-001		

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015B
MTBE	ND	2.0	EPA 8021B
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	85	63-146	EPA 8015B
Bromofluorobenzene (FID)	89	70-140	EPA 8015B
Trifluorotoluene (PID)	75	50-140	EPA 8021B
Bromofluorobenzene (PID)	68	56-132	EPA 8021B

Field ID:	BTW-2	Batch#:	153893
Type:	SAMPLE	Analyzed:	08/15/09
Lab ID:	214183-002		

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015B
MTBE	ND	2.0	EPA 8021B
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	92	63-146	EPA 8015B
Bromofluorobenzene (FID)	107	70-140	EPA 8015B
Trifluorotoluene (PID)	69	50-140	EPA 8021B
Bromofluorobenzene (PID)	71	56-132	EPA 8021B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	214183	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	09OAK06.1000		
Matrix:	Water	Sampled:	08/13/09
Units:	ug/L	Received:	08/13/09
Diln Fac:	1.000		

Field ID: BTW-1 Lab ID: 214183-003
Type: SAMPLE

Analyte	Result	RL	Batch#	Analyzed	Analysis
Gasoline C7-C12	ND	50	153893	08/15/09	EPA 8015B
MTBE	ND	2.0	153893	08/15/09	EPA 8021B
Benzene	ND	0.50	153952	08/17/09	EPA 8021B
Toluene	ND	0.50	153893	08/15/09	EPA 8021B
Ethylbenzene	ND	0.50	153893	08/15/09	EPA 8021B
m,p-Xylenes	ND	0.50	153893	08/15/09	EPA 8021B
o-Xylene	ND	0.50	153893	08/15/09	EPA 8021B

Surrogate	%REC	Limits	Batch#	Analyzed	Analysis
Trifluorotoluene (FID)	96	63-146	153893	08/15/09	EPA 8015B
Bromofluorobenzene (FID)	112	70-140	153893	08/15/09	EPA 8015B
Trifluorotoluene (PID)	68	50-140	153893	08/15/09	EPA 8021B
Bromofluorobenzene (PID)	73	56-132	153893	08/15/09	EPA 8021B

Field ID: I-1 Batch#: 153893
Type: SAMPLE Analyzed: 08/15/09
Lab ID: 214183-004

Analyte	Result	RL	Analysis
Gasoline C7-C12	530	50	EPA 8015B
MTBE	ND	2.0	EPA 8021B
Benzene	7.7	0.50	EPA 8021B
Toluene	2.0	0.50	EPA 8021B
Ethylbenzene	2.0	0.50	EPA 8021B
m,p-Xylenes	6.7	0.50	EPA 8021B
o-Xylene	19	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	111	63-146	EPA 8015B
Bromofluorobenzene (FID)	127	70-140	EPA 8015B
Trifluorotoluene (PID)	81	50-140	EPA 8021B
Bromofluorobenzene (PID)	97	56-132	EPA 8021B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	214183	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	09OAK06.1000		
Matrix:	Water	Sampled:	08/13/09
Units:	ug/L	Received:	08/13/09
Diln Fac:	1.000		

Type: BLANK Batch#: 153893
Lab ID: QC507716 Analyzed: 08/14/09

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015B
MTBE	ND	2.0	EPA 8021B
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	97	63-146	EPA 8015B
Bromofluorobenzene (FID)	92	70-140	EPA 8015B
Trifluorotoluene (PID)	87	50-140	EPA 8021B
Bromofluorobenzene (PID)	81	56-132	EPA 8021B

Type: BLANK Batch#: 153952
Lab ID: QC507973 Analyzed: 08/17/09

Analyte	Result	RL	Analysis
Benzene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	98	63-146	EPA 8015B
Bromofluorobenzene (FID)	96	70-140	EPA 8015B
Trifluorotoluene (PID)	95	50-140	EPA 8021B
Bromofluorobenzene (PID)	96	56-132	EPA 8021B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	214183	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	09OAK06.1000	Analysis:	EPA 8021B
Matrix:	Water	Batch#:	153893
Units:	ug/L	Analyzed:	08/14/09
Diln Fac:	1.000		

Type: BS Lab ID: QC507717

Analyte	Spiked	Result	%REC	Limits
MTBE	10.00	9.789	98	53-152
Benzene	10.00	9.198	92	79-120
Toluene	10.00	10.69	107	76-122
Ethylbenzene	10.00	10.96	110	77-125
m,p-Xylenes	10.00	11.55 b	116	76-126
o-Xylene	10.00	9.556	96	77-126

Surrogate	%REC	Limits
Trifluorotoluene (PID)	80	50-140
Bromofluorobenzene (PID)	79	56-132

Type: BSD Lab ID: QC507718

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	20.00	22.24	111	53-152	13	37
Benzene	20.00	19.55	98	79-120	6	20
Toluene	20.00	20.11	101	76-122	6	21
Ethylbenzene	20.00	20.22	101	77-125	8	21
m,p-Xylenes	20.00	21.60 b	108	76-126	7	23
o-Xylene	20.00	17.58	88	77-126	8	21

Surrogate	%REC	Limits
Trifluorotoluene (PID)	87	50-140
Bromofluorobenzene (PID)	87	56-132

b= See narrative
RPD= Relative Percent Difference

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	214183	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	09OAK06.1000	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC507719	Batch#:	153893
Matrix:	Water	Analyzed:	08/14/09
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	1,027	103	76-121

Surrogate	%REC	Limits
Trifluorotoluene (FID)	113	63-146
Bromofluorobenzene (FID)	113	70-140

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	214183	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	09OAK06.1000	Analysis:	EPA 8015B
Field ID:	E-1	Batch#:	153893
MSS Lab ID:	214183-001	Sampled:	08/13/09
Matrix:	Water	Received:	08/13/09
Units:	ug/L	Analyzed:	08/14/09
Diln Fac:	1.000		

Type: MS Lab ID: QC507720

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	20.32	2,000	1,401	69	66-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	112	63-146
Bromofluorobenzene (FID)	125	70-140

Type: MSD Lab ID: QC507721

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	1,688	83	66-120	19	20

Surrogate	%REC	Limits
Trifluorotoluene (FID)	127	63-146
Bromofluorobenzene (FID)	135	70-140

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	214183	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	09OAK06.1000	Analysis:	EPA 8021B
Matrix:	Water	Batch#:	153952
Units:	ug/L	Analyzed:	08/17/09
Diln Fac:	1.000		

Type: BS Lab ID: QC507974

Analyte	Spiked	Result	%REC	Limits
Benzene	20.00	17.11 b	86	79-120

Surrogate	%REC	Limits
Trifluorotoluene (PID)	102	50-140
Bromofluorobenzene (PID)	106	56-132

Type: BSD Lab ID: QC507975

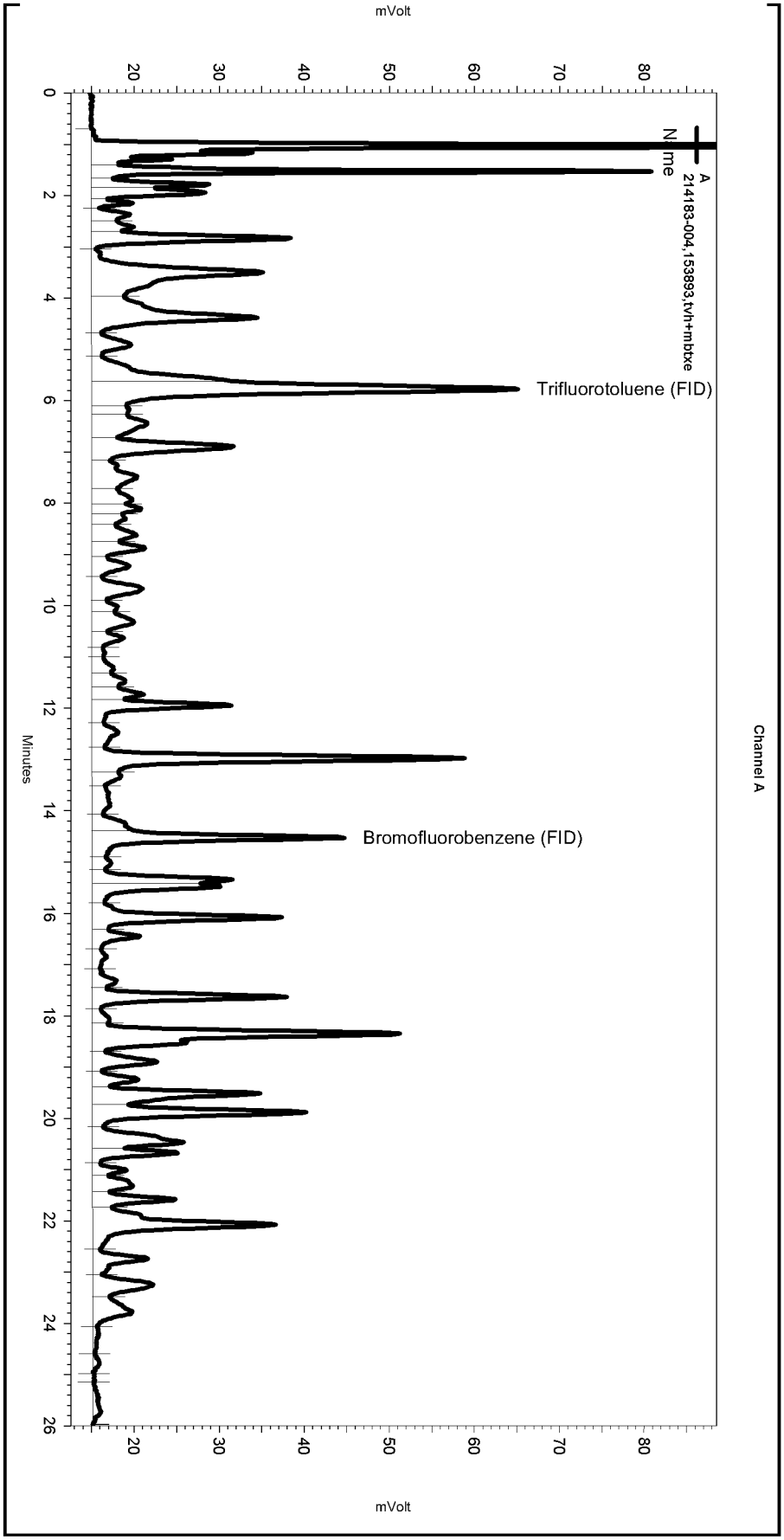
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Benzene	20.00	17.63 b	88	79-120	3	20

Surrogate	%REC	Limits
Trifluorotoluene (PID)	102	50-140
Bromofluorobenzene (PID)	106	56-132

b= See narrative
RPD= Relative Percent Difference

Sequence File: **\\Lims\gdrive\ezchrom\Projects\GC04\Sequence\226.seq**
Sample Name: **214183-004,153893,tvh+mbtxe**
Data File: **\\Lims\gdrive\ezchrom\Projects\GC04\Data\226_026**
Instrument: GC04 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)
Method Name: \\Lims\gdrive\ezchrom\Projects\GC04\Method\tvhbtxe219.met

Software Version 3.1.7
Run Date: 8/15/2009 3:56:09 AM
Analysis Date: 8/15/2009 9:14:02 AM
Sample Amount: 5 Multiplier: 5
Vial & pH or Core ID: a1.0



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Integration Events

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Width	0	0	0.2
Yes	Threshold	0	0	50

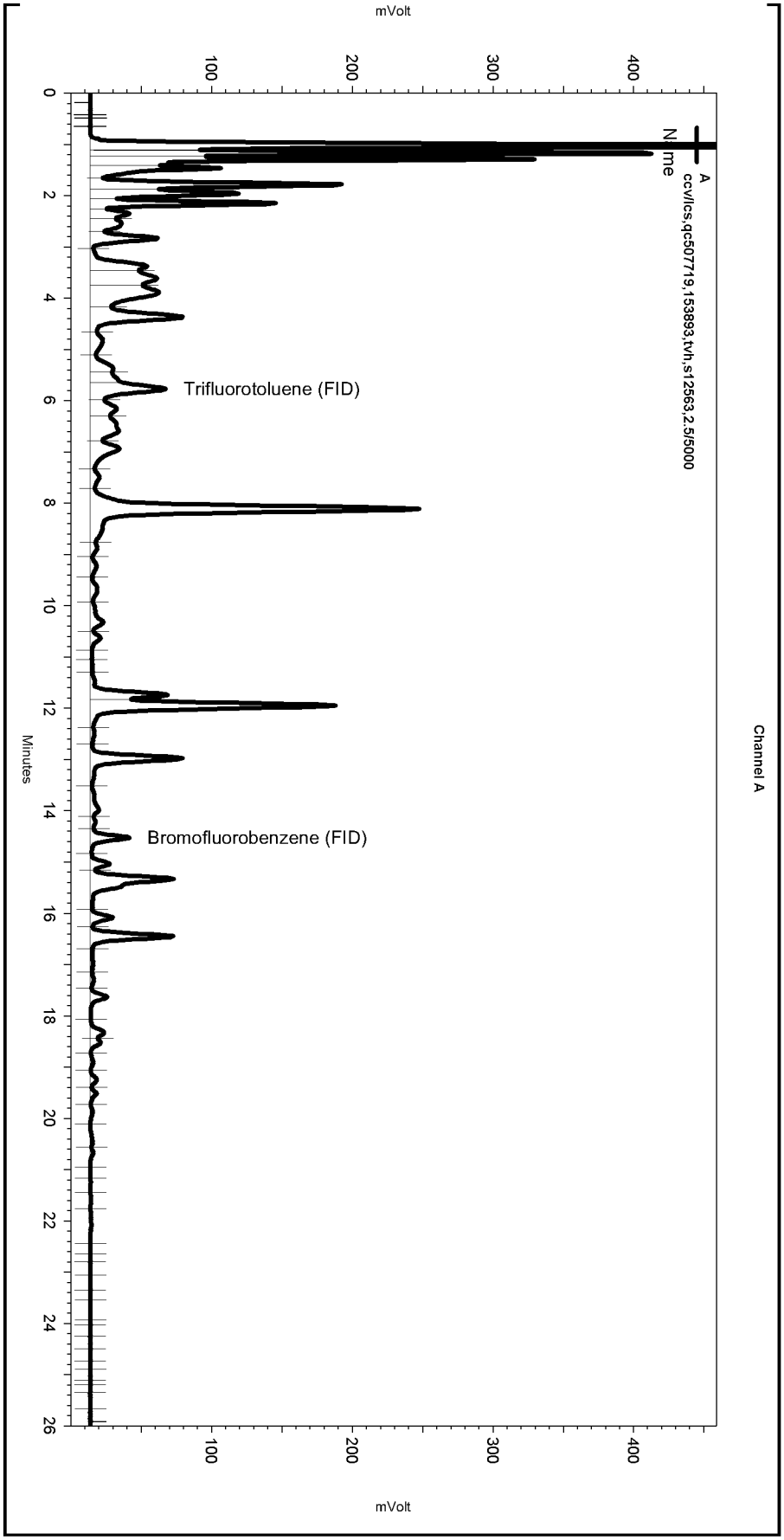
Manual Integration Fixes

Data File: \\Lims\gdrive\ezchrom\Projects\GC04\Data\226_026

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Split Peak	5.641	0	0
Yes	Split Peak	14.395	0	0

Sequence File: **\\Lims\gdrive\ezchrom\Projects\GC04\Sequence\226.seq**
Sample Name: **ccv/lcs,qc507719,153893,tvh,s12563,2.5/5000**
Data File: **\\Lims\gdrive\ezchrom\Projects\GC04\Data\226_005**
Instrument: GC04 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)
Method Name: \\Lims\gdrive\ezchrom\Projects\GC04\Method\tvhbtxe219.met

Software Version 3.1.7
Run Date: 8/14/2009 12:06:38 PM
Analysis Date: 8/15/2009 8:27:36 AM
Sample Amount: 5 Multiplier: 5
Vial & pH or Core ID: {Data Description}



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No items selected for this section

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No items selected for this section

Integration Events

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Width	0	0	0.2
Yes	Threshold	0	0	50

Manual Integration Fixes

Data File: \\Lims\gdrive\ezchrom\Projects\GC04\Data\226_005

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Split Peak	5.644	0	0

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	214183	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 3520C
Project#:	09OAK06.1000	Analysis:	EPA 8015B
Matrix:	Water	Received:	08/13/09
Units:	ug/L	Prepared:	08/14/09
Batch#:	153900	Analyzed:	08/17/09
Sampled:	08/13/09		

Field ID: E-1 Diln Fac: 1.000
Type: SAMPLE Cleanup Method: EPA 3630C
Lab ID: 214183-001

Analyte	Result	RL
Diesel C10-C24	ND	50
Motor Oil C24-C36	ND	300

Surrogate	%REC	Limits
o-Terphenyl	72	61-127

Field ID: BTW-2 Diln Fac: 1.000
Type: SAMPLE Cleanup Method: EPA 3630C
Lab ID: 214183-002

Analyte	Result	RL
Diesel C10-C24	ND	50
Motor Oil C24-C36	ND	300

Surrogate	%REC	Limits
o-Terphenyl	75	61-127

Field ID: I-1 Lab ID: 214183-004
Type: SAMPLE Diln Fac: 3.000

Analyte	Result	RL
Diesel C10-C24	12,000	150
Motor Oil C24-C36	2,400	900

Surrogate	%REC	Limits
o-Terphenyl	93	61-127

Type: BLANK Diln Fac: 1.000
Lab ID: QC507748 Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	ND	50
Motor Oil C24-C36	ND	300

Surrogate	%REC	Limits
o-Terphenyl	110	61-127

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

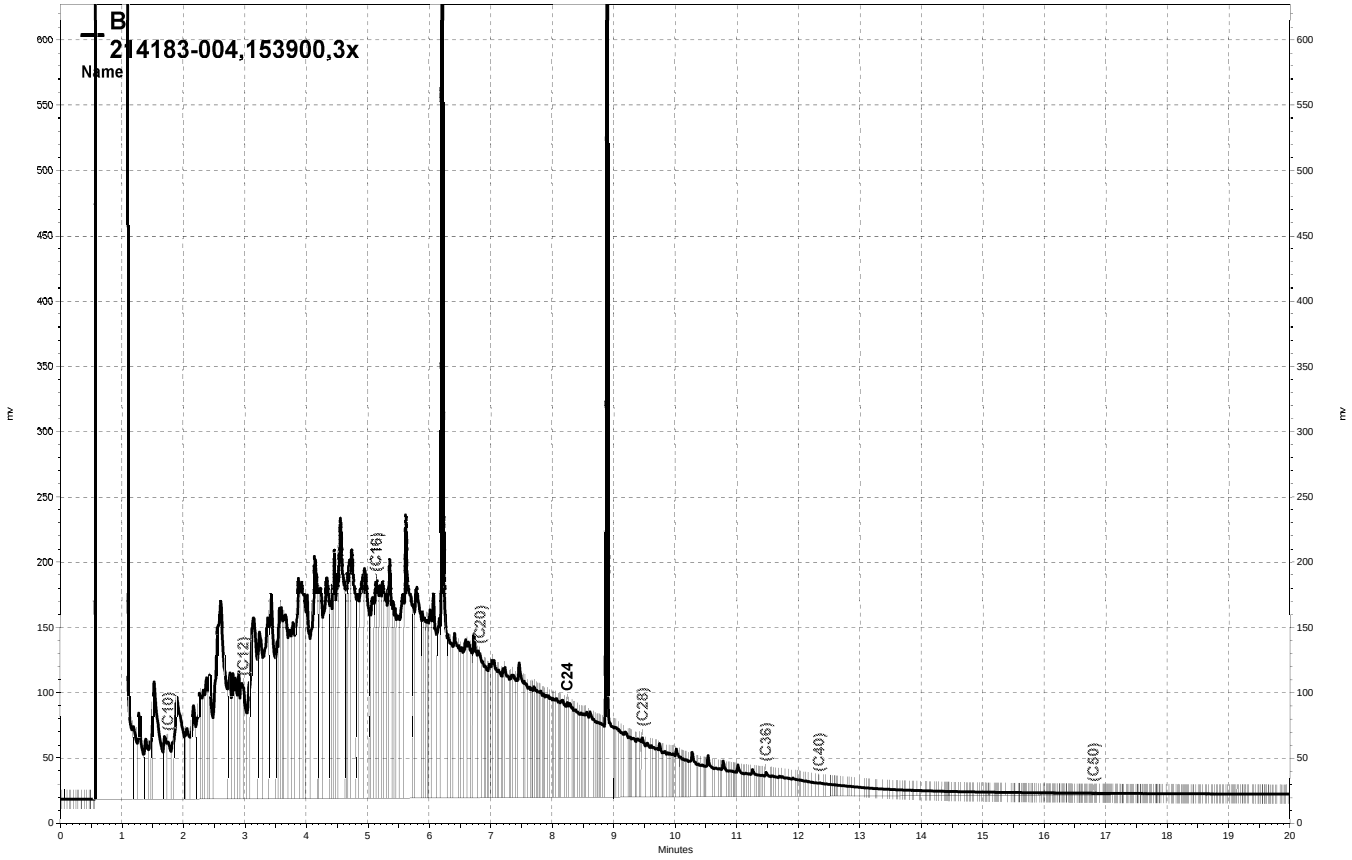
Batch QC Report

Total Extractable Hydrocarbons

Lab #:	214183	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 3520C
Project#:	09OAK06.1000	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC507749	Batch#:	153900
Matrix:	Water	Prepared:	08/14/09
Units:	ug/L	Analyzed:	08/18/09

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,143	86	50-120

Surrogate	%REC	Limits
o-Terphenyl	83	61-127



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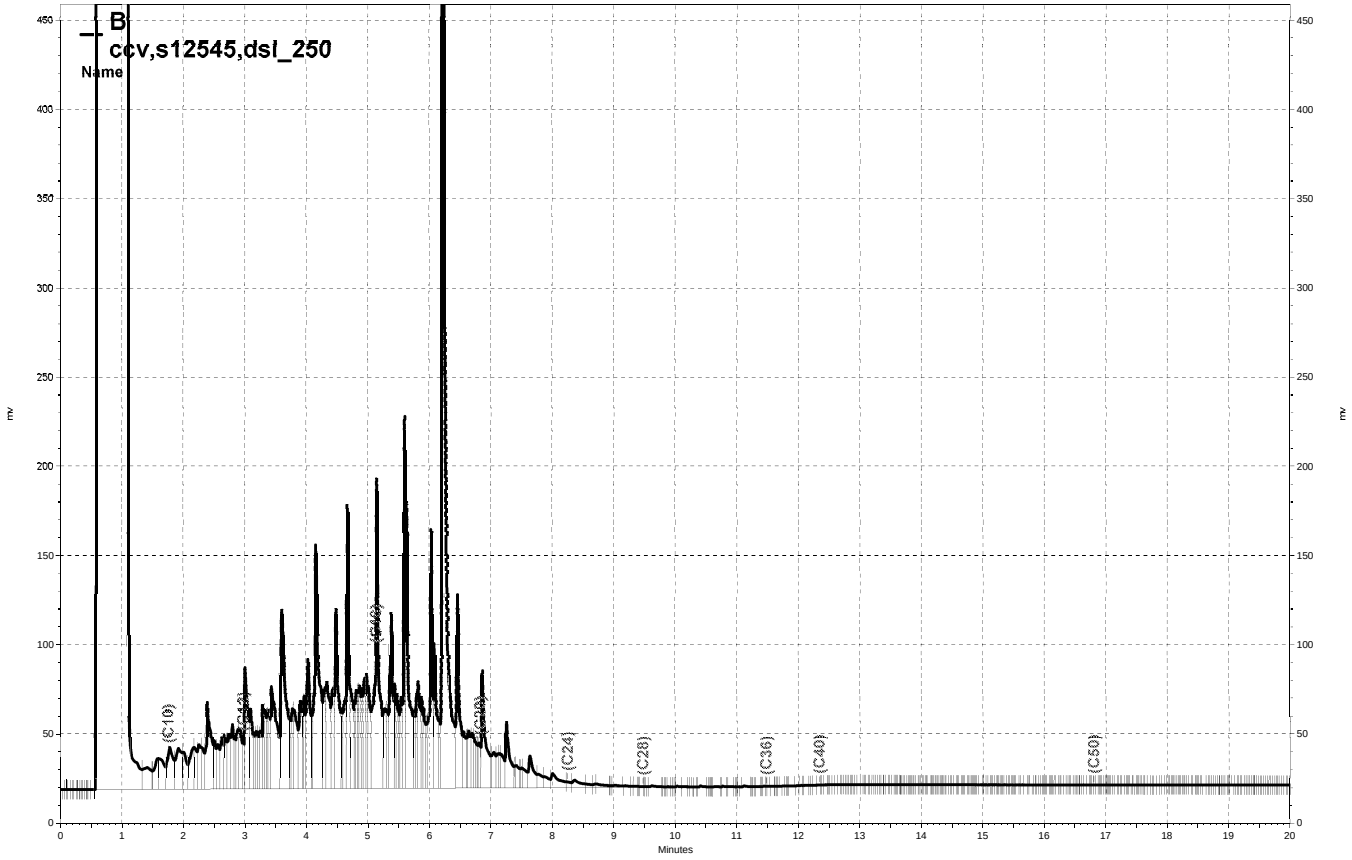

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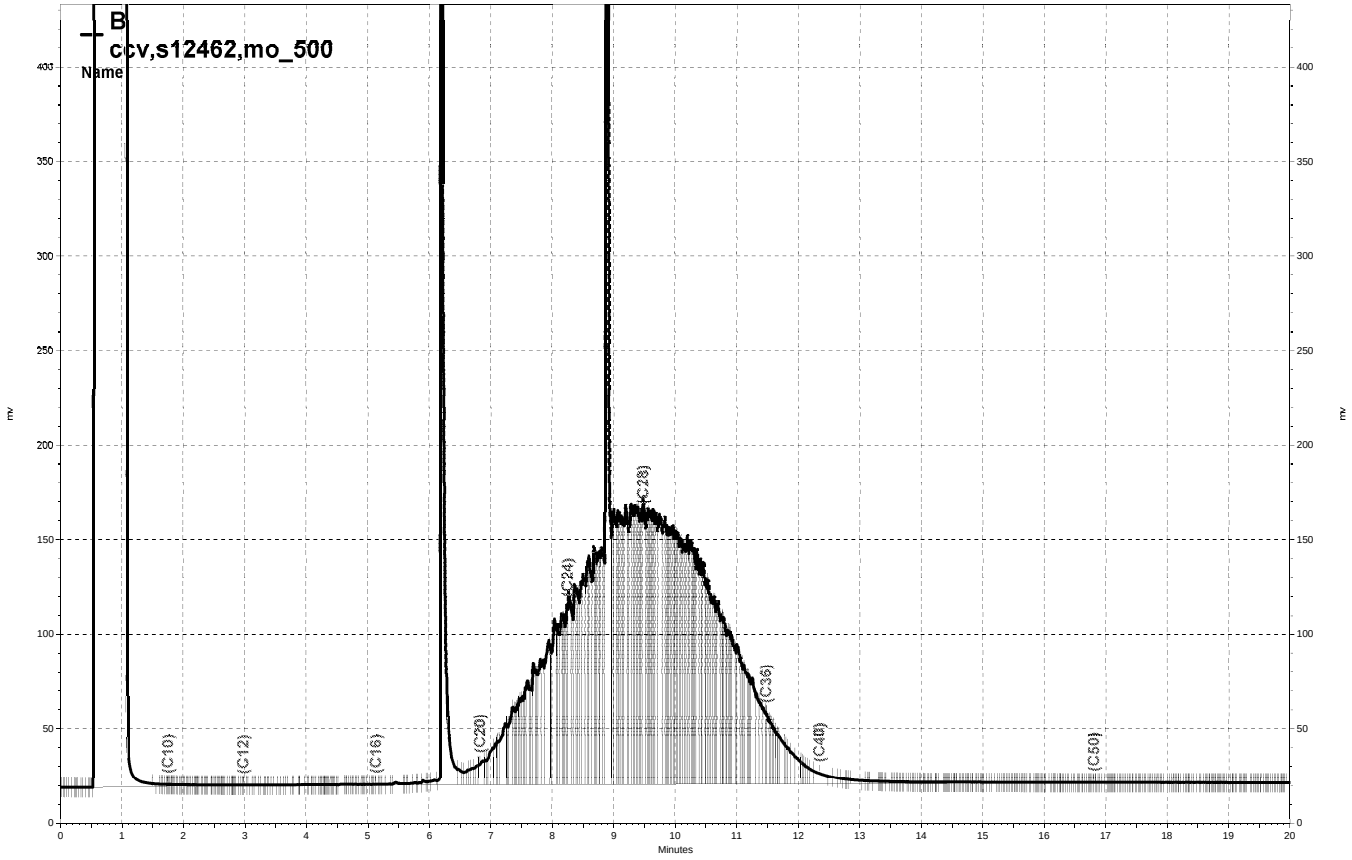

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Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 215229
ANALYTICAL REPORT

OTG Enviroengineering Solutions, Inc	Project : 09OAK06.1000
7700 Edgewater Drive	Location : MSC Remediation
Oakland, CA 94621	Level : II

Sample ID	Lab ID
E-1	215229-001
BTW-2	215229-002
I-1	215229-003

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: _____ Date: 10/07/2009
Project Manager

NELAP # 01107CA

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**215229**
Client:	**OTG Enviroengineering Solutions, Inc**
Project:	**09OAK06.1000**
Location:	**MSC Remediation**
Request Date:	**09/25/09**
Samples Received:	**09/25/09**

This data package contains sample and QC results for three water samples, requested for the above referenced project on 09/25/09. The samples were received cold and intact.

TPH-Purgeables and/or BTXE by GC (EPA 8015B and EPA 8021B):
High responses were observed for many analytes in the CCV analyzed 10/02/09 12:13; affected data was qualified with "b". High recoveries were observed for gasoline C7-C12 in the MS/MSD of E-1 (lab # 215229-001); the LCS was within limits, the associated RPD was within limits, and this analyte was not detected at or above the RL in the associated samples. High recoveries were observed for gasoline C7-C12 in the MS/MSD for batch 155681; the parent sample was not a project sample, the LCS was within limits, and the associated RPD was within limits. No other analytical problems were encountered.

TPH-Extractables by GC (EPA 8015B):
No analytical problems were encountered.

Polynuclear Aromatics by HPLC (EPA 8310):
High recoveries were observed for many analytes in the BS for batch 155485. High RPD was also observed for many analytes in the BS/BSD for batch 155485. No other analytical problems were encountered.

Curtis & Tompkins, Ltd.
Analytical Laboratory Since 1878
2323 Fifth Street
Berkeley, CA 94710
(510) 486-0900 Phone
(510) 486-0532 Fax

CHAIN OF CUSTODY

C & T LOGIN #: 215229

Sampler: Xinggang Tong
Report To: Xinggang Tong
Company: OTG Enviroengineering Solutions
Telephone: (510) 465-8982
~~Fax~~: xtong@otgenv.com

Project No.: 090AK06.1000
Project Name: MSC Remediation
Project P.O.:
Turnaround Time: 5-day

Lab No.	Sample ID.	Sampling Date Time	Matrix: Soil	Water	Waste	# of Containers	Preservative: HCL	H_2SO_4	HNO_3	ICE	Analysis: TPHgas, BTEX & MTBE	TPHdiesel w/ silica gel cleanup	TPHdiesel Amo	EPA 8310 for PAHs
1	E-1	9/25/09, 1:10 Pm		x							x	x		x
2	Bfw-2	9/25/09 1:25pm		x							x	x		
3	I-1	9/25/09 1:30pm			x						x		x	x

Notes:
email EDF for GeoTracker upload
Global ID: T0600100375
Logcode: OTGO

SAMPLE RECEIPT
Intact ☐ Cold ☐
On Ice ☒ Ambient ☐
Preservative Correct?
Yes ☐ No ☐ N/A

RELINQUISHED BY:	DATE / TIME	RECEIVED BY:	DATE / TIME
[signature]	9/25/09, 14:45	[signature]	9/25/09 14:45
	DATE / TIME		DATE / TIME
	DATE / TIME		DATE / TIME

SIGNATURE

COOLER RECEIPT CHECKLIST Curtis & Tompkins, Ltd.

Login # 215229 Date Received 9/25/09 Number of coolers 1
Client DTG Project MSC REMEDIATION

Date Opened 9/25/09 By (print) M. VILLANUEVA (sign)
Date Logged in 9/28/09 By (print) ELAS (sign)

1. Did cooler come with a shipping slip (airbill, etc) YES NO
   Shipping info
2A. Were custody seals present? ... ☐ YES (circle) on cooler on samples ☐ NO
   How many Name Date
2B. Were custody seals intact upon arrival? YES NO N/A
3. Were custody papers dry and intact when received? YES NO
4. Were custody papers filled out properly (ink, signed, etc)? YES NO
5. Is the project identifiable from custody papers? (If so fill out top of form) YES NO
6. Indicate the packing in cooler: (if other, describe)

☑ Bubble Wrap ☑ Foam blocks ☐ Bags ☐ None
☐ Cloth material ☐ Cardboard ☐ Styrofoam ☐ Paper towels

7. Temperature documentation:

Type of ice used: ☑ Wet ☐ Blue/Gel ☐ None Temp(°C)

☑ Samples Received on ice & cold without a temperature blank

☐ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? YES NO
   If YES, what time were they transferred to freezer?
9. Did all bottles arrive unbroken/unopened? YES NO
10. Are samples in the appropriate containers for indicated tests? YES NO
11. Are sample labels present, in good condition and complete? YES NO
12. Do the sample labels agree with custody papers? YES NO
13. Was sufficient amount of sample sent for tests requested? YES NO
14. Are the samples appropriately preserved? YES NO N/A
15. Are bubbles > 6mm absent in VOA samples? YES NO N/A
16. Was the client contacted concerning this sample delivery? YES NO ET
   If YES, Who was called? By Date:

COMMENTS

Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	215229	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	09OAK06.1000		
Matrix:	Water	Sampled:	09/25/09
Units:	ug/L	Received:	09/25/09
Diln Fac:	1.000		

Field ID:	E-1	Batch#:	155609
Type:	SAMPLE	Analyzed:	10/02/09
Lab ID:	215229-001		

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015B
MTBE	ND	2.0	EPA 8021B
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	104	64-147	EPA 8015B
Bromofluorobenzene (FID)	111	71-138	EPA 8015B
Trifluorotoluene (PID)	76	45-151	EPA 8021B
Bromofluorobenzene (PID)	82	54-134	EPA 8021B

Field ID:	BTW-2	Batch#:	155609
Type:	SAMPLE	Analyzed:	10/02/09
Lab ID:	215229-002		

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015B
MTBE	ND	2.0	EPA 8021B
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	104	64-147	EPA 8015B
Bromofluorobenzene (FID)	111	71-138	EPA 8015B
Trifluorotoluene (PID)	77	45-151	EPA 8021B
Bromofluorobenzene (PID)	84	54-134	EPA 8021B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	215229	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	09OAK06.1000		
Matrix:	Water	Sampled:	09/25/09
Units:	ug/L	Received:	09/25/09
Diln Fac:	1.000		

Field ID:	I-1	Batch#:	155681
Type:	SAMPLE	Analyzed:	10/05/09
Lab ID:	215229-003		

Analyte	Result	RL	Analysis
Gasoline C7-C12	440	50	EPA 8015B
MTBE	ND	2.0	EPA 8021B
Benzene	9.7	0.50	EPA 8021B
Toluene	2.1	0.50	EPA 8021B
Ethylbenzene	2.1	0.50	EPA 8021B
m,p-Xylenes	13	0.50	EPA 8021B
o-Xylene	5.9	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	108	64-147	EPA 8015B
Bromofluorobenzene (FID)	107	71-138	EPA 8015B
Trifluorotoluene (PID)	85	45-151	EPA 8021B
Bromofluorobenzene (PID)	86	54-134	EPA 8021B

Type:	BLANK	Batch#:	155609
Lab ID:	QC514900	Analyzed:	10/02/09

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015B
MTBE	ND	2.0	EPA 8021B
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	104	64-147	EPA 8015B
Bromofluorobenzene (FID)	105	71-138	EPA 8015B
Trifluorotoluene (PID)	75	45-151	EPA 8021B
Bromofluorobenzene (PID)	77	54-134	EPA 8021B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	215229	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	09OAK06.1000		
Matrix:	Water	Sampled:	09/25/09
Units:	ug/L	Received:	09/25/09
Diln Fac:	1.000		

Type:	BLANK	Batch#:	155681
Lab ID:	QC515200	Analyzed:	10/05/09

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015B
MTBE	ND	2.0	EPA 8021B
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	101	64-147	EPA 8015B
Bromofluorobenzene (FID)	98	71-138	EPA 8015B
Trifluorotoluene (PID)	80	45-151	EPA 8021B
Bromofluorobenzene (PID)	77	54-134	EPA 8021B

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	215229	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	09OAK06.1000	Analysis:	EPA 8021B
Matrix:	Water	Batch#:	155609
Units:	ug/L	Analyzed:	10/02/09
Diln Fac:	1.000		

Type: BS Lab ID: QC514901

Analyte	Spiked	Result	%REC	Limits
MTBE	20.00	22.01 b	110	58-143
Benzene	20.00	21.85 b	109	75-116
Toluene	20.00	19.87 b	99	72-124
Ethylbenzene	20.00	20.91 b	105	74-127
m,p-Xylenes	20.00	20.86 b	104	73-128
o-Xylene	20.00	21.32 b	107	73-126

Surrogate	%REC	Limits
Trifluorotoluene (PID)	85	45-151
Bromofluorobenzene (PID)	85	54-134

Type: BSD Lab ID: QC514902

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	20.00	18.87 b	94	58-143	15	31
Benzene	20.00	19.56 b	98	75-116	11	22
Toluene	20.00	18.29 b	91	72-124	8	24
Ethylbenzene	20.00	18.91 b	95	74-127	10	25
m,p-Xylenes	20.00	18.93 b	95	73-128	10	27
o-Xylene	20.00	19.34 b	97	73-126	10	25

Surrogate	%REC	Limits
Trifluorotoluene (PID)	81	45-151
Bromofluorobenzene (PID)	85	54-134

b= See narrative
RPD= Relative Percent Difference

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	215229	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	09OAK06.1000	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC514903	Batch#:	155609
Matrix:	Water	Analyzed:	10/02/09
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	3,000	3,328	111	77-118

Surrogate	%REC	Limits
Trifluorotoluene (FID)	129	64-147
Bromofluorobenzene (FID)	108	71-138

Curtis & Tompkins, Ltd.

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	215229	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	09OAK06.1000	Analysis:	EPA 8015B
Field ID:	E-1	Batch#:	155609
MSS Lab ID:	215229-001	Sampled:	09/25/09
Matrix:	Water	Received:	09/25/09
Units:	ug/L	Analyzed:	10/02/09
Diln Fac:	1.000		

Type: MS Lab ID: QC514904

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	15.12	2,000	2,422	120 *	66-110

Surrogate	%REC	Limits
Trifluorotoluene (FID)	145	64-147
Bromofluorobenzene (FID)	116	71-138

Type: MSD Lab ID: QC514905

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	2,321	115 *	66-110	4	11

Surrogate	%REC	Limits
Trifluorotoluene (FID)	141	64-147
Bromofluorobenzene (FID)	114	71-138

*= Value outside of QC limits; see narrative
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	215229	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	09OAK06.1000	Analysis:	EPA 8021B
Matrix:	Water	Batch#:	155681
Units:	ug/L	Analyzed:	10/05/09
Diln Fac:	1.000		

Type: BS Lab ID: QC515201

Analyte	Spiked	Result	%REC	Limits
MTBE	10.00	8.807	88	58-143
Benzene	10.00	9.642	96	75-116
Toluene	10.00	9.600	96	72-124
Ethylbenzene	10.00	10.14	101	74-127
m,p-Xylenes	10.00	10.23	102	73-128
o-Xylene	10.00	10.28	103	73-126

Surrogate	%REC	Limits
Trifluorotoluene (PID)	80	45-151
Bromofluorobenzene (PID)	82	54-134

Type: BSD Lab ID: QC515202

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	20.00	20.57	103	58-143	15	31
Benzene	20.00	21.69	108	75-116	12	22
Toluene	20.00	19.91	100	72-124	4	24
Ethylbenzene	20.00	20.95	105	74-127	3	25
m,p-Xylenes	20.00	20.78	104	73-128	2	27
o-Xylene	20.00	20.98	105	73-126	2	25

Surrogate	%REC	Limits
Trifluorotoluene (PID)	85	45-151
Bromofluorobenzene (PID)	86	54-134

RPD= Relative Percent Difference

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	215229	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	09OAK06.1000	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC515203	Batch#:	155681
Matrix:	Water	Analyzed:	10/05/09
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	1,023	102	77-118

Surrogate	%REC	Limits
Trifluorotoluene (FID)	117	64-147
Bromofluorobenzene (FID)	104	71-138

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	215229	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	09OAK06.1000	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	155681
MSS Lab ID:	215209-001	Sampled:	09/22/09
Matrix:	Water	Received:	09/25/09
Units:	ug/L	Analyzed:	10/05/09
Diln Fac:	1.000		

Type: MS Lab ID: QC515204

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	33.68	2,000	2,417	119 *	66-110

Surrogate	%REC	Limits
Trifluorotoluene (FID)	121	64-147
Bromofluorobenzene (FID)	110	71-138

Type: MSD Lab ID: QC515205

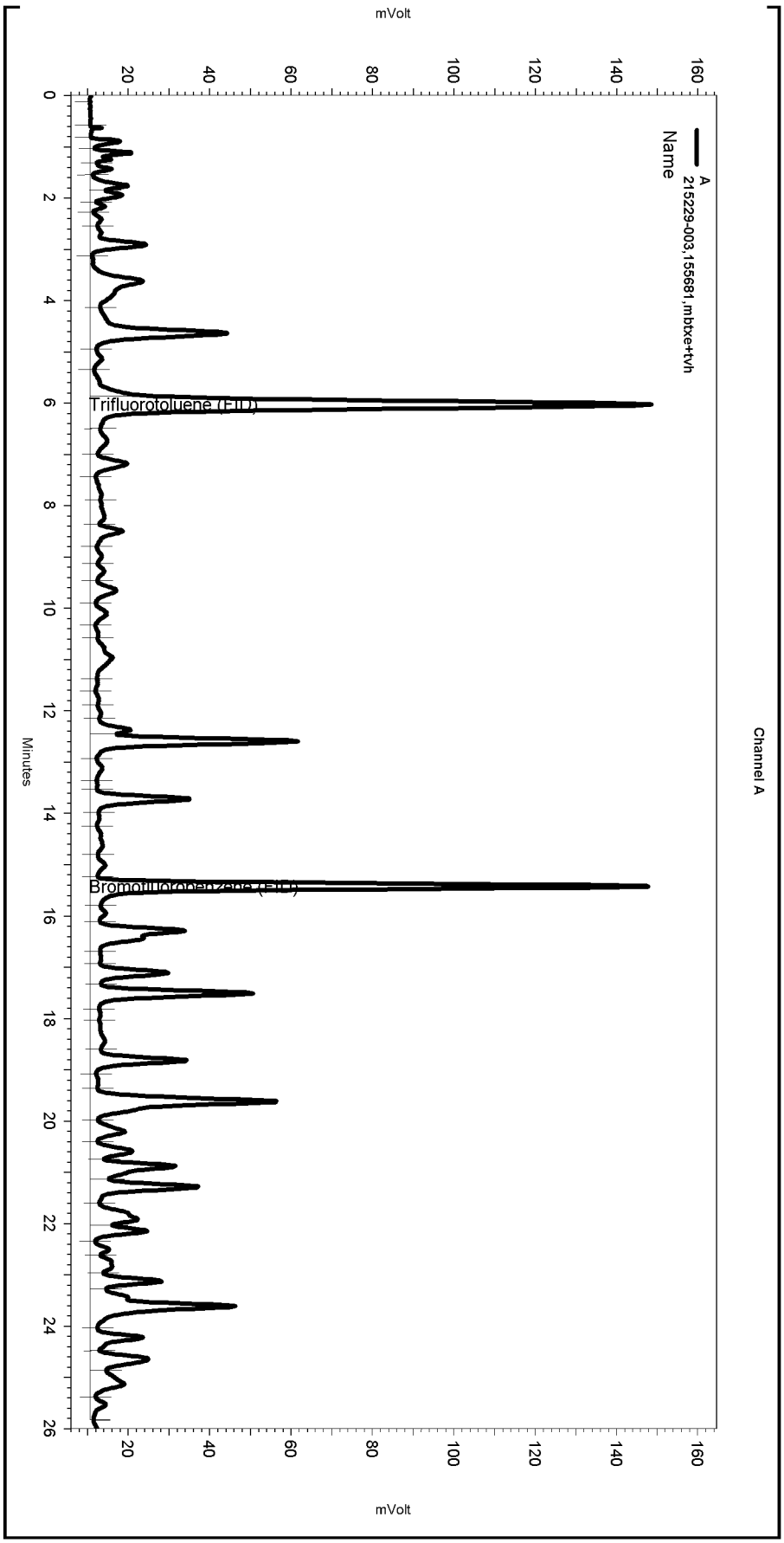
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	2,401	118 *	66-110	1	11

Surrogate	%REC	Limits
Trifluorotoluene (FID)	128	64-147
Bromofluorobenzene (FID)	113	71-138

*= Value outside of QC limits; see narrative
RPD= Relative Percent Difference

Sequence File: **\\Lims\gdrive\ezchrom\Projects\GC07\Sequence\278.seq**
Sample Name: **215229-003,155681,mbtxe+tvh**
Data File: **\\Lims\gdrive\ezchrom\Projects\GC07\Data\278_013**
Instrument: GC07 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)
Method Name: \\Lims\gdrive\ezchrom\Projects\GC07\Method\tvhbtxe267.met

Software Version 3.1.7
Run Date: 10/5/2009 6:48:01 PM
Analysis Date: 10/6/2009 10:02:43 AM
Sample Amount: 5 Multiplier: 5
Vial & pH or Core ID: b1.6



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Integration Events

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Width	0	0	0.2
Yes	Threshold	0	0	50

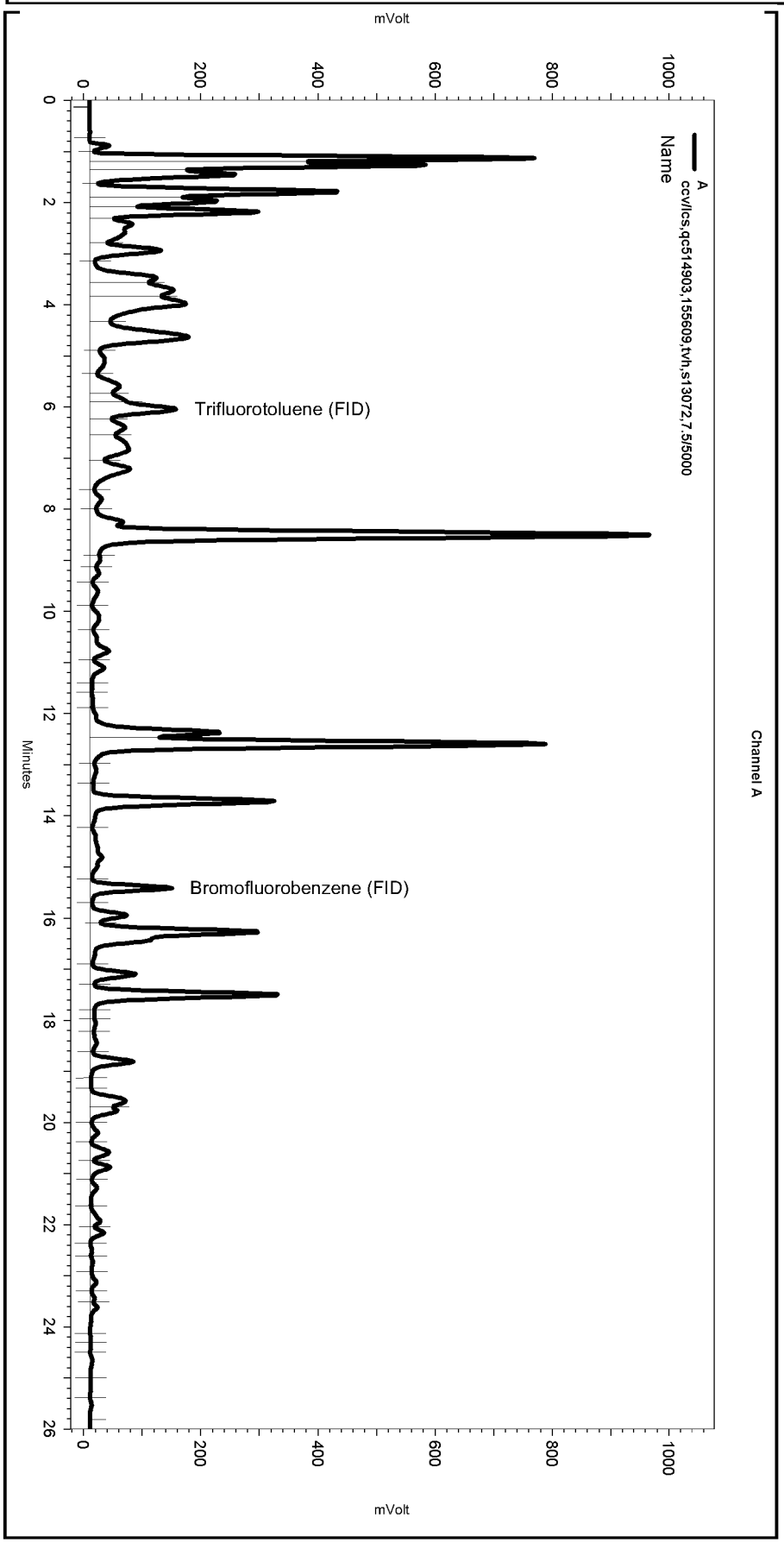
Manual Integration Fixes

Data File: \\Lims\gdrive\ezchrom\Projects\GC07\Data\278_013

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Lowest Point Horizontal Baseli	0	26.017	0
Yes	Split Peak	5.866	0	0

Sequence File: **\\Lims\gdrive\ezchrom\Projects\GC07\Sequence\275.seq**
Sample Name: **ccv/lcs,qc514903,155609,tvh,s13072,7.5/5000**
Data File: **\\Lims\gdrive\ezchrom\Projects\GC07\Data\275_009**
Instrument: GC07 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)
Method Name: \\Lims\gdrive\ezchrom\Projects\GC07\Method\tvhbtxe267.met

Software Version 3.1.7
Run Date: 10/2/2009 4:15:16 PM
Analysis Date: 10/5/2009 1:47:57 PM
Sample Amount: 5 Multiplier: 5
Vial & pH or Core ID: {Data Description}



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No items selected for this section

Integration Events

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Width	0	0	0.2
Yes	Threshold	0	0	50

Manual Integration Fixes

Data File: \\Lims\gdrive\ezchrom\Projects\GC07\Data\275_009

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Split Peak	5.908	0	0

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	215229	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 3520C
Project#:	09OAK06.1000	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	09/25/09
Units:	ug/L	Received:	09/25/09
Diln Fac:	1.000	Prepared:	10/01/09
Batch#:	155561		

Field ID:	E-1	Analyzed:	10/04/09
Type:	SAMPLE	Cleanup Method:	EPA 3630C
Lab ID:	215229-001		

Analyte	Result	RL
Diesel C10-C24	ND	50
Motor Oil C24-C36	ND	300

Surrogate	%REC	Limits
o-Terphenyl	83	60-130

Field ID:	BTW-2	Analyzed:	10/05/09
Type:	SAMPLE	Cleanup Method:	EPA 3630C
Lab ID:	215229-002		

Analyte	Result	RL
Diesel C10-C24	ND	50
Motor Oil C24-C36	ND	300

Surrogate	%REC	Limits
o-Terphenyl	91	60-130

Field ID:	I-1	Lab ID:	215229-003
Type:	SAMPLE	Analyzed:	10/05/09

Analyte	Result	RL
Diesel C10-C24	4,400	50
Motor Oil C24-C36	480	300

Surrogate	%REC	Limits
o-Terphenyl	99	60-130

Type:	BLANK	Analyzed:	10/05/09
Lab ID:	QC514703	Cleanup Method:	EPA 3630C

Analyte	Result	RL
Diesel C10-C24	ND	50
Motor Oil C24-C36	ND	300

Surrogate	%REC	Limits
o-Terphenyl	88	60-130

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Total Extractable Hydrocarbons

Lab #:	215229	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 3520C
Project#:	09OAK06.1000	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	155561
Units:	ug/L	Prepared:	10/01/09
Diln Fac:	1.000	Analyzed:	10/04/09

Type: BS Cleanup Method: EPA 3630C
Lab ID: QC514704

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,376	95	53-122

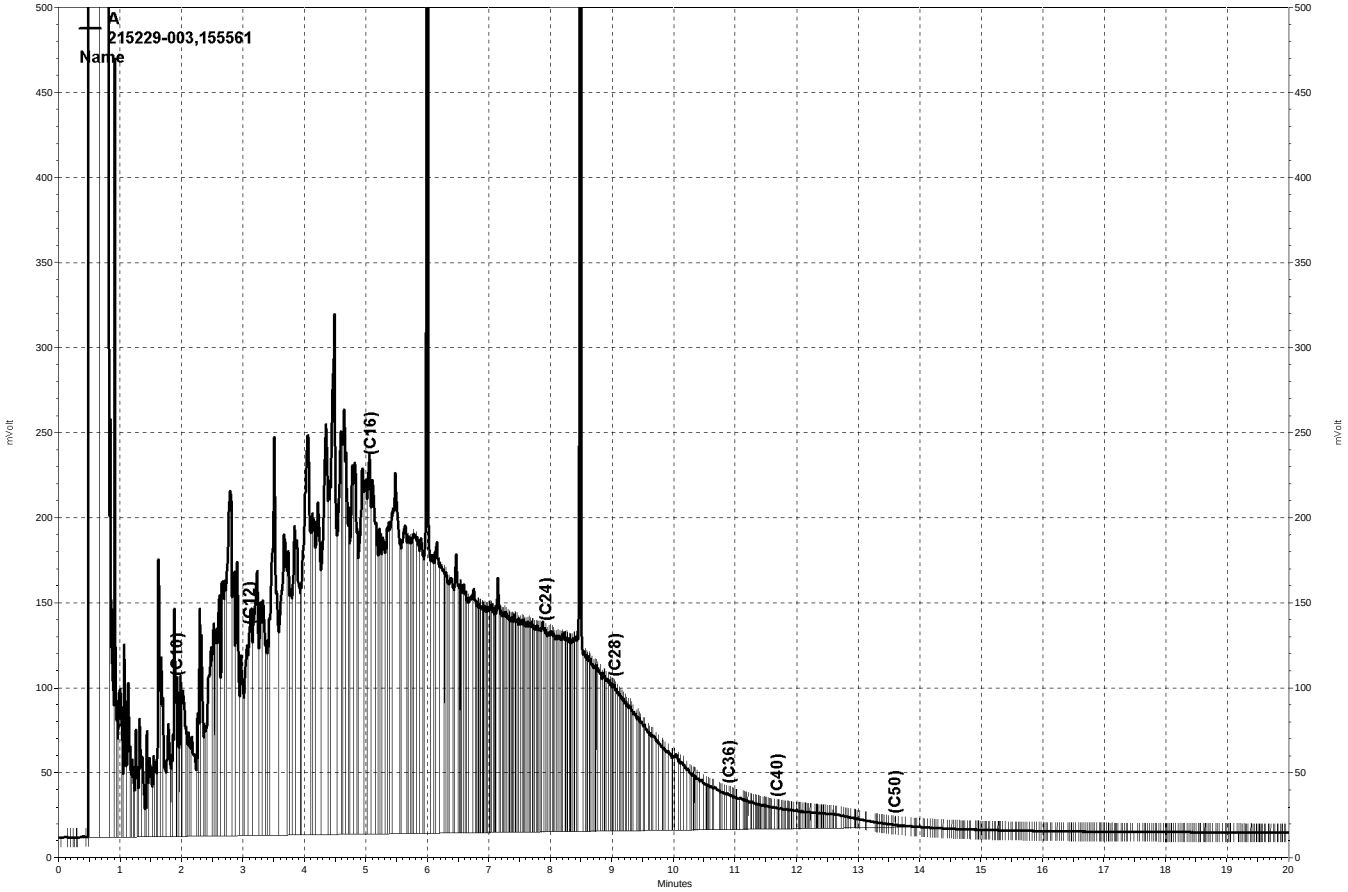
Surrogate	%REC	Limits
o-Terphenyl	105	60-130

Type: BSD Cleanup Method: EPA 3630C
Lab ID: QC514705

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	2,428	97	53-122	2	36

Surrogate	%REC	Limits
o-Terphenyl	109	60-130

RPD= Relative Percent Difference



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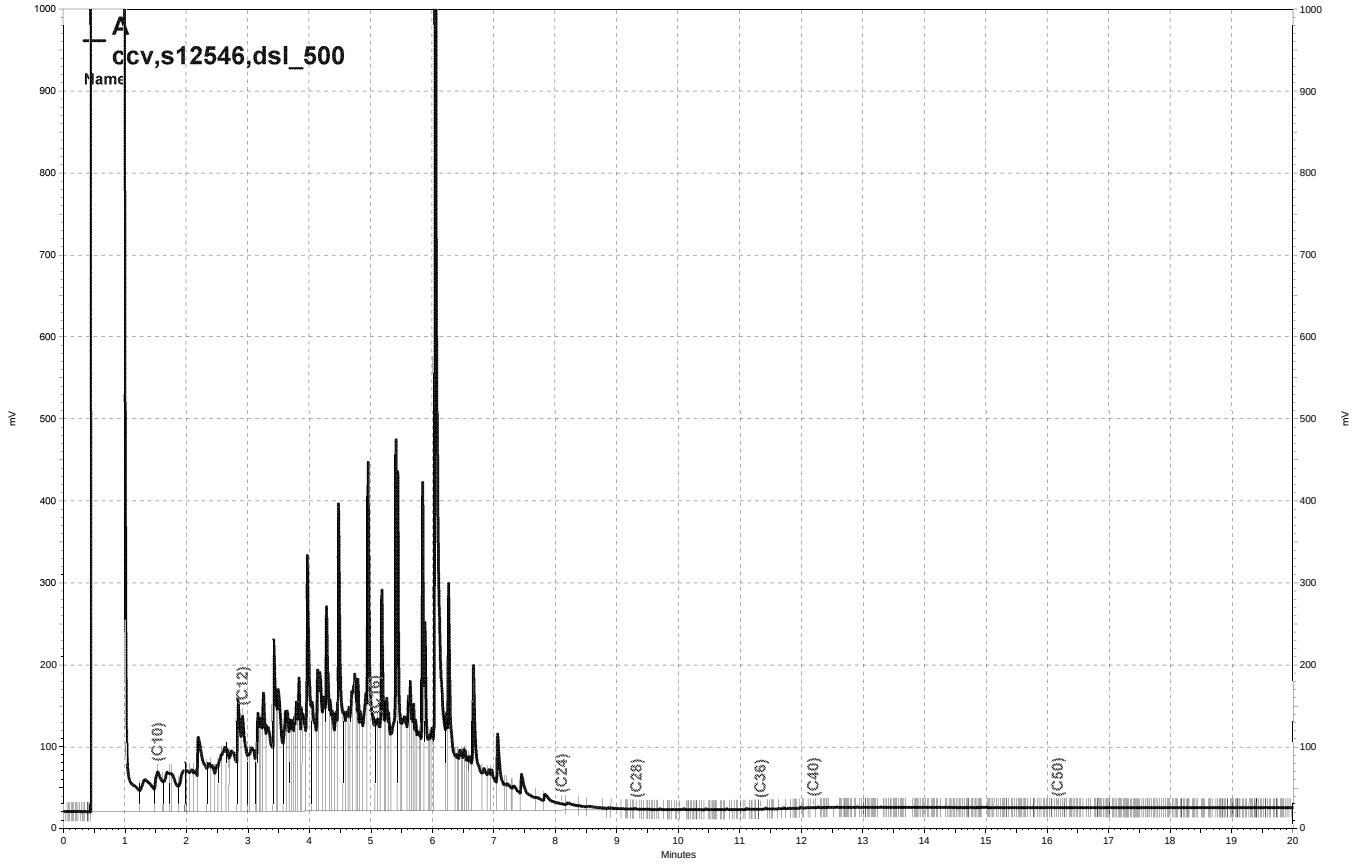

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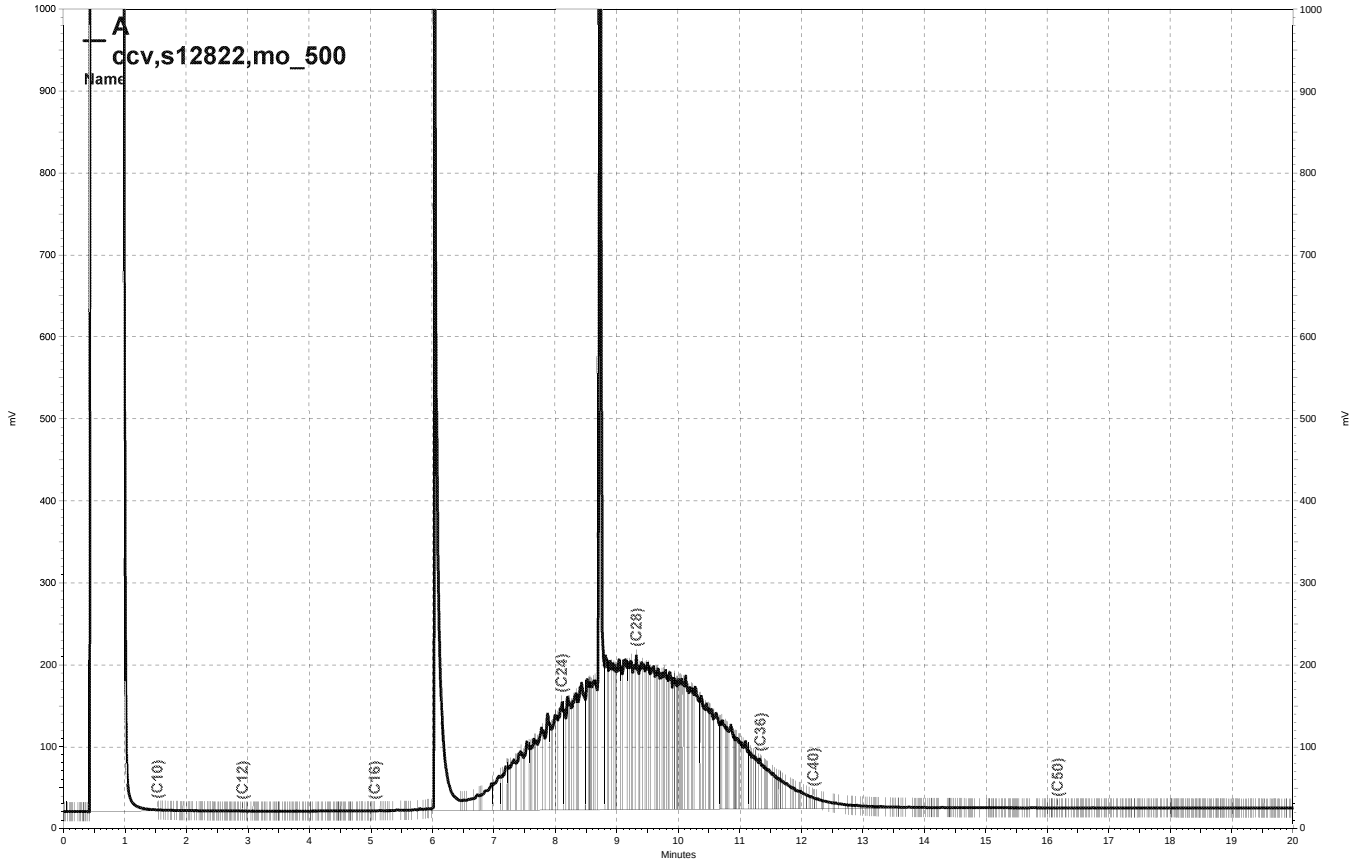

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Curtis & Tompkins, Ltd.

Polynuclear Aromatics by HPLC

Lab #:	215229	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 3520C
Project#:	09OAK06.1000	Analysis:	EPA 8310
Field ID:	E-1	Batch#:	155485
Lab ID:	215229-001	Sampled:	09/25/09
Matrix:	Water	Received:	09/25/09
Units:	ug/L	Prepared:	09/30/09
Diln Fac:	1.000	Analyzed:	10/02/09

Analyte	Result	RL
Naphthalene	ND	0.94
Acenaphthylene	ND	1.9
Acenaphthene	ND	0.94
Fluorene	ND	0.19
Phenanthrene	ND	0.09
Anthracene	ND	0.09
Fluoranthene	ND	0.19
Pyrene	ND	0.09
Benzo(a)anthracene	ND	0.09
Chrysene	ND	0.09
Benzo(b)fluoranthene	ND	0.19
Benzo(k)fluoranthene	ND	0.09
Benzo(a)pyrene	ND	0.09
Dibenz(a,h)anthracene	ND	0.19
Benzo(g,h,i)perylene	ND	0.19
Indeno(1,2,3-cd)pyrene	ND	0.09

Surrogate	%REC	Limits
1-Methylnaphthalene (UV)	98	56-123
1-Methylnaphthalene (F)	92	58-117

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Polynuclear Aromatics by HPLC

Lab #:	215229	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 3520C
Project#:	09OAK06.1000	Analysis:	EPA 8310
Field ID:	I-1	Batch#:	155485
Lab ID:	215229-003	Sampled:	09/25/09
Matrix:	Water	Received:	09/25/09
Units:	ug/L	Prepared:	09/30/09
Diln Fac:	1.000	Analyzed:	10/02/09

Analyte	Result	RL
Naphthalene	1.3	0.95
Acenaphthylene	ND	1.9
Acenaphthene	ND	0.95
Fluorene	0.38	0.19
Phenanthrene	ND	0.10
Anthracene	ND	0.10
Fluoranthene	0.68	0.19
Pyrene	0.83	0.10
Benzo(a)anthracene	0.22	0.10
Chrysene	0.25	0.10
Benzo(b)fluoranthene	ND	0.19
Benzo(k)fluoranthene	ND	0.10
Benzo(a)pyrene	0.20	0.10
Dibenz(a,h)anthracene	ND	0.19
Benzo(g,h,i)perylene	0.34	0.19
Indeno(1,2,3-cd)pyrene	0.12	0.10

Surrogate	%REC	Limits
1-Methylnaphthalene (UV)	95	56-123
1-Methylnaphthalene (F)	89	58-117

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Polynuclear Aromatics by HPLC

Lab #:	215229	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 3520C
Project#:	09OAK06.1000	Analysis:	EPA 8310
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC514396	Batch#:	155485
Matrix:	Water	Prepared:	09/30/09
Units:	ug/L	Analyzed:	10/02/09

Analyte	Result	RL
Naphthalene	ND	1.0
Acenaphthylene	ND	2.0
Acenaphthene	ND	1.0
Fluorene	ND	0.20
Phenanthrene	ND	0.10
Anthracene	ND	0.10
Fluoranthene	ND	0.20
Pyrene	ND	0.10
Benzo(a)anthracene	ND	0.10
Chrysene	ND	0.10
Benzo(b)fluoranthene	ND	0.20
Benzo(k)fluoranthene	ND	0.10
Benzo(a)pyrene	ND	0.10
Dibenz(a,h)anthracene	ND	0.20
Benzo(g,h,i)perylene	ND	0.20
Indeno(1,2,3-cd)pyrene	ND	0.10

Surrogate	%REC	Limits
1-Methylnaphthalene (UV)	98	56-123
1-Methylnaphthalene (F)	92	58-117

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Polynuclear Aromatics by HPLC

Lab #:	215229	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 3520C
Project#:	09OAK06.1000	Analysis:	EPA 8310
Matrix:	Water	Batch#:	155485
Units:	ug/L	Prepared:	09/30/09
Diln Fac:	1.000	Analyzed:	10/06/09

Type: BS Lab ID: QC514397

Analyte	Spiked	Result	%REC	Limits
Naphthalene	10.00	11.98	120 *	73-105
Acenaphthylene	20.00	24.73	124 *	78-109
Acenaphthene	10.00	12.01	120 *	73-107
Fluorene	2.000	2.417	121 *	77-107
Phenanthrene	1.000	1.230	123 *	76-108
Anthracene	1.000	1.266	127 *	72-104
Benzo(k)fluoranthene	1.000	1.220	122 *	77-107
Indeno(1,2,3-cd)pyrene	1.000	1.199	120 *	74-107

Surrogate	%REC	Limits
1-Methylnaphthalene (UV)	107	56-123
1-Methylnaphthalene (F)	108	58-117

Type: BSD Lab ID: QC514398

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Naphthalene	10.00	9.640	96	73-105	22 *	19
Acenaphthylene	20.00	20.21	101	78-109	20 *	18
Acenaphthene	10.00	9.882	99	73-107	19	20
Fluorene	2.000	1.970	99	77-107	20 *	17
Phenanthrene	1.000	0.9915	99	76-108	22 *	16
Anthracene	1.000	1.040	104	72-104	20 *	17
Benzo(k)fluoranthene	1.000	0.9916	99	77-107	21 *	16
Indeno(1,2,3-cd)pyrene	1.000	0.9960	100	74-107	19 *	17

Surrogate	%REC	Limits
1-Methylnaphthalene (UV)	91	56-123
1-Methylnaphthalene (F)	92	58-117

*= Value outside of QC limits; see narrative
RPD= Relative Percent Difference