SELF-MONITORING REPORT – FOURTH QUARTER & YEAR 2008 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

January 15, 2009

Prepared by

OTG

Enviroengineering Solutions, Inc.

464 19th Street, Suite 206
Oakland, CA 94612

under a subcontract to

Fugro West Inc.

1000 Broadway, Suite 440
Oakland, CA 94607

Oakland
All-America City
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CITY OF OAKLAND

DALZIEL BUILDING • 250 FRANK H. OGAWA PLAZA, SUITE 5301 • OAKLAND, CALIFORNIA 94612-2034

Public Works Agency
Environmental Services

FAX (510) 238-7286
TDD (510) 238-7644

January 16, 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 – Fourth Quarter and Year 2008
Groundwater Remediation at 7101 Edgewater Drive, Oakland, California

Dear Ms. Gonzales:

The City of Oakland is pleased to submit this Self-Monitoring Report, Fourth Quarter and Year 2008, 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 Fugro West Inc. and OTG Environgineering 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

Gopal Nair
Environmental Program Specialist

OTG **EnviroEngineering** ***Solutions, Inc.***

January 14, 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 – Fourth Quarter and Year 2008
Groundwater Remediation at 7101 Edgewater Drive, Oakland, CA

Dear Mr. Nair:

OTG Enviroengineering Solutions, Inc. (OTG) is pleased to submit this Self-Monitoring Report, Fourth Quarter and Year 2008, 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 Fugro West 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. Glenn Young, P.G., Fugro West 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) leases the land from the Port of Oakland for use as a corporation yard. 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 MSC 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. 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 in 2000 identified the existence of free-phase petroleum hydrocarbon product at four separate areas at the site, labeled as 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 fourth Quarter of 1989 through third quarter of 2002 and then semi-annually to current. Shallow groundwater elevation varies from 2 to 10 feet below ground surface and is partially subject to tidal influence. Shallow groundwater flow is toward the southwest to the nearest shoreline along San Leandro Bay across much of the site. In the northern portion of the MSC, groundwater flows in a more northerly direction toward the curving shoreline and Damon Slough (Baseline, January 2001)

Pilot-scale groundwater/soil vapor dual-phase extraction (DPE) tests were conducted in 2002 to enhance 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 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. 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 was turned on. On May 14, 2007, the DPE portion of the remediation system was turned on. Six additional extraction wells (RW-D6 through RW-D11) were installed within Plume D area in March 2007 (URS, May 2007). They were connected to the DPE system and were brought on-line under extraction on June 11, 2007.

2. DESCRIPTION OF REMEDIATION SYSTEM

The remediation system consists of extraction of liquid (petroleum product and groundwater) and soil vapor from 13 wells located in the Plume D area, separation of petroleum product from groundwater, treatment of groundwater by activated carbon, discharge of treated water to 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).

The 13 extraction wells are: RW-D1 through RW-D11, TBW-5 and RW-1. Their locations are shown on Figure 3. Wells 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. All wells, except RW-D6 through RW-D11, were equipped with both total fluid recovery pneumatic pumps specifically designed for viscous petroleum product recovery and vacuum lines for liquid/soil vapor 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. All wells are piped into a high vacuum extraction unit that can produce up to 28 inches of mercury vacuum. This vacuum unit can be operated at either soil vapor extraction only mode or simultaneous soil vapor and liquid extraction mode. The pneumatic pumps and the vacuum extraction unit can be operated independently.

The liquid extracted by the pneumatic pumps and the vacuum unit 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 lbs of GAC. Figure 5 illustrates the groundwater treatment portion of the remediation system and identifies sampling ports.

A 40 hp liquid-ring vacuum pump capable of 550 actual cubic feet per minute (ACFM) and up to 28” Hg extracts soil vapor and liquid from the 13 wells. The vapor is abated by a combination of thermal and catalytic oxidizer. At low vapor organic concentrations, activated carbon can also be used for vapor abatement.

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. The plan was to first use the pneumatic pumps to remove the free-phase product as much as practically achievable, and then to use 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 newly installed six wells (RW-D6 through RW-D11) were also brought on-line under DPE operations.

The groundwater extraction, treatment, and discharge system was operated continuously from January through June 2008, except shutdowns during weekly maintenance. However, operation difficulties increased significantly during the second half of 2008 and required frequent extended shutdowns for maintenance. The viscous organic matter extracted has progressively coated piping interior and various control sensors. It also clogged the radiator that provided cooling for the vacuum pump, causing frequent pump overheating and system shutdown. The remediation system was shutdown on November 14, 2008 for overhaul. The radiator and several control sensors were replaced in December 2008. Cleaning of piping interior continued through early January 2009. Routine operations and maintenance (O&M) of the system includes daily check of air compressor's oil & pressure levels, functions of liquid level sensors and pumps, draining condensate from air tank, 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 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 (Appendices A and B).

4 DISCHARGE MONITORING – FOURTH QUARTER AND YEAR 2008

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.

Major Highlights for the Fourth Quarter 2008 are the following:

- Groundwater extracted by the pneumatic pumps and the DPE for this reporting period (October 1 through December 31, 2008) totaled 62,010 gallons, which was treated and discharged into the local storm drain, resulting in an average monthly flow rate of 1.129 gallons per minute (gpm) in October, 0.294 gpm in November, and 0 gpm in December (Table 2). The remediation system was shutdown from November 14 through December 31 for overhaul. The viscous organic matter extracted has progressively coated piping interior and various control sensors and has clogged the radiator that provided cooling for the vacuum pump. The radiator and several control sensors were replaced in December.
- No separate-phase floating product was recovered, Approximately 5.5 lbs of total petroleum hydrocarbons (TPH, gasoline + diesel) was removed through the extracted groundwater (dissolved in groundwater), and 133 lbs of TPH was removed through soil vapor by the DPE (Table 8). The total weight of TPH removed from Plume D this quarter was 138.5 lbs, of which 96% was removed by the DPE through soil vapor extracted. Since the remediation system started in May 2006, a total of 57,679 lbs, or 8,149 gallons, of TPH has been removed from Plume D (Table 8). The recovered floating product was highly viscous and black in color. Its appearance does not resemble gasoline or diesel.
- Monthly monitorings were conducted on October 24 and November 14. There was no monitoring in December as the system was shutdown for overhaul. Monthly monitoring results are summarized in Tables 2, 3, and 5.
- The average concentrations for the influent (after the oil/water separator, but before the carbon treatment) for the fourth quarter 2008 were 1.0 mg/L TPHg, 9.05 mg/L TPHd,

and 0.0145 mg/L benzene. These concentrations are significant below their respective concentrations as measured at the start of the remediation system (Table 3).

- The effluent (treated groundwater) had pH values between 7.05 and 7.1, temperatures between 20.4 and 22.1 °C, conductivities between 11.55 and 11.75 mS/cm, and a turbidity of 4.0 NTU (Table 2).
- TPHg; TPHd; TPHmo; benzene, toluene, ethylbenzene, and xylenes (BTEX); and MTBE in the monthly effluent samples were all below their respective reporting limits. The reporting limit was 0.5 ug/L for BTEX and MTBE, 50 ug/L for TPHd and TPHd, and 300 ug/L for TPHmo (Table 3).
- The detection of tertiary Butyl Alcohol (TBA) in the August effluent sample (130 ug/L) triggered monthly sampling in September, October, and November for fuel oxygenates analysis in both the influent and the effluent. TBA was again detected in the subsequent three monthly samples in excess of 5 ug/L in both the influent and the effluent. TBA has broken through the activated carbon vessels. An activated carbon change service has been scheduled on January 2, 2009. There was no discharge in December.

Major Highlights for Year 2008 are the following:

- A total of 701,950 gallons of groundwater was extracted from January through December 2008, which was treated and discharged into local storm drain, resulting in an average flow rate of 1.336 gpm. Monthly groundwater extraction rate and volume are presented in Table 2.
- No free-phase floating product was encountered in 2008. A total of 14,432 lbs (or 2,039 gallons) of TPH (gas + diesel) was removed through groundwater and soil vapor extraction in 2008 (Table 8).
- Monitorings were conducted following the requirement of NPDES Permit No. CAG912002. No violations of the NPDES Permit requirements were identified throughout 2008. Monitoring results are summarized in Tables 1 through 6.
- The effluent (treated groundwater before entering storm drain) had pHs between 6.95 and 7.2, temperatures between 17.4 and 23.9 °C, conductivities between 11.49 and 19.69 mS/cm, and turbidities between 0.5 and 6.42 NTU (Table 2).
- TPHg, TPHd, TPHmo, BTEX, and MTBE in the monthly effluent samples were all below their respective reporting limits. The reporting limit was 0.5 ug/L for BTEX and MTBE (2.0 ug/L for MTBE when using EPA Method 8021B), 50 ug/L for TPHd and TPHd, and 300 ug/L for TPHmo (Table 3).
- No VOCs (by EPA Method 8260) and SVOCs (by EPA Methods 8310 and 8270) were reported in the effluent throughout 2008, except TBA, which was first reported in the effluent in August at 130 ug/L. Subsequent three additional monthly samples confirmed the presence of TBA in both the effluent and the influent in concentrations higher than its trigger level of 5 ug/L. An activated carbon change service has been scheduled on January 2, 2009, to replace the carbon with new activated carbon.
- The rainbow trout survival rate was 100% in the 96-hour static renewal bioassay conducted for the effluent sample collected in the first quarter 2008 (Table 4). After the

first year of quarterly testing, the fish bioassay is under annual monitoring schedule for subsequent years of operations. The next scheduled testing is in the first quarter 2009.

- The remediation system was shutdown from November 14 through the end of December for major maintenance activities. The extracted viscous organic matter has progressively coated piping interior and various control sensors. It also clogged the radiator that provided cooling for the vacuum pump. The radiator and several control sensors were replaced in December. Cleaning of piping interior continued through early January 2009.

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.

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	9/5/06	10/4/06	11/8/06	1/19/07	3/14/07	4/24/07	7/27/07
				& 8/11/06		& 12/6/06		& 2/22/07		5/17 & 6/21	
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		
Flow rate	on-site totalizer	on-site totalizer		
Turbidity	on-site	on-site		
pH	on-site	on-site		
Temperature	on-site	on-site		
E. conductivity	on-site	on-site		
Fish bioassay				
Benzene	EPA 8260B	EPA 8260B		
Toluene	EPA 8260B	EPA 8260B		
Ethylbenzene	EPA 8260B	EPA 8260B		
Total xylenes	EPA 8260B	EPA 8260B		
MTBE	EPA 8260B	EPA 8260B		
TPHg & TPHd	EPA 8015B	EPA 8015B		
EDB	EPA 8260B	EPA 8260B		
VOCs	EPA 8260B	EPA 8260B		
TAME	EPA 8260B	EPA 8260B		
DIPE	EPA 8260B	EPA 8260B		
ETBE	EPA 8260B	EPA 8260B		
TBA	EPA 8260B	EPA 8260B		
Ethanol	--	--		
Methanol	--	--		
SVOCs	--	--		
PAHs	--	--		
Hardness	--	--		
Antimony	--	--		
Arsenic	--	--		
Beryllium	--	--		
Cadmium	--	--		
Chromium	--	--		
Cr +6	--	--		
Copper	--	--		
Cyanide	--	--		
Lead	--	--		
Mercury	--	--		
Nickel	--	--		
Selenium	--	--		
Silver	--	--		
Thallium	--	--		
Zinc	--	--		

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	17.40	12.85	1.15	6.99	20.10	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	18.40	14.01	2.32	6.99	19.10	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	18.60	19.62	1.58	7.03	20.00	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	20.40	18.87	6.42	7.10	21.20	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	17.50	19.69	1.37	7.15	19.10	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	22.30	17.61	0.50	7.16	27.70	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	23.90	14.63	1.00	7.24	25.40	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	23.50	11.49	3.00	7.12	27.30	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	22.10	11.75	4.00	7.10	25.80	12.22		sampled	2,365,580				monthly monitoring
10/31/2008	18:00										2,375,580	50,300	0.129	379	
11/10/2008	16:30										2,379,380				
11/14/2008	15:00	7.10	20.40	11.55	4.00	7.15	22.60	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	
		--	--	--	--	--	--	--	--	--					

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)

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)

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
Antimony	µg/L	6	**2.30**	**1.80**	**0.12**	**0.13**	**0.35**	**0.15**	--	**0.47 J**
	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**
	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)
	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**
	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**
	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)
	g/day	2	--	--	--	--	--	--	--	--
Copper	µg/L	3.1	**1.30**	**0.90**	**1.30**	**1.50**	**1.20**	ND (0.28)	--	**0.70 J**
	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**
	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)
	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**
	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)
	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)
	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)
	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**
	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**
	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%**

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
Antimony	µg/L		ND (60)	ND (1)	--	--	--	**1.10**	--	**0.74 J**
	g/day	3	--	--	--	--	--	**0.01194**	--	**0.006279**
Arsenic	µg/L		**7.20**	**8.50**	--	--	--	**5.40**	--	**6.1**
	g/day	1	**0.06689**	**0.07897**	--	--	--	**0.05859**	--	**0.054717**
Beryllium	µg/L		ND (2)	ND (1)	--	--	--	ND (0.17)	--	ND (1.0)
	g/day	3	--	--	--	--	--	--	--	--
Cadmium	µg/L		**34.00**	**10.00**	--	--	--	**0.33**	--	**1.6**
	g/day	1	**0.31586**	**0.09290**	--	--	--	**0.00358**	--	**0.014352**
Total Cr	µg/L		ND (10)	ND (1)	--	--	--	**0.91**	--	**0.72 J**
	g/day	2	--	--	--	--	--	**0.00987**	--	**0.006279**
Cr +6	µg/L		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**
	g/day	3	**2.32250**	**0.23225**	--	--	--	--	--	**0.082524**
Lead	µg/L		**28.00**	**21.00**	--	--	--	**8.10**	--	**18**
	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)
	g/day	0.01	--	--	--	--	--	**0.00051**	--	--
Nickel	µg/L		**68.00**	**19.00**	--	--	--	**2.80**	--	**6.4**
	g/day	5	**0.63172**	**0.17651**	--	--	--	**0.03038**	--	**0.057408**
Selenium	µg/L		**9.40**	ND (1)	--	--	--	**0.31**	--	**0.34 J**
	g/day	2	**0.08733**	--	--	--	--	**0.00336**	--	**0.006279**
Silver	µg/L		ND (5)	ND (1)	--	--	--	ND (0.079)	--	ND (1.0)
	g/day	1	--	--	--	--	--	--	--	--
Thallium	µg/L		**25.00**	ND (1)	--	--	--	ND (0.30)	--	ND (1.0)
	g/day	3	**0.23225**	--	--	--	--	--	--	--
Zinc	µg/L		**31.00**	**57.00**	--	--	--	**23.00**	--	**37**
	g/day	10	**0.28799**	**0.52953**	--	--	--	**0.24955**	--	**0.33189**
Cyanide	µg/L		**10.00**	**10.00**	--	--	**20.00**	**30.00**	--	**0.8**
	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
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
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)
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)
Carbon tetrachloride	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)	--	--
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)	--	--
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)
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)	--	--
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)
Methylene chloride	5	ND (0.5)	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)	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)
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)	--	--
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)	--	--
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)	--	--
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)	--	--
Trichloroethene	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)	--	--
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)
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)
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)
Trichlorotrifluoroethane	5	ND (5)	ND (5)	ND (5)	ND (1.0)	--	--	--	--	--	--	--	--	--	--	ND (2.0)	ND (2.0)	--	--
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)
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)
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)
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)
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)
TBA		ND (10)	ND (10)	ND (10)	**140**	**140**	**160**	**160**	ND (10)	ND (10)	ND (10)	--	--	--	--	**130**	**87**	**120**	**92**
Ethanol		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)		--	--
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)		--	--
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)		--	--

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
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)
Benzene		**4,900**	--	**2,700**	--	**78**	**22**	**120**	**160**	**100**	ND (0.5)	**43**	**19**	**23**	**9**	--	**18**	**14**	**15**
Carbon tetrachloride		ND (36)	--	ND (13)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--
Chloroform		ND (36)	--	ND (13)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--
1,1-Dichloroethane		ND (36)	--	ND (13)	--	--	--	--	--	--	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)
1,1-Dichloroethene		ND (36)	--	ND (13)	--	--	--	--	--	--	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**
Methylene chloride		ND (36)	--	ND (250)	--	--	--	--	--	--	ND (10)	--	--	--	--	--	ND (10)	--	--
Tetrachloroethene		ND (36)	--	ND (13)	--	--	--	--	--	--	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**
c-1,2-Dichloroethene		ND (36)	--	ND (13)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--
t-1,2-Dichloroethene		ND (36)	--	ND (13)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--
1,1,1-Trichloroethane		ND (36)	--	ND (13)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--
1,1,2-Trichloroethane		ND (36)	--	ND (13)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--
Trichloroethene		ND (36)	--	ND (13)	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	ND (0.5)	--	--
Vinyl chloride		ND (36)	--	ND (13)	--	--	--	--	--	--	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**
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)
Ethylene dibromide		ND (36)	--	ND (13)	--	ND (0.5)	--	--	--	--	--	--	--	--	--	--	ND (0.5)	ND (0.5)	ND (0.5)
Trichlorotrifluoroethane		ND (360)	--	ND (13)	--	--	--	--	--	--	--	--	--	--	--	--	ND (2.0)	--	--
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**
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**
TAME		ND (36)	--	ND (13)	--	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)
ETBE		ND (36)	--	ND (13)	--	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**
Ethanol		ND(1,000)	--	ND(1,000)	--	--	--	--	--	--	ND (1,000)	--	--	--	--	--		--	--
Methanol		ND(1,000)	--	ND(1,000)	--	--	--	--	--	--	ND (1,000)	--	--	--	--	--		--	--
Isopropylbenzene		**40**	--	**16**	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	ND (0.5)		
Propylbenzene		**120**	--	**36**	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	**0.7**		
1,3,5-Trimethylbenzene		**410**	--	**270**	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	**36**		
1,2,4-Trimethylbenzene		**1,500**	--	**960**	--	--	--	--	--	--	ND (0.5)	--	--	--	--	--	**60**		
Naphthalene		**370**	--	**260**	--	--	--	--	--	--	ND (2.0)	--	--	--	--	--	**16**		
PAHs (EPA 8310 or 610)																			
Benzo(a)anthracene		**1.7**	--	**0.14**	--	--	--	--	--	--	ND (0.1)	--	--	--	--	--			
Benzo(a)pyrene		**1.6**	--	**0.12**	--	--	--	--	--	--	**0.15**	--	--	--	--	--			
Benzo(g,h,i)perylene		ND (1.0)	--	**0.21**	--	--	--	--	--	--	**0.44**	--	--	--	--	--			
Chrysene		**2.6**	--	**0.17**	--	--	--	--	--	--	**0.13**	--	--	--	--	--			
Fluoranthene		**3.8**	--	**0.63**	--	--	--	--	--	--	ND (0.2)	--	--	--	--	--			
Naphthalene		**130**	--	**230**	--	--	--	--	--	--	ND (0.98)	--	--	--	--	--			
Pyrene		**3.3**	--	**0.56**	--	--	--	--	--	--	**0.28**	--	--	--	--	--			
Acenaphthene		ND (1.0)	--	**130**	--	--	--	--	--	--	ND (0.98)	--	--	--	--	--			
Acenaphthylene		ND (1.0)	--	**58**	--	--	--	--	--	--	ND (2.0)	--	--	--	--	--			
Fluorene		ND (1.0)	--	**6.4**	--	--	--	--	--	--	ND (0.2)	--	--	--	--	--			
Phenanthrene		ND (1.0)	--	**1.6**	--	--	--	--	--	--	ND (0.1)	--	--	--	--	--			
Anthracene		ND (1.0)	--	**0.13**	--	--	--	--	--	--	ND (0.1)	--	--	--	--	--			
SVOCs (EPA 8270C or 625)																			
Dimethylphthalate		**28**	--	ND (97)	--	--	--	--	--	--	ND (.94)	--	--	--	--	--			
bis(2-Ethylhexyl)phthalate		**12**	--	ND (97)	--	--	--	--	--	--	ND (.94)	--	--	--	--	--			
Naphthalene		**290**	--	**160**	--	--	--	--	--	--	ND (.94)	--	--	--	--	--			
Phenol		**13**	--	**270**	--	--	--	--	--	--	ND (.94)	--	--	--	--	--			
All other SVOCs		ND (5)	--	ND (97)	--	--	--	--	--	--	ND (.94)	--	--	--	--	--			

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
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)
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)
Carbon tetrachloride	5	ND (0.5)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	--
Chloroform	5	ND (0.5)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	--
1,1-Dichloroethane	5	ND (0.5)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	--
1,2-Dichloroethane	5	ND (0.5)	--	--	--	ND (0.5)	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	ND (0.5)
1,1-Dichloroethene	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)
Methylene chloride	5	ND (0.5)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND (10)	--	--
Tetrachloroethene	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)
c-1,2-Dichloroethene	5	ND (0.5)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	--
t-1,2-Dichloroethene	5	ND (0.5)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	--
1,1,1-Trichloroethane	5	ND (0.5)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	--
1,1,2-Trichloroethane	5	ND (0.5)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	--
Trichloroethylene	5	ND (0.5)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	--
Vinyl chloride	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)
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)
Ethylene dibromide	5	ND (0.5)	--	--	--	ND (0.5)	--	--	--	--	--	--	--	--	--	--	ND (0.5)	--	ND (0.5)
Trichlorotrifluoroethane	5	ND (5)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND (2.0)	--	--
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)
DIPE		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)
TBA		ND (10)	--	--	--	**86**	--	--	--	--	**--**	--	--	--	--	--	**70**	--	**53**
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
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)
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)
Carbon tetrachloride	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)	--	--
1,1-Dichloroethane	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)
1,1-Dichloroethene	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)
Methylene chloride	5	--	ND (0.5)	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)	--	--
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)
c-1,2-Dichloroethene	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)	--	--
1,1,1-Trichloroethane	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)	--	--
Trichloroethene	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)	--	--
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)
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)
Ethylene dibromide	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)	--	--
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)
TPHd	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)
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)
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)
TBA		--	ND (10)	**110**	--	**130**	--	--	--	--	**22**	--	--	--	--	**140**	**100**	**99**	**74**
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, soil 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															

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	317	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	0.2
Oct-09	95.7	550	0.45	75	244	39,721	370	1,300	114	1.2	4	0.3
Nov-09	16.4	550	0.43	75	233	6,504	370	1,300	19	1.2	4	0.1
Dec-09	0	0	0	75	0	0	0	0	0	0.0	0	0.0

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

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

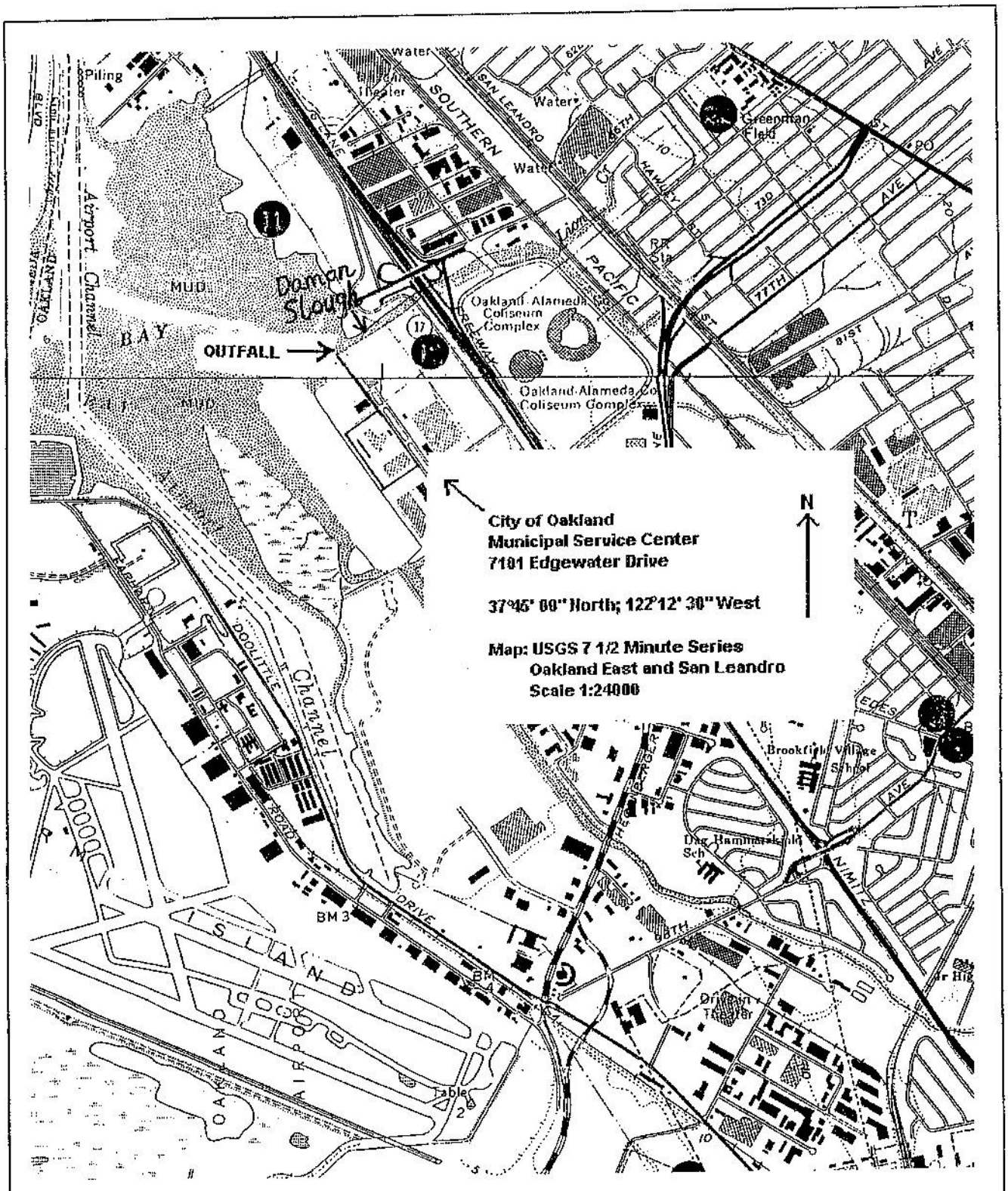


FIGURE 1 SITE LOCATION AND DISCHARGE LOCATION

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

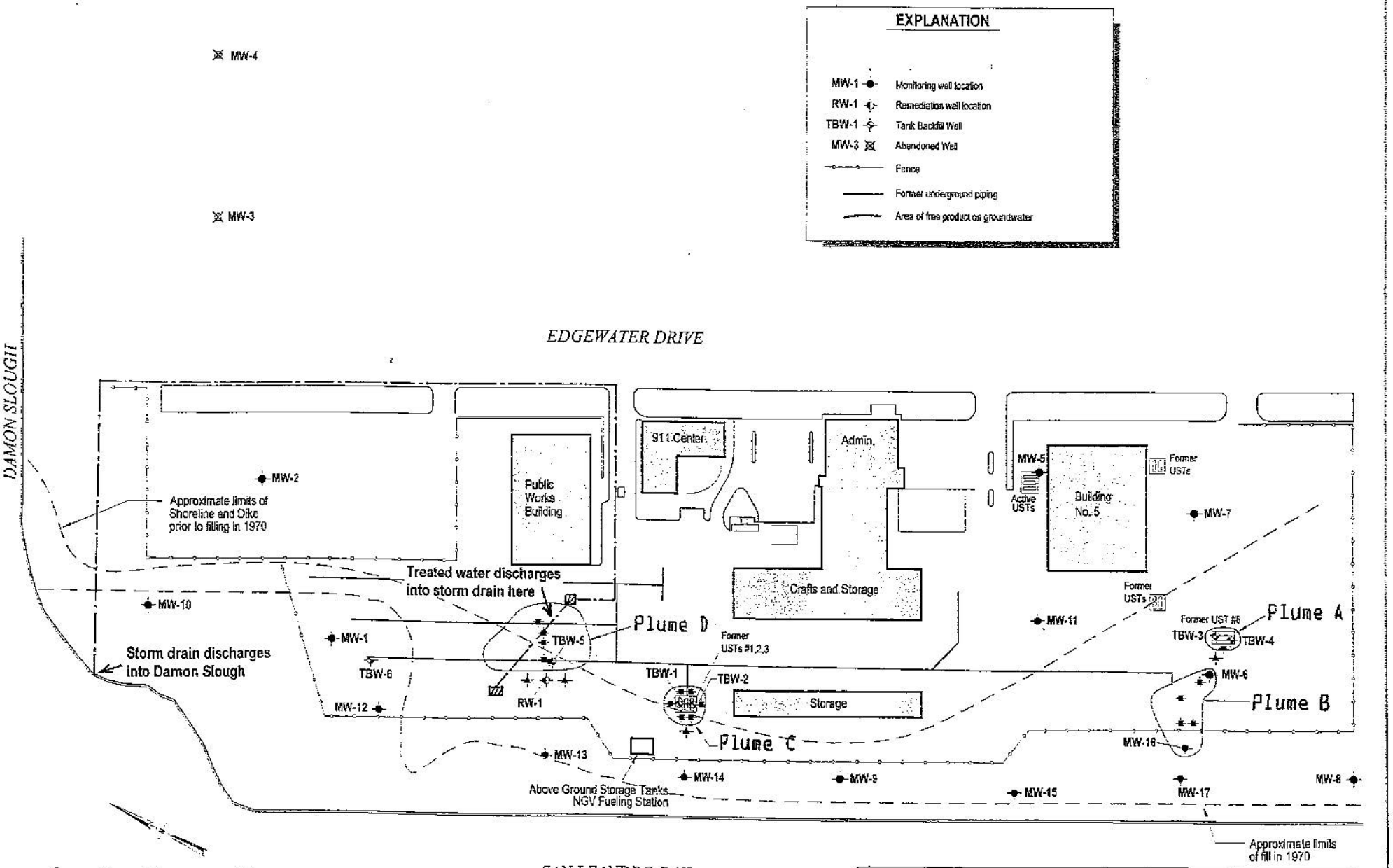


FIGURE 2 Identification of Free-Phase Petroleum Product Locations

EnviroEngineering Solutions, Inc.

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

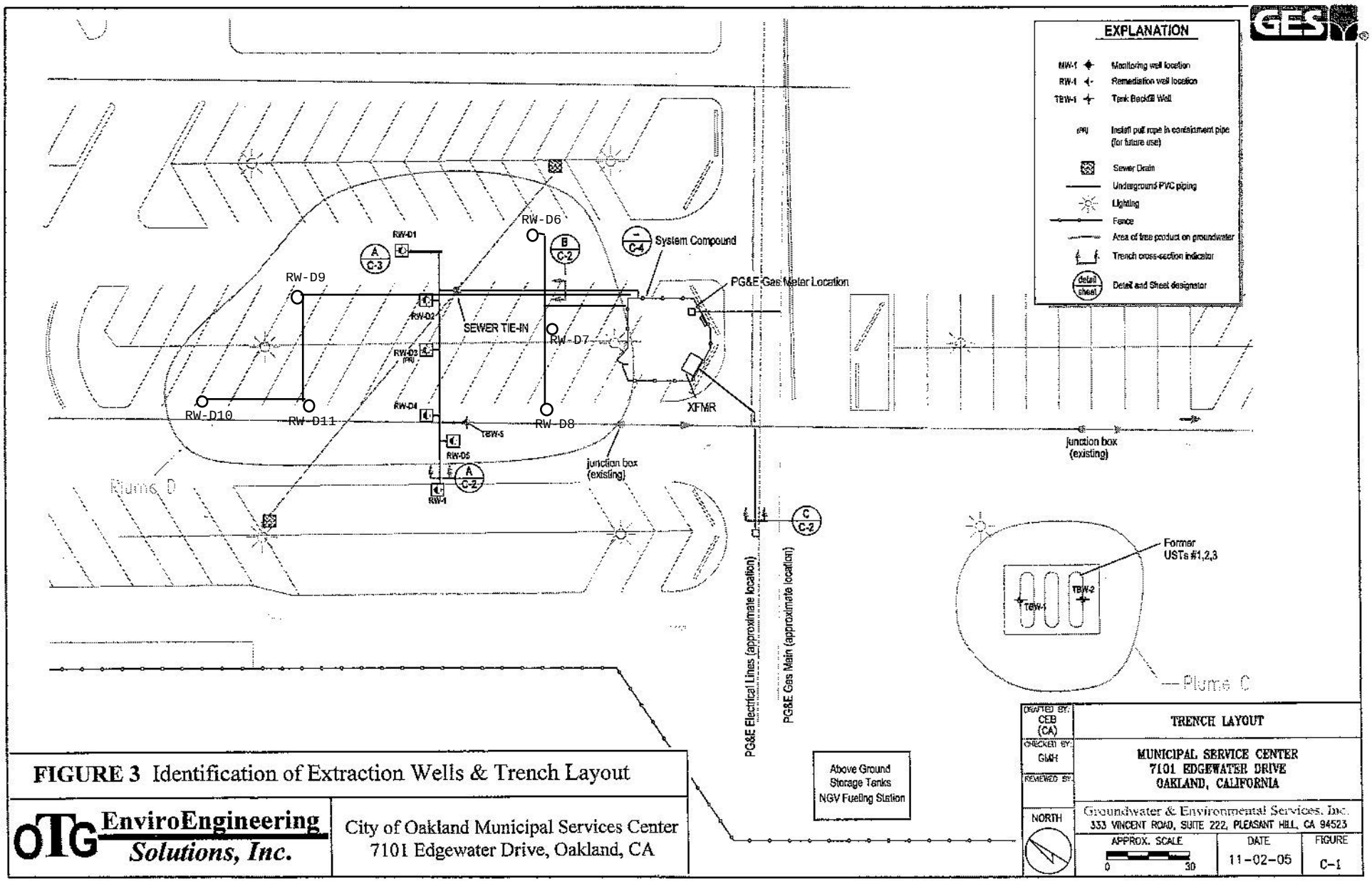
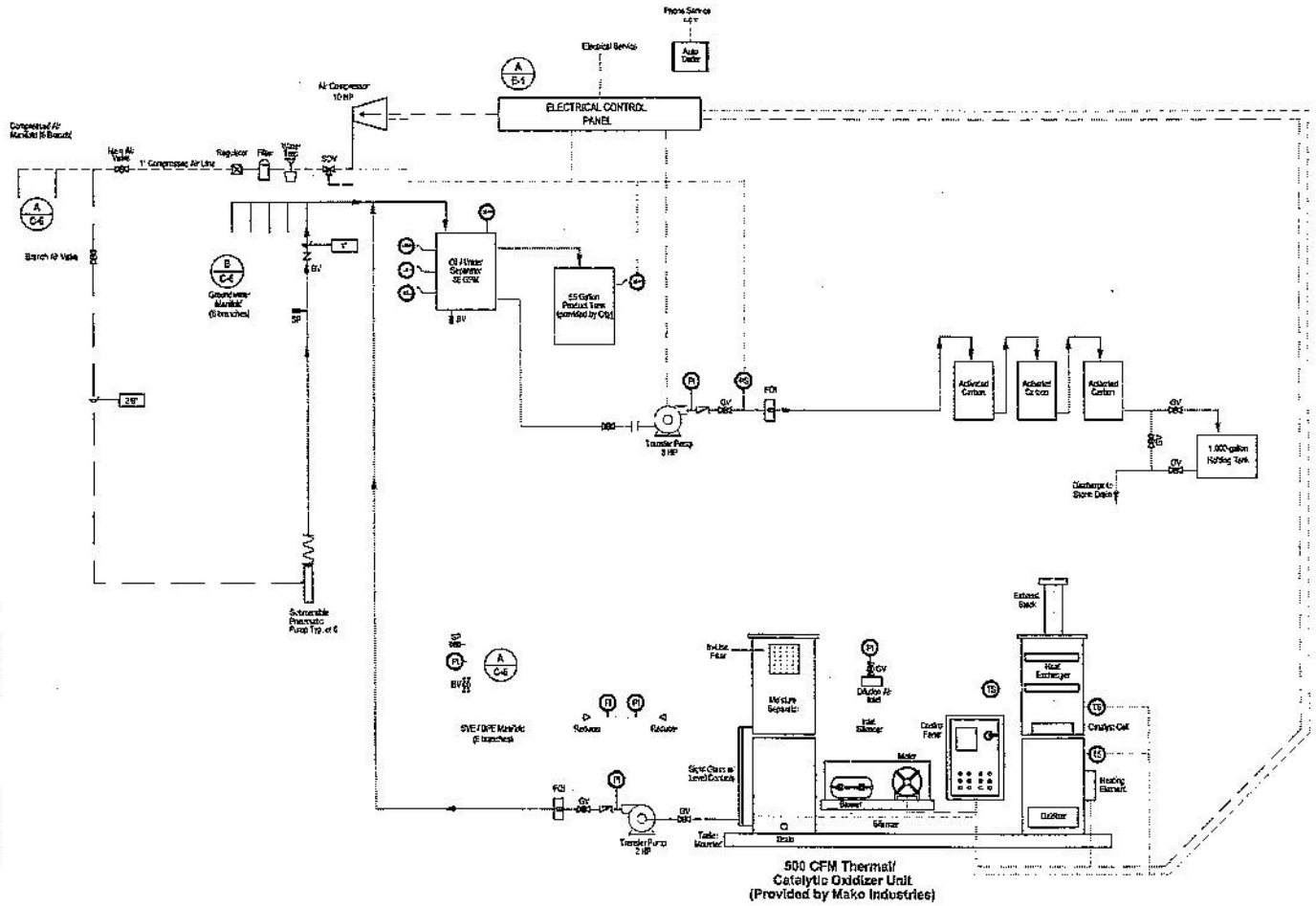


FIGURE 3 Identification of Extraction Wells & Trench Layout

EnviroEngineering Solutions, Inc.

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



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

OTG 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

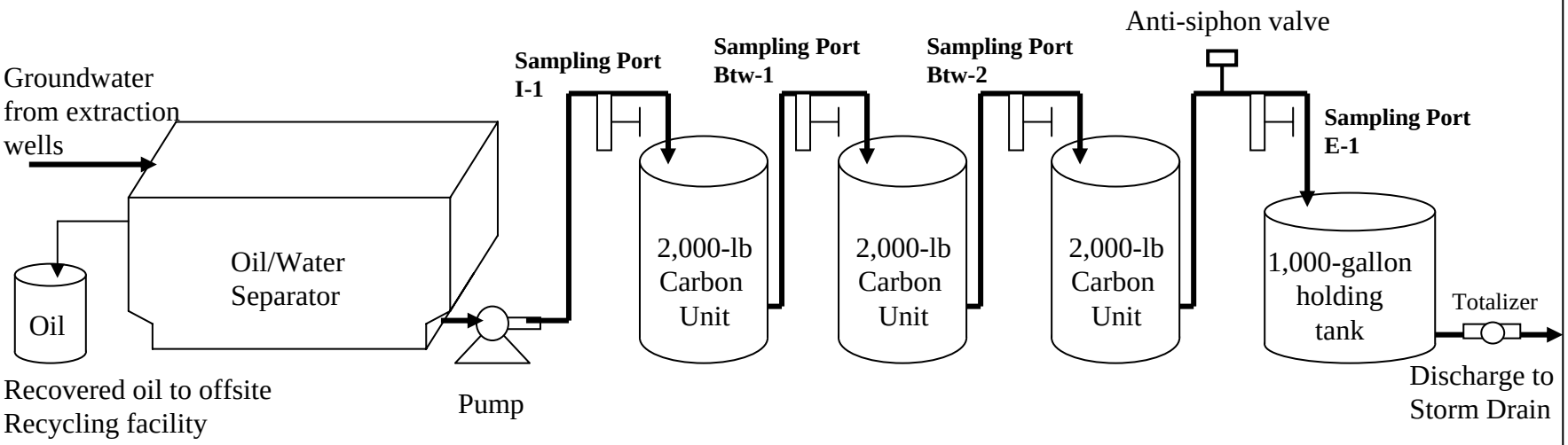


FIGURE 5 Schematic of Groundwater Treatment System and Sampling Locations

June 2006

EnviroEngineering *Solutions, Inc.*

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

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 207165
ANALYTICAL REPORT

OTG Enviroengineering Solutions, Inc	Project : 080AK02.1000
464 19th Street Suite 206	Location : MSC Remediation
Oakland, CA 94612	Level : II

Sample ID	Lab ID
E-1	207165-001
BTW-2	207165-002
I-1	207165-003

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: 11/05/2008
Project Manager

Signature: _____ Date: 11/06/2008
Senior Program Manager

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**207165**
Client:	**OTG Enviroengineering Solutions, Inc**
Project:	**080AK02.1000**
Location:	**MSC Remediation**
Request Date:	**10/24/08**
Samples Received:	**10/24/08**

This data package contains sample and QC results for three water samples, requested for the above referenced project on 10/24/08. The samples were received intact.

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

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

Volatile Organics by GC/MS (EPA 8260B):
No analytical problems were encountered.

Curtis & Tompkins, Ltd.

Total Volatile Hydrocarbons

Lab #:	207165	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	080AK02.1000	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	10/24/08
Units:	ug/L	Received:	10/24/08
Diln Fac:	1.000	Analyzed:	10/25/08
Batch#:	144084		

Field ID: E-1 Lab ID: 207165-001
Type: SAMPLE

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	102	61-149
Bromofluorobenzene (FID)	109	65-146

Field ID: BTW-2 Lab ID: 207165-002
Type: SAMPLE

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	106	61-149
Bromofluorobenzene (FID)	113	65-146

Field ID: I-1 Lab ID: 207165-003
Type: SAMPLE

Analyte	Result	RL
Gasoline C7-C12	1,000	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	111	61-149
Bromofluorobenzene (FID)	106	65-146

Type: BLANK Lab ID: QC467088

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	103	61-149
Bromofluorobenzene (FID)	100	65-146

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	207165	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	080AK02.1000	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	144084
Units:	ug/L	Analyzed:	10/25/08
Diln Fac:	1.000		

Type: BS Lab ID: QC467421

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	944.3	94	78-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	128	61-149
Bromofluorobenzene (FID)	102	65-146

Type: BSD Lab ID: QC467422

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	1,863	93	78-120	1	25

Surrogate	%REC	Limits
Trifluorotoluene (FID)	132	61-149
Bromofluorobenzene (FID)	115	65-146

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	207165	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 3520C
Project#:	080AK02.1000	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	10/24/08
Units:	ug/L	Received:	10/24/08
Batch#:	144199	Prepared:	10/28/08

Field ID:	E-1	Diln Fac:	1.000
Type:	SAMPLE	Analyzed:	10/31/08
Lab ID:	207165-001	Cleanup Method:	EPA 3630C

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

Surrogate	%REC	Limits
Hexacosane	87	58-127

Field ID:	BTW-2	Diln Fac:	1.000
Type:	SAMPLE	Analyzed:	10/30/08
Lab ID:	207165-002	Cleanup Method:	EPA 3630C

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

Surrogate	%REC	Limits
Hexacosane	76	58-127

Field ID:	I-1	Diln Fac:	3.000
Type:	SAMPLE	Analyzed:	10/30/08
Lab ID:	207165-003		

Analyte	Result	RL
Diesel C10-C24	10,000	150
Motor Oil C24-C36	6,800	900

Surrogate	%REC	Limits
Hexacosane	93	58-127

Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC467569	Analyzed:	10/31/08

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

Surrogate	%REC	Limits
Hexacosane	110	58-127

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Total Extractable Hydrocarbons

Lab #:	207165	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 3520C
Project#:	080AK02.1000	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC467570	Batch#:	144199
Matrix:	Water	Prepared:	10/28/08
Units:	ug/L	Analyzed:	10/31/08

Cleanup Method: EPA 3630C

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	1,827	73	52-120

Surrogate	%REC	Limits
Hexacosane	83	58-127

Curtis & Tompkins, Ltd.

Batch QC Report

Total Extractable Hydrocarbons

Lab #:	207165	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 3520C
Project#:	080AK02.1000	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	144199
MSS Lab ID:	207065-001	Sampled:	10/21/08
Matrix:	Water	Received:	10/21/08
Units:	ug/L	Prepared:	10/28/08
Diln Fac:	1.000	Analyzed:	10/31/08

Type: MS Cleanup Method: EPA 3630C
Lab ID: QC467571

Analyte	MSS Result	Spiked	Result	%REC	Limits
Diesel C10-C24	68.15	2,500	1,949	75	43-121

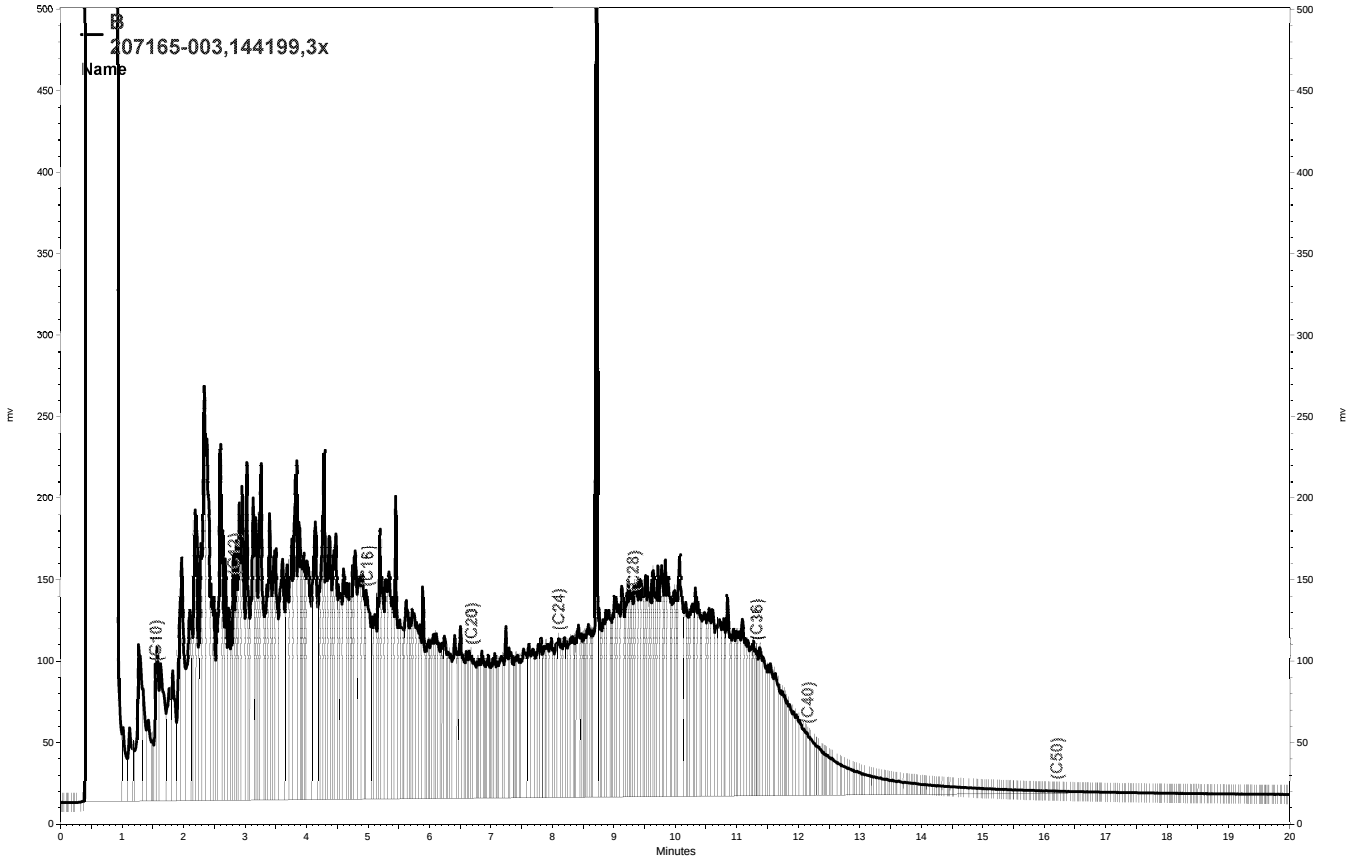
Surrogate	%REC	Limits
Hexacosane	89	58-127

Type: MSD Cleanup Method: EPA 3630C
Lab ID: QC467572

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	2,157	84	43-121	10	36

Surrogate	%REC	Limits
Hexacosane	96	58-127

RPD= Relative Percent Difference



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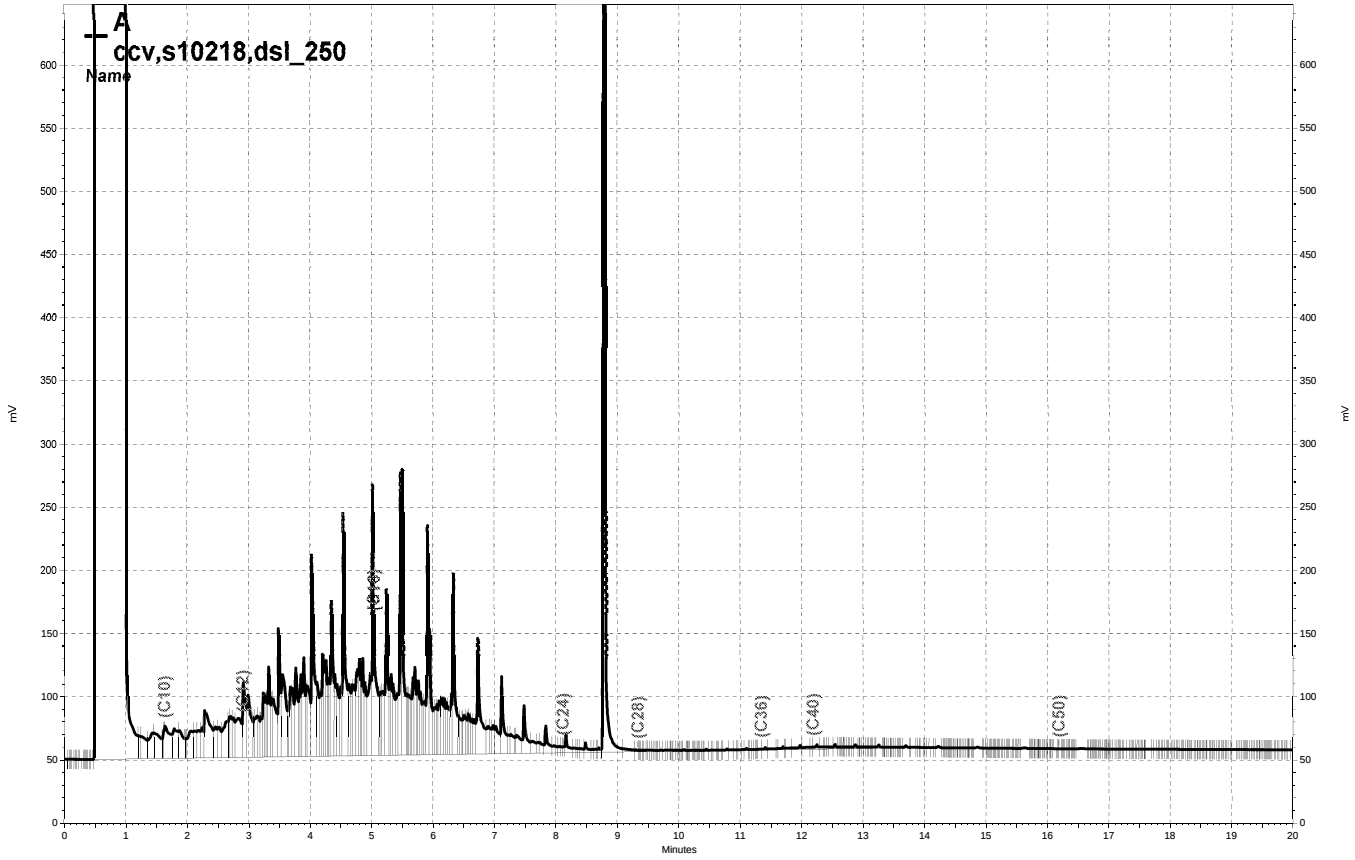

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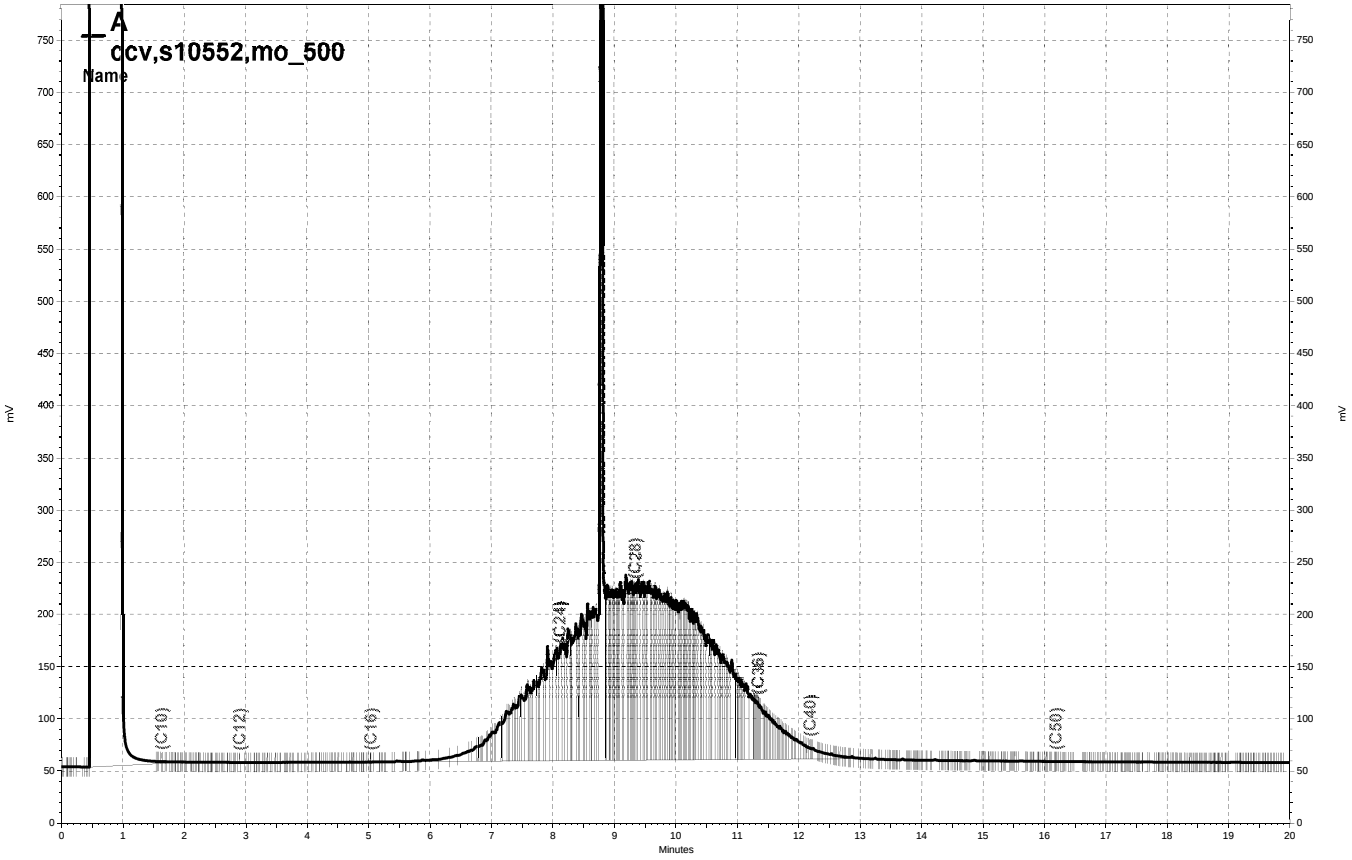

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Curtis & Tompkins, Ltd.

BTXE & Oxygenates

Lab #:	207165	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	080AK02.1000	Analysis:	EPA 8260B
Field ID:	E-1	Batch#:	144210
Lab ID:	207165-001	Sampled:	10/24/08
Matrix:	Water	Received:	10/24/08
Units:	ug/L	Analyzed:	10/29/08
Diln Fac:	1.000		

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	120	10
MTBE	ND	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
1,2-Dichloroethane	ND	0.5
Benzene	ND	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
Toluene	ND	0.5
1,2-Dibromoethane	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	102	80-125
1,2-Dichloroethane-d4	106	80-137
Toluene-d8	106	80-120
Bromofluorobenzene	110	80-122

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

BTXE & Oxygenates

Lab #:	207165	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	080AK02.1000	Analysis:	EPA 8260B
Field ID:	BTW-2	Batch#:	144210
Lab ID:	207165-002	Sampled:	10/24/08
Matrix:	Water	Received:	10/24/08
Units:	ug/L	Analyzed:	10/29/08
Diln Fac:	1.000		

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	99	10
MTBE	ND	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
1,2-Dichloroethane	ND	0.5
Benzene	ND	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
Toluene	ND	0.5
1,2-Dibromoethane	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	102	80-125
1,2-Dichloroethane-d4	106	80-137
Toluene-d8	103	80-120
Bromofluorobenzene	108	80-122

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

BTXE & Oxygenates

Lab #:	207165	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	080AK02.1000	Analysis:	EPA 8260B
Field ID:	I-1	Batch#:	144210
Lab ID:	207165-003	Sampled:	10/24/08
Matrix:	Water	Received:	10/24/08
Units:	ug/L	Analyzed:	10/29/08
Diln Fac:	1.000		

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	58	10
MTBE	ND	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
1,2-Dichloroethane	0.6	0.5
Benzene	14	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
Toluene	14	0.5
1,2-Dibromoethane	ND	0.5
Ethylbenzene	4.6	0.5
m,p-Xylenes	74	0.5
o-Xylene	60	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	104	80-125
1,2-Dichloroethane-d4	109	80-137
Toluene-d8	102	80-120
Bromofluorobenzene	94	80-122

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

BTXE & Oxygenates

Lab #:	207165	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	080AK02.1000	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	144210
Units:	ug/L	Analyzed:	10/29/08
Diln Fac:	1.000		

Type: BS Lab ID: QC467615

Analyte	Spiked	Result	%REC	Limits
tert-Butyl Alcohol (TBA)	100.0	119.4	119	59-152
MTBE	20.00	22.17	111	70-125
Isopropyl Ether (DIPE)	20.00	24.28	121	67-126
Ethyl tert-Butyl Ether (ETBE)	20.00	23.77	119	69-127
1,2-Dichloroethane	20.00	25.81	129	78-132
Benzene	20.00	20.42	102	80-120
Methyl tert-Amyl Ether (TAME)	20.00	22.94	115	80-122
Toluene	20.00	19.19	96	80-120
1,2-Dibromoethane	20.00	21.31	107	80-120
Ethylbenzene	20.00	19.92	100	80-122
m,p-Xylenes	40.00	38.09	95	80-126
o-Xylene	20.00	18.60	93	80-120

Surrogate	%REC	Limits
Dibromofluoromethane	98	80-125
1,2-Dichloroethane-d4	94	80-137
Toluene-d8	100	80-120
Bromofluorobenzene	94	80-122

Type: BSD Lab ID: QC467616

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
tert-Butyl Alcohol (TBA)	100.0	116.0	116	59-152	3	20
MTBE	20.00	22.16	111	70-125	0	20
Isopropyl Ether (DIPE)	20.00	24.20	121	67-126	0	20
Ethyl tert-Butyl Ether (ETBE)	20.00	23.79	119	69-127	0	20
1,2-Dichloroethane	20.00	24.37	122	78-132	6	20
Benzene	20.00	20.72	104	80-120	1	20
Methyl tert-Amyl Ether (TAME)	20.00	22.62	113	80-122	1	20
Toluene	20.00	18.99	95	80-120	1	20
1,2-Dibromoethane	20.00	20.14	101	80-120	6	20
Ethylbenzene	20.00	20.38	102	80-122	2	20
m,p-Xylenes	40.00	37.91	95	80-126	0	20
o-Xylene	20.00	18.72	94	80-120	1	20

Surrogate	%REC	Limits
Dibromofluoromethane	99	80-125
1,2-Dichloroethane-d4	90	80-137
Toluene-d8	98	80-120
Bromofluorobenzene	96	80-122

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

BTXE & Oxygenates

Lab #:	207165	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	080AK02.1000	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC467617	Batch#:	144210
Matrix:	Water	Analyzed:	10/29/08
Units:	ug/L		

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	ND	10
MTBE	ND	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
1,2-Dichloroethane	ND	0.5
Benzene	ND	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
Toluene	ND	0.5
1,2-Dibromoethane	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	97	80-125
1,2-Dichloroethane-d4	91	80-137
Toluene-d8	102	80-120
Bromofluorobenzene	100	80-122

ND= Not Detected
RL= Reporting Limit

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 #: 207165

Sampler: X. Tong

Project No.: 080AK02.1000 Report To: Xinggang Tong

Project Name: MSC Remediation Company: OTG Environmental Solutions

Project P.O.: Telephone: (510) 465-8982

Turnaround Time: 5-day Fax: ~~X tong~~ 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: TPH gas		TPH diesel & mo with Silica gel cleanup		TPH diesel & mo			8260 for BTEX & 5 fuel OXYgenates only (MTBE, TAME, DIPE, ETBE, TBA)				
1	E-1	10/24/08, 12:50		X									X		X					X				
2	BtW-2	10/24/08, 13:10		X									X		X					X				
	BtW-1	10/24/08		X																				
3	I-1	10/24/08, 13:25			X								X				X			X				

Notes:

SAMPLE RECEIPT
☒ Intact ☐ Cold
☐ On Ice ☒ Ambient

Preservative Correct?
☐ Yes ☐ No ☐ N/A

RELINQUISHED BY:

10/24/08 13:45 DATE / TIME

DATE / TIME

DATE / TIME

SIGNATURE

RECEIVED BY:

10/24/08 13:45 DATE / TIME

DATE / TIME

DATE / TIME

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

Laboratory Job Number 207867
ANALYTICAL REPORT

OTG Enviroengineering Solutions, Inc	Project : 080AK02.1000
464 19th Street Suite 206	Location : MSC Remediation
Oakland, CA 94612	Level : II

Sample ID	Lab ID
E-1	207867-001
BTW-2	207867-002
BTW-1	207867-003
I-1	207867-004

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: 12/04/2008
Project Manager

Signature: _____ Date: 12/04/2008
Senior Program Manager

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**207867**
Client:	**OTG Enviroengineering Solutions, Inc**
Project:	**080AK02.1000**
Location:	**MSC Remediation**
Request Date:	**11/14/08**
Samples Received:	**11/14/08**

This data package contains sample and QC results for four water samples, requested for the above referenced project on 11/14/08. The samples were received cold and intact.

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

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

Volatile Organics by GC/MS (EPA 8260B):
No analytical problems were encountered.

Curtis & Tompkins, Ltd.

Total Volatile Hydrocarbons

Lab #:	207867	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	080AK02.1000	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	145002
Units:	ug/L	Sampled:	11/14/08
Diln Fac:	1.000	Received:	11/14/08

Field ID: E-1 Lab ID: 207867-001
Type: SAMPLE Analyzed: 11/18/08

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	97	61-149
Bromofluorobenzene (FID)	97	65-146

Field ID: BTW-2 Lab ID: 207867-002
Type: SAMPLE Analyzed: 11/18/08

Analyte	Result	RL
Gasoline C7-C12	74 Y Z	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	98	61-149
Bromofluorobenzene (FID)	101	65-146

Field ID: I-1 Lab ID: 207867-004
Type: SAMPLE Analyzed: 11/17/08

Analyte	Result	RL
Gasoline C7-C12	1,000	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	104	61-149
Bromofluorobenzene (FID)	99	65-146

Type: BLANK Analyzed: 11/17/08
Lab ID: QC471004

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	99	61-149
Bromofluorobenzene (FID)	100	65-146

Y= Sample exhibits chromatographic pattern which does not resemble standard
Z= Sample exhibits unknown single peak or peaks
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	207867	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	080AK02.1000	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC471005	Batch#:	145002
Matrix:	Water	Analyzed:	11/17/08
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	1,045	104	78-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	116	61-149
Bromofluorobenzene (FID)	105	65-146

Curtis & Tompkins, Ltd.

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	207867	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	080AK02.1000	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	145002
MSS Lab ID:	207844-001	Sampled:	11/13/08
Matrix:	Water	Received:	11/13/08
Units:	ug/L	Analyzed:	11/17/08
Diln Fac:	1.000		

Type: MS Lab ID: QC471007

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	<13.69	2,000	2,109	105	65-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	127	61-149
Bromofluorobenzene (FID)	102	65-146

Type: MSD Lab ID: QC471008

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	2,138	107	65-120	1	20

Surrogate	%REC	Limits
Trifluorotoluene (FID)	129	61-149
Bromofluorobenzene (FID)	103	65-146

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	207867	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 3520C
Project#:	080AK02.1000	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	11/14/08
Units:	ug/L	Received:	11/14/08
Diln Fac:	1.000	Prepared:	11/24/08
Batch#:	145348		

Field ID: E-1 Analyzed: 12/02/08
Type: SAMPLE Cleanup Method: EPA 3630C
Lab ID: 207867-001

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

Surrogate	%REC	Limits
Hexacosane	98	58-127

Field ID: BTW-1 Analyzed: 12/02/08
Type: SAMPLE Cleanup Method: EPA 3630C
Lab ID: 207867-003

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

Surrogate	%REC	Limits
Hexacosane	97	58-127

Field ID: I-1 Lab ID: 207867-004
Type: SAMPLE Analyzed: 11/26/08

Analyte	Result	RL
Diesel C10-C24	8,100	50
Motor Oil C24-C36	3,400	300

Surrogate	%REC	Limits
Hexacosane	124	58-127

Type: BLANK Analyzed: 12/02/08
Lab ID: QC472465 Cleanup Method: EPA 3630C

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

Surrogate	%REC	Limits
Hexacosane	120	58-127

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Total Extractable Hydrocarbons

Lab #:	207867	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 3520C
Project#:	080AK02.1000	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	145348
Units:	ug/L	Prepared:	11/24/08
Diln Fac:	1.000	Analyzed:	12/02/08

Type: BS
Lab ID: QC472466
Cleanup Method: EPA 3630C

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,149	86	52-120

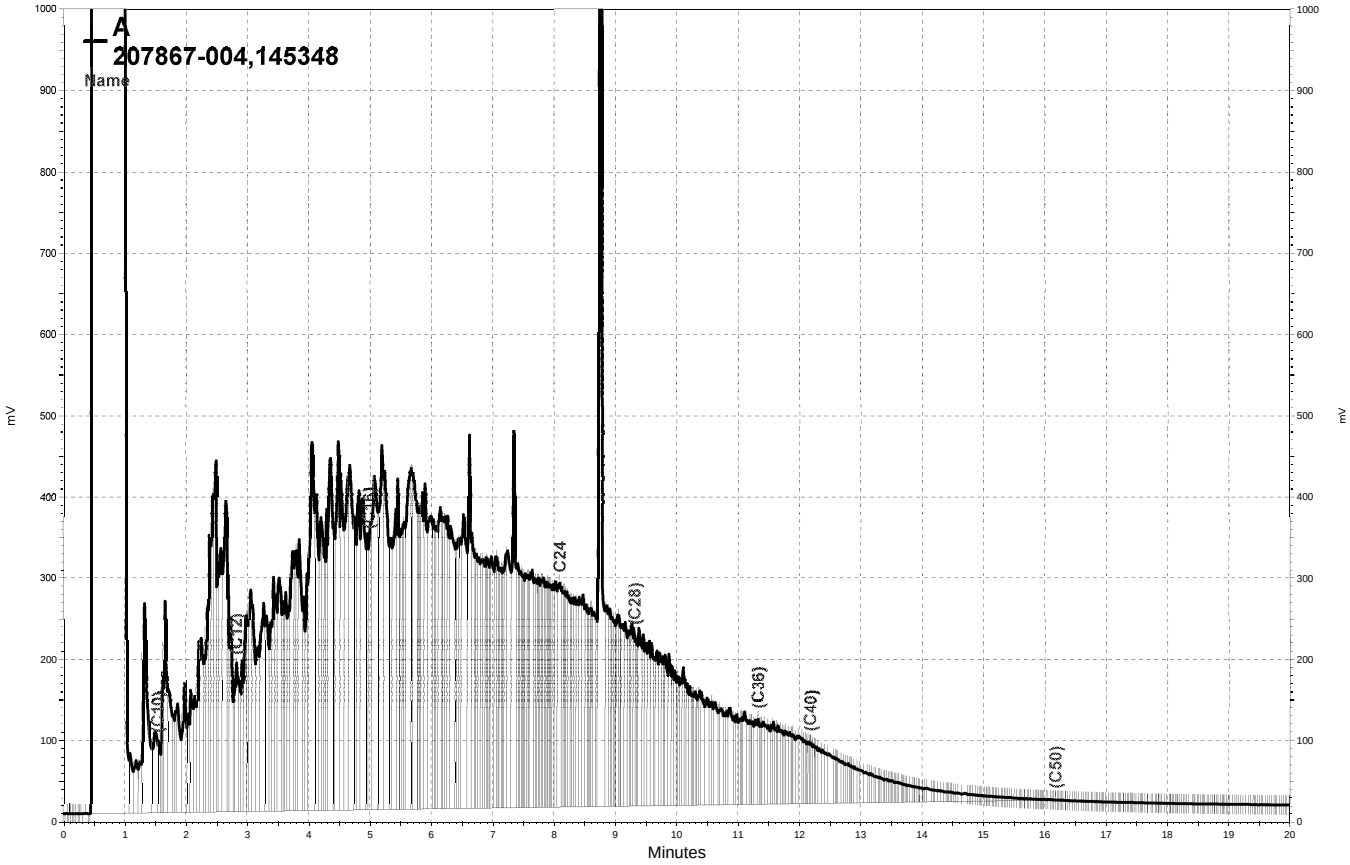
Surrogate	%REC	Limits
Hexacosane	98	58-127

Type: BSD
Lab ID: QC472467
Cleanup Method: EPA 3630C

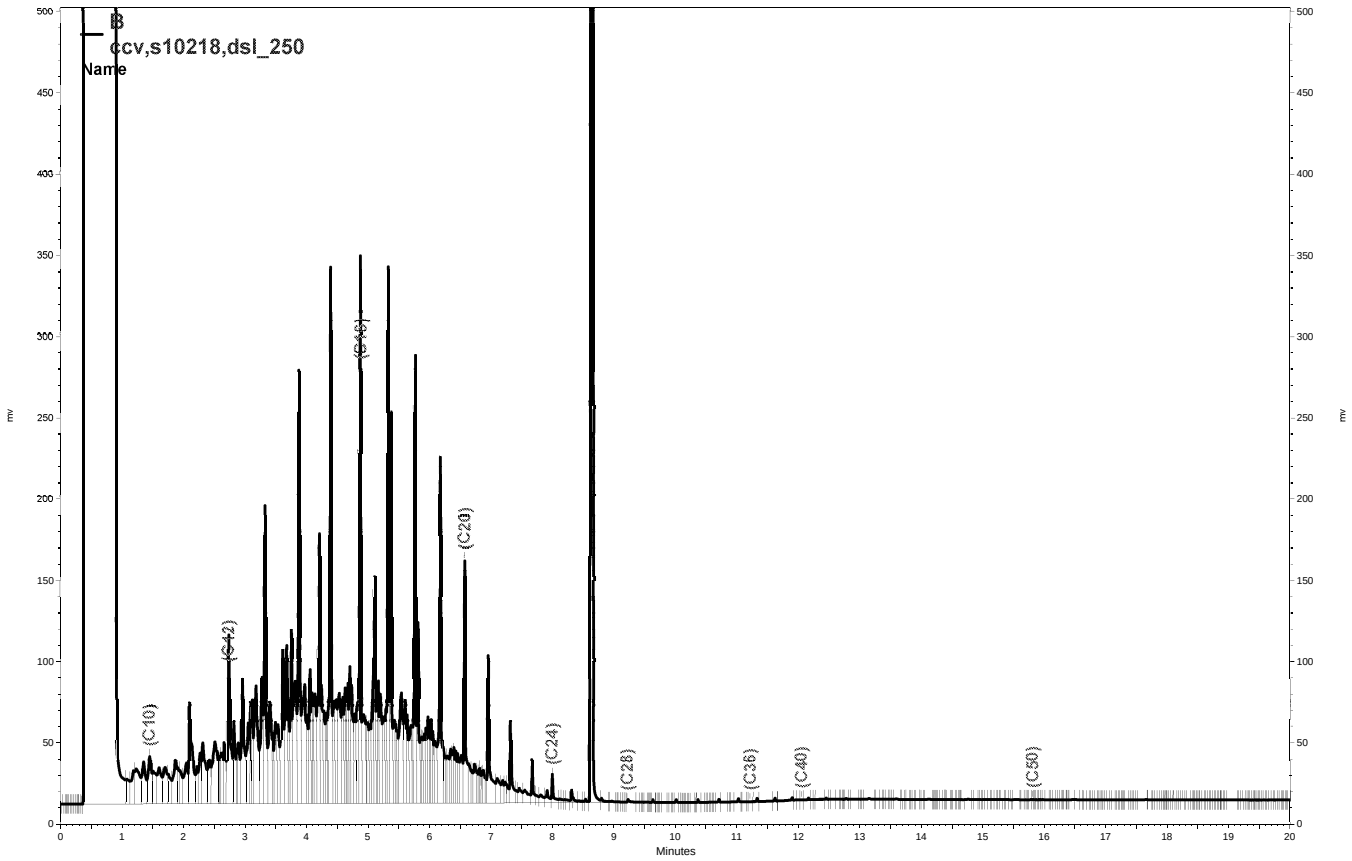
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	1,827	73	52-120	16	30

Surrogate	%REC	Limits
Hexacosane	89	58-127

RPD= Relative Percent Difference



\\Lims\gdrive\ezchrom\Projects\GC17A\Data\330a013, A



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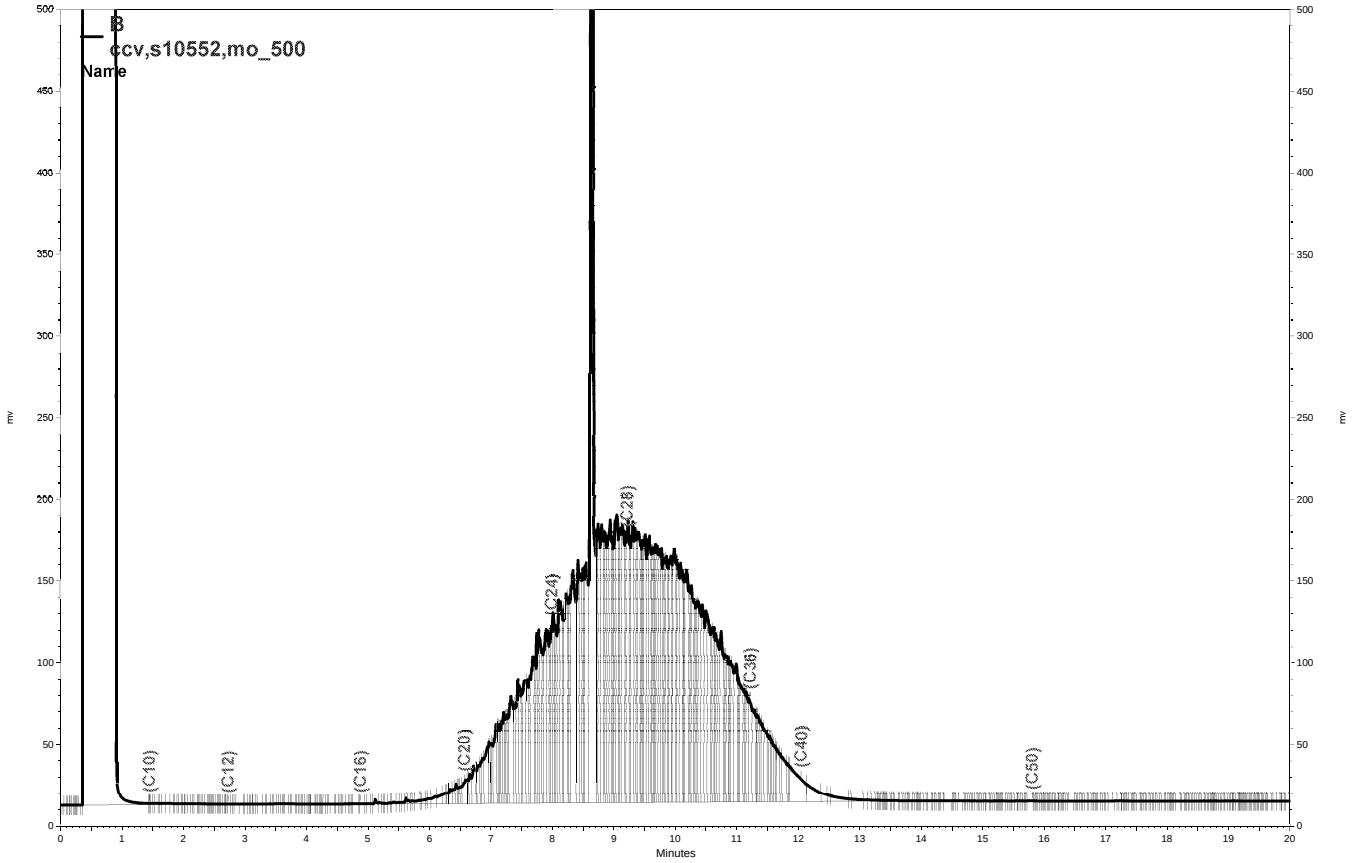

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Curtis & Tompkins, Ltd.

BTXE & Oxygenates

Lab #:	207867	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	080AK02.1000	Analysis:	EPA 8260B
Field ID:	E-1	Batch#:	145276
Lab ID:	207867-001	Sampled:	11/14/08
Matrix:	Water	Received:	11/14/08
Units:	ug/L	Analyzed:	11/22/08
Diln Fac:	1.000		

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	92	10
MTBE	ND	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
1,2-Dichloroethane	ND	0.5
Benzene	ND	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
Toluene	ND	0.5
1,2-Dibromoethane	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	121	80-125
1,2-Dichloroethane-d4	125	80-137
Toluene-d8	100	80-120
Bromofluorobenzene	100	80-122

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

BTXE & Oxygenates

Lab #:	207867	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	080AK02.1000	Analysis:	EPA 8260B
Field ID:	BTW-2	Batch#:	145276
Lab ID:	207867-002	Sampled:	11/14/08
Matrix:	Water	Received:	11/14/08
Units:	ug/L	Analyzed:	11/23/08
Diln Fac:	1.000		

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	74	10
MTBE	ND	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
1,2-Dichloroethane	ND	0.5
Benzene	ND	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
Toluene	ND	0.5
1,2-Dibromoethane	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	122	80-125
1,2-Dichloroethane-d4	126	80-137
Toluene-d8	99	80-120
Bromofluorobenzene	101	80-122

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

BTXE & Oxygenates

Lab #:	207867	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	080AK02.1000	Analysis:	EPA 8260B
Field ID:	BTW-1	Batch#:	145276
Lab ID:	207867-003	Sampled:	11/14/08
Matrix:	Water	Received:	11/14/08
Units:	ug/L	Analyzed:	11/23/08
Diln Fac:	1.000		

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	53	10
MTBE	ND	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
1,2-Dichloroethane	ND	0.5
Benzene	ND	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
Toluene	ND	0.5
1,2-Dibromoethane	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	119	80-125
1,2-Dichloroethane-d4	126	80-137
Toluene-d8	100	80-120
Bromofluorobenzene	100	80-122

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

BTXE & Oxygenates

Lab #:	207867	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	080AK02.1000	Analysis:	EPA 8260B
Field ID:	I-1	Batch#:	145276
Lab ID:	207867-004	Sampled:	11/14/08
Matrix:	Water	Received:	11/14/08
Units:	ug/L	Analyzed:	11/23/08
Diln Fac:	1.000		

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	53	10
MTBE	ND	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
1,2-Dichloroethane	ND	0.5
Benzene	15	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
Toluene	15	0.5
1,2-Dibromoethane	ND	0.5
Ethylbenzene	3.0	0.5
m,p-Xylenes	88	0.5
o-Xylene	67	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	118	80-125
1,2-Dichloroethane-d4	123	80-137
Toluene-d8	102	80-120
Bromofluorobenzene	98	80-122

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

BTXE & Oxygenates

Lab #:	207867	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	080AK02.1000	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	145276
Units:	ug/L	Analyzed:	11/22/08
Diln Fac:	1.000		

Type: BS Lab ID: QC472151

Analyte	Spiked	Result	%REC	Limits
tert-Butyl Alcohol (TBA)	100.0	78.84	79	59-152
MTBE	20.00	17.96	90	70-125
Isopropyl Ether (DIPE)	20.00	18.49	92	67-126
Ethyl tert-Butyl Ether (ETBE)	20.00	19.43	97	69-127
1,2-Dichloroethane	20.00	24.53	123	78-132
Benzene	20.00	20.25	101	80-120
Methyl tert-Amyl Ether (TAME)	20.00	19.68	98	80-122
Toluene	20.00	20.93	105	80-120
1,2-Dibromoethane	20.00	20.43	102	80-120
Ethylbenzene	20.00	21.25	106	80-122
m,p-Xylenes	40.00	42.50	106	80-126
o-Xylene	20.00	19.62	98	80-120

Surrogate	%REC	Limits
Dibromofluoromethane	109	80-125
1,2-Dichloroethane-d4	123	80-137
Toluene-d8	104	80-120
Bromofluorobenzene	99	80-122

Type: BSD Lab ID: QC472152

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
tert-Butyl Alcohol (TBA)	100.0	86.14	86	59-152	9	20
MTBE	20.00	17.96	90	70-125	0	20
Isopropyl Ether (DIPE)	20.00	18.10	90	67-126	2	20
Ethyl tert-Butyl Ether (ETBE)	20.00	19.26	96	69-127	1	20
1,2-Dichloroethane	20.00	23.68	118	78-132	4	20
Benzene	20.00	19.95	100	80-120	2	20
Methyl tert-Amyl Ether (TAME)	20.00	19.67	98	80-122	0	20
Toluene	20.00	20.58	103	80-120	2	20
1,2-Dibromoethane	20.00	20.12	101	80-120	2	20
Ethylbenzene	20.00	21.37	107	80-122	1	20
m,p-Xylenes	40.00	42.57	106	80-126	0	20
o-Xylene	20.00	19.65	98	80-120	0	20

Surrogate	%REC	Limits
Dibromofluoromethane	108	80-125
1,2-Dichloroethane-d4	120	80-137
Toluene-d8	102	80-120
Bromofluorobenzene	99	80-122

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

BTXE & Oxygenates

Lab #:	207867	Location:	MSC Remediation
Client:	OTG Enviroengineering Solutions, Inc	Prep:	EPA 5030B
Project#:	080AK02.1000	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC472168	Batch#:	145276
Matrix:	Water	Analyzed:	11/22/08
Units:	ug/L		

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	ND	10
MTBE	ND	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
1,2-Dichloroethane	ND	0.5
Benzene	ND	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
Toluene	ND	0.5
1,2-Dibromoethane	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	117	80-125
1,2-Dichloroethane-d4	123	80-137
Toluene-d8	99	80-120
Bromofluorobenzene	99	80-122

ND= Not Detected
RL= Reporting Limit

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 #: 207867

Sampler: X. Tong

Project No.: 080AK02.1000 | Report To: Xinggang Tong

Project Name: MSC Remediation | Company: OTG Environmental Solutions

Project P.O.: | Telephone: (510) 465-8982

Turnaround Time: 5-Day | Fax: 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: TPH gas	TPH diesel & mo with Silica gel cleanup	TPH diesel & mo	8260 for BTEX & 5 fuel Oxygenates only (MTBE, TAME, DIPE, ETBE, TBA)
1	E-1	11/14/08, 3:10pm		x		7					x	x		x
2	B-W-2	11/14/08 3:20pm		x		5					x			x
3	B-W-1	11/14/08 3:25pm		x		4						x		x
4	I-1	11/14/08 3:35pm		x		7					x		x	x

Notes:

SAMPLE RECEIPT
☒ Intact ☐ Cold
☐ On Ice ☒ Ambient

Preservative Correct?
☐ Yes ☐ No ☐ N/A

RELINQUISHED BY:

SIGNATURE — 11/14/08 4:10pm DATE / TIME

DATE / TIME

DATE / TIME

RECEIVED BY:

Olivia Nguyen — 11/14/08 1610 DATE / TIME

DATE / TIME

DATE / TIME

APPENDIX B

Laboratory Analytical Reports for DPE Vapor Samples

Torrent
LABORATORY, INC.

October 31, 2008

Xinggang Tong
OTG Enviroengineering Solutions,Inc
464 19th Street,Suite 206
Oakland, CA 94612

TEL: (510) 465-8982
FAX:

RE:

Order No.: 0810185

Dear Xinggang Tong:

Torrent Laboratory, Inc. received 2 samples on 10/24/2008 for the analyses presented in the following report.

All data for associated QC met EPA or laboratory specification(s) except where noted in the case narrative.
Reported data is applicable for only the samples received as part of the order number referenced above.

Torrent Laboratory, Inc, is certified by the State of California, ELAP #1991. If you have any questions regarding these tests results, please feel free to contact the Project Management Team at (408)263-5258;ext: 204.

Sincerely,

Laboratory Director 10/31/08 Date

Nutan Kabir
PM

TORRENT LABORATORY, INC.

483 Sinclair Frontage Road • Milpitas, CA • Phone: (408) 263-5258 • Fax: (408) 263-8293

Visit us at www.torrentlab.com email: analysis@torrentlab.com

Report prepared for: Xinggang Tong
OTG Enviroengineering Solutions,Inc

Date Received: 10/24/2008
Date Reported: 10/31/2008

Client Sample ID: A-2 Exhaust
Sample Location: 7101 Edgewater Dr,Oakland,CA
Sample Matrix: AIR
Date/Time Sampled 10/24/2008 12:30:00 PM

Lab Sample ID: 0810185-001
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Benzene	TO-15	10/29/2008	0.5	10	5.0	21	ppbv	R17740
Ethyl Benzene	TO-15	10/29/2008	0.5	10	5.0	ND	ppbv	R17740
m,p-Xylene	TO-15	10/29/2008	1	10	10	20	ppbv	R17740
o-xylene	TO-15	10/29/2008	0.5	10	5.0	10	ppbv	R17740
Toluene	TO-15	10/29/2008	0.5	10	5.0	10	ppbv	R17740
Surr: 4-Bromofluorobenzene	TO-15	10/29/2008	0	10	65-135	93.0	%REC	R17740
Benzene	TO-15	10/29/2008	1.6	10	16	68	µg/m³	R17740
Ethyl Benzene	TO-15	10/29/2008	2.17	10	22	ND	µg/m³	R17740
m,p-Xylene	TO-15	10/29/2008	2.05	10	20	89	µg/m³	R17740
o-xylene	TO-15	10/29/2008	2.7	10	27	43	µg/m³	R17740
Toluene	TO-15	10/29/2008	1.89	10	19	38	µg/m³	R17740
Surr: 4-Bromofluorobenzene	TO-15	10/29/2008	0	10	65-135	93.0	%REC	R17740
Gasoline	TO-3(MOD)	10/29/2008	100	10	1000	1400x	ppbv	G17740

Note: x - Although TPH as Gasoline constituents are present, TPH value ncludes a significant portion of non-gasoline hydrocarbons within range of C5-C12 quantified as Gasoline that biases the quantitation.

Gasoline	TO-3(MOD)	10/29/2008	352	10	3500	4900x	µg/m³	G17740

Note: x - Although TPH as Gasoline constituents are present, TPH value includes a significant portion of non-gasoline hydrocarbons within range of C5-C12 quantified as Gasoline that biases the quantitation.

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Report prepared for: Xinggang Tong
OTG Enviroengineering Solutions,Inc

Date Received: 10/24/2008
Date Reported: 10/31/2008

Client Sample ID: A-2 Inlet
Sample Location: 7101 Edgewater Dr,Oakland,CA
Sample Matrix: AIR
Date/Time Sampled 10/24/2008 12:45:00 PM

Lab Sample ID: 0810185-002
Date Prepared:

Parameters	Analysis Method	Date Analyzed	RL	Dilution Factor	MRL	Result	Units	Analytical Batch
Benzene	TO-15	10/30/2008	0.5	500	250	1200	ppbv	R17740
Ethyl Benzene	TO-15	10/30/2008	0.5	500	250	ND	ppbv	R17740
m,p-Xylene	TO-15	10/30/2008	1	500	500	3100	ppbv	R17740
o-xylene	TO-15	10/30/2008	0.5	500	250	1600	ppbv	R17740
Toluene	TO-15	10/30/2008	0.5	500	250	880	ppbv	R17740
Surr: 4-Bromofluorobenzene	TO-15	10/30/2008	0	500	65-135	88.2	%REC	R17740
Benzene	TO-15	10/30/2008	1.6	500	800	3700	µg/m³	R17740
Ethyl Benzene	TO-15	10/30/2008	2.17	500	1100	ND	µg/m³	R17740
m,p-Xylene	TO-15	10/30/2008	2.05	500	1000	13000	µg/m³	R17740
o-xylene	TO-15	10/30/2008	2.7	500	1400	6900	µg/m³	R17740
Toluene	TO-15	10/30/2008	1.89	500	940	3300	µg/m³	R17740
Surr: 4-Bromofluorobenzene	TO-15	10/30/2008	0	500	65-135	88.2	%REC	R17740
Gasoline	TO-3(MOD)	10/30/2008	100	1000	100000	370000x	ppbv	G17740

Note: x - Although TPH as Gasoline constituents are present, TPH value includes a significant portion of non-gasoline hydrocarbons within range of C5-C12 quantified as Gasoline that biases the quantitation.

Gasoline	TO-3(MOD)	10/30/2008	352	1000	350000	1300000x	µg/m³	G17740

Note: x - Although TPH as Gasoline constituents are present, TPH value includes a significant portion of non-gasoline hydrocarbons within range of C5-C12 quantified as Gasoline that biases the quantitation.

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

Definitions, legends and Notes

Note	Description
ug/kg	Microgram per kilogram (ppb, part per billion).
ug/L	Microgram per liter (ppb, part per billion).
mg/kg	Milligram per kilogram (ppm, part per million).
mg/L	Milligram per liter (ppm, part per million).
LCS/LCSD	Laboratory control sample/laboratory control sample duplicate.
MDL	Method detection limit.
MRL	Modified reporting limit. When sample is subject to dilution, reporting limit times dilution factor yields MRL.
MS/MSD	Matrix spike/matrix spike duplicate.
N/A	Not applicable.
ND	Not detected at or above detection limit.
NR	Not reported.
QC	Quality Control.
RL	Reporting limit.
% RPD	Percent relative difference.
a	pH was measured immediately upon the receipt of the sample, but it was still done outside the holding time.
sub	Analyzed by subcontracting laboratory, Lab Certificate #

These analyses were performed according to State of California Environmental Laboratory Accreditation program, Certificate # 1991

CLIENT: OTG Enviroengineering Solutions,Inc
Work Order: 0810185
Project:

ANALYTICAL QC SUMMARY REPORT

BatchID: G17740

Sample ID: **MB-G17740**	SampType: **MBLK**	TestCode: **TO-3Gas (MO**	Units: **ppbv**	Prep Date: **10/28/2008**	RunNo: **17740**
Client ID: **ZZZZZ**	Batch ID: **G17740**	TestNo: **TO-3(MOD)**		Analysis Date: **10/28/2008**	SeqNo: **254514**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	ND	100									

Sample ID: **MB-G**	SampType: **MBLK**	TestCode: **TO-3Gas (MO**	Units: **ppbv**	Prep Date: **10/29/2008**	RunNo: **17740**
Client ID: **ZZZZZ**	Batch ID: **G17740**	TestNo: **TO-3(MOD)**		Analysis Date: **10/29/2008**	SeqNo: **254612**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	ND	100									

Sample ID: **LCS-G17740**	SampType: **LCS**	TestCode: **TO-3Gas (MO**	Units: **ppbv**	Prep Date: **10/28/2008**	RunNo: **17740**
Client ID: **ZZZZZ**	Batch ID: **G17740**	TestNo: **TO-3(MOD)**		Analysis Date: **10/28/2008**	SeqNo: **254515**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	482.6	100	500	0	96.5	50	150				

Sample ID: **LCSD-G17740**	SampType: **LCSD**	TestCode: **TO-3Gas (MO**	Units: **ppbv**	Prep Date: **10/28/2008**	RunNo: **17740**
Client ID: **ZZZZZ**	Batch ID: **G17740**	TestNo: **TO-3(MOD)**		Analysis Date: **10/28/2008**	SeqNo: **254516**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Gasoline	444.7	100	500	0	88.9	50	150	482.6	8.18	30	

Qualifiers:

3 Recovery of the MS and/or MSD was out of control due t
4 The MS/MSD RPD was out of control due to matrix inter
Q Spike recovery and RPD control limits do not apply result
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

CLIENT: OTG Enviroengineering Solutions,Inc
Work Order: 0810185
Project:

ANALYTICAL QC SUMMARY REPORT

BatchID: R17740

Sample ID: **MB**	SampType: **MBLK**	TestCode: **TO-15**	Units: **ppbv**	Prep Date: **10/27/2008**	RunNo: **17740**
Client ID: **ZZZZZ**	Batch ID: **R17740**	TestNo: **TO-15**		Analysis Date: **10/27/2008**	SeqNo: **254349**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.28									
Ethyl Benzene	ND	0.093									
m,p-Xylene	ND	0.12									
o-xylene	ND	0.14									
Toluene	ND	0.14									
Surr: 4-Bromofluorobenzene	17.84	0	20	0	89.2	65	135				

Sample ID: **MB**	SampType: **MBLK**	TestCode: **TO-15**	Units: **ppbv**	Prep Date: **10/28/2008**	RunNo: **17740**
Client ID: **ZZZZZ**	Batch ID: **R17740**	TestNo: **TO-15**		Analysis Date: **10/28/2008**	SeqNo: **254354**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.28									
Ethyl Benzene	ND	0.093									
m,p-Xylene	ND	0.12									
o-xylene	ND	0.14									
Toluene	ND	0.14									
Surr: 4-Bromofluorobenzene	15.78	0	20	0	78.9	65	135				

Sample ID: **MB3-R17740**	SampType: **MBLK**	TestCode: **TO-15**	Units: **ppbv**	Prep Date: **10/29/2008**	RunNo: **17740**
Client ID: **ZZZZZ**	Batch ID: **R17740**	TestNo: **TO-15**		Analysis Date: **10/29/2008**	SeqNo: **254576**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.50									
Ethyl Benzene	ND	0.50									
m,p-Xylene	ND	0.50									
o-xylene	ND	0.50									
Toluene	ND	0.50									
Surr: 4-Bromofluorobenzene	18.65	0	20	0	93.3	65	135				

Qualifiers:
3 Recovery of the MS and/or MSD was out of control due t
4 The MS/MSD RPD was out of control due to matrix inter
Q Spike recovery and RPD control limits do not apply result
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

CLIENT: OTG Enviroengineering Solutions,Inc
Work Order: 0810185
Project:

ANALYTICAL QC SUMMARY REPORT

BatchID: R17740

Sample ID: **MB**	SampType: **MBLK**	TestCode: **TO-15**	Units: **ppbv**	Prep Date: **10/30/2008**	RunNo: **17740**
Client ID: **ZZZZZ**	Batch ID: **R17740**	TestNo: **TO-15**		Analysis Date: **10/30/2008**	SeqNo: **254607**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	ND	0.50									
Ethyl Benzene	ND	0.50									
m,p-Xylene	ND	0.50									
o-xylene	ND	0.50									
Toluene	ND	0.50									
Surr: 4-Bromofluorobenzene	17.99	0	20	0	90.0	65	135				

Sample ID: **LCS**	SampType: **LCS**	TestCode: **TO-15**	Units: **ppbv**	Prep Date: **10/27/2008**	RunNo: **17740**
Client ID: **ZZZZZ**	Batch ID: **R17740**	TestNo: **TO-15**		Analysis Date: **10/27/2008**	SeqNo: **254350**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	25.45	0.50	20	0	127	65	135				
Ethyl Benzene	21.53	0.50	20	0	108	65	135				
m,p-Xylene	42.15	0.50	40	0	105	65	135				
o-xylene	20.48	0.50	20	0	102	65	135				
Toluene	20.12	0.50	20	0	101	65	135				
Surr: 4-Bromofluorobenzene	21.56	0	20	0	108	65	135				

Sample ID: **LCSD**	SampType: **LCSD**	TestCode: **TO-15**	Units: **ppbv**	Prep Date: **10/27/2008**	RunNo: **17740**
Client ID: **ZZZZZ**	Batch ID: **R17740**	TestNo: **TO-15**		Analysis Date: **10/27/2008**	SeqNo: **254351**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzene	24.59	0.50	20	0	123	65	135	25.45	3.44	30	
Ethyl Benzene	20.66	0.50	20	0	103	65	135	21.53	4.12	30	
m,p-Xylene	40.98	0.50	40	0	102	65	135	42.15	2.81	30	
o-xylene	20.28	0.50	20	0	101	65	135	20.48	0.981	30	
Toluene	19.91	0.50	20	0	99.6	65	135	20.12	1.05	30	
Surr: 4-Bromofluorobenzene	21.53	0	20	0	108	65	135	0	0	30	

Qualifiers:
3 Recovery of the MS and/or MSD was out of control due t
4 The MS/MSD RPD was out of control due to matrix inter
Q Spike recovery and RPD control limits do not apply result
R RPD outside accepted recovery limits
S Spike Recovery outside accepted recovery limits

Torrent LABORATORY, INC.
483 Sinclair Frontage Road
Milpitas, CA 95035
Phone: 408.263.5258
FAX: 408.263.8293
www.torrentlab.com

CHAIN OF CUSTODY

• NOTE: SHADED AREAS ARE FOR TORRENT LAB USE ONLY •

LAB WORK ORDER NO: 0810185

Company Name: OTG Environmental Solutions Inc
Address: 464 19th St, Suite 206
City: Oakland State: CA Zip Code: 94612
Telephone: 510-465-8982 FAX:
REPORT TO: Xinggang Tong SAMPLER: X Tong

Location of Sampling: 710 Edgewater Dr., Oakland, CA
Purpose:
Special Instructions / Comments:
P.O. #: EMAIL: xtong@otg-env.com

TURNAROUND TIME:
- [ ] 10 Work Days
- [ ] 7 Work Days
- [x] 5 Work Days
- [ ] 3 Work Days
- [ ] 2 Work Days
- [ ] 1 Work Day
- [ ] Noon - Nxt Day
- [ ] 2 - 8 Hours
- [ ] Other

SAMPLE TYPE:
- [ ] Storm Water
- [ ] Waste Water
- [ ] Ground Water
- [ ] Soil
- [ ] Air
- [ ] Other

REPORT FORMAT:
- [ ] QC Level IV
- [ ] EDF
- [ ] Excel / EDD

ANALYSIS REQUESTED

LAB ID	CLIENT'S SAMPLE I.D.	DATE / TIME SAMPLED	MATRIX	# OF CONT	CONT TYPE	TPH gas & BTEX	Summa Canister ID	Initial Vac (-Hg")	Final Vac (-Hg")	REMARKS
001AA-2	Exhaust	10/24/08 12:30	Air	1	Summa	X	904	30	3	
002AA-2	Inlet	10/24/08 12:45	Air	1	Summa	X	1222	30	0	

TORRENT LAB

	Relinquished By:	Print:	Date:	Time:	Received By:	Print:	Date:	Time:
1		Xinggang Tong	10/24/08	3:07 pm			10/24	308
2		Chris Nagel	10/24	4:05 pm			10/24	4:05 pm

Were Samples Received in Good Condition? [x] Yes [ ] NO Samples on Ice? [ ] Yes [x] NO Method of Shipment: Hi Speed Sample seals intact? [ ] Yes [ ] NO [ ] N/A

NOTE: Samples are discarded by the laboratory 30 days from date of receipt unless other arrangements are made.

Page ____ of ____

Log In By: _____ Date: _____ Log In Reviewed By: _____ Date: _____