desert petroleum inc.

R0429

1/5

Mr. Robert Schultz
Alameda County Health Care Services
Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6719
FACSMILE (510) 337-9335

March 9, 2005

RE: The following report "Soil and Groundwater Investigation with Conceptual Model, Former Desert Petroleum Site DP #793" dated March 8, 2005, documents the soil and water sampling that occurred in December 2004 at DP793, 4035 Park Blvd., Oakland, California 94602.

Dear Mr. Schultz:

I have reviewed the enclosed report that I contracted Western Geo-Engineers to prepare.

I declare, under penalty of perjury, that the information and/or recommendations contained in the attached report are true and correct to the best of my knowledge.

Sincerely,

William Thompson, Desert Petroleum, Inc.

3/23/05
date

SOIL AND GROUNDWATER INVESTIGATION
WITH
CONCEPTUAL MODEL
FORMER DESERT PETROLEUM SITE DP#793
4035 PARK BLVD.
OAKLAND, CA.

For

DESERT PETROLEUM

March 8, 2005

By

-WEGE-
Western Geo-Engineers
1386 E. BEAMER STREET
WOODLAND, CA 95776
(530) 668-5300

TABLE OF CONTENTS

List of Tables

List of Figures

List of Appendices

-WEGE-
WESTERN
GEO-ENGINEERS
CALIF. CONTRACTOR #513857
REGISTERED GEOLOGISTS

1386 EAST BEAMER STREET
WOODLAND, CA 95776-6003
(530) 668-5300
FAX (530) 662-0273
wege@cal.net

Mr. Bill Thompson
Desert Petroleum
P.O. Box 1601
Oxnard, California 93032
(805) 644-6784 FAX (805) 654-0720

March 8, 2005

Dear Mr. Thompson:

The following report documents the results of the December 2004, soil and groundwater investigation (12 core borings) and the requested Site Conceptual Model for DP793, 4035 Park Blvd., Oakland, California.

1.0 SITE LOCATION AND IDENTIFICATION NUMBERS

Former Desert Petroleum #793 is a non-active service station (USTs and associated piping removed June 23, 1994), located on the northwest corner of the intersection of Park Boulevard and Hampel Street at 4035 Park Blvd., Oakland, California (Figure 1). The site is located in projected section 32; T1S; R3W; MDB&M at an approximate elevation of 210 feet above mean sea level (Figure 2).

East Bay Municipal Utility District - Sewer Discharge Permit #50435501
Alameda County Local Oversite STID 1248
San Francisco Bay Regional Board (Region 2) Case # 01-0170
Facility/Leak Site ID# T0600100158

2.0 SITE INVESTIGATION/REMEDIATION CHRONOLOGY

November 30, 1989	Alameda County Health Department (Mr. Ariu Levi) notified Desert Petroleum that gasoline was trickling into a sewer on Brighton Avenue through a crack in the bottom of the sewer access. Desert Petroleum's area manager was sent to the site to reconstruct and audit tank inventories and sales records. The audit indicated overages on all tanks.
December 1, 1989	Desert Petroleum contacted the station tenant, Mr. Jason Gopad, and advised him to test the fuel tanks and associated piping.
December 5, 1989	The retail fueling facility was closed.
December 6, 1989	Mr. Gopad had the underground storage tanks tested. The test results were inconclusive.
December 7, 1989	All fuel was removed from the underground storage tanks. The product lines were tested by Walton Engineering. The regular leaded and super unleaded lines passed. The regular unleaded line failed. A 1/2 inch hole in the 2 inch unleaded supply line was located beneath the eastern pump island. An ultrasound investigation was conducted to determine the location of the

	onsite sewer line. An onsite soil gas survey was conducted and indicated contamination associated with the pump islands and the sewer line on the western edge of the property.
December 8, 1989	Desert Petroleum submitted Unauthorized Release Report, drilling permits for site assessment obtained from Alameda County Flood Control and Water Conservation District, Zone 7, Underground Service Alert was notified.
December 11, 1989	Onsite drilling/sampling and well installation initiated. Sample borings RS-1, RS-2, RS-3, RS-5 and RS-4. Groundwater monitoring wells installed into borings RS-1, RS-5, and RS-6. Vapor extraction well installed into boring RS-2.
December 12, 1989	Encroachment permit secured from the City of Oakland for assessment work in Brighton Avenue. Sample boring RS-4 drilled and sampled just east of the sewer access in Brighton Avenue to the 10 foot depth.
December 13, 1989	The area northeast of the sewer access was excavated with a backhoe. Gasoline appeared to be seeping from the backfill around the sewer line. A water supply line was inadvertently broken (USA marker incorrectly marked the location of this line). A vacuum truck was used to pump out the water/product from the excavation. Approximately 7,200 gallons of water/gasoline was manifested and sent to H & H Shipyard for treatment and disposal. The water line was repaired, perforated 4 inch PVC pipe was placed vertically into the excavation and the excavation backfilled with pea gravel from approximately the 8 foot depth to subgrade, well RS-7. A portable vapor extraction unit connected to the sewer and RS-7 (operated during daylight hours).
December 15, 1989	RSI S.A.V.E. vapor extraction system installed and connected to onsite wells RS-1, RS-2, RS-5 and RS-6. Operated continuously for one week, then during daylight hours thereafter due to noise disturbance of neighbors. Length of vapor extraction and amounts of hydrocarbons removed not documented.
July 24, 1990	Soil boring/sampling investigations near the sewer lateral in residential backyard 1227 Hampel Avenue.
August 21, 1990	Soil boring/sampling investigations near the sewer lateral in residential backyards 4006 Brighton Avenue and 4010/4012 Brighton Avenue.
December 1990	Commenced quarterly groundwater monitoring.
September 8, 1993	Levine - Fricke, conducted soil boring/sampling investigation at residences 4003 Park Blvd. and 4006 Brighton Avenue. Constructed monitor well at 4003 Park Blvd for property owner of 4003 Park Blvd (not a part of 4035 Park Blvd. site assessment/investigation).
June 23, 1994	Removed all USTs and associated piping from 4035 Park Blvd.
August 14, 1995	Over-excavated UST and dispenser areas at 4035 Park Blvd, 1700 cubic yards of non-hazardous soil transported to and disposed at Forward Landfill, Stockton, California. Installed excavation well R3 (6 inch slotted PVC to 15 feet below surface) south of building, backfill excavation to 5 1/2 feet below surface with 1/4 inch pea gravel. Excavating removed monitor well RS-1.
August 16, 1995	Excavated and removed hydraulic hoists from station building.

August 31, 1995	Exploratory excavation at waste oil UST area, north of building and exploratory excavation west of building to 17 feet below surface. Installed excavation wells R1 in west excavation and R2 in north excavation.
September 5, 1995	Drilled/sampled and installed replacement well for RS-1 (MW-1).
May 2, 1996	Soil Probe Survey and soil sample borings along sewer route from 4035 Park Blvd. through back yards, to Brighton Avenue. Temporary casing set in hand augered borings BH-1, BH-2, BH-3, BH-4 and BH-5. Conducted slug tests on BH-1, BH-2, BH-3 and BH-5. Not enough water entry into BH-4 to conduct test. The following hydraulic conductivities (k) were calculated; BH-1 = 0.15 ft/day, BH-2 = 2.9 ft/day, BH-3 = 0.11 ft/day, and BH-5 = 4.8 ft/day.
January 17, 1997	Soil Probe Survey Brighton Avenue
August 12, 1999	Installed receptor trench, Brighton Avenue. 148 cubic yards non hazardous gasoline contaminated soil transported and disposed of at Vacaville Landfill, Vacaville, California. Installed wells RS-8, RS-9 and RS-10.
October 7, 1999	Pumped 19,451 gallons of gasoline contaminated groundwater from receptor trench, stored in above ground 22,000 gallon Baker tank.
January 24, 2000	Obtained sewer discharge permit from East Bay Municipal Utility District, started discharge of water stored in Baker tank to city sewer.
May 4, 2000	Started weekly purging of receptor trench well T1 (4 hours once per week). Discharged purged water through water carbon and then to sewer.
February 15, 2001	Set submersible pump in RS-5 to pump continuously, continued once a week purging of receptor well T1 (46,121 gallons removed from receptor trench well).
July 19, 2001	Ceased pumping of RS-5 and weekly purging of T1; 62,511 gallons removed from T1 and 78,919 gallons removed from RS-5 (total 141,430 gallons of gasoline contaminated groundwater treated and disposed to sewer).
March 21, 2002	Resumed pumping at RS-5.
August 6, 2002	246,849 gallons of gasoline contaminated groundwater pumped, treated and disposed to sewer.
November 20, 2002	Commenced weekly hand bailing of free phase product from well RS-8.
December 12, 2002	Purged receptor trench of 1432 gallons gasoline tainted groundwater.
January 9, 2003	Purged receptor trench of 1349 gallons gasoline tainted groundwater.
January 30, 2003	Purged receptor trench of 1624 gallons gasoline tainted groundwater.
March 13, 2003	Purged receptor trench of 1413 gallons gasoline tainted groundwater.
April 3, 2003	Purged receptor trench of 1305 gallons gasoline tainted groundwater.
April 9, 2003	Demolished existing service station building.
April 15, 2003	Replaced RS05 groundwater recovery pump with WEGE pump, while RS05 pump was serviced.
May 1, 2003	Reinstalled RS05 groundwater recovery pump. Submited Workplan to Investigate Contaminated Soils Above and Below the Water Table at the Former Area of the Station Building, 4035 Park Blvd., Oakland, CA.
May 6, 2003	Purged receptor trench of 1589 gallons gasoline tainted groundwater.
May 21, 2003	Purged receptor trench of 2544 gallons gasoline tainted groundwater.
June 25, 2003	Purged receptor trench of 1796 gallons gasoline tainted groundwater.

July 17, 2003	Purged receptor trench of 1560 gallons gasoline tainted groundwater.
July 31, 2003	Notice to initiate Workplan submitted May 1, 2003
August 6, 2003	Alameda County Health, Scott Seery, phoned Western Geo-Engineers, notifying them not to proceed with workplan.
August 13, 2003	Purged receptor trench of 1574 gallons gasoline tainted groundwater.
September 4, 2003	Purged receptor trench of 1477 gallons gasoline tainted groundwater.
October 3, 2003	Purged receptor trench of 1285 gallons gasoline tainted groundwater.
October 16, 2003	Removed water carbon unit #1, placed new water carbon in #2 position and moved #2 water carbon into #1 position.
November 20, 2003	Purged receptor trench of 1303 gallons gasoline tainted groundwater.
December 18, 2003	Purged receptor trench of 1303 gallons gasoline tainted groundwater.
January 22, 2004	Purged receptor trench of 1175 gallons gasoline tainted groundwater.
February 26, 2004	Purged receptor trench of 102 gallons gasoline tainted groundwater.
March 30, 2004	Purged receptor trench of 975 gallons gasoline tainted groundwater.
April 29, 2004	Purged receptor trench of 1406 gallons gasoline tainted groundwater.
May 13, 2004	Turned pumping system off, removed lid from #1 carbon and removed scaling from top of carbon, replaced lid and restarted pump.
May 27, 2004	Purged receptor trench of 1647 gallons gasoline tainted groundwater.
June 30, 2004	Purged receptor trench of 1759 gallons gasoline tainted groundwater.
July 29, 2004	No electrical power to treatment compound; has been disconnected.
September 24, 2004	New power panel at site, need 100 feet extension cord to connect pump controller to power for RS-5.
September 28, 2004	Restarted pumping at RS-5. Performed 1/4ly well samplings. Purged receptor trench of 1911 gallons.
September 30, 2004	Containment berm full of water, inspect carbon #1, leaking from bottom. Turned system off and removed carbon from system.
October 15, 2004	Take delivery of new water carbon, place #2 carbon into #1 position, new carbon into #2 position, restarted pumping system.
October 27, 2004	Alameda County Health requested Site Conceptual Model/Soil and Water Investigation Report by January 31, 2005.
December 8, 2004	Performed 1/4ly well samplings.
December 9-16, 2004	Direct push/cored 12 borings to obtain groundwater and soil samples.

3.0 REGIONAL GEOLOGY/HYDROGEOLOGY

Desert Petroleum site, DP793 is situated in the Coast Ranges Province of California. The Coast Ranges are a geomorphic province that trends north-northwesterly (30 - 40 degrees west of north), paralleling the Sierra Nevada, positioned east of the Pacific Ocean and west of the Great Valley Province.

The relief and topography of the Coastal Ranges consists of a series of independent ranges and valleys with crest averages between 2,000 and 4,000 feet in elevation. Most crests are rounded by errosion. San Francisco Bay is a shallow structural and topographic depression (valley) between the Berkeley Hills (western extension of the Diablo Range) on the east and the Santa Cruz Mountains on the west. Basement rocks underlying the area are those of the Franciscan

Assemblage and the Great Valley Sequence overlain by rocks of Miocene age, deposited at the continental margin. Most of the rocks in the Bay area were folded and faulted as a result of the early convergence of the North American and Pacific plates. About 10 million year ago, the tectonic regime in the Bay area changed from convergent to transform (Randall Ward et al. 1987). An extensive fracture zone between the North American and the Pacific plates consisting of northwest-trending right-lateral strike-slip faults extending from Mendocino County southeast near Mt. Misery of San Jose contains the Hayward, Rodgers Creek, Healdsburg and Maacama fault segments.

The Hayward fault is the boundary between two distinctly different geologic and physiographic provinces: the hills on the east side of the fault and the flatlands on the west side of the fault.

Streams of the Coastal Range flow northwest or southeast, following the valley floors. During the last major glaciation period (15,000 years ago) the sea level was 330 feet lower than it is today. The San Francisco Bay (a structural trough) contained no standing water and the streams draining the hills emptied directly into the Sacramento-San Joaquin River. Sediments were carried far into the Pacific Ocean where they were deposited. As the ice from the glaciers began to melt and sea level began to rise, the sea entered the Bay about 10,000 years ago, reaching its present level about 6,000 years ago. Sediments that were formally deposited into the Pacific Ocean were then deposited in and around the margins of the Bay producing flat lying alluvial fans and stream channel deposits. The groundwater basins within the Coastal Ranges are predominately unconsolidated fine to coarse grained sediments deposited by streams draining the mountain ranges.

4.0 LOCAL GEOLOGY /HYDROGEOLOGY

4.1 Geomorphology/Groundwater Occurrence

The site is located on the western slope of the Berkeley Hills. The Berkeley Hills are a northwest-southeast trending range within the Coastal Range Province of California. Erosion of the Coastal Ranges has filled the valleys within and bordering the Coastal Range with sequences of gravels, silts, sands, and clays. Groundwater in this area is contained within the "East Bay Plain". The East Bay Plain groundwater basin is composed of unconsolidated, fine to coarse grained sedimets deposited by streams draining the Diablo Range. Regional tectonic events and sea level fluctuations, caused by glaciation have subjected the East Bay Plain to alternating periods of marine inundation (fine sedimets) and subaerial exposure (coarse sediments). A sequence of silts and clays (confining layers) and coarse-grained sediments (alluvial fans) have been deposited on top of relatively impermeable bedrock.

As stated above, Section 3.0 - Regional Geology, the area is relatively unstable, ie. plate boundary, faulting and the hills are predominately highly tilted Franciscan Assemblage, Great Valley Sequence and Miocene age sedimentary and igneous rock. During seasonal soil saturation, slump blocks and rockslides are common to the area.

Drinking water for Alameda County originates from the Sierra Nevada mountain range, but at one time the East Bay Plain was the main water supply. Currently the East Bay Plain supplies water for

domestic irrigation and industrial purposes. The January 1994 Department of Water Resources Report "Ground Water Storage Capacity of a Portion of the East Bay Plain, Alameda County, California" indicates that about 2,560,000 acre-feet of groundwater is stored in the basin. Of this about 80,000 acre-feet can be safely used if water levels are maintained above sea level. The average thickness of the aquifer is approximately 50 feet, with depth to groundwater varying between 5 and 40 feet below land surface.

4.2 Stratigraphy/Groundwater Occurance

4.2.1 Station Property

In areas that have not be previously excavated or brought to grade with rock fill, the native soil from surface to 11 feet below ground surface (BGS) consists of dark brown silty clay. The dark brown silty clay is underlain by light brown stiff clay that includes occasional subrounded to rounded metavolcanic and quartz gravel. This clay extends to approximately 17 feet BGS. First groundwater is found in this clayey formation between 5 and 16 feet BGS. Direct Push Core Holes (December 2004) were tested between 11 and 19 feet BGS for the occurrence of groundwater. Due to the low yield, the test holes had to be left open overnight to allow enough water to enter prior to obtaining samples. A conglomerate of brown, clayey gravels and sands extends from the base of the brown clay to approximately 33 feet BGS. The conglomerate is consolidated to semiconsolidated. Direct Push Core Holes were tested for the presence of water between 24 and 30 feet BGS. Enough water entered the test hole within hours to obtain water samples. Firm brown clay underlies the conglomerate to 49.5 feet explored. Direct Push Core Holes were tested for the presence of water between 34 feet BGS and total depth. Due to low yield, these test holes were left open overnight to allow enough water entry to obtain samples, see Figures 12, 13 and 14 along with borehole logs - Appendix B.

4.2.2 Backyard Sewer Lateral Route

Assessments performed along the sewer lateral as it leaves the site and routes through the residential area towards Brighton Avenue show the subsurface to consist of fill from a couple of inches thick to two feet thick. Beneath the fill is a sequence of clay formations that vary from light brown to dark gray to approximately the 6 foot depth. Silty clay then extends to approximately the 14-foot depth. Beneath the silty clay is sand with occasional gravel (congolmerate). This sand is 11 feet thick at RS5 and is underlain by silty clay, see Figure 13 and Appendix B.

Hand augered borings were used to install temporary piezometers to perform "time recharge" slug tests of the shallow groundwater beneath the backyards near the sewer lateral route. These borings, B1, B2, B3, B4 and B5 were installed May 1996. Using the Bouwer and Rice Slug Test Model, hydraulic conductivity was calculated for each boring. Boring B4 did not produce enough water that day to perform the test. Depth to water measurements along with top of piezometer elevation level were used to determine gradient. The resulting groundwater velocities ranged from a low of 4.1 feet/year at BH1 to a high of 385 feet/year at BH5. Soil samples from these borings were analyzed for total organic carbon (TOC). Utilizing the TOC (340 - 5700 mg/Kg) amounts the retarded velocity for each borehole was then calculated for BTEX. Benzene in groundwater has a

retarded velocity ranging from 2.98 feet/year at BH1 to a high of 70 feet/year at BH5, see July 3, 1996 Western Geo-Engineers report "Sewer Lateral Investigation Report Desert Petroleum Station #793, 4035 Park Boulevard, Oakland, CA."

4.2.3 Brighton Avenue

Construction of the receptor trench along the eastern curb area of Brighton Avenue revealed two separate sequences of lithology. North of the storm drain catch basin the sequence consists of; clay to the four foot depth, silty clay to the seven foot depth, fine silty sand to the 9 foot depth, medium sand to the 10 foot depth, silty clay to the 11 ½ foot depth, gravel to the 12 foot depth, underlain by clay to the 16 foot depth. South of the storm catch basin is a sequence of silty clays and clays to the 10 foot depth.

Sandier sequence of sediments north of the storm water catch basin at Brighton Avenue compared to the sediments south of the storm water catch basin, indicate a facies change or a fault remnant striking east/west near the storm drain catch basin. A topographic lineation along the 200 foot contour is located in this area, see Figures 2 and 5.

4.2.4 Groundwater

Groundwater movement has been documented by depth to water measurements of the existing groundwater monitoring wells associated with this investigation, see Table 1. The groundwater flows west, northwest from the site towards the topographic low, catch basin, along Brighton Avenue. During precipitation events the area on site that has been over-excavated and then backfilled with pea gravel and road base becomes a groundwater high. Pumping from on site well RS5 has created a depression, cone, at RS5 with influence out to down gradient wells RS8 and RS10. Figures 6A represents the groundwater gradient derived from measurements obtained during the December 8, 2004 quarterly groundwater sampling round (RS5 is pumping at the time). Figure 6B represents the groundwater gradient determined from measurements obtained during the August 26, 1999 quarterly groundwater sampling round (RS5 not pumping at the time). The flow direction has not changed since initial monitoring of the site; the only influences to the groundwater gradient are the pumping of RS5 and seasonal precipitation events. Cross Sections Figures 12, 13 and 14 substantiate the fluctuation in groundwater elevations and RS5 pumping influence with the plot of the historic high and low groundwater levels.

5.0 CONTAMINANTS OF CONCERN (COC)

The unauthorized release that occurred from faulty unleaded regular gasoline dispensing piping near the dispenser area released gasoline to the subsurface of the site. Other than Total Petroleum Hydrocarbons as gasoline, the four main concerns are the gasoline components: Benzene, Toluene, Ethylbenzene and Xylene isomers (ortho, meta and para).

Total Petroleum Hydrocarbon as gasoline (TPHg). CAS: 8006-61-9. A carcinogen, Highly flammable (lower explosion limit (LEL) = 1.4%, upper explosion limit (UEL) = 7.6%). Insoluble, specific gravity (Sp. Gr) 0.72-0.76, vapor pressure (Vp) 38-300 mm Hg.

Benzene. CAS: 71-43-2. A carcinogen, Highly toxic, Flammable (LEL = 1.2%, UEL = 8%), TLV 0.1 ppm in air. Short Term (ST) 1 ppm in air. Immediately dangerous to Life or Health (IDLH) 500 ppm in air. Solubility 0.07%, Sp. Gr. 0.88, Vp 75 mmHg. The recommended CPHG (California Public Health Goal) for Benzene is 1.5 ug/L.

Toluene. CAS: 108-88-3. Toxic by ingestion, inhalation and skin absorption. Flammable (LEL=1.1%, UEL= 7.1%), TLV 100 ppm in air, ST 150 ppm in air, IDLH 500 ppm in air. Solubility 0.07%, Sp. Gr. 0.87, Vp 21 mmHg. The recommended CPHG for toluene is 150 ug/L.

Ethyl benzene. CAS: 100-41-4. Toxic by ingestion, inhalation and skin absorption. Flammable (LEL=0.8%, UEL= 6.7%), TLV 100 ppm in air, ST 125 ppm in air, IDLH 800 ppm in air. Solubility 0.01%, Sp. Gr. 0.87, Vp 7 mmHg. The recommended CPHG for Ethylbenzene is 300 ug/L.

Xylene (commercial mixture of ortho, para and meta). CAS: 1330-20-7. Toxic by ingestion and inhalation. Flammable (LEL=0.9%, UEL= 7%), TLV 100 ppm in air, ST 150 ppm in air, IDLH 900 ppm in air. Solubility 0.02%, Sp. Gr. 0.88, Vp 7-9 mmHg. The recommended CPHG for Xylenes is 1800 ug/L.

MtBE Methyl-tert-butyl ether. CAS: 1634-04-4. Flammable. Solubility 4%, Sp. Gr. 0.74. The recommended CPHG for MtBE is 13 ug/L. The MtBE does not seem to be associated with the unauthorized release from DP793. MtBE is found in water samples obtained at wells along Brighton Avenue. The most likely source for MtBE is from cars parked along Brighton Avenue.

6.0 SOIL AND WATER INVESTIGATION, DECEMBER 2004

From December 9 - 13, 2004 a Western Geo-Engineers geologist working directly under California Registered Geologist #3037 supervised the drilling, direct push continuous cores, at 12 locations at 4035 Park Blvd, see Figure 4. Woodward Drilling, C57#710079 using their Power Probe Direct Push drilling rig, obtained continuous cores (1 1/2 inch in diameter) in four foot sections of acrylic liner to total depth of the designated core holes. Cores were examined for lithoglogy, odor, color, the presence of water and field screened with a hand held photoionizing detector (PID) containing a 10.6 e.v. bulb. Selected samples were preserved and chain of custody (COC) delivered to a State of California certified laboratory for analysis using EPA mehtod 8260B (TPHg, BTEX, 5-osygenants), see Borehole Logs - Appendix B. Once depth was achieved the inner core barrel was retrieved, 1/2 inch diameter PVC casing, bottom five feet 0.02 inch slot was installed and the outer drill pipe removed past the bottom interval to obtain a water sample. The drill pipe/ PVC casing was left in most cases overnight to allow enough groundwater entry to obtain a water sample at depths greater than 34 feet below surface. Once the initial core hole had been completed, the rig was repositioned to drive a second test hole approximately 2 feet away to obtain shallow groundwater samples. The drill rod was driven with a disposable drive point to the desired sample

interval total depth. Half inch PVC casing with 5 feet of 0.02 inch screen on bottom was placed inside the drill rod, the drill rod was then pulled past the interval to be sampled, exposing the PVC screen to the formation. The drill rod and casing remained in the core hole until enough water had accumulated to obtain water samples. Once the water samples had been obtained the PVC casing along with the drill rod was removed and the hole destroyed with a 5% bentonite/cement slurry place using a one inch diameter triemie pipe placed to the bottom of the core hole.

Field observations noted during groundwater sampling procedures indicate that the upper groundwater bearing zone, silty clay between 11 and 19 feet below the surface has a low specific yield. Core holes C1 and C2 were dry at those depths. Core hole C13 was wet but made no water in the sample interval between 16 and 22 feet after setting overnight. The water bearing formation between 24 and 30 feet below surface, conglomerate, produced adequate water for sampling within 4 hours with the exception of core hole C12 which took 6 days to accumulate enough water for samples. The deeper water sample intervals, greater than 34 feet, with the exception of core hole C1 had to set overnight to accumulate enough water for samples. C1 produced enough water in 3 hours, see following table.

Core hole/date/time	Total depth/ date/time FT	Water sample interval/date/time FT	Destruction/date/time method
C1/12-9/09:30	49.5 /12-9/13:30	44.5-49.5 /12-9/16:40	TRIEME/12-9/17:00
C2/12-16/10:50	49.5 /12-16/13:50	38-49.5 /12-17/08:00	TRIEME/12-17/17:00
C3/12-15/13:30	42.0 /12-15/15:15	14-18 /12-16/08:45	TRIEME/12-16/17:00
		30-42 / 12-16/08:47	
C4/12-16/14:00	40.0 / 12-16/16:07	12-16 / 12-17/08:00	TRIEME/2-17/10:00
		27-40 / 12-17/08:00	
C6/12-13/11:14	35.0 / 12-13/11:45	15-19/12-13/15:45	TRIEME/12-13/17:00
		31-35/12-13/15:40	
C7/12-15/09:55	49.0 / 12-15/12:28	14-18 / 12-16/08:15	TRIEME/12-16/17:00
		34.5-49 / 12-16/08:30	
C8/12-14/11:56	38.0 / 12-14/13:33	11-16/12-15/08:15	TRIEME/12-15/17:00
		34-38/12-15/08:20	
C9/12-14/09:00	31.0 / 12-14/10:30	11-16/12-14/12:30	TRIEME/12-15/17:00
		27-31/2-15/08:00	
C10/12-13/12:00	34.0 / 12-13/15:12	11-16/12-14/08:30	TRIEME/12-14/17:00
		29-34/12-14/08:30	
C11/12-13/08:15	32.0 / 12-13/09:35	14-18/12-16/08:00	TRIEME/12-16/17:00
		29-32/12-13/12:15	
C12/12-10/09:45	30.0 / 12-10/14:00	12-16/12-16/14:00	TRIEME/12-16/17:00
		24-28/12-16/13:15	
C13/12-9/15:00	30.0 / 12-10/9:45	16-22/12-10/08:00 - (NO WATER 15.5HRS)	TRIEME/12-10/17:00
		24-30/12-10/10:30	

Table 2 contains the certified laboratory results of soil samples submitted to the laboratory.

Table 3 contains the certified laboratory results of water samples submitted to the laboratory.

7.0 GROUNDWATER CONTAMINATION

Groundwater monitoring was initiated on December 14, 1989. The initial set of wells (RS1, RS5 and RS6) contained significant concentrations of gasoline range hydrocarbons. Free phase floating product was evident in water samples obtained from wells RS5, RS6 and RS7 in February 1991. Installation of the intercept trench along with additional groundwater monitoring wells (MW1, RS8, RS9 and RS10) further defined the extent of the gasoline range hydrocarbon plume. Groundwater pumping from the intercept trench and well RS-5 has reduced the concentration of gasoline range hydrocarbons in the groundwater. Figures 7A/B through 11A/B represent current plume conditions, December 2004 (A) compared to conditions in August 1999 (B).

Figures 7A and 7B - Total Petroleum Hydrocarbons, gasoline. With the exception of the onsite area, area beneath the former building, the extent and concentrations have been greatly reduced.

Figures 8A and 8B - Benzene. Comparing these figures to the TPHg figures, a similar pattern of reduction in plume size and concentrations is observed. Again the onsite area beneath the former building contains high concentrations of benzene along with the area of the intercept trench.

Figures 9A and 9B - Toluene. Shows a similar pattern to that of the TPHg and Benzene plume figures.

Figures 10A and 10B - Ethylbenzene. Shows a similar patterns to that of the TPHg, Benzene and Toulene plume figures.

Figures 11A and 11B - Xylenes. Shows a similar patterns to that of the TPHg, Benzene, Toluene and Ethylbenzene figures with the exception that Figure 11A shows minor amounts of Xylenes extending from well RS8 downgradient to the intercept trench.

Based on the above figures, larger scale figures were developed to show current on-site groundwater plumes for TPHg and Benzene at different below ground surface depths.

Figure 15 - TPHg groundwater plume between 11 and 19 feet below ground surface. No water samples were obtained from core holes C1, C2 and C13 due to no water entry for a minimum of 12 hours.

Water samples obtained from the core holes C3, C4, C6, C7, C8, C9, C10, C11 and C12 were obtained after the holes stayed open overnight to allow enough water to accumulate for sampling. Figure 15 shows high concentrations of TPHg in the shallow groundwater ranging from a low of 550 ug/L at core hole C12 to a high of 66000 ug/L at core hole C9.

Figure 16 - TPHg groundwater plume between 24 and 30 feet below ground surface. Again no water samples were obtained from core holes C1 and C2 due to no water entry. Water samples obtained from core holes C3, C4, C6, C7, C8, C9, C10, C11, C12, and C13 were obtained the same day. Figure 16 shows reduced concentrations of TPHg compared to the shallower depth of Figure 15, with the highest concentration obtained from C11 of 7400 ug/L.

Figure 17 - TPHg groundwater plume between 35 and 40 feet below ground surface. Water samples were obtained from C1, C2, C3, C4, C6, C7, C8 and C10. Core holes C9, C11, C12 and C13 were not cored below 30 feet. Figure 17 shows further reduction of the TPHg plume with depth with only four samples showing concentration of TPHg above laboratory lower detection limits; C3 at 59 ug/L, C7 at 150 ug/L, C6 at 1100 ug/L and C10 at 1000 ug/L.

Figure 18 - Benzene groundwater plume between 11 and 19 feet below ground surface. No water samples were obtained from core holes C1, C2 and C13 due to no water entry for a minimum of 12 hours.

Water samples obtained from the core holes C3, C4, C6, C7, C8, C9, C10, C11 and C12 were obtained after the holes stayed open overnight to allow enough water to accumulate for sampling. Figure 18 shows high concentrations of Benzene in the shallow groundwater ranging from a low of 5.4 ug/L at core hole C4 to a high of 2400 ug/L at core hole C10.

Figure 19 - Benzene groundwater plume between 24 and 30 feet below ground surface. Again no water samples were obtained from core holes C1 and C2 due to no water entry. Water samples obtained from core holes C3, C4, C6, C7, C8, C9, C10, C11, C12, and C13 were obtained the same day. Figure 19 shows reduced concentrations of Benzene compared to the shallower depth of Figure 18, with the highest concentration obtained from C11 of 550 ug/L.

Figure 20 - Benzene groundwater plume between 35 and 40 feet below ground surface. Water samples were obtained from C1, C2, C3, C4, C6, C7, C8 and C10. Core holes C9, C11, C12 and C13 were not cored below 30 feet. Figure 20 shows further reduction of the Benzene plume with depth with only four samples showing concentration of Benzene above laboratory lower detection limits; C3 at 1.5 ug/L, C7 at 5.4 ug/L, C6 at 76 ug/L and C10 at 250 ug/L.

8.0 SOIL CONTAMINATION

8.1 Source Removal

December 7, 1989
All fuel was removed from the underground storage tanks. The supply lines were pressure tested by Walton Engineering. The regular leaded and the super-unleaded lines passed the tests; the regular unleaded line failed. Further investigation located a half-inch hole in the two inch unleaded supply line beneath the eastern pump island.

December 13, 1989
A backhoe excavated along the sewer lateral on Brighton Avenue. During excavating a six-inch water main was broken. A vacuum truck was used to collect the water from the excavation and the broken water main. RS-7 was installed into the excavation and the vacuum truck was used to pump water from RS-7 for one week. Approximately 7,200 gallons of fuel/wastewater from the excavation was manifest transported to H & H Shipyard for treatment and disposal.

December 15, 1989
A Internal Combustion Unit Vapor Extraction System (ICUVES) was connected to wells RS-1, RS-2, RS-5 and RS-6 and operated 24 hours a day for the first week, then only during daylight hours thereafter, due to noise complaints. A second portable ICUVES was connected to RS-7 and operated during daylight hours for gasoline vapor recovery. No estimates of source removal amounts can be located from the ICUVES operations.

June 23,1994
Excavated and removed the regular leaded steel underground storage tank (UST), the unleaded steel UST, the unleaded fiberglass UST, the waste oil steel UST, and all associated product dispensing piping and drain pipes. Performed documentation sampling under the direction of Jennifer Eberly, Alameda County Health Department. The excavated soil was placed back into the excavations for later removal with the concurrence of Ms. Eberly.

August 14, 1995
Completion of over-excavation of gasoline tainted soils associated with the UST and product dispensing system. An estimated 1700 cubic yards of non-hazardous gasoline contaminated soil was removed, profiled, transported and disposed to Forward Landfill, Stockton, California. Installed recovery/injection well R3 in the excavation south of the station building.

August 16,1995
Removed hydraulic hoists from station building.

August 31, 1995
Exploratory excavating at former waste oil UST area, north of the station building and area west of the station building. Installation of recovery/injection wells R1 and R2 into the excavations.

August 12, 1999
Completion of the receptor trench along Brighton Avenue, with installation of additional groundwater monitoring wells RS-8, RS-9 and RS-10. An estimated 148 cubic yards of non-hazardous gasoline tainted soils were removed, profiled and transported to Vacaville Landfill for disposal.

October 7, 1999
The completion of receptor trench de-watering and weekly purging. An estimated 19451 gallons of gasoline tainted groundwater was removed from the receptor trench and temporarily stored on site in a 22000 gallon Baker tank. This water was later disposed of to sanitary sewer after treatment through two in series water carbon units.

8.2 Soil Plume

Based on the new information from samples obtained from the direct push cores, December 2004, and the health risk modeling associated with these samples a sequence of soil plume figures have been generated showing Benzene as the driver for remediation. Figures 21 through 26 are isoconcentration figures of Benzene in soil from the 4-10 feet below ground surface to 30-34 feet

below ground surface. The isoconcentration color divides are yellow > 0.01 mg/Kg, blue>0.02 mg/Kg, red >0.2 mg/Kg and green > 2 mg/Kg. Modeling indicates that concentations of benzene at and greater than 0.02 mg/Kg will need to be removed/reduced.

Figure 21, 4 to 10 feet below ground surface; all soil samples tested were below laboratory lower detection limits for benzene.

Figure 22, 10 to 15 feet below ground surface; Samples obtained from cores C3, C6, C8 and C13 show levels of benzene greater than 0.02 mg/Kg with the highest concentration at C6 of 0.22 mg/Kg.

Figure 23, 15 to 20 feet below ground surface; Samples obtained from cores C3, C4, C6, C7, C8, C11 and C13 show levels of benzene greater than 0.02 mg/Kg with the highest concentration at C6 of 0.99 mg/Kg.

Figure 24, 20 to 25 feet below ground surface; Samples obtained from cores C3, C4, C6, C7, C8, C11 and C13 show levels of benzene greater than 0.02 mg/Kg with the highest concentration at C11 of 3.9 mg/Kg.

Figure 25, 25 to 30 feet below ground surface; Samples obtained from cores C6, C7 and C10 show levels of benzene greater than 0.02 mg/Kg with the highest concentration at C6 of 0.99 mg/Kg.

Figure 26, 30 to 35 feet below ground surface; Samples obtained from cores C6, C7, C10 and C11 show levels of benzene greater than 0.02 mg/Kg with the highest concentration at C7 of 0.14 mg/Kg.

9.0 RBCA TIER 2

To help determine the risks associated with this site a Risk Base Corrective Action (RBCA) Tier 2 Risk Assessment was performed on three separate segments of the groundwater plume. Segment 1 is the station proper Site Name DP 793, Segment 2 is the backyards along the sewer lateral Site Name DP 793-Backyards, and Segment 3 is Brighton Avenue, see Appendix G.

During the Tier 2 Assessment, Site-Specific Target Levels (SSTLs) were calculated, using the RBCA Spread Sheet System, for the following compounds of concern (COCs):

- Benzene in groundwater and subsurface soils
  using the California Cancer Slope Factor (SF) for Benzene.
- Toluene in groundwater and subsurface soils
- Ethylbenzene in groundwater and subsurface soils
- Xylenes in groundwater and subsurface soils
- MTBE in groundwater and subsurface soils

- TPHg as Hexane in groundwater and subsurface soils

Two potential transport pathways were considered during the Tier Two investigation of this site: Vapor Inhalation and Groundwater Ingestion. The third major pathway, soil ingestion, was not considered because there is no documented contamination in the upper three feet of soil, limiting the probability of the ingestion of contaminated soil.

9.1 Vapor Inhalation:

1. Volatilization to onsite inside air.
2. Volatilization to onsite outside air.

At the direction of Alameda County Health and the City of Oakland Fire Department. A Western Geo-Engineers geologist on September 20, 1996 obtained permission and collect air samples from the crawl spaces of the residences at 4006, 4026 and 4032 Brighton Avenue, from 1211, 1215, 1221, and 1227 Hampel Street and from 4003 Park Boulevard. At that time air samples were obtained from the sewer manways at Brighton Avenue, 4035 Park Boulevard and the backyard of 1221 Hampel Street. The samples were analyzed for Total Petroleum Hydrocarbons gasoline range (TPHg), Benzene, Toluene, Ethylbenzene, Xylenes and Methane. All but the methane were below laboratory lower detection limits of TPHg <50 ug/L, Benzene <0.5 ug/L, Toluene <0.6 ug/L, Ethylbenzene <0.5 ug/L and Xylenes <1.2 ug/L.

Methane concentrations are as follows:
Basements/crawlspaces
1211 Hampel Street 0.4 ug/L, 1215 Hampel Street 1.5 ug/L, 1221 Hampel Street 3.8 ug/L, 1227 Hampel Street 0.4 ug/L, 4006 Brighton Avenue 0.7 ug/L, 4026 Brighton Avenue 0.6 ug/L, 4032 Brighton Avenue 1.1 ug/L, and 4003 Park Blvd. 11.3 ug/L.

Sewer manways
1215 Hampel Street 0.7 ug/L, Brighten Avenue 0.4 ug/L and 4035 Park Blvd. 0.3 ug/L.

The lower explosion limit for gasoline in air is 52,000 ug/L.

The lower explosion limit for methane in air is 35,700 ug/L.

9.2 Groundwater Ingestion:

1. Onsite groundwater ingestion, residential. **The groundwater located in the shallow aquifer beneath this site is not suitable for commercial or domestic use due to the likelihood of biological and non-petroleum contaminants from leaking sewer and storm drain systems throughout the neighborhood.**

2. Off-site ingestion, Domestic. This was calculated for the intercept trench (T1) due to its downgradient proximity of the source and to determine if significant contamination will reach

the 2000 foot radius boundary. There are no known domestic and or commercial wells within a 2000 foot radius of the site. Because there is no down gradient well in the area the 2000 foot radius boundary was used to calculate off-site ingestion.

9.3 Toxicity Assessment

Of the compounds currently found at the site, the primary driver of risk is benzene.

9.3.1 Cancer Toxicity

Benzene, a class A carcinogen, has been shown in work place studies to cause Leukemia in humans. The California Cancer risk slope factor (SF) is 0.1 (1/(mg/kg-day)).

9.3.2 Non-cancer Toxicity.

Five compounds were considered for the non-cancer toxicity, Ethlybenzene, Hexane (TPHg), MTBE, Toluene, and Xylenes (which includes, meta, para and orto xylenes). See Appendies G, RBCA Spreadsheet, RBCA Chemical Data, and Toxicity Data for current EPA.

Hexane was used to represent the alkane (non-aromatic) portion of gasoline. Hexane was chosen because its properties represent the light, faster moving, end of the alkanes and as such represents the worst case for alkane migration.

At the concentrations currently found at this site, the risk of most importance is the chronic or long-term risk. Two types of chronic risk have to be assessed: cancer risk and non-cancer chronic exposure risk.

These two types of risk are treated differently because of the way they effect people. Carcinogens are modeled as if any amount of the compound will produce some possibility of causing cancer. Non carcinogens will not cause health effects until they reach a threshold value (TV). The TV concentration may have some adverse effect on the population. Below the TV, a high-risk compound may even have a beneficial effect, e.g., vitamin A and sodium chloride (table salt).

Because of these different effect models, the risk is calculated differently. The cancer risk is calculated as a probability of causing cancer using a slope factor (SF). The SF expresses the probability of developing cancer from the intake of 1 mg of compound per kg of body weight over a 70-year lifetime.

The non-cancer risk is calculated by comparing the chance of exceeding the TV of the compound. In order to insure that no sensitive person will be effected by the chemical, the Reference Dose (Rfd) that is used to calculate the risk of exposure is given an uncertainty factor of 10 to 1000 times less than the No-Observed-Adverse-Effect-Level (NOAEL). The NOAEL is the concentration at which no adverse effect was found in human and/or animal studies. The non-cancer risk is calculated by dividing the long-term ingestion rate by the Rfd. If the result is less than one, the health effects of the contaminant of concern will not be reached.

9.4 Exposure Assessment

Of the primary routes of exposure (inhalation, ingestion, injection and dermal contact), the following are the primary routes used for the RBCA model:

1. Ingestion of compounds in soil.
2. Ingestion of compounds in groundwater.
3. Inhalation of compounds in vapor form.
4. Dermal contact of compounds in soil and groundwater.

Of these routes of exposure, inhalation is the most likely route of exposure to be encountered at this site, see Figure 27 - Site Conceptual Exposure Model.

Ingestion of compounds in soil was considered only during soil excavation activities, because there is no documented contamination in the upper three feet of soil. The majority of contaminated soils have been removed by over-excavation of the USTs and associated piping dispensing area at 4035 Park Blvd. (to the 17 foot depth) and the Brighton Avenue eastern gutter area (to the 15.5 foot depth). Where contaminated soils still exists, these areas are paved over or are deeper than five feet below the surface, limiting the probability of the ingestion of contaminated soil.

On-site ingestion of compounds in groundwater was considered in order to determine the probability of adverse effects to off-site wells and maintenance of the groundwater pumping system at RS5. Ingestion of groundwater at the site is unlikely, as it would require turning RS-5 into a domestic well and proceeding to drink the water therefrom.

Off-site ingestion was considered in order to determine the probability of adverse effects to off-site downgradient receptor points (RS-9) and along the sewer main below Greenwood.

9.5 Concentrations Used

9.5.1 RBCA Tier 2 – Station proper

In order to test the probable impact of the current groundwater plume the upper confidence level (UCL) concentrations were calculated for the Monitor Wells within the plume and the December 2004 core samples.

The values used to determine the soil impacts were the highest values from samples obtained from the core samples on December 2004.

COMPOUND	MILLIGRAMS/LITER MILLIGRAMS/KILOGRAM	WELL
Benzene Water	2.4	2004 cores
Benzene Soil	3.9	2004 cores
Ethylbenzene Water	4.3	2004 cores
Ethylbenzene Soil	23	2004 cores

TPHg water represented in the RBCA by Hexane .	66	2004 cores
TPHg soil represented in the RBCA by Hexane .	1600	2004 cores
MTBE Water	0.09	2004 cores
MTBE Soil	0.0094	2004 cores
Toluene Water	1.1	2004 cores
Toluene Soil	15	2004 cores
Xylenes Water	12	2004 cores
Xylenes Soil	75	2004 cores

9.5.2 RBCA Tier 2 – Backyards (RS8)

In order to test the probable impact of the current groundwater plume the upper confidence level (UCL) concentrations were calculated for Monitor Well RS8, from the quarterly samples obtained in 2004. The values used to determine the soil impacts were the highest values from the soil samples obtained during installation of the backyard wells (RS8 and RS10).

COMPOUND	MILLIGRAMS/LITER MILLIGRAMS/KILOGRAM	WELL
Benzene Water	0.23	RS8
Benzene Soil	11	9.5 feet RS10
Ethylbenzene Water	0.44	RS8
Ethylbenzene Soil	21	9.5 feet RS10
TPHg water represented in the RBCA by Hexane.	26	RS8
TPHg soil represented in the RBCA by Hexane.	870	9.5 feet RS10
MTBE Water	0.0049	RS8
MTBE Soil	0.005	Lower detection limit
Toluene Water	0.26	RS8
Toluene Soil	62	9.5 feet RS10
Xylenes Water	2.8	RS8
Xylenes Soil	120	9.5 feet RS10

9.5.3 RBCA Tier 2 – West Brighton Avenue (T1)

In order to test the probable impact of the current groundwater plume the upper confidence level (UCL) concentrations were calculated for the trench well T1, quarterly sample results 2004.

The values used to determine the soil impacts were the highest values from the soil samples obtained during installation of well RS9.

COMPOUND	MILLIGRAMS/LITER MILLIGRAMS/KILOGRAM	WELL
Benzene Water	2.2	UCL T1 2004
Benzene Soil	0.41	10 feet RS9
Ethylbenzene Water	0.54	UCL T1 2004
Ethylbenzene Soil	0.87	10 feet RS9
TPHg water represented in the RBCA by Hexane .	12	UCL T1 2004
TPHg soil represented in the RBCA by Hexane .	67	10 feet RS9
MTBE Water	0.012	UCL T1 2004
MTBE Soil	0.005	Detection limit
Toluene Water	0.33	UCL T1 2004
Toluene Soil	2	10 feet RS9
Xylenes Water	0.64	UCL T1 2004
Xylenes Soil	4.9	10 feet RS9

9.6 Results

The results of a Tier 2 RBCA calculation are expressed as SSTLs. This is the concentration at which the calculated cancer risk will not exceed the 1/1,000,000 residential or 1/100,000 commercial cancer risk and the non-cancer threshold limit is less than one.

9.6.1 Surface Soils <3.3 feet bgs

RBCA Tier 2 – Station proper (Appendix G Worksheet 9.1)

No COCs exceeded the SSTLs for soil leaching to groundwater or ingestion, inhalation and dermal contact.

Volatilization to indoor air: Air sample obtained from the sewer manway was below laboratory lower detection limits for TPHg, BTEX.

RBCA Tier 2 – Backyards (Appendix G Worksheet 9.1)

Benzene exceeded the SSTLs for soil leaching to groundwater, the actual concentration was below laboratory lower detection limits of 0.005 mg/Kg.

Volatilization to indoor air: Air samples obtained from the basements/crawl spaces beneath 4006, 4026 and 4032 Brighton Avenue, from 1211, 1215, 1221, and 1227 Hampel Street and from 4003 Park Boulevard were below laboratory lower detection limits for TPHg and BTEX. Soil gas samples obtained from two locations in the backyard of 4006 Brighton Avenue were below laboratory lower detection limits for TPHg and BTEX.

RBCA Tier 2 – West Brighton Avenue (RS9) (Appendix G Worksheet 9.1)

Benzene exceeded the SSTLs for soil leaching to groundwater, the actual concentration was below laboratory lower detection limits of 0.005 mg/Kg.

Volatilization to indoor Air: Air sample obtained from the sewer manway in Brighton Avenue was below laboratory lower detection limits for TPHg, BTEX

9.6.2 Subsurface soils >3.3 feet bgs

RBCA Tier 2 – Station proper (Appendix G Worksheet 9.2)

Benzene, Ethylbenzene, Toluene, Xylenes and gasoline (hexane) exceeded the SSTLs for soil leaching to groundwater, volatilization to indoor air and volatilization to outdoor air; the corrective reduction factor (CRF) indicates that benzene needs to be reduced by 2300X's and gasoline (hexane) by 170X's.

RBCA Tier 2 – Backyards (Appendix G Worksheet 9.2)

Benzene, Ethylbenzene, Toluene, Xylenes and gasoline (hexane) exceeded the SSTLs for soil leaching to groundwater, volatilization to indoor air and volatilization to outdoor air; the corrective reduction factor (CRF) indicates that benzene needs to be reduced by 8400X's and gasoline (hexane) by 150X's.

RBCA Tier 2 – West Brighton Avenue (RS9) (Appendix G Worksheet 9.2)

Benzene and gasoline (hexane) exceeded the SSTLs for soil leaching to groundwater, volatilization to indoor air and volatilization to outdoor air; the corrective reduction factor (CRF) indicates that benzene needs to be reduced by 150X's and gasoline (hexane) by 3X's.

9.6.3 Groundwater

RBCA Tier 2 – Station proper (Appendix G Worksheet 9.3)

Benzene, Ethylbezne, Xylenes, MtBE and gasoline (hexane) exceeded the SSTLs for groundwater ingestion and volatilization to indoor air; the corrective reduction factor (CRF) indicates that benzene needs to be reduced by 2800X's and gasoline (hexane) by 30X's.

RBCA Tier 2 – Backyards (Appendix G Worksheet 9.3)

Benzene and gasoline (hexane exceeded the SSTLs for groundwater ingestion and volatilization to indoor air; the corrective reduction factor (CRF) indicates that benzene needs to be reduced by 270X's and gasoline (hexane) by 13X's.

RBCA Tier 2 – Brighton Avenue (Appendix G Worksheet 9.3)

Benzene and gasoline (hexane) exceeded the SSTLs for groundwater ingestion and volatilization to indoor air; the corrective reduction factor (CRF) indicates that benzene needs to be reduced by 770X's and gasoline (hexane) by 4X's.

9.7 Discussion

By definition, the SSTLs determine the concentrations at which the site will not pose a significant risk to the public or the workers at or near the site. On site, the SSTLs were exceeded for indoor air, outdoor air and groundwater exposure pathways. The sewer lateral backyard study indicates that the SSTLs were exceeded for outdoor air, indoor air and groundwater exposure pathways. The Brighton Avenue study indicates that the SSTLs were exceeded for indoor air, soil and groundwater exposure pathways. It must be noted that the values used for the backyard and Brighton Avenue soils are not current and are more indicative of historic than current risk.

9.7.1 Indoor Air

The RBCA Tier 2 studies indicated that the indoor air pathway has been exceeded. Subsurface lithology is composed of clays which would hinder the vertical/lateral migration of vapors which was substantiated by an earlier study that obtained air samples for analysis from sewer manways at Brighton Avenue, at the site (4035 Park Blvd) and along the backyard sewer later at 1215 Hampel Street and from the basement/crawl spaces of the following residences: 4006, 4026 and 4032 Brighton Avenue, from 1211, 1215, 1221, and 1227 Hampel Street and from 4003 Park Boulevard. Soil gas samples were also obtained from the backyard (3-foot depth) of 4006 Brighton Avenue. All samples were below lower laboratory detection limits for TPHg, BTEX, and MTBE.

9.7.2 Soil Exposure Pathways

No contaminated soils were found in the upper 3.3 feet of the studied areas. The station was extensively over-excavated removing the majority of contaminated soils to the 17-foot depth. The most recent soil samples obtained December 2004 indicated that the area previously under the building contains contaminated soils at 8 feet below ground surface, see Table 2. Where free phase floating product was discovered along Brighton Avenue, the installation of the receptor trench removed contaminated soils that were discovered between the 3 and 10 foot depth. In the backyards and along Brighton Avenue, the contaminated subsurface soils are associated with groundwater movement and the capillary fringe, which is deeper than the underground utility trenches, reducing the chance of dermal exposure from construction practices. The upper soils are composed of clay, which restricts the vertical and horizontal migration of vapors produced from the gasoline contaminant.

9.7.3 Groundwater pathway

There are no known private, municipal or industrial wells within a 2000 foot radius of the known extent of the groundwater gasoline plume. This groundwater is shallow and is not suited for domestic or industrial use. Of greater concern would be biological constituents in the groundwater from leaking sewers and storm drains. At the site (DP 793) groundwater is located between 5 and 20 feet below the surface. At Brighton Avenue (RS-7) groundwater is located between 3.7 and 4.7 feet below the surface. As shown during the various assessments of this site, the groundwater plume is associated with the sewer lateral that leaves DP 793 north along the backyards of 4006, 4010/4012, 4026, and 4032 Brighton Avenue, then west along the northern property line of 4032 Brighton Avenue, and then west across Brighton Avenue. This plume route shows migration along the route of least resistance, backfill of the sewer. And a damming effect that has retarded the downgradient migration of the plume along Brighton Avenue by water filled underground utility fill of the gas and water services. The native subsurface soils that contain the groundwater are very fine silty clays and clayey sands that do not typically allow for much of a downgradient extent of gasoline type plumes.

10.0 JOHNSON AND ETTINGER VAPOR INTRUSION MODEL

Results obtained from the RBCA TIER 2 modeling indicate that the indoor air exposure pathway is exceeded. The Johnson and Ettinger Vapor Intrusion Model was used to verify the RBCA TIER 2 results for vapor pathways.

The site proper was a gasoline dispensing and auto repair facility, all underground tanks, product dispensing piping have been removed and the majority of hydrocarbon impacted soils have been removed. The facility building was demolished in April 2003. In December 2004 a soil and groundwater sampling investigated the area formerly covered by the building along with areas north and west. The current owner of the site plans to build to residential buildings on the property. In order to determine if developing the property posed a risk to future inhabitants and to determine the risk to neighboring sensitive receptors the Johnson and Ettinger Vapor Intrusion Model was used.

The Johnson and Ettinger Model incorporates both convective and diffusive mechanisms for estimating the transport of contaminant vapors emanating from either subsurface soils or groundwater into indoor spaces located directly above the source of contamination, see Appendix G.

10.1 Findings

10.1.1 Soil

To determine the current risk to the proposed residences at 4035 Park Blvd., the highest concentrations for benzene, toluene, ethylbenzene and xylenes were obtained from the December 2004 core sample laboratory results and were used to calculate the risk as carcinogen (1 in a million) and non carcinogen using the acceptable risk of 1. As can be seen from the chart below,

benzene is the driving factor, exceeding the carcinogen risk and approaching the non-carcinogen risk.

contaminant	Carcinogen risk	Non-carcinogen risk
Benzene	240/million	0.32
Toluene	Not applicable (NA)	0.16
Ethylbenzene	NA	0.0092
Xylenes	NA	0.13

Since benzene is the driving source of risk for this site, modeling was performed on various soil depths below the ground surface (5 ft, 10 ft, 15 ft, etc. to 35 ft) to determine the amount of benzene that could be left in place, on site. No modeling was performed on off site soils, due in part to; lack of recent soil samples and the off-site monitor wells have declined in benzene concentration to below laboratory lower detection limits (wells RS8 and RS10).

The modeling indicated that the following at depth concentrations of benzene would need to be removed to protect against indoor air exposure risk.

5 ft depth	10 ft depth	15 ft depth	20 ft depth	25 ft depth	30 ft depth	35 ft depth
11.4 ug/Kg	12.7 ug/Kg	14.1 ug/Kg	15.4 ug/Kg	16.7 ug/Kg	18.1 ug/Kg	4 ug/Kg

10.1.2 Groundwater

Residential Backyards

Groundwater monitoring wells RS8 and RS10 are positioned in the residential area downgradient of the contamination source (4035 Park Blvd - DP793) and upgradient of the intercept trench along Brighton Avenue. The most recent groundwater analysis, December 8, 2004, show these wells to be below laboratory lower detection limits for Benzene, Toluene and Ethylbenzene with Xylenes detectable in RS8 at 0.66 ug/L and below lower detection limits in RS10.

Brighton Avenue - Residential Front Yards

The intercept trench runs along the eastern curb of Brighton Avenue for approximately 150 feet. Groundwater is normally found at 2 feet below the surface at the topographic low point (T1), 4.5 feet, south end of trench (T4) and below 9 feet at the north end of the trench (T3). The following factors were used: estimated depth of 4 feet below the surface to top of groundwater for the lowest topographic positioned residence (4032 Brighton Avenue), the most recent groundwater sample analysis from T1, the threshold value (TV) as carcinogen (1 in a million) and non carcinogen using the acceptable risk of 1 were used. Again the benzene in groundwater levels at the intercept trench pose an unacceptable risk.

contaminant	Carcinogen risk	Non-carcinogen risk
Benzene	28/million	0.037

11.0 NATURAL ATTENUATION - BIODEGRADATION

11.1 Bioremediation Sampling

Bacteria native to the soil at hydrocarbon contamination sites normally degrade hydrocarbons. The most effective hydrocarbon degraders (eaters) are the aerobic (oxygen using) bacteria. Usually the factor controlling the rate that these bacteria degrade the gasoline is the amount of available dissolved oxygen.

A much slower degradation process starts when the dissolved oxygen is consumed. The plume begins to become anaerobic and the bacteria commence to reduce nitrate, ferric iron, and sulfate to further degrade the hydrocarbons. Eventually, as these compounds and the oxygen are depleted, the bacteria begin methogenesis, in which the hydrocarbons are converted to methane.

In order to determine the site potential for natural Bioremediation, the wells were sampled during the August 26,1999 sampling round for the following electron acceptors:

1. Dissolved Oxygen, O_2
2. Nitrate, NO_3^-
3. Sulfate, SO_4^{--}
4. Ferrous Iron, Fe^{++}. The actual electron acceptor is Ferric Iron Fe^{+++} but it is insoluble, so the reaction product Fe^{++} is measured.
5. Additionally, the wells were sampled for TPHg/MBTEX.

During the August 26, 1999 and December 18, 2001 sampling field measurements were obtained from all of the monitoring wells and the receptor trench well T1 to evaluate the natural attenuation occurring at that time. A WEGE geologist, using a HACH spectrophotometer, analyzed water samples for Dissolved Oxygen (DO), and the electron acceptors Sulfate and Nitrate, and the reactive product Ferrous Iron, see Table 4.

On September 2, 1999 selected wells were sampled for carbon dioxide, methane, aerobic hydrocarbon degrading bacteria, orthophsphate and ammonia as nitrogen, see Table 4.

11.2 Results of Bioremediation Sampling

Comparison of DO measurements (O_2), August 26, 1999 to December 18, 2001. Dissolved Oxygen (DO) increased in wells RS2, RS5, RS6, RS7, RS8, RS9, R1, R2, R3 and T1. The increase in DO is felt to be influenced by the continuing pumping of contaminated groundwater from RS5, with treatment through activated carbon and discharge to sewer. The sewer system in the area is old clay pipe and most likely leaks, allowing treated, oxygen enhanced (pumping and discharge allows ambient oxygen to come in contact with the water) water to seep from the sewer line into the shallow groundwater. Also the pumping of RS5 allows groundwater not effected by the hydrocarbon plume to be pulled into the plume. Prior to pumping from RS5 wells RS2, RS5, RS7, R1, R2, and T1 were depleted of DO.

Comparison of field measurements for the electron acceptor Nitrate (NO_3), August 26, 1999 to December 18, 2001. Nitrate increased at wells MW1, RS2, RS5, RS7, RS8, R1, R2, R3 and T1. This shows elevated nitrate in groundwater near the building at the station property, extending along the backyard sewer lateral to the receptor trench at Brighton Avenue.

Comparison of field measurements for the electron acceptor Sulfate (SO_4), August 26, 1999 to December 18, 2001. Sulfate increased at wells MW1, RS2, RS8 and R1 with significant decreases at wells RS7, and T1. This indicates sulfate removal within the intercept trench and the excavated area containing RS7 and the sewer lateral of Brighton Avenue.

Comparison of field measurements for the electron acceptor Ferrous Iron (Fe^{+2}), August 26, 1999 to December 18, 2001. Fe^{+2} does not occur in aerobic environments but is a byproduct of reducing environments. The Fe^{+2} plume shows the area that is actively consuming available oxygen. Wells MW1, RS2, RS6, RS7, RS8, R1 and R2 showed reductions in Fe^{+2}. While wells RS5 and T1 showed increases in Fe^{+2}. Indicating that the groundwater plume has gone from a reducing environment to an oxygen enhance environment.

The August 1999 measurements of electron acceptors demonstrated that active bio-degradation was occurring at the site, along the sewer lateral and within the receptor trench with reduced DO and elevated levels of Fe^{+2} occurring in the same areas. Along with reductions of NO3 and SO4 compared to levels within the groundwater plumes higher TPHg concentration, where NO3 and SO4 still exist.

The September 1999 samples further defined the natural attenuation study. These samples were obtained from wells MW-1, RS-5, RS-6, RS-8, RS-9, RS-10 and T-1 were analyzed for biological indicators; Carbon Dioxide, Methane, and Aerobic Hydrocarbon Degrading Bacteria (AHDB) along with the nutrients Ortho Phosphate, and Ammonia as Nitrogen, see Table 4.

Comparing the Carbon Dioxide to Methane results indicates that the degradation is primarily oxygen based in nature, but some methogenic conditions exist with the presence of methane. The bacteria study shows that there are AHDB present within the hydrocarbon plume with the highest count at downgradient well RS-9 and the lowest count at upgradient well MW-1. The nutrients Orthophosphate and nitrogen have been depleted.

The December 2001 measurements of the electron acceptors showed dissolved oxygen, nitrate and sulfate levels increased. The only activity at the site was pumping of contaminated groundwater from RS5 with treatment through water carbon units prior to discharge to onsite sanitary sewer; while ferrous iron decreased. This indicates that the pumping at RS5 allows water outside of the plume to be pulled into the plume area replenishing the electron acceptors, also the discharge of the treated water from RS5 through the sewer allows flushing of the plume with cleaned oxygen rich water.

12.0 SENSITIVE RECEPTORS

Potential Receptor Exposure Model

A Potential Receptor Exposure model for this site is presented in Figure 27. This model only considers the Underground Storage Tank path as the fill material and industrial facilities paths do not apply to this site.

The tanks were emptied of all contents on December 7, 1989 and removed along with all associated piping on June 23, 1994. Over-excavation of onsite gasoline contaminated soils occurred in August 1995 with groundwater removal from RS5 commencing February 15, 2001.

With the removal of the tanks and associated piping the primary source of the hydrocarbon contamination at the site has been removed.

Currently the only active source at this site is the subsurface soil secondary source and the associated hydrocarbon contaminated water produce through leaching and mixing. This subsurface soil secondary source is located at the capillary fringe (approximately 8 feet below the surface) to approximately the 30 feet depth. The shallow depth to soil contamination along with the vaporization model (Johnson & Ettinger) indicates that direct vaporization of the soil contamination to soil vapor is a pathway along with leaching as the path of contaminant transport and exposure.

The residue soil contamination is continually leaching into the groundwater making reaching final cleanup levels problematic. As the contamination in the groundwater is removed, the TPHG associated with the soil will leach out to maintain equilibrium conditions. Also the low drainage rate of the shallow groundwater does not allow for adequate removal of the contaminated groundwater and exchange with non-contaminated groundwater. Soil and water sample results from the most recent assessment (December 2004) show that core hole C10 benzene concentration in water was 2.4 mg/l and the soil concentration was 3.9 mg/kg at core hole C11.

Vapor extraction would have limited removal of contaminants of concern in the vadose zone due to the high clay content of the soils and minor amounts of contaminants found above 8 feet BGS.

GROUNDWATER PUMPING

There are two scenarios for long term groundwater born exposure from this site:

Groundwater pumping from an on-site well.

This is unlikely for a number of reasons: the site is provided water by the City of Oakland. Such a well would have to be permitted by the District; therefore, the possibility of intentional production and ingestion of on-site groundwater is very small. The largest possibility of on-site exposure to this groundwater is through the continued groundwater sampling and recovery for treatment.

Groundwater transport of the contaminator.

Production Wells
No production wells are located within 2000 feet the site. With calculated velocity high of 385 feet per year (BH5) the travel time to the 2000 foot border should be 5 years.
$V = K \times I/ne \quad T = d/v$

On-site the contaminated groundwater is prevented from downward migration by the stiff clay at 40 feet below the surface, as evidence by soil samples taken during the December 2004 groundwater/soil investigation, Table 2.

Surface Waters
The closest surface water is Ardley Reservoir, 2500 feet southwest of the site and Sausal Creek approximately 2300 feet southeast of the site. Gradient flow from the site is to the west, northwest.

13.0 INTERCEPT TRENCH

13.1 Purging of Receptor (Intercept) Trench

Commencing on May 4, 2000, weekly pumping of the receptor trench has been performed for approximately 4 hours per week. During purging the depth to water within the trench is lowered an average of one foot. Immediately after purging ceases, the water level in the trench recovers to its original depth. Weekly purging of the receptor trench was suspended on July 19, 2001 at the request of Desert Petroleum. 62,511 gallons of contaminated groundwater had been removed from the trench, processed through two, in series, activated carbon water scrubs and discharged to the sanitary sewer. Due to the increase of gasoline range hydrocarbons in downgradient well RS9 sampled on November 5, 2002, the receptor trench was purged on December 12, 2002, removing 1,432 gallons during 5 hours of pumping. Periodic purging of the trench has occurred since that time. As of December 30, 2004 92,009 gallons of groundwater has been pumped from the receptor trench and purged from the groundwater monitoring wells, see Table 5.

14.0 PUMPING ON-SITE WELL RS-5

On February 15, 2001 a submersible pump with a pump bypass was placed into RS-5. The pump rate was adjusted to 1.5 gpm and allowed to continuously pump from RS-5 for one week. 3223 gallons were pumped from RS-5 through the two, in series, water carbon units and discharged to the sewer. On February 22, 2001 the pump was inspected and showed a slimy growth covering the pump and discharge line that was below the water level. The pump was cleaned and placed back into RS-5 and continued to discharge from RS-5 through the water carbon units to sewer until July 19, 2001. On July 19, 2001 Desert Petroleum requested suspension of further pumping at the site. The pump was removed and the site secured. From February 15 through July 19, 2001, 78,919 gallons of gasoline contaminated groundwater was recovered from RS-5 and treated through carbon before being discharged to the sewer. Pumping from RS5 was resumed on March 21, 2002. As of December 30, 2004, 655,963 gallons of groundwater have been pumped from RS5 and

treated through two, in series, water carbon units prior to being discharge to the sanitary sewer, see Table 5.

The pumping from RS-5 lowered the groundwater at this well by at least 15 feet, when compared to non pumping water measurements creating a cone of influence out to offsite wells RS-8 and RS-10, see Chart - Appendix A.

15.0 FREE PHASE FLOATING PRODUCT REMOVAL

Yellow Free Phase Floating Product was discovered in well RS8, 0.04 feet in thickness on August 6, 2002. Since all product storage and dispensing systems have been removed from the site (June 1994), it is thought that the product found in RS8, is residual from the November 1989 release and groundwater pumping at RS-5 is retrieving this residual product. Weekly bailing of the floating product commenced on November 20, 2002 and as of December 12, 2002, (the last noted detection of free phase product in RS8) 0.014 gallons of degraded gasoline have been removed and are stored on site in a 55 gallon 17H drum.

16.0 TOLUENE IN DRAIN SUMP LOCATED AT 3967 GREENWOOD AVE.

At the request of Alameda County Health, A Western Geo-Engineers (WEGE) geologist working directly under California Registered Geologist #3036 collected water samples from the drainage sump at 3976 Greenwood Avenue, Oakland, California on January 6, 2005, see Figure 3. Three 40ml VOA vials containing 0.5 ml HCl acid, as a preservative, were filled with no headspace. Digital pictures were obtained of the drainage sump at that time.

The samples were delivered with accompanying chain of custody documentation to KIFF Analytical LLC (DHS certified #2236) to be analyzed for TPH-G, BTEX, and MTBE using EPA methods 8260B. Toluene was the only analyte that tested above the laboratory lower detection limit of 0.5 ug/L.

Toluene

Toluene was detected at 0.62 ug/L for the water samples obtained from the sump. The recommended California Public Health Goal (CPHG) for toluene is 150 ug/L.

Uses of Toluene:
Toluene also known as methylbenzene and phenylmethane is the 27th highest volume chemical produced in the US. Toluene is used in gasoline, as a solvent for paints and coatings, gums, resins, most oils, rubber, vinyl organosols; diluent and thinner in nitrocellulose lacquers; adhesive solvent in plastic toys and model airplanes; chemicals (benzoic acid, benzyl and benzoyl derivatives, saccharin, medicines, dyes, perfumes); source of toluenediisocyanates (polyurethane resins); explosives (TNT); toluene sulfonates (detergents); scintillation counters (*reference: Sax, N. Irving & Lewis, Richard J. SR., Hawley's Condensed Chemical Dictionary, Eleventh Edition, page 1163*).

Discussion

Although toluene is a constituent of unleaded gasoline and the groundwater plume associated with the site located at 4035 Park Blvd contains toluene, it is felt that the trace amounts of toluene located in the sump sample is not associated with the 4035 Park Blvd release. The most downgradient monitor well, RS9 (approximately 155 feet upgradient of the sump) contains all of the BTEX constituents of gasoline and for only Toluene to be detected is highly unlikely from a gasoline release. The probable source for the Toluene is from paint solvents, thinners and/or adhesives.

17.0 SUMMARY

Modeling of the exposure pathways for the site (RBCA Tier 2 and Johnson and Ettinger Vapor Intrusion Models) indicate that subsurface soils and groundwater contamination needs to be reduced to prevent indoor air exposure of Benzene. Other than excavation practices no other exposure pathway exists to the site or surrounding residential area. There are no other sensitive receptors with in 2000 feet of the soil/groundwater plume. The most recent soil and groundwater samples obtained from drilling activities (December 2004) at 4035 Park Blvd showed high concentrations of TPHg and BTEX exist in the soils and shallow groundwater (8 ft to 32 ft below ground surface) beneath the area that was previously occupied by the station building. Water sampling of the December 2004 borings showed slow drainage, indicating low hydraulic conductivity in the silty clay and the clayey conglomerate formations. Previous slug test on temporary piezometers installed downgradient of the site, in the backyard of the surrounding residences, showed groundwater velocities ranging between 4 and 385 feet per year. Pumping of RS5 produces approximately 700 gallons per day (>0.5 gpm). To further slow the migration of the contaminants of concern, organic carbon analysis showed total organic carbon in the water bearing formations to range between 340 and 5700 mg/Kg. Along with the organic carbon, natural attenuation is occurring as evident from analysis for the electron acceptors (dissolved oxygen, nitrate, sulfate and ferric iron) along with the presence of biological indicators (carbon dioxide, methane, aerobic hydrocarbon degrading bacteria, and reduced nutrients ortho phosphate and ammonia as nitrogen).

Purging of the receptor trench (T1) facilitated the decrease in the TPHg concentrations in down gradient wells RS-7 and RS-9, see Table 1 and Appendix E-charts RS-7. The purging of the receptor trench is limited to approximately 1200 to 2000 gallons once per month. Although this does lower the water level in the trench, after pumping has ceased the water level rebounds to it original depth allowing for the gradient migration of TPHg contaminated groundwater to continue.

Pumping from RS-5 has created a cone of influence off-site downgradient out to RS-8 and RS-10. Pumping has increased the dissolved oxygen in RS-5 and hydrocarbon concentrations have declined in R1, R2, R3, RS-5, RS7, RS8, RS9, RS-10 and the Receptor Trench (T1). 0.04 feet of floating product (yellow gasoline) discovered during the August 6, 2002 sampling round could indicate that the pumping at RS-5 is capturing residual free phase product in that area.

The most recent sampling, December 8, 2004 shows continued decrease in hydrocarbons to levels lower than the May 31, 2001 sample results at wells RS5, RS6, RS7, RS9, RS10, R1, R2 and T1.

A moderate increase in hydrocarbon concentration downgradient of the site at well RS8 is seen, but is a substantially decreased when compared to the 2003 4th quarter sampling.

Previous sampling, September 2, 1999, showed that aerobic bacteria (hydrocarbon degraders) exist in the groundwater associated with the hydrocarbon plume. A workplan to augment the groundwater with oxygen (air sparging) and nutrients (phosphate and ammonium sulfate) dated August 29, 2000 was presented with the August 29, 2000, Third Quarter 2000 report. This workplan along with the May 31, 2001 conditions were discussed during a meeting at Alameda County Health that involved Mr. Thompson, Desert Petroleum, Mr. Seery, Alameda County Health and Mr. Converse, Western Geo-Engineers, on November 13, 2001. The meeting concluded that nutrient augmentation was not necessary at this time, but enhanced dissolved oxygen was needed. Due to neighborhood concerns, i.e. residential homes and apartments, air sparging and/or using a mechanical delivery device would create too much noise and a more passive oxygen delivery system was warranted, i.e. hydrogen peroxide or Oxygen Release Compound (ORC). An amended workplan was presented in Appendix G of the 4th Quarter 2001 report, dated January 7, 2002 and suggested that ORC would be the most beneficial means of enhancing dissolved oxygen in the groundwater plume. Western Geo-Engineers then requested Regenisis Inc. to perform a basic model using ORC to determine how to apply, and the amount needed. The Regenisis model indicated that a one-time application (would last approximately one year) of approximately 9,690 pounds of ORC would be needed, at a cost of $77,520.00 for materials, which does not include installation costs. Upon receipt of the Regenisis model, WEGE projected how much hydrogen peroxide would be necessary to increase the dissolved oxygen in the plume from 2 mg/L to 8 mg/L. This simple model indicated that 18 gallons of 35% solution hydrogen peroxide would be necessary per application, at a cost of $1,160.00 per monthly application or $13,920.00 for one year.

Further communications from Mr. Scott Seery with Mr. Converse occurred during the week of February 25 - March 1, 2002. Mr. Seery suggested another meeting to discuss remediation options prior to approving the amended workplan presented with the January 7, 2002 report. In a phone conversation between Mr. Converse and Mr. Seery on August 12, 2002, Mr. Seery requested that the peroxide treatment not be performed until further review of the site by Alameda County Health. On January 15, 2003 Mr. Toni Razzi resold the property to Mr. Kin Man Li (P.O. Box 348, Oakland, CA 94604). The new owner demolished the existing service station building. In December 2004 Western Geo-Engineers performed additional soil and groundwater sampling of areas previously located beneath the station building. Field observations, along with soil and water sample results, indicate that the subsurface soil conditions hinder groundwater movement, slowing degradation/dilution of the groundwater plume that exists between 11 and 32 feet below ground surface. The above-mentioned plan to use hydrogen peroxide and or ORC would have had limited impact on the remediation of the soils and groundwater at this site.

18.0 DATA GAPS

Review of the past and current soil and water sample results reveals data gaps for current soil contamination amounts. The most current soil analysis for COC for the backyards and Brighton Avenue is from the assessment performed in August 1999. The downgradient extent for groundwater transport along the sewer/storm drain lateral has not been fully documented.

19.0 RECOMMENDATIONS

With a new property owner intending to build residential buildings on 4035 Park Blvd., the following recommendations are made by Western Geo-Engineers.

- Determine which wells located at 4035 Park Blvd., are necessary for the assessment and remediation objectives and destroy the unnecessary wells as per Alameda County Health guidelines.
- Remove the onsite source of hydrocarbon contamination found in the soils and shallow groundwater at 4035 Park Blvd.
- Continue pumping RS5
- Install service laterals to the intercept trench well (T1) to perform continuous groundwater pumping from the trench.
- Define the downgradient extent of the hydrocarbon plume along the storm drain/sewer lateral.

20.0 REFERENCES

ASTM, ASTM Standards Related to Environmental Site Characterization, 1997

Banks, Harvey O., Intrusion of Salt Water Into Ground Water Basins of Southern Alameda County, State of California Department of Water Resources Division of Resources Planning, Bulletin No. 81, December 1960

Davis, Fenelton F., Mines and Mineral Resources of Alameda County, California, California Journal of Mines and Geology, Volume 46, Number 2, April 1950.

Jenkins, Olaf P., Geologic Guidebook of the San Francisco Bay Counties, Bulletin 154, Dept. of Natural Resources, State of California, December 1951

Kennedy, David N., Ground Water Storage Capacity of a Portion of the East Bay Plain, Alameda County, California, Department of Water Resources, Central District, January 1994.

Nilsen, T.H., Taylor, F.A., Brabb E.E., Recent Landslides in Alameda County, California (1940-71) An Estimate of Economic Losses and Correlations with Slope, Rainfall, and Ancient Landslide Deposits, Geological Survey Bulletin 1398, 1976.

Oakeshott, Gordon B., California's Changing Landscapes, A Guide to the Geology of the State, Division of Mines and Geology, State of California, 1971.

Sax, N. Irving and Lewis, Richard J. Sr., Hawley's Condensed Chemical Dictionary, eleventh edition, 1987

U.S. Department of Health and Human Services, NIOSH Pocket Guide to Chemical Hazards, January 2003

Ward, Randall M. Director, Earthquake Planning Scenario for a Magnitude 7.5 Earthquake on the Hayward Fault in the San Francisco Bay Area, California Department of Conservation, Division of Mines and Geology, Special Publication 78, 1987

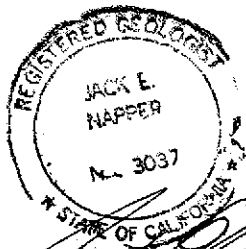
21.0 LIMITATIONS

This report is based upon the following:

A. The observations of field personnel.
B. The results of laboratory analyses performed by a state certified laboratory.
C. Referenced documents.
D. Our understanding of the regulations of the State of California, Alameda County and the City of Oakland.
E. Changes in groundwater conditions can occur due to variations in rainfall, temperature, local and regional water use, and local construction practices.
F. In addition, variations in the soil and groundwater conditions could exist beyond the points explored in this investigation.

State Certified Laboratory analytical results are included in this report. This laboratory follows EPA and State of California approved procedures; however, WEGE is not responsible for errors in these laboratory results. Western Geo-Engineers is a corporation under California Registered Geologist #3037 and/or Contractors License #513857. The services performed by Western Geo-Engineers have been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the State of California and the Oakland area. Our work and/or supervision of remediation and/or abatement operations, active or preliminary, at this site is in no way meant to imply that we are owners or operators of this site. Known or suspected contamination of soil and/or groundwater must be reported to the appropriate agencies in a timely manner. No other warranty, expressed or implied, is made.

Sincerely,



George Converse
Geologist

Jack E. Napper
Ca. Reg. Geologist #3037

cc: Mr. Robert Schultz, Alameda County Health (510) 567-6719
Mr. Leroy Griffin, Oakland Fire Dept.
Mr. Kin Man Li, property owner (510) 599-7000

TABLE 1
GROUNDWATER ELEVATIONS AND CERTIFIED ANALYTICAL LABAOFATACRY RESULTS FROM WATER SAMPLES
DESERT PETROLEUM, INC. SITE #793
4035 PARK BOULEVARD, OAKLAND, CALIFORNIA

ID#	DATE SAMPLED	WELL CASING ELEVATION (FEET AMSL	DEPTH TO GROUND WATER (FEET)	GROUND WATER ELEVATION (FEET AMSL	TPH-G (UG/L)	BENZENE (UG/L)	TOLUENE (UG/L)	ETHYL-BENZENE (UG/L)	XYLENES (UG/L)	MTBE (UG/L)	
	(All concentrations in parts per billion [ug/L, ppb]) (AMSL = Above mean sea level)										
(CALIFORNIA PUBLIC HEALTH GOAL)						(1.5)	(150)	(300)	(1800)	(13)	
RS-1	12/14/89	228.15	24.25	203.9	19000	2600	2700	200	1200		
RS-1	12/90				15000	3500	330	170	760		
RS-1	2/91				6900	910	200	39	540		
RS-1	6/91				1600	56	180	12	26		
RS-1	9/91				4100	730	7.6	5.1	24		
RS-1	12/91				8300	950	160	71	190		
RS-1	11/9/92	228.15	17.05	211.1	1700	730	9.6	16	14		
RS-1	4/7/94	228.15	13	215.15	860	84	12	16	110		
RS-1	6/19/94	228.15	13.37	214.78	1400	150	12	52	87		
RS-1	9/17/94	228.15	16.33	211.82	310	30	1.8	2.8	3.9		
RS-1	3/12/95	228.15	4.66	223.49	ND	ND	ND	ND	ND		
		DESTROYED BY OVER-EXCAVATION OF UST-DISPENSER AREAS (8/14/95									
		REPLACED WITH MW-1 9/5/95.									
MW-1	10/4/95	229.5	12.38	217.12	ND	ND	ND	ND	ND		
MW-1	12/21/95	229.5	13.40	216.1	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
MW-1	03/27/96	229.5	5.53	223.97	< 50	< 0.5	< 0.5	< 0.5	< 2	< 50	
MW-1	06/11/96	229.5	9.02	220.48	< 50	< 0.5	< 0.5	< 0.5	< 2	< 50	
MW-1	09/04/96	229.5	11.84	217.66	< 50	< 0.5	< 0.5	< 0.5	< 2	< 5	
MW-1	12/11/96	229.5	12.98	216.52	< 50	< 0.5	0.9	< 0.5	< 1	< 0.5	
MW-1	2/21/97	229.5	9.50	220	< 50	< 0.5	0.9	< 0.5	< 1	< 0.5	*
MW-1	5/28/97	229.5	11.18	218.32	< 50	3	3	< 0.5	< 1	< 0.5	*
MW-1	9/2/97	229.5	13.00	216.5	< 50	5	< 0.5	< 0.5	< 1	< 0.5	*
MW-1	11/24/97	229.5	14.12	215.38	< 50	5	< 0.5	< 0.5	< 1	< 0.5	*
MW-1	2/25/98	229.5	6.41	223.09	< 50	< 0.5	< 0.5	< 0.5	< 1	< 0.5	*
MW-1	7/8/98	229.5	7.28	222.22	< 50	< 0.5	< 0.5	< 0.5	< 1	< 1	*
MW-1	9/16/98	229.5	10.96	218.54	< 50	< 0.5	< 0.5	< 0.5	< 1	< 1	*
MW-1	11/24/98	229.5	12.24	217.26	52	2.3	5.2	< 0.5	5.4	11	*
MW-1	2/23/99	229.5	7.14	222.36	< 50	< 0.5	5	< 0.5	< 1	< 0.5	
MW-1	5/5/99	229.5	7.00	222.5	< 50	2	<0.5	< 0.5	< 1	8	
MW-1***	8/26/99	229.5	11.41	218.09	<50	4.1	<0.5	< 0.5	< 1	<1	
MW-1	11/10/99	229.5	13.27	216.23	<50	<0.5	<0.5	< 0.5	< 1	<0.5	
MW-1	2/9/00	229.5	13.76	215.74	<50	<0.5	<0.5	0.5	< 1	0.5	
MW-1	6/30/00	229.5	10.63	218.87	<50	<0.5	<0.5	< 0.5	< 1	< 0.5	
MW-1	8/8/00	229.5	11.77	217.73	62	1	2	< 0.5	2	< 0.5	
MW-1	11/16/00	229.5	13.33	216.17	<50	<0.5	<0.5	< 0.5	< 1	< 0.5	
MW-1	3/8/01	229.5	12.30	217.2	<50	<0.5	<0.5	< 0.5	< 0.5	< 0.5	****
MW-1	5/31/01	229.5	11.88	217.62	<50	<0.5	<0.5	< 0.5	< 0.5	< 0.5	****
MW-1	12/18/01	229.5	13.74	215.76	<50	<0.5	<0.5	< 0.5	< 0.5	< 0.5	****
MW-1	2/19/02	229.5	14.42	215.08	<50	<0.5	<0.5	< 0.5	< 0.5	< 0.5	****
MW-1	5/7/02	229.5	10.78	218.72	<50	<0.5	<0.5	< 0.5	< 0.5	< 0.5	****
MW-1	8/6/02	229.5	12.70	216.8	<50	<0.5	<0.5	< 0.5	< 0.5	< 0.5	****
MW-1	11/5/02	229.5	15.00	214.5	<50	<0.5	<0.5	< 0.5	< 0.5	< 0.5	****
MW-1	12/12/02	229.5	15.46	214.04							
MW-1	3/13/03	229.5	14.51	214.99	<50	<0.5	<0.5	< 0.5	< 0.5	< 0.5	****
MW-1	5/6/03	229.5	11.06	218.44	<50	<0.5	<0.5	< 0.5	< 0.5	< 0.5	****
MW-1	8/13/03	229.5	13.13	216.37	<50	<0.5	<0.5	< 0.5	< 0.5	< 0.5	****
MW-1	11/20/03	229.5	14.85	214.65	<50	<0.5	<0.5	< 0.5	< 0.5	< 0.5	****
MW-1	1/22/04	229.5	13.65	215.85							
MW-1	3/30/04	229.5	11.68	217.82	<50	<0.5	<0.5	< 0.5	< 0.5	< 0.5	****
MW-1	6/10/04	229.5	13.08	216.42	<50	<0.5	<0.5	< 0.5	< 0.5	< 0.5	****
MW-1	9/28/04	229.5	14.33	215.17	<50	<0.5	<0.5	< 0.5	< 0.5	< 0.5	****
MW-1	12/8/04	229.5	14.67	214.83	<50	<0.5	<0.5	< 0.5	< 0.5	< 0.5	****

TABLE 1
GROUNDWATER ELEVATIONS AND CERTIFIED ANALYTICAL LABAORATAORY RESULTS FROM WATER SAMPLES
DESERT PETROLEUM, INC. SITE #793
4035 PARK BOULEVARD, OAKLAND, CALIFORNIA

ID#	DATE SAMPLED	WELL CASING ELEVATION (FEET AMSL)	DEPTH TO GROUND WATER (FEET)	GROUND WATER ELEVATION (FEET AMSL)	TPH-G (UG/L)	BENZENE (UG/L)	TOLUENE (UG/L)	ETHYL-BENZENE (UG/L)	XYLENES (UG/L)	MTBE (UG/L)	
	(All concentrations in parts per billion [ug/L, ppb]) (AMSL = Above mean sea level)										
(CALIFORNIA PUBLIC HEALTH GOAL)						(1.5)	(150)	(300)	(1800)	(13)	
RS-2	12/14/89	227.39									
RS-2	6/19/94	227.39	10.89	216.50							
RS-2	3/12/95	227.39	5.26	222.13	ND	ND	ND	ND	ND		
RS-2	10/4/95	227.39	15.05	212.34	ND	ND	ND	ND	ND		
RS-2	12/21/95	227.39	9.95	217.44	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
RS-2	03/27/96	227.39	6.28	221.11	< 50	< 0.5	< 0.5	< 0.5	< 2	< 50	
RS-2	06/11/96	227.39	8.00	219.39	< 50	1.2	2.8	< 0.5	< 2	< 50	
RS-2	09/04/96	227.39	9.89	217.50	< 50	< 0.5	< 0.5	< 0.5	< 2	< 5	
RS-2	12/11/96	227.39	8.38	219.01	< 50	< 0.5	< 0.5	< 0.5	< 1	6	
RS-2	2/21/97	227.39	6.96	220.43	< 50	< 0.5	< 0.5	< 0.5	< 1	< 0.5	*
RS-2	5/28/97	227.39	10.02	217.37	< 50	3	3	< 0.5	< 1	< 0.5	*
RS-2	9/2/97	227.39	11.46	215.93	< 50	< 0.5	< 0.5	< 0.5	< 1	< 0.5	*
RS-2	11/24/97	227.39	10.43	216.96	< 50	< 0.5	1	< 0.5	3	< 0.5	*
RS-2	2/25/98	227.39	3.57	223.82	< 50	< 0.5	< 0.5	< 0.5	< 1	< 0.5	*
RS-2	7/8/98	227.39	8.83	218.56	< 50	< 0.5	< 0.5	< 0.5	< 1	< 1	*
RS-2	9/16/98	227.39	10.60	216.79	< 50	< 0.5	< 0.5	< 0.5	< 1	< 1	*
RS-2	11/24/98	227.39	13.27	214.12	140	2.8	19	2.6	3.3	15	*
RS-2	2/23/99	227.39	4.06	223.33	< 50	< 0.5	< 0.5	< 0.5	< 1	< 0.5	
RS-2	5/5/99	227.39	7.70	219.69	< 50	0.7	< 0.5	< 0.5	< 1	6	
RS-2***	8/26/99	227.39	11.42	215.97	200	15	23	1.7	23	9	*
RS-2	11/10/99	227.39	15.94	211.45	< 50	<0.5	<0.5	<0.5	< 1	<0.5	
RS-2	2/9/00	227.39	8.91	218.48	< 50	<0.5	<0.5	<0.5	< 1	<0.5	
RS-2	6/30/00	227.39	9.79	217.60	52	2	<0.5	<0.5	< 1	<0.5	
RS-2	8/8/00	227.39	10.71	216.68	60	<0.5	<0.5	<0.5	< 1	<0.5	
RS-2	11/16/00	227.39	10.39	217.00	< 50	<0.5	<0.5	<0.5	< 1	<0.5	
RS-2	3/8/01	227.39	6.62	220.77	< 50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-2	5/31/01	227.39	10.09	217.30	< 50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-2	12/18/01	227.39	6.99	220.40	< 50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-2	2/19/02	227.39	8.08	219.31	< 50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-2	5/7/02	227.39	9.27	218.12	< 50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-2	8/6/02	227.39	11.38	216.01	< 50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-2	11/5/02	227.39	17.09	210.30	< 50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-2	12/12/02	227.39	13.19	214.20							
RS-2	3/13/03	227.39	8.93	218.46	< 50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-2	5/6/03	227.39	8.05	219.34	< 50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-2	8/13/03	227.39	11.16	216.23	< 50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-2	11/20/03	227.39	17.62	209.77	< 50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-2	1/22/04	227.39	7.40	219.99							
RS-2	3/30/04	227.39	7.95	219.44	< 50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-2	6/10/04	227.39	10.56	216.83	< 50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-2	9/28/04	227.39	17.02	210.37	< 50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-2	12/8/04	227.39	9.80	217.59	< 50	<0.5	<0.5	<0.5	<0.5	<0.5	****

TABLE 1
GROUNDWATER ELEVATIONS AND CERTIFIED ANALYTICAL LABAORATAORY RESULTS FROM WATER SAMPLES
DESERT PETROLEUM, INC. SITE #793
4035 PARK BOULEVARD, OAKLAND, CALIFORNIA

ID#	DATE SAMPLED	WELL CASING ELEVATION (FEET AMSL)	DEPTH TO GROUND WATER (FEET)	GROUND WATER ELEVATION (FEET AMSL)		TPH-G (UG/L)	BENZENE (UG/L)	TOLUENE (UG/L)	ETHYL-BENZENE (UG/L)	XYLENES (UG/L)	MTBE (UG/L)	
	(All concentrations in parts per billion [ug/L, ppb]) (AMSL = Above mean sea level)											
(CALIFORNIA PUBLIC HEALTH GOAL)							(1.5)	(150)	(300)	(1800)	(13)	
RS-5	12/14/89	227.61	25.97	201.64		57000	3100	4300	670	3400		
RS-5	2/91	227.61	FLOATING PRODUCT									
RS-5	6/91	227.61	FLOATING PRODUCT									
RS-5	9/91	227.61	FLOATING PRODUCT									
RS-5	12/91	227.61	FLOATING PRODUCT									
RS-5	11/9/92	227.61	20.73	206.88		50000	650	4800	1100	15000		
RS-5	4/7/94	227.61	18.16	209.45		27000	5000	8700	550	2800		
RS-5	6/19/94	227.61	18.11	209.5		20000	2100	5300	470	2500		
RS-5	9/17/94	227.61	19.63	207.98		9300	230	340	110	700		
RS-5	3/12/95	227.61	14.54	213.07		93000	6400	2000	19000	10000		
RS-5	10/4/95	227.61	17.53	210.08		16000	420	2100	320	1800		
RS-5	12/21/95	227.61	17.47	210.14		48000	3500	9200	840	4800	56	
RS-5	03/27/96	227.61	13.51	214.1		68000	4900	18000	1700	11000	< 3000	
RS-5	06/11/96	227.61	14.25	213.36		66000	6300	20000	2100	12000	< 3000	
RS-5	09/04/96	227.61	16.50	211.11		31000	2100	11000	1100	6800	400	
RS-5	12/11/96	227.61	15.88	211.73		85000	7000	21000	1800	8900	570	
RS-5	2/21/97	227.61	13.76	213.85	sh	100000	5000	22000	1700	7300	<0.5	*
RS-5	5/28/97	227.61	15.77	211.84		52000	4500	19000	2100	10000	<0.5	*
RS-5	9/2/97	227.61	17.47	210.14		38000	2200	9400	1300	5800	<0.5	
RS-5	11/24/97	227.61	18.67	208.94		45000	4000	16000	1900	9700	<0.5	*
RS-5	2/25/98	227.61	10.53	217.08		160000	2700	31000	5300	28000	<0.5	*
RS-5	7/8/98	227.61	13.75	213.86		45000	2800	12000	2000	8500	<10	*
RS-5	9/16/98	227.61	15.80	211.81		49000	1400	7500	1700	8600	<5	*
RS-5	11/24/98	227.61	16.64	210.97		89000	5300	15000	2800	13000	<10	
RS-5	2/23/99	227.61	12.36	215.25		19000	1900	11000	2500	4800	<25	*
RS-5	5/5/99	227.61	12.78	214.83		78000	2000	10000	3000	15000	540	*
RS-5***	8/26/99	227.61	16.06	211.55		35000	870	4000	1900	8300	<1	*
RS-5	11/10/99	227.61	17.54	210.07		40000	1000	5600	1800	8100	<0.5	
RS-5	2/9/00	227.61	16.31	211.3		46000	1400	6900	2700	11000	<0.5	
RS-5	6/30/00	227.61	15.15	212.46		37000	810	5200	2200	9100	<2.5	*
RS-5	8/8/00	227.61	16.10	211.51		14000	330	500	1400	6500	<0.5	
RS-5	11/16/00	227.61	17.38	210.23		23000	430	2300	1100	4800	<0.5	*
RS-5	3/8/01	227.61	27.72	199.89		11000	360	260	140	1500	2.6	****
RS-5	5/31/01	227.61	22.96	204.65		7500	26	11	38	470	<5	****
RS-5	12/18/01	227.61	15.61	212		12000	610	1200	100	1500	<5	****
RS-5	2/19/02	227.61	14.80	212.81		22000	460	1700	680	4000	<5	****
RS-5	5/7/02	227.61	31.77	195.84		700	150	10	19	67	5.2	****
RS-5	8/6/02	227.61	31.77	195.84		< 50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-5	11/5/02	227.61	31.77	195.84		12000	150	360	21	890	<2	****
RS-5	12/12/02	227.61	21.53	206.08								
RS-5	3/13/03	227.61	36.70	190.91		240	5.5	1.9	2.3	9.6	1.4	****
RS-5	5/6/03	227.61	14.52	213.09								
RS-5	8/13/03	227.61	31.77	195.84		310	1.4	<0.5	1	2.9	<0.5	****
RS-5	11/20/03	227.61	32.00	195.61		17000	150	720	240	1800	0.72	****
RS-5	1/22/04	227.61	25.30	202.31								
RS-5	3/30/04	227.61	21.90	205.71		4000	370	59	13	380	2.6	****
RS-5	6/10/04	227.61	35.00	192.61		120	7	0.88	1.3	4.3	1.3	****
RS-5	9/28/04	227.61	19.05	208.56		2600	110	89	75	56	<0.5	****
RS-5	12/8/04	227.61	25.00	202.61		< 50	<0.5	<0.5	<0.5	<0.5	<0.5	****

TABLE 1
GROUNDWATER ELEVATIONS AND CERTIFIED ANALYTICAL LABAORATAORY RESULTS FROM WATER SAMPLES
DESERT PETROLEUM, INC. SITE #793
4035 PARK BOULEVARD, OAKLAND, CALIFORNIA

ID#	DATE SAMPLED	WELL CASING ELEVATION (FEET AMSL)	DEPTH TO GROUND WATER (FEET)	GROUND WATER ELEVATION (FEET AMSL)	TPH-G (UG/L)	BENZENE (UG/L)	TOLUENE (UG/L)	ETHYL-BENZENE (UG/L)	XYLENES (UG/L)	MTBE (UG/L)	
	(All concentrations in parts per billion [ug/L, ppb]) (AMSL = Above mean sea level)										
(CALIFORNIA PUBLIC HEALTH GOAL)						(1.5)	(150)	(300)	(1800)	(13)	
RS-6	12/14/89	227.22	22.52	204.7	11000	1400	1700	160	860		
RS-6	2/91	227.22	FLOATING PRODUCT								
RS-6	6/91	227.22			95000	4200	4200	650	3700		
RS-6	9/91	227.22	FLOATING PRODUCT								
RS-6	12/91	227.22			64000	3700	2300	730	4100		
RS-6	11/9/92	227.22	19.43	207.79	19000	1600	710	500	1600		
RS-6	4/7/94	227.22	14.42	212.8	16000	1200	1300	290	1100		
RS-6	6/19/94	227.22	14.45	212.77	23000	1300	2200	590	2200		
RS-6	9/17/94	227.22	19.52	207.7	24000	630	790	250	1100		
RS-6	3/12/95	227.22	8.90	218.32	3200	450	13	82	230		
RS-6	10/4/95	227.22	17.78	209.44	3700	170	250	38	290		
RS-6	12/21/95	227.22	14.98	212.24	3100	120	30	16	150	58	
RS-6	03/27/96	227.22	10.00	217.22	6900	180	440	79	360	< 300	
RS-6	06/11/96	227.22	12.00	215.22	7400	220	150	30	100	<1000	
RS-6	09/04/96	227.22	15.00	212.22	1400	68	2.6	7.7	9.2	14	
RS-6	12/11/96	227.22	12.36	214.86	1800	39	16	10	18	< 0.5	
RS-6	2/21/97	227.22	10.00	217.22	2100	71	85	25	40	< 0.5	*
RS-6	5/28/97	227.22	13.56	213.66	1700	34	12	11	16	< 0.5	*
RS-6	9/2/97	227.22	16.35	210.87	940	34	71	9	55	< 0.5	*
RS-6	11/24/97	227.22	15.72	211.5	490	9	6	1	7	< 0.5	*
RS-6	2/25/98	227.22	6.26	220.96	1400	22	47	5	52	< 0.5	*
RS-6**	7/8/98	227.22	11.41	215.81	1500	83	9	84	2	<10	*
RS-6	7/30/98	227.22			<50	<0.5	<0.5	<0.5	<1		
RS-6	9/16/98	227.22	13.42	213.8	990	23	<0.5	<0.5	<1	<1	*
RS-6	11/24/98	227.22	15.91	211.31	3400	5.3	<0.5	<0.5	14	<0.5	
RS-6	2/23/99	227.22	7.00	220.22	1000	3.4	3.2	1.6	7.3	<0.5	
RS-6	5/5/99	227.22	10.29	216.93	1100	50	10	80	15	2	
RS-6***	8/26/99	227.22	13.72	213.5	690	44	2.5	30	31	<5	
RS-6	11/10/99	227.22	13.90	213.32	1800	2	2	0.9	16	< 0.5	
RS-6	2/9/00	227.22	12.77	214.45	410	3	3	4	7	< 0.5	
RS-6	6/30/00	227.22	12.69	214.53	660	7	2	5	6	< 0.5	
RS-6	8/8/00	227.22	14.72	212.5	660	2	3	2	6	< 0.5	
RS-6	11/16/00	227.22	15.28	211.94	560	1	2	1	5	< 0.5	
RS-6	3/8/01	227.22	10.10	217.12	2200	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-6	5/31/01	227.22	12.96	214.26	630	<0.5	<0.5	<0.5	<0.5	<5	****
RS-6	12/18/01	227.22	10.88	216.34	56	0.53	<0.5	<0.5	0.56	<0.5	****
RS-6	2/19/02	227.22	11.08	216.14	<50	<0.5	<0.5	0.6	<0.5	<0.5	****
RS-6	5/7/02	227.22	12.31	214.91	240	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-6	8/6/02	227.22	14.23	212.99	130	<0.5	<0.5	<0.5	<0.5	3	****
RS-6	11/5/02	227.22	17.99	209.23	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-6	12/12/02	227.22	17.57	209.65							
RS-6	3/13/03	227.22	11.82	215.4	120	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-6	5/6/03	227.22	10.10	217.12	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-6	8/13/03	227.22	13.88	213.34	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-6	11/20/03	227.22	18.62	208.6	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-6	1/22/04	227.22	11.24	215.98							
RS-6	3/30/04	227.22	10.72	216.5	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-6	6/10/04	227.22	13.52	213.7	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-6	9/28/04	227.22	17.95	209.27	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-6	12/8/04	227.22	14.80	212.42	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****

TABLE 1
GROUNDWATER ELEVATIONS AND CERTIFIED ANALYTICAL LABAORATAORY RESULTS FROM WATER SAMPLES
DESERT PETROLEUM, INC. SITE #793
4035 PARK BOULEVARD, OAKLAND, CALIFORNIA

ID#	DATE SAMPLED	WELL CASING ELEVATION (FEET AMSL)	DEPTH TO GROUND WATER (FEET)	GROUND WATER ELEVATION (FEET AMSL)	TPH-G (UG/L)	BENZENE (UG/L)	TOLUENE (UG/L)	ETHYL-BENZENE (UG/L)	XYLENES (UG/L)	MTBE (UG/L)	
(CALIFORNIA PUBLIC HEALTH GOAL)						(1.5)	(150)	(300)	(1800)	(13)	
RS-7	12/14/89	195.99									
RS-7	7/90	195.99			5600000	24000	210000	50000	740000		
RS-7	2/91	195.99	FLOATING PRODUCT								
RS-7	6/91	195.99	FLOATING PRODUCT								
RS-7	9/91	195.99	FLOATING PRODUCT								
RS-7	12/91	195.99			270000	11000	22000	2000	13000		
RS-7	11/9/92	195.99	4.62	191.37	81000	12000	16000	1900	13000		
RS-7	4/7/94	195.99	4.03	191.96	74000	16000	16000	1400	8500		
RS-7	6/19/94	195.99	4.07	191.92	83000	22000	19000	1500	9500		
RS-7	9/17/94	195.99	4.05	191.94	270000	13000	15000	2100	1100		
RS-7	3/12/95	195.99	3.72	192.27	35000	5100	560	6300	3600		
RS-7	10/4/95	195.99	4.03	191.96	96000	14000	14000	1300	7000		
RS-7	12/21/95	195.99	3.95	192.04	70000	9300	12000	860	5600	210	
RS-7	03/27/96	195.99	3.80	192.19	64000	8900	14000	1100	8300	< 3000	
RS-7	06/11/96	195.99	3.79	192.2	65000	12000	17000	1600	9700	<5000	
RS-7	09/04/96	195.99	3.99	192	20000	4900	2100	670	4400	100	
RS-7	12/11/96	195.99	3.78	192.21	17000	4400	7500	570	4600	180	
RS-7	2/21/97	195.99	3.82	192.17	93000	31000	47000	3800	23000	<0.5	*
RS-7	5/28/97	195.99	3.82	192.17	52000	12000	8200	2000	11000	<0.5	*
RS-7	9/2/97	195.99	3.96	192.03	28000	6100	2800	950	3800	<50	
RS-7	11/24/97	195.99	3.76	192.23	18000	4300	5900	600	2900	<0.5	*
RS-7	2/25/98	195.99	3.70	192.29	13000	4300	7100	1100	5800	<0.5	*
RS-7**	7/8/98	195.99	3.76	192.23	45000	10000	3400	2000	8000	<10	*
RS-7	7/30/98	195.99			72000	12000	2100	2000	9100		
RS-7	9/16/98	195.99	3.83	192.16	5000	6500	160	<2.5	500	<5	*
RS-7	11/24/98	195.99	3.77	192.22	19000	2100	1100	500	2100	<0.5	
RS-7	2/23/99	195.99	3.70	192.29	83000	6500	9900	1200	7000	<10	
RS-7	5/5/99	195.99	3.88	192.11	47000	7400	4800	1300	7400	540	
RS-7***	8/26/99	195.99	4.16	191.83	15000	3400	91	950	970	<5	
RS-7	11/10/99	195.99	4.12	191.87	10000	2900	170	630	1200	<0.5	
RS-7	2/9/00	195.99	3.98	192.01	9400	1400	120	480	600	<0.5	
RS-7	6/30/00	195.99	4.04	191.95	8200	3300	190	430	540	<0.5	
RS-7	8/8/00	195.99	4.06	191.93	11000	2300	150	430	520	<0.5	
RS-7	11/16/00	195.99	4.04	191.95	5400	1500	40	240	200	<0.5	
RS-7	3/8/01	195.99	3.94	192.05	12000	3300	260	480	850	17	****
RS-7	5/31/01	195.99	4.01	191.98	10000	1900	120	320	620	<100	****
RS-7	12/18/01	195.99	4.81	191.18	2700	450	21	86	120	3.3	****
RS-7	2/19/02	195.99	3.91	192.08	20000	2600	360	570	1900	11	****
RS-7	5/7/02	195.99	3.97	192.02	9200	1400	120	360	780	6.6	****
RS-7	8/6/02	195.99	4.06	191.93	8300	1300	71	250	480	<10	****
RS-7	11/5/02	195.99	4.11	191.88	9300	1500	90	330	680	<10	****
RS-7	12/12/02	195.99	4.13	191.86							
RS-7	3/13/03	195.99	4.02	191.97	5500	990	51	180	330	6.1	****
RS-7	5/6/03	195.99	3.98	192.01	4800	740	36	160	310	4.7	****
RS-7	8/13/03	195.99	4.09	191.9	9400	1300	65	310	620	6.1	****
RS-7	11/20/03	195.99	4.10	191.89	4800	700	13	110	110	<5	****
RS-7	1/22/04	195.99	4.12	191.87							
RS-7	3/30/04	195.99	4.05	191.94	3800	540	33	140	210	3.4	****
RS-7	6/10/04	195.99	4.12	191.87	4000	740	22	82	130	2.8	****
RS-7	9/28/04	195.99	4.18	191.81	5000	640	20	110	130	2.8	****
RS-7	12/8/04	195.99	3.92	192.07	3700	290	18	130	190	0.56	****

TABLE 1
GROUNDWATER ELEVATIONS AND CERTIFIED ANALYTICAL LABAORATAORY RESULTS FROM WATER SAMPLES
DESERT PETROLEUM, INC. SITE #793
4035 PARK BOULEVARD, OAKLAND, CALIFORNIA

ID#	(All concentrations in parts per billion [ug/L, ppb]) (AMSL = Above mean sea level) DATE SAMPLED	WELL CASING ELEVATION (FEET AMSL	DEPTH TO GROUND WATER (FEET)	GROUND WATER ELEVATION (FEET AMSL	TPH-G (UG/L)	BENZENE (UG/L)	TOLUENE (UG/L)	ETHYL-BENZENE (UG/L)	XYLENES (UG/L)	MTBE (UG/L)	
(CALIFORNIA PUBLIC HEALTH GOAL)						(1.5)	(150)	(300)	(1800)	(13)	
RS-8	12/14/89										
RS-8	09/04/96										
RS-8	12/11/96										
RS-8	2/21/97										
RS-8	5/28/97										
RS-8	9/2/97										
RS-8	11/24/97										
RS-8	2/25/98										
RS-8	7/8/98										
RS-8	9/16/98										
RS-8	11/24/98										
RS-8	2/23/99										
RS-8	5/5/99										
RS-8***	8/26/99	214.67	7.25	207.42	160000	24000	35000	4200	24000	<5	
RS-8	11/10/99	214.67	8.69	205.98	150000	21000	29000	3000	14000	<0.5	
RS-8	2/9/00	214.67	7.23	207.44	14000	1900	3200	270	2300	<0.5	
RS-8	6/30/00	214.67	3.99	210.68	6400	570	870	150	770	<0.5	
RS-8	8/8/00	214.67	7.52	207.15	100000	24000	40000	2300	9900	<0.5	*
RS-8	11/16/00	214.67	6.14	208.53	110000	14000	21000	2100	9600	<20	*
RS-8	3/8/01	214.67	9.40	205.27	10000	740	840	220	990	<2	****
RS-8	5/31/01	214.67	6.83	207.84	730	11	29	4.2	31	<5	****
RS-8	12/18/01	214.67	7.14	207.53	4500	230	370	77	750	<0.5	****
RS-8	2/19/02	214.67	7.69	206.98	780	33	21	5.1	45	<0.5	****
RS-8	5/7/02	214.67	7.82	206.85	24000	1500	1800	830	2700	<10	****
RS-8	8/6/02	214.67	13.46	201.21		0.04	feet floating product				
RS-8	11/5/02	214.67	13.96	200.71		0.40	feet floating product				
RS-8	12/12/02	214.67	14.38	200.29		0.08	feet floating product				
RS-8	3/13/03	214.67	10.99	203.68	90000	1100	14000	2500	12000	<50	****
RS-8	5/6/03	214.67	5.35	209.32	1600	6.7	46	21	170	<0.5	****
RS-8	8/13/03	214.67	11.96	202.71	100000	1200	10000	2500	13000	<50	****
RS-8	11/21/03	214.67	12.30	202.37	100000	1700	10000	1700	12000	<25	****
RS-8	1/22/04	214.67	9.63	205.04							
RS-8	3/30/04	214.67	8.70	205.97	18000	69	110	130	1200	<5	****
RS-8	6/10/04	214.67	10.65	204.02	33000	210	350	360	2300	<5	****
RS-8	9/28/04	214.67	9.00	205.67	6000	59	20	100	170	<1	****
RS-8	12/8/04	214.67	4.50	210.17	1100	<0.5	<0.5	<0.5	0.66	<0.5	****

TABLE 1
GROUNDWATER ELEVATIONS AND CERTIFIED ANALYTICAL LABAORATAORY RESULTS FROM WATER SAMPLES
DESERT PETROLEUM, INC. SITE #793
4035 PARK BOULEVARD, OAKLAND, CALIFORNIA

ID#	DATE SAMPLED	WELL CASING ELEVATION (FEET AMSL	DEPTH TO GROUND WATER (FEET)	GROUND WATER ELEVATION (FEET AMSL	TPH-G (UG/L)	BENZENE (UG/L)	TOLUENE (UG/L)	ETHYL-BENZENE (UG/L)	XYLENES (UG/L)	MTBE (UG/L)	
	(All concentrations in parts per billion [ug/L, ppb]) (AMSL = Above mean sea level)										
(CALIFORNIA PUBLIC HEALTH GOAL)						(1.5)	(150)	(300)	(1800)	(13)	
RS-9	12/14/89										
RS-9***	09/04/96										
RS-9***	12/11/96										
RS-9***	2/21/97										
RS-9***	5/28/97										
RS-9***	9/2/97										
RS-9***	11/24/97										
RS-9***	2/25/98										
RS-9***	7/8/98										
RS-9***	9/16/98										
RS-9***	11/24/98										
RS-9***	2/23/99										
RS-9***	5/5/99										
RS-9***	8/26/99	195.63	7.46	188.17	17000	3500	1200	360	1600	180	*
RS-9	11/10/99	195.63	7.91	187.72	2800	520	62	46	130	<0.5	
RS-9	2/9/00	195.63	6.09	189.54	3400	650	74	64	130	<0.5	
RS-9	6/30/00	195.63	6.77	188.86	3000	600	79	74	120	<0.5	
RS-9	8/8/00	195.63	7.32	188.31	4900	500	430	160	530	<0.5	
RS-9	11/16/00	195.63	6.33	189.3	3000	350	220	90	220	<0.5	
RS-9	3/8/01	195.63	4.93	190.7	<50	3.4	<0.5	<0.5	<0.5	<0.5	****
RS-9	5/31/01	195.63	4.01	191.62	510	96	6	6.2	9.1	5.5	****
RS-9	12/18/01	195.63	4.81	190.82	210	11	1.8	3.9	7.6	<0.5	****
RS-9	2/19/02	195.63	4.99	190.64	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-9	5/7/02	195.63	6.08	189.55	130	7.9	<0.5	1.2	<0.5	0.67	****
RS-9	8/6/02	195.63	6.93	188.7	380	29	1.2	2.3	2.9	3.1	****
RS-9	11/5/02	195.63	7.53	188.1	1800	240	9	27	110	8.6	****
RS-9	12/12/02	195.63	7.23	188.4							
RS-9	3/13/03	195.63	5.73	189.9	410	30	3	6	9.5	3.3	****
RS-9	5/6/03	195.63	4.83	190.8	910	72	15	9.2	26	5.5	****
RS-9	8/13/03	195.63	8.24	187.39	810	20	<0.5	2.4	1.6	3.6	****
RS-9	11/20/03	195.63	6.99	188.64	3600	920	5.3	6.1	20	30	****
RS-9	1/22/04	195.63	5.43	190.2							
RS-9	3/30/04	195.63	5.07	190.56	1900	360	9.3	19	48	21	****
RS-9	6/10/04	195.63	6.18	189.45	950	180	3	8.4	14	8.7	****
RS-9	9/28/04	195.63	6.94	188.69	4900	1800	5.9	5	16	31	****
RS-9	12/8/04	195.63	4.42	191.21	74	<0.5	<0.5	<0.5	<0.5	<0.5	****

TABLE 1
GROUNDWATER ELEVATIONS AND CERTIFIED ANALYTICAL LABAORATAORY RESULTS FROM WATER SAMPLES
DESERT PETROLEUM, INC. SITE #793
4035 PARK BOULEVARD, OAKLAND, CALIFORNIA

ID#	DATE SAMPLED	WELL CASING ELEVATION (FEET AMSL)	DEPTH TO GROUND WATER (FEET)	GROUND WATER ELEVATION (FEET AMSL	TPH-G (UG/L)	BENZENE (UG/L)	TOLUENE (UG/L)	ETHYL-BENZENE (UG/L)	XYLENES (UG/L)	MTBE (UG/L)	
	(All concentrations in parts per billion [ug/L, ppb]) (AMSL = Above mean sea level)										
(CALIFORNIA PUBLIC HEALTH GOAL)						(1.5)	(150)	(300)	(1800)	(13)	
RS-10	12/14/89										
RS-10***	09/04/96										
RS-10***	12/11/96										
RS-10***	2/21/97										
RS-10***	5/28/97										
RS-10***	9/2/97										
RS-10***	11/24/97										
RS-10***	2/25/98										
RS-10***	7/8/98										
RS-10***	9/16/98										
RS-10***	11/24/98										
RS-10***	2/23/99										
RS-10***	5/5/99										
RS-10***	8/26/99	208.46	3.76	204.7	5100	160	340	190	1000	32	*
RS-10	11/10/99	208.46	3.83	204.63	500	7	2	2	4	<0.5	
RS-10	2/9/00	208.46	0.31	208.15	100	4	3	1	6	<0.5	
RS-10	6/30/00	208.46	2.22	206.24	640	5	2	4	2	<0.5	
RS-10	8/8/00	208.46	2.46	206	460	2	2	2	7	<0.5	
RS-10	11/16/00	208.46	2.46	206	360	1	1	2	<1	<0.5	
RS-10	3/8/01	208.46	2.82	205.64	53	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-10	5/31/01	208.46	4.93	203.53	210	<0.5	<0.5	1.5	5	<5	****
RS-10	12/18/01	208.46	2.10	206.36	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-10	2/19/02	208.46	2.29	206.17	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-10	5/7/02	208.46	2.92	205.54	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-10	8/6/02	208.46	4.11	204.35	<50	<0.5	0.7	<0.5	1.6	<0.5	****
RS-10	11/5/02	208.46	4.05	204.41	54	<0.5	1.2	<0.5	1.1	<0.5	****
RS-10	12/12/02	208.46	6.81	201.65							
RS-10	3/13/03	208.46	3.00	205.46	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-10	5/6/03	208.46	2.55	205.91	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-10	8/13/03	208.46	3.68	204.78	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-10	11/20/03	208.46	4.45	204.01	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-10	1/22/04	208.46									
RS-10	3/30/04	208.46	3.05	205.41	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-10	6/10/04	208.46	4.85	203.61	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
RS-10	9/28/04	208.46	6.75	201.71	<50	4.6	<0.5	<0.5	<0.5	<0.5	****
RS-10	12/8/04	208.46	1.74	206.72	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****

TABLE 1
GROUNDWATER ELEVATIONS AND CERTIFIED ANALYTICAL LABAORATAORY RESULTS FROM WATER SAMPLES
DESERT PETROLEUM, INC. SITE #793
4035 PARK BOULEVARD, OAKLAND, CALIFORNIA

ID#	DATE SAMPLED	WELL CASING ELEVATION (FEET AMSL)	DEPTH TO GROUND WATER (FEET)	GROUND WATER ELEVATION (FEET AMSL)	TPH-G (UG/L)	BENZENE (UG/L)	TOLUENE (UG/L)	ETHYL-BENZENE (UG/L)	XYLENES (UG/L)	MTBE (UG/L)	
(CALIFORNIA PUBLIC HEALTH GOAL)						(1.5)	(150)	(300)	(1800)	(13)	
R1	12/14/89										
R1	09/04/96	227.69	15.00	212.69	1800	1100	3	29	< 10	< 30	
R1	12/11/96	227.69	10.30	217.39	<50	<0.5	< 0.5	< 0.5	< 1	4	
R1	2/21/97	227.69	11.88	215.81	2500	670	9	3	13	<0.5	*
R1	5/28/97	227.69	14.03	213.66	24000	4300	36	2000	370	<0.5	*
R1	9/2/97	227.69	14.98	212.71	4400	320	6	340	72	20	
R1	11/24/97	227.69	14.06	213.63	100	39	1	18	10	<0.5	
R1	2/25/98	227.69	8.93	218.76	1200	400	8	13	150	<0.5	
R1	7/8/98	227.69	11.36	216.33	68	14	< 0.5	< 0.5	< 1	<1	*
R1	9/16/98	227.69	13.30	214.39	16000	3400	92	< 0.5	410	<1	*
R1	11/24/98	227.69	10.72	216.97	340	19	1.6	35	9.7	<0.5	
R1	2/23/99	227.69	9.34	218.35	60	16	0.6	5.6	1.2	<0.5	
R1	5/5/99	227.69	11.30	216.39	1300	290	3	150	1	15	
R1	8/26/99	227.69	13.97	213.72	6500	630	<0.5	1300	<1	<1	
R1	11/10/99	227.69	13.73	213.96	480	12	4	22	9	<0.5	
R1	2/9/00	227.69	13.10	214.59	<50	8	<0.5	1	<1	<0.5	
R1	6/30/00	227.69	13.42	214.27	2600	350	35	1900	220	<0.5	
R1	8/8/00	227.69	14.25	213.44	10000	910	76	2100	390	<0.5	
R1	3/8/01	227.69	13.72	213.97	<50	<0.5	<0.5	<0.5	<0.5	<0.5	**
R1	3/8/01	227.69	13.72	213.97	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
R1	5/31/01	227.69	15.77	211.92	3800	400	16	470	67	<5	****
R1	12/18/01	227.69	9.90	217.79	<50	<0.5	<0.5	1.5	<0.5	<0.5	****
R1	2/19/02	227.69	10.86	216.83	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
R1	5/7/02	227.69	16.17	211.52	53	3.3	<0.5	1	<0.5	<0.5	****
R1	8/6/02	227.69	16.83	210.86	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
R1	11/5/02	227.69	16.92	210.77	dry, groundwater deeper than 210.77 foot elevation						
R1	12/12/02	227.69	16.94	210.75							
R1	3/13/03	227.69	15.69	212	<50	4.5	<0.5	<0.5	<0.5	<0.5	****
R1	5/6/03	227.69	10.75	216.94	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
R1	8/13/03	227.69	16.04	211.65	430	17	<0.5	1.4	1.1	<0.5	****
R1	11/20/03	227.69	dry								
R1	1/22/04	227.69	14.40	213.29							
R1	3/30/04	227.69	14.05	213.64	<50	2.8	<0.5	<0.5	<0.5	<0.5	****
R1	6/10/04	227.69	15.85	211.84	3200	85	2.6	38	8.3	<0.5	****
R1	9/28/04	227.69	15.06	212.63	2000	35	2.2	12	4.4	<0.5	****
R1	12/8/04	227.69	9.70	217.99	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****

(All concentrations in parts per billion [ug/L, ppb])
(AMSL = Above mean sea level)

TABLE 1
GROUNDWATER ELEVATIONS AND CERTIFIED ANALYTICAL LABAORATAORY RESULTS FROM WATER SAMPLES
DESERT PETROLEUM, INC. SITE #793
4035 PARK BOULEVARD, OAKLAND, CALIFORNIA

ID#	DATE SAMPLED	WELL CASING ELEVATION (FEET AMSL)	DEPTH TO GROUND WATER (FEET)	GROUND WATER ELEVATION (FEET AMSL)	TPH-G (UG/L)	BENZENE (UG/L)	TOLUENE (UG/L)	ETHYL-BENZENE (UG/L)	XYLENES (UG/L)	MTBE (UG/L)	
	(All concentrations in parts per billion [ug/L, ppb]) (AMSL = Above mean sea level)										
(CALIFORNIA PUBLIC HEALTH GOAL)						(1.5)	(150)	(300)	(1800)	(13)	
R2	12/14/89										
R2	09/04/96	230.68	13.44	217.24	14000	7600	<10	170	190	<100	
R2	12/11/96	230.68	12.42	218.26	488	300	1	< 0.5	30	16	
R2	2/21/97	230.68	10.50	220.18	5700	2100	5	2	10	3	*
R2	5/28/97	230.68	13.10	217.58	36000	14000	63	260	220	<0.5	*
R2	9/2/97	230.68	14.16	216.52	30000	12000	330	1000	790	47	
R2	11/24/97	230.68	14.71	215.97	41000	15000	830	1500	4200	<0.5	*
R2	2/25/98	230.68	7.39	223.29	800	400	<0.5	<0.5	15	<0.5	*
R2	7/8/98	230.68	11.27	219.41	290	31	< 0.5	1	< 1	2	*
R2	9/16/98	230.68	13.73	216.95	6600	11000	24	<0.5	35	<1	*
R2	11/24/98	230.68	11.67	219.01	6100	<0.5	36	<0.5	21	<0.5	
R2	2/20/99	230.68	7.55	223.13	1100	310	3	2	26	<0.5	
R2	5/5/99	230.68	10.89	219.79	11000	5300	7	36	7	8	
R2	8/26/99	227.28	13.14	214.14	6700	940	33	190	240	<1	*
R2	11/10/99	227.28	14.42	212.86	5100	2600	160	1800	8100	<0.5	*
R2	2/9/00	227.28	12.45	214.83	4700	1400	110	130	340	<0.5	
R2	6/30/00	227.28	12.94	214.34	7100	3200	110	300	480	<0.5	
R2	8/8/00	227.28	13.58	213.7	30000	13000	250	1000	2700	<0.5	
R2	11/16/00	227.28	14.33	212.95	44000	17000	230	790	3600	<0.5	
R2	3/8/01	227.28	11.15	216.13	2300	640	8.6	61	170	<2	****
R2	5/31/01	227.28	13.38	213.9	2200	580	12	72	100	<25	****
R2	12/18/01	227.28	12.35	214.93	4900	2000	120	44	280	<5	****
R2	2/19/02	227.28	11.32	215.96	2100	1200	<5	14	<5	<5	****
R2	5/7/02	227.28	13.15	214.13	2500	660	7.5	170	26	<2.5	****
R2	8/6/02	227.28	14.51	212.77	6300	1800	150	220	340	<5	****
R2	11/5/02	227.28	15.46	211.82	11000	3000	140	57	620	<20	****
R2	12/12/02	227.28	15.70	211.58							
R2	3/13/03	227.28	12.96	214.32	580	200	1.2	5.4	3.8	<1	****
R2	5/6/03	227.28	11.14	216.14	70	25	<0.5	<0.5	1.3	<0.5	****
R2	8/13/03	227.28	14.01	213.27	1800	340	8	49	12	<2	****
R2	11/20/03	227.28	15.35	211.93	8000	1400	46	57	490	<5	****
R2	1/22/04	227.28	12.10	215.18							
R2	3/30/04	227.28	11.48	215.8	<50	3	<0.5	<0.5	<0.5	<0.5	****
R2	6/10/04	227.28	13.95	213.33	77	7.7	<0.5	<0.5	<0.5	<0.5	****
R2	9/28/04	227.28	14.80	212.48	500	120	2	25	2.7	0.71	****
R2	12/8/04	227.28	12.25	215.03	100	8.5	<0.5	<0.5	5	<0.5	****

TABLE 1
GROUNDWATER ELEVATIONS AND CERTIFIED ANALYTICAL LABAORATAORY RESULTS FROM WATER SAMPLES
DESERT PETROLEUM, INC. ST.E #793
4035 PARK BOULEVARD, OAKLAND, CALIFORNIA

ID#	DATE SAMPLED	WELL CASING ELEVATION (FEET AMSL	DEPTH TO GROUND WATER (FEET)	GROUND WATER ELEVATION (FEET AMSL	TPH-G	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	MTBE	
	(All concentrations in parts per billion [ug/L, ppb]) (AMSL = Above mean sea level)										
(CALIFORNIA PUBLIC HEALTH GOAL)					(UG/L)	(UG/L) (1.5)	(UG/L) (150)	(UG/L) (300)	(UG/L) (1800)	(UG/L) (13)	
R3	12/14/89										
R3	09/04/96	230.32	9.90	220.42	<50	<0.5	<0.5	<0.5	<2	<5	
R3	12/11/96	230.32	8.18	222.14	<50	<0.5	<0.5	<0.5	<1	5	
R3	2/21/97	230.32	6.76	223.56	340	35	59	8	54	<0.5	*
R3	5/28/97	230.32	2.98	220.34	<50	<0.5	<0.5	<0.5	<1	<0.5	*
R3	9/2/97	230.32	10.86	219.46	<50	4	<0.5	<0.5	<1	<0.5	*
R3	11/24/97	230.32	11.20	219.12	not enough water to sample. No sample						
R3	2/25/98	230.32	3.42	226.9	<50	<0.5	<0.5	<0.5	<1	<0.5	*
R3	7/8/98	230.32	8.78	221.54	140	<0.5	<0.5	4	24	<1	*
R3	9/16/98	230.32	10.38	219.94	<50	<0.5	<0.5	<0.5	<1	<1	*
R3	11/24/98	230.32	11.12	219.2	not enough water to sample. No samplo						
R3	2/23/99	230.32	3.95	226.37	<50	<0.5	<0.5	<0.5	<1	<0.5	*
R3	5/5/99	230.32	7.58	222.74	80	9	<0.5	<0.5	<1	6	
R3	8/26/99	227.25	10.76	216.49	<50	2	<0.5	<0.5	<1	1	*
R3	11/10/99	227.25	11.09	216.16	140	3	4	1	11	<0.5	
R3	2/9/00	227.25	8.76	218.49	<50	2	<0.5	<0.5	<1	<0.5	
R3	6/30/00	227.25	9.67	217.58	<50	0.7	<0.5	1	1	<0.5	
R3	8/8/00	227.25	10.44	216.81	72	<0.5	<0.5	<0.5	<1	<0.5	
R3	11/16/00	227.25	10.26	216.99	110	4	1	<0.5	3	<0.5	
R3	3/8/01	227.25	6.54	220.71	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
R3	5/31/01	227.25	10.01	217.24	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
R3	12/18/01	227.25	6.79	220.46	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
R3	2/19/02	227.25	7.86	219.39	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
R3	5/7/02	227.25	9.20	218.05	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
R3	8/6/02	227.25	10.62	216.63	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
R3	11/5/02	227.25	11.07	216.18	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
R3	12/12/02	227.25	11.28	215.97							
R3	3/13/03	227.25	8.69	218.56	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
R3	5/6/03	227.25	8.02	219.23	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
R3	8/13/03	227.25	dry		DRY						
R3	11/20/03	227.25	dry		DRY						
R3	1/22/04	227.25	7.30	219.95							
R3	3/30/04	227.25	7.85	219.4	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
R3	6/10/04	227.25	10.30	216.95	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
R3	9/28/04	227.25	dry		DRY						
R3	12/8/04	227.25	9.00	218.25	<50	<0.5	<0.5	<0.5	<0.5	<0.5	****

TABLE 1
GROUNDWATER ELEVATIONS AND CERTIFIED ANALYTICAL LABAORATAORY RESULTS FROM WATER SAMPLES
DESERT PETROLEUM, INC. SITE #793
4035 PARK BOULEVARD, OAKLAND, CALIFORNIA

ID#	DATE SAMPLED	WELL CASING ELEVATION (FEET AMSL	DEPTH TO GROUND WATER (FEET)	GROUND WATER ELEVATION (FEET AMSL	TPH-G (UG/L)	BENZENE (UG/L) (1.5)	TOLUENE (UG/L) (150)	ETHYL-BENZENE (UG/L) (300)	XYLENES (UG/L) (1800)	MTBE (UG/L) (13)	
(All concentrations in parts per billion [ug/L, ppb]) (AMSL = Above mean sea level) (CALIFORNIA PUBLIC HEALTH GOAL)											
T 1	12/14/89										
T 1	09/04/96										
T 1	12/11/96										
T 1	2/21/97										
T 1	5/28/97										
T 1	9/2/97										
T 1	11/24/97										
T 1	2/25/98										
T 1	7/8/98										
T 1	9/16/98										
T 1	11/24/98										
T 1	2/23/99										
T 1	5/5/99										
T 1***	8/26/99	195.11	2.44	192.67	40000	7200	5000	950	8100	53	*
T 1	11/10/99	195.11	2.23	192.88	46000	5600	3600	910	6500	<0.5	
T 1	2/9/00	195.11	2.22	192.89	35000	2900	5700	720	6600	<0.5	
T 1	6/30/00	195.11	2.22	192.89	30000	3400	3200	950	4600	<5	
T 1	8/8/00	195.11	2.73	192.38	8900	1600	760	260	870	<5	
T 1	11/16/00	195.11	2.72	192.39	4000	1300	92	80	290	<0.5	
T 1	3/8/01	195.11	2.12	192.99	25000	4400	3400	770	3200	26	****
T 1	5/31/01	195.11	2.30	192.81	8900	940	210	340	1500	<50	****
T 1	12/18/01	195.11	2.20	192.91	48000	3700	5500	1200	5300	24	****
T 1	2/19/02	195.11	1.96	193.15	64000	8600	6000	1700	6800	55	****
T 1	5/7/02	195.11	2.22	192.89	41000	9200	910	2000	6200	62	****
T 1	8/6/02	195.11	2.32	192.79	28000	5500	240	1300	2600	32	****
T 1	11/5/02	195.11	2.52	192.59	11000	3000	65	660	610	18	****
T 1	12/12/02	195.11	2.55	192.56							
T 1	3/13/03	195.11	2.23	192.88	930	150	17	23	60	2.6	****
T 1	5/6/03	195.11	2.37	192.74	6800	1000	230	310	820	10	****
T 1	8/13/03	195.11	2.41	192.7	9600	1500	110	440	910	10	****
T 1	11/20/03	195.11	2.50	192.61	10000	1800	120	520	510	11	****
T 1	1/22/04	195.11									
T 1	3/30/04	195.11			15000	1800	660	610	2000	8.6	****
T 1	6/10/04	195.11	2.40	192.71	5500	570	2	240	130	2.7	****
T 1	9/28/04	195.11	2.52	192.59	8700	2600	100	450	15	15	****
T 1	12/8/04	195.11	1.96	193.15	2900	820	32	14	47	6.9	****
T 2	1/22/04	195.3	2.54	192.76							
T 2	3/30/04	195.3	2.50	192.8							
T 2	6/10/04	195.3	2.60	192.7							
T 2	9/28/04	195.3	car								
T 2	12/8/04	195.3	2.04	193.26							
T 3	1/22/04	202.38									
T 3	6/10/04	202.38	9.80	192.58							
T 3	9/28/04	202.38	9.90	192.48							
T 3	12/8/04	202.38	9.24	193.14							
T4	1/22/04	197.48	4.70	192.78							
T4	3/30/04	197.48	4.66	192.82							
T4	6/10/04	197.48	4.76	192.72							
T4	9/28/04	197.48	4.86	192.62							
T4	12/8/04	197.48	4.21	193.27							

TABLE 1
GROUNDWATER ELEVATIONS AND CERTIFIED ANALYTICAL LABAORATAORY RESULTS FROM WATER SAMPLES
DESERT PETROLEUM, INC. SITE #793
4035 PARK BOULEVARD, OAKLAND, CALIFORNIA

ID#	DATE SAMPLED	WELL CASING ELEVATION (FEET AMSL	DEPTH TO GROUND WATER (FEET)	GROUND WATER ELEVATION (FEET AMSL		TPH-G (UG/L)	BENZENE (UG/L)	TOLUENE (UG/L)	ETHYL-BENZENE (UG/L)	XYLENES (UG/L)	MTBE (UG/L)	
(CALIFORNIA PUBLIC HEALTH GOAL)							(1.5)	(150)	(300)	(1800)	(13)	
LF 1	1/22/04	226.59	29.12	197.47								
LF 1	3/30/04	226.59	26.45	200.14		<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
LF 1	6/10/04	226.59	27.57	199.02		<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
LF 1	9/28/04	226.59	28.72	197.87		<50	<0.5	<0.5	<0.5	<0.5	<0.5	****
LF 1	12/8/04	226.59	car									

(All concentrations in parts per billion [ug/L, ppb])
(AMSL = Above mean sea level)

ND	BELOW LABORATORY DETECTION LIMITS
TPH-G	TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
*	MTBE results confirmed by EPA Method 8260 (GC/MS)
**	LAB REPORT HAD RS-6 AND RS-7 MISLABELED, RESAMPLE ON 7/30/98 CONFIRMED.
***	WELL CASING ELEVATION SURVEY 8-27-99, WADE HAMMOND No.6163,BENCH MARK CITY OF OAKLAND
****	SAMPLES ANALYZED USING EPA METHOD 8260B

TABLE 2
SOIL SAMPLE (CERTIFIED LABORATORY RESULTS)
FORMER DP #793
4035 PARK BLVD., OAKLAND, CALIFORNIA

SAMPLE ID	SAMPLED BY	DATE SAMPLED	DEPTH SAMPLED BELOW SURFACE IN FEET	EPA METHOD 8020 TPHg mg/Kg	BENZENE mg/Kg	TOLUENE mg/Kg	ETHYL-BENZENE mg/Kg	XYLENES mg/Kg	MTBE mg/Kg	TOC mg/Kg	TBA mg/Kg
SOIL BORINGS/MONITOR WELLS INSTALLATIONS BY RSI											
RS-1	RSI	12/11/89	5	**16**	na	na	na	na			
RS-1	RSI	12/11/89	10	**33**	na	na	na	na			
RS-1	RSI	12/11/89	15	<1	na	na	na	na			
RS-1	RSI	12/11/89	20	<1	<0.003	**0.008**	<0.003	<0.003			
RS-1	RSI	12/11/89	25	**10**	**0.056**	**0.12**	**0.041**	**0.13**			
RS-1	RSI	12/11/89	30	<1	<0.003	**0.012**	<0.003	<0.003			
RS-2	RSI	12/11/89	5	<1	na	na	na	na			
RS-2	RSI	12/11/89	10	11	na	na	na	na			
RS-2	RSI	12/11/89	15	<1	na	na	na	na			
RS-2	RSI	12/11/89	20	<1	<0.003	**0.017**	<0.003	<0.003			
RS-3	RSI	12/11/89	5	<1	<0.003	**0.043**	<0.003	**0.008**			
RS-3	RSI	12/11/89	10	<1	<0.003	**0.02**	<0.003	<0.003			
RS-4	RSI	12/12/89	5	**50**	**0.78**	**3.4**	**0.74**	**4.1**			
RS-4	RSI	12/12/89	10	**8**	**0.25**	**0.94**	**0.17**	**0.92**			
RS-5	RSI	12/12/89	5	<1	na	na	na	na			
RS-5	RSI	12/12/89	10	<1	na	na	na	na			
RS-5	RSI	12/12/89	15	<1	na	na	na	na			
RS-5	RSI	12/12/89	20	**530**	**1.5**	**8.4**	**3.9**	**22**			
RS-5	RSI	12/12/89	25	**4**	**0.7**	**0.42**	**0.58**	**0.26**			
RS-5	RSI	12/12/89	30	**1600**	na	na	na	na			
RS-5	RSI	12/12/89	35	<1	na	na	na	na			
RS-5	RSI	12/12/89	40	**1**	**0.036**	**0.069**	**0.009**	**0.043**			
RS-6	RSI	12/13/89	5	<1	na	na	na	na			
RS-6	RSI	12/13/89	10	<1	na	na	na	na			
RS-6	RSI	12/13/89	15	<1	na	na	na	na			
RS-6	RSI	12/13/89	20	<1	**0.017**	**0.007**	<0.003	**0.015**			
RS-6	RSI	12/13/89	25	<1	**0.009**	**0.011**	<0.003	<0.003			
RS-6	RSI	12/13/89	30	<1	na	na	na	na			
RS-6	RSI	12/13/89	35	<1	**0.005**	**0.007**	<0.003	**0.006**			
RS-7(SB-1)	RSI	12/14/89	STOCKPI	**130**	**0.46**	**3.6**	**1**	**7.6**			
RS-7(SB-2)	RSI	12/14/89	STOCKPI	**370**	**1.1**	**13**	**4.4**	**29**			
SOIL BORINGS ALONG SEWER LATERAL											
DPO-SS1	WWC	7/24/90	3.5	<1	<0.005	<0.005	<0.005	<0.005			
DPO-SS1	WWC	7/24/90	5	<1	**0.005**	<0.005	<0.005	**0.011**			
DPO-SB1	WWC	8/21/90	5	**390**	**2.5**	**17**	**9.4**	**47**			
DPO-SB2	WWC	8/21/90	5	**41**	**0.31**	**1.4**	**0.92**	**4.4**			
DPO-SB2	WWC	8/21/90	10	**230**	**3.5**	**21**	**5**	**43**			
DPO-SB2	WWC	8/21/90	15	<1	**0.052**	**0.13**	**0.019**	**0.099**			
DPO-SB2	WWC	8/21/90	20	<1	**0.03**	**0.033**	**0.0076**	**0.03**			
DPO-SB3	WWC	9/19/90	15	<1	<0.005	<0.005	<0.005	**0.0073**			

TABLE 2
SOIL SAMPLE (CERTIFIED LABORATORY RESULTS)
FORMER DP #793
4035 PARK BLVD., OAKLAND, CALIFORNIA

SAMPLE ID	SAMPLED BY	DATE SAMPLED	DEPTH SAMPLED BELOW SURFACE IN FEET	EPA METHOD 8020 TPHg mg/Kg	BENZENE mg/Kg	TOLUENE mg/Kg	ETHYL-BENZENE mg/Kg	XYLENES mg/Kg	MTBE mg/Kg	TOC mg/Kg	TBA mg/Kg
SOIL BORINGS AT 4003 AND 4006 BRIGHTON AVENUE											
SB-A	LF	9/8/93	5	<0.2	<0.005	<0.005	<0.005	<0.005			
SB-A	LF	9/8/93	15	<0.2	<0.005	<0.005	<0.005	<0.005			
SB-B	LF	9/8/93	5	<0.2	<0.005	<0.005	<0.005	<0.005			
SB-B	LF	9/8/93	12.5	**400**	**1.7**	**17**	**8.2**	**44**			
LF-1	LF	9/9/93	6	<0.2	<0.005	<0.005	<0.005	<0.005			
LF-1	LF	9/9/93	15.5	<0.2	<0.005	<0.005	<0.005	<0.005			
UST AND PIPING REMOVAL DOCUMENTATION SAMPLING											
REGULAR LEADED STEEL UST											
T1A	WEGE	6/23/94	14	**2**	**0.022**	**0.075**	**0.03**	**0.16**			
T1B	WEGE	6/23/94	14	<1	**0.027**	**0.028**	**0.006**	**0.026**			
UNLEADED STEEL UST											
T2A	WEGE	6/23/94	14	<1	**0.022**	**0.027**	**0.005**	**0.022**			
T2B	WEGE	6/23/94	14	<1	**0.017**	**0.025**	**0.005**	**0.02**			
UNLEADED FIBERGLASS UST											
T3A	WEGE	6/23/94	14	<1	**0.013**	**0.012**	<0.005	<0.015			
T3B	WEGE	6/23/94	14	<1	**0.013**	**0.011**	<0.005	<0.015			
WASTE OIL UST											
WO-1	WEGE	6/23/94	7.5	**3**	**0.063**	**0.34**	**0.048**	**0.23**			
PRODUCT DISPENSING SYSTEM											
PL-1	WEGE	6/23/94	2.5	<1	**0.01**	<0.005	<0.005	**0.02**			
PL-2	WEGE	6/23/94	2.5	<1	**0.01**	**0.031**	**0.0059**	**0.032**			
OVER-EXCAVATION OF USTs AND PRODUCT DISPENSING AREAS											
SIDEWALLS OF UST EXCAVATION AND SOUTH OF BUILDING											
SWA -13	WEGE	8/8/95	13	**3**	**0.005**	**0.009**	**0.046**	**0.36**			
SWB-6	WEGE	8/8/95	6	<1	<0.005	<0.005	<0.005	<0.005			
SWC-13	WEGE	8/8/95	13	**3**	<0.005	<0.005	<0.005	**0.022**			
SWD-6	WEGE	8/8/95	6	<1	<0.005	<0.005	<0.005	<0.005			
SWE-11.5	WEGE	8/8/95	11.5	<1	<0.005	<0.005	<0.005	<0.005			
F-14	WEGE	8/8/95	14	**3**	**0.12**	**0.24**	**0.053**	**0.29**			
G-17	WEGE	8/8/95	17	**6**	**0.16**	**0.31**	**0.11**	**0.68**			
H-SW-BOT-16	WEGE	8/10/95	16	**1000**	**3.6**	**31**	**14**	**77**			
I-SW BUILD 8	WEGE	8/10/95	8	**2000**	**4.5**	**35**	**18**	**130**			
J-BOT WEST	WEGE	8/11/95	13	<1	<0.005	<0.005	<0.005	<0.005			
K-SW WEST 8	WEGE	8/11/95	8	<1	<0.005	<0.005	<0.005	**0.005**			
SIDEWALLS AND BASE OF EXCAVATION SOUTH OF PUMP ISLANDS AND DISPENSER AREAS											
PI-1	WEGE	8/14/95	12	<1	<0.005	<0.005	<0.005	<0.005			
PI-2	WEGE	8/14/95	7	<1	**0.011**	<0.005	**0.005**	**0.03**			
PI-3	WEGE	8/14/95	8	<1	<0.005	<0.005	<0.005	<0.005			
PI-4	WEGE	8/14/95	6	<1	<0.005	<0.005	<0.005	<0.005			
HYDRAULIC HOIST AREAS											
SLP-7	WEGE	8/16/95	7	na							
SLP-14.5	WEGE	8/16/95	14.5	**1200**	**8.8**	**25**	**18**	**92**			
NPL-7	WEGE	8/16/95	7	na							

TABLE 2
SOIL SAMPLE (CERTIFIED LABORATORY RESULTS)
FORMER DP #793
4035 PARK BLVD., OAKLAND, CALIFORNIA

SAMPLE ID	SAMPLED BY	DATE SAMPLED	DEPTH SAMPLED BELOW SURFACE IN FEET	EPA METHOD 8020 TPHg mg/Kg	BENZENE mg/Kg	TOLUENE mg/Kg	ETHYL-BENZENE mg/Kg	XYLENES mg/Kg	MTBE mg/Kg	TOC mg/Kg	TBA mg/Kg
WASTE OIL UST											
T1-17	WEGE	8/31/95	17	**940**	**2.1**	**3.3**	**7.9**	**33**			
EXPLORATORY PIT WEST OF BUILDING											
T2-11.5	WEGE	8/31/95	11.5	<1	<0.005	<0.005	<0.005	<0.005			
T2-17.5	WEGE	8/31/95	17.5	**4**	**0.05**	**0.07**	**0.062**	**0.31**			
BORING FOR MONITOR WELL MW1, REPLACED RS-1 WHICH WAS OVER-EXCAVATED.											
MW1-5	WEGE	9/5/95	5	<1	**0.005**	**0.005**	<0.005	**0.015**			
MW1-10	WEGE	9/5/95	10	<1	<0.005	<0.005	<0.005	<0.005			
MW1-15	WEGE	9/5/95	15	<1	<0.005	<0.005	<0.005	<0.005			
MW1-20	WEGE	9/5/95	20	<1	<0.005	<0.005	<0.005	<0.005			
SEWER LATERAL INVESTIGATION											
BH1-5	WEGE	5/1/96	5	<0.2	<0.005	<0.005	<0.005	<0.005			
BH1-10	WEGE	5/1/96	10	**31**	<0.005	**0.16**	**0.22**	**0.71**		390	
BH2-5.5	WEGE	5/2/96	5.5	<0.2	<0.005	<0.005	<0.005	<0.005		2400	
BH3-5	WEGE	5/2/96	5	<0.2	<0.005	<0.005	<0.005	<0.005			
BH3-8.5	WEGE	5/2/96	8.5	<0.2	<0.005	<0.005	<0.005	<0.005			
BH3-10.5	WEGE	5/2/96	10.5	<0.2	**0.09**	<0.005	<0.005	**0.021**		340	
BH4-6.5	WEGE	5/2/96	6.5	<0.2	<0.005	<0.005	<0.005	<0.005			
BH4-8.5	WEGE	5/2/96	8.5	<0.2	<0.005	<0.005	<0.005	<0.005		460	
BH5-5	WEGE	5/2/96	5	<0.2	<0.005	<0.005	<0.005	<0.005			
BH5-6.5	WEGE	5/2/96	6.5	<0.2	<0.005	<0.005	<0.005	<0.005		5700	
AUGER 1	WEGE	1/17/97	0.9	**0.5**	<0.005	**0.017**	<0.005	<0.01	**0.14**		
AUGER 2	WEGE	1/17/97	7	**0.68**	**0.024**	**0.032**	**0.009**	**0.024**	**0.07**		
AUGER 3	WEGE	1/17/97	4.5	<0.5	<0.005	0.017	<0.005	<0.01	**0.085**		
ADDITIONAL MONITOR WELLS ALONG SEWER LATERAL											
RS8-10	WEGE	8/2/99	10	**160**	**0.49**	**0.79**	**2.6**	**6.2**	<0.005		
RS9-6	WEGE	8/3/99	6	<0.5	<0.005	<0.005	<0.005	<0.01	<0.005		
RS9-10	WEGE	8/3/99	10	**67**	**0.41**	**2**	**0.87**	**4.9**	<0.005		
RS10-6	WEGE	8/5/99	6	<0.5	0.005	<0.005	<0.005	<0.01	<0.005		
RS10-9.5	WEGE	8/5/99	9.5	**870**	**11**	**62**	**21**	**120**	<0.005		
RECEPTOR TRENCH DOCUMENTATION SAMPLES											
TRENCH-A-15	WEGE	8/4/99	15	<0.5	**0.072**	**0.011**	**0.008**	**0.015**	<0.005		
TRENCH-B-10	WEGE	8/4/99	10	**140**	**2**	**4**	**2.4**	**10**	<0.005		
TRENCH-C-14	WEGE	8/4/99	14	<0.5	**0.009**	**0.017**	**0.005**	**0.031**	<0.005		
TRENCH-D-10.5	WEGE	8/5/99	10.5	<0.5	<0.005	**0.006**	<0.005	**0.017**	<0.005		
TRENCH-E-5	WEGE	8/5/99	5	4000	**17**	**260**	**110**	**580**	<0.005		
TRENCH-F-10.5	WEGE	8/5/99	10.5	<0.5	**0.064**	**0.015**	**0.01**	**0.046**	<0.005		
TRENCH-G-7	WEGE	8/6/99	7	1100	**1.4**	**70**	**34**	**180**	**4.5**		
TRENCH-H-10.5	WEGE	8/6/99	10.5	<0.5	<0.005	<0.005	<0.005	**0.018**	<0.005		
TRENCH-I-5	WEGE	8/6/99	5	<0.5	<0.005	<0.005	<0.005	<0.01	<0.005		
TRENCH-J-10	WEGE	8/6/99	10	<0.5	**0.021**	**0.079**	**0.011**	**0.057**	<0.005		
TRENCH-K-12.5	WEGE	8/9/99	12.5	<0.5	<0.005	<0.005	<0.005	<0.01	<0.005		
TRENCH-L-10	WEGE	8/9/99	10	<0.5	<0.005	<0.005	<0.005	<0.01	<0.005		
TRENCH-M-6	WEGE	8/12/99	6	<0.5	<0.005	<0.005	<0.005	<0.01	<0.005		
TRENCH-N-8	WEGE	8/12/99	8	<0.5	**0.012**	**0.005**	<0.005	**0.012**	<0.005		
TRENCH-O-10	WEGE	8/12/99	10	<0.5	**0.011**	<0.005	<0.005	**0.011**	<0.005		
TRENCH-P-6	WEGE	8/12/99	6	<0.5	**0.045**	<0.005	<0.005	<0.01	<0.005		

TABLE 2
SOIL SAMPLE (CERTIFIED LABORATORY RESULTS)
FORMER DP #793
4035 PARK BLVD., OAKLAND, CALIFORNIA

SAMPLE ID	SAMPLED BY	DATE SAMPLED	DEPTH SAMPLED BELOW SURFACE IN FEET	EPA METHOD 8020 TPHg mg/Kg	BENZENE mg/Kg	TOLUENE mg/Kg	ETHYL-BENZENE mg/Kg	XYLENES mg/Kg	MTBE mg/Kg	TOC mg/Kg	TBA mg/Kg
SOIL CORES DECEMBER 2004											
CORE HOLE 1											
C1-8/8.25	WEGE	12/9/04	8.25	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
C1-12/12.25	WEGE	12/9/04	12.25	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
C1-20/20.25	WEGE	12/9/04	20.25	**12**	<0.005	<0.005	**0.0083**	<0.005	<0.005		
C1-23.75/24	WEGE	12/9/04	24	**1500**	<0.05	**0.097**	**5.1**	**15**	<0.05		
C1-39.75/40	WEGE	12/9/04	40	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
C1-45.75/46	WEGE	12/9/04	46	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
C1-49.25/49.5	WEGE	12/9/04	49.5	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
CORE HOLE 2											
C2-8.5/8.75	WEGE	12/16/04	8.75	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
C2-19/19.25	WEGE	12/16/04	19.25	<1	<0.005	<0.005	<0.005	<0.005	<0.005		**0.012**
C2-22.5/23	WEGE	12/16/04	23	**2.5**	<0.005	<0.005	<0.005	<0.005	<0.005		
C2-39.75/40	WEGE	12/16/04	40	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
C2-49.25/49.5	WEGE	12/16/04	49.5	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
CORE HOLE 3											
C3-7.75/8	WEGE	12/15/04	8	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
C3-15/15.5	WEGE	12/15/04	15.5	**270**	**0.16**	**0.14**	**4.2**	**2.3**	<0.05		
C3-31.75/32	WEGE	12/15/04	32	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
C3-35.75/36	WEGE	12/15/04	36	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
C3-41.75/42	WEGE	12/15/04	42	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
CORE HOLE 4											
C4-7.75/8	WEGE	12/16/04	8	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
C4-19.5/20	WEGE	12/16/04	20	**58**	**0.044**	**0.83**	**1.1**	**2.1**	<0.005		**0.092**
C4-25.75/26	WEGE	12/16/04	26	<1	<0.005	<0.005	<0.005	**0.0056**	<0.005		
C4-39.75/40	WEGE	12/16/04	40	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
CORE HOLE 5, NOT DRILLED											
CORE HOLE 6											
C6-7.75/8	WEGE	12/13/04	8	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
C6-15.75/16	WEGE	12/13/04	16	**120**	**0.22**	<0.025	**0.16**	<0.05	<0.025		
C6-16.5/17	WEGE	12/13/04	17	**1600**	**0.99**	<0.25	**23**	**3.2**	<0.25		
C6-31.75/32	WEGE	12/13/04	32	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
C6-34.75/35	WEGE	12/13/04	35	<1	**0.035**	<0.005	<0.005	<0.005	<0.005		
CORE HOLE 7											
C7-7.75/8	WEGE	12/15/04	8	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
C7-18/18.25	WEGE	12/15/04	18.25	**220**	**0.055**	**0.031**	**0.64**	**0.05**	<0.025		
C7-29.75/30	WEGE	12/15/04	30	<1	**0.14**	**0.028**	**0.013**	**0.029**	<0.005		
C7-45.75/46	WEGE	12/15/04	46	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
C7-48.75/49	WEGE	12/15/04	49	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
CORE HOLE 8											
C8-7.75/8	WEGE	12/14/04	8	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
C8-11.75/12.0	WEGE	12/14/04	12	**470**	<0.1	<0.1	**0.13**	<0.1	<0.1		
C8-15.75/16.0	WEGE	12/14/04	16	**7.2**	**0.08**	**0.043**	**0.25**	**0.3**	<0.005		
C8-29.75/30.0	WEGE	12/14/04	30	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
C8-37.75/38	WEGE	12/14/04	38	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
CORE HOLE 9											
C9-7.75/8	WEGE	12/14/04	8	**520**	<0.25	<0.25	**4.2**	**5.4**	<0.25		
C9-11.75/12	WEGE	12/14/04	12	**1300**	<0.25	**0.72**	**17**	**75**	<0.25		
C9-23.75/24	WEGE	12/14/04	24	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
C9-30.75/31	WEGE	12/14/04	31	<1	<0.005	<0.005	<0.005	<0.005	<0.005		

TABLE 2
SOIL SAMPLE (CERTIFIED LABORATORY RESULTS)
FORMER DP #793
4035 PARK BLVD., OAKLAND, CALIFORNIA

SAMPLE ID	SAMPLED BY	DATE SAMPLED	DEPTH SAMPLED BELOW SURFACE IN FEET	EPA METHOD 8020 TPHg mg/Kg	BENZENE mg/Kg	TOLUENE mg/Kg	ETHYL-BENZENE mg/Kg	XYLENES mg/Kg	MTBE mg/Kg	TOC mg/Kg	TBA mg/Kg
CORE HOLE 10											
C10-7.75/8	WEGE	12/13/04	8	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
C10-16/16.25	WEGE	12/13/04	16.25	**1.1**	**0.005**	<0.005	**0.026**	**0.067**	<0.005		
C10-29.75/30	WEGE	12/13/04	30	<1	**0.085**	<0.005	<0.005	<0.005	**0.0066**		
C10-33.75/34	WEGE	12/13/04	34	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
CORE HOLE 11											
C11-7.75/8	WEGE	12/13/04	8	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
C11-17.5/18	WEGE	12/13/04	18	**2.4**	**0.012**	<0.005	**0.013**	**0.028**	<0.005		
C11-23.75/24.0	WEGE	12/13/04	24	**210**	**3.9**	**15**	**4.4**	**23**	<0.025		
C11-28.75/29	WEGE	12/13/04	29	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
C11-31.75/32	WEGE	12/13/04	32	<1	**0.027**	<0.005	<0.005	<0.005	<0.005		
CORE HOLE 12											
C12-5.75/6.0	WEGE	12/10/04	6	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
C12-15.75/16	WEGE	12/10/04	16	**6**	<0.005	<0.005	**0.056**	<0.005	<0.005		
C12-19.75/20	WEGE	12/10/04	20	**3.2**	<0.005	<0.005	<0.005	<0.005	<0.005		
C12-29.75/30	WEGE	12/10/04	30	**4.4**	<0.005	<0.005	<0.005	<0.005	<0.005		
CORE HOLE 13											
C13-3.75/4.0	WEGE	12/9/04	4	<1	<0.005	<0.005	<0.005	<0.005	<0.005		
C13-13.75/14	WEGE	12/9/04	14	**23**	**0.097**	<0.005	**0.31**	**0.46**	<0.005		
C13-21/21.5	WEGE	12/9/04	21.5	**180**	**0.74**	**1.1**	**2.8**	**12**	<0.025		
C13-23.75/24	WEGE	12/10/04	24	<1	**0.19**	<0.005	<0.005	**0.016**	**0.0094**		
C13-29.75/30	WEGE	12/10/04	30	<1	<0.005	<0.005	<0.005	<0.005	<0.005		

RSI REMEDIATION SERVICE, INT'L
WWC WATERWORKS CORP.
LF LEVINE-FRICKE
WEGE WESTERN GEO-ENGINEERS

< BELOW LABORATORY LOWER DETECTION LIMITS
mg/Kg milligrams per kilogram (parts per million)
TPHg TOTAL PETROLEUM HYDROCARBONS GASOLINE RANGE
MTBE METHYL TERTIARY BUTYL ETHER
TOC Total Organic Carbon

TABLE 3
GROUNDWATER CERTIFIED ANALYTICAL LABAORATAORY RESULTS FROM WATER SAMPLES OBTAINED FROM CORES.
DESERT PETROLEUM, INC. SITE #793
4035 PARK BOULEVARD, OAKLAND, CALIFORNIA

ID#	EPA METHOD 8260B							
	DATE SAMPLED	SAMPLE INTERVAL FEET BELOW SURFACE	TPH-G (UG/L)	BENZENE (UG/L) (1.5)	TOLUENE (UG/L) (150)	ETHYL-BENZENE (UG/L) (300)	XYLENES (UG/L) (1800)	MTBE (UG/L) (13)
C1-W42/49.5	12/9/04	42 - 49.5	<50	<0.5	<0.5	<0.5	<0.5	<0.5
C2-W38/49.5	12/12/04	38 - 49.5	<50	<0.5	1.4	<0.5	<0.5	<0.5
C3-W14/18	12/16/04	14 - 18	58000	630	98	4300	12000	<25
C3-W30/42	12/16/04	30 - 42	59	1.5	1.5	1.5	4.3	<0.5
C4-W12/16	12/17/04	12 - 16	11000	5.4	14	280	7.4	<1.5
C4-W27/40	12/17/04	27 - 40	<50	<0.5	2.9	0.54	1.4	<0.5
C6-W15/19	12/13/04	15 - 19	16000	1100	130	1300	1400	<2
C6-W35	12/13/04	31 - 35	1100	76	120	40	160	27
C7-W14-18	12/16/04	14 - 18	3400	160	7.8	78	17	<1
C7-W34.5/49	12/16/04	34.5 - 49	150	5.4	9.1	4.9	17	<0.5
C8-11/16	12/15/04	11 - 16	18000	65	170	990	1200	<5
C8-34/38	12/15/04	34 - 38	<50	<0.5	5.5	0.62	1.2	<0.5
C9-water11-16	12/14/04	11 - 16	66000	970	540	4100	10000	<25
C9-27/31	12/15/04	27 - 31	1800	300	14	20	13	43
C10 water11-16	12/14/04	11 - 16	44000	2400	230	3700	6800	<20
C10 water29-34	12/14/04	29 - 34	1000	250	72	1.7	6	90
C11-W14/18	12/16/04	14 - 18	5700	650	230	240	560	5.7
C11-W29/32	12/13/04	29 - 32	7400	550	1100	200	1000	5.1
C12-W12/16	12/10/04	12 - 16	550	<0.5	<0.5	<0.5	<0.5	<0.5
C12-W24/28	12/10/04	24 - 28	5100	48	<1	160	330	<1
C13-W24/30	12/10/04	24 - 30	99	5.3	1.6	2	6.4	5.7

ug/L micrograms/Liter

TABLE 4
GROUNDWATER ELEVATIONS AND ELECTRON ACCEPTOR RESULTS FROM WATER SAMPLES
DESERT PETROLEUM, INC. SITE #793
4035 PARK BOULEVARD, OAKLAND, CALIFORNIA

(All concentrations in parts per million [mg/L, ppm] unless otherwise noted)
(AMSL = Above mean sea level)

ID#	DATE SAMPLED	WELL CASING ELEVATION (FEET AMSL)	FIELD MEASUREMENTS: DEPTH TO GROUND WATER (FEET)	GROUND WATER ELEVATION (FEET AMSL)	DISSOLVED OXYGEN O2 (MG/L)	SULFATE SO4 (MG/L)	NITRATE NO3 (MG/L)	FERROUS IRON FE2 (MG/L)	TEMP-ERATURE (F)	pH	CERTIFIED LABORATORY RESULTS DISSOLVED IN WATER: TOTAL PETROLEUM HYDROCARBONS GASOLINE (MG/L)	CARBON DI OXIDE CO2 (MG/L)	METHANE CH4 (MG/L)	AEROBIC HYDROCARBON DEGRADING BACTERIA CFU/ML	ORTHO-PHOSPHATE PO4 (MG/L)	AMMONIA as NITROGEN N (MG/L)
MW-1	8/26/99	229.57	11.41	218.16	4.9	35	0	0.25	75.4	6.55	<0.05					
	9/2/99	229.57	11.65	217.92					72.9	8.16		0.13	<0.00001	10	<1	<0.5
	3/8/01	229.57	12.30	217.27	4.9				67.6	7.33	<0.05					
	12/18/01	229.57	13.74	215.83	4.4	61	7.6	0	67.1	7.63	<0.05					
RS-2	8/26/99	227.39	11.42	215.97	0.7	46	2.7	0.65	80.9	6.97	0.2					
	9/2/99	227.39	12.00	215.39								nm	nm	nm	nm	nm
	12/18/01	227.39	6.99	220.4	4.6	>77	11.4	0.07	67.6	7.75	<0.05					
RS-5	8/26/99	227.61	16.06	211.55	0.7	31	1.3	0.92	71.7	7.08	35					
	9/2/99	227.61	16.26	211.35					66.4	7.15		0.16	0.00021	3000	<1	<0.5
	3/8/01	227.61	27.72	199.89	3.1				59.7	7.46	11					
	12/18/01	227.61	15.61	212	1.4	37	8.2	>3.3	66.6	6.83	12					
RS-6	8/26/99	227.22	13.72	213.5	1.2	76	0.3	>3.3	77.8	6.66	0.69					
	9/2/99	227.22	14.14	213.08					69	6.69		0.36	<0.00001	400	<1	<0.5
	12/18/01	227.22	10.88	216.34	4.3	>77	0	0	66.7	6.84	0.056					
RS-7	8/26/99	195.99	4.16	191.83	0.3	>77	0.8	1.27	73.4	6.99	15					
	9/2/99	195.99	4.14	191.85								nm	nm	nm	nm	nm
	12/18/01	195.99	4.81	191.18	2.5	1	6	0.87	68.1	6.82	2.7					
RS-8	8/26/99	214.67	7.25	207.42	2.6	0	0	0.54	69.2	6.7	160					
	9/2/99	214.67	7.38	207.29					71.7	5.74		0.058	0.000018	6600	<1	<0.5
	3/8/01	214.67	9.40	205.27	2.2				63.3	6.97	10					
	12/18/01	214.67	7.14	207.53	4.2	49	9.2	0.08	67.3	6.98	0.23					
RS-9	8/26/99	195.63	7.46	188.17	2.1	7	0	0.59	73.5	6.95	17					
	9/2/99	195.63	7.61	188.02					70.9	6.98		0.25	0.0021	10000	<1	<0.5
	3/8/01	195.63	4.93	190.7	8.1				62.7	6.89	<0.05					
	12/18/01	195.63	4.81	190.82	WATER TO CLOUDY, LIGHT GREY				68.3	6.8	0.21					
RS-10	8/26/99	208.46	3.76	204.7	4.2	nm	nm	nm	70.9	8.03	5.1					
	9/2/99	208.46	3.96	204.5					73.3	7.24		0.1	0.000037	8800	<1	<0.5
	3/8/01	208.46	2.82	205.64	3.5				61.5	6.16	0.053					
	12/18/01	208.46	2.10	206.36	4.3	46	4.1	0	66.9	6.54	<0.05					
R1	8/26/99	227.69	13.97	213.72	0.4	9	0	>3.3	70.6	6.38	6.5					
	9/2/99	227.69	14.18	213.51								nm	nm	nm	nm	nm
	12/18/01	227.69	9.90	217.79	5.2	14	4.2	0	66.4	7.24	<0.05					
R2	8/26/99	227.28	13.14	214.14	0.4	>77	0.8	0.3	72.7	6.65	6.7					
	9/2/99	227.28	13.23	214.05								nm	nm	nm	nm	nm
	12/18/01	227.28	12.35	214.93	2.8	>77	1.3	0.07	66.5	6.69	4.9					

TABLE 4
GROUNDWATER ELEVATIONS AND ELECTRON ACCEPTOR RESULTS FROM WATER SAMPLES
DESERT PETROLEUM, INC. SITE #793
4035 PARK BOULEVARD, OAKLAND, CALIFORNIA

(All concentrations in parts per million [mg/L, ppm] unless otherwise noted)
(AMSL = Above mean sea level)

ID#	DATE SAMPLED	WELL CASING ELEVATION (FEET AMSL)	FIELD MEASUREMENTS: DEPTH TO GROUND WATER (FEET)	GROUND WATER ELEVATION (FEET AMSL)	DISSOLVED OXYGEN O2 (MG/L)	SULFATE SO4 (MG/L)	NITRATE NO3 (MG/L)	FERROUS IRON FE2 (MG/L)	TEMP-ERATURE (F)	pH	CERTIFIED LABORATORY RESULTS DISSOLVED IN WATER: TOTAL PETROLEUM HYDROCARBONS GASOLINE (MG/L)	CARBON DI OXIDE CO2 (MG/L)	METHANE CH4 (MG/L)	AEROBIC HYDROCARBON DEGRADING BACTERIA CFU/ML	ORTHO-PHOSPHATE PO4 (MG/L)	AMMONIA as NITROGEN N (MG/L)
R3	8/26/99	230.32	10.76	219.56	2.5	>77	0.7	0.05	75	6.95	<0.05					
	9/2/99	230.32	10.87	219.45								nm	nm	nm	nm	nm
	12/18/01	230.32	6.79	223.53	5.5	>77	6.2	0	67.1	6.91	<0.05					
T 1	8/26/99	195.11	2.44	192.67	0.8	32	0.5	0.03	75.3	7.29	40					
	9/2/99	195.11	2.20	192.91					78.1	7.57		0.11	0.00019	1300	<1	<0.5
	3/8/01	195.11	2.18	192.93	3.1						25					
	12/18/01	195.11	2.20	192.91	2.8	0	4.3	0.6	66.3	6.52	48					
T 2	8/26/99	195.3	CAR		nm	nm	nm	nm	nm	nm	NA					
	9/2/99	195.3	CAR									nm	nm	nm	nm	nm
T 3	8/26/99	202.38	CAR		nm	nm	nm	nm	nm	nm	NA					
	9/2/99	202.38	CAR									nm	nm	nm	nm	nm
T 4	8/26/99	197.48	CAR		nm	nm	nm	nm	nm	nm	NA					
	9/2/99	197.48	CAR									nm	nm	nm	nm	nm
LF-1	8/26/99	226.59	CAR		nm	nm	nm	nm	nm	nm	NA					
	9/2/99	226.59	CAR						nm	nm		nm	nm	nm	nm	nm

NA NOT ANALYZED
nm NOT MEASURED
CAR CAR PARKED OVER WELL, NO ACCESS
MG/L milligrams per liter (ppm)
F degrees Fahrenheit
< below laboratory lower detection limits.
CFU/ML colony forming units per millilit AMSL ABOVE MEAN SEA LEVEL

TABLE 5
GROUNDWATER REMOVAL
FORMER DP #793
4035 PARK BLVD., OAKLAND, CALIFORNIA

DATE PURGED	METER READING IN GALLONS RS5	METER READING IN GALLONS TRENCH	DEPTH TOP OF WATER IN FEET T1	GALLONS PURGED T1 and/or 1/4ly monitoring	ACCUMULATED GALLONS REMOVED FROM TRENCH &WELLS in GALLONS	Accumulated gallons removed from RS5 Gallons	TOTAL GALLONS REMOVED	INFLUENT CONCENTRATIONS EPA METHOD 8020 - 8260B TPHg ug/L	BENZENE ug/L	TOLUENE ug/L	ETHYL-BENZENE ug/L	XYLENES ug/L	MTBE ug/L	Sample Location
					0									
8/9/99			6.47	200	200		200.0							
8/10/99			5.02	1730	1930		1930.0							
8/11/99			7.89	960	2890		2890.0							
8/12/99			8.12	800	3690		3690.0							
8/13/99			8.87	600	4290		4290.0							
9/2/99			2.2	3600	7890		7890.0	40000	7200	5000	950	8100	53	T1
9/16/99			2.27	5131	13021		13021.3							
9/23/99			4.26	3351	16372		16372.3							
9/30/99			4.69	1734	18106		18106.3							
10/7/99			4.78	293	18400		18399.5							
1/25/00				0	18400		18399.5							
1/26/00				0	18400		18399.5							
1/28/00		1098330.0		0	18400		18399.5							
2/23/00		1102560.0		0	18400		18399.5	35000	2900	5700	720	6600	<0.5	T1
2/29/00		1109680.0	2.22	0	18400		18399.5							
3/23/00		1109720.0		0	18400		18399.5		1020	6500	1010	5090		
5/4/00		1110780.0		1060	19460		19459.5							
5/12/00		1111700.0	2.19	920	20380		20379.5							
5/18/00		1113359.0	2.18	1659	22039		22038.5							
5/25/00		1113840.0		481	22520		22519.5							
5/31/00		1115111.0	2.15	1271	23791		23790.5							
6/16/00		1115823.0		712	24503		24502.5							
6/28/00		1116293.0	2.22	470	24973		24972.5							
6/30/00		1116303.0		10	24983		24982.5	30000	3400	3200	950	4600	<5	T1
7/5/00		1116313.0		10	24993		24992.5							
7/6/00		1116313.0		0	24993		24992.5							
7/13/00		1117816.0		1503	26496		26495.5							
7/20/00		1118892.0	2.29	1076	27572		27571.5							
7/27/00		1118892.0	2.21	0	27572		27571.5							
8/3/00		1120336.0	2.9	1444	29016		29015.5							
8/10/00		1121041.0	2.75	705	29721		29720.5	8900	1600	760	260	870	<5	T1
8/17/00		1121041.0	2.73	0	29721		29720.5							
8/24/00		1121860.0	2.75	819	30540		30539.5							
8/30/00		1122720.0	2.75	860	31400		31399.5							
9/7/00		1123270.0	2.78	550	31950		31949.5							
9/14/00		1123810.0	2.79	540	32490		32489.5							
9/21/00		1123810.0		0	32490		32489.5							
10/5/00		1124253.0	2.81	443	32933		32932.5							

TABLE 5
GROUNDWATER REMOVAL
FORMER DP #793
4035 PARK BLVD., OAKLAND, CALIFORNIA

DATE PURGED	METER READING IN GALLONS RS5	METER READING IN GALLONS TRENCH	DEPTH TOP OF WATER IN FEET T1	GALLONS PURGED T1 and/or 1/4ly monitoring	ACCUMULATED GALLONS REMOVED FROM TRENCH &WELLS in GALLONS	Accumulated gallons removed from RS5 Gallons	TOTAL GALLONS REMOVED	INFLUENT CONCENTRATIONS EPA METHOD 8020 - 8260B TPHg ug/L	BENZENE ug/L	TOLUENE ug/L	ETHYL-BENZENE ug/L	XYLENES ug/L	MTBE ug/L	Sample Location
					0									
10/12/00		1124660.0	2.4	407	33340		33339.5							
10/19/00		1125904.3		1244	34584		34583.8							
10/26/00		1127167.0	2.22	1263	35847		35846.5							
11/9/00		1128367.2	2.87	1200	37047		37046.7							
11/16/00		1129779.5		1412	38459		38459.0	4000	1300	92	80	290	<0.5	T1
11/22/00		1130940.5	2.72	1161	39620		39620.0							
12/1/00		1132147.0	2.21	1207	40827		40826.5							
12/7/00		1132147.0	2.21	0	40827		40826.5							
12/14/00		1132823.0	2.55	676	41503		41502.5							
12/21/00		1134087.4	2.3	1264	42767		42766.9							
12/28/00		1134714.8	2.32	627	43394		43394.3							
1/11/01		1134714.8	2.32	0	43394		43394.3							
1/18/01		1135243.8	2.3	529	43923		43923.3							
1/25/01		1136144.0	2.46	900	44824		44823.5							
2/8/01		1136659.0	2.3	515	45339		45338.5							
2/15/01		1137441.4	2.38	782	46121		46120.9							
2/22/01	1140664.5	1141123.6	2	459	46580	3223.1	49803.1							
3/1/01	1150033.2	1150736.5	2.18	703	47283	12132.7	59416.0							
3/8/01	1158270.7	1158901.1	2.18	630	47914	19666.9	67580.6	25000	4400	3400	770	3200	26	T1
3/14/01	1161991.1	1162321.2	2.49	330	48244	22756.9	71000.7							
3/21/01	1162321.4	1162321.4	2.49	0	48244	22757.1	71000.9							
4/4/01	1162321.4	1163471.7	2.54	1150	49394	22757.1	72161.2							
4/12/01	1163471.7	1164723.5	2.16	1252	50646	22757.1	73403.0							
4/19/01	1172032.3	1173267.0	2.45	1235	51881	30065.9	81946.5							
4/26/01	1179315.2	1180276.0	2.26	961	52841	36114.1	88955.5							
5/3/01	1180334.5	1181423.5	2.3	1089	53930	36172.6	90103.0							
5/10/01	1188209.3	1188209.3	2.29	0	53930	42958.4	96888.8							
5/16/01	1188209.3	1189899.1	2.29	1690	55620	42958.4	98578.6							
5/24/01	1197065.0	1198018.4	2.13	953	56574	50124.3	106697.9							
5/31/01	1198878.6	1199647.3	2.3	769	57342	50984.5	108326.8	8900	940	210	340	1500	<50	T1
6/6/01	1203386.1	1204217.2	2.32	831	58173	54723.3	112896.7							
6/14/01	1210661.4	1210661.4	2.31	0	58173	61167.5	119340.9							
6/21/01	1214124.2	1214600.0	3.41	476	58649	64630.3	123279.5							
6/28/01	1218305.1	1219387.7	2.37	1083	59732	68335.4	128067.2							
7/5/01	1222739.6	1223625.4	3.5	886	60618	71687.3	132304.9							
7/12/01	1227553.1	1228500.0	3	947	61565	75615.0	137179.5							
7/19/01	1231804.3	1232750.7	3.61	946	62511	78919.3	141430.2	CEASE PUMPING						
12/18/01	purged water from 1/4ly			238	62749	78919.3	141668.2	48000	3700	5500	1200	5300	24	T1
2/19/02	purged water from 1/4ly			246	62995	78919.3	141914.2	64000	8600	6000	1700	6800	55	T1

TABLE 5
GROUNDWATER REMOVAL
FORMER DP #793
4035 PARK BLVD., OAKLAND, CALIFORNIA

DATE PURGED	METER READING IN GALLONS RS5	METER READING IN GALLONS TRENCH	DEPTH TOP OF WATER IN FEET T1	GALLONS PURGED T1 and/or 1/4ly monitoring	ACCUMULATED GALLONS REMOVED FROM TRENCH &WELLS in GALLONS	Accumulated gallons removed from RS5 Gallons	TOTAL GALLONS REMOVED	INFLUENT CONCENTRATIONS EPA METHOD 8020 - 8260B TPHg ug/L	BENZENE ug/L	TOLUENE ug/L	ETHYL-BENZENE ug/L	XYLENES ug/L	MTBE ug/L	Sample Location
					0									
3/21/02	1235760.0	1235760.0		0	62995	78919.3	141914.2	set pump into RS5, restart pumping from RS-5						
3/27/02	1243817.8	1243817.8		0	62995	86977.1	149972.0							
4/11/02	1259678.6	1259678.6		0	62996	102837.9	165832.8							
5/7/02	1283903.1	1283903.1	2.22	132	63127	126930.4	190057.3	41000	9200	910	2000	6200	62	T1
6/6/02	1308480.0	1308480.0		0	63127	151507.3	214634.2							
7/18/02	1330934.8	1330934.8		0	63127	173962.1	237089.0							
8/6/02	1340694.7	1340694.7		0	63127	183722.0	246848.9	28000	5500	240	1300	2600	32	T1
9/12/02	1364301.5	1364301.5		0	63127	207328.8	270455.7	12000	270	330	130	1100	2	RS5
10/30/02	1389884.7	1389884.7		0	63127	232912.0	296038.9							
11/5/02	1392931.0	1392931.0		0	63127	235958.3	299085.2	12000	150	360	21	890	<2	RS5
12/12/02	1408784.2	1410216.0		1432	64559	251811.5	316370.2							
1/9/03	1430304.1	1431653.1		1349	65908	271899.6	337807.3							
1/30/03	1447338.3	1448961.9	2.3	1624	67531	287584.8	355116.1							
2/19/03	1462658.4	1462658.4		0	67531	301281.3	368812.6							
3/13/03	1477211.2	1478624.6	2.23	1413	68945	315834.1	384778.8	240	5.5	1.9	2.3	9.6	1.4	RS5
3/26/03	1487952.3	1487952.3		0	68945	325161.8	394106.5							
4/3/03	1492921.1	1494226.5	2.27	1305	70250	330130.6	400380.7							
5/6/03	1509139.0	1510725.0	2.37	1586	71836	345043.1	416879.2	6800	1000	230	310	820	10	T1
5/21/03	1522165.2	1524709.6		2544	74381	356483.3	430863.8							
6/5/03	1536327.1	1536327.1		0	74381	368100.8	442481.3							
7/3/03	1558031.2	1558031.2		0	74381	389804.9	464185.4							
7/17/03	1567315.6	1568875.6	2.56	1560	75941	399089.3	475029.8							
8/13/03	1585901.5	1587475.1	2.41	1574	77514	416115.2	493629.3	310	1.4	<0.5	1	2.9	<0.5	RS5
9/4/03	1601163.7	1602640.5	2.67	1477	78991	429803.8	508794.7							
9/25/03	1614942.0	1614942.0		0	78991	442105.3	521096.2							
10/3/03	1619477.8	1620763.0	2.32	1285	80276	446641.1	526917.2							
10/8/03	1623572.9	1623572.9		0	80276	449451.0	529727.1							
10/14/03	1626700.0	1626700.0		0	80276	452578.1	532854.2							
10/16/03	1627622.0	1627622.0		0	80276	453500.1	533776.2							
10/24/03	1631506.9	1631506.9		0	80276	457385.0	537661.1							
10/30/03	1634530.0	1634530.0		0	80276	460408.1	540684.2							
11/6/03	1637906.5	1637906.5		0	80276	463784.6	544060.7							
11/13/03	1641361.3	1641361.3		0	80276	467239.4	547515.5							
11/20/03	1644688.6	1645991.4		1303	81579	470566.7	552145.6	17000	150	720	240	1800	0.72	RS5
11/30/03	1649967.5	1649967.5		0	81579	474542.8	556121.7							
12/3/03	1649967.4	1649967.4		0	81579	474542.7	556121.6							
12/11/03	1649977.6	1649977.6		0	81579	474552.9	556131.8							
12/18/03	1654385.3	1655688.6		1303	82882	478960.6	561842.8							
12/23/03	1655682.0	1655682.0		0	82882	478954.0	561836.2							

TABLE 5
GROUNDWATER REMOVAL
FORMER DP #793
4035 PARK BLVD., OAKLAND, CALIFORNIA

DATE PURGED	METER READING IN GALLONS RS5	METER READING IN GALLONS TRENCH	DEPTH TOP OF WATER IN FEET T1	GALLONS PURGED T1 and/or 1/4ly monitoring	ACCUMULATED GALLONS REMOVED FROM TRENCH &WELLS in GALLONS	Accumulated gallons removed from RS5 Gallons	TOTAL GALLONS REMOVED	INFLUENT CONCENTRATIONS EPA METHOD 8020 - 8260B TPHg ug/L	BENZENE ug/L	TOLUENE ug/L	ETHYL-BENZENE ug/L	XYLENES ug/L	MTBE ug/L	Sample Location
					0									
12/30/03	1655682.0	1655682.0		0	82882	478954.0	561836.2							
1/22/04	1672236.9	1673412.0		1175	84057	495508.9	579566.2							
2/26/04	1696276.0	1696378.0		102	84159	518372.9	602532.2							
3/30/04	1722614.0	1723589.0		975	85134	544608.9	629743.2	15000	1800	660	610	2000	8.6	T1
4/8/04	1729975.5	1729975.5		0	85134	550995.4	636129.7	4000	370	59	13	380	2.6	RS5
4/14/04	1734113.2	1734113.2		0	85134	555133.1	640267.4							
4/22/04	1739978.0	1739978.0		0	85134	560997.9	646132.2							
4/29/04	1744687.9	1746094.5		1407	86541	565707.8	652248.7							
5/13/04	1754248.1	1754248.1		0	86541	573861.4	660402.3							
5/21/04	1759593.7	1759593.7		0	86541	579207.0	665747.9							
5/27/04	1762418.0	1764065.5		1648	88188	582031.3	670219.7							
6/3/04	1769445.0	1769445.0		0	88188	587410.8	675599.2	5500	570	2	240	130	2.7	T1
6/10/04	1774349.0	1774349.0		0	88188	592314.8	680503.2	120	7	0.88	1.3	4.3	1.3	RS5
6/17/04	1778979.0	1778979.0		0	88188	596944.8	685133.2							
6/25/04	1783576.7	1783576.7		0	88188	601542.5	689730.9							
6/30/04	1786027.0	1787786.1		1759	89948	603992.8	693940.3							
7/8/04	1787858.5	1787858.5		0	89948	604065.2	694012.7							
7/22/04	1791170.5	1791170.5		0	89948	607377.2	697324.7							
7/29/04	1791170.5	1791170.5		0	89948	607377.2	697324.7	no electrical power to site (no pumping).						
9/24/04	1791170.0	1791170.0		0	89948	607376.7	697324.2	new electrical power to site (restart pump RS5).						
9/28/04	1791275.2	1793186.5		1911	91859	607481.9	699340.7	2600	110	89	75	56	<0.5	RS5
9/30/04	1794233.0	1794233.0		0	91859	608528.4	700387.2	8700	2600	100	450	240	15	T1
10/15/04	1794243.8	1794243.8		0	91859	608539.2	700398.0							
10/28/04	1800669.8	1800669.8		0	91859	614965.2	706824.0							
11/5/04	1805236.0	1805236.0		0	91859	619531.4	711390.2							
11/19/04	1813980.8	1813980.8		0	91859	628276.2	720135.0							
12/8/04	1826103.7	1826253.7		150	92009	640399.1	732407.9	<50	<0.5	<0.5	<0.5	<0.5	<0.5	RS5
12/30/04	1841818.0	1841818.0		0	92009	655963.4	747972.2							

ug/L micrograms per liter (parts per billion)
mg/L milligrams per liter (parts per million)
WESTERN GEO-ENGINEERS

< BELOW LABORATORY LOWER DETECTION LIMITS
mg/Kg milligrams per kilogram (parts per million)
TPHg TOTAL PETROLEUM HYDROCARBONS GASOLINE RANGE
MTBE METHYL TERTIARY BUTYL ETHER

* SAMPLED ON AUGUST 26, 1999
T1 Receptor Trench Well
RS5 Monitor Well RS5 (pumping well)

TABLE 6

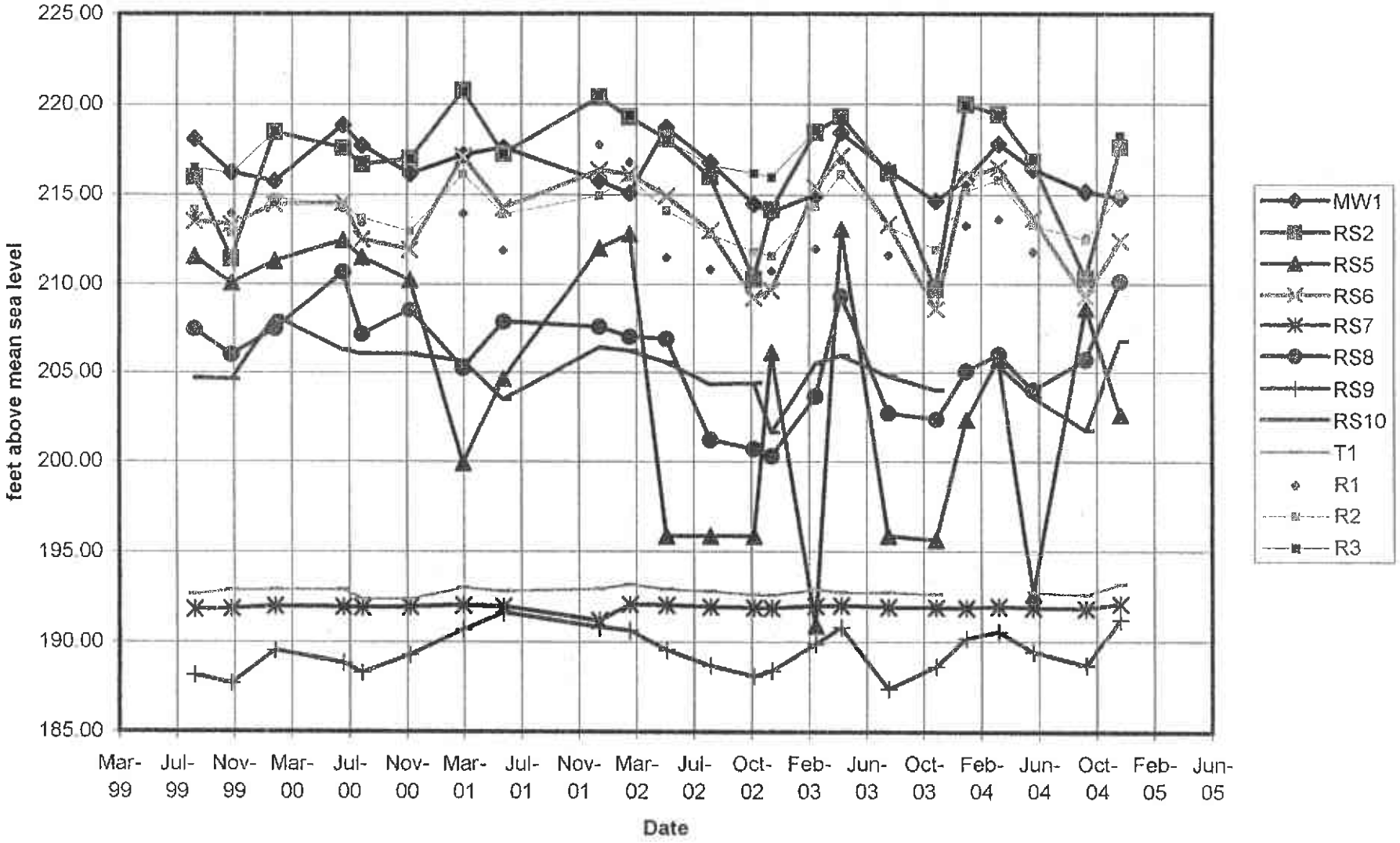
MONITOR WELL CONSTRUCTION SUMMARY TABLE - DP 793, 4035 PARK BLVD., OAKLAND, CA.

WELL ID	DATE INSTALLED	STATUS	TOTAL DEPTH FEET	BORING DIAMETER INCHES	WELL DIAMETER INCHES	CASING MATERIAL	SCREEN INTERVAL FEET	SCREEN SIZE INCHES	CEMENT SEAL FEET	BENTONITE SEAL FEET	FILTER PACK FEET	FILTER PACK TYPE
MONITOR WELLS												
RS1	12/12/89	DESTROYED	31	10	4	PVC	5 TO 30	0.02	0 TO 1.5	1.5 TO 4.5	4.5 TO 31	#3 SAND
RS2	12/12/89	ACTIVE	20.5	10	4	PVC	5 TO 20	0.02	0 TO 1.5	1.5 TO 4.5	4.5 TO 20.5	#3 SAND
RS5	12/13/89	PUMPING	40	10	4	PVC	14 TO 39	0.02	0 TO 9	9 TO 13	13 TO 40	#3 SAND
RS6	12/13/89	ACTIVE	35	10	4	PVC	9 TO 34	0.02	0 TO 4	4 TO 7	7 TO 35	#3 SAND
RS7	12/13/89	ACTIVE	8	EXCAVATION	4	PVC	3 TO 5	0.02	0 TO 1		1 TO 8	PEA GRAVEL
MW1	9/5/95	ACTIVE	20	8	2	PVC	10 TO 20	0.01	0 TO 6	6 TO 7.8	7.8 TO 20	#2/12 SAND
RS8	8/3/99	ACTIVE	14	8	2	PVC	4 TO 14	0.02	0 TO 3	3 TO 3.5	3.5 TO 14	#3 SAND
RS9	8/3/99	ACTIVE	15	8	2	PVC	5 TO 15	0.02	0 TO 3	3 TO 4.5	4.5 TO 15	#3 SAND
RS10	8/6/99	ACTIVE	10	8	2	PVC	1.5 TO 10	0.02	0 TO 1	1 TO 1.5	1.5 TO 10	#3 SAND
EXCAVATION WELLS ON SITE												
R1	8/31/95	ACTIVE	17.5	EXCAVATION	6	PVC	7.5 TO 17.5	0.02			1.5 TO 17.5	PEA GRAVEL
R2	8/31/95	ACTIVE	17.5	EXCAVATION	6	PVC	7.5 TO 17.5	0.02			1.5 TO 17.5	PEA GRAVEL
R3	8/10/95	ACTIVE	17	EXCAVATION	6	PVC	4.5 TO 13.5	0.02			4.5 TO 17	PEA GRAVEL
INTERCEPT TRENCH												
T1	8/5/99	ACTIVE	16	EXCAVATION	4	PVC	2.5 TO 16	0.02	0 TO 1		2 TO 16	PEA GRAVEL
T2	8/5/99	ACTIVE	15	EXCAVATION	4	PVC	9.5 TO 15	0.02	0 TO 1		2 TO 15	PEA GRAVEL
T3	8/5/99	ACTIVE	12.5	EXCAVATION	2	PVC	5 TO 12	0.02	0 TO 1		2 TO 12.5	PEA GRAVEL
T4	8/5/99	ACTIVE	8.5	EXCAVATION	2	PVC	1.5 TO 8.5	0.02	0 TO 1		2 TO 8.5	PEA GRAVEL

APPENDIX A.

GROUNDWATER ELEVATION CHART

Groundwater Elevation



APPENDIX B.

WELL CONSTRUCTION AND BOREHOLE LOGS

DESERT PETROLEUM STATION #793

Oakland, CA
Date: 12-11-89
Time Started/Finished: 9:00/1:00 (12-12-89)
Sampling Method: Mod Cal
Rig Type: MOBILE B-61 HSA
Drilling Contractor: Datum

BORING/MONITORING WELL: RS-1

Logged By: BJM
Casing Size & Type: 4" PVC
Screen Size & Type: 4" PVC; 0.020" Slots
Filter Pack: #3 Sand
Traffic Cover Elevation:
Datum/Reference:

DEPTH (FEET)	SAMPLE INT.	PID ppm	BLOWS PER HALF FOOT	WELL DETAILS	USCS	SOIL DESCRIPTION AND NOTES
0						
5		110	2, 3, 3		CL	SILTY CLAY, BLACK, VERY DAMP, SLIGHT HYDROCARBON ODOR.
10		52	7, 10, 13		CL	CLAY, BLACK, VERY MOIST, "STICKY", SLIGHT HYDROCARBON ODOR.
15		105	17, 22, 28			CLAY, BROWN, DAMP, MALLEABLE, NO HYDROCARBON ODOR.
20		102	14, 17, 21		SC	CLAYEY SAND WITH SOME GRAVEL, GREY-TAN, FINE-MEDIUM GRAIN, DAMP, NO HYDROCARBON ODOR.
						12-11-89
						12-12-89
25		50	11, 13, 18		CL	SANDY CLAY WITH GRAVEL, TAN, FINE GRAIN, SAMPLER WET BUT SAMPLE IS NOT SATURATED, SLIGHT HYDROCARBON ODOR.
30		5	21, 37, 50		SC	CLAYEY SAND WITH SOME GRAVEL, TAN, MEDIUM-COARSE GRAIN, SAMPLER WET BUT SAMPLE IS NOT SATURATED, NO HYDROCARBON ODOR.
35						TD AT 31 FEET. CSG AT 30 FEET.
40						
45						

DESERT PETROLEUM STATION #793

Oakland, CA
Date: 12-11-89
Time Started/Finished: 11:00/10:00 (12-12-89)
Sampling Method: Mod Cal
Rig Type: MOBILE B-61 HSA
Drilling Contractor: Datum

BORING/MONITORING WELL: RS-2

Logged By: BJM
Casing Size & Type: 4" PVC
Screen Size & Type: 4" PVC; 0.020" Slots
Filter Pack: #3 Sand
Traffic Cover Elevation:
Datum/Reference:

DEPTH (FEET)	SAMPLE INT.	PID ppm	BLOWS PER HALF FOOT	WELL DETAILS	USCS	SOIL DESCRIPTION AND NOTES
0						
5	X	2	2, 2, 3		CL	CLAY, BLACK, DAMP, NO HYDROCARBON ODOR.
10	X	1.5	9, 13, 19			SANDY CLAY WITH GRAVEL IN BOTTOM 2" OVERLAIN BY BLACK CLAY, DAMP, NO HYDROCARBON ODOR.
15	X	<1	17, 27, 34		SC	CLAYEY SAND WITH SOME GRAVEL, TAN TO GRAY GREEN, FINE-MEDIUM GRAIN, DAMP, SEMI-CONSOLIDATED, NO HYDROCARBON ODOR.
20	X	<1	27, 37, 41		CL	SANDY CLAY WITH SOME GRAVEL, BROWN, SLIGHTLY DAMP, NO HYDROCARBON ODOR. TD AT 20.5 FEET. CSG AT 20 FEET.
25						
30						
35						
40						
45						

DESERT PETROLEUM STATION #793

Oakland, CA
Date: 12-11-89
Time Started/Finished: 3:15/4:00
Sampling Method: Mod Cal
Rig Type: MOBILE B-61 HSA
Drilling Contractor: Datum

BORING/MONITORING WELL: RS-3

Logged By: BJM
Casing Size & Type: –
Screen Size & Type: –
Filter Pack: –
Traffic Cover Elevation:
Datum/Reference:

DEPTH (FEET)	SAMPLE INT.	PID ppm	BLOWS PER HALF FOOT	WELL DETAILS	USCS	SOIL DESCRIPTION AND NOTES
0						
5	X	6	3, 3, 4		CL	SILTY CLAY, BLACK, DAMP, NO HYDROCARBON ODOR.
					CL	
10	X	2	7, 8, 9			SILTY CLAY, AS ABOVE. TD AT 10 FEET. BACKFILL WITH CEMENT TO 5 FEET. BACKFILL WITH CUTTINGS FROM 5 FEET TO SURFACE.
15						
20						
25						
30						
35						
40						
45						

RSI

DESERT PETROLEUM STATION #793

Oakland, CA
Date: 12-12-89
Time Started/Finished: 1:45/2:45
Sampling Method: Mod Cal
Rig Type: MOBILE B-61 HSA
Drilling Contractor: Datum

BORING/MONITORING WELL: RS-4

Logged By: BJM
Casing Size & Type: –
Screen Size & Type: –
Filter Pack: –
Traffic Cover Elevation:
Datum/Reference:

DEPTH (FEET)	SAMPLE INT.	PID ppm	BLOWS PER HALF FOOT	WELL DETAILS	USCS	SOIL DESCRIPTION AND NOTES
0						
5	X	4	5, 10, 13		CL	CLAY, TAN, DAMP, MALLEABLE, NO HYDROCARBON ODOR.
					CL	
10	X	3	10, 12, 17			CLAY, AS ABOVE. TD AT 10 FEET. BACKFILL WITH CUTTINGS.
15						
20						
25						
30						
35						
40						
45						

DESERT PETROLEUM STATION #793

Oakland, CA
Date: 12-12-89
Time Started/Finished: 4:15/12:00 (12-13-89)
Sampling Method: Mod Cal
Rig Type: MOBILE B-61 HSA
Drilling Contractor: Datum

BORING/MONITORING WELL: RS-5

Logged By: BJM
Casing Size & Type: 4" PVC
Screen Size & Type: 4" PVC; 0.020" Slots
Filter Pack: #3 Sand
Traffic Cover Elevation:
Datum/Reference:

DEPTH (FEET)	SAMPLE INT.	PID ppm	BLOWS PER HALF FOOT	WELL DETAILS	USCS	SOIL DESCRIPTION AND NOTES
0						
5	X	2	3, 4, 8		CL	SILTY CLAY, BLACK AND TAN MOTTLED, DAMP, NO HYDROCARBON ODOR.
10	X	1	9, 11, 15		ML	SANDY CLAY, TAN, FINE-COARSE GRAIN, DAMP, NO HYDROCARBON ODOR.
15	X	13	7, 7, 8		CL	CLAY , DARK BROWN, DAMP, NO HYDROCARBON ODOR.
						12-12-89
						12-13-89
20	X	64	7, 9, 9		CL	SILTY CLAY, BLACK AND TAN MOTTLED, COHESIVE, DAMP, NO HYDROCARBON ODOR.
25	X	14	7, 7, 6	▼	SC	CLAYEY SAND, TAN, MEDIUM-COARSE GRAIN, DAMP, NO HYDROCARBON ODOR.
30	X	96	17, 30, 40		SC	CLAYEY SAND, AS ABOVE OVERLAIN BY A VERY COHESIVE SANDY CLAY, SLIGHT HYDROCARBON ODOR.
35	X	34	17, 24, 34		CL	SILTY CLAY, TAN, SAMPLER WET BUT SAMPLE NOT SATURATED, SLIGHT HYDROCARBON ODOR.
40	X	60	13, 19, 27		CL	SANDY CLAY WITH SOME GRAVEL OVERLAIN BY CLAY, TAN, DAMP, SLIGHT HYDROCARBON ODOR.
						TD AT 40 FEET.
						CSG AT 39 FEET.
45						

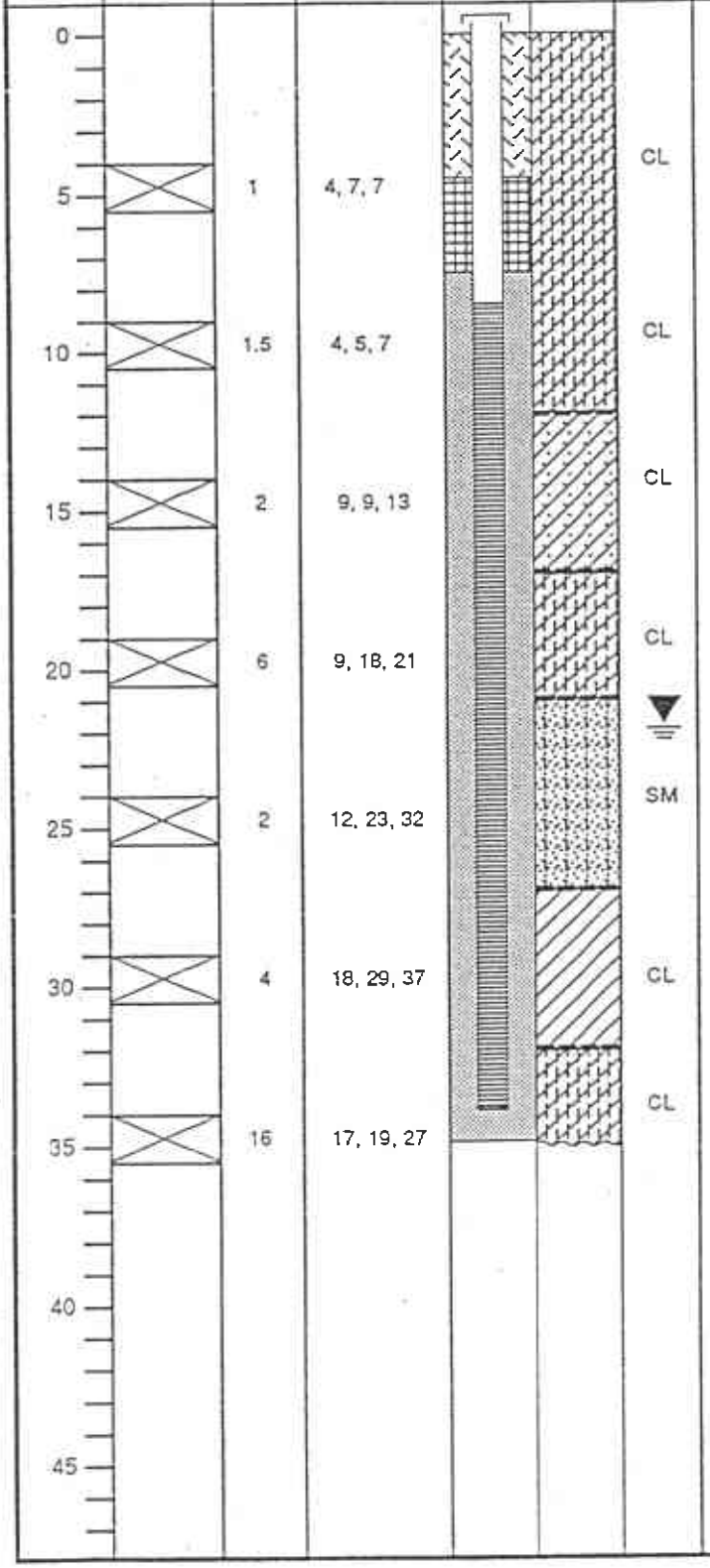
RSI

DESERT PETROLEUM STATION #793

Oakland, CA
Date: 12-13-89
Time Started/Finished: 1:15/4:45
Sampling Method: Mod Cal
Rig Type: MOBILE B-61 HSA
Drilling Contractor: Datum

BORING/MONITORING WELL: RS-6

Logged By: BJM
Casing Size & Type: 4" PVC
Screen Size & Type: 4" PVC; 0.020" Slots
Filter Pack: #3 Sand
Traffic Cover Elevation:
Datum/Reference:



-WEGE-

WESTERN GEO-ENGINEERS

BORING: **MW-1**

DATE DRILLED: 9/5/95

▌SAMPLE INTERVAL

▼WATER

BORE HOLE LOG

DESERT PETROLEUM, INC.

PROJECT: **D.P. STATION #793**	GEOLOGIST: G. CONVERSE	SURFACE ELEVATION:
LOCATION: 4035 PARK BLVD. Oakland, California	DRILLER: E. Forsstrom	TOTAL DEPTH: 20'
DRILLING CONTRACTOR: WOODWARD DRILLING	DEPTH TO WATER: 18'	CASING: 2" PVC TO 20'.

REMARKS: 8" hollow stem auger powered by Mobile drill rig used to drill well. HNU PID WITH 10.2 EV BULB USED TO SCREEN SAMPLES AND DRILLING.

DEPTH (FT)	SAMPLE No.	BLOWS/.5 FT	PPM TVO VAPOR	CORE DESCRPTION	GRAPHIC LOG	REMARKS
			0	3" ASPHALT SURFACE		BORING CONVERTED INTO GROUND WATER MONITORING WELL MW-1.
5'	MW1 -5	2/1/2	0/0/0	CLAY, DARK BROWN, SILTY, MOIST, NO ODOR. (CL-ML) DRILL STIFF AT 8 FEET.		
10'	MW1 -10	2/4/10	0/0/0	CLAY, BROWN, STIFF, DECREASE IN SILT, NO ODOR. (CL-ML)		
15'	MW1 -15	6/11/17	0/0/0	CLAY, LT BROWN, STIFF, MOIST, NO ODOR, WITH OCC. GRAVEL, SBANG-ANG, QTZ & MET VOLC. (CL-GP)		
▼ 20'	MW1 -20	10/17 /24	0/0/0	SAND, BROWN, WET, FINE-MEDIUM, QUARTZ, SUBROUND, W/VARIG. MET VOLC/IGN. OCC PEBBLES, SUBRD, WHT. QTZ. NO ODOR. (SP-SC)		FIRST WATER @ 18' BGS.
25'						
30'						
35'						
40'						
45'						NOTE: PID CALIBRATED WITH ISOBUTYLENE AS 100 PPM VAPOR

WEGE WELL CONSTRUCTION LOG

DESERT PETROLEUM, INC

PROJECT NAME 4035 PARK BLVD., OAKLAND, CA.

MONITOR WELL NUMBER MW-1

TOP OF CASING ELEVATION

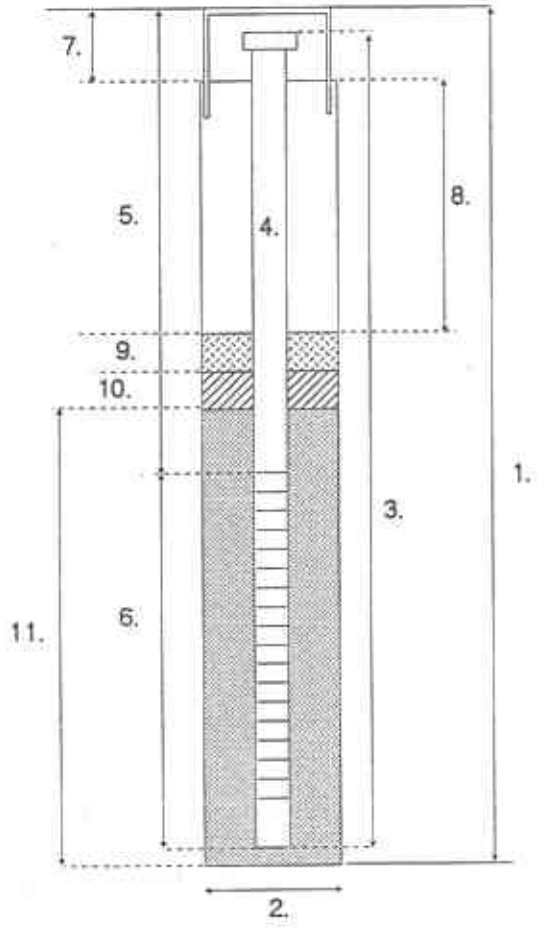
PROJECT NUMBER DP #793

DATE COMPLETED 9/5/95

WELL TYPE 2" PVC GROUND WATER MONITORING WELL

REMARKS: UPGRADIENT REPLACEMENT GROUND WATER MONITORING WELL. REPLACES RS-1, DESTROYED DURING OVER-EXCAVATION OF UST AND PUMP ISLAND AREAS.

TYPICAL MONITORING WELL



WELL CONSTRUCTION

1. Total Depth of hole 20.0'
2. Diameter of boring 8"
3. Casing length 20'
4. Casing diameter 2"
5. Depth to top of screen 10'
6. Length of screen 10'
   screen interval 10'-20'
   screen type sch 40 PVC F480
   screen size 0.010"
7. Surface seal surface - 1'
   seal material TB w/concrete
8. Backfill 1' - 6'
   seal material neat cement.
9. Upper seal 6'-7.8'
   seal material 1/4" hydrated bentonite pellets.
10. Lower seal 7.8"-10'
    seal material #030 Sand
11. Annulus 10' - 20'
    material #2/12 sand

NOTE EACH WELL CONSTRUCTED WITH POLY-VINYL CHLORIDE (PVC) CASING WITH TREADED BOTTOM CAPS AND WATER TIGHT LOCABLE TOP CAPS. ALL PVC STEAM CLEANED PRIOR TO CONSTRUCTION OF WELL.

-WEGE-

WESTERN GEO-ENGINEERS

PAGE 1 OF 1

BORING: BH-1

DATE DRILLED: 5 / 1 / 9 6

▮ SAMPLE INTERVAL

▼ WATER

BORE HOLE LOG

PROJECT: DESERT PETROLEUM DP793	GEOLOGIST: G. CONVERSE	SURFACE ELEVATION:
LOCATION: 4035 Park Boulevard Oakland, CA.	DRILLER: G. CONVERSE	TOTAL DEPTH: 10.5FT
DRILLING CONTRACTOR: WESTERN GEO-ENGINEERS	DEPTH TO WATER: 9.5'	CASING: 2" F480 PVC, 0.020 slot

REMARKS: HAND AUGERED AND SET TEMPORARY CASING TO SAMPLE SOIL AND GROUND WATER.

DEPTH (FT)	SAMPLE No.	BLOWS/5 FT	PPM TVO VAPOR	CORE DESCRPTION	GRAPHIC LOG	REMARKS
2.5'				CLAY, dark brown, silty, moist, no odor. (CH-ML)		Boring performed in backyard of 4006 Brighton Avenue, near sewer lateral.
5.0'	BH1 -5		0			
7.5'				CLAY, light brown, expanding, moist, no odor. (CH)		water first encountered during drilling at 9.5'. 24 hours later at 6.82'.
▼ 10.0'	BH1 -10		80	CLAY, dark green/grey, silty, wet, trace degraded p etroleum odor. (CH-ML)		
12.5'						
15.0'				TOTAL DEPTH 10.5'		
				ppmv vapor colume is actual mg/L gasoline range hydrocarbons in soil using a FID-GC, non certified.		

REGISTERED GEOLOGIST
JACK E. NAPPER
No. 3037
STATE OF CALIFORNIA

-WEGE-

WESTERN GEO-ENGINEERS

BORING: BH-2

DATE DRILLED: 5 / 2 / 9 6

▮ SAMPLE INTERVAL

▼ WATER

BORE HOLE LOG

PROJECT: DESERT PETROLEUM DP793	GEOLOGIST: G. CONVERSE	SURFACE ELEVATION:
LOCATION: 4035 Park Boulevard Oakland, CA.	DRILLER: G. CONVERSE	TOTAL DEPTH: 5.4FT
DRILLING CONTRACTOR: WESTERN GEO-ENGINEERS	DEPTH TO WATER: 4.5'	CASING: 2" F480 PVC, 0.020 slot

REMARKS: HAND AUGERED AND SET TEMPORARY CASING TO SAMPLE SOIL AND GROUND WATER.

DEPTH (FT)	SAMPLE No.	BLOWS/5 FT	PPM TVO VAPOR	CORE DESCRPTION	GRAPHIC LOG	REMARKS
				Top Soil		Boring performed in backyard of 4026 Brighton Avenue, near sewer lateral.
2.5'				CLAY, dark brown, silty, moist, no odor. (CH-ML)		
▼ 5.0'	BH2-5		0			water first encountered during drilling at 4.5'. 6 hours later at 2.3'.
7.5'				TOTAL DEPTH 5.4'		
10.0'						
12.5'						
15.0'						

ppmv vapor colume is actual mg/L gasoline range hydrocarbons in soil using a FID-GC, non certified.

REGISTERED GEOLOGIST
JACK E. NAPPER
No. 3037
STATE OF CALIFORNIA

-WEGE-
WESTERN GEO-ENGINEERS

BORING: BH-3
DATE DRILLED: 5 / 2 / 9 6

▌ SAMPLE INTERVAL
▼ WATER

BORE HOLE LOG

PROJECT: DESERT PETROLEUM DP793	GEOLOGIST: G. CONVERSE	SURFACE ELEVATION:
LOCATION: 4035 Park Boulevard Oakland, CA.	DRILLER: G. CONVERSE	TOTAL DEPTH: 10.5FT
DRILLING CONTRACTOR: WESTERN GEO-ENGINEERS	DEPTH TO WATER: 10.0'	CASING: 2" F480 PVC, 0.020 slot

REMARKS: HAND AUGERED AND SET TEMPORARY CASING TO SAMPLE SOIL AND GROUND WATER.

DEPTH (FT)	SAMPLE No.	BLOWS/5 FT	PPM TVO VAPOR	CORE DESCRPTION	GRAPHIC LOG	REMARKS
2.5'				CLAY, dark brown, silty, moist, no odor. (CH-ML)		Boring performed in backyard of 4032 Brighton Avenue, near sewer lateral.
5.0'				CLAY, blue/grey, silty, moist, no odor. (CH-ML)		
7.5'	BH3 -8.5		2.2	CLAY, light brown, expanding, moist, no odor. (CH)		water first encountered during drilling at 10'. 4 hours later at 8.25'.
10.0' ▼	BH3-10.5		4.5			
12.5'						
15.0'				TOTAL DEPTH 10.5'		

ppmv vapor colume is actual mg/L gasoline range hydrocarbons in soil using a FID-GC, non certified.

REGISTERED GEOLOGIST
JACK E. NAPPER
No. 3037
STATE OF CALIFORNIA

-WEGE-

WESTERN GEO-ENGINEERS

PAGE 1 OF 1

BORING: BH-4

DATE DRILLED: 5 / 2 / 9 6

▮ SAMPLE INTERVAL

▼ WATER

BORE HOLE LOG

PROJECT: DESERT PETROLEUM DP793	GEOLOGIST: G. CONVERSE	SURFACE ELEVATION:
LOCATION: 4035 Park Boulevard Oakland, CA.	DRILLER: G. CONVERSE	TOTAL DEPTH: 14.0 FT
DRILLING CONTRACTOR: WESTERN GEO-ENGINEERS	DEPTH TO WATER:	CASING: 2" F480 PVC, 0.020 slot

REMARKS: HAND AUGERED AND SET TEMPORARY CASING TO SAMPLE SOIL AND GROUND WATER.

DEPTH (FT)	SAMPLE No.	BLOWS/5 FT	PPM TVO VAPOR	CORE DESCRPTION	GRAPHIC LOG	REMARKS
2.5'				CLAY, dark brown, silty, moist, no odor. (CH-ML)		Boring performed in backyard of 1211 N. Hampiel Avenue, near sewer lateral.
5.0'						
7.5'	BH 4			CLAY, light brown, expanding, moist, no odor. (CH)		
10.0'	BH4 -8.5		0			
12.5'						Boring deepened to 14.0 feet on 5/6/96. Formation refusal in gravel. still no water.
15.0'				GRAVEL, angular, no odor		
				TOTAL DEPTH 14.0'		
				ppmv vapor colume is actual mg/L gasoline range hydrocarbons in soil using a FID-GC, non certified.		

REGISTERED GEOLOGIST
JACK E. NAPPER
No. 3037
STATE OF CALIFORNIA

-WEGE-

WESTERN GEO-ENGINEERS

BORING: BH-5

DATE DRILLED: 5 / 2 / 9 6

▮ SAMPLE INTERVAL

▼ WATER

BORE HOLE LOG

PROJECT: DESERT PETROLEUM DP793	GEOLOGIST: G. CONVERSE	SURFACE ELEVATION:
LOCATION: 4035 Park Boulevard Oakland, CA.	DRILLER: G. CONVERSE	TOTAL DEPTH: 8.5FT
DRILLING CONTRACTOR: WESTERN GEO-ENGINEERS	DEPTH TO WATER: 6.0'	CASING: 2" F480 PVC, 0.020 slot

REMARKS: HAND AUGERED AND SET TEMPORARY CASING TO SAMPLE SOIL AND GROUND WATER.

DEPTH (FT)	SAMPLE No.	BLOWS/.5 FT	PPM TVO VAPOR	CORE DESCRPTION	GRAPHIC LOG	REMARKS
				Top Soil		Boring performed in backyard of 1227 N. Hampel Avenue, near sewer lateral.
2.5'	BH5 -2.5		0	CLAY, light brown, silty, no odor. (CH-ML)		
5.0' ▼	BH5 -5		0	CLAY, dark brown, silty, moist, no odor. (CH-ML)		
7.5'						
10.0'	BH5-8.5		0			Water first encountered during drilling at 6.0', after purging at 6.4'.
12.5'						
15.0'				TOTAL DEPTH 8.5'		
				ppmv vapor colume is actual mg/L gasoline range hydrocarbons in soil using a FID-GC, non certified.		

REGISTERED GEOLOGIST
JACK E. NAPPER
No. 3037
STATE OF CALIFORNIA

-WEGE-

Western Geo-Engineers

BORING: RS-8
DATE DRILLED: 8-2-99

▌SAMPLE INTERVAL

▼WATER

BORE HOLE LOG

PROJECT: DP 793 - SEWER LATERAL	GEOLOGIST: GEORGE CONVERSE	SURFACE ELEVATION: 214.98
LOCATION: 4006 BRIGHTON AVE. OAKLAND, CA	DRILLER: STEVE BROADWAY	TOTAL DEPTH: 14 FT
DRILLING CONTRACTOR: WESTERN GEO-ENGINEERS	DEPTH TO WATER: 11'	CASING: 2" SCH 40 PVC

REMARKS: HAND AUGERED WITH 8" BUCKET
SCREENED WITH MINIRAE PID WITH 10.6 EV. BULB.

DEPTH (FT)	SAMPLE No.	BLOWS/FT.	PPM TVO VAPOR	CORE DESCRIPTION	GRAPHIC LOG	REMARKS
			0.0	SILTY CLAY, BROWN, HARD, DRY NO ODOR (CL-ML)		
2'			0.0			
4'				SILTY CLAY, DARK BROWN, HARD, MOIST, NO ODOR (CL-ML)		
			0.0			
6'			0.0	CLAY, MEDIUM GRAY, STIFF, MOIST, NO ODOR (CL)		
8'						
10' ▼	RS8 -10		177	SILT, CLAY GRAY-GREEN TRACE OF FINE SAND, DEG. PET. ODOR WET. (CL-ML)		
12'						
14'				Total depth drilled 14'		

REGISTERED GEOLOGIST
JACK E. NAPPER
No. 3037
STATE OF CALIFORNIA

WEGE WELL CONSTRUCTION LOG

PROJECT NAME DP 793
4006 BRIGHTON AVENUE

PROJECT NUMBER

MONITOR WELL NUMBER RS-8

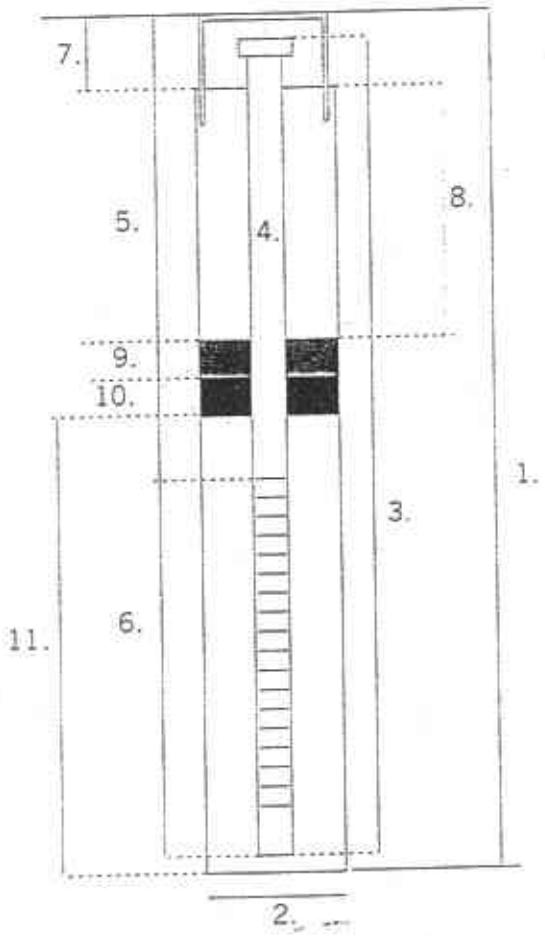
TOP OF CASING ELEVATION 214.67'

DATE COMPLETED AUGUST 3, 1999

WELL TYPE GROUNDWATER MONITORING WELL

REMARKS: WELL INSTALLED THROUGH 8 INCH HAND AUGERED BORING

TYPICAL MONITORING WELL



WELL CONSTRUCTION

1. Total Depth of hole 14'
2. Diameter of boring 8"
3. Casing length 14'
4. Diameter of casing 2"
5. Depth to top of screen 4.0'
6. Length of screen 10'
   screen interval 4' - 14.0"
   screen type MONOFLEX F480
   screen size 0.020"
7. Surface seal 6" TRAFFIC BOX
   seal material CONCRETE
8. Backfill 8" - 3'
   seal material NEAT CEMENT
9. Upper seal 3' - 3.5'
   seal material BENTONITE
10. Lower seal
    seal material
11. Annulus 3.5'-14'
    material #3 MONTERAY SAND

NOTE: Well constructed with poly-vinyl chloride (PVC) casing with threaded bottom cap and slip on top cap. Also, PVC steam cleaned before constructing each well. Traffic boxes are water tight and locked for security.

Western Geo-Engineers

BORING: RS-9
DATE DRILLED: 8-3-99

▮ SAMPLE INTERVAL
▼ WATER

BORE HOLE LOG

PROJECT: DP 793 - SEWER LATERAL	GEOLOGIST: GEORGE CONVERSE	SURFACE ELEVATION: 195.86
LOCATION: 4037 BRIGHTON AVE. OAKLAND, CA	DRILLER: STEVE BROADWAY	TOTAL DEPTH: 15 FT
DRILLING CONTRACTOR: WESTERN GEO-ENGINEERS	DEPTH TO WATER: 9'	CASING: 2" SCH 40 PVC

REMARKS: HAND AUGERED WITH 8" BUCKET
SCREENED WITH MINIRAE PID WITH 10.6 EV. BULB.

DEPTH (FT)	SAMPLE No.	BLOWS/FT.	PPM TVO VAPOR	CORE DESCRIPTION	GRAPHIC LOG	REMARKS
			0.0	SILTY CLAY, BROWN, HARD, DRY W/OCC ROCK NO ODOR (CL-ML)		
2'			0.0	SILTY CLAY, DARK BROWN, HARD, NO ODOR (CL-ML)		
4'			0.0	SILTY CLAY, DARK BROWN, HARD, MOIST, NO ODOR (CL-ML)		
6'	RS9-6		0.2	CLAY GRAY STIFF NO ODOR WET. (CL-ML)		
8'				CLAY BROWN STIFF NO ODOR WET. (CL-ML)		
▼ 10'	RS9-10		3.7	TRACE ODOR WET. (CL-ML)		
12'			0.2	SILT, CLAY BROWN W/TRACE OF CHARCOAL INCLUSIONS ODOR WET. (CL-ML)		
14'			0.2	SILT, CLAY MED. GRAY, W/SAND FN- GRANULAR RED-BLACK W/ WHITE CHERT. WET. (CL-ML-SC)		

Total depth drilled
15'

REGISTERED GEOLOGIST
JACK E. NAPPER
No. 3037
STATE OF CALIFORNIA

WEGE WELL CONSTRUCTION LOG

PROJECT NAME DP 793
4037 BRIGHTON AVENUE

PROJECT NUMBER

WELL TYPE GROUNDWATER MONITORING WELL

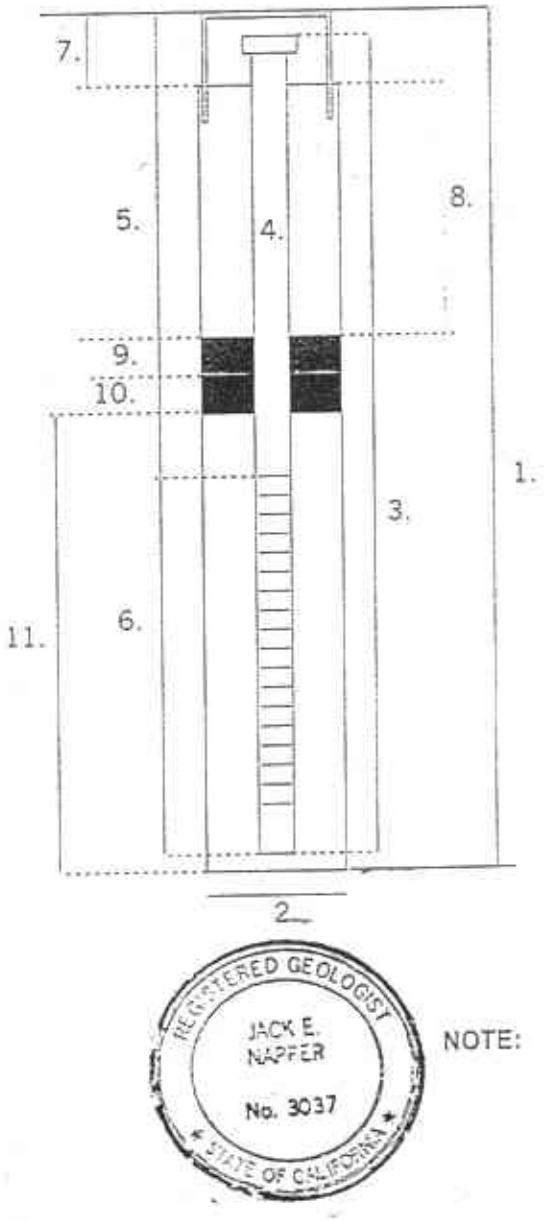
REMARKS: WELL INSTALLED THROUGH 8 INCH HAND AUGERED BORING

MONITOR WELL NUMBER RS-9

TOP OF CASING ELEVATION 195.63'

DATE COMPLETED AUGUST 3, 1999

TYPICAL MONITORING WELL



WELL CONSTRUCTION

1. Total Depth of hole 15'
2. Diameter of boring 8"
3. Casing length 15'
4. Diameter of casing 2"
5. Depth to top of screen 5.0'
6. Length of screen 10'
   screen interval 5' - 15.0"
   screen type MONOFLEX F480
   screen size 0.020"
7. Surface seal 6" TRAFFIC BOX
   seal material CONCRETE
8. Backfill 8" - 3'
   seal material NEAT CEMENT
9. Upper seal 3' - 4.5'
   seal material BENTONITE
10. Lower seal
    seal material
11. Annulus 4.5' - 15'
    material #3 MONTERAY SAND

REGISTERED GEOLOGIST
JACK E. NAPPER
No. 3037
STATE OF CALIFORNIA

NOTE: Well constructed with poly-vinyl chloride (PVC) casing with threaded bottom cap and slip on top cap. Also, PVC steam cleaned before constructing each well. Traffic boxes are water tight and locked for security.

-WEGE-

Western Geo-Engineers

BORING: RS-10
DATE DRILLED: 8-5-99

▮ SAMPLE INTERVAL

▼ WATER

BORE HOLE LOG

PROJECT: DP 793 - SEWER LATERAL	GEOLOGIST: DAVID THRELFALL	SURFACE ELEVATION: 208.71
LOCATION: 4026 BRIGHTON AVE. OAKLAND, CA.	DRILLER: STEVE BROADWAY	TOTAL DEPTH: 10.5 FT
DRILLING CONTRACTOR: WESTERN GEO-ENGINEERS	DEPTH TO WATER: 5'	CASING: 2" SCH 40 PVC

REMARKS: HAND AUGERED WITH 6" BUCKET
SCREENED WITH MINIRAE PID WITH 10.6 EV. BULB.

DEPTH (FT)	SAMPLE No.	BLOWS/FT.	PPM TVO VAPOR	CORE DESCRIPTION	GRAPHIC LOG	REMARKS
2'				PLANTER SOIL, DRK BROWN SILTY W/ORGANICS NO ODOR (CL-ML)		
4'				CLAY, GRAY, STICKY, WET (CL-ML)		
6' ▼	RS10 -6			CLAY, SILTY, RED W/OCC. ANGUL GRAVEL, PET. ODOR (CL-ML-SC)		
8'						
10'	RS10 -9.5					
12'				Total depth drilled 10.5'		

REGISTERED GEOLOGIST
JACK E. NAPPER
No. 3037
STATE OF CALIFORNIA

WEGE WELL CONSTRUCTION LOG

PROJECT NAME DP 793
4026 BRIGHTON AVENUE

PROJECT NUMBER

WELL TYPE GROUNDWATER MONITORING WELL

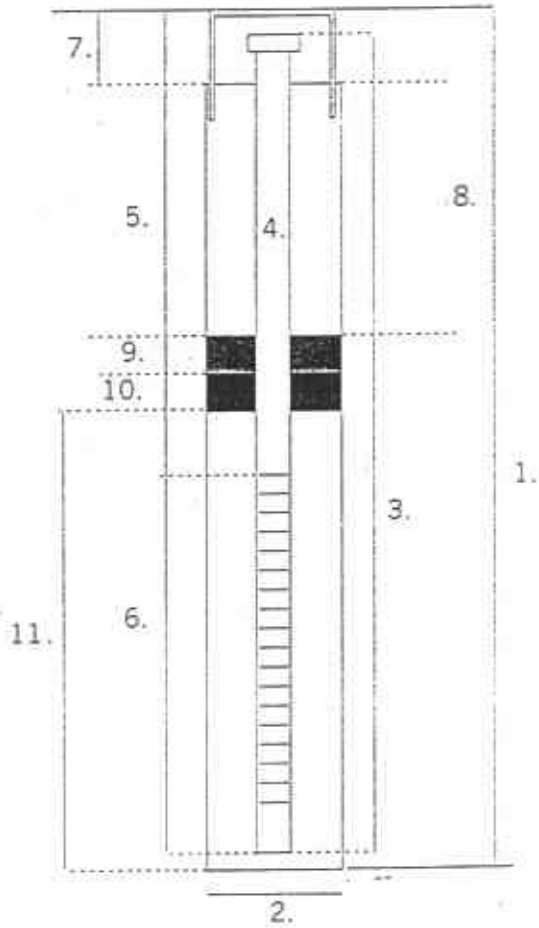
MONITOR WELL NUMBER RS-10

TOP OF CASING ELEVATION 208.46'

DATE COMPLETED AUGUST 6, 1995

REMARKS: WELL INSTALLED THROUGH 6 INCH HAND AUGERED BORING

TYPICAL MONITORING WELL



WELL CONSTRUCTION

1. Total Depth of hole 10'
2. Diameter of boring 6"
3. Casing length 10'
4. Diameter of casing 2"
5. Depth to top of screen 1.5'
6. Length of screen 8.5'
   screen interval 1.5' - 10.0"
   screen type MONOFLEX F480
   screen size 0.020"
7. Surface seal 6" TRAFFIC BOX
   seal material CONCRETE
8. Backfill SURFACE -1'
   seal material NEAT CEMENT
9. Upper seal 1.0' -1.5'
   seal material BENTONITE
10. Lower seal
    seal material
11. Annulus 1.5'-10'
    material #3 MONTERAY SAND

NOTE: Well constructed with poly-vinyl chloride (PVC) casing with threaded bottom cap and slip on top cap. Also, PVC steam cleaned before constructing each well. Traffic boxes are water tight and locked for security.

Western Geo-Engineers

PAGE 1 OF 1

BORING: C-1
DATE DRILLED: Dec. 9, 2004

▮ SAMPLE INTERVAL
▼ WATER

BORE HOLE LOG

PROJECT: DP793	GEOLOGIST: GEORGE CONVERSE	SURFACE ELEVATION:
LOCATION: 4035 PARK BLVD. OAKLAND, CA	DRILLER: Rick Barragan	TOTAL DEPTH: 49.5 FT
DRILLING CONTRACTOR: WOODWARD Drilling	DEPTH TO WATER: 42 feet	CASING:

REMARKS: HAND AUGER FIRST 5 FEET. DIRECT PUSH CORE WITH 3" CORE BARREL TO 49.5FOOT DEPTH. AIR MONITORING WITH PID,10.6 EV. BULB.

DEPTH (FT)	SAMPLE No.	PPM TVO VAPOR	CORE DESCRPTION	GRAPHIC LOG	REMARKS
		0.1	Asphalt 2 inch thick Rock fill, angular, franciscan, 3-6" length		
4'		0.3	Rock fill, degraded, angular, franciscan 3-6" length with clay.		
8'	C1-8/8.25	3.4	Sand, medium gray (SM) Silt, brown with clay (ML-CH) Clay, brown, silty, no odor. (CH-ML)		
12'	C1-12/12.5	34	Clay, dark gray, Tr odor. (CH) Clay, brown, silty, no odor. (CH-ML)		
16'		3.7	Clay, brown, with orange oxidation, stiff,. (CH)		
20'	C1-20/20.5	70	Clay, md gray, molten silty		
24'	C1-23.5/24	500	Tr deg petrol. Odor (CH-ML)		
		7.8	Clay, orange oxidation, stiff,. (CH) Clay, brown/ gray, silty (CH-ML)		
28'		40			
32'		21	Clay, brown/orange, silty firm(CH-ML)		
		60			
36'		5.4			
		86	Conglom. Met/volc rock with clay(GP-GC)		
40'	C1-39.5/40	3			
		20	Clay, brown, firm(CH)		
44'		28	Sand, vfn-fn w/brown clay (SM-CH)		
	C1-45.75/46	5.2	Clay, brown, firm(CH)		
48'	C1-49.25/49.5	6			
			TOTAL DEPTH CORED 49.5 (formation refusal)		

-WEGE-

Western Geo-Engineers

BORING: C-2
DATE DRILLED: Dec. 16, 2004

▮ SAMPLE INTERVAL
▼ WATER

BORE HOLE LOG

PROJECT: DP793	GEOLOGIST: GEORGE CONVERSE	SURFACE ELEVATION:
LOCATION: 4035 PARK BLVD. OAKLAND, CA	DRILLER: Rick Barragan	TOTAL DEPTH: 49.5 FT
DRILLING CONTRACTOR: WOODWARD Drilling	DEPTH TO WATER: 10.5 feet	CASING:

REMARKS: HAND AUGER FIRST 5 FEET. DIRECT PUSH CORE WITH 3" CORE BARREL TO 49 5FOOT DEPTH. AIR MONITORING WITH PID, 10.6 EV. BULB.

DEPTH (FT)	SAMPLE No.	PPM TVO VAPOR	CORE DESCRPTION	GRAPHIC LOG	REMARKS
		0.0	Soil Rock fill, angular, franciscan, 3-6" length		
4'					
		0.0			
8'	C2-8.5/8.75	0.0	Silt, brown with clay (ML-CH) Clay, brown, firm, no odor. (CH)		
▼ 12'		0.0	Clay, brown, silty, wet, no odor. (CH-ML)		
16'			Clay, olive green, stiff,. (CH) Gravel, met/volc pebbles in clay		
	C2-19/19.25	0.0	(GP-GC)		
20'		0.3	Clay, md brown, stiff (CH)		
	C2-22.5/23	450	Conglom. Met/volc rock with clay olive green-		
24'		0.4	brown(GP-GC)		
28'		0.0	Clay, brown, silty, stiff (CH-ML)		
		0.0			
32'		0.6			
		0.2	Clay, olive green, silty firm(CH-ML)		
36'		0.5	Conglom. Met/volc rock		
40'	C2-39.75/40	1.4	with clay(GP-GC)		
		1.0	Clay, brown, firm(CH)		
44'		1.5			
		1.2	Clay, brown, firm(CH)		
48'					
	C2-49.25/49.5	1.0			
			TOTAL DEPTH CORED 49.5 (formation refusal)		

Western Geo-Engineers

PAGE 1 OF 1

BORING: C-3
DATE DRILLED: Dec. 15, 2004

▮ SAMPLE INTERVAL
▼ WATER

BORE HOLE LOG

PROJECT: DP793	GEOLOGIST: GEORGE CONVERSE	SURFACE ELEVATION:
LOCATION: 4035 PARK BLVD. OAKLAND, CA	DRILLER: Rick Barragan	TOTAL DEPTH: 42 FT
DRILLING CONTRACTOR: WOODWARD Drilling	DEPTH TO WATER: 13 feet	CASING:

REMARKS: HAND AUGER FIRST 5 FEET. DIRECT PUSH CORE WITH 3" CORE BARREL TO 42 FOOT DEPTH. AIR MONITORING WITH PID, 10.6 EV. BULB.

DEPTH (FT)	SAMPLE No.	PPM TVO VAPOR	CORE DESCRPTION	GRAPHIC LOG	REMARKS
		0.0	Soil Rock fill, angular, franciscan, 3-6" length.		
4'					
	C3-7.75/8	0.0	Clay, brown, silty, no odor. (CH-ML)		
8'		5.5	Silt, brown with clay (ML-CH)		
		28			
12' ▼		2000	Clay, dk brown, wet soft, no odor. (CH)		Petroleum odor
	C3-15/15.5				
16'			Clay, olive green, firm wet,. (CH)		
		2000			
20'		320			
		2000	Clay, olive green, firm wet w/occ. Qtz pebble (CH)		
24'		2000	Conglom. Met/volc rock with clay olive green/brown(GP-GC)		
28'		2000			
	C3-31.75/32	35	Sand, fn-crs, met volc brown, wet (SM)		
32'			Gravel, sand, clay, wet, brown (GP_GC)		
	C3-35.75/36	17			
36'		17	Conglom. Met/volc rock with clay(GP-GC)		
40'					
	C3-41.75/42	17	Clay, brown, firm(CH)		
44'			TOTAL DEPTH CORED 42.0 ft		
48'					

Western Geo-Engineers

BORING: C-4
DATE DRILLED: Dec. 16, 2004

▮ SAMPLE INTERVAL
▼ WATER

BORE HOLE LOG

PROJECT: DP793	GEOLOGIST: GEORGE CONVERSE	SURFACE ELEVATION:
LOCATION: 4035 PARK BLVD. OAKLAND, CA	DRILLER: Rick Barragan	TOTAL DEPTH: 40 FT
DRILLING CONTRACTOR: WOODWARD Drilling	DEPTH TO WATER: 13 feet	CASING:

REMARKS: HAND AUGER FIRST 5 FEET. DIRECT PUSH CORE WITH 3" CORE BARREL TO 40 FOOT DEPTH. AIR MONITORING WITH PID, 10.6 EV. BULB.

DEPTH (FT)	SAMPLE No.	PPM TVO VAPOR	CORE DESCRPTION	GRAPHIC LOG	REMARKS
		0.0	Soil Rock fill, angular, franciscan, 3-6" length.		
4'					
		0.0	Clay, brown, silty, no odor. (CH-ML)		
8'	▮ C4-7.75/8				
		0.1			
		0.5			
12' ▼		4.5	Clay, dk brown, wet soft, no odor. (CH)		
			Clay, olive green, firm wet,. (CH)		
16'		4.5	Clay, brwn w/occ qtz gran, wet,. (CH)		
	▮ C4-19.5/20	2000			Petroleum odor
20'		2000	Conglom. Met/volc rock with clay md grey/brown(GP-GC)		
24'		~~500~~			
	▮ C4-25.75/26	15	Sand, fn-crs, met volc brown, wet (SM)		
28'		0.7			
			Gravel, sand, clay, wet, brown (GP_GC)		
32'		0.2	Conglom. Met/volc rock with clay(GP-GC)		
			~~Red Oxidation Zone at contact~~		
36'		0.2	Clay, brown, firm(CH)		
			Interbedded, sand, sandy/clayey gravel		
40'	▮ C4-39.75/40	2.4	Clay, brown, firm(CH)		
44'			TOTAL DEPTH CORED 40.0 ft		
48'					

Western Geo-Engineers

BORING: C-6
DATE DRILLED: Dec. 13, 2004

▮ SAMPLE INTERVAL
▼ WATER

BORE HOLE LOG

PROJECT: DP793	GEOLOGIST: GEORGE CONVERSE	SURFACE ELEVATION:
LOCATION: 4035 PARK BLVD. OAKLAND, CA	DRILLER: Rick Barragan	TOTAL DEPTH: 35 FT
DRILLING CONTRACTOR: WOODWARD Drilling	DEPTH TO WATER: 12 feet	CASING:

REMARKS: HAND AUGER FIRST 5 FEET. DIRECT PUSH CORE WITH 3" CORE BARREL TO 35 FOOT DEPTH. AIR MONITORING WITH PID, 10.6 EV. BULB.

DEPTH (FT)	SAMPLE No.	PPM TVO VAPOR	CORE DESCRPTION	GRAPHIC LOG	REMARKS
		0.0	Soil		
4'			Rock fill, angular, franciscan, 3-6" length.		
	C6-7.75/8	12			
8'		0.0	Clay, brown, silty, no odor. (CH-ML)		
		0.0			
12' ▼		0.0	Clay, dk brown, wet soft, no odor. (CH)		
	C6-15.5/16	40	Clay, blk, firm wet.. (CH)		
16'	C6-16.5/17	2000			
			Clay,olive green w/ rd oxid nod., (CH)		Petroleum odor
20'		2000			
		2000	Clay, gravel Met/volc rock with clay md olive/brown(GP-GC)		
24'		400			
		940	Clay, brown, firm(CH)		
28'					
		1000	Clay, grey, firm(CH)		
32'	C6-31.75/32	50			
		24	Clay, brown, firm(CH)		
	C6-34.75/35	0.0			
36'			TOTAL DEPTH CORED 35.0 ft		
40'					
44'					
48'					

Western Geo-Engineers

BORING: C-7
DATE DRILLED: Dec. 15, 2004

▮ SAMPLE INTERVAL
▼ WATER

BORE HOLE LOG

PROJECT: DP793	GEOLOGIST: GEORGE CONVERSE	SURFACE ELEVATION:
LOCATION: 4035 PARK BLVD. OAKLAND, CA	DRILLER: Rick Barragan	TOTAL DEPTH: 49 FT
DRILLING CONTRACTOR: WOODWARD Drilling	DEPTH TO WATER: 11 feet	CASING:

REMARKS: HAND AUGER FIRST 5 FEET. DIRECT PUSH CORE WITH 3" CORE BARREL TO 49 FOOT DEPTH. AIR MONITORING WITH PID, 10.6 EV. BULB.

DEPTH (FT)	SAMPLE No.	PPM TVO VAPOR	CORE DESCRIPTION	GRAPHIC LOG	REMARKS
		0.0	Soil		
4'			Rock fill, angular, franciscan, 3-6" length.		
8'	▮ C7-7.75/8	12	Clay, brown, silty, no odor. (CH-ML)		
		3.0	Rock fill, 3-6" length.		
▼		0.0	Clay, md brown, wet soft, no odor. (CH)		
12'		12			
		148	Clay, blk, firm wet,. (CH)		
16'		2000			
	▮ C7-18/18.5	2000	Clay,olive green, (CH)		Petroleum odor
20'		30			
			Clay, brown w/ olive tint, firm(CH)		
24'		2000			
		2000	Clay, gravel Met/volc rock with clay md olive/brown(GP-GC)		
		2000			
28'	▮ C7-29.75/30	2000	Clay, gravel Met/volc rock with clay		
		100	blue-grey(GP-GC)		
32'		300	Sand/gravel, brown, wet (SM-GP)		
		0.0	Interbedded sand/gravel & clay/gravel		
36'		40	lenses (SM-GP-CG)		
40'					
		33	Clay, brown, firm(CH)		
44'			Clay, gravel Met/volc rock with clay		
	▮ C7-45.75/46	29	brown(GP-GC)		
		0.0	Clay, brown, firm(CH)		
48'	▮ C7-48.75/49	0.0			
			TOTAL DEPTH CORED 49.0 ft (formation refusal)		

Western Geo-Engineers

PAGE 1 OF 1

BORING: C-8
DATE DRILLED:Dec. 14, 2004

SAMPLE INTERVAL
WATER

BORE HOLE LOG

PROJECT: DP793	GEOLOGIST: GEORGE CONVERSE	SURFACE ELEVATION:
LOCATION: 4035 PARK BLVD. OAKLAND, CA	DRILLER: Rick Barragan	TOTAL DEPTH: 38FT
DRILLING CONTRACTOR: WOODWARD Drilling	DEPTH TO WATER: 11 feet	CASING:

REMARKS: HAND AUGER FIRST 5 FEET. DIRECT PUSH CORE WITH 3" CORE BARREL TO 38 FOOT DEPTH. AIR MONITORING WITH PID, 10.6 EV. BULB.

DEPTH (FT)	SAMPLE No.	PPM TVO VAPOR	CORE DESCRIPTION	GRAPHIC LOG	REMARKS
			Soil		Note: PID not responding, high readir due to high air moisture
4'			Rock fill, angular, franciscan, 3-6" length.		
8'	C8-7.75/8		Clay, brown, silty, no odor. (CH-ML)		
	C8-11.75/12		Clay, md brown, wet soft, Tr odor. (CH)		Petroleum odor
12'			Clay, blk, firm wet,. (CH)		
16'			Clay,brwn, no odor, (CH)		
20'					
24'			Clay, gravel Met/volc rock with clay ~~md olive/brown(GP-GC)~~		
28'	C8-29.75/30		~~Clay, gravel Met/volc rock with clay~~ reddish brown(GP-GC)		
32'			Sand/gravel, brown, wet (SM-GP) Red oxidize inclusions		
36'	C8-37.75/38				
40'			TOTAL DEPTH CORED 38 ft		
44'					
48'					

Western Geo-Engineers

PAGE 1 OF 1

BORING: C-9
DATE DRILLED: Dec. 14, 2004

SAMPLE INTERVAL

WATER

BORE HOLE LOG

PROJECT: DP793	GEOLOGIST: GEORGE CONVERSE	SURFACE ELEVATION:
LOCATION: 4035 PARK BLVD. OAKLAND, CA	DRILLER: Rick Barragan	TOTAL DEPTH: 31 FT
DRILLING CONTRACTOR: WOODWARD Drilling	DEPTH TO WATER: 11 feet	CASING:

REMARKS: HAND AUGER FIRST 5 FEET. DIRECT PUSH CORE WITH 3" CORE BARREL TO 31 FOOT DEPTH. AIR MONITORING WITH PID, 10.6 EV. BULB

DEPTH (FT)	SAMPLE No.	PPM TVO VAPOR	CORE DESCRIPTION	GRAPHIC LOG	REMARKS
			Soil		Note: PID not responding, atmopshere moisture to high.
4'			Rock fill, angular, franciscan, 3-6" length.		
8'	C9-7.75/8				
			Clay, black, wet soft, . (CH)		Petroleum odor
12'	C9-11.75/12				
			Clay, green/brown, sticky wet,. (CH)		Slight Petroleum odor
16'			Clay, brown, stiff (CH)		No Petroleum odor
			Clay, yellow/ brown, stiff (CH)		
20'					
24'	C9-23.75/24		Clay, gravel Met/volc rock with clay md olive/brown(GP-GC)		
28'			~~Clay, brown, soft(CH)~~ Clay, gravel /brown(GP-GC)		
	C9-30.75/31				
32'			Clay, brown, stiff(CH)		
			TOTAL DEPTH CORED 31.0 ft		
36'					
40'					
44'					
48'					

Western Geo-Engineers

PAGE 1 OF 1

BORING: C-10
DATE DRILLED: Dec. 14, 2004

▮ SAMPLE INTERVAL
▼ WATER

BORE HOLE LOG

PROJECT: DP793	GEOLOGIST: GEORGE CONVERSE	SURFACE ELEVATION:
LOCATION: 4035 PARK BLVD. OAKLAND, CA	DRILLER: Rick Barragan	TOTAL DEPTH: 34 FT
DRILLING CONTRACTOR: WOODWARD Drilling	DEPTH TO WATER: 12.5 feet	CASING:

REMARKS: HAND AUGER FIRST 5 FEET. DIRECT PUSH CORE WITH 3" CORE BARREL TO 34 FOOT DEPTH. AIR MONITORING WITH PID, 10.6 EV. BULB.

DEPTH (FT)	SAMPLE No.	PPM TVO VAPOR	CORE DESCRIPTION	GRAPHIC LOG	REMARKS
		0.0	Soil		
4'		0.0	Rock fill, angular, franciscan, 3-6" length.		
8'	▮C10-7.75/8				
		0.0	Silt, clayey, brown. (ML-CL)		
			Clay, brown, silty, wet,. (CH)		
12' ▼		2000	Clay, dk brown, silty w/ occ gravel (CH)		Petroleum odor
16'	▮C10-16/16.25	2000	Clay, olive green, stiff wet(CH)		
		210	Clay, brown, w/occ gravel (CH)		
20'		136	Clay, olive green, stiff wet(CH)		
		265	Clay, brown, stiff (CH)		
24'		630	Clay, brown, w/occ gravel (CH)		
		2000	Clay, gravel Met/volc rock with clay		
28'		190	md olive/brown(GP-GC)		
	▮C10-29.75/30	28	Clay, olive green, stiff(CH)		
			Clay, red brown, stiff(CH)		
32'		50	Clay, brown, silty, stiff. (CH-ML)		
	▮C10-33.75/34	30			
36'			TOTAL DEPTH CORED 34.0 ft		
40'					
44'					
48'					

Western Geo-Engineers

BORING: C-11
DATE DRILLED: Dec. 13, 2004

▮ SAMPLE INTERVAL
▼ WATER

BORE HOLE LOG

PROJECT: DP793	GEOLOGIST: GEORGE CONVERSE	SURFACE ELEVATION:
LOCATION: 4035 PARK BLVD. OAKLAND, CA	DRILLER: Rick Barragan	TOTAL DEPTH: 32 FT
DRILLING CONTRACTOR: WOODWARD Drilling	DEPTH TO WATER: 15 feet	CASING:

REMARKS: HAND AUGER FIRST 5 FEET. DIRECT PUSH CORE WITH 3" CORE BARREL TO 32 FOOT DEPTH. AIR MONITORING WITH PID, 10.6 EV. BULB.

DEPTH (FT)	SAMPLE No.	PPM TVO VAPOR	CORE DESCRIPTION	GRAPHIC LOG	REMARKS
		0.0	Soil		
4'			Rock fill, angular, franciscan, 3-6" length.		
		21.5	Clay, brown, silty,. (CH)		
8'	▮C11-7.75/8	2			
			Silt, clayey, brown. (ML-CL)		
			Clay, brown, silty, wet,. (CH)		
12' ▼		30	Clay, dk brown, plastic (CH)		
		70			
16'			Gravel in clay matrix (GP-CH)		Petroleum odor
	▮C11-17.5/18	260			
	▮C11-19.75/20	50	Clay, brown, w/occ gravel (CH)		
20'		2000			
	▮C11-23.75/24	187			
24'		2000	Clay, olive green, stiff(CH)		
		500			
		2000	Clay, olive, silty, stiff. (CH-ML)		
28'	▮C11-28.75/29	28			
		6.1	Clay, brown, silty, stiff. (CH-ML)		
32'	▮C11-31.75/32	0.0			
			TOTAL DEPTH CORED 32.0 ft		
36'					
40'					
44'					
48'					

Western Geo-Engineers

PAGE 1 OF 1

BORING: C-12
DATE DRILLED: Dec. 10, 2004

▮ SAMPLE INTERVAL
▼ WATER

BORE HOLE LOG

PROJECT: DP793	GEOLOGIST: GEORGE CONVERSE	SURFACE ELEVATION:
LOCATION: 4035 PARK BLVD. OAKLAND, CA	DRILLER: Rick Barragan	TOTAL DEPTH: 30 FT
DRILLING CONTRACTOR: WOODWARD Drilling	DEPTH TO WATER: 12 feet	CASING:

REMARKS: HAND AUGER FIRST 5 FEET. DIRECT PUSH CORE WITH 3" CORE BARREL TO 30 FOOT DEPTH. AIR MONITORING WITH PID, 10.6 EV. BULB.

DEPTH (FT)	SAMPLE No.	PPM TVO VAPOR	CORE DESCRIPTION	GRAPHIC LOG	REMARKS
		0.0	Soil Clay, dk brown. (CH)		
4'			Crushed rock Silt, clayey, brown. (ML-CL)		
	C12-5.75/6	0.0	Crushed rock Clay, brown/orange. (CH)		
		10			
8'			Silt, clayey, brown. (ML-CL)		Plant roots
		13	Clay, dk brown. (CH)		
12' ▼					
		7	Clay, dk brown, plastic (CH)		Petroleum odor
16'	C12-15.75/16	80	Clay, olive, plastic (CH)		
					Core barrel jammed no recovery. 16-20 ft.
20'	C12-19.75/20	100			
		26	Clay, olive green, stiff(CH)		
24'		12			
		6			
		0.0	Clay, brown, silty, stiff. (CH-ML)		
28'					
	C12-29.75/30	0.0	Clay, red/ brown, silty, stiff. (CH-ML)		
32'					
			TOTAL DEPTH CORED 30.0 ft		
36'					
40'					
44'					
48'					

Western Geo-Engineers

BORING: C-13
DATE DRILLED: Dec. 10, 2004

▮ SAMPLE INTERVAL
▼ WATER

BORE HOLE LOG

PROJECT: DP793	GEOLOGIST: GEORGE CONVERSE	SURFACE ELEVATION:
LOCATION: 4035 PARK BLVD. OAKLAND, CA	DRILLER: Rick Barragan	TOTAL DEPTH: 30 FT
DRILLING CONTRACTOR: WOODWARD Drilling	DEPTH TO WATER: 8 feet	CASING:

REMARKS: HAND AUGER FIRST 5 FEET. DIRECT PUSH CORE WITH 3" CORE BARREL TO 30 FOOT DEPTH. AIR MONITORING WITH PID, 10.6 EV. BULB.

DEPTH (FT)	SAMPLE No.	PPM TVO VAPOR	CORE DESCRIPTION	GRAPHIC LOG	REMARKS
		0.0	Soil Crushed rock		
4'	C13-3.75/4		Clay, brown. (CH)		
		82	Sand, brown (SP)		
		30	Silt, clayey, brown. (ML-CL)		
8' ▼			Clay, brown. (CH)		
		13			
		51	Clay, dk brown, plastic (CH)		Petroleum odor
12'					
	C13-13.75/14	35	Clay, olive, plastic (CH)		
		20	Gravel, clayey, sbrd/elongated		
16'			metvolc 1/2"-1" length (GP-CL)		
		56	Clay, md grey/brown, stiff(CH)		
		100			
20'			Claystone, degraded, grey/blue grey		
	C13-21/21.25	1000	Clay, brown, silty, stiff. (CH-ML)		
		47	Gravel, clayey, sbrd/elongated		
24'		4.7	metvolc 1/2"-1" length (GP-CL)		
			Siltstone, brown		
		4.7			
28'			Clay, brown, silty, stiff. (CH-ML)		
	C13-29.75/30	2.0			
32'					
			TOTAL DEPTH CORED 30.0 ft		
36'					
40'					
44'					
48'					

R0429
2/5

APPENDIX C.

LABORATORY REPORTS, DECEMBER 2004

KIFF ANALYTICAL LLC

Report Number : 41439
Date : 12/20/2004

George Converse
Western Geo-Engineers
1386 East Beamer Street
Woodland, CA 95776

Subject : 16 Soil Samples
Project Name : DP 793 Soil/Water Probe
Project Number : DP793

Dear Mr. Converse,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Joel Kiff

KIFF ANALYTICAL LLC

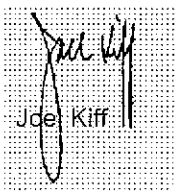
Report Number : 41439
Date : 12/20/2004

Subject : 16 Soil Samples
Project Name : DP 793 Soil/Water Probe
Project Number : DP793

Case Narrative

Matrix Spike/Matrix Spike Duplicate Results associated with sample C1-23.75/24 for the analyte Toluene were outside of control limits. This may indicate a bias for the sample that was spiked. Since the LCS recoveries were within control limits, no data are flagged.

Approved By:



2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41439
Date : 12/20/2004

Project Name : **DP 793 Soil/Water Probe**
Project Number : **DP793**

Sample : **C1-8/8.25** Matrix : Soil Lab Number : 41439-01
Sample Date :12/9/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/14/2004
Toluene - d8 (Surr)	106		% Recovery	EPA 8260B	12/14/2004
4-Bromofluorobenzene (Surr)	88.8		% Recovery	EPA 8260B	12/14/2004

Sample : **C1-12/12.25** Matrix : Soil Lab Number : 41439-02
Sample Date :12/9/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/14/2004
Toluene - d8 (Surr)	108		% Recovery	EPA 8260B	12/14/2004
4-Bromofluorobenzene (Surr)	89.3		% Recovery	EPA 8260B	12/14/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41439
Date : 12/20/2004

Project Name : **DP 793 Soil/Water Probe**
Project Number : **DP793**

Sample : **C1-20/20.25** Matrix : Soil Lab Number : 41439-03
Sample Date :12/9/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Ethylbenzene	**0.0083**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
TPH as Gasoline	**12**	1.0	mg/Kg	EPA 8260B	12/16/2004
Toluene - d8 (Surr)	105		% Recovery	EPA 8260B	12/14/2004
4-Bromofluorobenzene (Surr)	92.1		% Recovery	EPA 8260B	12/14/2004

Sample : **C1-23.75/24** Matrix : Soil Lab Number : 41439-04
Sample Date :12/9/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.050**	0.050	mg/Kg	EPA 8260B	12/16/2004
Toluene	**0.097**	0.050	mg/Kg	EPA 8260B	12/16/2004
Ethylbenzene	**5.1**	0.050	mg/Kg	EPA 8260B	12/16/2004
Total Xylenes	**15**	0.050	mg/Kg	EPA 8260B	12/16/2004
Methyl-t-butyl ether (MTBE)	**< 0.050**	0.050	mg/Kg	EPA 8260B	12/16/2004
TPH as Gasoline	**1500**	25	mg/Kg	EPA 8260B	12/17/2004
Toluene - d8 (Surr)	93.2		% Recovery	EPA 8260B	12/16/2004
4-Bromofluorobenzene (Surr)	102		% Recovery	EPA 8260B	12/16/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41439
Date : 12/20/2004

Project Name : **DP 793 Soil/Water Probe**
Project Number : **DP793**

Sample : **C1-39.75/40** Matrix : Soil Lab Number : 41439-05
Sample Date :12/9/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/13/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/13/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/13/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/13/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/13/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/13/2004
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	12/13/2004
4-Bromofluorobenzene (Surr)	99.2		% Recovery	EPA 8260B	12/13/2004

Sample : **C1-45.75/46** Matrix : Soil Lab Number : 41439-06
Sample Date :12/9/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/14/2004
Toluene - d8 (Surr)	103		% Recovery	EPA 8260B	12/14/2004
4-Bromofluorobenzene (Surr)	94.2		% Recovery	EPA 8260B	12/14/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41439
Date : 12/20/2004

Project Name : **DP 793 Soil/Water Probe**
Project Number : **DP793**

Sample : **C1-49.25/49.5** Matrix : Soil Lab Number : 41439-07
Sample Date :12/9/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/14/2004
Toluene - d8 (Surr)	104		% Recovery	EPA 8260B	12/14/2004
4-Bromofluorobenzene (Surr)	93.6		% Recovery	EPA 8260B	12/14/2004

Sample : **C12-5.75/6.0** Matrix : Soil Lab Number : 41439-08
Sample Date :12/10/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/14/2004
Toluene - d8 (Surr)	105		% Recovery	EPA 8260B	12/14/2004
4-Bromofluorobenzene (Surr)	90.1		% Recovery	EPA 8260B	12/14/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41439
Date : 12/20/2004

Project Name : **DP 793 Soil/Water Probe**
Project Number : **DP793**

Sample : **C12-15.75/16** Matrix : Soil Lab Number : 41439-09
Sample Date :12/10/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Ethylbenzene	**0.056**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
TPH as Gasoline	**6.0**	1.0	mg/Kg	EPA 8260B	12/14/2004
Toluene - d8 (Surr)	94.6		% Recovery	EPA 8260B	12/14/2004
4-Bromofluorobenzene (Surr)	91.3		% Recovery	EPA 8260B	12/14/2004

Sample : **C12-19.75/20** Matrix : Soil Lab Number : 41439-10
Sample Date :12/10/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
TPH as Gasoline	**3.2**	1.0	mg/Kg	EPA 8260B	12/14/2004
Toluene - d8 (Surr)	108		% Recovery	EPA 8260B	12/14/2004
4-Bromofluorobenzene (Surr)	94.0		% Recovery	EPA 8260B	12/14/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41439
Date : 12/20/2004

Project Name : **DP 793 Soil/Water Probe**
Project Number : **DP793**

Sample : **C12-29.75/30** Matrix : Soil Lab Number : 41439-11
Sample Date :12/10/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
TPH as Gasoline	**4.4**	1.0	mg/Kg	EPA 8260B	12/14/2004
Toluene - d8 (Surr)	107		% Recovery	EPA 8260B	12/14/2004
4-Bromofluorobenzene (Surr)	94.1		% Recovery	EPA 8260B	12/14/2004

Sample : **C13-3.75/4** Matrix : Soil Lab Number : 41439-12
Sample Date :12/9/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/14/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/14/2004
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	12/14/2004
4-Bromofluorobenzene (Surr)	93.4		% Recovery	EPA 8260B	12/14/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41439
Date : 12/20/2004

Project Name : **DP 793 Soil/Water Probe**
Project Number : **DP793**

Sample : **C13-13.75/14** Matrix : Soil Lab Number : 41439-13
Sample Date :12/9/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**0.097**	0.025	mg/Kg	EPA 8260B	12/19/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Ethylbenzene	**0.31**	0.025	mg/Kg	EPA 8260B	12/19/2004
Total Xylenes	**0.46**	0.025	mg/Kg	EPA 8260B	12/19/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
TPH as Gasoline	**23**	2.5	mg/Kg	EPA 8260B	12/19/2004
Toluene - d8 (Surr)	105		% Recovery	EPA 8260B	12/19/2004
4-Bromofluorobenzene (Surr)	92.8		% Recovery	EPA 8260B	12/19/2004

Sample : **C13-21/21.5** Matrix : Soil Lab Number : 41439-14
Sample Date :12/9/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**0.74**	0.025	mg/Kg	EPA 8260B	12/13/2004
Toluene	**1.1**	0.025	mg/Kg	EPA 8260B	12/13/2004
Ethylbenzene	**2.8**	0.025	mg/Kg	EPA 8260B	12/13/2004
Total Xylenes	**12**	0.025	mg/Kg	EPA 8260B	12/13/2004
Methyl-t-butyl ether (MTBE)	**< 0.025**	0.025	mg/Kg	EPA 8260B	12/13/2004
TPH as Gasoline	**180**	2.5	mg/Kg	EPA 8260B	12/13/2004
Toluene - d8 (Surr)	97.3		% Recovery	EPA 8260B	12/13/2004
4-Bromofluorobenzene (Surr)	102		% Recovery	EPA 8260B	12/13/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41439
Date : 12/20/2004

Project Name : **DP 793 Soil/Water Probe**
Project Number : **DP793**

Sample : **C13-23.75/24** Matrix : Soil Lab Number : 41439-15
Sample Date :12/10/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**0.19**	0.0050	mg/Kg	EPA 8260B	12/13/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/13/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/13/2004
Total Xylenes	**0.016**	0.0050	mg/Kg	EPA 8260B	12/13/2004
Methyl-t-butyl ether (MTBE)	**0.0094**	0.0050	mg/Kg	EPA 8260B	12/13/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/13/2004
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	12/13/2004
4-Bromofluorobenzene (Surr)	98.0		% Recovery	EPA 8260B	12/13/2004

Sample : **C13-29.75/30** Matrix : Soil Lab Number : 41439-16
Sample Date :12/10/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/13/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/13/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/13/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/13/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/13/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/13/2004
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	12/13/2004
4-Bromofluorobenzene (Surr)	98.4		% Recovery	EPA 8260B	12/13/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

Report Number : 41439

Date : 12/20/2004

QC Report : Method Blank Data

Project Name : **DP 793 Soil/Water Probe**

Project Number : **DP793**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/13/2004
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/13/2004
Ethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/13/2004
Total Xylenes	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/13/2004
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/13/2004
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	12/13/2004
Toluene - d8 (Surr)	102		%	EPA 8260B	12/13/2004
4-Bromofluorobenzene (Surr)	98.6		%	EPA 8260B	12/13/2004
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/15/2004
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/15/2004
Ethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/15/2004
Total Xylenes	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/15/2004
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/15/2004
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	12/15/2004
Toluene - d8 (Surr)	100		%	EPA 8260B	12/15/2004
4-Bromofluorobenzene (Surr)	102		%	EPA 8260B	12/15/2004
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/16/2004
Ethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/16/2004
Total Xylenes	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/16/2004
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	12/16/2004
Toluene - d8 (Surr)	96.0		%	EPA 8260B	12/16/2004
4-Bromofluorobenzene (Surr)	90.0		%	EPA 8260B	12/16/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/17/2004
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/17/2004

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

Report Number : 41439

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 12/20/2004

Project Name : **DP 793 Soil/Water Probe**

Project Number : **DP793**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Benzene	41439-05	<0.0050	0.0395	0.0392	0.0374	0.0368	mg/Kg	EPA 8260B	12/13/04	94.6	94.0	0.653	70-130	25
Toluene	41439-05	<0.0050	0.0395	0.0392	0.0380	0.0376	mg/Kg	EPA 8260B	12/13/04	96.2	95.9	0.318	70-130	25
Tert-Butanol	41439-05	<0.0050	0.198	0.196	0.182	0.177	mg/Kg	EPA 8260B	12/13/04	92.2	90.5	1.96	70-130	25
Methyl-t-Butyl Ether	41439-05	<0.0050	0.0395	0.0392	0.0381	0.0384	mg/Kg	EPA 8260B	12/13/04	96.5	98.0	1.53	70-130	25
Benzene	41475-01	<0.0050	0.0366	0.0370	0.0256	0.0259	mg/Kg	EPA 8260B	12/15/04	70.2	70.0	0.284	70-130	25
Toluene	41475-01	<0.0050	0.0366	0.0370	0.0244	0.0243	mg/Kg	EPA 8260B	12/15/04	66.8	65.6	1.94	70-130	25
Tert-Butanol	41475-01	<0.0050	0.183	0.185	0.128	0.133	mg/Kg	EPA 8260B	12/15/04	70.2	71.6	1.96	70-130	25
Methyl-t-Butyl Ether	41475-01	<0.0050	0.0366	0.0370	0.0280	0.0289	mg/Kg	EPA 8260B	12/15/04	76.5	78.0	1.83	70-130	25
Benzene	41504-10	<0.0050	0.0379	0.0371	0.0344	0.0330	mg/Kg	EPA 8260B	12/16/04	90.9	88.8	2.26	70-130	25
Toluene	41504-10	<0.0050	0.0379	0.0371	0.0339	0.0329	mg/Kg	EPA 8260B	12/16/04	89.5	88.6	1.02	70-130	25
Tert-Butanol	41504-10	<0.0050	0.189	0.186	0.168	0.164	mg/Kg	EPA 8260B	12/16/04	88.9	88.4	0.537	70-130	25
Methyl-t-Butyl Ether	41504-10	<0.0050	0.0379	0.0371	0.0370	0.0357	mg/Kg	EPA 8260B	12/16/04	97.6	96.1	1.52	70-130	25
Benzene	41542-09	<0.0050	0.0380	0.0382	0.0339	0.0339	mg/Kg	EPA 8260B	12/17/04	89.4	88.6	0.827	70-130	25
Toluene	41542-09	<0.0050	0.0380	0.0382	0.0350	0.0353	mg/Kg	EPA 8260B	12/17/04	92.1	92.3	0.226	70-130	25
Tert-Butanol	41542-09	0.0094	0.190	0.191	0.184	0.188	mg/Kg	EPA 8260B	12/17/04	92.0	93.3	1.42	70-130	25
Methyl-t-Butyl Ether	41542-09	<0.0050	0.0380	0.0382	0.0403	0.0418	mg/Kg	EPA 8260B	12/17/04	106	109	2.94	70-130	25

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

Report Number : 41439

Date : 12/20/2004

QC Report : Laboratory Control Sample (LCS)

Project Name : **DP 793 Soil/Water Probe**

Project Number : **DP793**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	0.0392	mg/Kg	EPA 8260B	12/13/04	92.7	70-130
Toluene	0.0392	mg/Kg	EPA 8260B	12/13/04	94.3	70-130
Tert-Butanol	0.196	mg/Kg	EPA 8260B	12/13/04	86.6	70-130
Methyl-t-Butyl Ether	0.0392	mg/Kg	EPA 8260B	12/13/04	100	70-130
Benzene	0.0372	mg/Kg	EPA 8260B	12/15/04	93.1	70-130
Toluene	0.0372	mg/Kg	EPA 8260B	12/15/04	97.4	70-130
Tert-Butanol	0.186	mg/Kg	EPA 8260B	12/15/04	91.6	70-130
Methyl-t-Butyl Ether	0.0372	mg/Kg	EPA 8260B	12/15/04	100	70-130
Benzene	0.0382	mg/Kg	EPA 8260B	12/16/04	88.3	70-130
Toluene	0.0382	mg/Kg	EPA 8260B	12/16/04	87.9	70-130
Tert-Butanol	0.191	mg/Kg	EPA 8260B	12/16/04	94.5	70-130
Methyl-t-Butyl Ether	0.0382	mg/Kg	EPA 8260B	12/16/04	94.6	70-130
Benzene	0.0380	mg/Kg	EPA 8260B	12/17/04	82.3	70-130
Toluene	0.0380	mg/Kg	EPA 8260B	12/17/04	85.4	70-130
Tert-Butanol	0.190	mg/Kg	EPA 8260B	12/17/04	94.2	70-130
Methyl-t-Butyl Ether	0.0380	mg/Kg	EPA 8260B	12/17/04	94.6	70-130

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. 41439 Page 1 of 2

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): George Converse
Company/Address: Wege
1786 E Beamer St Woodland
Phone No.: 530 668 5300 FAX No.:
Project Number: DP 793 P.O. No:
Project Name: DP 793 Soil/water probe
Project Address: Oakland

California EDF Report? ☑ Yes ☐ No
Recommended but not mandatory to complete this section:
Sampling Company Log Code:
Global ID:
EDF Deliverable To (Email Address):
Sampler Signature:

Sample Designation	Sampling Date	Sampling Time	Container: 40 ml VOA	Container: SLEEVE	Preservative: HCl	Preservative: HNO_3	Preservative: ICE	Preservative: NONE	Matrix: WATER	Matrix: SOIL	BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas/BTEX (8260B)	7 Oxygenates/TPH Gas/BTEX (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421/239.2) TOTAL (X) W.E.T. (X)	TAT: 12 hr/24 hr/48 hr/72 hr/1 wk	For Lab Use Only
C1 - 8/8.25	12-9-04	1019		✓			✓			✓					✓									Lab	41439-01
C1 - 12/12.25		1027		✓			✓			✓					✓										-02
C1 - 20/20.25		1034		✓			✓			✓					✓										-03
C1 - 23.75/24		1037		✓			✓			✓					✓										-04
C1 - 39.75/40		1210		✓			✓			✓					✓										-05
C1 - 45.75/46		1250		✓			✓			✓					✓										-06
C1 - 49.25/49.5		1330		✓			✓			✓					✓										-07
C12 - 5.75/6.0	12-10-04	1000		✓			✓			✓					✓										-08
C12 - 15.75/16		10:15		✓			✓			✓					✓										-09
C12 - 19.75/20		13:30		✓			✓			✓					✓										-10

	Date	Time	
Relinquished by:	12/10/04	1725	Received by:
Relinquished by:	Date	Time	Received by:
Relinquished by:	12/10/04	1725	Received by Laboratory: DW for Kiff Analytical

Remarks:

Bill to: Wege

Distribution: White - Lab, Pink - Originator

Forms/coc 121001.fh9

KIFF ANALYTICAL LLC

2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. 41439 Page 2 of 2

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): Gene Coniere
Company/Address:
Phone No.: FAX No.:
Project Number: DP793
P.O. No:
Project Name: DP793 Soil/water probe
Project Address: Oakland

California EDF Report? ☑ Yes ☐ No
Recommended but not mandatory to complete this section:
Sampling Company Log Code:
Global ID:
EDF Deliverable To (Email Address):
Sampler Signature:

Sample Designation	Sampling Date	Sampling Time	Container: 40 ml VOA	Container: SLEEVE	Preservative: HCl	Preservative: HNO_3	Preservative: ICE	Preservative: NONE	Matrix: WATER	Matrix: SOIL	BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas/BTEX (8260B)	7 Oxygenates/TPH Gas/BTEX (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421/239.2) TOTAL (X) W.E.T. (X)	TAT: 12 hr/24 hr/48 hr/72 hr/1 wk	For Lab Use Only
C12 - 29.75/30	12-10-04	1410		✓			✓			✓					✓									14	411
C13 - 3.75/4	12-9-04	1515		✓			✓			✓					✓										-12
C13 - 13.75/14	"	1550		✓			✓			✓					✓										-13
C13 - 21/21.5	"	1620		✓			✓			✓					✓										-14
C13 - 23.75/24	12-10-04	925		✓			✓			✓					✓										-15
C13 - 29.75/30	"	944		✓			✓			✓					✓										-16

	Date	Time		
Relinquished by:	12-10-04	1725	Received by:	Remarks:
Relinquished by:			Received by:	
Relinquished by:	121004	1725	Received by Laboratory:	Bill to:

Distribution: White - Lab, Pink - Originator

Forms/coc 121001.fh9

KIFF ANALYTICAL LLC

Report Number : 41542
Date : 12/21/2004

George Converse
Western Geo-Engineers
1386 East Beamer Street
Woodland, CA 95776

Subject : 24 Soil Samples
Project Name : DP793-Corning
Project Number : DP793

Dear Mr. Converse,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Joel Kiff

KIFF ANALYTICAL LLC

Report Number : 41542
Date : 12/21/2004

Project Name : **DP793-Corning**
Project Number : **DP793**

Sample : **C3-7.75/8** Matrix : Soil Lab Number : 41542-01
Sample Date :12/15/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/17/2004
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	12/17/2004
4-Bromofluorobenzene (Surr)	104		% Recovery	EPA 8260B	12/17/2004

Sample : **C3-15/15.5** Matrix : Soil Lab Number : 41542-02
Sample Date :12/15/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**0.16**	0.050	mg/Kg	EPA 8260B	12/19/2004
Toluene	**0.14**	0.050	mg/Kg	EPA 8260B	12/19/2004
Ethylbenzene	**4.2**	0.050	mg/Kg	EPA 8260B	12/19/2004
Total Xylenes	**2.3**	0.050	mg/Kg	EPA 8260B	12/19/2004
Methyl-t-butyl ether (MTBE)	**< 0.050**	0.050	mg/Kg	EPA 8260B	12/19/2004
TPH as Gasoline	**270**	5.0	mg/Kg	EPA 8260B	12/19/2004
Toluene - d8 (Surr)	108		% Recovery	EPA 8260B	12/19/2004
4-Bromofluorobenzene (Surr)	92.5		% Recovery	EPA 8260B	12/19/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41542
Date : 12/21/2004

Project Name : **DP793-Corning**
Project Number : **DP793**

Sample : **C3-31.75/32** Matrix : Soil Lab Number : 41542-03
Sample Date :12/15/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/17/2004
Toluene - d8 (Surr)	107		% Recovery	EPA 8260B	12/17/2004
4-Bromofluorobenzene (Surr)	89.8		% Recovery	EPA 8260B	12/17/2004

Sample : **C3-35.75/36** Matrix : Soil Lab Number : 41542-04
Sample Date :12/15/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/17/2004
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	12/17/2004
4-Bromofluorobenzene (Surr)	102		% Recovery	EPA 8260B	12/17/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41542
Date : 12/21/2004

Project Name : **DP793-Corning**
Project Number : **DP793**

Sample : **C3-41.75/42** Matrix : Soil Lab Number : 41542-05
Sample Date :12/15/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/17/2004
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	12/17/2004
4-Bromofluorobenzene (Surr)	89.0		% Recovery	EPA 8260B	12/17/2004

Sample : **C6-7.75/8** Matrix : Soil Lab Number : 41542-06
Sample Date :12/13/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/17/2004
Toluene - d8 (Surr)	98.6		% Recovery	EPA 8260B	12/17/2004
4-Bromofluorobenzene (Surr)	86.4		% Recovery	EPA 8260B	12/17/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41542
Date : 12/21/2004

Project Name : **DP793-Corning**
Project Number : **DP793**

Sample : **C6-15.75/16** Matrix : Soil Lab Number : 41542-07
Sample Date :12/13/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**0.22**	0.025	mg/Kg	EPA 8260B	12/18/2004
Toluene	**< 0.025**	0.025	mg/Kg	EPA 8260B	12/18/2004
Ethylbenzene	**0.16**	0.025	mg/Kg	EPA 8260B	12/18/2004
Total Xylenes	**< 0.050**	0.050	mg/Kg	EPA 8260B	12/18/2004
Methyl-t-butyl ether (MTBE)	**< 0.025**	0.025	mg/Kg	EPA 8260B	12/18/2004
TPH as Gasoline	**120**	5.0	mg/Kg	EPA 8260B	12/18/2004
Toluene - d8 (Surr)	98.8		% Recovery	EPA 8260B	12/18/2004
4-Bromofluorobenzene (Surr)	87.6		% Recovery	EPA 8260B	12/18/2004

Sample : **C6-16.5/17** Matrix : Soil Lab Number : 41542-08
Sample Date :12/13/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**0.99**	0.25	mg/Kg	EPA 8260B	12/18/2004
Toluene	**< 0.25**	0.25	mg/Kg	EPA 8260B	12/18/2004
Ethylbenzene	**23**	0.25	mg/Kg	EPA 8260B	12/18/2004
Total Xylenes	**3.2**	0.25	mg/Kg	EPA 8260B	12/18/2004
Methyl-t-butyl ether (MTBE)	**< 0.25**	0.25	mg/Kg	EPA 8260B	12/18/2004
TPH as Gasoline	**1600**	50	mg/Kg	EPA 8260B	12/18/2004
Toluene - d8 (Surr)	103		% Recovery	EPA 8260B	12/18/2004
4-Bromofluorobenzene (Surr)	92.9		% Recovery	EPA 8260B	12/18/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41542
Date : 12/21/2004

Project Name : **DP793-Corning**
Project Number : **DP793**

Sample : **C6-31.75/32** Matrix : Soil Lab Number : 41542-09
Sample Date :12/13/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/17/2004
Toluene - d8 (Surr)	97.6		% Recovery	EPA 8260B	12/17/2004
4-Bromofluorobenzene (Surr)	91.2		% Recovery	EPA 8260B	12/17/2004

Sample : **C6-34.75/35** Matrix : Soil Lab Number : 41542-10
Sample Date :12/13/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**0.035**	0.0050	mg/Kg	EPA 8260B	12/18/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/18/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/18/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/18/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/18/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/18/2004
Toluene - d8 (Surr)	103		% Recovery	EPA 8260B	12/18/2004
4-Bromofluorobenzene (Surr)	102		% Recovery	EPA 8260B	12/18/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41542
Date : 12/21/2004

Project Name : **DP793-Corning**
Project Number : **DP793**

Sample : **C7-7.75/8.0** Matrix : Soil Lab Number : 41542-11
Sample Date :12/15/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/18/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/18/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/18/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/18/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/18/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/18/2004
Toluene - d8 (Surr)	103		% Recovery	EPA 8260B	12/18/2004
4-Bromofluorobenzene (Surr)	102		% Recovery	EPA 8260B	12/18/2004

Sample : **C7-18/18.25** Matrix : Soil Lab Number : 41542-12
Sample Date :12/15/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**0.055**	0.025	mg/Kg	EPA 8260B	12/19/2004
Toluene	**0.031**	0.025	mg/Kg	EPA 8260B	12/19/2004
Ethylbenzene	**0.64**	0.025	mg/Kg	EPA 8260B	12/19/2004
Total Xylenes	**0.050**	0.025	mg/Kg	EPA 8260B	12/19/2004
Methyl-t-butyl ether (MTBE)	**< 0.025**	0.025	mg/Kg	EPA 8260B	12/19/2004
TPH as Gasoline	**220**	2.5	mg/Kg	EPA 8260B	12/19/2004
Toluene - d8 (Surr)	107		% Recovery	EPA 8260B	12/19/2004
4-Bromofluorobenzene (Surr)	91.4		% Recovery	EPA 8260B	12/19/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41542
Date : 12/21/2004

Project Name : **DP793-Corning**
Project Number : **DP793**

Sample : **C7-29.75/30** Matrix : Soil Lab Number : 41542-13
Sample Date :12/15/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**0.14**	0.0050	mg/Kg	EPA 8260B	12/19/2004
Toluene	**0.028**	0.0050	mg/Kg	EPA 8260B	12/19/2004
Ethylbenzene	**0.013**	0.0050	mg/Kg	EPA 8260B	12/19/2004
Total Xylenes	**0.029**	0.0050	mg/Kg	EPA 8260B	12/19/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/19/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/19/2004
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	12/19/2004
4-Bromofluorobenzene (Surr)	101		% Recovery	EPA 8260B	12/19/2004

Sample : **C7-45.75/46** Matrix : Soil Lab Number : 41542-14
Sample Date :12/15/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/18/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/18/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/18/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/18/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/18/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/18/2004
Toluene - d8 (Surr)	103		% Recovery	EPA 8260B	12/18/2004
4-Bromofluorobenzene (Surr)	103		% Recovery	EPA 8260B	12/18/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41542
Date : 12/21/2004

Project Name : **DP793-Corning**
Project Number : **DP793**

Sample : **C7-48.75/49** Matrix : Soil Lab Number : 41542-15
Sample Date :12/15/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/18/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/18/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/18/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/18/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/18/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/18/2004
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	12/18/2004
4-Bromofluorobenzene (Surr)	103		% Recovery	EPA 8260B	12/18/2004

Sample : **C10-7.78/8** Matrix : Soil Lab Number : 41542-16
Sample Date :12/13/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/17/2004
Toluene - d8 (Surr)	103		% Recovery	EPA 8260B	12/17/2004
4-Bromofluorobenzene (Surr)	106		% Recovery	EPA 8260B	12/17/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41542
Date : 12/21/2004

Project Name : **DP793-Corning**
Project Number : **DP793**

Sample : **C10-16/16.25** Matrix : Soil Lab Number : 41542-17
Sample Date :12/13/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Ethylbenzene	**0.026**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Total Xylenes	**0.067**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
TPH as Gasoline	**1.1**	1.0	mg/Kg	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	107		% Recovery	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	92.1		% Recovery	EPA 8260B	12/21/2004

Sample : **C10-29.75/30** Matrix : Soil Lab Number : 41542-18
Sample Date :12/13/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**0.085**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	**0.0066**	0.0050	mg/Kg	EPA 8260B	12/21/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	103		% Recovery	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	91.0		% Recovery	EPA 8260B	12/21/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41542
Date : 12/21/2004

Project Name : **DP793-Corning**
Project Number : **DP793**

Sample : **C10-33.75/34** Matrix : Soil Lab Number : 41542-19
Sample Date :12/13/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/17/2004
Toluene - d8 (Surr)	103		% Recovery	EPA 8260B	12/17/2004
4-Bromofluorobenzene (Surr)	105		% Recovery	EPA 8260B	12/17/2004

Sample : **C11-7.75/8.0** Matrix : Soil Lab Number : 41542-20
Sample Date :12/13/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/17/2004
Toluene - d8 (Surr)	103		% Recovery	EPA 8260B	12/17/2004
4-Bromofluorobenzene (Surr)	106		% Recovery	EPA 8260B	12/17/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41542
Date : 12/21/2004

Project Name : **DP793-Corning**
Project Number : **DP793**

Sample : **C11-17.5/18.0** Matrix : Soil Lab Number : 41542-21
Sample Date :12/13/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**0.012**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Ethylbenzene	**0.013**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Total Xylenes	**0.028**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
TPH as Gasoline	**2.4**	1.0	mg/Kg	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	108		% Recovery	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	92.6		% Recovery	EPA 8260B	12/21/2004

Sample : **C11-23.75/24.0** Matrix : Soil Lab Number : 41542-22
Sample Date :12/13/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**3.9**	0.025	mg/Kg	EPA 8260B	12/18/2004
Toluene	**15**	0.025	mg/Kg	EPA 8260B	12/18/2004
Ethylbenzene	**4.4**	0.025	mg/Kg	EPA 8260B	12/18/2004
Total Xylenes	**23**	0.025	mg/Kg	EPA 8260B	12/18/2004
Methyl-t-butyl ether (MTBE)	**< 0.025**	0.025	mg/Kg	EPA 8260B	12/18/2004
TPH as Gasoline	**210**	2.5	mg/Kg	EPA 8260B	12/18/2004
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	12/18/2004
4-Bromofluorobenzene (Surr)	101		% Recovery	EPA 8260B	12/18/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41542
Date : 12/21/2004

Project Name : **DP793-Corning**
Project Number : **DP793**

Sample : **C11-28.75/29** Matrix : Soil Lab Number : 41542-23
Sample Date :12/13/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/17/2004
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	12/17/2004
4-Bromofluorobenzene (Surr)	103		% Recovery	EPA 8260B	12/17/2004

Sample : **C11-31.75/32** Matrix : Soil Lab Number : 41542-24
Sample Date :12/13/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**0.027**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/17/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/17/2004
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	12/17/2004
4-Bromofluorobenzene (Surr)	102		% Recovery	EPA 8260B	12/17/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

Report Number : 41542

Date : 12/21/2004

QC Report : Method Blank Data

Project Name : **DP793-Corning**

Project Number : **DP793**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/17/2004
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/17/2004
Ethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/17/2004
Total Xylenes	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/17/2004
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/17/2004
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	12/17/2004
Toluene - d8 (Surr)	103		%	EPA 8260B	12/17/2004
4-Bromofluorobenzene (Surr)	103		%	EPA 8260B	12/17/2004
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/17/2004
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/17/2004
Ethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/17/2004
Total Xylenes	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/17/2004
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/17/2004
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	12/17/2004
Toluene - d8 (Surr)	96.6		%	EPA 8260B	12/17/2004
4-Bromofluorobenzene (Surr)	87.0		%	EPA 8260B	12/17/2004
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/18/2004
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/18/2004
Ethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/18/2004
Total Xylenes	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/18/2004
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/18/2004
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	12/18/2004
Toluene - d8 (Surr)	99.5		%	EPA 8260B	12/18/2004
4-Bromofluorobenzene (Surr)	101		%	EPA 8260B	12/18/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
Ethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
Total Xylenes	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	12/20/2004
Toluene - d8 (Surr)	104		%	EPA 8260B	12/20/2004
4-Bromofluorobenzene (Surr)	106		%	EPA 8260B	12/20/2004

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

Report Number : 41542

Date : 12/21/2004

QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **DP793-Corning**

Project Number : **DP793**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Benzene	41527-02	<0.0050	0.0391	0.0382	0.0332	0.0325	mg/Kg	EPA 8260B	12/17/04	84.9	85.0	0.133	70-130	25
Toluene	41527-02	<0.0050	0.0391	0.0382	0.0345	0.0329	mg/Kg	EPA 8260B	12/17/04	88.1	86.0	2.33	70-130	25
Tert-Butanol	41527-02	<0.0050	0.196	0.191	0.165	0.160	mg/Kg	EPA 8260B	12/17/04	84.4	83.7	0.867	70-130	25
Methyl-t-Butyl Ether	41527-02	<0.0050	0.0391	0.0382	0.0340	0.0327	mg/Kg	EPA 8260B	12/17/04	86.8	85.4	1.54	70-130	25
Benzene	41542-09	<0.0050	0.0380	0.0382	0.0339	0.0339	mg/Kg	EPA 8260B	12/17/04	89.4	88.6	0.827	70-130	25
Toluene	41542-09	<0.0050	0.0380	0.0382	0.0350	0.0353	mg/Kg	EPA 8260B	12/17/04	92.1	92.3	0.226	70-130	25
Tert-Butanol	41542-09	0.0094	0.190	0.191	0.184	0.188	mg/Kg	EPA 8260B	12/17/04	92.0	93.3	1.42	70-130	25
Methyl-t-Butyl Ether	41542-09	<0.0050	0.0380	0.0382	0.0403	0.0418	mg/Kg	EPA 8260B	12/17/04	106	109	2.94	70-130	25
Benzene	41483-13	<0.0050	0.0382	0.0385	0.0322	0.0350	mg/Kg	EPA 8260B	12/18/04	84.3	90.8	7.34	70-130	25
Toluene	41483-13	<0.0050	0.0382	0.0385	0.0321	0.0348	mg/Kg	EPA 8260B	12/18/04	83.8	90.3	7.44	70-130	25
Tert-Butanol	41483-13	<0.0050	0.191	0.193	0.141	0.158	mg/Kg	EPA 8260B	12/18/04	73.7	82.1	10.9	70-130	25
Methyl-t-Butyl Ether	41483-13	<0.0050	0.0382	0.0385	0.0290	0.0320	mg/Kg	EPA 8260B	12/18/04	75.9	83.0	9.00	70-130	25
Benzene	41527-12	<0.0050	0.0386	0.0378	0.0369	0.0364	mg/Kg	EPA 8260B	12/20/04	95.7	96.3	0.657	70-130	25
Toluene	41527-12	<0.0050	0.0386	0.0378	0.0385	0.0376	mg/Kg	EPA 8260B	12/20/04	99.6	99.4	0.191	70-130	25
Tert-Butanol	41527-12	<0.0050	0.193	0.189	0.180	0.179	mg/Kg	EPA 8260B	12/20/04	93.3	94.5	1.26	70-130	25
Methyl-t-Butyl Ether	41527-12	<0.0050	0.0386	0.0378	0.0364	0.0366	mg/Kg	EPA 8260B	12/20/04	94.4	96.8	2.55	70-130	25

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

Report Number : 41542

QC Report : Laboratory Control Sample (LCS)

Date : 12/21/2004

Project Name : **DP793-Corning**

Project Number : **DP793**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	0.0369	mg/Kg	EPA 8260B	12/17/04	97.8	70-130
Toluene	0.0369	mg/Kg	EPA 8260B	12/17/04	104	70-130
Tert-Butanol	0.184	mg/Kg	EPA 8260B	12/17/04	98.8	70-130
Methyl-t-Butyl Ether	0.0369	mg/Kg	EPA 8260B	12/17/04	101	70-130
Benzene	0.0380	mg/Kg	EPA 8260B	12/17/04	82.3	70-130
Toluene	0.0380	mg/Kg	EPA 8260B	12/17/04	85.4	70-130
Tert-Butanol	0.190	mg/Kg	EPA 8260B	12/17/04	94.2	70-130
Methyl-t-Butyl Ether	0.0380	mg/Kg	EPA 8260B	12/17/04	94.6	70-130
Benzene	0.0397	mg/Kg	EPA 8260B	12/18/04	89.7	70-130
Toluene	0.0397	mg/Kg	EPA 8260B	12/18/04	88.7	70-130
Tert-Butanol	0.198	mg/Kg	EPA 8260B	12/18/04	80.6	70-130
Methyl-t-Butyl Ether	0.0397	mg/Kg	EPA 8260B	12/18/04	82.2	70-130
Benzene	0.0364	mg/Kg	EPA 8260B	12/20/04	93.2	70-130
Toluene	0.0364	mg/Kg	EPA 8260B	12/20/04	98.4	70-130
Tert-Butanol	0.182	mg/Kg	EPA 8260B	12/20/04	93.2	70-130
Methyl-t-Butyl Ether	0.0364	mg/Kg	EPA 8260B	12/20/04	89.0	70-130

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. 41542 Page 1 of 3

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): George Converse

Company/Address: Wege
1386 E Beamer St, Woodland

Phone No.: 530 668 5300 FAX No.:

Project Number: DP793 P.O. No.:

Project Name: DP793- Coring

Project Address: San Jose

California EDF Report? ☑ Yes ☐ No

Recommended but not mandatory to complete this section:
Sampling Company Log Code:
Global ID:
EDF Deliverable To (Email Address):

Sampler Signature: [signature]

Sample Designation	Sampling Date	Sampling Time	Container: 40 ml VOA	Container: SLEEVE	Preservative: HCl	Preservative: HNO_3	Preservative: ICE	Preservative: NONE	Matrix: WATER	Matrix: SOIL	BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas/BTEX (8260B)	7 Oxygenates/TPH Gas/BTEX (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421/239.2) TOTAL (X) W.E.T. (X)	TAT 12 hr/24 hr/48 hr/72 hr/1 wk	For Lab Use Only
C3 -7.75/8	12-15-04	1348		✓			✓			✓					✓									24	01
C3 -15/15.5		1400		✓			✓			✓					✓										02
C3 -31.75/32		1440		✓			✓			✓					✓										03
C3- 35.75/36		1450		✓			✓			✓					✓										04
C3- 41.75/42		1515		✓			✓			✓					✓										05
C6 - 7.75/8	12-13-04	1045		✓			✓			✓					✓										06
C6 - 15.75/16		1052		✓			✓			✓					✓										07
C6 - 16.5/17		1056		✓			✓			✓					✓										08
C6 - 31.75/32		1122		✓			✓			✓					✓										09
C6 - 34.75/35		1145		✓			✓			✓					✓										10

Relinquished by	Date	Time	Received by
[signature]	12-15-04	1905	
	121504	1905	Received by Laboratory: Kiff Analytical [signature]

Remarks:

Bill to: Wege

Distribution: White - Lab, Pink - Originator

Forms/coc 121001.fh9

KIFF ANALYTICAL LLC

2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. 41542 Page 2 of 3

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): George Converse

Company/Address:

Phone No.: FAX No.:

Project Number: DP 743 P.O. No:

Project Name: DP 743 Corning

Project Address:

California EDF Report? ☑ Yes ☐ No

Recommended but not mandatory to complete this section:

Sampling Company Log Code:

Global ID:

EDF Deliverable To (Email Address):

Sampler Signature: [illegible] Converse

Analysis Request

Sample Designation	Sampling Date	Sampling Time	Container: 40 ml VOA	Container: SLEEVE	Preservative: HCl	Preservative: HNO_3	Preservative: ICE	Preservative: NONE	Matrix: WATER	Matrix: SOIL	BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas/BTEX (8260B)	7 Oxygenates/TPH Gas/BTEX (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421/239.2) TOTAL (X) W.E.T. (X)	TAT 12 hr/24 hr/48 hr/72 hr/1 wk	For Lab Use Only
C7-7.75/8.0	12-15-04	1003		✓			✓			✓					✓									12	11
C7-18/18.25	(	1015		✓			✓			✓					✓									(	12
C7-29.75/30	(	1040		✓			✓			✓					✓									(	13
C7-45.75/46	(	1203		✓			✓			✓					✓									(	14
C7-48.75/49	(	1228		✓			✓			✓					✓									(	15
C10-7.78/8	12-13-04	1405		✓			✓			✓					✓									(	16
C10-16/16.25	(	1425		✓			✓			✓					✓									(	17
C10-29.75/30	(	1500		✓			✓			✓					✓									(	18
C10-33.75/34	(	1512		✓			✓			✓					✓									12	19

Relinquished by:	Date	Time	Received by:
George Converse	12-15-04	1908	
	12-15-05	1905	Received by Laboratory: Kiff Analytical [illegible]

Remarks:

Bill to: Ucge

Distribution: White - Lab, Pink - Originator

Forms/coc 121001.fh9

KIFF ANALYTICAL LLC

2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. 41542 Page 3 of 3

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): George Conrene
Company/Address: WEGE 1386 E Beamer
Phone No.: FAX No.:
Project Number: DP793
P.O. No:
Project Name: DP793 - Conroy
Project Address:

California EDF Report? ☑ Yes ☐ No

Recommended but not mandatory to complete this section:
Sampling Company Log Code:
Global ID:
EDF Deliverable To (Email Address):
Sampler Signature: George Conrene

Sample Designation	Sampling Date	Sampling Time	Container: 40 ml VOA	Container: SLEEVE	Preservative: HCl	Preservative: HNO_3	Preservative: ICE	Preservative: NONE	Matrix: WATER	Matrix: SOIL	Analysis Request: BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas/BTEX (8260B)	7 Oxygenates/TPH Gas/BTEX (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421/239.2) TOTAL (X) W.E.T. (X)	TAT: 12 hr/24 hr/48 hr/72 hr/1 wk	For Lab Use Only
C11 - 7.75/8.0	12-13-04	0835		✓			✓			✓					✓										20
C11 - 12.5/13.0		0850		✓			✓			✓					✓										21
C11 - 23.75/24.0		0910		✓			✓			✓					✓										22
C11 - 28.75/29		0925		✓			✓			✓					✓										23
C11 - 31.75/32		0935		✓			✓			✓					✓										24

Relinquished by:	Date	Time	Received by:
George Conrene	12-15-04	1905	
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Laboratory:
	121504	1905	Kiff Analytical

Remarks:

Bill to: WEGE

Distribution: White - Lab, Pink - Originator

Forms/coc 121001.fh9

KIFF ANALYTICAL LLC

Report Number : 41587
Date : 12/27/2004

George Converse
Western Geo-Engineers
1386 East Beamer Street
Woodland, CA 95776

Subject : 9 Soil Samples
Project Name : DP793 - Cores
Project Number : DP793

Dear Mr. Converse,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Joel Kiff

KIFF ANALYTICAL LLC

Report Number : 41587
Date : 12/27/2004

Project Name : **DP793 - Cores**
Project Number : **DP793**

Sample : **C2 - 8.5/8.75** Matrix : Soil Lab Number : 41587-01
Sample Date :12/16/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Diisopropyl ether (DIPE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Ethyl-t-butyl ether (ETBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Tert-amyl methyl ether (TAME)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Tert-Butanol	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	12/20/2004
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	12/20/2004
4-Bromofluorobenzene (Surr)	99.9		% Recovery	EPA 8260B	12/20/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41587
Date : 12/27/2004

Project Name : **DP793 - Cores**
Project Number : **DP793**

Sample : **C2 - 19/19.25** Matrix : Soil Lab Number : 41587-02
Sample Date :12/16/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Diisopropyl ether (DIPE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Ethyl-t-butyl ether (ETBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Tert-amyl methyl ether (TAME)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Tert-Butanol	**0.012**	0.0050	mg/Kg	EPA 8260B	12/20/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/20/2004
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	12/20/2004
4-Bromofluorobenzene (Surr)	102		% Recovery	EPA 8260B	12/20/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41587
Date : 12/27/2004

Project Name : **DP793 - Cores**
Project Number : **DP793**

Sample : **C2 - 22.5/23.0** Matrix : Soil Lab Number : 41587-03
Sample Date :12/16/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Diisopropyl ether (DIPE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Ethyl-t-butyl ether (ETBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Tert-amyl methyl ether (TAME)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Tert-Butanol	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
TPH as Gasoline	**2.5**	1.0	mg/Kg	EPA 8260B	12/20/2004
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	12/20/2004
4-Bromofluorobenzene (Surr)	102		% Recovery	EPA 8260B	12/20/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41587
Date : 12/27/2004

Project Name : **DP793 - Cores**
Project Number : **DP793**

Sample : **C2 - 39.75/40** Matrix : Soil Lab Number : 41587-04
Sample Date :12/16/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Diisopropyl ether (DIPE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Ethyl-t-butyl ether (ETBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Tert-amyl methyl ether (TAME)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Tert-Butanol	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/20/2004
Toluene - d8 (Surr)	104		% Recovery	EPA 8260B	12/20/2004
4-Bromofluorobenzene (Surr)	100		% Recovery	EPA 8260B	12/20/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41587
Date : 12/27/2004

Project Name : **DP793 - Cores**
Project Number : **DP793**

Sample : **C2 - 49.25/49.5** Matrix : Soil Lab Number : 41587-05
Sample Date :12/16/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Diisopropyl ether (DIPE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Ethyl-t-butyl ether (ETBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Tert-amyl methyl ether (TAME)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Tert-Butanol	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/20/2004
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	12/20/2004
4-Bromofluorobenzene (Surr)	102		% Recovery	EPA 8260B	12/20/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41587
Date : 12/27/2004

Project Name : **DP793 - Cores**
Project Number : **DP793**

Sample : **C4 - 7.75/8** Matrix : Soil Lab Number : 41587-06
Sample Date :12/16/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Diisopropyl ether (DIPE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Ethyl-t-butyl ether (ETBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Tert-amyl methyl ether (TAME)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
Tert-Butanol	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/20/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/20/2004
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	12/20/2004
4-Bromofluorobenzene (Surr)	99.8		% Recovery	EPA 8260B	12/20/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41587
Date : 12/27/2004

Project Name : **DP793 - Cores**
Project Number : **DP793**

Sample : **C4 - 19.5/20.0** Matrix : Soil Lab Number : 41587-07
Sample Date :12/16/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**0.044**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Toluene	**0.83**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Ethylbenzene	**1.1**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Total Xylenes	**2.1**	0.025	mg/Kg	EPA 8260B	12/20/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Diisopropyl ether (DIPE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Ethyl-t-butyl ether (ETBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Tert-amyl methyl ether (TAME)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Tert-Butanol	**0.092**	0.015	mg/Kg	EPA 8260B	12/21/2004
TPH as Gasoline	**58**	2.5	mg/Kg	EPA 8260B	12/20/2004
Toluene - d8 (Surr)	98.0		% Recovery	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	102		% Recovery	EPA 8260B	12/21/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41587
Date : 12/27/2004

Project Name : **DP793 - Cores**
Project Number : **DP793**

Sample : **C4 - 25.75/26** Matrix : Soil Lab Number : 41587-08
Sample Date :12/16/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Total Xylenes	**0.0056**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Diisopropyl ether (DIPE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Ethyl-t-butyl ether (ETBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Tert-amyl methyl ether (TAME)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Tert-Butanol	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	103		% Recovery	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	105		% Recovery	EPA 8260B	12/21/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41587
Date : 12/27/2004

Project Name : **DP793 - Cores**
Project Number : **DP793**

Sample : **C4 - 39.75/40** Matrix : Soil Lab Number : 41587-09
Sample Date :12/16/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Diisopropyl ether (DIPE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Ethyl-t-butyl ether (ETBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Tert-amyl methyl ether (TAME)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Tert-Butanol	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	103		% Recovery	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	104		% Recovery	EPA 8260B	12/21/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

Report Number : 41587

Date : 12/27/2004

QC Report : Method Blank Data

Project Name : **DP793 - Cores**

Project Number : **DP793**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
Ethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
Total Xylenes	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
Diisopropyl ether (DIPE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
Ethyl-t-butyl ether (ETBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
Tert-amyl methyl ether (TAME)	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
Tert-Butanol	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	12/20/2004
Toluene - d8 (Surr)	101		%	EPA 8260B	12/20/2004
4-Bromofluorobenzene (Surr)	99.6		%	EPA 8260B	12/20/2004
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
Ethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
Total Xylenes	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
Diisopropyl ether (DIPE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
Ethyl-t-butyl ether (ETBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
Tert-amyl methyl ether (TAME)	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
Tert-Butanol	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	12/20/2004
Toluene - d8 (Surr)	104		%	EPA 8260B	12/20/2004
4-Bromofluorobenzene (Surr)	106		%	EPA 8260B	12/20/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

Report Number : 41587

Date : 12/27/2004

QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **DP793 - Cores**

Project Number : **DP793**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Benzene	41567-09	<0.0050	0.0405	0.0399	0.0374	0.0368	mg/Kg	EPA 8260B	12/20/04	92.3	92.2	0.114	70-130	25
Toluene	41567-09	<0.0050	0.0405	0.0399	0.0388	0.0380	mg/Kg	EPA 8260B	12/20/04	96.0	95.3	0.698	70-130	25
Tert-Butanol	41567-09	<0.0050	0.202	0.200	0.194	0.195	mg/Kg	EPA 8260B	12/20/04	96.0	97.8	1.91	70-130	25
Methyl-t-Butyl Ether	41567-09	<0.0050	0.0405	0.0399	0.0389	0.0375	mg/Kg	EPA 8260B	12/20/04	96.1	94.0	2.16	70-130	25
Benzene	41527-12	<0.0050	0.0386	0.0378	0.0369	0.0364	mg/Kg	EPA 8260B	12/20/04	95.7	96.3	0.657	70-130	25
Toluene	41527-12	<0.0050	0.0386	0.0378	0.0385	0.0376	mg/Kg	EPA 8260B	12/20/04	99.6	99.4	0.191	70-130	25
Tert-Butanol	41527-12	<0.0050	0.193	0.189	0.180	0.179	mg/Kg	EPA 8260B	12/20/04	93.3	94.5	1.26	70-130	25
Methyl-t-Butyl Ether	41527-12	<0.0050	0.0386	0.0378	0.0364	0.0366	mg/Kg	EPA 8260B	12/20/04	94.4	96.8	2.55	70-130	25

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

Report Number : 41587

Date : 12/27/2004

QC Report : Laboratory Control Sample (LCS)

Project Name : **DP793 - Cores**

Project Number : **DP793**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	0.0397	mg/Kg	EPA 8260B	12/20/04	89.4	70-130
Toluene	0.0397	mg/Kg	EPA 8260B	12/20/04	92.7	70-130
Tert-Butanol	0.198	mg/Kg	EPA 8260B	12/20/04	91.0	70-130
Methyl-t-Butyl Ether	0.0397	mg/Kg	EPA 8260B	12/20/04	92.9	70-130
Benzene	0.0364	mg/Kg	EPA 8260B	12/20/04	93.2	70-130
Toluene	0.0364	mg/Kg	EPA 8260B	12/20/04	98.4	70-130
Tert-Butanol	0.182	mg/Kg	EPA 8260B	12/20/04	93.2	70-130
Methyl-t-Butyl Ether	0.0364	mg/Kg	EPA 8260B	12/20/04	89.0	70-130

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. 41587 Page 1 of 1

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): George Cancine

Company/Address: WEGE 1386 E Beamer St, Woodland,

Phone No.: 530 668 5300 FAX No.:

Project Number: DP793 P.O. No:

Project Name: DP 793 - Cores

Project Address: San Jose

California EDF Report? ☑ Yes ☐ No

Recommended but not mandatory to complete this section:

Sampling Company Log Code:

Global ID:

EDF Deliverable To (Email Address):

Sampler Signature: [signature]

Sample Designation	Date	Time	40 ml VOA	SLEEVE	HCl	HNO_3	ICE	NONE	WATER	SOIL	BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas/BTEX (8260B)	7 Oxygenates/TPH Gas/BTEX (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421/239.2) TOTAL (X) W.E.T. (X)	TAT 12 hr/24 hr/48 hr/72 hr/1 wk	For Lab Use Only
C2 - 8.5/8.75	12-16-04	1106		✓			✓			✓						✓								1w	-01
C2 - 19/19.25		1130		✓			✓			✓						✓									-02
C2 - 22.5/23.0		1131		✓			✓			✓						✓									-03
C2 - 39.75/40		1240		✓			✓			✓						✓									-04
C2 - 49.25/49.5		1350		✓			✓			✓						✓									-05
C4 - 7.75/8		1445		✓			✓			✓						✓									-06
C4 - 19.5/20.0		1500		✓			✓			✓						✓									-07
C4 - 25.75/26		1510		✓			✓			✓						✓									-08
C4 - 39.75/40		1607		✓			✓			✓						✓									-09

Relinquished by:	Date	Time	Received by:
[signature]	12-17-04	1322	
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Laboratory:
	121704	1322	[signature] / Kiff Analytical

Remarks:

Bill to: WEGE

Distribution: White - Lab, Pink - Originator

Forms/coc 121001.fh9

KIFF ANALYTICAL LLC

Report Number : 41541
Date : 12/22/2004

George Converse
Western Geo-Engineers
1386 East Beamer Street
Woodland, CA 95776

Subject : 6 Water Samples
Project Name : DP793-Corning
Project Number : DP793

Dear Mr. Converse,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Joel Kiff

KIFF ANALYTICAL LLC

Report Number : 41541
Date : 12/22/2004

Project Name : **DP793-Corning**
Project Number : **DP793**

Sample : **C6-W/15/19** Matrix : Water Lab Number : 41541-01
Sample Date :12/13/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**1100**	2.0	ug/L	EPA 8260B	12/22/2004
Toluene	**130**	2.0	ug/L	EPA 8260B	12/22/2004
Ethylbenzene	**1300**	2.0	ug/L	EPA 8260B	12/22/2004
Total Xylenes	**1400**	2.0	ug/L	EPA 8260B	12/22/2004
Methyl-t-butyl ether (MTBE)	**< 2.0**	2.0	ug/L	EPA 8260B	12/22/2004
TPH as Gasoline	**16000**	200	ug/L	EPA 8260B	12/22/2004
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	12/22/2004
4-Bromofluorobenzene (Surr)	102		% Recovery	EPA 8260B	12/22/2004

Sample : **C6-W35** Matrix : Water Lab Number : 41541-02
Sample Date :12/13/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**76**	0.50	ug/L	EPA 8260B	12/21/2004
Toluene	**120**	0.50	ug/L	EPA 8260B	12/21/2004
Ethylbenzene	**40**	0.50	ug/L	EPA 8260B	12/21/2004
Total Xylenes	**160**	0.50	ug/L	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	**27**	0.50	ug/L	EPA 8260B	12/21/2004
TPH as Gasoline	**1100**	50	ug/L	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	106		% Recovery	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	92.0		% Recovery	EPA 8260B	12/21/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41541
Date : 12/22/2004

Project Name : **DP793-Corning**
Project Number : **DP793**

Sample : **C8-11/16** Matrix : Water Lab Number : 41541-03
Sample Date :12/15/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**65**	5.0	ug/L	EPA 8260B	12/21/2004
Toluene	**170**	5.0	ug/L	EPA 8260B	12/21/2004
Ethylbenzene	**990**	5.0	ug/L	EPA 8260B	12/21/2004
Total Xylenes	**1200**	5.0	ug/L	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	**< 5.0**	5.0	ug/L	EPA 8260B	12/21/2004
TPH as Gasoline	**18000**	500	ug/L	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	108		% Recovery	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	92.3		% Recovery	EPA 8260B	12/21/2004

Sample : **C8-34/38** Matrix : Water Lab Number : 41541-04
Sample Date :12/15/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.50**	0.50	ug/L	EPA 8260B	12/21/2004
Toluene	**5.5**	0.50	ug/L	EPA 8260B	12/21/2004
Ethylbenzene	**0.62**	0.50	ug/L	EPA 8260B	12/21/2004
Total Xylenes	**1.2**	0.50	ug/L	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	**< 0.50**	0.50	ug/L	EPA 8260B	12/21/2004
TPH as Gasoline	**< 50**	50	ug/L	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	105		% Recovery	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	89.3		% Recovery	EPA 8260B	12/21/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41541
Date : 12/22/2004

Project Name : **DP793-Corning**
Project Number : **DP793**

Sample : **C9-27/31** Matrix : Water Lab Number : 41541-05
Sample Date :12/15/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**300**	1.0	ug/L	EPA 8260B	12/21/2004
Toluene	**14**	1.0	ug/L	EPA 8260B	12/21/2004
Ethylbenzene	**20**	1.0	ug/L	EPA 8260B	12/21/2004
Total Xylenes	**13**	1.0	ug/L	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	**43**	1.0	ug/L	EPA 8260B	12/21/2004
TPH as Gasoline	**1800**	100	ug/L	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	104		% Recovery	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	91.6		% Recovery	EPA 8260B	12/21/2004

Sample : **C11-W29/32** Matrix : Water Lab Number : 41541-06
Sample Date :12/13/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**550**	2.0	ug/L	EPA 8260B	12/21/2004
Toluene	**1100**	2.0	ug/L	EPA 8260B	12/21/2004
Ethylbenzene	**200**	2.0	ug/L	EPA 8260B	12/21/2004
Total Xylenes	**1000**	2.0	ug/L	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	**5.1**	2.0	ug/L	EPA 8260B	12/21/2004
TPH as Gasoline	**7400**	250	ug/L	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	105		% Recovery	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	92.2		% Recovery	EPA 8260B	12/21/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

Report Number : 41541

Date : 12/22/2004

QC Report : Method Blank Data

Project Name : **DP793-Corning**

Project Number : **DP793**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/21/2004
Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/21/2004
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/21/2004
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/21/2004
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	95.8		%	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	85.0		%	EPA 8260B	12/21/2004
Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/22/2004
Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/22/2004
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/22/2004
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/22/2004
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/22/2004
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/22/2004
Toluene - d8 (Surr)	103		%	EPA 8260B	12/22/2004
4-Bromofluorobenzene (Surr)	101		%	EPA 8260B	12/22/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

Report Number : 41541

Date : 12/22/2004

QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **DP793-Corning**

Project Number : **DP793**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Benzene	41524-10	<0.50	38.0	37.2	36.6	35.3	ug/L	EPA 8260B	12/21/04	96.4	94.7	1.80	70-130	25
Toluene	41524-10	<0.50	38.0	37.2	35.4	34.4	ug/L	EPA 8260B	12/21/04	93.1	92.5	0.649	70-130	25
Tert-Butanol	41524-10	<5.0	190	186	188	186	ug/L	EPA 8260B	12/21/04	99.0	99.6	0.690	70-130	25
Methyl-t-Butyl Ether	41524-10	<0.50	38.0	37.2	38.2	36.4	ug/L	EPA 8260B	12/21/04	100	97.8	2.82	70-130	25
Benzene	41584-02	1.1	39.8	39.9	37.9	38.3	ug/L	EPA 8260B	12/22/04	92.5	93.2	0.803	70-130	25
Toluene	41584-02	0.86	39.8	39.9	39.8	40.2	ug/L	EPA 8260B	12/22/04	98.0	98.5	0.454	70-130	25
Tert-Butanol	41584-02	5.4	199	200	196	194	ug/L	EPA 8260B	12/22/04	95.9	94.5	1.45	70-130	25
Methyl-t-Butyl Ether	41584-02	11	39.8	39.9	45.1	47.4	ug/L	EPA 8260B	12/22/04	85.4	91.0	6.31	70-130	25

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

Report Number : 41541

Date : 12/22/2004

QC Report : Laboratory Control Sample (LCS)

Project Name : **DP793-Corning**

Project Number : **DP793**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	40.0	ug/L	EPA 8260B	12/21/04	94.5	70-130
Toluene	40.0	ug/L	EPA 8260B	12/21/04	93.0	70-130
Tert-Butanol	200	ug/L	EPA 8260B	12/21/04	99.0	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	12/21/04	97.1	70-130
Benzene	40.0	ug/L	EPA 8260B	12/22/04	96.8	70-130
Toluene	40.0	ug/L	EPA 8260B	12/22/04	104	70-130
Tert-Butanol	200	ug/L	EPA 8260B	12/22/04	93.6	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	12/22/04	98.6	70-130

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. 41541 Page 1 of 1

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): George Conrene
Company/Address: WECE 1386 E Beamer St, Woodland
Phone No.: 530 668 5302 FAX No.:
Project Number: DP793 P.O. No:
Project Name: DP793 - Cating
Project Address: San Jose

California EDF Report? ☑ Yes ☐ No

Recommended but not mandatory to complete this section:
Sampling Company Log Code:
Global ID:
EDF Deliverable To (Email Address):
Sampler Signature: George Conrene

Sample Designation	Sampling Date	Sampling Time	Container: 40 ml VOA	Container: SLEEVE	Preservative: HCl	Preservative: HNO_3	Preservative: ICE	Preservative: NONE	Matrix: WATER	Matrix: SOIL	BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas/BTEX (8260B)	7 Oxygenates/TPH Gas/BTEX (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421/239.2) TOTAL (X) W.E.T. (X)	TAT: 12 hr/24 hr/48 hr/72 hr/1 wk	For Lab Use Only
C6 - W 15/19	12-13-04	1545	2		✓		✓		✓						✓										01
C6 - W 35	12-13-04	1540	3		✓		✓		✓						✓										02
C8 - W 16	12-13-04	815	3		✓		✓		✓						✓										03
C8 - W 34/38	12-15-04	820	3		✓		✓		✓						✓										04
C9 - W 27/31	12-13-04	8:00	3		✓		✓		✓						✓										05
C11 - W 29/32	12-13-04	1215	3		✓		✓		✓						✓										06

	Date	Time		
Relinquished by: George Conrene	12/15/04	1655	Received by:	Remarks:
Relinquished by:	Date	Time	Received by:	
Relinquished by:	Date 12/15/04	Time 1855	Received by Laboratory: Kiff Analytical	Bill to: Wildland Engr

Distribution: White - Lab, Pink - Originator

Forms/coc 121001.fh9

KIFF ANALYTICAL LLC

Report Number : 41588
Date : 12/27/2004

George Converse
Western Geo-Engineers
1386 East Beamer Street
Woodland, CA 95776

Subject : 8 Water Samples
Project Name : DP793-Ceres
Project Number : DP793

Dear Mr. Converse,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Joel Kiff

KIFF ANALYTICAL LLC

Report Number : 41588
Date : 12/27/2004

Project Name : **DP793-Ceres**
Project Number : **DP793**

Sample : **C2-W 38/49.5** Matrix : Water Lab Number : 41588-01
Sample Date :12/12/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.50**	0.50	ug/L	EPA 8260B	12/21/2004
Toluene	**1.4**	0.50	ug/L	EPA 8260B	12/21/2004
Ethylbenzene	**< 0.50**	0.50	ug/L	EPA 8260B	12/21/2004
Total Xylenes	**< 0.50**	0.50	ug/L	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	**< 0.50**	0.50	ug/L	EPA 8260B	12/21/2004
TPH as Gasoline	**< 50**	50	ug/L	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	97.0		% Recovery	EPA 8260B	12/21/2004

Sample : **C3-W 14/18** Matrix : Water Lab Number : 41588-02
Sample Date :12/16/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**630**	25	ug/L	EPA 8260B	12/21/2004
Toluene	**98**	25	ug/L	EPA 8260B	12/21/2004
Ethylbenzene	**4300**	25	ug/L	EPA 8260B	12/21/2004
Total Xylenes	**12000**	25	ug/L	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	**< 25**	25	ug/L	EPA 8260B	12/21/2004
TPH as Gasoline	**58000**	2500	ug/L	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	86.5		% Recovery	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	93.8		% Recovery	EPA 8260B	12/21/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41588
Date : 12/27/2004

Project Name : **DP793-Ceres**
Project Number : **DP793**

Sample : **C3-W 30/42** Matrix : Water Lab Number : 41588-03
Sample Date :12/16/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**1.5**	0.50	ug/L	EPA 8260B	12/21/2004
Toluene	**1.5**	0.50	ug/L	EPA 8260B	12/21/2004
Ethylbenzene	**1.5**	0.50	ug/L	EPA 8260B	12/21/2004
Total Xylenes	**4.3**	0.50	ug/L	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	**< 0.50**	0.50	ug/L	EPA 8260B	12/21/2004
TPH as Gasoline	**59**	50	ug/L	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	97.7		% Recovery	EPA 8260B	12/21/2004

Sample : **C4-W 12/16** Matrix : Water Lab Number : 41588-04
Sample Date :12/17/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**5.4**	1.5	ug/L	EPA 8260B	12/22/2004
Toluene	**14**	1.5	ug/L	EPA 8260B	12/22/2004
Ethylbenzene	**280**	1.5	ug/L	EPA 8260B	12/22/2004
Total Xylenes	**7.4**	1.5	ug/L	EPA 8260B	12/22/2004
Methyl-t-butyl ether (MTBE)	**< 1.5**	1.5	ug/L	EPA 8260B	12/22/2004
TPH as Gasoline	**11000**	200	ug/L	EPA 8260B	12/22/2004
Toluene - d8 (Surr)	90.2		% Recovery	EPA 8260B	12/22/2004
4-Bromofluorobenzene (Surr)	102		% Recovery	EPA 8260B	12/22/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41588
Date : 12/27/2004

Project Name : **DP793-Ceres**
Project Number : **DP793**

Sample : **C4-W 27/40** Matrix : Water Lab Number : 41588-05
Sample Date :12/17/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.50**	0.50	ug/L	EPA 8260B	12/21/2004
Toluene	**2.9**	0.50	ug/L	EPA 8260B	12/21/2004
Ethylbenzene	**0.54**	0.50	ug/L	EPA 8260B	12/21/2004
Total Xylenes	**1.4**	0.50	ug/L	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	**< 0.50**	0.50	ug/L	EPA 8260B	12/21/2004
TPH as Gasoline	**< 50**	50	ug/L	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	97.9		% Recovery	EPA 8260B	12/21/2004

Sample : **C7-W 14/18** Matrix : Water Lab Number : 41588-06
Sample Date :12/16/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**160**	1.0	ug/L	EPA 8260B	12/21/2004
Toluene	**7.8**	1.0	ug/L	EPA 8260B	12/21/2004
Ethylbenzene	**78**	1.0	ug/L	EPA 8260B	12/21/2004
Total Xylenes	**17**	1.0	ug/L	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	**< 1.0**	1.0	ug/L	EPA 8260B	12/21/2004
TPH as Gasoline	**3400**	100	ug/L	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	90.8		% Recovery	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	101		% Recovery	EPA 8260B	12/21/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41588
Date : 12/27/2004

Project Name : **DP793-Ceres**
Project Number : **DP793**

Sample : **C7-W 34.5/49** Matrix : Water Lab Number : 41588-07
Sample Date :12/16/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**5.4**	0.50	ug/L	EPA 8260B	12/21/2004
Toluene	**9.1**	0.50	ug/L	EPA 8260B	12/21/2004
Ethylbenzene	**4.9**	0.50	ug/L	EPA 8260B	12/21/2004
Total Xylenes	**17**	0.50	ug/L	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	**< 0.50**	0.50	ug/L	EPA 8260B	12/21/2004
TPH as Gasoline	**150**	50	ug/L	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	97.5		% Recovery	EPA 8260B	12/21/2004

Sample : **C11-W 14/18** Matrix : Water Lab Number : 41588-08
Sample Date :12/16/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**650**	2.5	ug/L	EPA 8260B	12/21/2004
Toluene	**230**	2.5	ug/L	EPA 8260B	12/21/2004
Ethylbenzene	**240**	2.5	ug/L	EPA 8260B	12/21/2004
Total Xylenes	**560**	2.5	ug/L	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	**5.7**	2.5	ug/L	EPA 8260B	12/21/2004
TPH as Gasoline	**5700**	250	ug/L	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	89.2		% Recovery	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	101		% Recovery	EPA 8260B	12/21/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

Report Number : 41588

Date : 12/27/2004

QC Report : Method Blank Data

Project Name : **DP793-Ceres**

Project Number : **DP793**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/22/2004
Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/22/2004
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/22/2004
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/22/2004
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/22/2004
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/22/2004
Toluene - d8 (Surr)	103		%	EPA 8260B	12/22/2004
4-Bromofluorobenzene (Surr)	101		%	EPA 8260B	12/22/2004
Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/21/2004
Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/21/2004
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/21/2004
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/21/2004
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	99.6		%	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	96.3		%	EPA 8260B	12/21/2004
Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/21/2004
Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/21/2004
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/21/2004
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/21/2004
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	86.6		%	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	90.0		%	EPA 8260B	12/21/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/21/2004
Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/21/2004
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/21/2004
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/21/2004
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	102		%	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	97.1		%	EPA 8260B	12/21/2004

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

Report Number : 41588

Date : 12/27/2004

QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **DP793-Ceres**

Project Number : **DP793**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Benzene	41584-02	1.1	39.8	39.9	37.9	38.3	ug/L	EPA 8260B	12/22/04	92.5	93.2	0.803	70-130	25
Toluene	41584-02	0.86	39.8	39.9	39.8	40.2	ug/L	EPA 8260B	12/22/04	98.0	98.5	0.454	70-130	25
Tert-Butanol	41584-02	5.4	199	200	196	194	ug/L	EPA 8260B	12/22/04	95.9	94.5	1.45	70-130	25
Methyl-t-Butyl Ether	41584-02	11	39.8	39.9	45.1	47.4	ug/L	EPA 8260B	12/22/04	85.4	91.0	6.31	70-130	25
Benzene	41598-01	<0.50	40.0	40.0	40.6	39.2	ug/L	EPA 8260B	12/21/04	102	97.9	3.61	70-130	25
Toluene	41598-01	<0.50	40.0	40.0	39.2	37.8	ug/L	EPA 8260B	12/21/04	98.1	94.4	3.83	70-130	25
Tert-Butanol	41598-01	<5.0	200	200	210	206	ug/L	EPA 8260B	12/21/04	105	103	2.21	70-130	25
Methyl-t-Butyl Ether	41598-01	<0.50	40.0	40.0	40.6	40.5	ug/L	EPA 8260B	12/21/04	102	101	0.326	70-130	25
Benzene	41598-06	5.9	40.0	40.0	52.3	50.9	ug/L	EPA 8260B	12/21/04	116	112	3.16	70-130	25
Toluene	41598-06	<0.50	40.0	40.0	39.3	38.6	ug/L	EPA 8260B	12/21/04	98.4	96.6	1.85	70-130	25
Tert-Butanol	41598-06	<5.0	200	200	199	195	ug/L	EPA 8260B	12/21/04	99.6	97.7	2.01	70-130	25
Methyl-t-Butyl Ether	41598-06	1.1	40.0	40.0	34.5	42.7	ug/L	EPA 8260B	12/21/04	83.6	104	21.8	70-130	25
Benzene	41588-01	<0.50	40.0	40.0	38.3	37.0	ug/L	EPA 8260B	12/21/04	95.8	92.6	3.38	70-130	25
Toluene	41588-01	1.4	40.0	40.0	41.9	40.7	ug/L	EPA 8260B	12/21/04	101	98.2	3.01	70-130	25
Tert-Butanol	41588-01	<5.0	200	200	203	204	ug/L	EPA 8260B	12/21/04	101	102	0.776	70-130	25
Methyl-t-Butyl Ether	41588-01	<0.50	40.0	40.0	33.2	33.1	ug/L	EPA 8260B	12/21/04	83.1	82.6	0.580	70-130	25

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

Report Number : 41588

QC Report : Laboratory Control Sample (LCS)

Date : 12/27/2004

Project Name : **DP793-Ceres**

Project Number : **DP793**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	40.0	ug/L	EPA 8260B	12/22/04	96.8	70-130
Toluene	40.0	ug/L	EPA 8260B	12/22/04	104	70-130
Tert-Butanol	200	ug/L	EPA 8260B	12/22/04	93.6	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	12/22/04	98.6	70-130
Benzene	40.0	ug/L	EPA 8260B	12/21/04	103	70-130
Toluene	40.0	ug/L	EPA 8260B	12/21/04	103	70-130
Tert-Butanol	200	ug/L	EPA 8260B	12/21/04	103	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	12/21/04	102	70-130
Benzene	40.0	ug/L	EPA 8260B	12/21/04	114	70-130
Toluene	40.0	ug/L	EPA 8260B	12/21/04	100	70-130
Tert-Butanol	200	ug/L	EPA 8260B	12/21/04	97.6	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	12/21/04	100	70-130
Benzene	40.0	ug/L	EPA 8260B	12/21/04	96.9	70-130
Toluene	40.0	ug/L	EPA 8260B	12/21/04	104	70-130
Tert-Butanol	200	ug/L	EPA 8260B	12/21/04	97.9	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	12/21/04	85.3	70-130

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. 41588 Page 1 of 1

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): George Conver

Company/Address: CEGE
1386 E Beamer St Woodland

Phone No.: 530 668 5300 FAX No.:

Project Number: DP 793 P.O. No:

Project Name: DP793-Cores

Project Address: San Jose

California EDF Report? ☑ Yes ☐ No

Recommended but not mandatory to complete this section:
Sampling Company Log Code:
Global ID:
EDF Deliverable To (Email Address):
Sampler Signature: G Conver

Sample Designation	Sampling Date	Sampling Time	Container: 40 ml VOA	Container: SLEEVE	Preservative: HCl	Preservative: HNO_3	Preservative: ICE	Preservative: NONE	Matrix: WATER	Matrix: SOIL	Analysis Request: BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas/BTEX (8260B)	7 Oxygenates/TPH Gas/BTEX (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421/239.2) TOTAL (X) W.E.T. (X)	TAT: 12 hr/24 hr/48 hr/72 hr/1 wk	For Lab Use Only
C2-W 38/49.5	12-12-04	0808	3		✓		✓		✓						✓									4d	-01
C3-W 14/18	12-16-04	0845	3		✓		✓		✓						✓										-02
C3-W 30/42	12-16-04	0847	3		✓		✓		✓						✓										-03
C4-W 12/16	12-17-04	0806	3		✓		✓		✓						✓										-04
C4-W 27/40	12-17-04	0803	3		✓		✓		✓						✓										-05
C7-W 14/18	12-16-04	0815	3		✓		✓		✓						✓										-06
C7-W 34.5/49	12-16-04	0820	3		✓		✓		✓						✓										-07
C11-W 14/18	12-16-04	0822	3		✓		✓		✓						✓										-08

	Date	Time		
Relinquished by: G Conver	12-17-04	1315	Received by:	Remarks:
Relinquished by:	Date	Time	Received by:	
Relinquished by:	Date	Time	Received by Laboratory: Drew Ty Kiff Analytical	Bill to: CEGE
	12/17/04	1315		

Distribution: White - Lab, Pink - Originator

Forms/coc 121001.fh9

KIFF ANALYTICAL LLC

Report Number : 41438
Date : 12/17/2004

George Converse
Western Geo-Engineers
1386 East Beamer Street
Woodland, CA 95776

Subject : 4 Water Samples
Project Name : DP 793 Soil/Water Probe
Project Number : DP793

Dear Mr. Converse,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Joel Kiff

KIFF ANALYTICAL LLC

Report Number : 41438

Date : 12/17/2004

Project Name : **DP 793 Soil/Water Probe**

Project Number : **DP793**

Sample : **C1-W42/49.5** Matrix : Water Lab Number : 41438-01

Sample Date :12/9/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.50**	0.50	ug/L	EPA 8260B	12/15/2004
Toluene	**< 0.50**	0.50	ug/L	EPA 8260B	12/15/2004
Ethylbenzene	**< 0.50**	0.50	ug/L	EPA 8260B	12/15/2004
Total Xylenes	**< 0.50**	0.50	ug/L	EPA 8260B	12/15/2004
Methyl-t-butyl ether (MTBE)	**< 0.50**	0.50	ug/L	EPA 8260B	12/15/2004
TPH as Gasoline	**< 50**	50	ug/L	EPA 8260B	12/15/2004
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	12/15/2004
4-Bromofluorobenzene (Surr)	101		% Recovery	EPA 8260B	12/15/2004

Sample : **C12-W12/16** Matrix : Water Lab Number : 41438-02

Sample Date :12/10/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.50**	0.50	ug/L	EPA 8260B	12/16/2004
Toluene	**< 0.50**	0.50	ug/L	EPA 8260B	12/16/2004
Ethylbenzene	**< 0.50**	0.50	ug/L	EPA 8260B	12/16/2004
Total Xylenes	**< 0.50**	0.50	ug/L	EPA 8260B	12/16/2004
Methyl-t-butyl ether (MTBE)	**< 0.50**	0.50	ug/L	EPA 8260B	12/16/2004
TPH as Gasoline	**550**	50	ug/L	EPA 8260B	12/16/2004
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	12/16/2004
4-Bromofluorobenzene (Surr)	101		% Recovery	EPA 8260B	12/16/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41438
Date : 12/17/2004

Project Name : **DP 793 Soil/Water Probe**
Project Number : **DP793**

Sample : **C12-W24/28** Matrix : Water Lab Number : 41438-03
Sample Date :12/10/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**48**	1.0	ug/L	EPA 8260B	12/16/2004
Toluene	**< 1.0**	1.0	ug/L	EPA 8260B	12/16/2004
Ethylbenzene	**160**	1.0	ug/L	EPA 8260B	12/16/2004
Total Xylenes	**330**	1.0	ug/L	EPA 8260B	12/16/2004
Methyl-t-butyl ether (MTBE)	**< 1.0**	1.0	ug/L	EPA 8260B	12/16/2004
TPH as Gasoline	**5100**	100	ug/L	EPA 8260B	12/16/2004
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	12/16/2004
4-Bromofluorobenzene (Surr)	101		% Recovery	EPA 8260B	12/16/2004

Sample : **C13-W24/30** Matrix : Water Lab Number : 41438-04
Sample Date :12/10/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**5.3**	0.50	ug/L	EPA 8260B	12/15/2004
Toluene	**1.6**	0.50	ug/L	EPA 8260B	12/15/2004
Ethylbenzene	**2.0**	0.50	ug/L	EPA 8260B	12/15/2004
Total Xylenes	**6.4**	0.50	ug/L	EPA 8260B	12/15/2004
Methyl-t-butyl ether (MTBE)	**5.7**	0.50	ug/L	EPA 8260B	12/15/2004
TPH as Gasoline	**99**	50	ug/L	EPA 8260B	12/15/2004
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	12/15/2004
4-Bromofluorobenzene (Surr)	99.6		% Recovery	EPA 8260B	12/15/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

Report Number : 41438

Date : 12/17/2004

QC Report : Method Blank Data

Project Name : **DP 793 Soil/Water Probe**

Project Number : **DP793**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/15/2004
Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/15/2004
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/15/2004
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/15/2004
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/15/2004
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/15/2004
Toluene - d8 (Surr)	100		%	EPA 8260B	12/15/2004
4-Bromofluorobenzene (Surr)	100		%	EPA 8260B	12/15/2004
Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/15/2004
Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/15/2004
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/15/2004
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/15/2004
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/15/2004
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/15/2004
Toluene - d8 (Surr)	100		%	EPA 8260B	12/15/2004
4-Bromofluorobenzene (Surr)	100		%	EPA 8260B	12/15/2004
Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/16/2004
Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/16/2004
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/16/2004
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/16/2004
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/16/2004
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/16/2004
Toluene - d8 (Surr)	101		%	EPA 8260B	12/16/2004
4-Bromofluorobenzene (Surr)	99.4		%	EPA 8260B	12/16/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

Report Number : 41438

QC Report : Matrix Spike/ Matrix Spike Duplicate

Date : 12/17/2004

Project Name : **DP 793 Soil/Water Probe**

Project Number : **DP793**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Benzene	41463-03	<0.50	40.0	40.0	38.7	38.1	ug/L	EPA 8260B	12/15/04	96.8	95.3	1.49	70-130	25
Toluene	41463-03	<0.50	40.0	40.0	40.8	39.8	ug/L	EPA 8260B	12/15/04	102	99.5	2.42	70-130	25
Tert-Butanol	41463-03	<5.0	200	200	204	204	ug/L	EPA 8260B	12/15/04	102	102	0.190	70-130	25
Methyl-t-Butyl Ether	41463-03	<0.50	40.0	40.0	38.5	38.6	ug/L	EPA 8260B	12/15/04	96.3	96.4	0.149	70-130	25
Benzene	41438-04	5.3	40.0	40.0	49.2	47.8	ug/L	EPA 8260B	12/15/04	110	106	3.28	70-130	25
Toluene	41438-04	1.6	40.0	40.0	43.9	42.3	ug/L	EPA 8260B	12/15/04	106	102	3.75	70-130	25
Tert-Butanol	41438-04	9.4	200	200	210	208	ug/L	EPA 8260B	12/15/04	100	99.6	0.655	70-130	25
Methyl-t-Butyl Ether	41438-04	5.7	40.0	40.0	42.0	41.6	ug/L	EPA 8260B	12/15/04	90.8	89.7	1.21	70-130	25
Benzene	41512-03	<0.50	40.0	40.0	39.5	38.1	ug/L	EPA 8260B	12/16/04	98.7	95.2	3.66	70-130	25
Toluene	41512-03	<0.50	40.0	40.0	40.9	39.3	ug/L	EPA 8260B	12/16/04	102	98.4	3.79	70-130	25
Tert-Butanol	41512-03	<5.0	200	200	202	198	ug/L	EPA 8260B	12/16/04	101	98.9	2.22	70-130	25
Methyl-t-Butyl Ether	41512-03	<0.50	40.0	40.0	36.4	35.1	ug/L	EPA 8260B	12/16/04	91.1	87.8	3.74	70-130	25

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

Report Number : 41438

QC Report : Laboratory Control Sample (LCS)

Date : 12/17/2004

Project Name : **DP 793 Soil/Water Probe**

Project Number : **DP793**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	40.0	ug/L	EPA 8260B	12/15/04	92.3	70-130
Toluene	40.0	ug/L	EPA 8260B	12/15/04	96.5	70-130
Tert-Butanol	200	ug/L	EPA 8260B	12/15/04	96.6	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	12/15/04	92.9	70-130
Benzene	40.0	ug/L	EPA 8260B	12/15/04	98.3	70-130
Toluene	40.0	ug/L	EPA 8260B	12/15/04	103	70-130
Tert-Butanol	200	ug/L	EPA 8260B	12/15/04	99.0	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	12/15/04	92.1	70-130
Benzene	40.0	ug/L	EPA 8260B	12/16/04	98.3	70-130
Toluene	40.0	ug/L	EPA 8260B	12/16/04	103	70-130
Tert-Butanol	200	ug/L	EPA 8260B	12/16/04	100	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	12/16/04	92.1	70-130

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. 41438 Page 1 of 1

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): George Converse

Company/Address: WEGE 1386 E Beamer St, Woodland

Phone No.: 530 668 5300 FAX No.:

Project Number: DP793 P.O. No:

Project Name: DP793 Soil/water Probe

Project Address: Oakland

California EDF Report? [X] Yes [ ] No

Recommended but not mandatory to complete this section:
Sampling Company Log Code:
Global ID:
EDF Deliverable To (Email Address):

Sampler Signature: [signature]

Sample Designation	Date	Time	40 ml VOA	SLEEVE				HCl	HNO$_3$	ICE	NONE		WATER	SOIL		BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas/BTEX (8260B)	7 Oxygenates/TPH Gas/BTEX (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421/239.2) TOTAL (X) W.E.T. (X)					TAT 12 hr/24 hr/48 hr/72 hr/1 wk	For Lab Use Only
C1-W 42/49.5	12-9-04	1640	3					✓		✓			✓							✓													1 wk	-01
C12-W 12/16	12-10-04	1400	(					(		(			(							(													(	-02
C12-W 24/28	12-10-04	1315	(					(		(			(							(													(	-03
C13-W 24/30	12-10-04	1030	(					(		(			(							(													(	-04

Relinquished by:	Date	Time	Received by:
G Converse	12-10-04	1715	
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Laboratory:
	121004	1715	[signature] / Kiff Analytical

Remarks:

Bill to: WEGE

Distribution: White - Lab, Pink - Originator

Forms/coc 121001.fh9

KIFF ANALYTICAL LLC

Report Number : 41593
Date : 12/30/2004

George Converse
Western Geo-Engineers
1386 East Beamer Street
Woodland, CA 95776

Subject : 9 Soil Samples and 3 Water Samples
Project Name : DP793
Project Number :

Dear Mr. Converse,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Joel Kiff

KIFF ANALYTICAL LLC

Report Number : 41593
Date : 12/30/2004

Project Name : **DP793**
Project Number :

Sample : **C8 - 7.75/8.0** Matrix : Soil Lab Number : 41593-01
Sample Date :12/14/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	102		% Recovery	EPA 8260B	12/21/2004

Sample : **C8 - 11.75/12.0** Matrix : Soil Lab Number : 41593-02
Sample Date :12/14/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.10**	0.10	mg/Kg	EPA 8260B	12/22/2004
Toluene	**< 0.10**	0.10	mg/Kg	EPA 8260B	12/22/2004
Ethylbenzene	**0.13**	0.10	mg/Kg	EPA 8260B	12/22/2004
Total Xylenes	**< 0.10**	0.10	mg/Kg	EPA 8260B	12/22/2004
Methyl-t-butyl ether (MTBE)	**< 0.10**	0.10	mg/Kg	EPA 8260B	12/22/2004
TPH as Gasoline	**470**	10	mg/Kg	EPA 8260B	12/22/2004
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	12/22/2004
4-Bromofluorobenzene (Surr)	95.5		% Recovery	EPA 8260B	12/22/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41593
Date : 12/30/2004

Project Name : **DP793**
Project Number :

Sample : **C8 - 15.75/16.0** Matrix : Soil Lab Number : 41593-03
Sample Date :12/14/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**0.080**	0.0050	mg/Kg	EPA 8260B	12/22/2004
Toluene	**0.043**	0.0050	mg/Kg	EPA 8260B	12/22/2004
Ethylbenzene	**0.25**	0.0050	mg/Kg	EPA 8260B	12/22/2004
Total Xylenes	**0.30**	0.0050	mg/Kg	EPA 8260B	12/22/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/22/2004
TPH as Gasoline	**7.2**	1.0	mg/Kg	EPA 8260B	12/22/2004
Toluene - d8 (Surr)	94.5		% Recovery	EPA 8260B	12/22/2004
4-Bromofluorobenzene (Surr)	97.0		% Recovery	EPA 8260B	12/22/2004

Sample : **C8 - 29.75/30.0** Matrix : Soil Lab Number : 41593-04
Sample Date :12/14/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/22/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/22/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/22/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/22/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/22/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/22/2004
Toluene - d8 (Surr)	103		% Recovery	EPA 8260B	12/22/2004
4-Bromofluorobenzene (Surr)	95.7		% Recovery	EPA 8260B	12/22/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41593
Date : 12/30/2004

Project Name : **DP793**
Project Number :

Sample : **C8 - 37.75/38.0** Matrix : Soil Lab Number : 41593-05
Sample Date :12/14/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/22/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/22/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/22/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/22/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/22/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/22/2004
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	12/22/2004
4-Bromofluorobenzene (Surr)	97.3		% Recovery	EPA 8260B	12/22/2004

Sample : **C9 - 7.75/8.0** Matrix : Soil Lab Number : 41593-06
Sample Date :12/14/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.25**	0.25	mg/Kg	EPA 8260B	12/30/2004
Toluene	**< 0.25**	0.25	mg/Kg	EPA 8260B	12/30/2004
Ethylbenzene	**4.2**	0.25	mg/Kg	EPA 8260B	12/30/2004
Total Xylenes	**5.4**	0.25	mg/Kg	EPA 8260B	12/30/2004
Methyl-t-butyl ether (MTBE)	**< 0.25**	0.25	mg/Kg	EPA 8260B	12/30/2004
TPH as Gasoline	**520**	50	mg/Kg	EPA 8260B	12/30/2004
Toluene - d8 (Surr)	110		% Recovery	EPA 8260B	12/30/2004
4-Bromofluorobenzene (Surr)	92.8		% Recovery	EPA 8260B	12/30/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41593
Date : 12/30/2004

Project Name : **DP793**
Project Number :

Sample : **C9 - 11.75/12.0** Matrix : Soil Lab Number : 41593-07
Sample Date :12/14/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.25**	0.25	mg/Kg	EPA 8260B	12/22/2004
Toluene	**0.72**	0.25	mg/Kg	EPA 8260B	12/22/2004
Ethylbenzene	**17**	0.25	mg/Kg	EPA 8260B	12/22/2004
Total Xylenes	**75**	0.25	mg/Kg	EPA 8260B	12/22/2004
Methyl-t-butyl ether (MTBE)	**< 0.25**	0.25	mg/Kg	EPA 8260B	12/22/2004
TPH as Gasoline	**1300**	50	mg/Kg	EPA 8260B	12/22/2004
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	12/22/2004
4-Bromofluorobenzene (Surr)	98.5		% Recovery	EPA 8260B	12/22/2004

Sample : **C9 - 23.75/24.0** Matrix : Soil Lab Number : 41593-08
Sample Date :12/14/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	108		% Recovery	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	92.8		% Recovery	EPA 8260B	12/21/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41593
Date : 12/30/2004

Project Name : **DP793**
Project Number :

Sample : **C9 - 30.75/31.0** Matrix : Soil Lab Number : 41593-09
Sample Date :12/14/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Toluene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Ethylbenzene	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Total Xylenes	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	**< 0.0050**	0.0050	mg/Kg	EPA 8260B	12/21/2004
TPH as Gasoline	**< 1.0**	1.0	mg/Kg	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	106		% Recovery	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	91.0		% Recovery	EPA 8260B	12/21/2004

Sample : **C9 water 11-16'** Matrix : Water Lab Number : 41593-10
Sample Date :12/14/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**970**	25	ug/L	EPA 8260B	12/22/2004
Toluene	**540**	25	ug/L	EPA 8260B	12/22/2004
Ethylbenzene	**4100**	25	ug/L	EPA 8260B	12/22/2004
Total Xylenes	**10000**	25	ug/L	EPA 8260B	12/22/2004
Methyl-t-butyl ether (MTBE)	**< 25**	25	ug/L	EPA 8260B	12/22/2004
TPH as Gasoline	**66000**	2500	ug/L	EPA 8260B	12/22/2004
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	12/22/2004
4-Bromofluorobenzene (Surr)	98.3		% Recovery	EPA 8260B	12/22/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 41593

Date : 12/30/2004

Project Name : **DP793**

Project Number :

Sample : **C10 water 11-16'** Matrix : Water Lab Number : 41593-11

Sample Date :12/14/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**2400**	20	ug/L	EPA 8260B	12/23/2004
Toluene	**230**	20	ug/L	EPA 8260B	12/23/2004
Ethylbenzene	**3700**	20	ug/L	EPA 8260B	12/23/2004
Total Xylenes	**6800**	20	ug/L	EPA 8260B	12/23/2004
Methyl-t-butyl ether (MTBE)	**< 20**	20	ug/L	EPA 8260B	12/23/2004
TPH as Gasoline	**44000**	2000	ug/L	EPA 8260B	12/23/2004
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	12/23/2004
4-Bromofluorobenzene (Surr)	102		% Recovery	EPA 8260B	12/23/2004

Sample : **C10 water 29-34'** Matrix : Water Lab Number : 41593-12

Sample Date :12/14/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**250**	0.50	ug/L	EPA 8260B	12/23/2004
Toluene	**72**	0.50	ug/L	EPA 8260B	12/23/2004
Ethylbenzene	**1.7**	0.50	ug/L	EPA 8260B	12/23/2004
Total Xylenes	**6.0**	0.50	ug/L	EPA 8260B	12/23/2004
Methyl-t-butyl ether (MTBE)	**90**	0.50	ug/L	EPA 8260B	12/23/2004
TPH as Gasoline	**1000**	50	ug/L	EPA 8260B	12/23/2004
Toluene - d8 (Surr)	99.6		% Recovery	EPA 8260B	12/23/2004
4-Bromofluorobenzene (Surr)	101		% Recovery	EPA 8260B	12/23/2004

Approved By: Joel Kiff

2795 2nd St., Suite 300 Davis, CA 95616 530-297-4800

Report Number : 41593

Date : 12/30/2004

QC Report : Method Blank Data

Project Name : **DP793**

Project Number :

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	12/22/2004
Toluene	< 0.50	0.50	ug/L	EPA 8260B	12/22/2004
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	12/22/2004
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	12/22/2004
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	12/22/2004
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	12/22/2004
Toluene - d8 (Surr)	97.7		%	EPA 8260B	12/22/2004
4-Bromofluorobenzene (Surr)	91.3		%	EPA 8260B	12/22/2004
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
Ethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
Total Xylenes	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/20/2004
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	12/20/2004
Toluene - d8 (Surr)	104		%	EPA 8260B	12/20/2004
4-Bromofluorobenzene (Surr)	106		%	EPA 8260B	12/20/2004
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/21/2004
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/21/2004
Ethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/21/2004
Total Xylenes	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/21/2004
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/21/2004
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	12/21/2004
Toluene - d8 (Surr)	102		%	EPA 8260B	12/21/2004
4-Bromofluorobenzene (Surr)	102		%	EPA 8260B	12/21/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/28/2004
Toluene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/28/2004
Ethylbenzene	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/28/2004
Total Xylenes	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/28/2004
Methyl-t-butyl ether (MTBE)	< 0.0050	0.0050	mg/Kg	EPA 8260B	12/28/2004
TPH as Gasoline	< 1.0	1.0	mg/Kg	EPA 8260B	12/28/2004
Toluene - d8 (Surr)	100		%	EPA 8260B	12/28/2004
4-Bromofluorobenzene (Surr)	89.6		%	EPA 8260B	12/28/2004

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

Report Number : 41593

Date : 12/30/2004

QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **DP793**

Project Number :

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Benzene	41561-02	<0.50	38.2	38.0	32.8	33.2	ug/L	EPA 8260B	12/22/04	85.9	87.2	1.53	70-130	25
Toluene	41561-02	<0.50	38.2	38.0	34.8	34.4	ug/L	EPA 8260B	12/22/04	91.3	90.5	0.886	70-130	25
Tert-Butanol	41561-02	<5.0	191	190	218	194	ug/L	EPA 8260B	12/22/04	114	102	11.3	70-130	25
Methyl-t-Butyl Ether	41561-02	42	38.2	38.0	77.7	77.8	ug/L	EPA 8260B	12/22/04	94.3	95.0	0.802	70-130	25
Benzene	41527-12	<0.0050	0.0386	0.0378	0.0369	0.0364	mg/Kg	EPA 8260B	12/20/04	95.7	96.3	0.657	70-130	25
Toluene	41527-12	<0.0050	0.0386	0.0378	0.0385	0.0376	mg/Kg	EPA 8260B	12/20/04	99.6	99.4	0.191	70-130	25
Tert-Butanol	41527-12	<0.0050	0.193	0.189	0.180	0.179	mg/Kg	EPA 8260B	12/20/04	93.3	94.5	1.26	70-130	25
Methyl-t-Butyl Ether	41527-12	<0.0050	0.0386	0.0378	0.0364	0.0366	mg/Kg	EPA 8260B	12/20/04	94.4	96.8	2.55	70-130	25
Benzene	41593-01	<0.0050	0.0397	0.0384	0.0302	0.0282	mg/Kg	EPA 8260B	12/21/04	76.1	73.3	3.75	70-130	25
Toluene	41593-01	<0.0050	0.0397	0.0384	0.0318	0.0292	mg/Kg	EPA 8260B	12/21/04	80.1	76.2	4.97	70-130	25
Tert-Butanol	41593-01	<0.0050	0.198	0.192	0.144	0.153	mg/Kg	EPA 8260B	12/21/04	72.3	79.6	9.56	70-130	25
Methyl-t-Butyl Ether	41593-01	<0.0050	0.0397	0.0384	0.0339	0.0310	mg/Kg	EPA 8260B	12/21/04	85.5	80.7	5.78	70-130	25
Benzene	41739-02	<0.0050	0.0398	0.0398	0.0335	0.0350	mg/Kg	EPA 8260B	12/28/04	84.3	88.1	4.32	70-130	25
Toluene	41739-02	<0.0050	0.0398	0.0398	0.0355	0.0367	mg/Kg	EPA 8260B	12/28/04	89.2	92.4	3.40	70-130	25
Tert-Butanol	41739-02	<0.0050	0.199	0.199	0.192	0.200	mg/Kg	EPA 8260B	12/28/04	96.4	100	3.97	70-130	25
Methyl-t-Butyl Ether	41739-02	<0.0050	0.0398	0.0398	0.0395	0.0417	mg/Kg	EPA 8260B	12/28/04	99.5	105	5.34	70-130	25

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

Report Number : 41593

QC Report : Laboratory Control Sample (LCS)

Date : 12/30/2004

Project Name : **DP793**

Project Number :

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	40.0	ug/L	EPA 8260B	12/21/04	88.6	70-130
Toluene	40.0	ug/L	EPA 8260B	12/21/04	92.4	70-130
Tert-Butanol	200	ug/L	EPA 8260B	12/21/04	103	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	12/21/04	101	70-130
Benzene	0.0364	mg/Kg	EPA 8260B	12/20/04	93.2	70-130
Toluene	0.0364	mg/Kg	EPA 8260B	12/20/04	98.4	70-130
Tert-Butanol	0.182	mg/Kg	EPA 8260B	12/20/04	93.2	70-130
Methyl-t-Butyl Ether	0.0364	mg/Kg	EPA 8260B	12/20/04	89.0	70-130
Benzene	0.0398	mg/Kg	EPA 8260B	12/21/04	90.4	70-130
Toluene	0.0398	mg/Kg	EPA 8260B	12/21/04	95.3	70-130
Tert-Butanol	0.199	mg/Kg	EPA 8260B	12/21/04	91.0	70-130
Methyl-t-Butyl Ether	0.0398	mg/Kg	EPA 8260B	12/21/04	96.2	70-130
Benzene	0.0397	mg/Kg	EPA 8260B	12/28/04	84.4	70-130
Toluene	0.0397	mg/Kg	EPA 8260B	12/28/04	90.0	70-130
Tert-Butanol	0.198	mg/Kg	EPA 8260B	12/28/04	98.2	70-130
Methyl-t-Butyl Ether	0.0397	mg/Kg	EPA 8260B	12/28/04	104	70-130

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. 41593 | Page 1 of 2

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): George Converse

Company/Address: WEGE 1316 E Beamer Woodland, CA

Phone No.: 530 668 5300 | FAX No.: 530 662 0273

Project Number: | P.O. No:

Project Name: DP793

Project Address: 4035 Park Blvd. Oakland, CA

California EDF Report? ☐ Yes ☒ No

Recommended but not mandatory to complete this section:

Sampling Company Log Code:

Global ID:

EDF Deliverable To (Email Address):

Sampler Signature: [signature]

Analysis Request columns: BTEX (8021B); BTEX/TPH Gas/MTBE (8021B/M8015); TPH as Diesel (M8015); TPH as Motor Oil (M8015); TPH Gas/BTEX/MTBE (8260B); 5 Oxygenates/TPH Gas/BTEX (8260B); 7 Oxygenates/TPH Gas/BTEX (8260B); 5 Oxygenates (8260B); 7 Oxygenates (8260B); Lead Scav. (1,2 DCA & 1,2 EDB - 8260B); EPA 8260B (Full List); Volatile Halocarbons (EPA 8260B); Lead (7421/239.2) TOTAL (X) W.E.T. (X)

TAT: 12 hr/24 hr/48 hr/72 hr/1 wk (1 wk circled)

Sample Designation	Date	Time	40 ml VOA	SLEEVE	HCl	HNO_3	ICE	NONE	WATER	SOIL	TPH Gas/BTEX/MTBE (8260B)	TAT	For Lab Use Only
C8-7.75/8.0	12-14-04	11:59		1			✓			✓	X	normal	01
C8-11.75/12.0	↓	12:02		↓			↓			↓	X	↓	02
C8-15.75/16.0	↓	12:07		↓			↓			↓	X	↓	03
C8-29.75/30.0	↓	12:41		↓			↓			↓	X	↓	04
C8-37.75/38.0	↓	1:22		↓			↓			↓	X	↓	05
C9-7.75/8.0	↓	10:00		↓			↓			↓	X	↓	06
C9-11.75/12.0	↓	10:05		↓			↓			↓	X	↓	07
C9-23.75/24.0	↓	10:25		↓			↓			↓	X	↓	08
C9-30.75/31.0	12-14-04	10:50		1			✓			✓	X	normal	09

Relinquished by:	Date	Time	Received by:
[signature]	12/17/04	13:23	
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Laboratory:
	12/17/04	13:53	[signature] Kiff Analytical

Remarks:

Bill to: WEGE

Distribution: White - Lab, Pink - Originator

Forms/coc 121001.th9

KIFF ANALYTICAL LLC

2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. 41593 Page 2 of 2

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): George Converse
Company/Address: UECC 1380 E. Beamer Woodland, CA
Phone No.: 530 666 5300 FAX No.: 530 662 0273
Project Number: P.O. No:
Project Name: DP 793
Project Address: 4035 Park Blvd. Oakland, CA

California EDF Report? ☐ Yes ☒ No
Recommended but not mandatory to complete this section:
Sampling Company Log Code:
Global ID:
EDF Deliverable To (Email Address):
Sampler Signature: [signature]

Sample Designation	Sampling Date	Sampling Time	Container: 40 ml VOA	Container: SLEEVE	Preservative: HCl	Preservative: HNO_3	Preservative: ICE	Preservative: NONE	Matrix: WATER	Matrix: SOIL	Analysis Request: TPH Gas/BTEX/MTBE (8260B)	TAT: 12 hr/24 hr/48 hr/72 hr/1 wk	For Lab Use Only
C9 water 11-16'	12/14/04	12:20	3								X	normal	10
C10 water 11-16'	12/14/04	8:32	3								X	"	11
C10 water 29-34'	12/14/04	8:36	3								X	normal	12

Analysis Request: BTEX (8021B); BTEX/TPH Gas/MTBE (8021B/M8015); TPH as Diesel (M8015); TPH as Motor Oil (M8015); 5 Oxygenates/TPH Gas/BTEX (8260B); 7 Oxygenates/TPH Gas/BTEX (8260B); 5 Oxygenates (8260B); 7 Oxygenates (8260B); Lead Scav. (1,2 DCA & 1,2 EDB - 8260B); EPA 8260B (Full List); Volatile Halocarbons (EPA 8260B); Lead (7421/239.2); TOTAL (X); W.E.T. (X)

	Date	Time	
Relinquished by: [signature]	12/17/04	1337	Received by:
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Laboratory: Kiff Analytical
	12/17/04	1337	[signature]

Remarks:

Bill to: UECC

Distribution: White - Lab, Pink - Originator

Forms/coc 121001.fh9

R0429
3/5-

APPENDIX D.

FIELD NOTES AND DRILLER'S DAILY SHEETS

(1)

12-9-04

C1 9:30

drill to 5 feet

PID Asphalt 2"

Rock fill 3.5'

Clay

decayed rock 4.0

0.1 6.5 sand fill med grey

0.1 6.75 silt brown clay PID=0.1

0.3

7.0 Top sand vfn - fn clayey

7.5 X

.4 > 8.0 clay brown firm w/ occ rock & clayish organic

clay brown silty moist PID=7.4

5.6 11.5 clay Dk gray to dry odor

34.0 12.0 clay Brown silty NO odor

13.5 clay Brown stiff

16.0

3.7 19 stones oxidized clay

14.5 gray mottled to ft odor

7.8

20.0

70.0

Sample C1 - 8/8.25
10:15

Sample C1 - 12/12.5
10:17

Sample C1 - 17½/18
10:20

Sample C1 20-20½
10:34

12-9-04 (2)

PID C1

20.0

300 clay stiff gray moist pet odor

22 - - - -

500 Clay gray silty moist clay petrol odor

24

50

25 orange clay @ 25.25

7.8 26 clay silty sandy

27 — clay gray/brown no odor Tr pet odor

41 → 28

40

36 ~~40~~ - clay intermix vertically gray/orange no odor

260 30 Clay orange-brown

230 31 silty firm

220 32

60 33

34 Clay orange brown silty

35

5.4 36 decrease in clay

86 37

98 38 33.5

3.0 39 ~~gray~~ clay trace rock bed - gray gravel clay/gravel 38.5 39.0

2.5 40 clay brown trace in silt 40-41 no odor

15 41 Clay brown firm

20 42

22.5 sand wh-fi clayey 42.25-42.5

43 Clay w/minor silt

28

44 silt clay 44-44.5

4.8 45 Clay brown firm

5.2 46

Sample C1 23 3/4-24.0 10:37

Sample C1 25.75-26.0 10:43

Sample C1 28/28.5 11:00

Sample C1 33 1/2/34 11:15

Sample C1 39 1/2/40 12:10

Sample C1 43.75/44 12:32

Sample C1 45.75/46 12:50

12-9-04 (3)

water sample @ 1640

PID 46.0

4.7 47 clay Brown firm

Sample C1 47.75/48.0
1300 hr

6.0 48 Clay med brown

42 - 49.5 ft

49

Sample C1 49.25/49.5
1330

50 formation refusal @ 49.5

Pull rods to 42.0 feet to test for any water entry

13:30 Place 5' 0.02 slot to 49.5 - 44.5 1st set to test for water 14:40 test no water, Pulled PVC - wet on bottom of clay 1st set

15 C-13 15 cols position ...

PID

0

1 rock fill

2

3 clay Brown

Sample C13 3.75/4
@ 15:15

82 4 Sand Brown

Silty clayey

5

6

clay brown

7 Black soft clay

▽ 30 8

9

med-stiff clay ...

10 wet

11

sample C13 - 11.75/12
15:25

12 Test for water 8-12 feet 1st stand for 15 minutes no water entry

51

13

35 14 Clay olive green Brown wet

sample C13- 13.75/14
1550

395 15

20

20 16

30.5 16.25 gravel ... wet ... 1" elongated in clay

17 16.8

96 stiff clay med grey/brown

18

19

100 20

(4)

(4)

C-13

20 clay brown/checked

1000 21 hard elongated clay brown
gray - blue gray

47 22 Clay brown

12-10-04 9:05 start Bake 12 23 1/4" - 1/2" shaped gravel rock

24 gravel/clay brown

4.7 25 silt to fine /clay brown

26 clay brown

4.7 27

28

20 29 traces of silt no odor

30

Sample C13 - 20/20.25 16:20

Set 1/2" slotted pvc

Sample C13 21/21.25 16:30

22-16' let set overnight for water entry

8 Am 12-10-04 no water

Sample C13 23.75/24 0925

set pvc slot 24-30 to test water @ 9:52

Sample C13 29.75/30 9:44

C-12

0

0 1 dirt dark brown

2 clay dk brown

0 3 crushed rock

0 silt brown

4 crushed rock

0 5 angular

0 6 Clay Brown/orange firm dry

silt clayey brown

10.0 7 color change dk brown clay

8 roots

17.0 9 clay decrease in silt w/depth

10

11

100 12 dk brown silt moist

Sample C12 - 5.75/6 1000

Sample C12 - 11.75/12 10:10

(5)

▽ 12

7 13 Clay chocolate brown Tr odor = clay pit moist

14

10 15

80 16 Clay olive green

Sample C12 – 15.75/16 10:15

2nd hole close to 18' set pvc for each sample obtain each sample 1315 C12 – 24ft

Test for water 10:15 – 1045 fill water ~~each~~ for 13–16 ft lost ~~drive~~ shoe tried to move hole 4 feet North ~~fast~~

17

18 recovered 1 ft

19 fill rock clogged sleeve

20

No recovery after 2 attempts to 22 feet move hole to East 1 foot

Started 1300 hrs

PID =1 21 16 Olive green clay to 16.25

Clay brown 16.5

22 17 Clay gravel shell sharp wet w/ 1 ft 1/8"–1/2"

0.5 23 18 — 16.75 Clay stiff

24 19 — 17.75 fractured rock

25 20 — 18.1

1.0 26 Clay w/ rock fragments brown wet odor

27 — 19.5 Dry rock

17 28 wet seal gray/red brown Tr clay pit odor

29 20. —

26 30 21 olive green clay

Sample C12 – 19.75/20 13:30

100 22

26 23

12

12 olive green clay

Fracture in silt

6 26

0 27

Sample C12 – 23/23.25 1340

C12 26/26.25 1355

0 28 Clay brown

0 29 Clay red/brown silt

0 30

(6)

12-13-04

C-11 8:15

0 dirt surface

1 soil

2 rock fill

3

4

5

21.5 5.5

6 clay brown no odor

7

2.0 8

9

10 silt clayey

clayey
11 silt clay

12

13

30 14 dk gray/black clay mod dry Marks

15 pet odor wet

70 16

gravel
120 17 clay w/gravel

260 18 gravel clay 1/2"-1" sized mets vole

19 clay Brown brown

50 20 w/ occ gravel

21

2000 22

151 23

dk green
2000 24 silty clay brown strong gasoline odor

12-13-04

porta potty delivered afternoon
Far West Sanitation
800 832-6886

Sample C11- 7.75/8.0
8:35

Sample C11- 11.75/12.0
8:41

drive second hole to 18 feet
set screen 18-14 feet to test water
9:30 - 6:19 no water entry
12-15-04 6" hole on bottom sample 12-16-04 0800
north east 1 foot

Sample C11 - 15.75/16
8:47

Sample C11 17.5/18
8:50

Sample C11- 19.75-/20
09:00

Sample C11- 23.5/24
0910

(7)

C11

500 24 clay silty brown / olive green
25 olive green clay moist silty
400 26 trace water
2000 27 | no water
28
0 28 color change to brown no odor
6.1 29 |
0 30
0 31
0 32

C11 - 26.75/27 0915

C11 - 28.75/29.0 0925

C11 - 31.75/32.0 9:35

pull drill rod to 26 ft
place 1 1/2" PVC screen
0950 32 - 28 ft test water
- 10:15 no water entry
water sample @ 12:15 C11 is 29-32

12/14/04
no water @ 8:40

C6 move location North east - cross edge of ditch

C5 is cancelled

PID
0 soil
0 1 rock 6" / Backfill
0 2 brown black burnt
3 crush rock
0 & brown clay
4
12 6 crushed rock fill
0 7 |
0 8 |
C 9 brown silty clay
C 10
0
11 chocolate brown clay silty wet
▽ 0 12 wet
0 13 Brown clay
0
14
40 15 Dk gray black clay
18 16

C6 - 7.75/8.0 10:45

C6 - 11.75/12 1050

C6 - 15.75/16 1052

(8)

C6

2000 16 Dk gray soft clay wet

2000 17 | gray clay pet odor

18 |

19 olive green firm

2000 20 w/ red oxid mottle dry

2000 21 clay brown/white w/ gravel

22 mod pet odor

2000 23

2000 24

840

2000 400 25

700 240 26 clay olive green

940 27 sand/gravel in clay matrix

770 28 clay w/ gravel

887

60 29 28 ft Brown clay firm gray clay

1000

50 30 Brown clay wet (moist)

31

0 32 clay wet

24 Brown

0 33

2 34

35

C10

0 fill trench etc

1

2

3

4

C6 16.5/17 10:56

Drove 2" hole to 19 feet set screen hydropunch

15-19 screen

place 1/2" casing PVC to 19 feet

sample @ 1545

C6 - 19.75/20 10:58

C6 23.75/24 11:04

~~C6 25.75/26 11:10~~

C6 26.75/27 11:10

~~26.75/27 11:10~~

C6 28.75/29 11:17

C6 31.75/32 11:22

set 4' slot 31-35 @ 11:45

low water @ 1:15 pm

pull drill rod

leave casing in hole

sample @ 15:40

C6 34.75/35.0

(9)

C10

PID	Depth	Description
	4	rock fill
0	5	
	6	
	7	
0	8	Brown clayey silt
0	9	
0	10	
	11	
0		Clay Brown silty
0	12	
	▽ 12.5	
2000	13	Dk gray / chocolate clay silty wet
	14	[illegible] occ gravel
	15	
2000	16	olive green clay wet
		Brown silty clay
2000	17	w/ occ gravel
		olive green clay
210	18	firm
	19	Brown clay firm
136	20	
	21	
265		
	22	increase in silt
200	23	occ [illegible] / gravel size
		brown
630	24	
2000	25	gravel / clay 1/4"-1/2" [illegible]
		brown
500	26	[illegible] broken claystone clay
700	27	Clay mod gray w/ [illegible]
500		black white
190	28	Clay brown [illegible]
		Clay olive green
28	29	
		red brown Clay
30	30	[illegible] silt

C10 - ~~8/8.25~~ 7.75/8
14:05

C10 - 12/12.25
14:08

C10 - 16/16.25
1425

C10 - 20/20.25
1435

C10 - 23/23.25
1445

C10 - 26.5/27.0
1452

C10 - 29.75/30
1500

C 10 12-13-04 10

150 30 clay brown stiff
31 Tr silt no odor
dry
90 32 Clay brown
15 33 stiff
Tr silt
30 34 no odor

C10 - 31.75/32
15:05

C10 - 33.75/34
15:12

pull drill Rod to 25 ft
set PVC slotted casing

~~hydro punch to 16 feet~~

12/14/04 - water samples
C-10 water @ 16.0' 8:32
C-10 water @ 34.0' 8:36

(11)

C9 12/17/04

Fill

clay, soft dk brown to black, strong pet odor

+ C9 7.75-8

black, gooey clay strong pet odor 12-14'

+ C9 11.75-12

greenish brown stiff clay slight pet odor

C9 - 15.75-16

stiff brown clay no odor

yellow stiff brown clay no odor

C9 19.75-20

clay with ½" gravel stiff clay silt + sand

+ slight pet odor C9 23.75-24

some gravel to dk brown clay

C9 27.75-28

not encountered

(12)

C9 (cont)

obtain
rock sample
C9 - 27/31 @ 8AM 12-15-0

Not working

29 brown clay with small gravel chips grading to
30
31 stiff brown clay no odor @ 31 feet

* C9 30.75-31

TD 31'

Set water screens @ 11-16' — sampled @ 210 12/14/04
26-31' — no water @ 2100 12/14/04

PID

C8 12/14/04 @ 11:56

0
1
2
3 Fill
4
5
6

wb C8 - 11/16 @ 815 12-15-04

7 drk brown silt & clay
8 no odor

* C8 7.75-8.0 @ 11:59

9
10 soft brown clay some pet odor
11 black clay strong pet odor
12 black clay strong pet odor

* C8 11.75-12.0 12:02

13
14
15 black gassy clay strong pet odor
16 greenish brown stiff clay some odor starting @ 16.0 ft

* C8 15.75-16 12:07

17 gradational color change to lighter brown
18
19
20 stiff brown clay no odor

C8 19.75-20

(13)

C8

21 Stiff ~~brown~~ brown clay with
1/4" rock fragments starting at 21.5'

22

23 brown silt + clay with broken gravel slight petro odor — C8 22.75-23.0 12:17

24

25

26 greenish brown silt + clay with gravel pet odor — C8 25.75-26 12:29
color change from greenish brown to reddish brown @ 27 ft.

27

28 reddish brown coarse sand + gravel

29 * C8 29.75-30 12:41

30 rounded + broken pebbles to 1"

31

32 red oxide inclusions — C8 31.75-32 12:47

33

34 Same as above with ~~grading to sand~~ less sand ~~with~~ ~~broken gravel~~

35

36 C8 35.75-36 1:05

37

38 * C8 37.75-38 1:22

TD - 38.0'

well C8 - 34/38
8:20 12-15-04

water
Screens 33 - 38
~~#2~~ - 16

no water in either @ 2:40 12/14

Post obtain create samples & drilling holes C8 & C9 Decca

12-15-04 (14) positive log 9:58

C7

PID	Depth	Description	Sample
	0	soil	
	1	rock fill	
	2		
	3		
	4		
	5		
	6		
	7	7.75 clay brown soft	
12	8		C7 - 7.75/8 @ 10:03
3.0	9	rock fill; clay med brown	
	10		
0	11	wet all 11'	
0	12		C7 - 11.75/12 @ 10:05
12	13		
60	14		
	15	Dk brown/chocolate clay soft pet odor	
148	16	wet	C7 - 15.75/16 @ 10:12
2000	17		
	18	olive green brown clay firm	C7 18/18.25 10:15
	19		
70	20	brown clay firm	C7 19.75/20 10:20
2000	21	clay brown/olive tint firm	
2000	22		
2000	23		C7 23.25/23.5 10:25
	24	24.8	
2000	25	gravel/clay mixed w/ clay claystone red/black/white	
	26		
2000	27	decrease in gravel	C7 26.75/27 10:30

14' – 18': set hydropunch @ 12:45 sample 12-16-04 / 0815

CID C7 (15) 12-15-04

2000 27 Blue/gray sandy silty gravelly clay hard — gravel [illegible] red, white black
28 brown/olive tint clay gravelly sandy silty
~~150~~ 2000 29 blue gray gravelly clay

C7 29.75/30 10:40

~~35~~ 250 30 gravel/coarse sand in clay brown wet
100 31
32
145 300 33 wet

C7 32.75/33.0 1055

75 34 firm mixes in clay not wet
45 35 wet clay sand/gravel w/ red oxid nodules

C7 35.5/35.75 1100

0 36 in clay brown
Tx in clay clay w/ sand/gravel
37
40 sand clay w/ min gravel in clay nodule
50 38 clay w/ [illegible] sand/gravel decrease w/ depth

C7 38.75/39 11:10

10 39 clay sft brown
48 40 silty

C7 40.75/41 11:20

33 41 clay firm clay w/ fn sand silt
20 42 clay mod brown firm

C7 42.75/43 11:35

12 43 clay brown/lt olive Tint firm
34 44
45 gravel sand clay dry
29 45
0 46 clay Combn mod brown to silt

C7 45.75/46 1205

20 47 gravel w/clay [illegible] shiod [illegible] 1/8"-1/2" dry
clay firm brown

C7 47.25/47.5 12:10

0 48
0 49 min silt firm. refusal

pull drive rod to 34.5 feet set pvc slot

C7 48.75/49.0 12:28

set PVC@ 12:35

Set pvc Sample 12-16-04 0830

(16)

C3 12-15-04 position rig 1:30

0
1 soil
2
fill
3 push
4
5
6
0 7
0 8 clay silty
5.5 9 Silt clay
Brown
28 10
42 11 clay soft moist
dk brn
57 12 Dk grey/chocolate
clay soft silty wet
2000 13 Pet odor
14
2000 15
16 Clay olive green
2000 17 soft wet
18 Clay firm
2000 19
2000 20
320 21 Clay firm olive green
2000 22
23 trace pebble red ~~elongated~~ rectangle 1" chert
clay w/ occ pebbly
2000 24 olive
25 brown conglom
2000 26
2000 27 gravel/clay sand

hydropunch
14 12-15-04
4:30 pm
Sample 12-16-04
0845
18

C3 - 7.75/8.0 1345

C3 11.75/12 1350

C3 15-15.5 1400

C3 18.75/19 14:02

C3 21.75/22 14:06

C3 23.75/24 14:08

C3 26.75/27 14:15

(17)

C3 12-15-04

2000 27 brown
28 color chert olive
2000 29
2000 30 Conglom

sand coarse/fine wet

28 31
38 32 gravel/sand
increase in clay
33 clay/gravel/sand
45 gravel/sand w/ clay
34 wet
12 35
17 36 clay gravel/sand
37 Conglom
17 38 brown
29 39 very red brown, white black clasts of ? rock
17 40
40.27
41 clay brown firm silty
42

C3 - 29.75/30 14:30

C3 31.75/32 14:40

C3 35.75/36 1450

C3 39.75/40 15:05

C3 41.75/42 15:15

set casing & pull
drill rod to 30 feet 3:30 12-15-04
sample 12-16-04 08 47

12-16-04 ~~C4~~ C2

10:50 0 soil
PID 1 fill
0 2 rock fill
3
4
5
6

18

C2

PID

6 back fill

0 7

8 silt clay brown no odor

0 9 clay brown firm

0 10 ▽

wet clay silty med brown

0 11

0 12

clay silty

0 13

0 14 dk brown wet

15 clay med brown w/olive tint

0 16 pebble

0 17 ~~gravel~~

0 18 ~~gravel~~

0 19 clay med brown stiff

0 20 conglom clay green/brown w/ sand/gravel

0.3 21

Dry Tr odor

0.1 22 clay sand fn-crs

450 23 sand - dry

22 olive green/brown matrix

2.5 24

0.3 25 clay claystone brown wet @ 25 - decrease in clay

0.4 26

0.8 27 clay silty brown no odor

0 28

0 29

0 30 clay brown stiff minor silt

0.0

0.3 31

0.5

0.6 32

0.2 33

C2 - ~~8/8.25~~ 8.5/8.75
11:06 12-16-04

C2 - 12/12.25
11:12

C2 16/16.25
11:18

C2 19/19.25
11:30

C2 22.5/23.0
11:37

C2 23.75/24
11:32

23 - 27 geoprobe 11-6-04 wet

no water 12-17-04 0830

C2 26.75/27 11:42

No water @ 9:45 Pull casing/destroy boring

C2 29.75/30 11:52

C2 31.75/32 recov

C2 12-16-04 19

0.1 33
0.1 34 color change brown w/ olive tint
0.2 35 clay brown to greenish...
0.1 36
0 clay is wet silty
0 37 very firm
0.5 38 clay silty w/ ... Brown
0.6
1.1 39 very moist brown clay no odor
1.4 40 ~1 sand ... red oxidation 39.6-39.7
.8 41 clay firm
1.0 42 brown no odor
1.5 43 clay ... brown firm
1.0
1.2 44
1.2 45
.8
1.0 46
1.0 47
48
49
49.5 TD

C2 34.25/34.5 12:15

C2 36.75/37 12:30

C2 39.75/40 1240

C2 42.75/43 1300

C2 44.75/45 1320

C2 46.75/47 13:32

C2 49.25/49.5 1350

Set PVC screen & pull Drill Rod to 38 feet 12-16-04 1400
obtain water sample 0805
C2-W 38/49.5

C4

0
1 dirt fill
2 rock fill
3
4
0 5
0 6
7
0.1 clay silty dk brown
8 moist no odor
9

C4 7.75/8 1445

C4

0.1 10 clay silty
0.5 11 soft [illegible]
20.5 12 [illegible] clay stiff wet to [illegible]
13
4.5 14 13/14 clay
10.3 15
1.6 16 olive green clay
17 Clay [illegible] w/ [illegible] green [illegible] chert
18 gravel clay [illegible]
4.5 19 clay 18.5
2000 20 [illegible] gray chert
21 [illegible] Brown clay [illegible]
2000 22
200 23 Brown coarse sand/clay
500 24 damp
25 25.5
150 26 gray/green [illegible] wet
4.5 27 Sand [illegible]
0.7 28 [illegible] brown [illegible]
0.7 29
0.6 30
0.2 31 Clay/Sand [illegible] green [illegible] [illegible] red oxid [illegible] wet
0.2 32 brown
33 Sand/gravel wet 33.5 red oxid at contact
0.4 34 Clay [illegible]
0.2 35 [illegible]
0.1 36 Sand/Sandy gravel / clay [illegible]
37 [illegible] red oxid [illegible]
2.4 38 clay [illegible]
39
40 TD
41
42
43
44
45
46
47
48
49
50

C4 – 11.75/12 1447

[12 hydropunch set @ 16-20 12/16/04 16]

C4 – 15.75/16 1452

[illegible] [illegible] 8:40 C4-[illegible]/16

C4 – 18.75/19 1455

C4 – 19.5/20 1500

C4 – 21.75/22 1505

C4 25.75/26 1510

C4 29.75/30 1520

C4 31.75/32 1525

C4 34.75/35 1535

C4 37.75/38 1600

C4 39.75/40 1607

pull rods to 27.0 to test [illegible] @ 1615 12/16/04
obtain water sample 12-17-04 8:08
C4-W2 [illegible]/40

WOODWARD DRILLING CO., INC.

P.O. BOX 336, RIO VISTA, CA 94571 C-57 LIC.# 710079

(707) 374 - 4300 FAX: (707) 374 - 5677 # 1215

GEN X - POWER PROBE

Client: Weqe

JOB/P.O.#:

SITE: Empty Lot

ADDRESS: 4035 Park Blvd

CITY: Oakland

DATE: 12-09-04

CO.REP. George Converse

OPERATOR: Ricky

HELPER: Bill

DESCRIPTION OF WORK PERFORMED

Hand cleared two borings to 5'. Continuous sample one boring to 50'. Set temp casing in rods and pulled eight feet out. Left it over night but collected H2O sample. Continuous sample another boring to 12'. Pulled 4' out. Set casing no water. Pushed to 22'. Set casing and pulled to 16'. Left

DEPTHS OF PROJECT			
1 50'	7	13	19
2 22'	8	14	20
3	9	15	21
4	10	16	22
5	11	17	23
6	12	18	24

Depth to water					
Total Number of Borings	2				
Total Depth of Borings	72'				
Total Number of Water Samples	1				
Total Time for Water Samples	1/2 hr				
# of Expendable Tips (")		Concrete Core		Catchers	n/c
Peristaltic Pump 1/2" bailer	1	Welder		Safety Upgrade	
H2O Recovery Enhancement Pump		Generator		Cones - Left Onsite	
Total Number of Wells		Jackhammer		Open hole covers	
Total Depth of Wells		De-ionized Water		Sand Size (#)	
Total Number of Injection Borings		Prepack Flowthru 3/4" x 2.5'		Sand Size (#)	
Total Number of Injections		Prepack Flowthru 3/4" x 5'		55 Gallon Drums	
Total Time for Injections		3/4" x 2.5' Blank Riser		20 Gallon Drums	
Total Fluid Injected		3/4" x 5' Blank Riser		5 gallon Drums	
High Pressure Injection Pump		Prepack Flowtru 1" x 2.5'		Bentonite Chips	
# of Vapor Extraction Borings		Prepack Flowthru 1" x 5'		Bentonite Pellets	
# of Vapor Extractions		1" x 2.5' Blank Riser		Coated Bent. Pellets	
Vapor Extraction Puimp		1" x 5' Blank Riser		Bentonite Gel	
O-Rings 1 1/2	4	Prepack Flowthru 1.25" x 2.5'		Portland Cement	
Tubing / Type ( ) / size ( )		Prepack Flowthru 1.25" x 5'		Fast Set Cement	
Travel Time	4	1.25" x 2.5' Blank Riser		Set 45 / 928	
Mileage		1.25" x 5' Blank Riser		Plastic Sheeting	
Probe Hours	8 1/2	Prepack Flowthru 1.5" x 2.5'		Wood Plug (")	
Drill Hours		Prepack Flowthru 1.5" x 5'		4' sample tubes	22
Standby		1.5" x 2.5' Blank Riser		End Caps	44
Development Time		1.5" x 5' Blank Riser		Soil Sample Box ( )	
Development Pump (")		Prepack Flowthru 2" x 2.5'		Catchers	
Subsistence ( ) People		Prepack Flowthru 2" x 5'		Visqueen	1
Support Truck		2" x 2.5' Blank Riser		3/4" x 5' 0.10	3
Steam Cleaner		2" x 5' Blank Riser		3/4" x 5' blank	14
Grout Pump		Soil Sample Case 10 / 20		Threaded rod	62

1 Stanley blades 3

CLIENT/REP SIGNATURE DATE 12-13-04

WOODWARD DRILLING CO., INC.

P.O. BOX 336, RIO VISTA, CA 94571 C-57 LIC.# 710079

(707) 374 - 4300 FAX: (707) 374 - 5677 #1215

GEN X - POWER PROBE

Client: Wege

JOB/P.O.#:.

SITE: Empty Lot

ADDRESS: 4035 Park Blvd

CITY: Oakland

DATE: 12-10-04

CO.REP. George Converse

OPERATOR: Ricky

HELPER: Bill

DEPTHS OF PROJECT

1 8'	7	13	19
2 16'	8	14	20
3 28'	9	15	21
4 30'	10	16	22
5	11	17	23
6	12	18	24

Depth to water	12', 30', 50'
Total Number of Borings	4
Total Depth of Borings	92'
Total Number of Water Samples	5
Total Time for Water Samples	1 hr

DESCRIPTION OF WORK PERFORMED

Pulled rods out of 50' boring then grouted thru tremie pipe. Probed on yesterday's boring open 22' to 30' Pulled up 8' and left temp casing in rods. Moved over and probed to 16' Left casing in that boring. Moved 8' over and probed to 16' then hit a rock and it fell in the rods not allowing for soil to come in. Tried to break it went to 28'. Moved truck forward & probed new boring to 30'

# of Expendable Tips (")	0	Concrete Core		Catchers	
Peristaltic Pump 1/2" bailers	3	Welder		Safety Upgrade	
H2O Recovery Enhancement Pump		Generator		Cones - Left Onsite	
Total Number of Wells		Jackhammer		Open hole covers	
Total Depth of Wells		De-ionized Water		Sand Size (#)	
Total Number of Injection Borings		Prepack Flowthru 3/4" x 2.5'		Sand Size (#)	
Total Number of Injections		Prepack Flowthru 3/4" x 5'		55 Gallon Drums	
Total Time for Injections		3/4" x 2.5' Blank Riser		20 Gallon Drums	
Total Fluid Injected		3/4" x 5' Blank Riser		5 gallon Drums	
High Pressure Injection Pump		Prepack Flowtru 1" x 2.5'		Bentonite Chips	
# of Vapor Extraction Borings		Prepack Flowthru 1" x 5'		Bentonite Pellets	
# of Vapor Extractions		1" x 2.5' Blank Riser		Coated Bent. Pellets	
Vapor Extraction Puimp		1" x 5' Blank Riser		Bentonite Gel	
O-Rings 1 1/4"	4	Prepack Flowthru 1.25" x 2.5'		Portland Cement	8
Tubing / Type ( ) / size ( )		Prepack Flowthru 1.25" x 5'		Fast Set Cement	0
Travel Time	4	1.25" x 2.5' Blank Riser		Set 45 / 928	
Mileage		1.25" x 5' Blank Riser		Plastic Sheeting	
Probe Hours	6 1/2	Prepack Flowthru 1.5" x 2.5'		Wood Plug (")	
Drill Hours		Prepack Flowthru 1.5" x 5'		4' sample tubes	17
Standby		1.5" x 2.5' Blank Riser		End Caps	30
Development Time		1.5" x 5' Blank Riser		Soil Sample Box ( )	
Development Pump (")		Prepack Flowthru 2" x 2.5'		Catchers	
Subsistence ( ) People		Prepack Flowthru 2" x 5'		3/4" x 5' 0.010	3
Support Truck		2" x 2.5' Blank Riser		3/4" x 5' blank	10
Steam Cleaner		2" x 5' Blank Riser		1" tremie pipe	50'
Grout Pump		Soil Sample Case 10 / 20		3/4 thread end	2
				1 1/4" …	1

CLIENT/REP SIGNATURE ______________________ DATE ____________

Set temp casing in 28 boring while we probed the first one. Grouted all …

WOODWARD DRILLING CO., INC.

P.O. BOX 336, RIO VISTA, CA 94571 C-57 LIC.# 710079
(707) 374 - 4300 FAX: (707) 374 - 5677

#1215

GEN X - POWER PROBE

Client: Wege

DATE: 12-16-04

JOB/P.O.#:

CO.REP. George Conveser

SITE: Empty Lot

OPERATOR: Riley

ADDRESS: 435 Park Blvd

HELPER: Bill

CITY: Oakland

DESCRIPTION OF WORK PERFORMED

Collected 5 H_2O samples from Yesterday 1 boring Pulled rods & grouted Continuous sample two borings (50'-40') Hydro punched 2 w/ 1 3/4" rods to 27' & 11'. Set temp casing in all four borings. Left overnight. Picked up.

DEPTHS OF PROJECT

1 50'	7	13	19
2 27'	8	14	20
3 40'	9	15	21
4 11'	10	16	22
5	11	17	23
6	12	18	24

Depth to water	wires		Concrete Core			Catchers	
Total Number of Borings	4		Welder			Safety Upgrade	
Total Depth of Borings	133'		Generator			Cones - Left Onsite	
Total Number of Water Samples	5		Jackhammer			Open hole covers	
Total Time for Water Samples	1½		De-ionized Water			Sand Size (#)	
# of Expendable Tips (2 3/8 ")	2		Prepack Flowthru 3/4" x 2.5'			Sand Size (#)	
Peristaltic Pump ½" bailers	4		Prepack Flowthru 3/4" x 5'			55 Gallon Drums	
H2O Recovery Enhancement Pump			3/4" x 2.5' Blank Riser			20 Gallon Drums	
Total Number of Wells			3/4" x 5' Blank Riser			5 gallon Drums	
Total Depth of Wells			Prepack Flowtru 1" x 2.5'			Bentonite Chips	
Total Number of Injection Borings			Prepack Flowthru 1" x 5'			Bentonite Pellets	
Total Number of Injections			1" x 2.5' Blank Riser			Coated Bent. Pellets	
Total Time for Injections			1" x 5' Blank Riser			Bentonite Gel	
Total Fluid Injected			Prepack Flowthru 1.25" x 2.5'			Portland Cement	9
High Pressure Injection Pump			Prepack Flowthru 1.25" x 5'			Fast Set Cement	0
# of Vapor Extraction Borings			1.25" x 2.5' Blank Riser			Set 45 / 928	
# of Vapor Extractions			1.25" x 5' Blank Riser			Plastic Sheeting	
Vapor Extraction Puimp			Prepack Flowthru 1.5" x 2.5'			Wood Plug (")	
O-Rings 1 1/4" & 2 3/8"	10/4		Prepack Flowthru 1.5" x 5'			4' sample tubes	26
Tubing / Type ( ) / size ( )			1.5" x 2.5' Blank Riser			End Caps	52
Travel Time	4		1.5" x 5' Blank Riser			Soil Sample Box ( )	
Mileage			Prepack Flowthru 2" x 2.5'			Catchers 3/4" x 5' slot	2
Probe Hours	7½		Prepack Flowthru 2" x 5'			3/4" x 5' blank	11
Drill Hours			2" x 2.5' Blank Riser			3/4" caps	2
Standby			2" x 5' Blank Riser			1" x 5' slot	2
Development Time			Soil Sample Case 10 / 20			1" x 10' blank	3
Development Pump (")							
Subsistence ( ) People							
Support Truck							
Steam Cleaner							
Trout Pump							

CLIENT/REP SIGNATURE _____ DATE _____

WOODWARD DRILLING CO., INC.

P.O. BOX 336, RIO VISTA, CA 94571 C-57 LIC.# 710079
(707) 374 - 4300 FAX: (707) 374 - 5677

#1215

GEN X - POWER PROBE

Client: Wege
JOB/P.O.#:
SITE: Empty Lot
ADDRESS: 4035 Park Blvd.
CITY: Oakland

DATE: 12-17-04
CO.REP. George Converse
OPERATOR: Ricky
HELPER: Bill

DESCRIPTION OF WORK PERFORMED

Grabbed 3 H2O samples. The fourth one was dry Pulled rods out of borings & aerated all four. Picked up & cleaned up.

DEPTHS OF PROJECT			
1	7	13	19
2	8	14	20
3	9	15	21
4	10	16	22
5	11	17	23
6	12	18	24

Depth to water	VARIES		Concrete Core			Catchers	
Total Number of Borings	8		Welder			Safety Upgrade	
Total Depth of Borings	8		Generator			Cones - Left Onsite	
Total Number of Water Samples	3		Jackhammer			Open hole covers	
Total Time for Water Samples	1/2 hr		De-ionized Water			Sand Size (#)	
# of Expendable Tips (")	0		Prepack Flowthru 3/4" x 2.5'			Sand Size (#)	
Peristaltic Pump 1/2" bailers	4		Prepack Flowthru 3/4" x 5'			55 Gallon Drums	
H2O Recovery Enhancement Pump			3/4" x 2.5' Blank Riser			20 Gallon Drums	
Total Number of Wells			3/4" x 5' Blank Riser			5 gallon Drums	
Total Depth of Wells			Prepack Flowtru 1" x 2.5'			Bentonite Chips	
Total Number of Injection Borings			Prepack Flowthru 1" x 5'			Bentonite Pellets	
Total Number of Injections			1" x 2.5' Blank Riser			Coated Bent. Pellets	
Total Time for Injections			1" x 5' Blank Riser			Bentonite Gel	
Total Fluid Injected			Prepack Flowthru 1.25" x 2.5'			Portland Cement	10
High Pressure Injection Pump			Prepack Flowthru 1.25" x 5'			Fast Set Cement	0
# of Vapor Extraction Borings			1.25" x 2.5' Blank Riser			Set 45 / 928	
# of Vapor Extractions			1.25" x 5' Blank Riser			Plastic Sheeting	
Vapor Extraction Puimp			Prepack Flowthru 1.5" x 2.5'			Wood Plug (")	
O-Rings	0		Prepack Flowthru 1.5" x 5'			4' sample tubes	
Tubing / Type ( ) / size ( )			1.5" x 2.5' Blank Riser			End Caps	
Travel Time	4		1.5" x 5' Blank Riser			Soil Sample Box ( )	
Mileage			Prepack Flowthru 2" x 2.5'			Catchers	
Probe Hours	2.5		Prepack Flowthru 2" x 5'			Bentonite Plugs	2
Drill Hours			2" x 2.5' Blank Riser				
Standby			2" x 5' Blank Riser				
Development Time			Soil Sample Case 10 / 20				
Development Pump (")							
Subsistence ( ) People							
Support Truck							
Steam Cleaner							
Shut Pump							

CLIENT/REP SIGNATURE _____ DATE _____

WOODWARD DRILLING CO., INC.

P.O. BOX 336, RIO VISTA, CA 94571 C-57 LIC.# 710079

(707) 374 - 4300 FAX: (707) 374 - 5677 #1215

GEN X - POWER PROBE

Client: Weaf

JOB/P.O.#:

SITE: Empty Lot

ADDRESS: 4035 Park Blvd

CITY: Oakland

DATE: 12-15-09

CO.REP. George Converse

OPERATOR: Ritley

HELPER: Bill

DEPTHS OF PROJECT

1 49	7	13	19
2 18	8	14	20
3 42'	9	15	21
4 18'	10	16	22
5	11	17	23
6	12	18	24

Depth to water	3 water samples
Total Number of Borings	4
Total Depth of Borings	127'
Total Number of Water Samples	3
Total Time for Water Samples	1 hr
# of Expendable Tips (2 3/8" ")	3
Peristaltic Pump 1/2" bailers	3
H2O Recovery Enhancement Pump	
Total Number of Wells	
Total Depth of Wells	
Total Number of Injection Borings	
Total Number of Injections	
Total Time for Injections	
Total Fluid Injected	
High Pressure Injection Pump	
# of Vapor Extraction Borings	
# of Vapor Extractions	
Vapor Extraction Puimp	
O-Rings 1 1/4" / 2 3/8"	6/4
Tubing / Type ( ) / size ( )	
Travel Time	4
Mileage	
Probe Hours	7 1/2
Drill Hours	
Standby	
Development Time	
Development Pump (")	
Subsistence ( ) People	
Support Truck	
Steam Cleaner	
Grout Pump	

DESCRIPTION OF WORK PERFORMED

Grabbed 3 H_2O samples from yesterdays borings then pulled rods out. Grouted four borings. Then Continuous sample two borings (49', 42'). Hydro-punched two borings to 18'. Left casing in the four borings we did today. Also left rods in the ground. Did not collect any H_2O from todays!

Concrete Core		Catchers	
Welder		Safety Upgrade	
Generator		Cones - Left Onsite	
Jackhammer		Open hole covers	
De-ionized Water		Sand Size (#)	
Prepack Flowthru 3/4" x 2.5'		Sand Size (#)	
Prepack Flowthru 3/4" x 5'		55 Gallon Drums	
3/4" x 2.5' Blank Riser		20 Gallon Drums	
3/4" x 5' Blank Riser		5 gallon Drums	
Prepack Flowtru 1" x 2.5'		Bentonite Chips	
Prepack Flowthru 1" x 5'		Bentonite Pellets	
1" x 2.5' Blank Riser		Coated Bent. Pellets	
1" x 5' Blank Riser		Bentonite Gel	
Prepack Flowthru 1.25" x 2.5'		Portland Cement	8
Prepack Flowthru 1.25" x 5'		Fast Set Cement	6
1.25" x 2.5' Blank Riser		Set 45 / 928	
1.25" x 5' Blank Riser		Plastic Sheeting	
Prepack Flowthru 1.5" x 2.5'		Wood Plug (")	
Prepack Flowthru 1.5" x 5'		4' sample tubes	28
1.5" x 2.5' Blank Riser		End Caps	56
1.5" x 5' Blank Riser		Soil Sample Box ( )	
Prepack Flowthru 2" x 2.5'		Catchers 3/4" 0.10	2
Prepack Flowthru 2" x 5'		3/4" blanks x 5'	17
2" x 2.5' Blank Riser		PVC 0.10	2
2" x 5' Blank Riser		x 10' blanks	3
Soil Sample Case 10 / 20		[illegible]	3
		[illegible]	1

CLIENT/REP SIGNATURE ______________________ DATE ____________

WOODWARD DRILLING CO., INC.

P.O. BOX 336, RIO VISTA, CA 94571 C-57 LIC.# 710079

(707) 374 - 4300 FAX: (707) 374 - 5677

#1215

GEN X - POWER PROBE

Client: Weg(?)

JOB/P.O.#:

SITE: Empty Lot

ADDRESS: 4035 Park Blvd.

CITY: Oakland

DATE: 12-14-04

CO.REP. Dave Threlfall

OPERATOR: Ricky

HELPER: Bill

DEPTHS OF PROJECT

1 31'	7	13	19
2 16'	8	14	20
3 38'	9	15	21
4 16'	10	16	22
5	11	17	23
6	12	18	24

DESCRIPTION OF WORK PERFORMED

Continous sample two borings hydropunch with 2 3/8" rods to ... two borings & set casing in rods & pulled out. Collected three water samples. Two from borings left from night before & one from today. Cemented borings from yesterday. Picked up & cleaned up.

Depth to water					
Total Number of Borings	4				
Total Depth of Borings	101'				
Total Number of Water Samples	#3				
Total Time for Water Samples	#1 [illegible]				
# of Expendable Tips (2 3/8 ")	3	Concrete Core		Catchers	
Peristaltic Pump 3/8" bailers	3	Welder		Safety Upgrade	
H2O Recovery Enhancement Pump		Generator		Cones - Left Onsite	
Total Number of Wells		Jackhammer		Open hole covers	
Total Depth of Wells		De-ionized Water		Sand Size (#)	
Total Number of Injection Borings		Prepack Flowthru 3/4" x 2.5'		Sand Size (#)	
Total Number of Injections		Prepack Flowthru 3/4" x 5'		55 Gallon Drums	
Total Time for Injections		3/4" x 2.5' Blank Riser		20 Gallon Drums	
Total Fluid Injected		3/4" x 5' Blank Riser		5 gallon Drums	
High Pressure Injection Pump		Prepack Flowtru 1" x 2.5'		Bentonite Chips	
# of Vapor Extraction Borings		Prepack Flowthru 1" x 5'		Bentonite Pellets	
# of Vapor Extractions		1" x 2.5' Blank Riser		Coated Bent. Pellets	
Vapor Extraction Puimp		1" x 5' Blank Riser		Bentonite Gel	
O-Rings 1 1/4"	5	Prepack Flowthru 1.25" x 2.5'		Portland Cement	5
Tubing / Type ( ) / size ( )		Prepack Flowthru 1.25" x 5'		Fast Set Cement	0
Travel Time	4	1.25" x 2.5' Blank Riser		Set 45 / 928	
Mileage		1.25" x 5' Blank Riser		Plastic Sheeting	
Probe Hours	6	Prepack Flowthru 1.5" x 2.5'		Wood Plug (")	
Drill Hours		Prepack Flowthru 1.5" x 5'		4' sample tubes	21
Standby		1.5" x 2.5' Blank Riser		End Caps	42
Development Time		1.5" x 5' Blank Riser		Soil Sample Box ( )	
Development Pump (")		Prepack Flowthru 2" x 2.5'		Catchers	
Subsistence ( ) People		Prepack Flowthru 2" x 5'		3/4" x 5' screen	3
Support Truck		2" x 2.5' Blank Riser		3/4" x 5' blank	12
Steam Cleaner		2" x 5' Blank Riser		3/4" threaded cap	3
Grout Pump 2 3/8" O-Rings	#5	Soil Sample Case 10 / 20		Stanley blades	3
				1" x 5' screen	1
				1" x 10' blank	1

since 12-9-04

CLIENT/REP SIGNATURE ______________________ DATE __________

WOODWARD DRILLING CO., INC.

P.O. BOX 336, RIO VISTA, CA 94571 C-57 LIC.# 710079
(707) 374 - 4300 FAX: (707) 374 - 5677 #1215

GEN X - POWER PROBE

Client: Wrap.

DATE: 12-13-04

JOB/P.O.#:

CO.REP. George Converse

SITE: Emp + Lot

OPERATOR: Ricky

ADDRESS: 4035 Park Blvd

HELPER: Bill

CITY: Oakland

DESCRIPTION OF WORK PERFORMED

Continous sample three borings from surface (32'-35'-34') Hydropunch three borings. (20'-19'-16') Collected three water samples. Left three borings open. Grouted all others to surface. Picked up & cleaned up. Other two borings were to 9' because bit rod

DEPTHS OF PROJECT			
1 32	7 4'	13	19
2 20'	8 4'	14	20
3 35'	9	15	21
4 19'	10	16	22
5 34'	11	17	23
6 16'	12	18	24

Depth to water							
Total Number of Borings	6						
Total Depth of Borings	169'						
Total Number of Water Samples	3						
Total Time for Water Samples	1 1/2 hr						
# of Expendable Tips (2"/5 ")	#9	Concrete Core			Catchers		
Peristaltic Pump 5/8" bailers	3	Welder			Safety Upgrade		
H2O Recovery Enhancement Pump		Generator			Cones - Left Onsite		
Total Number of Wells		Jackhammer			Open hole covers		
Total Depth of Wells		De-ionized Water			Sand Size (#)		
Total Number of Injection Borings		Prepack Flowthru 3/4" x 2.5'			Sand Size (#)		
Total Number of Injections		Prepack Flowthru 3/4" x 5'			55 Gallon Drums		
Total Time for Injections		3/4" x 2.5' Blank Riser			20 Gallon Drums		
Total Fluid Injected		3/4" x 5' Blank Riser			5 gallon Drums		
High Pressure Injection Pump		Prepack Flowtru 1" x 2.5'			Bentonite Chips		
# of Vapor Extraction Borings		Prepack Flowthru 1" x 5'			Bentonite Pellets		
# of Vapor Extractions		1" x 2.5' Blank Riser			Coated Bent. Pellets		
Vapor Extraction Puimp		1" x' 5' Blank Riser			Bentonite Gel		
O-Rings 1 7/8"	3	Prepack Flowthru 1.25" x 2.5'			Portland Cement	0	
Tubing / Type ( ) / size ( )	0	Prepack Flowthru 1.25" x 5'			Fast Set Cement	0	
Travel Time	7	1.25" x 2.5' Blank Riser			Set 45 / 928		
Mileage		1.25" x 5' Blank Riser			Plastic Sheeting		
Probe Hours	8	Prepack Flowthru 1.5" x 2.5'			Wood Plug (")		
Drill Hours		Prepack Flowthru 1.5" x 5'			4' sample tubes	33	
Standby		1.5" x 2.5' Blank Riser			End Caps	700	
Development Time		1.5" x 5' Blank Riser			Soil Sample Box ( )		
Development Pump (")		Prepack Flowthru 2" x 2.5'			Catchers		
Subsistence ( ) People		Prepack Flowthru 2" x 5'			3/4" x 5' O.D.	40	
Support Truck		2" x 2.5' Blank Riser			3/4" x 5' blank	18	
Steam Cleaner		2" x 5' Blank Riser			3/4" threaded rod	6	
Grout Pump		Soil Sample Case 10 / 20			Stamp blade	1	

CLIENT/REP SIGNATURE _____ DATE _____

KIFF ANALYTICAL LLC

2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. _____ Page 1 of 2

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): George Concepcion
Company/Address: Cerco 1786 E Bayou St Woodland
Phone No.: 530 668 5300 FAX No.:
Project Number: DP793 P.O. No:
Project Name: DP 793 Soil Under Slab
Project Address: Oakland

California EDF Report? ☑ Yes ☐ No

Recommended but not mandatory to complete this section:
Sampling Company Log Code: . . .
Global ID: . . . . . .
EDF Deliverable To (Email Address):
Sampler Signature: [signature]

Sample Designation	Sampling Date	Sampling Time	Container: 40 ml VOA	Container: SLEEVE	Container:	Container:	Container:	Preservative: HCl	Preservative: HNO_3	Preservative: ICE	Preservative: NONE	Preservative:	Matrix: WATER	Matrix: SOIL	Matrix:
C1 - 8/8.25	12-7-24	1015		✓						✓				✓	
C1 - 12/12.25		1047		✓						✓				✓	
C1 - 20/20.25		1034		✓						✓				✓	
C1 - 23.75/24		1037		✓						✓				✓	
C1 - 39.75/40		1210		✓						✓				✓	
C1 - 45.75/46		1230		✓						✓				✓	
C1 - 49.25/49.5		1330		✓						✓				✓	
C12 - 5.75/6.0	12-4-24	1045		✓						✓				✓	
C12 - 15.75/16		1015		✓						✓				✓	
C12 - 19.75/20		1320		✓						✓				✓	

Analysis Request	TAT	For Lab Use Only
BTEX (8021B)		
BTEX/TPH Gas/MTBE (8021B/M8015)		
TPH as Diesel (M8015)		
TPH as Motor Oil (M8015)		
TPH Gas/BTEX/MTBE (8260B)	12 hr/24 hr/48 hr/72 hr/1 wk: Rush	4
5 Oxygenates/TPH Gas/BTEX (8260B)		
7 Oxygenates/TPH Gas/BTEX (8260B)		
5 Oxygenates (8260B)		
7 Oxygenates (8260B)		
Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)		
EPA 8260B (Full List)		
Volatile Halocarbons (EPA 8260B)		
Lead (7421/239.2) TOTAL (X) W.E.T. (X)		

	Date	Time		
Relinquished by: [signature]	12-7-24	1725	Received by:	Remarks:
Relinquished by:	Date	Time	Received by:	
Relinquished by:	Date 12/8/24	Time 1725	Received by Laboratory: [signature] Kiff Analytical	Bill to: Cerco

Distribution: White - Lab, Pink - Originator

Forms/coc 121001.fh9

KIFF ANALYTICAL LLC
2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. _____ Page 2 of 2

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): Gene Comer

Company/Address:

Phone No.: FAX No.:

Project Number: DP793

P.O. No:

Project Name: DP793 Soil/Grab Water

Project Address: Oakland

California EDF Report? [4] Yes [ ] No

Recommended but not mandatory to complete this section:

Sampling Company Log Code: . . .

Global ID: . . . . . .

EDF Deliverable To (Email Address):

Sampler Signature: G Comer

Analysis Request

Sample Designation	Sampling Date	Sampling Time	Container: 40 ml VOA	Container: SLEEVE	Preservative: HCl	Preservative: HNO_3	Preservative: ICE	Preservative: NONE	Matrix: WATER	Matrix: SOIL	BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas/BTEX (8260B)	7 Oxygenates/TPH Gas/BTEX (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421/239.2) TOTAL (X) W.E.T. (X)	TAT: 12 hr/24 hr/48 hr/72 hr/1 wk	For Lab Use Only
C12 - 29.75/30	12-6-04	1410		✓			✓			✓					✓									24	
C13 - 3.75/4	12-9-04	1515		✓			✓			✓					✓										
C13 - 13.75/14	"	1520		✓			✓			✓					✓										
C13 - 21/21.5	"	1612		✓			✓			✓					✓										
C13 - 23.75/24	12-10-04	925		✓			✓			✓					✓										
C13 - 29.75/30	"	944					✓			✓					✓										

Relinquished by:	Date	Time	Received by:	Remarks:
G Comer	12-16-04	1725		
Relinquished by:	Date	Time	Received by:	
Relinquished by:	Date	Time	Received by Laboratory:	Bill to:
	12/16/04	1725	Sent To Kiff Analytical	Use

Distribution: White - Lab, Pink - Originator

Forms/coc 121001.fh9

KIFF ANALYTICAL LLC

2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. ________ Page 1 of 1

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): George Converse

Company/Address: WEGE 1386 E Beamer St, Woodland

Phone No.: 530 668 5300 FAX No.:

Project Number: DP793 P.O. No:

Project Name: DP793 Soil/Leach Probe

Project Address: Oakland

California EDF Report? [X] Yes [ ] No

Recommended but not mandatory to complete this section:

Sampling Company Log Code:

Global ID:

EDF Deliverable To (Email Address):

Sampler Signature: G Converse

Sample Designation	Sampling Date	Sampling Time	Container: 40 ml VOA	Container: SLEEVE				Preservative: HCl	Preservative: HNO_3	Preservative: ICE	Preservative: NONE	Matrix: WATER	Matrix: SOIL	
C1-W 41/44.5	12-9-04	1545	3					✓		✓		✓		
C12-W 12/16	12-6-04	1400	〃					〃		〃		〃		
C12-W 24/28	12-10-04	1315	〃					〃		〃		〃		
C13-W 24/30	12-10-04	1630	〃					〃		〃		〃		

Analysis Request

Sample Designation	BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas/BTEX (8260B)	7 Oxygenates/TPH Gas/BTEX (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421/239.2) TOTAL (X) W.E.T. (X)					TAT 12 hr/24 hr/48 hr/72 hr/1 wk	For Lab Use Only
C1-W 41/44.5					✓													1wk	
C12-W 12/16					〃													〃	
C12-W 24/28					〃													〃	
C13-W 24/30					〃													〃	

Relinquished by:	Date	Time	Received by:
G Converse	12-10-04	1715	
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Laboratory:
	121004	1715	[illegible] Kiff Analytical

Remarks:

Bill to: WEGE

Distribution: White - Lab, Pink - Originator

Forms/coc 121001.fh9

KIFF ANALYTICAL LLC

2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. ______ Page 1 of 3

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): George Converse

Company/Address: Cuese
1386 E Beamer St, Woodland

Phone No.: 530 668 5300 FAX No.:

Project Number: DP793 P.O. No.:

Project Name: DP793 - Chevy

Project Address: San Juan

California EDF Report? [x] Yes [ ] No

Recommended but not mandatory to complete this section:

Sampling Company Log Code:

Global ID:

EDF Deliverable To (Email Address):

Sampler Signature: G Converse

Analysis Request

Sample Designation	Sampling Date	Sampling Time	Container: 40 ml VOA	Container: SLEEVE	Preservative: HCl	Preservative: HNO_3	Preservative: ICE	Preservative: NONE	Matrix: WATER	Matrix: SOIL	BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas/BTEX (8260B)	7 Oxygenates/TPH Gas/BTEX (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421/239.2) TOTAL (X) W.E.T. (X)	TAT 12 hr/24 hr/48 hr/72 hr/1 wk	For Lab Use Only
C3 - 7.75/8	12-15-04	1345		✓			✓			✓					✓									1 wk	
C[illegible] - 15/15.5		1430		✓			✓			✓					✓										
C3 - [illegible]/32		1440		✓			✓			✓					✓										
C3 - [illegible]/36		1480		✓			✓			✓					✓										
C[illegible] - [illegible]/42		1515		✓			✓			✓					✓										
C6 - [illegible]/8	12-13-04	1045		✓			✓			✓					✓										
C6 - [illegible]/16		1052		✓			✓			✓					✓										
C6 - 16.5/17		1056		✓			✓			✓					✓										
C6 - 31.75/32		1122		✓			✓			✓					✓										
C6 - 34.75/35		1145		✓			✓			✓					✓										

Relinquished by:	Date	Time	Received by:
G Converse	12-15-04	1905	
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Laboratory: Kiff Analytical
	121504	1905	Jeremy [illegible]

Remarks:

Bill to: Cuese

Distribution: White - Lab, Pink - Originator

Forms/coc 121001.fh9

KIFF ANALYTICAL LLC

2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. _____ Page 2 of 3

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): Cassie Connelly

Company/Address:

Phone No.: FAX No.:

Project Number: DP 743

P.O. No:

Project Name: DP 743 Conoco

Project Address:

California EDF Report? ☑ Yes ☐ No

Recommended but not mandatory to complete this section:

Sampling Company Log Code: - - -

Global ID: - - - - - - - - - - -

EDF Deliverable To (Email Address):

Sampler Signature: Cassie Connelly

Sample Designation	Sampling: Date	Sampling: Time	Container: 40 ml VOA	Container: SLEEVE	Container:	Container:	Container:	Preservative: HCl	Preservative: HNO_3	Preservative: ICE	Preservative: NONE	Matrix: WATER	Matrix: SOIL
C7 - 7.75/8.0	12/3/04	1103		✓					·	✓			✓
C7 - 18/18.25		1015		✓						✓			✓
C7 - 29.75/30		1040		✓						✓			✓
C7 - 45.75/46		1203		✓						✓			✓
C7 - 48.75/49		1228		✓						✓			✓
C6 - 7.75/8	12/3/04	1405		✓						✓			✓
C10 - 16/16.25		1425		✓						✓			✓
C10 - 29.75/30		1500		✓						✓			✓
C10 - 33.75/34		1512		✓						✓			✓

Analysis Request

BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas/BTEX (8260B)	7 Oxygenates/TPH Gas/BTEX (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421/239.2) TOTAL (X) W.E.T. (X)					
				✓													
				✓													
				✓													
				✓													
				✓													
				✓													
				✓													
				✓													
				✓													

TAT

12 hr / 24 hr / 48 hr / 72 hr / 1 wk

14 4

For Lab Use Only

Relinquished by:	Date	Time	Received by:
Cassie Connelly	12/7/04	1900	
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Laboratory:
	121505	1905	Jeremy DeJesus

Remarks:

Bill to: Conoco

Distribution: White - Lab, Pink - Originator

Forms/coc 121001.fh9

KIFF ANALYTICAL LLC

2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. ______ Page 3 of 3

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): Glenn Connor

California EDF Report? [x] Yes [ ] No

Company/Address: WEGE 1386 E Beamer

Recommended but not mandatory to complete this section:

Sampling Company Log Code:

Global ID:

Phone No.: FAX No.:

Project Number: DP793 P.O. No:

EDF Deliverable To (Email Address):

Project Name: DP793-Cortez

Sampler Signature: G Connor

Project Address:

Analysis Request columns: BTEX (8021B); BTEX/TPH Gas/MTBE (8021B/M8015); TPH as Diesel (M8015); TPH as Motor Oil (M8015); TPH Gas/BTEX/MTBE (8260B); 5 Oxygenates/TPH Gas/BTEX (8260B); 7 Oxygenates/TPH Gas/BTEX (8260B); 5 Oxygenates (8260B); 7 Oxygenates (8260B); Lead Scav. (1,2 DCA & 1,2 EDB - 8260B); EPA 8260B (Full List); Volatile Halocarbons (EPA 8260B); Lead (7421/239.2) TOTAL (X) W.E.T. (X); TAT: 12 hr/24 hr/48 hr/72 hr/1 wk; For Lab Use Only

Sample Designation	Date	Time	40 ml VOA	SLEEVE	HCl	HNO3	ICE	NONE	WATER	SOIL	TPH Gas/BTEX/MTBE (8260B)	TAT
C11- 7.75/8.0	12-13-04	835		✓			✓			✓	✓	1 wk
C11- 17.5/18.0		850		✓			✓			✓	✓	
C11- 23.75/24.0		0910		✓			✓			✓	✓	
C11- 28.75/29		0925		✓			✓			✓	✓	
C11- 31.75/32		0935		✓			✓			✓	✓	

Relinquished by:	Date	Time	Received by:	Remarks:
G Connor	12-15-04	1425		
Relinquished by:	Date	Time	Received by:	
Relinquished by:	Date 121504	Time 1905	Received by Laboratory: Kiff Analytical [illegible]	Bill to: WEGE

Distribution: White - Lab, Pink - Originator

Forms/coc 121001.fh9

KIFF ANALYTICAL LLC

2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. ______ Page 1 of 1

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): George Converse

Company/Address: WEGE 1386 E Beamer St, Woodland

Phone No.: 530 668 5300

FAX No.:

Project Number: DP793

P.O. No:

Project Name: DP793 - Coring

Project Address: San Jose

California EDF Report? ☐ Yes ☐ No

Recommended but not mandatory to complete this section:

Sampling Company Log Code:

Global ID:

EDF Deliverable To (Email Address):

Sampler Signature: G Converse

Sample Designation	Sampling Date	Sampling Time	Container: 40 ml VOA	Container: SLEEVE	Preservative: HCl	Preservative: HNO_3	Preservative: ICE	Preservative: NONE	Matrix: WATER	Matrix: SOIL	BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas/BTEX (8260B)	7 Oxygenates/TPH Gas/BTEX (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421/239.2) TOTAL (X) W.E.T. (X)	TAT 12 hr/24 hr/48 hr/72 hr/1 wk	For Lab Use Only
C6-W15/19	12-13-04	1545	3		✓		✓		✓						✓									10 d	
C6-W35	12-13-04	1550	3		✓		✓		✓						✓										
C8-14/16	12-13-04	815	3		✓		✓		✓						✓										
C8-34/38	12-15-04	820	3		✓		✓		✓						✓										
C9-27/31	12-15-04	8:00	3		✓		✓		✓						✓										
C11-W29/32	12-13-04	1115	3		✓		✓		✓						✓										

Relinquished by:	Date	Time	Received by:
G Converse	12/15/04	1655	
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Laboratory: Kiff Analytical
	121504	1655	[illegible]

Remarks:

Bill to: Weber-Hayes [illegible]

Distribution: White - Lab, Pink - Originator

Forms/coc 121001.fh9

41593

KIFF ANALYTICAL LLC

2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. ______ Page 1 of 2

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): George Converse

Company/Address: WEGE Bill C. Bremen Woodland CA

Phone No.: 530 668 5300 FAX No.: 530 662 0273

Project Number: P.O. No:

Project Name: D0793

Project Address: 4555 Main Street Oakland, CA

California EDF Report? ☐ Yes ☒ No

Recommended but not mandatory to complete this section:
Sampling Company Log Code:
Global ID:
EDF Deliverable To (Email Address):

Sampler Signature: [signature]

Analysis Request

Sample Designation	Date	Time	40 ml VOA	SLEEVE	HCl	HNO_3	ICE	NONE	WATER	SOIL	BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas/BTEX (8260B)	7 Oxygenates/TPH Gas/BTEX (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421/239.2) TOTAL (X) W.E.T. (X)	TAT 12 hr/24 hr/48 hr/72 hr/1 wk	For Lab Use Only
C8-7.75/8.0	12-14-04	11:39		1			|			|					X									1wk	
C8-11.75/12.0		12:02					|			|					X										
C8-15.75/16.0		12:07					|			|					X										
C8-29.75/30.0		12:41					|			|					X										
C8-37.75/38.0		1:12					|			|					X										
C9-7.75/8.0		10:00					|			|					X										
C9-11.75/12.0		10:05					|			|					X										
C9-23.75/24.0		10:25					|			|					X										
C9-30.75/31.0	12-14-04	10:40		1			|			|					X									1wk	

Relinquished by:	Date	Time	Received by:
[signature]	12/16/04	13:23	
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Laboratory: Kiff Analytical
	12/17/04	13:53	[signature]

Remarks:

Bill to: WEGE

Distribution: White - Lab, Pink - Originator

Forms/coc 121001.fh9

KIFF ANALYTICAL LLC

2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. ________ Page 2 of 2

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): George [illegible]

California EDF Report? ☐ Yes ☒ No

Company/Address: [illegible]

Recommended but not mandatory to complete this section:
Sampling Company Log Code:
Global ID:
EDF Deliverable To (Email Address):

Phone No.: [illegible] FAX No.: 530 [illegible]

Project Number: P.O. No:

Project Name: [illegible] 793

Sampler Signature: [signature]

Project Address: [illegible] Blvd. [illegible], CA

Sample Designation	Sampling Date	Sampling Time	Container: 40 ml VOA	Container: SLEEVE	Preservative: HCl	Preservative: HNO_3	Preservative: ICE	Preservative: NONE	Matrix: WATER	Matrix: SOIL	BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas/BTEX (8260B)	7 Oxygenates/TPH Gas/BTEX (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421/239.2) TOTAL (X) W.E.T. (X)	TAT: 12 hr/24 hr/48 hr/72 hr/1 wk	For Lab Use Only
C9 water [illegible]	12/[illegible]	12:20	3		|		|		|						X									1 wk	
C[illegible] water [illegible]	12/[illegible]/04	8:32	3		|		|		|						X									|	
C[illegible] water 29-34'	12/[illegible]/04	8:36	3		|		|		|						X									1 wk	

Relinquished by:	Date	Time	Received by:
[signature]	12/17/04	1337	
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Laboratory:
	12/17/04	1337	[signature] Kiff Analytical

Remarks:

Bill to: [illegible]

Distribution: White - Lab, Pink - Originator

Forms/coc 121001.fh9

KIFF ANALYTICAL LLC

2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. _____ Page 1 of 1

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): George Comeau
Company/Address: LAW ECE
1386 E Bianna St, Woodland
Phone No.: 530 668 5200 FAX No.:
Project Number: DP793
P.O. No:
Project Name: DP793 - Comeau
Project Address: San Jose

California EDF Report? ☐ Yes ☐ No
Recommended but not mandatory to complete this section:
Sampling Company Log Code: - - -
Global ID: - - - - - - - - - - - -
EDF Deliverable To (Email Address):
Sampler Signature: George Comeau

Sample Designation	Sampling: Date	Sampling: Time	Container: 40 ml VOA	Container: SLEEVE	Container:	Container:	Container:	Preservative: HCl	Preservative: HNO_3	Preservative: ICE	Preservative: NONE	Matrix: WATER	Matrix: SOIL
C2 - 8.5/8.75	12-16-04	1106		✓						✓			✓
C2 - 19/19.25		1130		✓						✓			✓
C2 - 22.5/23.0		1131		✓						✓			✓
C2 - 39.75/40		1240		✓						✓			✓
C2 - 49.25/49.5		1350		✓						✓			✓
C4 - 7.75/8		1445		✓						✓			✓
C4 - 19.5/20.0		1500		✓						✓			✓
C4 - 25.75/26		1510		✓						✓			✓
C4 - 39.75/40		1607		✓						✓			✓

Analysis Request	TAT: 12 hr / 24 hr / 48 hr / 72 hr / 1 wk	For Lab Use Only
BTEX (8021B)	1	4
BTEX/TPH Gas/MTBE (8021B/M8015)		
TPH as Diesel (M8015)		
TPH as Motor Oil (M8015)		
TPH Gas/BTEX/MTBE (8260B)		
5 Oxygenates/TPH Gas/BTEX (8260B)	✓	
7 Oxygenates/TPH Gas/BTEX (8260B)		
5 Oxygenates (8260B)		
7 Oxygenates (8260B)		
Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)		
EPA 8260B (Full List)		
Volatile Halocarbons (EPA 8260B)		
Lead (7421/239.2) TOTAL (X) W.E.T. (X)		

Relinquished by:	Date	Time	Received by:
George Comeau	12-17-04	1322	
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Laboratory:
	121704	1322	on ice - Kiff Analytical

Remarks:

Bill to: LAW ECE

Distribution: White - Lab, Pink - Originator

Forms/coc 121001.fh9

KIFF ANALYTICAL LLC

2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. _____ Page 1 of 1

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): George Conner

California EDF Report? ☑ Yes ☐ No

Company/Address: UCCE
1356 E Bayne St Woodland

Recommended but not mandatory to complete this section:
Sampling Company Log Code: - - -

Phone No.: 530 668 5300

FAX No.:

Global ID: - - - - - - - - - - -

Project Number: DF 793

P.O. No:

EDF Deliverable To (Email Address):

Project Name: DF793-Conner

Sampler Signature: George Conner

Project Address: San Jose

Sample Designation	Sampling: Date	Sampling: Time	Container: 40 ml VOA	Container: SLEEVE	Container:	Container:	Container:	Preservative: HCl	Preservative: HNO_3	Preservative: ICE	Preservative: NONE	Preservative:	Matrix: WATER	Matrix: SOIL	Matrix:	BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas/BTEX (8260B)	7 Oxygenates/TPH Gas/BTEX (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421/239.2) TOTAL (X) W.E.T. (X)					TAT: 12 hr/24 hr/48 hr/72 hr/1 wk	For Lab Use Only
C2-W 38/44.5	12-17-04	0848	3					✓		✓			✓							✓														4/4	
C3-W 14/18	12-16-04	0845	3					✓		✓			✓							✓															
C3-W 34/42	12-16-04	0847	3					✓		✓			✓							✓															
C4-W 12/16	12-17-04	0846	3					✓		✓			✓							✓															
C4-W 27/40	12-17-04	0853	3					✓		✓			✓							✓															
C7-W 14/18	12-16-04	0815	3					✓		✓			✓							✓															
C7-W 34.5/49	12-16-04	0852	3					✓		✓			✓							✓															
C11-W 14/18	12-16-04	0800	3					✓		✓			✓							✓															

Relinquished by:	Date	Time	Received by:	Remarks:
George Conner	12-17-04	1315		
Relinquished by:	Date	Time	Received by:	
Relinquished by:	Date	Time	Received by Laboratory:	Bill to:
	12/17/04	1315	Drop To Kiff Analytical	UCCE

Distribution: White - Lab, Pink - Originator

Forms/coc 121001.fh9

KIFF ANALYTICAL LLC

2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. ______ Page 1 of 2

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): George Converse

Company/Address: WEGE 1986 E Beamer St Woodland

Phone No.: 530 668 5300 | FAX No.:

Project Number: DP 793 | P.O. No:

Project Name: DP 793 - 1st Qtr

Project Address: Oakland

California EDF Report? ☒ Yes ☐ No

Recommended but not mandatory to complete this section:

Sampling Company Log Code:

Global ID:

EDF Deliverable To (Email Address):

Sampler Signature: G Converse

Sample Designation	Date	Time	40 ml VOA	SLEEVE	HCl	HNO_3	ICE	NONE	WATER	SOIL
MW-01	6-10-04	1350	3		✓		✓		✓	
RS-02	6-10-04	1425	3		✓		✓		✓	
RS-05	6-10-04	1625	3		✓		✓		✓	
RS-06	6-10-04	1530	3		✓		✓		✓	
RS-07	6-10-04	1135	3		✓		✓		✓	
RS-08	6-10-04	1055	3		✓		✓		✓	
RS-09	6-10-04	905	3		✓		✓		✓	
RS-10	6-10-04	1025	3		✓		✓		✓	
LF-01	6-10-04	1238	3		✓		✓		✓	
T1	6-10-04	952	3		✓		✓		✓	

Analysis Request

Sample Designation	BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas/BTEX (8260B)	7 Oxygenates/TPH Gas/BTEX (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421/239.2) TOTAL (X) W.E.T. (X)	TAT 12 hr/24 hr/48 hr/72 hr/1 wk	For Lab Use Only
MW-01					✓									1wk	
RS-02					✓									1wk	
RS-05					✓									1wk	
RS-06					✓									1wk	
RS-07					✓									1wk	
RS-08					✓									1wk	
RS-09					✓									1wk	
RS-10					✓									1wk	
LF-01					✓									1wk	
T1					✓									1wk	

Relinquished by	Date	Time	Received by
G Converse	6-11-04	840	
	06/11/04	0840	Received by Laboratory: [illegible] Kiff Analytical

Remarks:

Bill to: WEGE

Distribution: White - Lab, Pink - Originator

Forms/coc 121001.fh9

KIFF ANALYTICAL LLC

2795 2nd Street, Suite 300
Davis, CA 95616
Lab: 530.297.4800
Fax: 530.297.4808

Lab No. ____________

Chain-of-Custody Record and Analysis Request

Project Contact (Hardcopy or PDF To): George Converse

Company/Address: WEGE

Phone No.:

FAX No.:

Project Number: DP-793

P.O. No:

Project Name: DP793 - [illegible]

Project Address: Oakland

California EDF Report? ☒ Yes ☐ No

Recommended but not mandatory to complete this section:

Sampling Company Log Code:

Global ID:

EDF Deliverable To (Email Address):

Sampler Signature: [signature]

Analysis Request

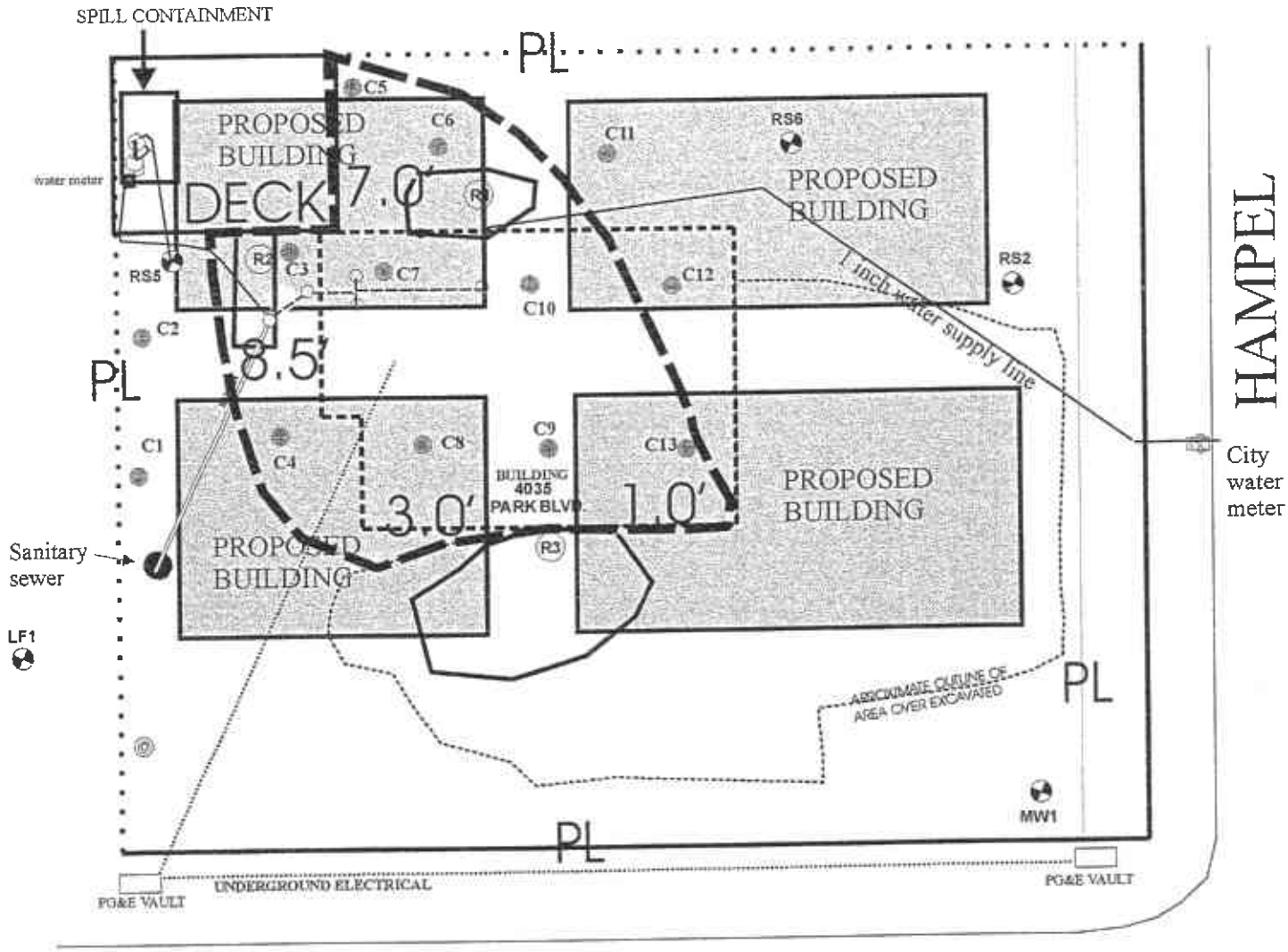
Sample Designation	Date	Time	Container: 40 ml VOA	Container: SLEEVE				Preservative: HCl	Preservative: HNO_3	Preservative: ICE	Preservative: NONE	Matrix: WATER	Matrix: SOIL	BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas/BTEX (8260B)	7 Oxygenates/TPH Gas/BTEX (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421/239.2) TOTAL (X) W.E.T. (X)					TAT: 12 hr/24 hr/48 hr/72 hr/1 wk	For Lab Use Only
R-01	6/4/04	1717	3					✓		✓		✓						✓													1wk	
R-02	〃	1658	3					✓		✓		✓						✓													〃	
R-03	〃	1559	3					✓		✓		✓						✓													〃	
EB	〃	1715	3					✓		✓		✓						✓													〃	

Relinquished by:	Date	Time	Received by:
[signature] G Converse	6/4/04	840	
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by Laboratory:
	060404	1540	[signature] Kiff Analytical

Remarks:

Bill to: WEGE

Distribution: White - Lab, Pink - Originator



OUTLINE AREA OF COBBLE FILL.

7.0' DEPTH TO BASE OF COBBLE FILL.

MW1 MONITOR WELL

2 in series 55 gallon carbon filters.

C1 - C13 Proposed locations for continuous core borings.

FIGURE 3- PROPOSED HOUSES SEWER DISCHARGE TREATMENT COMPOUND WASTEWAER DISCHARGE PERMIT # 5043550 1

(Revised 10/27/03)

NOTE: THE PROPOSED SOIL/WATER SAMPLE LOCATIONS ARE APPROXIMATELY ON 15 FOOT SPACINGS THAT WOULD ALLOW FOR THE COLLECTION OF SOIL AND GROUNDWATER SAMPLES TO PERFORM A DETAILED RISK ASSESSMENT OF THE AREAS PROJECTED FOR FUTURE HOME SITES. THE 15 FOOT SPACING WOULD HELP IN EVALUATING IF AND WHAT AMOUNTS OF CONTAMINATED SOILS WOULD NEED TO BE EXCAVATED AND WOULD ADD TO THE ASSESSMENT OF WHERE AND HOW THE ORIGINAL PETROLEUM RELEASE LEFT THE SITE AND ENTERED THE SEWER AND BACKYARDS OF ADJACENT PROPERTIES. DRILLING METHODS; SINCE THERE IS A COBBLE BACKFILL, DIRECT PUSH W/AUGER CAPABILITIES METHODS MAY BE NECESSARY TO PENETRATE TO THE DESIRED DEPTHS.

SITE SAFETY PLAN

FOR

DESERT PETROLEUM, INC.
DIRECT PUSH CORING AND SAMPLING ASSESSMENT

FACILITY BACKGROUND:

SITE ADDRESS: **4035 PARK BLVD., OAKLAND, CA**

SITE OWNER NAME: **KIN MAN LI**

DIRECTIONS TO SITE: **From Interstate 80 west take Highway 680 south, east onto Highway 12, south onto Highway 13 then west onto Park Blvd. Site is fenced lot northwest corner Park Blvd and Hammel.**

TYPE FACILITY: Former gasoline retail currently vacant lot.

KEY PERSONNEL AND RESPONSIBILITIES

CONSULTANT: **Western Geo-Engineers – Sampling (C57-513857)**
1386 E. Beamer Street
Woodland, Ca. 95776-6003
(530) 668-5300
Field Geologist – George Converse
CA. REG. Geologist #3037 – Jack E. Napper

CONTRACTORS: **DRILLING C57 – 710079**
Woodward Drilling, Inc.
P.O. Box 336
Rio Vista, CA 94571
(707) 374-4300

SAFETY OFFICER: **George Converse**

ENTRY OBJECTIVIES Perform direct push sampling of soil and groundwater using "Power Probe" drilling rig with minimal disturbance to site operations. Total depth of probes approximately 45 - 50 feet below the surface. Destroy probe holes same day.

SITE ACTIVITIES:

1. Health and Safety tailgate meeting.
2. Construct soil stockpile area on-site.
3. Power Probe test holes.
4. Pressure grout place neat cement into probe holes. Resurface with like material.
5. Clean site.
6. Cover excavated soils with plastic liner.

JOB HAZARD ANALYSES

PHYSICAL HAZARDS

X NOISE
X UNDERGROUND HAZARDS
_EXCAVATIONS/TRENCHES
X OTHER__gasoline range hydrocarbon vapors_
X TRAFFIC
__OVERHEAD HAZARDS
X MECHANICAL EQUIPMENT

LEVEL OF PROTECTIVE EQUIPMENT

__A __B __C X D

PERSONAL PROTECTIVE EQUIPMENT

R = REQUIRED A = AS NEEDED

R HARD HAT
R SAFETY BOOTS
R ORANGE VEST
R HEARING PROTECTION
R SAFETY EYEWEAR (TYPE)SAFETY GLASSES
__RESPIRATOR (TYPE)_____
__FILTER (TYPE)_____
R GLOVES (TYPES)NYTRIL INNER GLOOVE LEATHER OUTER GLOOVE

A TYVEK COVERALLS
__5 MIN ESCAPE RESPIRATOR
__OTHER_____

MONITORING EQUIPMENT ON SITE

__OGRANIC VAPOR ANALYZER
__OXYGEN METER
__COMBUSTIBLE GAS METER
__H_2S METER
__W.B.G.T.
R PID WITH LAMP OF 10.6Ev
__SORBENT SAMPLE TUBES (TYPE)____
__PASSIVE DOSIMETER
__AIR SAMPLING PUMP
__FILTER MEDIA_____

RISK ASSESSMENT

FIRE AND EXPLOSION REVENTION: THE WORK AREAS WILL BE TAPED AND CONED OFF TO KEEP THE GENERAL PUBLIC OUT. NO SMOKING SIGNS WILL BE POSTED ON THE CONES. SMOKING WILL NOT BE PERMITTED INSIDE THE WORK AREA. ALL ELECTRICAL EQUIPMENT USED WILL BE IN GOOD WORKING CONDITION WITH NO EXPOSED WIRES. SPARK ARRESTORS WILL BE ON ALL MOTOR AND EXHUASTS. HAND TOOLS WILL BE SPARK RESISTANT.

FIRE EXTINGUISHERS WILL BE PLACE NEAR THE DRILLING RIG FOR EASY ACCESS. EXTINGUISHERS WILL BE CARBON DIOXIDE TYPE (FLAMMABLE LIQUIDS AND ELECTRICAL FIRES).

TRAFFIC: Site is completely fence off no unauthorized personnel will be allowed to enter.

WEATHER: COOL TEMPERATURES ARE EXPECTED, 45 - 60 DEGREE F TEMPERATURE.

CONTAMINATED SOILS: EXCAVATED SOILS ARE EXPECTED TO CONTAIN GASOLINE RANGE HYDROCARBONS.

CONTAMINATED GROUNDWATER: EXPECTED TO CONTAIN GASOLINE RANGE HYDROCARBONS.

EXPOSURE MONITORING PLAN

SITE CLOSURE: THE WORK AREAS WILL BE SECURED WITH CONES AND CAUTION TAPE. NON-SMOKING SIGNS WILL BE POSTED. WORKERS WILL WEAR STEEL TOE BOOTS (SHOES), HARD HATS AND EAR PROTECTION. ALL WORK WILL BE CONDUCTED INSIDE OF THE CONED OFF. THE HEALTH AND SAFETY OFFICER WILL WATCH FOR UNAUTHORIZED TRAFFIC AND THE WORKERS WILL USE THE BUDDY SYSTEM.

COLD: WORKERS WILL DRINK PLENTY OF FLUIDS, WEAR APPROPRIATE CLOTHING AND KEEP CLOTHING AS DRY AS POSSIBLE TO SHEILD FROM FOGGY WEATHER THAT MAY BE AS COLD AS 35 DEGREES AND WILL PERFORM SELF MONITORING FOR EXTREMITY NUMBNESS, FATIGUE, DIZZINESS, ALERTNESS. HEALTH AND SAFETY OFFICER WILL MONITOR WORKERS FOR ALERTNESS AND FLUID INTAKE. IF NECESSARY WORK WILL BE SLOWED OR PERFORMED IN SHIFTS IF COLD FATIGUE IS NOTICED.

HEAT: DURING SUMMER TIME, WHEN MEAN DAYTIME DAILY TEMPERATUREA ARE EXPECTED TO EXCEED 70^0F. WHEN WEARING STANDARD LEVEL D WORK UNIFORMS A HEAT MONITORING PROGRAM IS INITIATED AT AMBIENT TEMPERATURE EXCEEDING 85^0F.

Monitoring: Pulse for 30 seconds multiplied by 2 should not exceed 110 beats per minute
Workers will take breaks as needed.
Workers will intake fluids as needed.

DRILLING: WORKERS WILL USE COMMON SENSE AND GOOD WORK HABITS TO PERFORM THEIR DESIGNATED JOBS.

CONTAMINANT EXPOSURE: GEOLOGIST/HEALTH AND SAFETY OFFICER WILL MONITOR THE DRILLING ACTIVITIES AND SOILS/FLUIDS GENERATED BY THE DRILLING ACTIVITIES FOR ORGANIC VAPORS USING A PHOTO IONIZING DETECTOR WITH A 10.6 EV BULB. IF WORK AREA EXCEDES **25 PPMV** THE DRUILLING WILL BE SLOWED TO DECREASE THE PPMV VALUE.

WORK ZONES AND SECURITY MEASURES

THE IMMEDIATE WORK ZONES WILL BE CONED OFF AND THE HEALTH AND SAFETY OFFICER WILL INSURE THAT NO UNAUTHORIZED PERSONNEL ENTER THE WORK AREA.

DECONTAMINATION MEASURES

At the end of each workday all personnel (and subcontractors) will thoroughly wash their hands, face and footwear before leaving the site. In the event that personnel protective equipment is necessary, all disposable items will be deposited into a steel drum container on site and all reusable items will be washed with TSP detergent and rinsed with clean water. Residual liquid will be placed into a 55 gallon drum that will be labeled and stored on site. Personnel will not be allowed to leave the contaminated area without completing the decontamination process. All waste material will be placed in environmental drums or tanks and stored at site. All containers will be properly labeled as per current City, County and State regulations.

GENERAL SAFE WORK PRACTICES

All personnel performing sampling will wear disposable gloves. Anyone entering the site without authorization will be asked to leave and escorted out of the control area. All workers will practice good hygiene practices: no smoking in control area, wash hands and face prior to handling food and drinks, be aware of the public at all times.

MEDICAL CONTINGENCY PLAN

HOSPITAL/CLINIC: Alameda County Medical Center
ADDRESS: Highland Park, E. 31st & 14th Ave.
PHONE NUMBER: (510) 437-4557
PARAMEDIC: 911 FIRE: 911 POLICE: 911

Any personnel at the site who are injured must notify the Site Safety Officer. Paramedics can be at the site location within 10 minutes for extreme emergencies. If any chemical exposures are exceeded, a medical exam will be required.

JOB HAZARD ANALYSIS

MAIN COMPOUND (S) OF INTEREST: IN PPMV

EXPOSURE TABLE

COMPOUND	TLV-8HR	IDLH	STEL(st)	C	NIOSH PAGE
BENZENE	0.1	500	1.0	Ca	26
TOLUENE	100	500	150	300	310
XYLENES	100	900	150		336
ETHYLBENZENE	100	800	125		132
MTBE				Ca?	

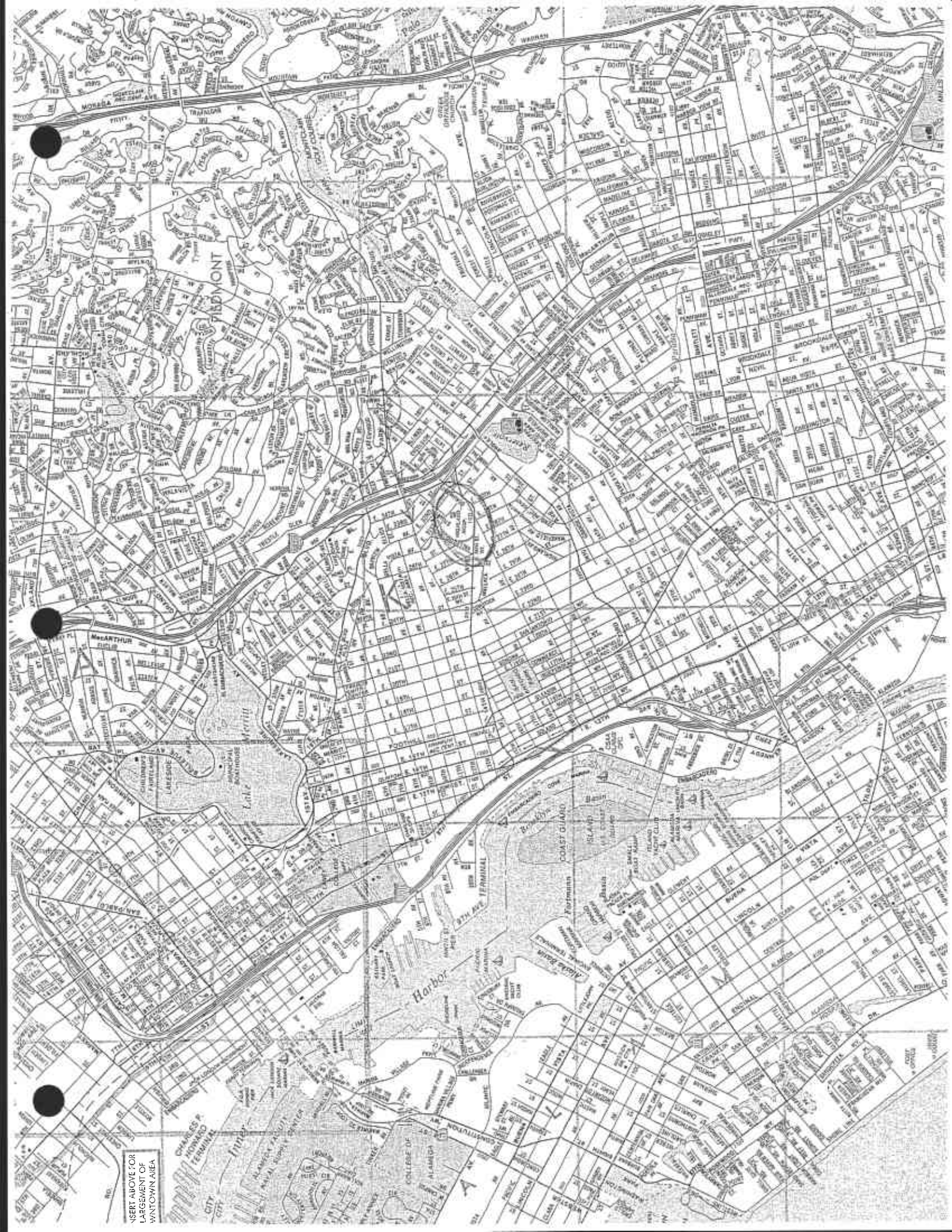
Ca – CARCINOGENS, SEE PAGE 344 OF NIOSH
Ca? – QUESTIONABLE CARCINOGEN
TLV-8HR, THRESHOLD LIMIT VALUE AVERAGED OVER AN 8-HOUR DAY– NIOSH RECOMMENDED. OSHA USES PEL'S (PERMISSABLE EXPOSURE LEVELS) WHICH ARE LESS CONSERVATIVE THAN THE TLV'S.
IDLH – IMMEDIALTLY DANGEROUS TO LIFE AND HEALTH WITH 30 MINUTE EXPOSURE.
STEL – SHORT TERM EXPOSURE LEVEL, CAN BE EXPOSED FOR 15 MINUTES 4 TIMES A SHIFT WITH AT LEASE 1 HOUR BETWEEN EXPOSURES.
C – CEILING, DO NOT EXCEED THIS EXPOSURE WITHOUT SOME SORT OF AIR PURIFYING DEVISE.

TARGET ORGANS

EYES, SKIN, RESPITORY SYSTEM, BLOOD, CENTRAL NERVOUS SYSTEM, BONE MARROW, LIVER, KIDNEYS AND GASTROINTESTINAL TRACT.

ROUTES OF EXPOSURE

INHALLATION, ABSORBTION, INGESTION AND INJECTION


PIEDMONT
MacARTHUR
Lake Merritt
Harbor
Inner
COAST GUARD
ISLAND
CHARLES P. HOWARD TERMINAL
INSERT ABOVE FOR LARGEMENT OF WNTOWN AREA

SYMPTOMS

IRRITATION TO EYES, NOSE, SKIN, THROAT, AND UPPER RESPORATORY SYSTEM. SKIN BURNS MUSCLE SPASMS, SLOW PULSE. WEAK, CONFUSED, DIZZY, LIGHT HEADED, EUPHORIC, EXCITED, NARCOUSIS.

SITE HAZARD INFORMATION PROVIDED BY: GEORGE CONVERSE

PHONE NUMBER **(530) 668-5300** **DATE November 30, 2004**

I HAVE READ AND FULLY UNDERSTAND THE INFORMATION AND SAFETY REQUIREMENTS IN THIS SITE SAFETY PLAN.

SIGNATURES

Rick Barragan [signature] 12-09-04	
(print name sign name date)	**(print name sign name date)**
BILL S. Kishi Sr. [signature] 12-9-04	
(print name sign name date)	**(print name sign name date)**
(print name sign name date)	**(print name sign name date)**
(print name sign name date)	**(print name sign name date)**
(print name sign name date)	**(print name sign name date)**
(print name sign name date)	**(print name sign name date)**

CASCADE DRILLING, INC.
CALIFORNIA
STATE CONTRACTOR'S
LICENSE # 657-717510

SACRAMENTO
3632 Omec Circle
Rancho Cordova, CA 95742
(916) 638-1169 PH
(916) 638-5611 FAX

FAXED
August 17, 2004

Proposal #: S4-469

George Converse
Western Geo Engineers
1386 East Beamer Street
Woodland, CA 95776

FX: (530) 662-0273
PH: (530) 668-5300

Dear Mr. Converse:

Cascade Drilling, Inc. is pleased to submit this proposal for direct push services at **Former Desert Petroleum #793, 4035 Park Blvd. in Oakland, CA.** This proposal is based on your fax and is valid for 60 days.

Push, Sample & Backfill 13-30' to 50' Borings (Est. 6)	$2,500.00/Day
Per Diem, 2 Man Crew (Est. 6)	$300.00/Night
Level C Add	$20.00/Hr/Man
Mob / Demob	Included
55 Gallon 17H Drums (Open)	$40.00/Ea
Sample Liners (Open)	$5.00/Ea
Hydropunch Sampling (Est. 26)	$25.00/Ea
Project Estimated Total	**$17,450.00**

TERMS AND CONDITIONS

Your firm shall be responsible for 1) Obtaining any well or site specific permits. 2) Furnishing Cascade Drilling, Inc. with current Dig Alert confirmation number(s). 3) Locating and clearly marking any underground installations or utilities. 4) Obtaining access to the site for normal, truck mounted drill rig with no overhead wires within 20 feet of the holes. Cascade Drilling, Inc. shall not be responsible for any damages to underground improvements not clearly and accurately marked.

If there are any changes to the above quoted scope of work or bedrock, cobbles, flowing sands, or other adverse drilling conditions are encountered, drilling may be continued on a time and materials basis or terminated at the discretion of Cascade Drilling, Inc.

CANCELLATION: A fee of $500.00 will apply for any job cancelled within 24 hours of the scheduled start time.
PAYMENT TERMS: Payment is due 60 days after receipt of Invoice unless prior arrangements have been made.

We look forward to working with you. Please call if you have any questions or require additional information.

Sincerely,

Don Kinloch
General Manager

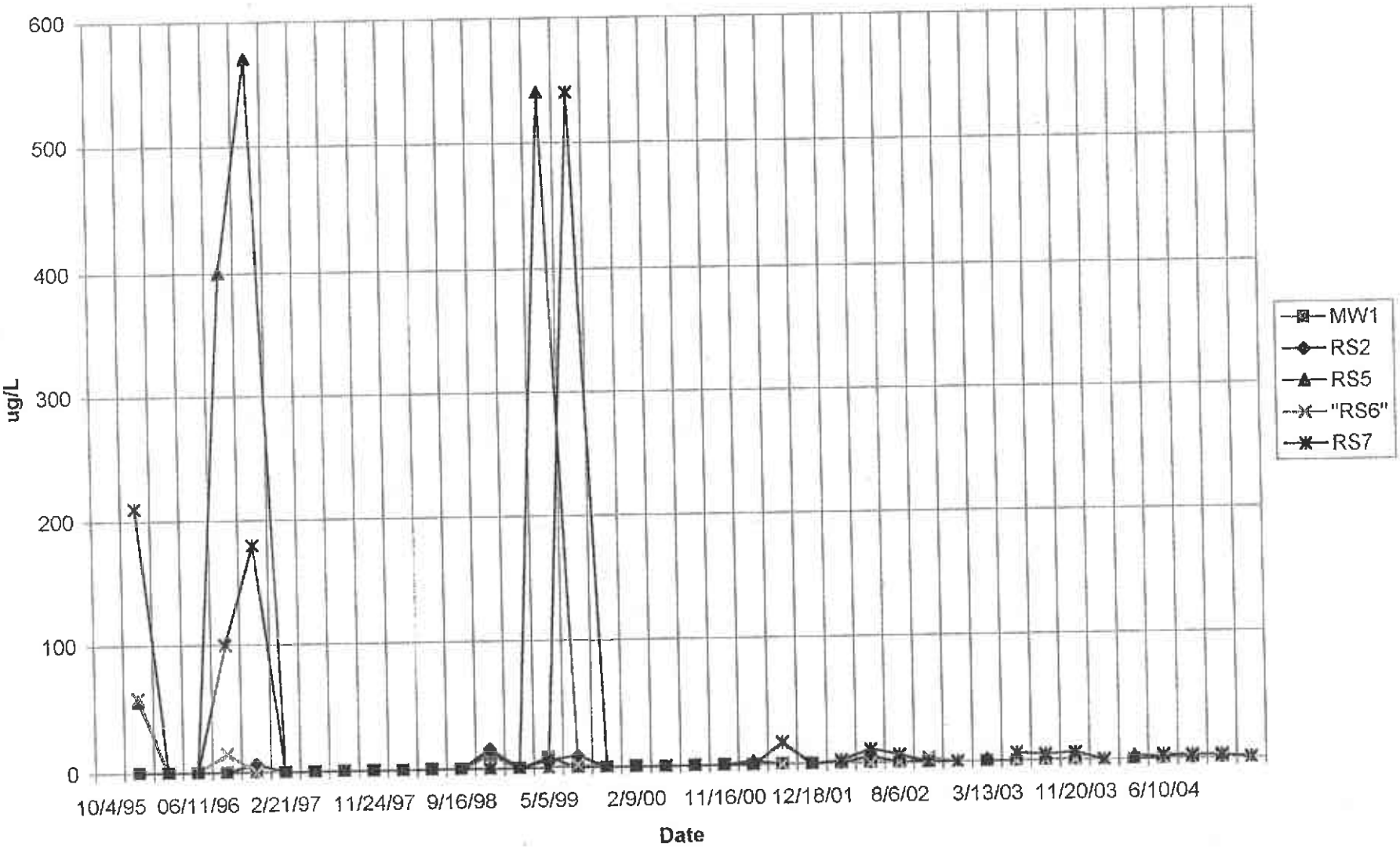
Proposal Terms and Conditions Acceptance

Authorized Signature: _____
Title: _____
Date: _____

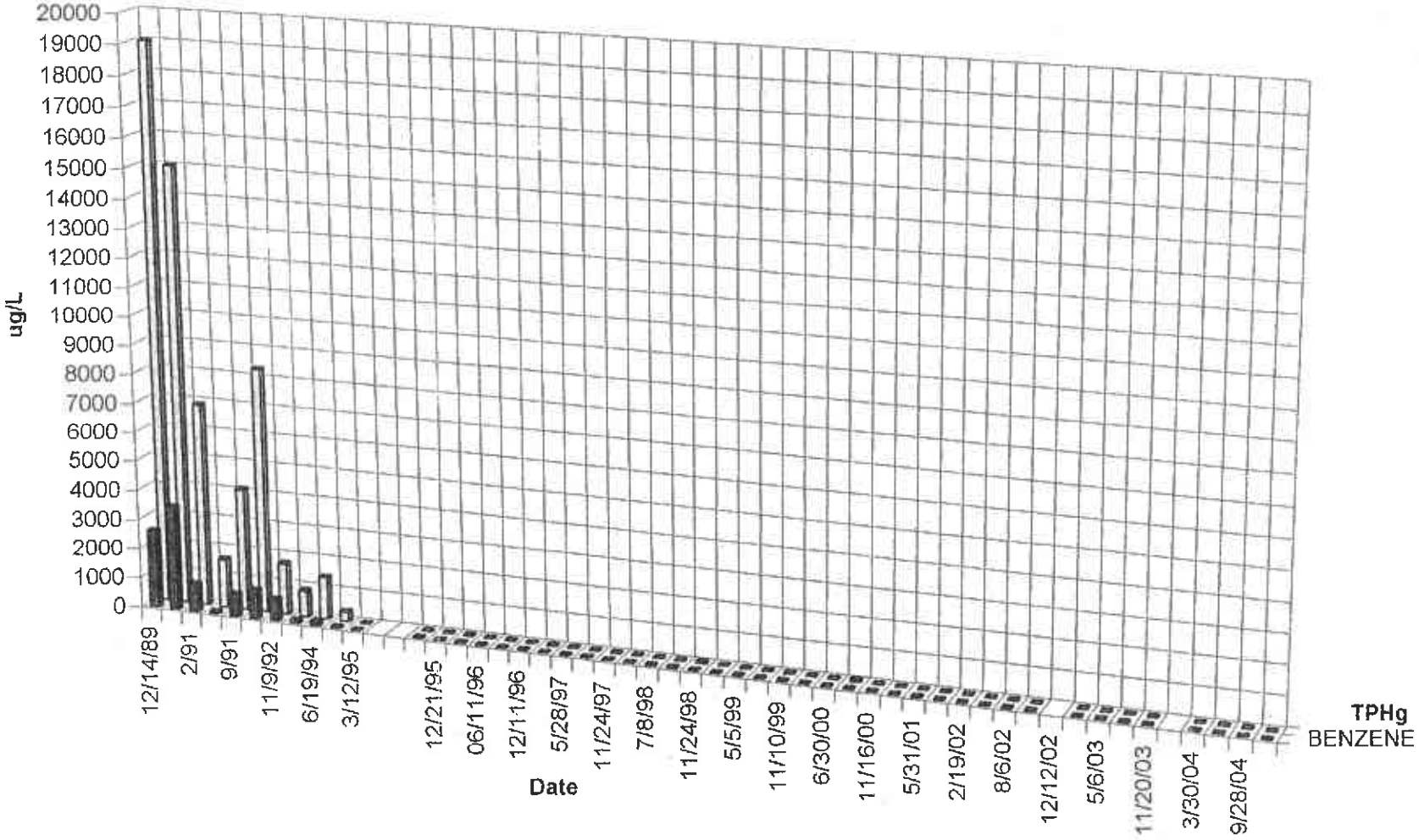
APPENDIX E

MtBE, TPHg AND BENZENE CHARTS

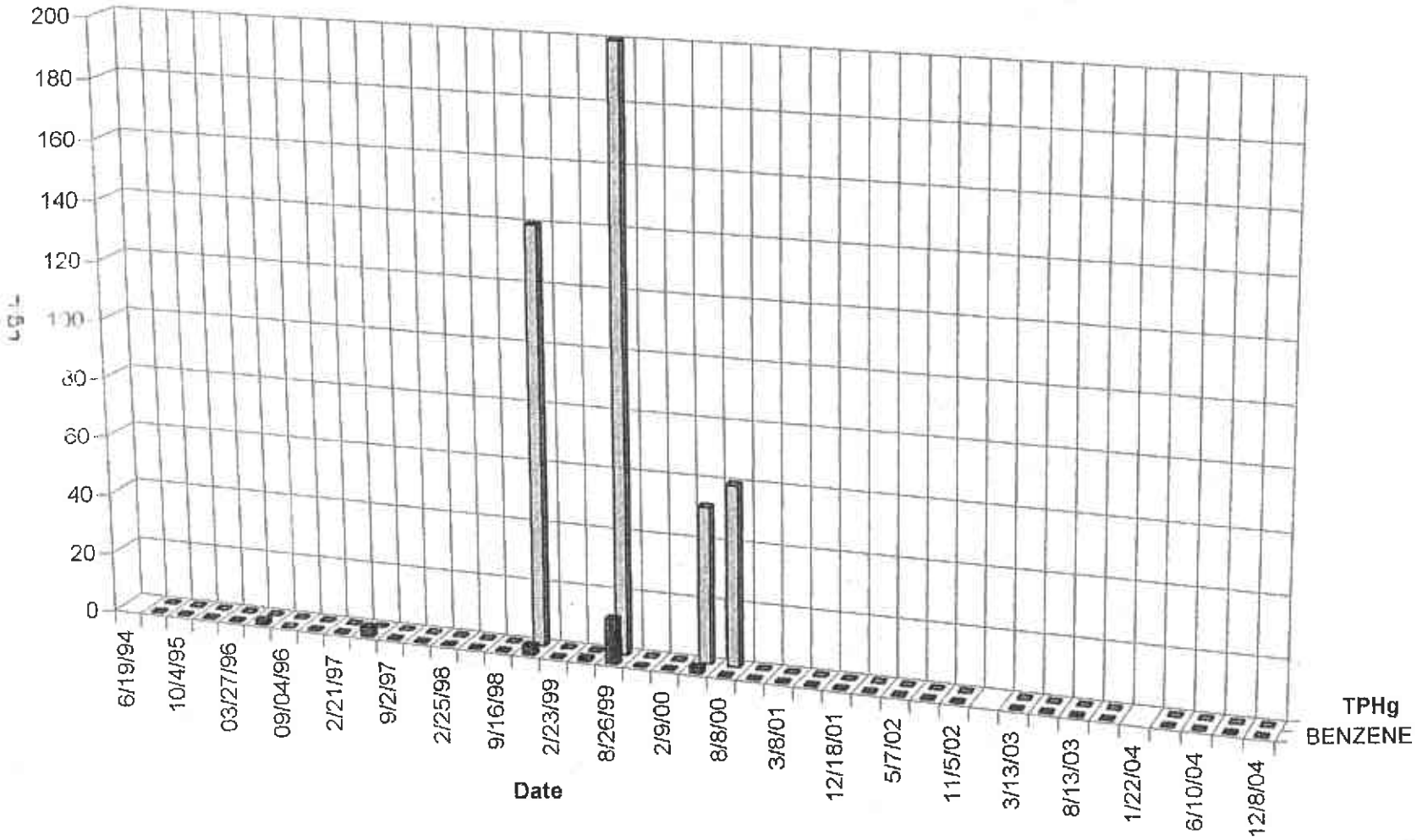
MTBE IN WELLS



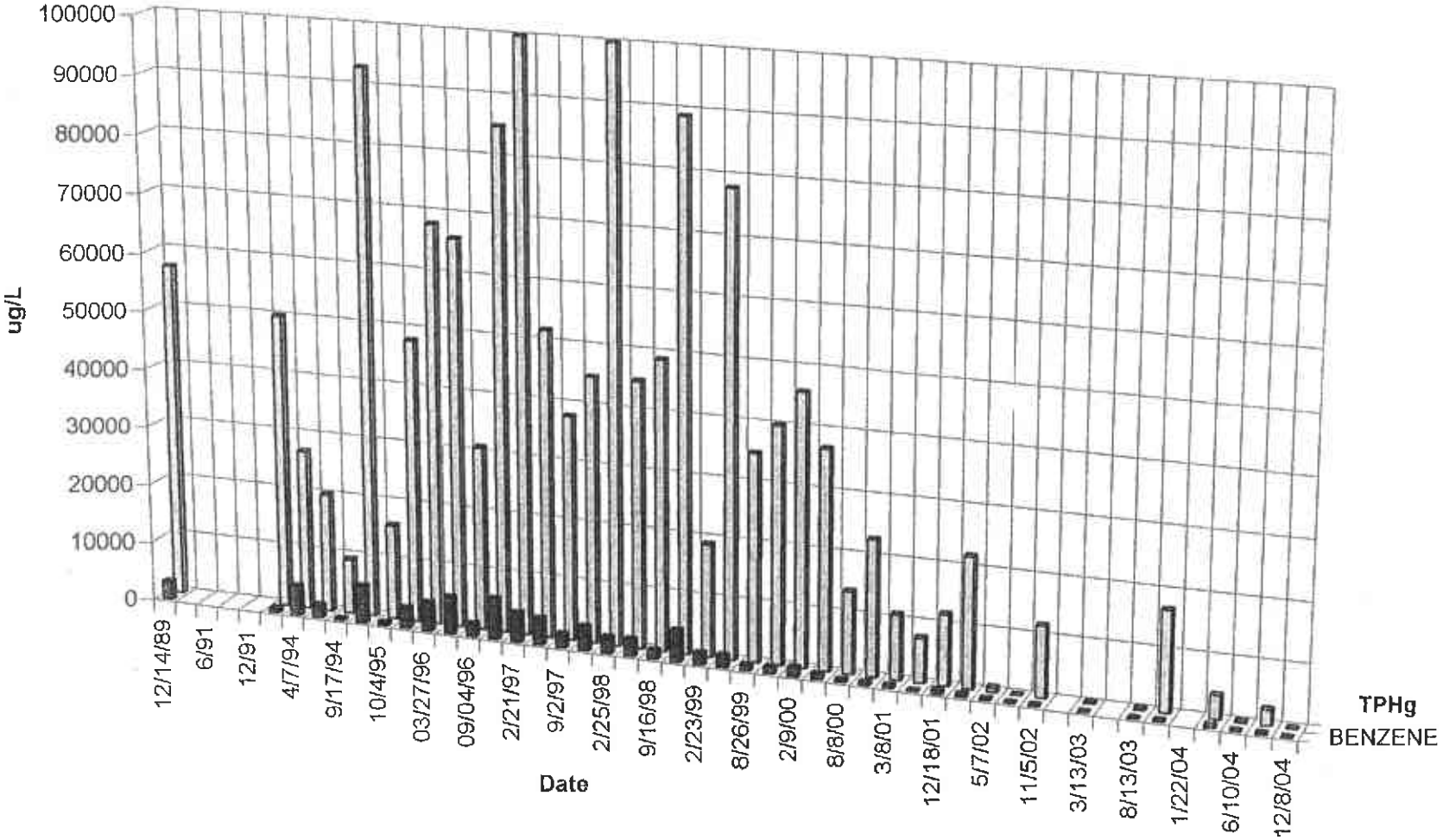
RS-1/MW-1 TPHg


20000
19000
18000
17000
16000
15000
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
ug/L
12/14/89
2/91
9/91
11/9/92
6/19/94
3/12/95
12/21/95
06/11/96
12/11/96
5/28/97
11/24/97
7/8/98
11/24/98
5/5/99
11/10/99
6/30/00
11/16/00
5/31/01
2/19/02
8/6/02
12/12/02
5/6/03
11/20/03
3/30/04
9/28/04
Date
TPHg
BENZENE

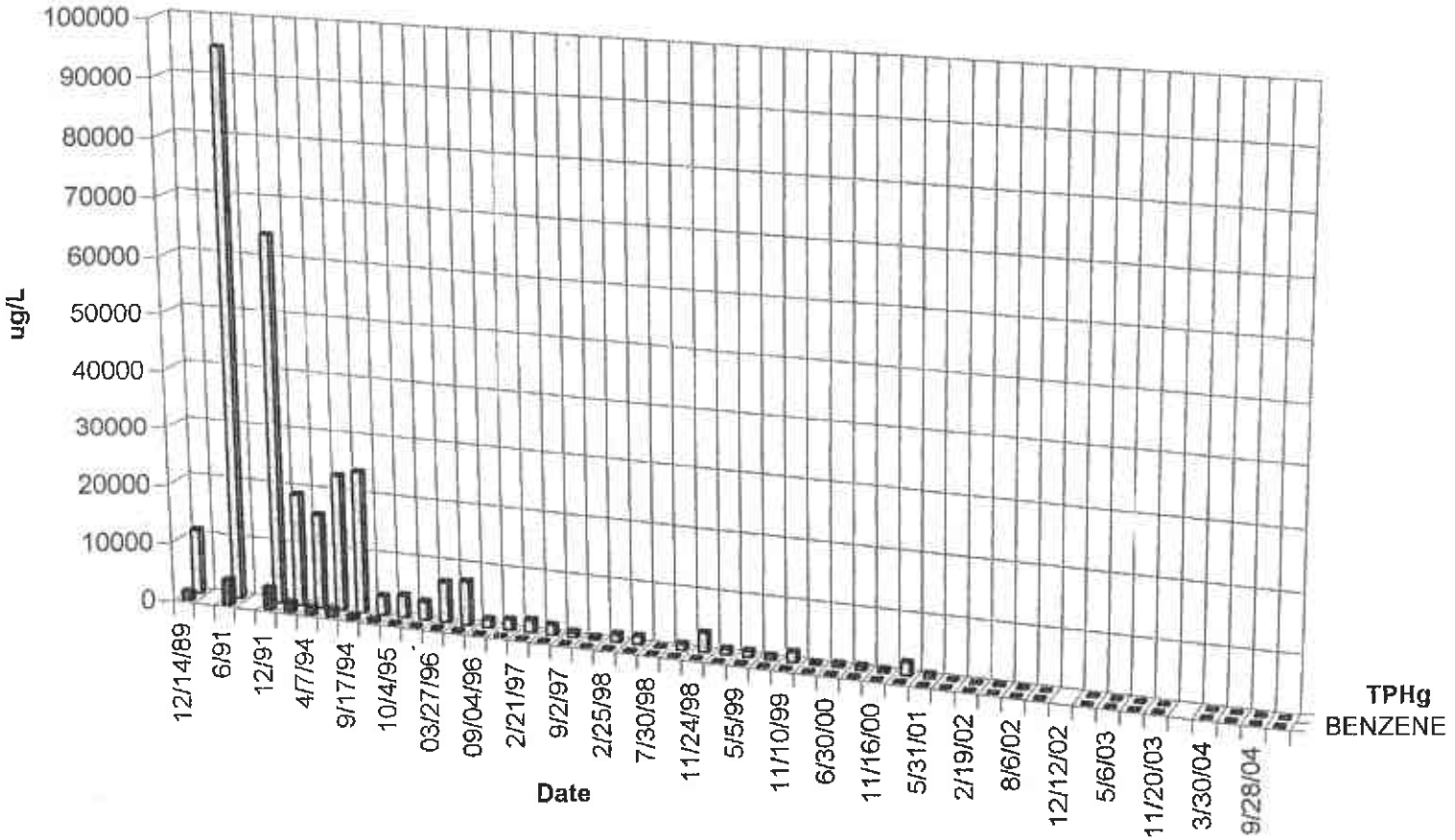
RS-2 TPHg


200
180
160
140
120
100
80
60
40
20
0
ug/L
6/19/94
10/4/95
03/27/96
09/04/96
2/21/97
9/2/97
2/25/98
9/16/98
2/23/99
8/26/99
2/9/00
8/8/00
3/8/01
12/18/01
5/7/02
11/5/02
3/13/03
8/13/03
1/22/04
6/10/04
12/8/04
Date
TPHg
BENZENE

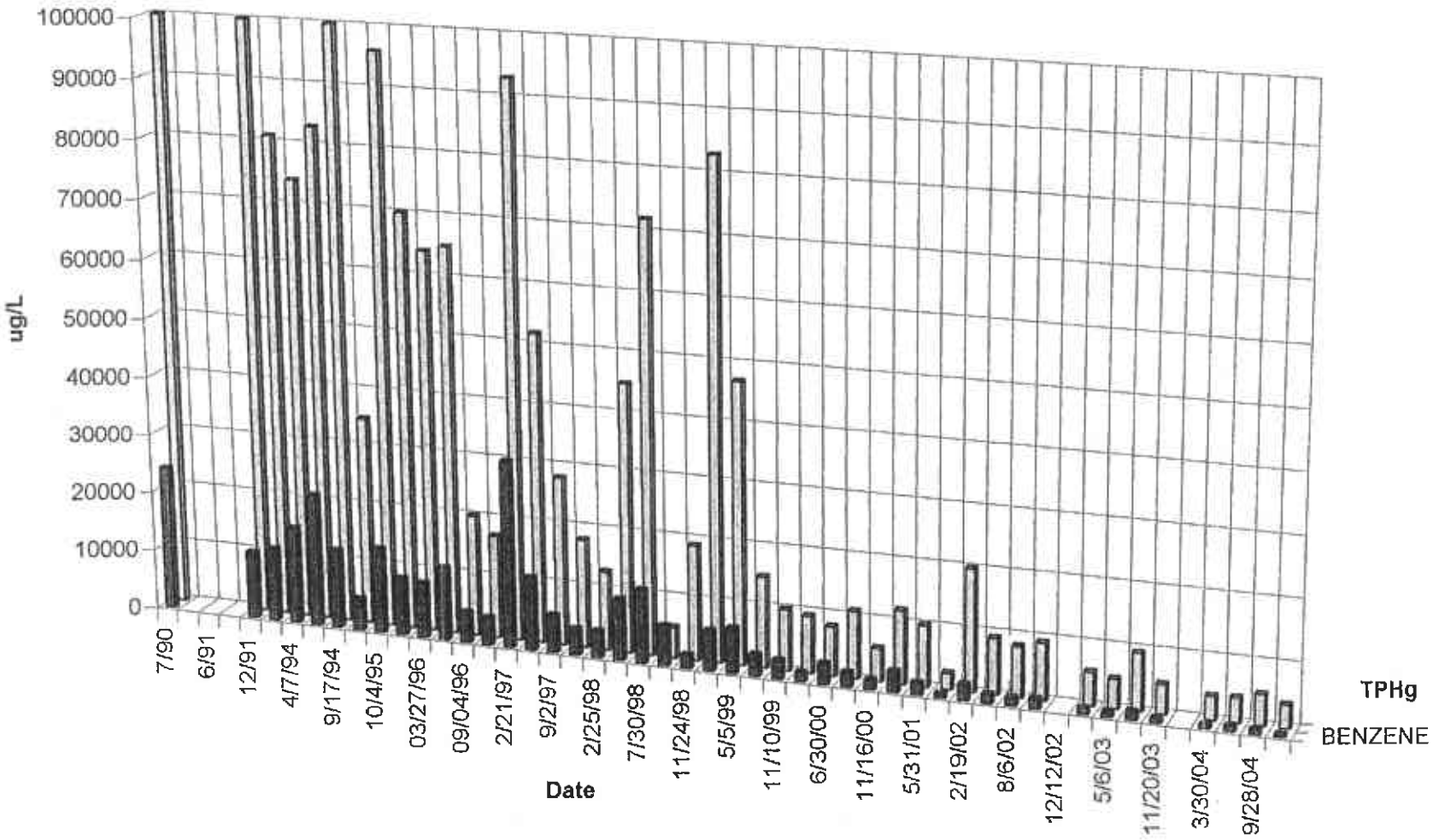
RS-5


100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
ug/L
12/14/89
6/91
12/91
4/7/94
9/17/94
10/4/95
03/27/96
09/04/96
2/21/97
9/2/97
2/25/98
9/16/98
2/23/99
8/26/99
2/9/00
8/8/00
3/8/01
12/18/01
5/7/02
11/5/02
3/13/03
8/13/03
1/22/04
6/10/04
12/8/04
Date
TPHg
BENZENE

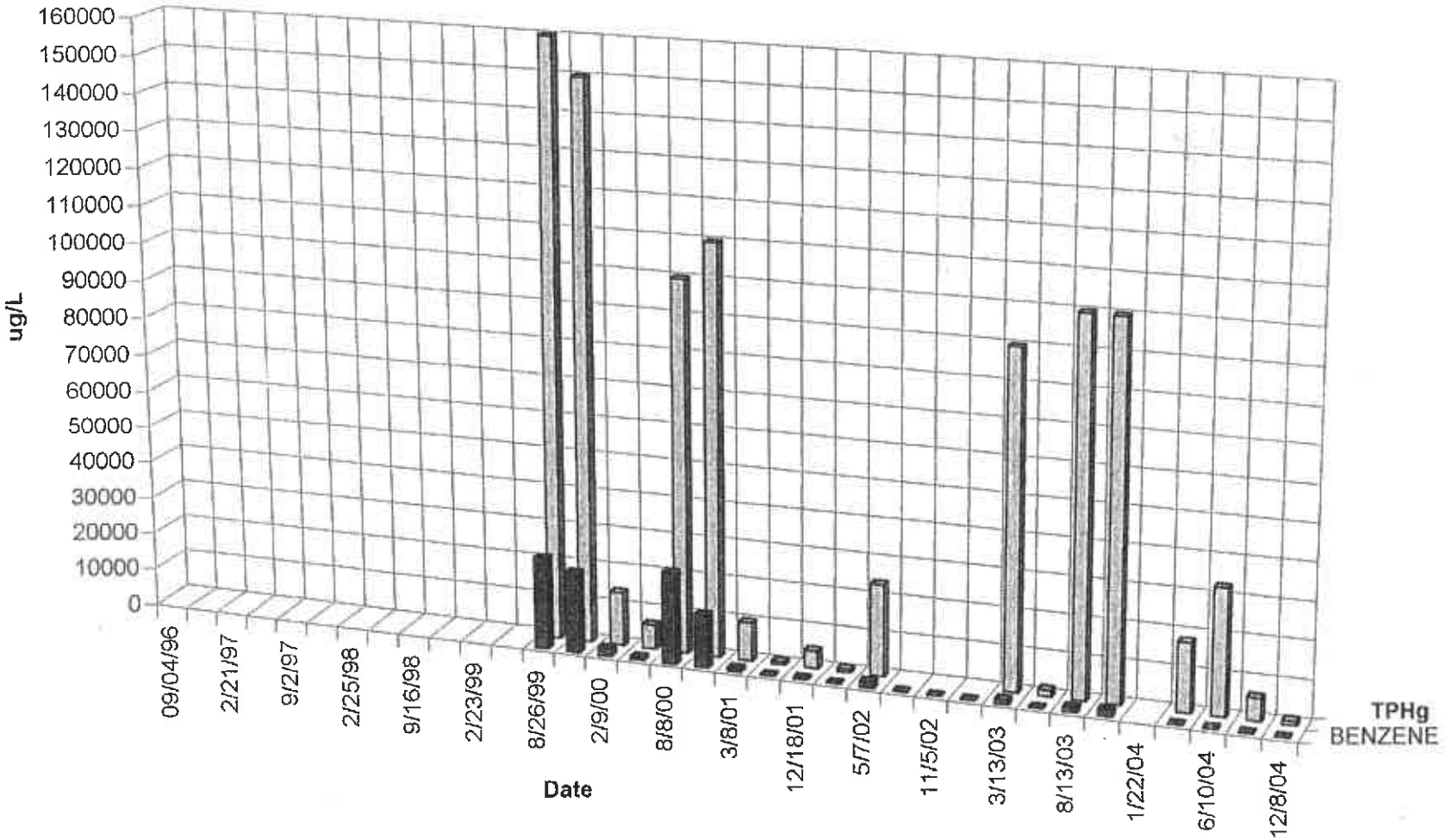
RS-6


100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
ug/L
12/14/89
6/91
12/91
4/7/94
9/17/94
10/4/95
03/27/96
09/04/96
2/21/97
9/2/97
2/25/98
7/30/98
11/24/98
5/5/99
11/10/99
6/30/00
11/16/00
5/31/01
2/19/02
8/6/02
12/12/02
5/6/03
11/20/03
3/30/04
9/28/04
Date
TPHg
BENZENE

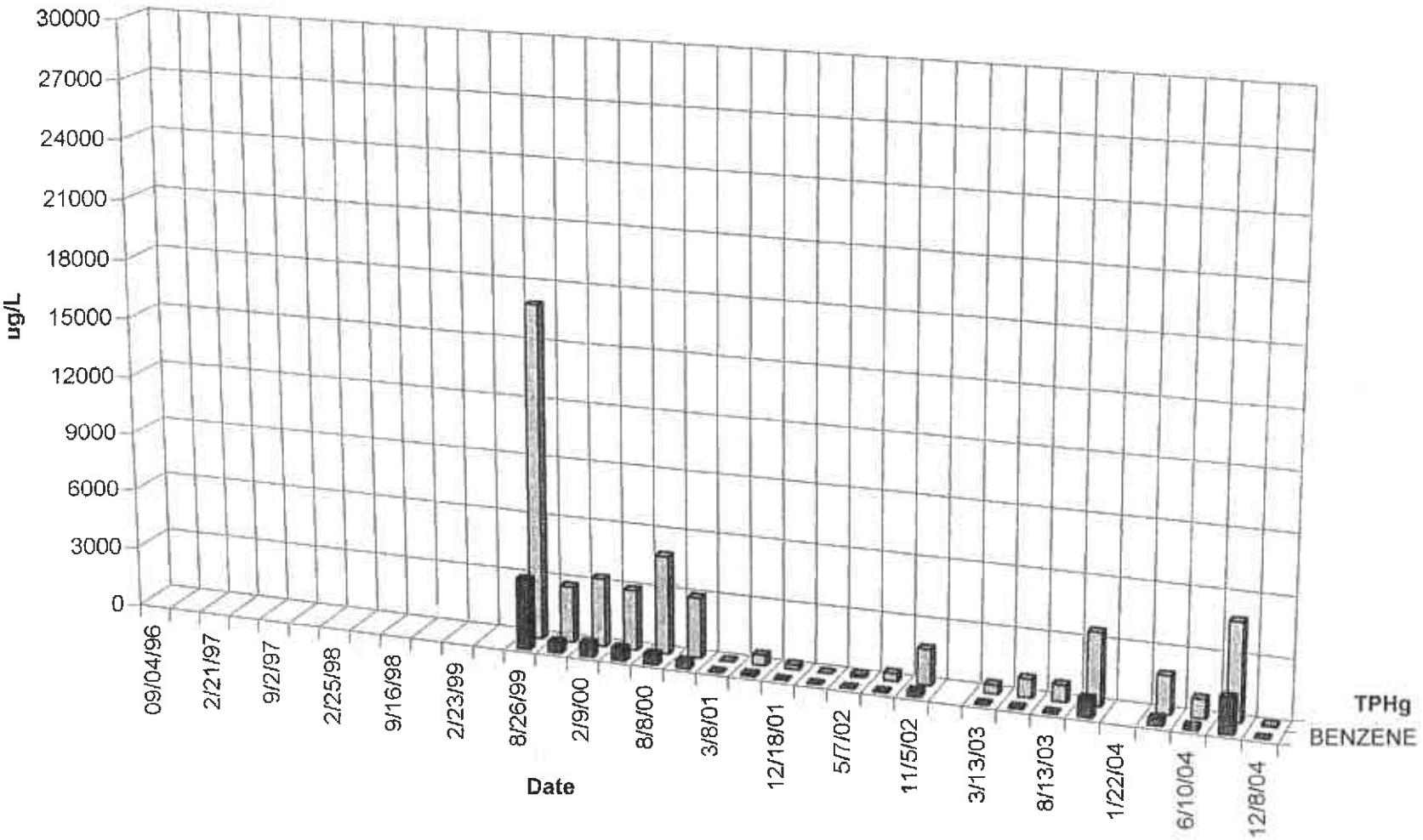
RS-7


100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
ug/L
7/90
6/91
12/91
4/7/94
9/17/94
10/4/95
03/27/96
09/04/96
2/21/97
9/2/97
2/25/98
7/30/98
11/24/98
5/5/99
11/10/99
6/30/00
11/16/00
5/31/01
2/19/02
8/6/02
12/12/02
5/6/03
11/20/03
3/30/04
9/28/04
Date
TPHg
BENZENE

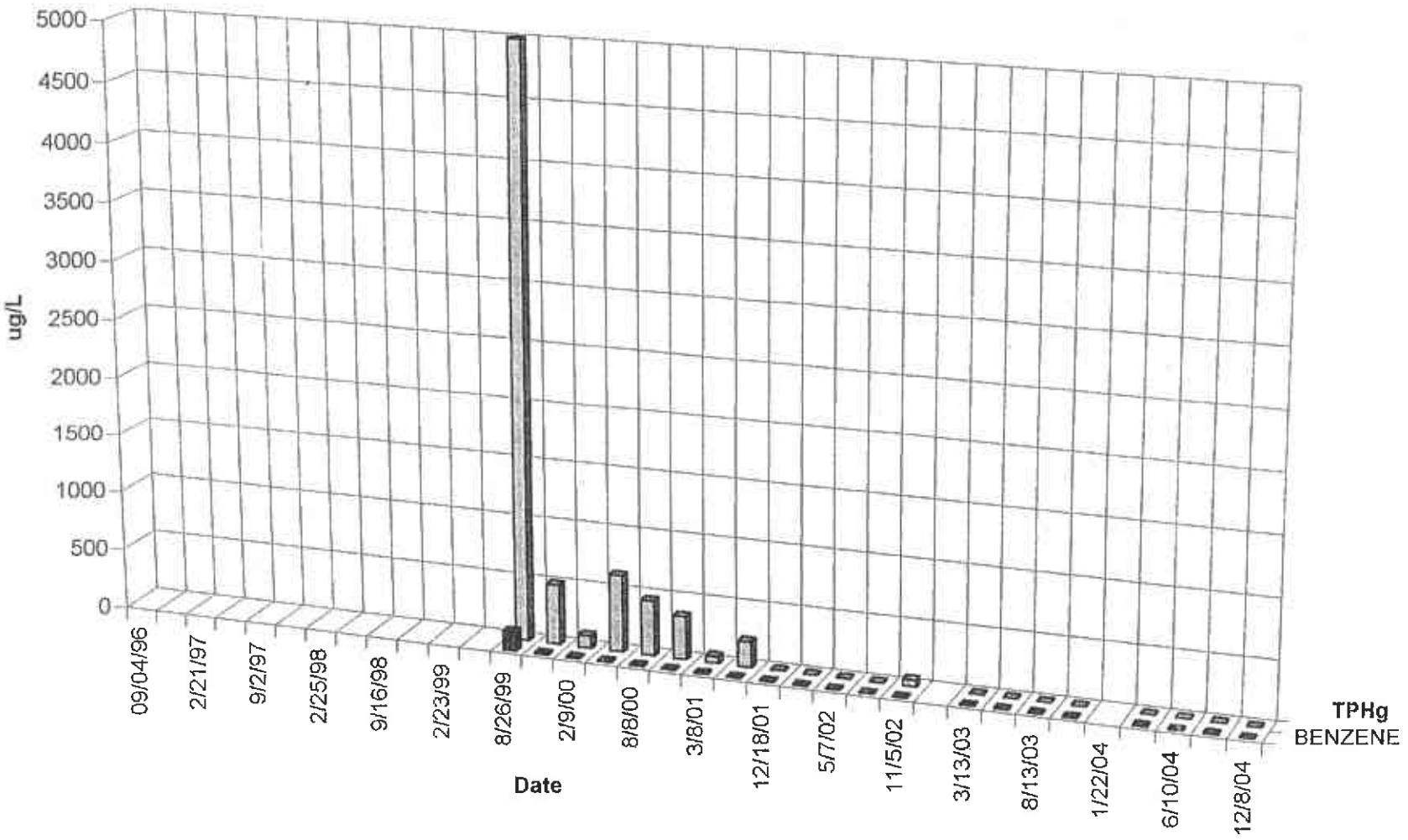
RS-8


160000
150000
140000
130000
120000
110000
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
ug/L
09/04/96
2/21/97
9/2/97
2/25/98
9/16/98
2/23/99
8/26/99
2/9/00
8/8/00
3/8/01
12/18/01
5/7/02
11/5/02
3/13/03
8/13/03
1/22/04
6/10/04
12/8/04
Date
TPHg
BENZENE

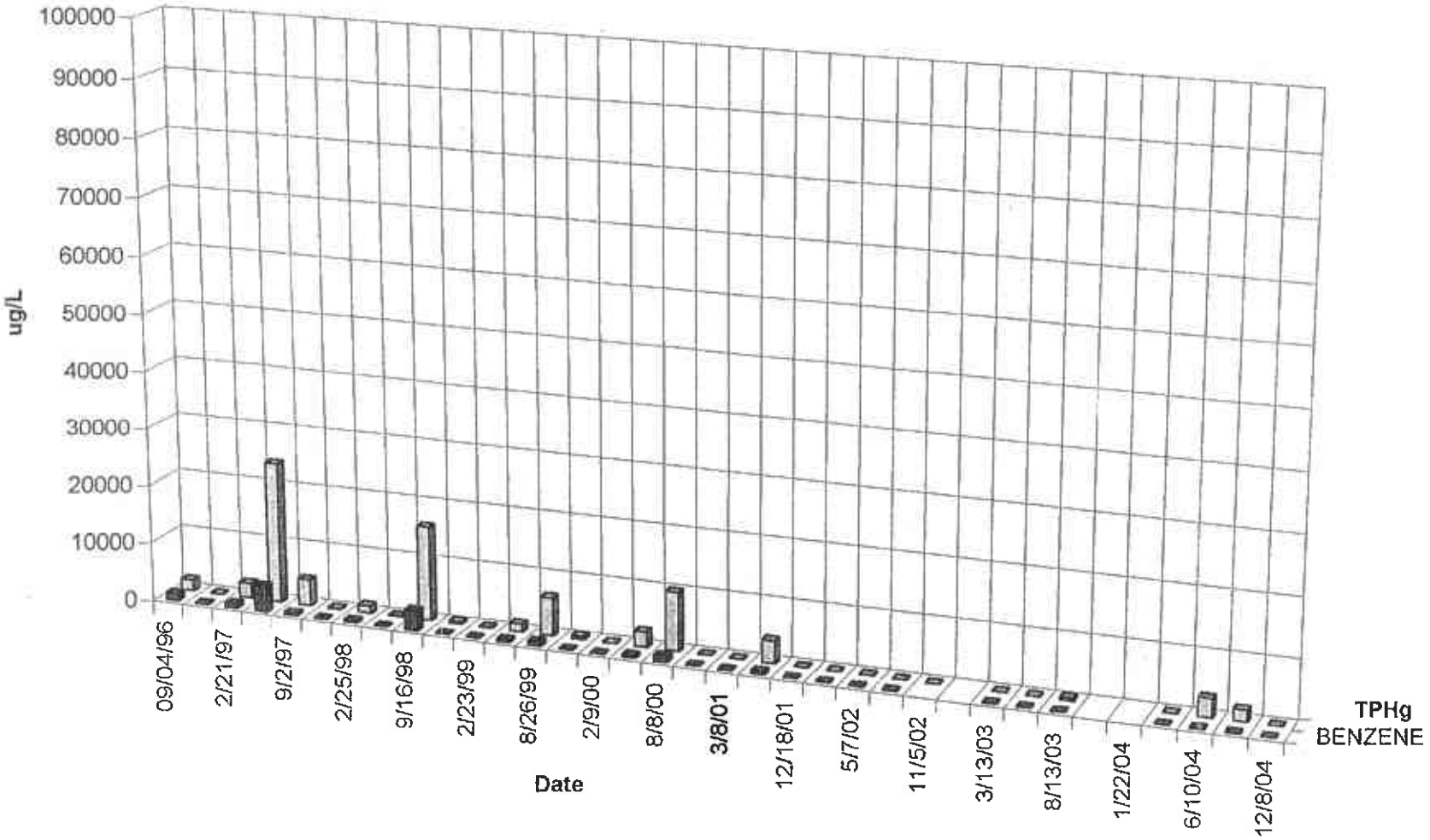
RS-9


30000
27000
24000
21000
18000
15000
12000
9000
6000
3000
0
ug/L
09/04/96
2/21/97
9/2/97
2/25/98
9/16/98
2/23/99
8/26/99
2/9/00
8/8/00
3/8/01
12/18/01
5/7/02
11/5/02
3/13/03
8/13/03
1/22/04
6/10/04
12/8/04
Date
TPHg
BENZENE

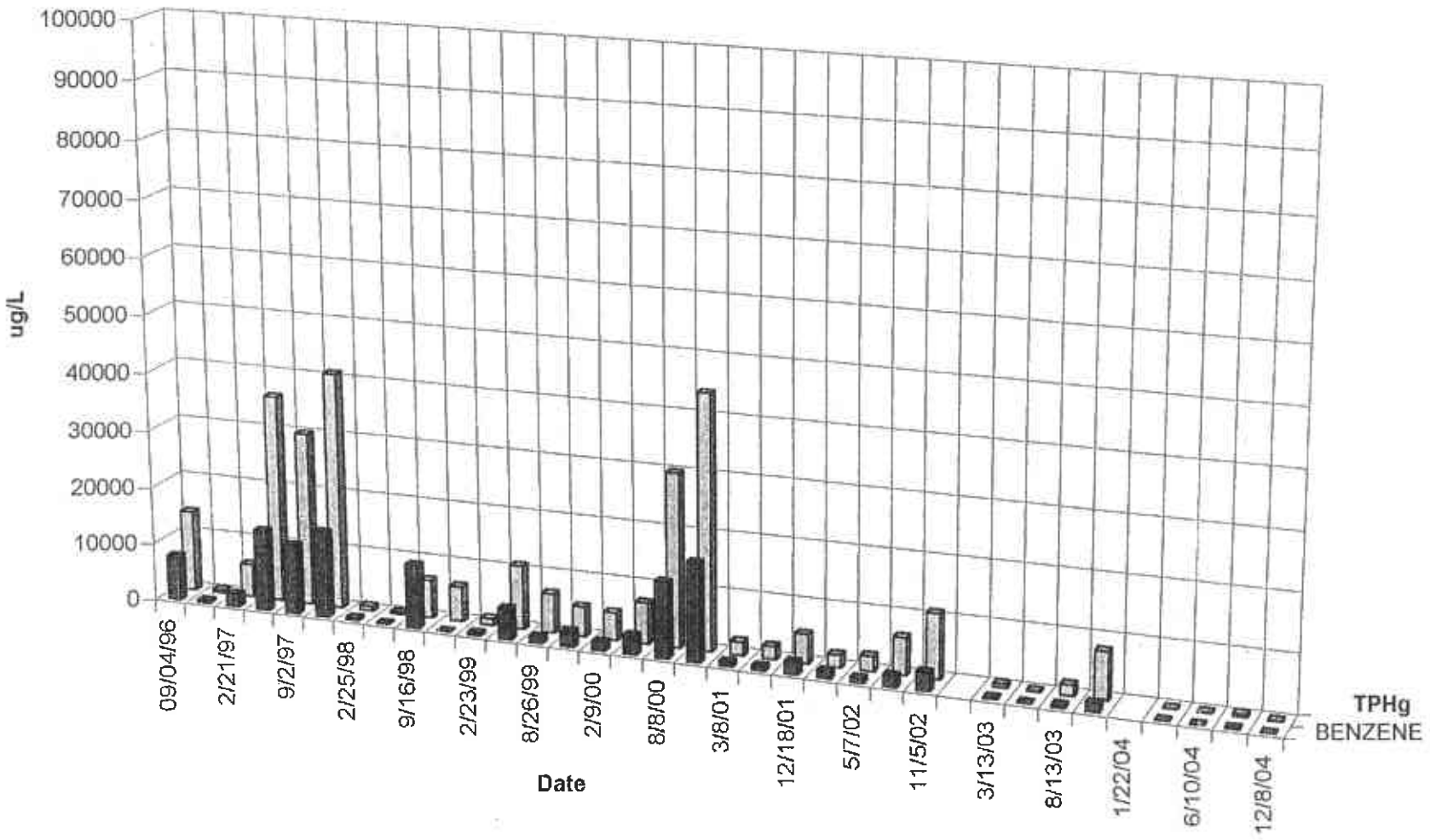
RS-10


5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
ug/L
09/04/96
2/21/97
9/2/97
2/25/98
9/16/98
2/23/99
8/26/99
2/9/00
8/8/00
3/8/01
12/18/01
5/7/02
11/5/02
3/13/03
8/13/03
1/22/04
6/10/04
12/8/04
Date
TPHg
BENZENE

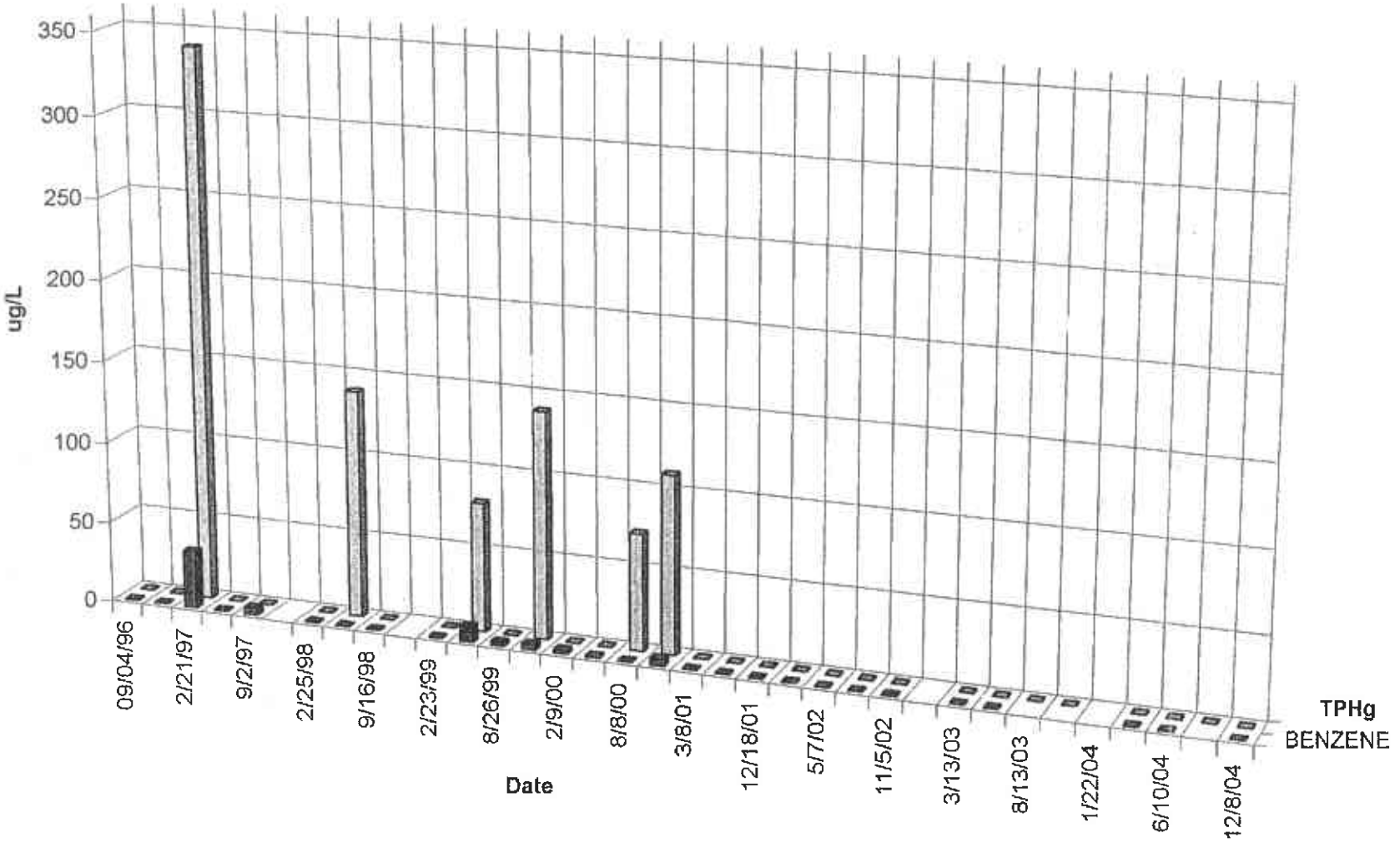
R-1


100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
ug/L
09/04/96
2/21/97
9/2/97
2/25/98
9/16/98
2/23/99
8/26/99
2/9/00
8/8/00
3/8/01
12/18/01
5/7/02
11/5/02
3/13/03
8/13/03
1/22/04
6/10/04
12/8/04
Date
TPHg
BENZENE

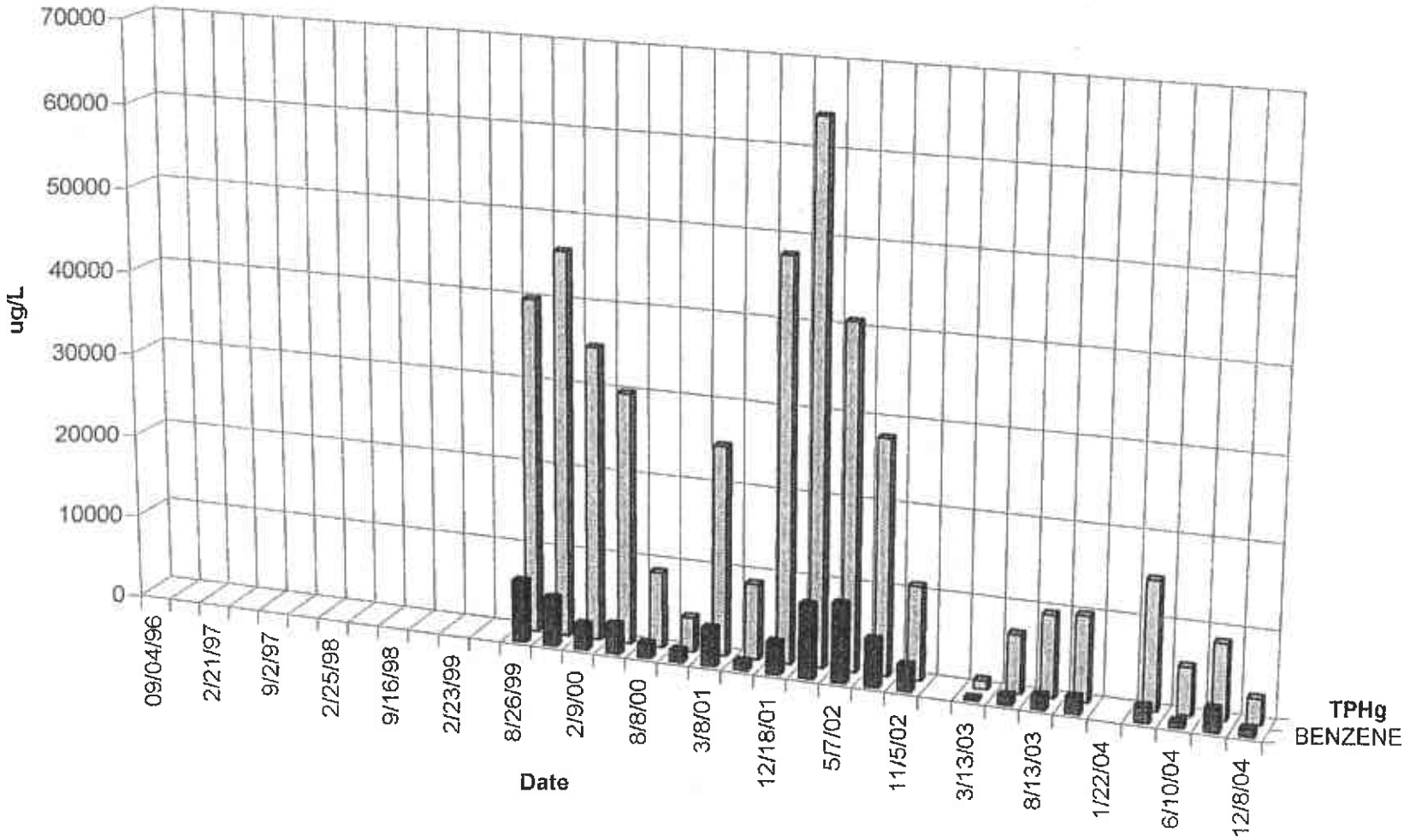
R-2


100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
ug/L
09/04/96
2/21/97
9/2/97
2/25/98
9/16/98
2/23/99
8/26/99
2/9/00
8/8/00
3/8/01
12/18/01
5/7/02
11/5/02
3/13/03
8/13/03
1/22/04
6/10/04
12/8/04
Date
TPHg
BENZENE

R-3


350
300
250
200
150
100
50
0
ug/L
09/04/96
2/21/97
9/2/97
2/25/98
9/16/98
2/23/99
8/26/99
2/9/00
8/8/00
3/8/01
12/18/01
5/7/02
11/5/02
3/13/03
8/13/03
1/22/04
6/10/04
12/8/04
Date
TPHg
BENZENE

T-1


70000
60000
50000
40000
30000
20000
10000
0
ug/L
09/04/96
2/21/97
9/2/97
2/25/98
9/16/98
2/23/99
8/26/99
2/9/00
8/8/00
3/8/01
12/18/01
5/7/02
11/5/02
3/13/03
8/13/03
1/22/04
6/10/04
12/8/04
Date
TPHg
BENZENE

APPENDIX F

ALAMEDA COUNTY HEALTH CARE SERVICES, OCTOBER 27, 2004 DIRECTIVE

LAMEDA COUNTY
EALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

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

October 27, 2004

William Thompson
Desert Petroelum, Inc.
P.O. Box 1601
Oxnard, CA 93032

Kin Man Li et al.
P.O. Box 348
Oakland, CA 94604

Razi Tony
3609 East 14th St.
Oakland, CA 94601

Golpad & Karimabadi
c/o Matt Haley
1633 San Pablo Ave.
Oakland, CA 94608

Subject: Fuel Leak Case No. RO0000429, Desert Petroleum/J&M Service Station #7, 4035 Park Blvd., Oakland, California

Dear Messrs. Thompson, Li, Tony, and Haley:

Based on the recommendations in Desert Petroleum's July 26, 2004 groundwater monitoring report, and on my September 3, 2004 telephone conversation with Ana McCowen of Desert Petroleum, Alameda County Environmental Health (ACEH) understands that Desert Petroleum has not proceeded with the required subsurface investigation. On June 8, 2004, ACEH conditionally approved Western Geo-Engineer's October 23, 2003 revision to the May 1, 2003 workplan for subsurface investigation. Please perform the required investigation and address the following technical comments. We request that you present your results in a written report following the schedule specified below.

TECHNICAL COMMENTS

1. Site Conceptual Model

As part of your report, and in anticipation of a Corrective Action Plan (CAP) for the site, ACEH requests a Site Conceptual Model (SCM) that illustrates the relationship between contaminants, retention/transport media, and receptors. The SCM needs to incorporate all aspects of the contaminant release investigation, including site geology, hydrogeology, release and cleanup history, residual and dissolved contamination, attenuation mechanisms, pathways to nearby receptors, and likely magnitude of potential impacts to receptors. The SCM is developed using readily available (existing) data and is used to identify data gaps that are subsequently filled as the investigation proceeds. Investigations continue until the SCM is not likely to significantly change upon collection of additional information, and the SCM is said to be "validated." By clarifying major site issues, the validated SCM forms the foundation for developing the most likely to succeed and cost-effective corrective action plan.

Technical guidance for developing SCMs is presented in ASTM 1689-95(2003)e1 *Standard Guide for Developing Conceptual Site Models for Contaminated Sties;* American Petroleum Institute Publication No. 4699 *Strategies for Characterizing Subsurface Releases of Gasoline Containing MTBE*, February 2000; EPA 510-B-97-001 *Expedited Site Assessment Tools for Underground Storage Tank Sites: A Guide for Regulators*, March 1997; and the State Water

Resources Control Board's *Guidelines for Investigation and Cleanup of MTBE and Other Ether-Based Oxygenates, Appendix C,* March 27, 2000.

The SCM for this project is to include the following:

A. A concise narrative discussion of the regional geologic and hydrogeologic setting. Include a list of technical references you reviewed.

B. A concise discussion of the on-site and off-site geology, hydrogeology, release source and history, secondary source areas, remediation status, risk evaluation, plume migration, attenuation mechanisms, preferential pathways, and potential threat to downgradient receptors. The SCM shall include an analysis of the hydraulic flow system at and downgradient from the site.

C. Local and regional maps showing location of sources, extent of soil and groundwater contamination for appropriate depth intervals (i.e., an interpretive drawings and isoconcentration maps—not a plot of laboratory results), rose diagram of recent and historical groundwater gradients, and locations of receptors. "Receptors" include, but are not limited to, all supply wells and surface water bodies within 2,000 feet of the source area, and all potentially impacted schools, hospitals, daycare facilities, residences, and other areas of heightened concern for vapor impact.

D. Geologic cross-sections (parallel and perpendicular to the contaminant plume axis) which include subsurface geologic features, depth to groundwater, man-made conduits, soil boring and sampling locations, monitoring well construction, and an interpretive drawing of the vertical extent of soil and groundwater contamination (i.e., an interpretive drawing—not a plot of laboratory results).

E. Exposure evaluation flowchart (similar to Figure 2 in ASTM's Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites).

F. Plots of chemical concentrations vs. time and vs. distance from the source. Plots should be shown for each monitoring well which has had detectable levels of contaminants.

G. Summary tables of chemical concentrations in each historically sampled media (including soil, groundwater and soil vapor).

H. Boring and well logs (including construction/screening), and a summary table indicating construction specifications for each monitoring and extraction well.

I. Identification and listing of specific data gaps that require further investigation during subsequent phases of work.

J. Proposed activities to investigate and fill data gaps identified above.

TECHNICAL REPORT REQUEST

Please submit technical reports to ACEH (Attn: Robert Schultz) according to the following schedule:

- January 31, 2005 - *Soil and Water Investigation Report* containing the SCM requested above

- End of First Month of Each Quarter – *Quarterly Monitoring Report* covering the previous quarter's groundwater monitoring

ACEH makes this request pursuant to California Health & Safety Code Section 25296.10. CCR Title 23 Sections 2652 through 2654, and 2721 through 2728 outline the responsibilities of a responsible party in response to a reportable unauthorized release from a petroleum UST system, and require your compliance with this request.

PROFESSIONAL CERTIFICATION AND CONCLUSIONS/RECOMMENDATIONS

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

PERJURY STATEMENT

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

AGENCY OVERSIGHT

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

Please call me at (510) 567-6719 with any questions regarding this case.

Sincerely,

Robert W. Schultz, R.G.
Hazardous Materials Specialist

cc: Michael Gabriel, Glenview Neighborhood Association, 4200 Park Blvd., Box 111, Oakland, CA 94602
Derrick Williams, 4032 Brighton Ave., Oakland, CA 94602
George Converse, Western Geo-Engineers, 1386 Beamer St., Woodland, CA 95776
Donna Drogos, ACEH
Robert W. Schultz, ACEH

RBCA SITE ASSESSMENT | **Tier 2 Worksheet 8.3**

Site Name: DP793
Site Location: 4035 Park Blvd., Oakland, California

Completed By: George Converse
Date Completed: 2/2/2005

TIER 2 BASELINE RISK SUMMARY TABLE

	BASELINE CARCINOGENIC RISK					BASELINE TOXIC EFFECTS				
	Individual COC Risk		Cumulative COC Risk		Risk Limit(s) Exceeded?	Hazard Quotient		Hazard Index		Toxicity Limit(s) Exceeded?
EXPOSURE PATHWAY	Maximum Value	Target Risk	Total Value	Target Risk		Maximum Value	Applicable Limit	Total Value	Applicable Limit	
OUTDOOR AIR EXPOSURE PATHWAYS										
Complete:	1.9E-6	1.0E-6	1.9E-6	N/A	■	3.3E-1	1.0E+0	3.5E-1	N/A	☐
INDOOR AIR EXPOSURE PATHWAYS										
Complete:	1.1E-3	1.0E-6	1.1E-3	N/A	■	1.9E+2	1.0E+0	2.0E+2	N/A	■
SOIL EXPOSURE PATHWAYS										
Complete:	8.8E-10	1.0E-6	9.0E-10	N/A	☐	3.4E-5	1.0E+0	4.0E-5	N/A	☐
GROUNDWATER EXPOSURE PATHWAYS										
Complete:	2.8E-3	1.0E-6	2.8E-3	N/A	■	3.7E+1	1.0E+0	4.4E+1	N/A	■
CRITICAL EXPOSURE PATHWAY (Select Maximum Values From Complete Pathways)										
	2.8E-3	1.0E-6	2.8E-3	N/A	■	1.9E+2	1.0E+0	2.0E+2	N/A	■

RBCA SITE ASSESSMENT | **Tier 2 Worksheet 9.1**

Site Name: DP793 | Completed By: George Converse

Site Location: 4035 Park Blvd., Oakland, California | Date Completed: 2/2/2005

SURFACE SOIL SSTL VALUES (< 0 FT BGS)

Target Risk (Class A & B) 1.0E-6 ☐ MCL exposure limit? Calculation Option: 2

Target Risk (Class C) 1.0E-5 ☐ PEL exposure limit?

Target Hazard Quotient 1.0E+0

SSTL Results For Complete Exposure Pathways ("x" If Complete)

CONSTITUENTS OF CONCERN		Representative Concentration	X	Soil Leaching to Groundwater			X	Ingestion and Dermal Contact		X	Construction Worker	Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No.	Name	(mg/kg)		Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)		Residential: (on-site)	Commercial: (on-site)		Commercial: (on-site)	(mg/kg)	"■" If yes	Only if "yes" left
71-43-3	Benzene CA	5.0E-4		1.7E-3	NA	NA		5.7E-1	NA		3.3E+1	1.7E-3	☐	<1
100-41-4	Ethylbenzene CA	5.0E-4		1.2E+1	NA	NA		>Res	NA		>Res	1.2E+1	☐	<1
110-54-3	Hexane, n-	5.0E-2		>Res	NA	NA		>Res	NA		>Res	>Res	☐	<1
1634-04-4	Methyl t-Butyl Ether CA	5.0E-4		5.4E-2	NA	NA		3.3E+1	NA		1.9E+3	5.4E-2	☐	<1
108-88-3	Toluene CA	5.0E-4		1.7E+1	NA	NA		>Res	NA		>Res	1.7E+1	☐	<1
1330-20-7	Xylene CA	5.0E-4		5.9E+1	NA	NA		>Res	NA		>Res	5.9E+1	☐	<1

>Res indicates risk-based target concentration greater than constituent residual saturation value

Software: GSI RBCA Spreadsheet Serial: G-443-CSX-444

Version: 1.0.1

RBCA SITE ASSESSMENT | **Tier 2 Worksheet 9.2**

Site Name: DP793 | Completed By: George Converse

Site Location: 4035 Park Blvd., Oakland, California | Date Completed: 2/2/2005

SUBSURFACE SOIL SSTL VALUES (> 0 FT BGS)

Target Risk (Class A & B) 1.0E-6 ☐ MCL exposure limit?

Target Risk (Class C) 1.0E-5 ☐ PEL exposure limit?

Target Hazard Quotient 1.0E+0

Calculation Option: 2

SSTL Results For Complete Exposure Pathways ("x" If Complete)

CONSTITUENTS OF CONCERN		Representative Concentration	X Soil Leaching to Groundwater			X Soil Volatilization to Indoor Air		X Soil Volatilization to Outdoor Air		Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No.	Name	(mg/kg)	Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)	Residential: (on-site)	Commercial: (on-site)	Residential: (on-site)	Commercial: (on-site)	(mg/kg)	"■" If yes	Only if "yes" left
71-43-3	Benzene CA	3.9E+0	1.7E-3	NA	NA	3.9E-3	NA	2.2E+0	NA	1.7E-3	■	2.3E+03
100-41-4	Ethylbenzene CA	2.3E+1	1.2E+1	NA	NA	>Res	NA	>Res	NA	1.2E+1	■	2.0E+00
110-54-3	Hexane, n-	1.6E+3	>Res	NA	NA	9.5E+0	NA	>Res	NA	9.5E+0	■	1.7E+02
1634-04-4	Methyl t-Butyl Ether CA	9.4E-3	5.4E-2	NA	NA	2.2E-1	NA	1.3E+2	NA	5.4E-2	☐	<1
108-88-3	Toluene CA	1.5E+1	1.7E+1	NA	NA	9.5E+0	NA	>Res	NA	9.5E+0	■	2.0E+00
1330-20-7	Xylene CA	7.5E+1	5.9E+1	NA	NA	1.4E+1	NA	>Res	NA	1.4E+1	■	5.0E+00

>Res indicates risk-based target concentration greater than constituent residual saturation value

Software: GSI RBCA Spreadsheet Serial: G-443-CSX-444
Version: 1.0.1

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.3

Site Name: DP793
Site Location: 4035 Park Blvd., Oakland, California

Completed By: George Converse
Date Completed: 2/2/2005

GROUNDWATER SSTL VALUES

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

☐ MCL exposure limit?
☐ PEL exposure limit?

Calculation Option: 2

SSTL Results For Complete Exposure Pathways ("x" if Complete)

CONSTITUENTS OF CONCERN		Representative Concentration	X Groundwater Ingestion			X Groundwater Volatilization to Indoor Air		X Groundwater Volatilization to Outdoor Air		Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No.	Name	(mg/L)	Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)	Residential: (on-site)	Commercial: (on-site)	Residential (on-site)	Commercial: (on-site)	(mg/L	"■" If yes	Only if "yes" left
71-43-3	Benzene CA	2.4E+0	8.5E-4	NA	NA	4.4E-2	NA	2.3E+1	NA	8.5E-4	■	2.8E+03
100-41-4	Ethylbenzene CA	4.3E+0	3.7E+0	NA	NA	>Sol	NA	>Sol	NA	3.7E+0	■	1.0E+00
110-54-3	Hexane, n-	6.6E+1	2.2E+0	NA	NA	3.8E+0	NA	>Sol	NA	2.2E+0	■	3.0E+01
1634-04-4	Methyl t-Butyl Ether CA	9.0E-2	4.9E-2	NA	NA	2.8E+0	NA	5.3E+2	NA	4.9E-2	■	2.0E+00
108-88-3	Toluene CA	1.1E+0	4.0E+0	NA	NA	1.1E+2	NA	>Sol	NA	4.0E+0	☐	<1
1330-20-7	Xylene CA	1.2E+1	9.1E+0	NA	NA	1.8E+2	NA	>Sol	NA	9.1E+0	■	1.0E+00

>Sol Indicates risk-based target concentration greater than constituent solubility

Software: GSI RBCA Spreadsheet
Version: 1.0.1

Serial: G-443-CSX-444

RBCA TIER 1/TIER 2 EVALUATION

Output Table 1

Site Name: DP793 | Job Identification: DP793 -1 | Software: GSI RBCA Spreadsheet
Site Location: 4035 Park Blvd., Oakland, Calif. | Date Completed: 2/2/05 | Version: 1.0.1
Completed By: George Converse

NOTE: values which differ from Tier 1 default values are shown in bold italics and underlined.

Exposure Parameter	Definition (Units)	Residential Adult	Residential (1-6yrs)	Residential (1-16 yrs)	Commercial/Industrial Chronic	Commercial/Industrial Constrctn
ATc	Averaging time for carcinogens (yr)	70				
ATn	Averaging time for non-carcinogens (yr)	30	6	16	25	1
BW	Body Weight (kg)	70	15	35	70	
ED	Exposure Duration (yr)	30	6	16	25	1
t	Averaging time for vapor flux (yr)	30			25	1
EF	Exposure Frequency (days/yr)	350			250	180
EF.Derm	Exposure Frequency for dermal exposure	350			250	
IRgw	Ingestion Rate of Water (L/day)	2			1	
IRs	Ingestion Rate of Soil (mg/day)	100	200		50	100
IRadj	Adjusted soil ing. rate (mg-yr/kg-d)	1.1E+02			9.4E+01	
IRa.in	Inhalation rate indoor (m^3/day)	15			20	
IRa.out	Inhalation rate outdoor (m^3/day)	20			20	10
SA	Skin surface area (dermal) (cm^2)	5.8E+03		2.0E+03	5.8E+03	5.8E+03
SAadj	Adjusted dermal area (cm^2-yr/kg)	2.1E+03			1.7E+03	
M	Soil to Skin adherence factor	1				
AAFs	Age adjustment on soil ingestion	FALSE			FALSE	
AAFd	Age adjustment on skin surface area	FALSE			FALSE	
tox	Use EPA tox data for air (or PEL based)?	TRUE				
gwMCL?	Use MCL as exposure limit in groundwater?	FALSE				

Matrix of Exposed Persons to Complete Exposure Pathways		Residential	Commercial/Industrial Chronic	Commercial/Industrial Constrctn
Outdoor Air Pathways:				
SS.v	Volatiles and Particulates from Surface Soils	FALSE	FALSE	FALSE
S.v	Volatilization from Subsurface Soils	TRUE	FALSE	
GW.v	Volatilization from Groundwater	TRUE	FALSE	
Indoor Air Pathways:				
S.b	Vapors from Subsurface Soils	TRUE	FALSE	
GW.b	Vapors from Groundwater	TRUE	FALSE	
Soil Pathways:				
SS.d	Direct Ingestion and Dermal Contact	TRUE	FALSE	TRUE
Groundwater Pathways:				
GW.i	Groundwater Ingestion	TRUE	FALSE	
S.l	Leaching to Groundwater from all Soils	TRUE	FALSE	

Matrix of Receptor Distance and Location On- or Off-Site		Residential Distance	Residential On-Site	Commercial/Industrial Distance	Commercial/Industrial On-Site
GW	Groundwater receptor (cm)		TRUE		FALSE
S	Inhalation receptor (cm)		TRUE		FALSE

Matrix of Target Risks		Individual	Cumulative
TRab	Target Risk (class A&B carcinogens)	1.0E-06	
TRc	Target Risk (class C carcinogens)	1.0E-05	
THQ	Target Hazard Quotient	1.0E+00	
Opt	Calculation Option (1, 2, or 3)	2	
Tier	RBCA Tier	2	

Surface Parameters	Definition (Units)	Residential	Constrctn
A	Contaminated soil area (cm^2)	***4.0E+06***	***4.0E+06***
W	Length of affect. soil parallel to wind (cm)	***2.1E+03***	***2.1E+03***
W.gw	Length of affect. soil parallel to groundwater (cm	***2.4E+03***	
Uair	Ambient air velocity in mixing zone (cm/s)	2.3E+02	
delta	Air mixing zone height (cm)	2.0E+02	
Lss	Thickness of affected surface soils (cm)		
Pe	Particulate areal emission rate (g/cm^2/s)	6.9E-14	

Groundwater	Definition (Units)	Value
delta.gw	Groundwater mixing zone depth (cm)	***4.9E+02***
I	Groundwater infiltration rate (cm/yr)	***6.1E+01***
Ugw	Groundwater Darcy velocity (cm/yr)	***3.1E+03***
Ugw.tr	Groundwater seepage velocity (cm/yr)	***1.1E+04***
Ks	Saturated hydraulic conductivity(cm/s)	1.0E-03
grad	Groundwater gradient (cm/cm)	1.0E-01
Sw	Width of groundwater source zone (cm)	
Sd	Depth of groundwater source zone (cm)	
phi.eff	Effective porosity in water-bearing unit	3.0E-01
foc.sat	Fraction organic carbon in water-bearing unit	***4.6E-02***
BIO?	Is bioattenuation considered?	TRUE
BC	Biodegradation Capacity (mg/L)	

Soil	Definition (Units)	Value		
hc	Capillary zone thickness (cm)	***6.1E+01***		
hv	Vadose zone thickness (cm)	***2.7E+02***		
rho	Soil density (g/cm^3)	1.7		
foc	Fraction of organic carbon in vadose zone	***0.0019***		
phi	Soil porosity in vadose zone	0.38		
Lgw	Depth to groundwater (cm)	***3.4E+02***		
Ls	Depth to top of affected subsurface soil (cm)	***2.7E+02***		
Lsubs	Thickness of affected subsurface soils (cm)	***4.6E+02***		
pH	Soil/groundwater pH	6.5		
		capillary	vadose	foundation
phi.w	Volumetric water content	0.342	0.12	0.12
phi.a	Volumetric air content	0.038	0.26	0.26

Building	Definition (Units)	Residential	Commercial
Lb	Building volume/area ratio (cm)	2.0E+02	3.0E+02
ER	Building air exchange rate (s^-1)	1.4E-04	2.3E-04
t.crk	Foundation crack thickness (cm)	1.5E+01	
eta	Foundation crack fraction	0.01	

Transport Parameters	Definition (Units)	Residential	Commercial
Groundwater			
ax	Longitudinal dispersivity (cm)		
ay	Transverse dispersivity (cm)		
az	Vertical dispersivity (cm)		
Vapor			
dcy	Transverse dispersion coefficient (cm)		
dcz	Vertical dispersion coefficient (cm)		

RBCA CHEMICAL DATABASE

Physical Property Data

CAS Number	Constituent	type	Molecular Weight (g/mole) MW	ref	Diffusion Coefficients in air (cm2/s) Dair	ref	in water (cm2/s) Dwat	ref	log (Koc) or log(Kd) (@ 20 - 25 C) log(l/kg)	ref	Henry's Law Constant (@ 20 - 25 C) (atm-m3) mol	(unitless)	ref	Vapor Pressure (@ 20 - 25 C) (mm Hg)	ref	Solubility (@ 20 - 25 C) (mg/L)	ref	acid pKa	base pKb	ref
71-43-3	Benzene CA	O	78.1		9.30E-02		1.10E-05		1.58		5.29E-03	2.20E-01		9.52E+01		1.75E+03				
100-41-4	Ethylbenzene CA	O	106.2		7.60E-02		8.50E-06		1.98		7.69E-03	3.20E-01		1.00E+01		1.52E+02				
110-54-3	Hexane, n-	O	86.2	5	2.00E-01	4	7.77E-06	4	2.68	4	1.22E-01	5.07E+00	4	1.50E+02	4	1.30E+01	5			
1634-04-4	Methyl t-Butyl Ether CA	O	88.146		7.92E-02		9.41E-05		1.08		5.77E-04	2.40E-02		2.49E+02		4.80E+04				
108-88-3	Toluene CA	O	92.4		8.50E-02		9.40E-06		2.13		6.25E-03	2.60E-01		3.00E+01		5.15E+02				
1330-20-7	Xylene CA	O	106.2		7.20E-02		8.50E-06		2.38		6.97E-03	2.90E-01		7.00E+00		1.98E+02				

Site Name: DP793 Site Location: 4035 Park Blvd., Oaklan Completed By: George Converse Date Completed: 2/2/2005

Software version: 1.0.1

CAS Number	Constituent	Reference Dose (mg/kg/day) Oral RfD_oral	ref	Inhalation RfD_inhal	ref	Slope Factors 1/(mg/kg/day) Oral SF_oral	ref	Inhalation SF_inhal	ref	EPA Weight of Evidence	Is Constituent Carcinogenic ?
71-43-3	Benzene CA	2.00E-02		2.00E-02	30	1.00E-01		1.00E-01		A	TRUE
100-41-4	Ethylbenzene CA	1.00E-01		2.86E-01	30						FALSE
110-54-3	Hexane, n-	6.00E-02	A	5.71E-02	R	-		-			FALSE
1634-04-4	Methyl t-Butyl Ether CA	5.00E-03				1.73E-03		1.73E-03	31	?	TRUE OEHHA draft
108-88-3	Toluene CA	1.10E-01		5.70E-02	30					D	FALSE
1330-20-7	Xylene CA	2.50E-01		8.57E-02	30					D	FALSE

Site Name: DP793 Site Location: 4035 Park Blvd., Oakl Completed By: George Converse Date Completed: 2/2/2005

Software version: 1.0.1

RBCA CHEMICAL DATABASE

Miscellaneous Chemical Data

CAS Number	Constituent	Maximum Contaminant Level MCL (mg/L)	reference	Permissible Exposure Limit PEL/TLV (mg/m3)	ref	Relative Absorption Factors Oral	Dermal	Detection Limits Groundwater (mg/L)	ref	Soil (mg/kg)	ref	Half Life (First-Order Decay) (days) Saturated	Unsaturated	ref
71-43-3	Benzene CA	1.00E-03		3.20E+00		1	0.5	0.0005		0.005		720	720	
100-41-4	Ethylbenzene CA	7.00E-02		4.34E+02		1	0.5	0.0005		0.005		228	228	
110-54-3	Hexane, n-					1	0.5							
1634-04-4	Methyl t-Butyl Ether CA			1.44E+02		1	0.5	0.005		0.05				
108-88-3	Toluene CA	1.50E-01		1.47E+02		1	0.5	0.0005		0.005		28	28	
1330-20-7	Xylene CA	1.75E+00		4.34E+02		1	0.5	0.002		0.005		360	360	

Site Name: DP793 Site Location: 4035 Park Blvd., Oakland, California Completed By: George Converse Date Completed: 2/2/2005

Software version: 1.0.1

REPRESENTATIVE COC CONCENTRATIONS IN SOURCE MEDIA

(Complete the following table)

CONSTITUENT	Representative COC Concentration in Groundwater		in Surface Soil		in Subsurface Soil	
	value (mg/L)	note	value (mg/kg)	note	value (mg/kg)	note
Benzene CA	2.4E+0	max	5.0E-4	max	3.9E+0	max
Ethylbenzene CA	4.3E+0	max	5.0E-4	max	2.3E+1	max
Hexane, n-	6.6E+1	max	5.0E-2	max	1.6E+3	max
Methyl t-Butyl Ether CA	2.5E-2	max	5.0E-4	max	9.4E-3	max
Toluene CA	1.1E+0	max	5.0E-4	max	1.5E+1	max
Xylene CA	1.2E+1	max	5.0E-4	max	7.5E+1	max

Site Name: DP793
Site Location: 4035 Park Blvd., Oakland, California

Completed By: George Converse
Date Completed: 2/2/2005

RBCA SITE ASSESSMENT | **Input Screen 6.3**

CONSTITUENT MOLE FRACTIONS

(Complete the following table)

CONSTITUENT	Mole Fraction of Constituent in Source Material
Benzene CA	
Ethylbenzene CA	
Hexane, n-	
Methyl t-Butyl Ether CA	
Toluene CA	
Xylene CA	

Site Name: DP793 Completed By: George Converse

Site Location: 4035 Park Blvd., Oakland Date Completed: 2/2/2005

RBCA SITE ASSESSMENT	Input Screen 9.4

GROUNDWATER DAF VALUES

(Enter DAF values in the grey area of the following table)

CONSTITUENT	Dilution Attenuation Factor (DAF) in Groundwater	
	Residential Receptor	Comm./Ind. Receptor
Benzene CA	1.0E+0	1.0E+0
Ethylbenzene CA	1.0E+0	1.0E+0
Hexane, n-	1.0E+0	1.0E+0
Methyl t-Butyl Ether CA	1.0E+0	1.0E+0
Toluene CA	1.0E+0	1.0E+0
Xylene CA	1.0E+0	1.0E+0

Site Name: DP793
Site Location: 4035 Park Blvd., Oakland, California

Completed By: George Converse
Date Completed: 2/2/2005

RBCA SITE ASSESSMENT | Input Screen 9.1

CONSTITUENT HALF-LIFE VALUES

(Complete the following table)

CONSTITUENT	Half-Life of Constituent (day)
Benzene CA	
Ethylbenzene CA	
Hexane, n-	
Methyl t-Butyl Ether CA	
Toluene CA	
Xylene CA	

Site Name: DP793
Site Location: 4035 Park Blvd., Oakland,

Completed By: George Converse
Date Completed: 2/2/2005

RBCA SITE ASSESSMENT

EXPOSURE LIMITS IN GROUNDWATER AND AIR

CONSTITUENT	Exposure Limits Applied to Receptors	
	Groundwater (MCL) (mg/L)	Air (Comm. only) (PEL/TLV) (mg/m^3)
Benzene CA		
Ethylbenzene CA		
Hexane, n-		
Methyl t-Butyl Ether CA		
Toluene CA		
Xylene CA		

Site Name: DP793
Site Location: 4035 Park Blvd., Oakland, California

Completed By: George Converse
Date Completed: 2/2/2005

Site Name: DP793 Site Location: 4035 Park Blvd., Oakland, Californi Completed By: George Convers Date Completed: 2/2/2005

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ☐ (CHECKED IF PATHWAY IS ACTIVE)

SURFACE SOILS: VAPOR AND DUST INHALATION

Constituents of Concern	Exposure Concentration 1) Source Medium: Surface Soil Conc. (mg/kg)	2) NAF Value (m^3/kg) Receptor		3) Exposure Medium: Outdoor Air: POE Conc. (mg/m^3) (1) / (2)		4) Exposure Multiplier: (IR×EF×ED)/(BW×AT) (m^3/kg-day)		5) Average Daily Intake Rate: (mg/kg-day) (3) X (4)	
Benzene CA	5.0E-4								
Ethylbenzene CA	5.0E-4								
Hexane, n-	5.0E-2								
Methyl t-Butyl Ether CA	5.0E-4								
Toluene CA	5.0E-4								
Xylene CA	5.0E-4								

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/yr)
ET = Exposure time (hrs/day)
IR = Inhalation rate (m^3/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

Site Name: DP793 Site Location: 4035 Park Blvd., Oakland, Californi Completed By: George Convers Date Completed: 2/2/2005

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

SUBSURFACE SOILS: VAPOR INHALATION

Exposure Concentration

Constituents of Concern	1) Source Medium: Subsurface Soil Conc. (mg/kg)	2) NAF Value (m^3/kg) Receptor: On-Site Residential		3) Exposure Medium: Outdoor Air: POE Conc. (mg/m^3) (1) / (2) On-Site Residential		4) Exposure Multiplier: (IRxEFxED)/(BWxAT) (m^3/kg-day) On-Site Residential		5) Average Daily Intake Rate: (mg/kg-day) (3) X (4) On-Site Residential	
Benzene CA	3.9E+0	2.6E+4		1.5E-4		1.2E-1		1.8E-5	
Ethylbenzene CA	2.3E+1	2.6E+4		9.0E-4		2.7E-1		2.5E-4	
Hexane, n-	1.6E+3	2.6E+4		6.2E-2		2.7E-1		1.7E-2	
Methyl t-Butyl Ether CA	9.4E-3	2.6E+4		3.7E-7		1.2E-1		4.3E-8	
Toluene CA	1.5E+1	2.6E+4		5.8E-4		2.7E-1		1.6E-4	
Xylene CA	7.5E+1	2.6E+4		2.9E-3		2.7E-1		8.0E-4	

NOTE: ABS = Dermal absorption factor (dim); AF = Adherance factor (mg/cm^2); AT = Averaging time (days); BW = Body weight (kg); CF = Units conversion factor; ED = Exposure duration (yrs); EF = Exposure frequencey (days/yr); ET = Exposure time (hrs/day); IR = Inhalation rate (m^3/day); POE = Point of exposure; SA = Skin exposue area (cm^2/day)

Site Name: DP793 | Site Location: 4035 Park Blvd., Oakland, Ca | Completed By: George Converse | Date Completed: 2/2/2005 | 3 OF 9

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER: VAPOR INHALATION

Exposure Concentration

Constituents of Concern	1) Source Medium: Groundwater Conc. (mg/L)	2) NAF Value (m^3/L) Receptor: On-Site Residential		3) Exposure Medium: Outdoor Air: POE Conc. (mg/m^3) (1) / (2): On-Site Residential		4) Exposure Multiplier: (IRxEFxED)/(BWxAT) (m^3/kg-day): On-Site Residential		5) Average Daily Intake Rate: (mg/kg-day) (3) X (4): On-Site Residential		TOTAL PATHWAY INTAKE (mg/kg-day) (Sum intake values from surface, subsurface & groundwater routes.): On-Site Residential	
Benzene CA	2.4E+0	2.7E+5		8.8E-6		1.2E-1		1.0E-6		1.9E-5	
Ethylbenzene CA	4.3E+0	2.7E+5		1.6E-5		2.7E-1		4.3E-6		2.5E-4	
Hexane, n-	6.6E+1	9.8E+3		6.8E-3		2.7E-1		1.9E-3		1.9E-2	
Methyl t-Butyl Ether CA	2.5E-2	1.1E+5		2.3E-7		1.2E-1		2.7E-8		7.0E-8	
Toluene CA	1.1E+0	2.8E+5		4.0E-6		2.7E-1		1.1E-6		1.6E-4	
Xylene CA	1.2E+1	3.0E+5		4.0E-5		2.7E-1		1.1E-5		8.1E-4	

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/yr)
ET = Exposure time (hrs/day)
IR = Inhalation rate (m^3/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

Site Name: DP793 | Site Location: 4035 Park Blvd., Oakland, California | Completed By: George Converse | Date Completed: 2/2/2005 | 1 OF 4

TIER 2 PATHWAY RISK CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAYS ARE ACTIVE)

	CARCINOGENIC RISK						TOXIC EFFECTS				
Constituents of Concern	(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Residential		(3) Inhalation Slope Factor (mg/kg-day)^-1	(4) Individual COC Risk (2) x (3) On-Site Residential		(5) Total Toxicant Intake Rate (mg/kg/day) On-Site Residential		(6) Inhalation Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6) On-Site Residential	
Benzene CA	A	1.9E-5		1.0E-1	1.9E-6		4.4E-5		2.0E-2	2.2E-3	
Ethylbenzene CA							2.5E-4		2.9E-1	8.7E-4	
Hexane, n-							1.9E-2		5.7E-2	3.3E-1	
Methyl t-Butyl Ether CA	?	7.0E-8		1.7E-3	1.2E-10						
Toluene CA	D						1.6E-4		5.7E-2	2.8E-3	
Xylene CA	D						8.1E-4		8.6E-2	9.5E-3	
Total Pathway Carcinogenic Risk =					1.9E-6	0.0E+0	*Total Pathway Hazard Index =*			3.5E-1	0.0E+0

Site Name: DP793 Site Location: 4035 Park Blvd., Oakland, Californi Completed By: George Convers Date Completed: 2/2/2005

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

SUBSURFACE SOILS:
VAPOR INTRUSION TO BUILDINGS

Exposure Concentration

Constituents of Concern	1) Source Medium: Subsurface Soil Conc. (mg/kg)	2) NAF Value (m^3/kg) Receptor: On-Site Residential		3) Exposure Medium: Indoor Air: POE Conc. (mg/m^3) (1) / (2): On-Site Residential		4) Exposure Multiplier (IRxEFxED)/(BWxAT) (m^3/kg-day): On-Site Residential		5) Average Daily Intake Rate (mg/kg-day) (3) X (4): On-Site Residential	
Benzene CA	3.9E+0	3.4E+1		1.1E-1		8.8E-2		1.0E-2	
Ethylbenzene CA	2.3E+1	3.4E+1		6.7E-1		2.1E-1		1.4E-1	
Hexane, n-	1.6E+3	3.4E+1		4.7E+1		2.1E-1		9.6E+0	
Methyl t-Butyl Ether CA	9.4E-3	3.4E+1		2.8E-4		8.8E-2		2.4E-5	
Toluene CA	1.5E+1	3.4E+1		4.4E-1		2.1E-1		9.0E-2	
Xylene CA	7.5E+1	3.4E+1		2.2E+0		2.1E-1		4.5E-1	

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/yr)
ET = Exposure time (hrs/day)
IR = Inhalation rate (m^3/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

Site Name: DP793 Site Location: 4035 Park Blvd., Oakland, Ca Completed By: George Converse Date Completed: 2/2/2005

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER:
VAPOR INTRUSION TO BUILDINGS

Constituents of Concern	Exposure Concentration 1) Source Medium: Groundwater Conc. (mg/L)	2) NAF Value (m^3/L) Receptor: On-Site Residential		3) Exposure Medium: Indoor Air: POE Conc. (mg/m^3) (1) / (2) — On-Site Residential		4) Exposure Multiplier: (IRxEFxED)/(BWxAT) (m^3/kg-day) — On-Site Residential		5) Average Daily Intake Rate: (mg/kg-day) (3) X (4) — On-Site Residential		TOTAL PATHWAY INTAKE (mg/kg-day) (Sum intake values from subsurface & groundwater routes.) — On-Site Residential	
Benzene CA	2.4E+0	3.9E+2		6.2E-3		8.8E-2		5.4E-4		1.1E-2	
Ethylbenzene CA	4.3E+0	3.8E+2		1.1E-2		2.1E-1		2.3E-3		1.4E-1	
Hexane, n-	6.6E+1	1.4E+1		4.9E+0		2.1E-1		1.0E+0		1.1E+1	
Methyl t-Butyl Ether CA	2.5E-2	4.3E+2		5.9E-5		8.8E-2		5.2E-6		2.9E-5	
Toluene CA	1.1E+0	3.9E+2		2.8E-3		2.1E-1		5.7E-4		9.1E-2	
Xylene CA	1.2E+1	4.2E+2		2.8E-2		2.1E-1		5.8E-3		4.6E-1	

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/yr)
ET = Exposure time (hrs/day)
IR = Inhalation rate (m^3/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

Site Name: DP793 | Site Location: 4035 Park Blvd., Oakland, California | Completed By: George Converse | Date Completed: 2/2/2005 | 2 OF 4

TIER 2 PATHWAY RISK CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAYS ARE ACTIVE)

	CARCINOGENIC RISK						TOXIC EFFECTS			
Constituents of Concern	(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Residential		(3) Inhalation Slope Factor (mg/kg-day)^-1	(4) Individual COC Risk (2) x (3) On-Site Residential		(5) Total Toxicant Intake Rate (mg/kg/day) On-Site Residential		(6) Inhalation Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6) On-Site Residential	
Benzene CA	A	1.1E-2		1.0E-1	1.1E-3		2.5E-2		2.0E-2	1.2E+0	
Ethylbenzene CA							1.4E-1		2.9E-1	4.9E-1	
Hexane, n-							1.1E+1		5.7E-2	1.9E+2	
Methyl t-Butyl Ether CA	?	2.9E-5		1.7E-3	5.1E-8						
Toluene CA	D						9.1E-2		5.7E-2	1.6E+0	
Xylene CA	D						4.6E-1		8.6E-2	5.3E+0	
Total Pathway Carcinogenic Risk =					1.1E-3	0.0E+0	*Total Pathway Hazard Index =*			2.0E+2	0.0E+0

Site Name: DP793 Site Location: 4035 Park Blvd., Oakland, California Completed By: George Co Date Completed: 2/2/2005

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

SOIL EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

SURFACE SOILS OR SEDIMENTS:
DERMAL CONTACT

Constituents of Concern	Exposure Concentration 1) Source Medium: Surface Soil Conc. (mg/kg)	2) Exposure Multiplier (SAxAFxABSxCFxEFxED)/(BWxAT) (kg/kg-day): On-Site Residential	2) Exposure Multiplier: On-Site Commercial	3) Average Daily Intake Rate (mg/kg-day) (1) x (2): On-Site Residential	3) Average Daily Intake Rate: On-Site Commercial
Benzene CA	5.0E-4	1.7E-5		8.5E-9	
Ethylbenzene CA	5.0E-4	4.0E-5		2.0E-8	
Hexane, n-	5.0E-2	4.0E-5		2.0E-6	
Methyl t-Butyl Ether CA	5.0E-4	1.7E-5		8.5E-9	
Toluene CA	5.0E-4	4.0E-5		2.0E-8	
Xylene CA	5.0E-4	4.0E-5		2.0E-8	

NOTE: ABS = Dermal absorption factor (dim) BW = Body weight (kg) EF = Exposure frequency (days/yr POE = Point of exposure
AF = Adherance factor (mg/cm^2) CF = Units conversion factor ET = Exposure time (hrs/day) SA = Skin exposure area (cm^2/day)
AT = Averaging time (days) ED = Exposure duration (yrs) IR = Intake rate (mg/day)

Site Name: DP793 Site Location: 4035 Park Blvd., Oakland, C Completed By: George Convers Date Completed: 2/2/2005

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

SOIL EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

SURFACE SOILS OR SEDIMENTS: Exposure Concentration

INGESTION

Constituents of Concern	1) Source Medium: Surface Soil Conc. (mg/kg)	2) Exposure Multiplier (IRxCFxEFxED)/(BWxAT) (kg/kg-day): On-Site Residential	2) Exposure Multiplier: On-Site Commercial	3) Average Daily Intake Rate (mg/kg-day) (1) x (2): On-Site Residential	3) Average Daily Intake Rate: On-Site Commercial	TOTAL PATHWAY INTAKE (mg/kg-day) (Sum intake values from dermal & ingestion routes.): On-Site Residential	TOTAL PATHWAY INTAKE: On-Site Commercial
Benzene CA	5.0E-4	5.9E-7		2.9E-10		8.8E-9	
Ethylbenzene CA	5.0E-4	1.4E-6		6.8E-10		2.1E-8	
Hexane, n-	5.0E-2	1.4E-6		6.8E-8		2.1E-6	
Methyl t-Butyl Ether CA	5.0E-4	5.9E-7		2.9E-10		8.8E-9	
Toluene CA	5.0E-4	1.4E-6		6.8E-10		2.1E-8	
Xylene CA	5.0E-4	1.4E-6		6.8E-10		2.1E-8	

NOTE: ABS = Dermal absorption factor (dim); AF = Adherance factor (mg/cm^2); AT = Averaging time (days); BW = Body weight (kg); CF = Units conversion factor; ED = Exposure duration (yrs); EF = Exposure frequencey (days/yr); ET = Exposure time (hrs/day); IR = Intake rate (mg/day); POE = Point of exposure; SA = Skin exposure area (cm^2/day)

Site Name: DP793 | Site Location: 4035 Park Blvd., Oakland, California | Completed By: George Converse | Date Completed: 2/2/2005 | 3 OF 4

TIER 2 PATHWAY RISK CALCULATION

SOIL EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAYS ARE ACTIVE)

Constituents of Concern	(1) EPA Carcinogenic Classification	CARCINOGENIC RISK: (2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Residential	(2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Commercial	(3) Oral Slope Factor (mg/kg-day)^-1	(4) Individual COC Risk (2) x (3) On-Site Residential	(4) Individual COC Risk (2) x (3) On-Site Commercial	TOXIC EFFECTS: (5) Total Toxicant Intake Rate (mg/kg/day) On-Site Residential	(5) Total Toxicant Intake Rate (mg/kg/day) On-Site Commercial	(6) Oral Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6) On-Site Residential	(7) Individual COC Hazard Quotient (5) / (6) On-Site Commercial
Benzene CA	A	8.8E-9		1.0E-1	8.8E-10		2.1E-8		2.0E-2	1.0E-6	
Ethylbenzene CA							2.1E-8		1.0E-1	2.1E-7	
Hexane, n-							2.1E-6		6.0E-2	3.4E-5	
Methyl t-Butyl Ether CA	?	8.8E-9		1.7E-3	1.5E-11		2.1E-8		5.0E-3	4.1E-6	
Toluene CA	D						2.1E-8		1.1E-1	1.9E-7	
Xylene CA	D						2.1E-8		2.5E-1	8.2E-8	

Total Pathway Carcinogenic Risk = 9.0E-10 | 0.0E+0

Total Pathway Hazard Index = 4.0E-5 | 0.0E+0

Site Name: DP793 Site Location: 4035 Park Blvd., Oakland, California Completed By: George Convers Date Completed: 2/2/2005

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

SOIL: LEACHING TO GROUNDWATER/ GROUNDWATER INGESTION

Exposure Concentration

Constituents of Concern	1) Source Medium: Soil Concentration (mg/kg)	2) NAF Value (L/kg) Receptor: On-Site Residential		3) Exposure Medium: Groundwater: POE Conc. (mg/L) (1)/(2) On-Site Residential		4) Exposure Multiplier: (IRxEFxED)/(BWxAT) (L/kg-day) On-Site Residential		5) Average Daily Intake Rate: (mg/kg-day) (3) x (4) On-Site Residential	
Benzene CA	3.9E+0	2.0E+0		2.0E+0		1.2E-2		2.3E-2	
Ethylbenzene CA	2.3E+1	3.4E+0		6.8E+0		2.7E-2		1.9E-1	
Hexane, n-	1.6E+3	2.0E+1		8.1E+1		2.7E-2		2.2E+0	
Methyl t-Butyl Ether CA	9.4E-3	1.1E+0		8.6E-3		1.2E-2		1.0E-4	
Toluene CA	1.5E+1	4.1E+0		3.6E+0		2.7E-2		9.9E-2	
Xylene CA	7.5E+1	6.4E+0		1.2E+1		2.7E-2		3.2E-1	

NOTE: ABS = Dermal absorption factor (dim); AF = Adherance factor (mg/cm^2); AT = Averaging time (days); BW = Body Weight (kg); CF = Units conversion factor; ED = Exposure duration (yrs); EF = Exposure frequencey (days/yr); ET = Exposure time (hrs/day); IR = Intake rate (L/day); POE = Point of exposure; SA = Skin exposure area (cm^2/day)

Site Name: DP793 | Site Location: 4035 Park Blvd., Oakland, California | Completed By: George Converse | Date Completed: 2/2/2005 | 9 OF 9

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER: INGESTION

Constituents of Concern	Exposure Concentration 1) Source Medium: Groundwater Conc. (mg/L)	2) NAF Value (dim) Receptor: On-Site Residential		3) Exposure Medium: Groundwater; POE Conc. (mg/L) (1)X(2) — On-Site Residential		4) Exposure Multiplier: (IRxEFxED)/(BWxAT) (L/kg-day) — On-Site Residential		5) Average Daily Intake Rate: (mg/kg-day) (3) x (4) — On-Site Residential		MAX. PATHWAY INTAKE (mg/kg-day) (Maximum intake of active pathways soil leaching & groundwater routes.) — On-Site Residential	
Benzene CA	2.4E+0	1.0E+0		2.4E+0		1.2E-2		2.8E-2		2.8E-2	
Ethylbenzene CA	4.3E+0	1.0E+0		4.3E+0		2.7E-2		1.2E-1		1.9E-1	
Hexane, n-	6.6E+1	1.0E+0		6.6E+1		2.7E-2		1.8E+0		2.2E+0	
Methyl t-Butyl Ether CA	2.5E-2	1.0E+0		2.5E-2		1.2E-2		2.9E-4		2.9E-4	
Toluene CA	1.1E+0	1.0E+0		1.1E+0		2.7E-2		3.0E-2		9.9E-2	
Xylene CA	1.2E+1	1.0E+0		1.2E+1		2.7E-2		3.3E-1		3.3E-1	

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/yr)
ET = Exposure time (hrs/day)
IR = Intake rate (L/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

RBCA SITE ASSESSMENT | **Tier 2 Worksheet 8.2**

Site Name: DP793 | Site Location: 4035 Park Blvd., Oakland, California | Completed By: George Converse | Date Completed: 2/2/2005 | *4 OF 4*

TIER 2 PATHWAY RISK CALCULATION

GROUNDWATER EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAYS ARE ACTIVE)

		CARCINOGENIC RISK					TOXIC EFFECTS				
Constituents of Concern	(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Residential		(3) Oral Slope Factor (mg/kg-day)^-1	(4) Individual COC Risk (2) x (3) On-Site Residential		(5) Total Toxicant Intake Rate (mg/kg/day) On-Site Residential		(6) Oral Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6) On-Site Residential	
Benzene CA	A	2.8E-2		1.0E-1	2.8E-3		6.6E-2		2.0E-2	3.3E+0	
Ethylbenzene CA							1.9E-1		1.0E-1	1.9E+0	
Hexane, n-							2.2E+0		6.0E-2	3.7E+1	
Methyl t-Butyl Ether CA	?	2.9E-4		1.7E-3	5.1E-7		6.8E-4		5.0E-3	1.4E-1	
Toluene CA	D						9.9E-2		1.1E-1	9.0E-1	
Xylene CA	D						3.3E-1		2.5E-1	1.3E+0	

Total Pathway Carcinogenic Risk = 2.8E-3 | 0.0E+0

Total Pathway Hazard Index = 4.4E+1 | 0.0E+0

RBCA SITE ASSESSMENT | **Tier 2 Worksheet 8.3**

Site Name: DP793 - BACKYARDS
Site Location: 4035 Park Blvd., Oakland, California

Completed By: George Converse
Date Completed: 9/23/1999

TIER 2 BASELINE RISK SUMMARY TABLE

	BASELINE CARCINOGENIC RISK					BASELINE TOXIC EFFECTS				
	Individual COC Risk		Cumulative COC Risk		Risk Limit(s) Exceeded?	Hazard Quotient		Hazard Index		Toxicity Limit(s) Exceeded?
EXPOSURE PATHWAY	Maximum Value	Target Risk	Total Value	Target Risk		Maximum Value	Applicable Limit	Total Value	Applicable Limit	
OUTDOOR AIR EXPOSURE PATHWAYS										
Complete:	4.8E-6	1.0E-6	4.8E-6	N/A	■	1.7E-1	1.0E+0	2.0E-1	N/A	☐
INDOOR AIR EXPOSURE PATHWAYS										
Complete:	4.7E-3	1.0E-6	4.7E-3	N/A	■	1.7E+2	1.0E+0	2.0E+2	N/A	■
SOIL EXPOSURE PATHWAYS										
Complete:	8.8E-9	1.0E-6	9.0E-9	N/A	☐	4.1E-5	1.0E+0	6.0E-5	N/A	☐
GROUNDWATER EXPOSURE PATHWAYS										
Complete:	8.4E-3	1.0E-6	8.4E-3	N/A	■	2.6E+1	1.0E+0	4.6E+1	N/A	■
CRITICAL EXPOSURE PATHWAY (Select Maximum Values From Complete Pathways)										
	8.4E-3	1.0E-6	8.4E-3	N/A	■	1.7E+2	1.0E+0	2.0E+2	N/A	■

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.1

Site Name: DP793 - BACKYARDS
Site Location: 4035 Park Blvd., Oakland, California

Completed By: George Converse
Date Completed: 9/23/1999

SURFACE SOIL SSTL VALUES (< 3.3 FT BGS)

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

☐ MCL exposure limit?
☐ PEL exposure limit?

Calculation Option: 2

SSTL Results For Complete Exposure Pathways ("x" If Complete)

CONSTITUENTS OF CONCERN		Representative Concentration	X Soil Leaching to Groundwater			X Ingestion and Dermal Contact		X Construction Worker	Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No.	Name	(mg/kg)	Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)	Residential: (on-site)	Commercial: (on-site)	Commercial: (on-site)	(mg/kg)	"■" If yes	Only if "yes" left
71-43-3	Benzene CA	5.0E-3	1.3E-3	NA	NA	5.7E-1	NA	3.3E+1	1.3E-3	■	4.0E+00
100-41-4	Ethylbenzene CA	5.0E-3	9.5E+0	NA	NA	>Res	NA	>Res	9.5E+0	☐	<1
110-54-3	Hexane, n-	5.0E-3	>Res	NA	NA	>Res	NA	>Res	>Res	☐	<1
1634-04-4	Methyl t-Butyl Ether CA	5.0E-3	4.2E-2	NA	NA	3.3E+1	NA	1.9E+3	4.2E-2	☐	<1
108-88-3	Toluene CA	5.0E-3	1.3E+1	NA	NA	>Res	NA	>Res	1.3E+1	☐	<1
1330-20-7	Xylene CA	1.0E-2	4.5E+1	NA	NA	>Res	NA	>Res	4.5E+1	☐	<1

>Res indicates risk-based target concentration greater than constituent residual saturation value

Software: GSI RBCA Spreadsheet
Version: 1.0.1

Serial: G-443-CSX-444

RBCA SITE ASSESSMENT | Tier 2 Worksheet 9.2

Site Name: DP793 - BACKYARDS
Site Location: 4035 Park Blvd., Oakland, California

Completed By: George Converse
Date Completed: 9/23/1999

SUBSURFACE SOIL SSTL VALUES (> 3.3 FT BGS)

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

☐ MCL exposure limit?
☐ PEL exposure limit?

Calculation Option: 2

SSTL Results For Complete Exposure Pathways ("x" If Complete)

CONSTITUENTS OF CONCERN		Representative Concentration	X Soil Leaching to Groundwater			X Soil Volatilization to Indoor Air		X Soil Volatilization to Outdoor Air		Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No.	Name	(mg/kg)	Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)	Residential: (on-site)	Commercial: (on-site)	Residential: (on-site)	Commercial: (on-site)	(mg/kg)	"■" If yes	Only if "yes" left
71-43-3	Benzene CA	1.1E+1	1.3E-3	NA	NA	2.3E-3	NA	2.3E+0	NA	1.3E-3	■	8.4E+03
100-41-4	Ethylbenzene CA	2.1E+1	9.5E+0	NA	NA	2.8E+1	NA	>Res	NA	9.5E+0	■	2.0E+00
110-54-3	Hexane, n-	8.7E+2	>Res	NA	NA	5.7E+0	NA	>Res	NA	5.7E+0	■	1.5E+02
1634-04-4	Methyl t-Butyl Ether CA	5.0E-3	4.2E-2	NA	NA	2.1E-1	NA	1.3E+2	NA	4.2E-2	☐	<1
108-88-3	Toluene CA	6.2E+1	1.3E+1	NA	NA	5.7E+0	NA	>Res	NA	5.7E+0	■	1.1E+01
1330-20-7	Xylene CA	1.2E+2	4.5E+1	NA	NA	8.5E+0	NA	>Res	NA	8.5E+0	■	1.4E+01

>Res indicates risk-based target concentration greater than constituent residual saturation value

Software: GSI RBCA Spreadsheet
Version: 1.0.1

Serial: G-443-CSX-444

RBCA SITE ASSESSMENT | **Tier 2 Worksheet 9.3**

Site Name: DP793 - BACKYARDS
Site Location: 4035 Park Blvd., Oakland, California

Completed By: George Converse
Date Completed: 9/23/1999

GROUNDWATER SSTL VALUES

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quolient 1.0E+0

☐ MCL exposure limit?
☐ PEL exposure limit?

Calculation Option: 2

SSTL Results For Complete Exposure Pathways ("x" if Complete)

CONSTITUENTS OF CONCERN		Representative Concentration	X Groundwater Ingestion			X Groundwater Volatilization to Indoor Air		X Groundwater Volatilization to Outdoor Air		Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No.	Name	(mg/L)	Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)	Residential: (on-site)	Commercial: (on-site)	Residential (on-site)	Commercial: (on-site)	(mg/L	"■" If yes	Only if "yes" left
71-43-3	Benzene CA	2.3E-1	8.5E-4	NA	NA	2.4E-2	NA	2.1E+1	NA	8.5E-4	■	2.7E+02
100-41-4	Ethylbenzene CA	4.4E-1	3.7E+0	NA	NA	>Sol	NA	>Sol	NA	3.7E+0	☐	<1
110-54-3	Hexane, n-	2.6E+1	2.2E+0	NA	NA	2.0E+0	NA	>Sol	NA	2.0E+0	■	1.3E+01
1634-04-4	Methyl t-Butyl Ether CA	4.9E-3	4.9E-2	NA	NA	2.5E+0	NA	6.3E+2	NA	4.9E-2	☐	<1
108-88-3	Toluene CA	2.6E-1	4.0E+0	NA	NA	5.9E+1	NA	>Sol	NA	4.0E+0	☐	<1
1330-20-7	Xylene CA	2.8E+0	9.1E+0	NA	NA	9.5E+1	NA	>Sol	NA	9.1E+0	☐	<1

>Sol indicates risk-based target concentration greater than constituent solubility

Software: GSI RBCA Spreadsheet
Version: 1.0.1

Serial: G-443-CSX-444

RBCA TIER 1/TIER 2 EVALUATION

Output Table 1

Site Name: DP793 - BACKYARDS Job Identification: DP793 -2
Site Location: 4035 Park Blvd., Oakland, Calif Date Completed: 9/23/99
Completed By: George Converse

Software: GSI RBCA Spreadsheet
Version: 1.0.1

NOTE: values which differ from Tier 1 default values are shown in bold italics and underlined.

Exposure Parameter	Definition (Units)	Residential Adult	Residential (1-6yrs)	Residential (1-16 yrs)	Commercial/Industrial Chronic	Commercial/Industrial Constrctn
ATc	Averaging time for carcinogens (yr)	70				
ATn	Averaging time for non-carcinogens (yr)	30	6	16	25	1
BW	Body Weight (kg)	70	15	35	70	
ED	Exposure Duration (yr)	30	6	16	25	1
t	Averaging time for vapor flux (yr)	30			25	1
EF	Exposure Frequency (days/yr)	350			250	180
EF.Derm	Exposure Frequency for dermal exposure	350			250	
IRgw	Ingestion Rate of Water (L/day)	2			1	
IRs	Ingestion Rate of Soil (mg/day)	100	200		50	100
IRadj	Adjusted soil ing. rate (mg-yr/kg-d)	1.1E+02			9.4E+01	
IRa.in	Inhalation rate indoor (m^3/day)	15			20	
IRa.out	Inhalation rate outdoor (m^3/day)	20			20	10
SA	Skin surface area (dermal) (cm^2)	5.8E+03		2.0E+03	5.8E+03	5.8E+03
SAadj	Adjusted dermal area (cm^2-yr/kg)	2.1E+03			1.7E+03	
M	Soil to Skin adherence factor	1				
AAFs	Age adjustment on soil ingestion	FALSE			FALSE	
AAFd	Age adjustment on skin surface area	FALSE			FALSE	
tox	Use EPA tox data for air (or PEL based)?	TRUE				
gwMCL?	Use MCL as exposure limit in groundwater?	FALSE				

Matrix of Exposed Persons to Complete Exposure Pathways		Residential	Commercial/Industrial Chronic	Commercial/Industrial Constrctn
Outdoor Air Pathways:				
SS.v	Volatiles and Particulates from Surface Soils	FALSE	FALSE	FALSE
S.v	Volatilization from Subsurface Soils	TRUE	FALSE	
GW.v	Volatilization from Groundwater	TRUE	FALSE	
Indoor Air Pathways:				
S.b	Vapors from Subsurface Soils	TRUE	FALSE	
GW.b	Vapors from Groundwater	TRUE	FALSE	
Soil Pathways:				
SS.d	Direct Ingestion and Dermal Contact	TRUE	FALSE	TRUE
Groundwater Pathways:				
GW.i	Groundwater Ingestion	TRUE	FALSE	
S.l	Leaching to Groundwater from all Soils	TRUE	FALSE	

Matrix of Receptor Distance and Location On- or Off-Site		Residential Distance	Residential On-Site	Commercial/Industrial Distance	Commercial/Industrial On-Site
GW	Groundwater receptor (cm)		TRUE		FALSE
S	Inhalation receptor (cm)		TRUE		FALSE

Matrix of Target Risks		Individual	Cumulative
TRab	Target Risk (class A&B carcinogens)	1.0E-06	
TRc	Target Risk (class C carcinogens)	1.0E-05	
THQ	Target Hazard Quotient	1.0E+00	
Opt	Calculation Option (1, 2, or 3)	2	
Tier	RBCA Tier	2	

Surface Parameters	Definition (Units)	Residential	Constrctn
A	Contaminated soil area (cm^2)	***2.3E+06***	***2.3E+06***
W	Length of affect. soil parallel to wind (cm)	***1.2E+03***	***1.2E+03***
W.gw	Length of affect. soil parallel to groundwater (cm	***2.1E+03***	
Uair	Ambient air velocity in mixing zone (cm/s)	2.3E+02	
della	Air mixing zone height (cm)	2.0E+02	
Lss	Thickness of affected surface soils (cm)	1.0E+02	
Pe	Particulate areal emission rate (g/cm^2/s)	6.9E-14	

Groundwater	Definition (Units)	Value
delta.gw	Groundwater mixing zone depth (cm)	***4.9E+02***
I	Groundwater infiltration rate (cm/yr)	***6.1E+01***
Ugw	Groundwater Darcy velocity (cm/yr)	***2.1E+03***
Ugw.tr	Groundwater seepage velocity (cm/yr)	***6.8E+03***
Ks	Saturated hydraulic conductivity(cm/s)	1.0E-03
grad	Groundwater gradient (cm/cm)	6.5E-02
Sw	Width of groundwater source zone (cm)	
Sd	Depth of groundwater source zone (cm)	
phi.eff	Effective porosity in water-bearing unit	3.0E-01
foc.sat	Fraction organic carbon in water-bearing unit	***4.6E-02***
BIO?	Is bioattenuation considered?	TRUE
BC	Biodegradation Capacity (mg/L)	

Soil	Definition (Units)	Value		
hc	Capillary zone thickness (cm)	***3.0E+01***		
hv	Vadose zone thickness (cm)	***2.7E+02***		
rho	Soil density (g/cm^3)	1.7		
foc	Fraction of organic carbon in vadose zone	***0.0019***		
phi	Soil porosity in vadose zone	0.38		
Lgw	Depth to groundwater (cm)	***3.0E+02***		
Ls	Depth to top of affected subsurface soil (cm)	***2.1E+02***		
Lsubs	Thickness of affected subsurface soils (cm)	***7.6E+02***		
pH	Soil/groundwater pH	6.5		
		capillary	vadose	foundation
phi.w	Volumetric water content	0.342	0.12	0.12
phi.a	Volumetric air content	0.038	0.26	0.26

Building	Definition (Units)	Residential	Commercial
Lb	Building volume/area ratio (cm)	2.0E+02	3.0E+02
ER	Building air exchange rate (s^-1)	1.4E-04	2.3E-04
Lcrk	Foundation crack thickness (cm)	1.5E+01	
eta	Foundation crack fraction	0.01	

Transport Parameters	Definition (Units)	Residential	Commercial
Groundwater			
ax	Longitudinal dispersivity (cm)		
ay	Transverse dispersivity (cm)		
az	Vertical dispersivity (cm)		
Vapor			
dcy	Transverse dispersion coefficient (cm)		
dcz	Vertical dispersion coefficient (cm)		

RBCA CHEMICAL DATABASE

Physical Property Data

CAS Number	Constituent	type	Molecular Weight (g/mole) MW	ref	Diffusion Coefficients in air (cm2/s) Dair	ref	Diffusion Coefficients in water (cm2/s) Dwat	ref	log (Koc) or log(Kd) (@ 20 - 25 C) log(l/kg)	ref	Henry's Law Constant (@ 20 - 25 C) (atm-m3/mol)	(unitless)	ref	Vapor Pressure (@ 20 - 25 C) (mm Hg)	ref	Solubility (@ 20 - 25 C) (mg/L)	ref	acid pKa	base pKb	ref
71-43-3	Benzene CA	O	78.1		9.30E-02		1.10E-05		1.58		5.29E-03	2.20E-01		9.52E+01		1.75E+03				
100-41-4	Ethylbenzene CA	O	106.2		7.60E-02		8.50E-06		1.98		7.69E-03	3.20E-01		1.00E+01		1.52E+02				
110-54-3	Hexane, n-	O	86.2	5	2.00E-01	4	7.77E-06	4	2.68	4	1.22E-01	5.07E+00	4	1.50E+02	4	1.30E+01	5			
1634-04-4	Methyl t-Butyl Ether CA	O	88.146		7.92E-02		9.41E-05		1.08		5.77E-04	2.40E-02		2.49E+02		4.80E+04				
108-88-3	Toluene CA	O	92.4		8.50E-02		9.40E-06		2.13		6.25E-03	2.60E-01		3.00E+01		5.15E+02				
1330-20-7	Xylene CA	O	106.2		7.20E-02		8.50E-06		2.38		6.97E-03	2.90E-01		7.00E+00		1.98E+02				

Site Name: DP793 - BACKYARDS Site Location: 4035 Park Blvd., Oaklan Completed By: George Converse Date Completed: 9/23/1999

Software version: 1.0.1

RBCA CHEMICAL DATABASE	Toxicity Data

CAS Number	Constituent	Reference Dose (mg/kg/day) Oral RfD_oral	ref	Inhalation RfD_inhal	ref	Slope Factors 1/(mg/kg/day) Oral SF_oral	ref	Inhalation SF_inhal	ref	EPA Weight of Evidence	Is Constituent Carcinogenic ?
71-43-3	Benzene CA	2.00E-02		2.00E-02	30	1.00E-01		1.00E-01		A	TRUE
100-41-4	Ethylbenzene CA	1.00E-01		2.86E-01	30						FALSE
110-54-3	Hexane, n-	6.00E-02	A	5.71E-02	R	-		-			FALSE
1634-04-4	Methyl t-Butyl Ether CA	5.00E-03				1.73E-03		1.73E-03	31	?	TRUE OEHHA draft
108-88-3	Toluene CA	1.10E-01		5.70E-02	30					D	FALSE
1330-20-7	Xylene CA	2.50E-01		8.57E-02	30					D	FALSE

Site Name: DP793 - BACKYARDS Site Location: 4035 Park Blvd., Oakl Completed By: George Converse Date Completed: 9/23/1999

Software version: 1.0.1

RBCA CHEMICAL DATABASE

Miscellaneous Chemical Data

CAS Number	Constituent	Maximum Contaminant Level MCL (mg/L)	reference	Permissible Exposure Limit PEL/TLV (mg/m3)	ref	Relative Absorption Factors Oral	Dermal	Detection Limits Groundwater (mg/L)	ref	Soil (mg/kg)	ref	Half Life (First-Order Decay) (days) Saturated	Unsaturated	ref
71-43-3	Benzene CA	1.00E-03		3.20E+00		1	0.5	0.0005		0.005		720	720	
100-41-4	Ethylbenzene CA	7.00E-02		4.34E+02		1	0.5	0.0005		0.005		228	228	
110-54-3	Hexane, n-					1	0.5							
1634-04-4	Methyl t-Butyl Ether CA			1.44E+02		1	0.5	0.005		0.05				
108-88-3	Toluene CA	1.50E-01		1.47E+02		1	0.5	0.0005		0.005		28	28	
1330-20-7	Xylene CA	1.75E+00		4.34E+02		1	0.5	0.002		0.005		360	360	

Site Name: DP793 - BACKYARDS Site Location: 4035 Park Blvd., Oakland, California Completed By: George Converse Date Completed: 9/23/1999

Software version: 1.0.1

REPRESENTATIVE COC CONCENTRATIONS IN SOURCE MEDIA

(Complete the following table)

CONSTITUENT	Representative COC Concentration					
	in Groundwater		in Surface Soil		in Subsurface Soil	
	value (mg/L)	note	value (mg/kg)	note	value (mg/kg)	note
Benzene CA	2.3E-1	UCL	5.0E-3		1.1E+1	max
Ethylbenzene CA	4.4E-1	UCL	5.0E-3		2.1E+1	max
Hexane, n-	2.6E+1	UCL	5.0E-3		8.7E+2	max
Methyl t-Butyl Ether CA	4.9E-3	UCL	5.0E-3		5.0E-3	max
Toluene CA	2.6E-1	UCL	5.0E-3		6.2E+1	max
Xylene CA	2.8E+0	UCL	1.0E-2		1.2E+2	max

Site Name: DP793 - BACKYARDS
Site Location: 4035 Park Blvd., Oakland, California

Completed By: George Converse
Date Completed: 9/23/1999

RBCA SITE ASSESSMENT | **Input Screen 6.3**

CONSTITUENT MOLE FRACTIONS

(Complete the following table)

CONSTITUENT	Mole Fraction of Constituent in Source Material
Benzene CA	
Ethylbenzene CA	
Hexane, n-	
Methyl t-Butyl Ether CA	
Toluene CA	
Xylene CA	

Site Name: DP793 - BACKYARDS Completed By: George Converse
Site Location: 4035 Park Blvd., Oakland Date Completed: 9/23/1999

RBCA SITE ASSESSMENT | **Input Screen 9.4**

GROUNDWATER DAF VALUES

(Enter DAF values in the grey area of the following table)

CONSTITUENT	Dilution Attenuation Factor (DAF) in Groundwater	
	Residential Receptor	Comm./Ind. Receptor
Benzene CA	1.0E+0	1.0E+0
Ethylbenzene CA	1.0E+0	1.0E+0
Hexane, n-	1.0E+0	1.0E+0
Methyl t-Butyl Ether CA	1.0E+0	1.0E+0
Toluene CA	1.0E+0	1.0E+0
Xylene CA	1.0E+0	1.0E+0

Site Name: DP793 - BACKYARDS
Site Location: 4035 Park Blvd., Oakland, California

Completed By: George Converse
Date Completed: 9/23/1999

RBCA SITE ASSESSMENT | Input Screen 9.1

CONSTITUENT HALF-LIFE VALUES

(Complete the following table)

CONSTITUENT	Half-Life of Constituent (day)
Benzene CA	
Ethylbenzene CA	
Hexane, n-	
Methyl t-Butyl Ether CA	
Toluene CA	
Xylene CA	

Site Name: DP793 - BACKYARDS Completed By: George Converse
Site Location: 4035 Park Blvd., Oakland, Date Completed: 9/23/1999

RBCA SITE ASSESSMENT

EXPOSURE LIMITS IN GROUNDWATER AND AIR

CONSTITUENT	Exposure Limits Applied to Receptors	
	Groundwater (MCL) (mg/L)	Air (Comm. only) (PEL/TLV) (mg/m^3)
Benzene CA		
Ethylbenzene CA		
Hexane, n-		
Methyl t-Butyl Ether CA		
Toluene CA		
Xylene CA		

Site Name: DP793 - BACKYARDS
Site Location: 4035 Park Blvd., Oakland, California

Completed By: George Converse
Date Completed: 9/23/1999

Site Name: DP793 - BACKYARDS | Site Location: 4035 Park Blvd., Oakland, Californi | Completed By: George Convers | Date Completed: 9/23/1999 | 1 OF 9

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ☐ (CHECKED IF PATHWAY IS ACTIVE)

SURFACE SOILS: VAPOR AND DUST INHALATION

Constituents of Concern	Exposure Concentration 1) Source Medium: Surface Soil Conc. (mg/kg)	2) NAF Value (m^3/kg) Receptor		3) Exposure Medium: Outdoor Air: POE Conc. (mg/m^3) (1) / (2)		4) Exposure Multiplier (IRxEFxED)/(BWxAT) (m^3/kg-day)		5) Average Daily Intake Rate (mg/kg-day) (3) X (4)	
Benzene CA	5.0E-3								
Ethylbenzene CA	5.0E-3								
Hexane, n-	5.0E-3								
Methyl t-Butyl Ether CA	5.0E-3								
Toluene CA	5.0E-3								
Xylene CA	1.0E-2								

NOTE: ABS = Dermal absorption factor (dim); AF = Adherance factor (mg/cm^2); AT = Averaging time (days); BW = Body weight (kg); CF = Units conversion factor; ED = Exposure duration (yrs); EF = Exposure frequencey (days/yr); ET = Exposure time (hrs/day); IR = Inhalation rate (m^3/day); POE = Point of exposure; SA = Skin exposure area (cm^2/day)

Site Name: DP793 - BACKYARDS | Site Location: 4035 Park Blvd., Oakland, Californi | Completed By: George Convers | Date Completed: 9/23/1999 | 2 OF 9

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

SUBSURFACE SOILS: VAPOR INHALATION

Constituents of Concern	Exposure Concentration 1) Source Medium: Subsurface Soil Conc. (mg/kg)	2) NAF Value (m^3/kg) Receptor: On-Site Residential		3) Exposure Medium: Outdoor Air: POE Conc. (mg/m^3) (1) / (2) On-Site Residential		4) Exposure Multiplier: (IRxEFxED)/(BWxAT) (m^3/kg-day) On-Site Residential		5) Average Daily Intake Rate: (mg/kg-day) (3) X (4) On-Site Residential	
Benzene CA	1.1E+1	2.7E+4		4.1E-4		1.2E-1		4.8E-5	
Ethylbenzene CA	2.1E+1	2.7E+4		7.8E-4		2.7E-1		2.1E-4	
Hexane, n-	8.7E+2	2.7E+4		3.2E-2		2.7E-1		8.8E-3	
Methyl t-Butyl Ether CA	5.0E-3	2.7E+4		1.9E-7		1.2E-1		2.2E-8	
Toluene CA	6.2E+1	2.7E+4		2.3E-3		2.7E-1		6.3E-4	
Xylene CA	1.2E+2	2.7E+4		4.5E-3		2.7E-1		1.2E-3	

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/yr)
ET = Exposure time (hrs/day)
IR = Inhalation rate (m^3/day)
POE = Point of exposure
SA = Skin exposue area (cm^2/day)

Site Name: DP793 - BACKYARDS | Site Location: 4035 Park Blvd., Oakland, Ca | Completed By: George Converse | Date Completed: 9/23/1999 | 3 OF 9

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER: VAPOR INHALATION

Constituents of Concern	Exposure Concentration 1) Source Medium: Groundwater Conc. (mg/L)	2) NAF Value (m^3/L) Receptor: On-Site Residential		3) Exposure Medium: Outdoor Air: POE Conc. (mg/m^3) (1) / (2): On-Site Residential		4) Exposure Multiplier (IRxEFxED)/(BWxAT) (m^3/kg-day): On-Site Residential		5) Average Daily Intake Rate (mg/kg-day) (3) X (4): On-Site Residential		TOTAL PATHWAY INTAKE (mg/kg-day) (Sum intake values from surface, subsurface & groundwater routes.): On-Site Residential	
Benzene CA	2.3E-1	2.4E+5		9.5E-7		1.2E-1		1.1E-7		4.8E-5	
Ethylbenzene CA	4.4E-1	2.4E+5		1.8E-6		2.7E-1		5.0E-7		2.1E-4	
Hexane, n-	2.6E+1	8.6E+3		3.0E-3		2.7E-1		8.3E-4		9.7E-3	
Methyl t-Butyl Ether CA	4.9E-3	1.3E+5		3.8E-8		1.2E-1		4.5E-9		2.6E-8	
Toluene CA	2.6E-1	2.5E+5		1.1E-6		2.7E-1		2.9E-7		6.3E-4	
Xylene CA	2.8E+0	2.6E+5		1.0E-5		2.7E-1		2.9E-6		1.2E-3	

NOTE: ABS = Dermal absorption factor (dim); AF = Adherance factor (mg/cm^2); AT = Averaging time (days); BW = Body weight (kg); CF = Units conversion factor; ED = Exposure duration (yrs); EF = Exposure frequencey (days/yr); ET = Exposure time (hrs/day); IR = Inhalation rate (m^3/day); POE = Point of exposure; SA = Skin exposure area (cm^2/day)

RBCA SITE ASSESSMENT | **Tier 2 Worksheet 8.2**

Site Name: DP793 - BACKYARDS | Site Location: 4035 Park Blvd., Oakland, California | Completed By: George Converse | Date Completed: 9/23/1999 |

TIER 2 PATHWAY RISK CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAYS ARE ACTIVE)

	CARCINOGENIC RISK						TOXIC EFFECTS				
Constituents of Concern	(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Residential		(3) Inhalation Slope Factor (mg/kg-day)^-1	(4) Individual COC Risk (2) x (3) On-Site Residential		(5) Total Toxicant Intake Rate (mg/kg/day) On-Site Residential		(6) Inhalation Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6) On-Site Residential	
Benzene CA	A	4.8E-5		1.0E-1	4.8E-6		1.1E-4		2.0E-2	5.6E-3	
Ethylbenzene CA							2.1E-4		2.9E-1	7.5E-4	
Hexane, n-							9.7E-3		5.7E-2	1.7E-1	
Methyl t-Butyl Ether CA	?	2.6E-8		1.7E-3	4.5E-11						
Toluene CA	D						6.3E-4		5.7E-2	1.1E-2	
Xylene CA	D						1.2E-3		8.6E-2	1.4E-2	
Total Pathway Carcinogenic Risk =					4.8E-6	0.0E+0	*Total Pathway Hazard Index =*			2.0E-1	0.0E+0

Site Name: DP793 - BACKYARDS | Site Location: 4035 Park Blvd., Oakland, Californi Completed By: George Convers | Date Completed: 9/23/1999 | 4 OF 9

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

SUBSURFACE SOILS: VAPOR INTRUSION TO BUILDINGS Constituents of Concern	Exposure Concentration 1) Source Medium Subsurface Soil Conc. (mg/kg)	2) NAF Value (m^3/kg) Receptor On-Site Residential		3) Exposure Medium Indoor Air: POE Conc. (mg/m^3) (1) / (2) On-Site Residential		4) Exposure Mulliplier (IRxEFxED)/(BWxAT) (m^3/kg-day) On-Site Residential		5) Average Daily Intake Rate (mg/kg-day) (3) X (4) On-Site Residential	
Benzene CA	1.1E+1	2.0E+1		5.4E-1		8.8E-2		4.7E-2	
Ethylbenzene CA	2.1E+1	2.0E+1		1.0E+0		2.1E-1		2.1E-1	
Hexane, n-	8.7E+2	2.0E+1		4.3E+1		2.1E-1		8.7E+0	
Methyl t-Butyl Ether CA	5.0E-3	3.1E+1		1.6E-4		8.8E-2		1.4E-5	
Toluene CA	6.2E+1	2.0E+1		3.0E+0		2.1E-1		6.2E-1	
Xylene CA	1.2E+2	2.0E+1		5.9E+0		2.1E-1		1.2E+0	

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequency (days/yr)
ET = Exposure time (hrs/day)
IR = Inhalation rate (m^3/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

Site Name: DP793 - BACKYARDS | Site Location: 4035 Park Blvd., Oakland, Ca | Completed By: George Converse | Date Completed: 9/23/1999 | 5 OF 9

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER:
VAPOR INTRUSION TO BUILDINGS

Exposure Concentration

Constituents of Concern	1) Source Medium: Groundwater Conc. (mg/L)	2) NAF Value (m^3/L) Receptor: On-Site Residential		3) Exposure Medium: Indoor Air: POE Conc. (mg/m^3) (1) / (2) On-Site Residential		4) Exposure Multiplier: (IRxEFxED)/(BWxAT) (m^3/kg-day) On-Site Residential		5) Average Daily Intake Rate: (mg/kg-day) (3) X (4) On-Site Residential		TOTAL PATHWAY INTAKE (mg/kg-day) (Sum intake values from subsurface & groundwater routes.) On-Site Residential	
Benzene CA	2.3E-1	2.1E+2		1.1E-3		8.8E-2		9.7E-5		4.7E-2	
Ethylbenzene CA	4.4E-1	2.0E+2		2.2E-3		2.1E-1		4.4E-4		2.1E-1	
Hexane, n-	2.6E+1	7.1E+0		3.7E+0		2.1E-1		7.6E-1		9.5E+0	
Methyl t-Butyl Ether CA	4.9E-3	3.8E+2		1.3E-5		8.8E-2		1.1E-6		1.5E-5	
Toluene CA	2.6E-1	2.1E+2		1.2E-3		2.1E-1		2.5E-4		6.2E-1	
Xylene CA	2.8E+0	2.3E+2		1.2E-2		2.1E-1		2.5E-3		1.2E+0	

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequency (days/yr)
ET = Exposure time (hrs/day)
IR = Inhalation rate (m^3/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

RBCA SITE ASSESSMENT | **Tier 2 Worksheet 8.2**

Site Name: DP793 - BACKYARDS | Site Location: 4035 Park Blvd., Oakland, California | Completed By: George Converse | Date Completed: 9/23/1999 |

TIER 2 PATHWAY RISK CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAYS ARE ACTIVE)

	CARCINOGENIC RISK						TOXIC EFFECTS				
Constituents of Concern	(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Residential		(3) Inhalation Slope Factor (mg/kg-day)^-1	(4) Individual COC Risk (2) x (3) On-Site Residential		(5) Total Toxicant Intake Rate (mg/kg/day) On-Site Residential		(6) Inhalation Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6) On-Site Residential	
Benzene CA	A	4.7E-2		1.0E-1	4.7E-3		1.1E-1		2.0E-2	5.5E+0	
Ethylbenzene CA							2.1E-1		2.9E-1	7.4E-1	
Hexane, n-							9.5E+0		5.7E-2	1.7E+2	
Methyl t-Butyl Ether CA	?	1.5E-5		1.7E-3	2.6E-8						
Toluene CA	D						6.2E-1		5.7E-2	1.1E+1	
Xylene CA	D						1.2E+0		8.6E-2	1.4E+1	
Total Pathway Carcinogenic Risk =					4.7E-3	0.0E+0	*Total Pathway Hazard Index =*			2.0E+2	0.0E+0

Site Name: DP793 - BACKYARD Site Location: 4035 Park Blvd., Oakland, California Completed By: George Co Date Completed: 9/23/1999

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

SOIL EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

SURFACE SOILS OR SEDIMENTS: Exposure Concentration

DERMAL CONTACT

Constituents of Concern	1) Source Medium: Surface Soil Conc. (mg/kg)	2) Exposure Multiplier (SAxAFxABSxCFxEFxED)/(BWxAT) (kg/kg-day): On-Site Residential	2) Exposure Multiplier: On-Site Commercial	3) Average Daily Intake Rate (mg/kg-day) (1) x (2): On-Site Residential	3) Average Daily Intake Rate: On-Site Commercial
Benzene CA	5.0E-3	1.7E-5		8.5E-8	
Ethylbenzene CA	5.0E-3	4.0E-5		2.0E-7	
Hexane, n-	5.0E-3	4.0E-5		2.0E-7	
Methyl t-Butyl Ether CA	5.0E-3	1.7E-5		8.5E-8	
Toluene CA	5.0E-3	4.0E-5		2.0E-7	
Xylene CA	1.0E-2	4.0E-5		4.0E-7	

NOTE: ABS = Dermal absorption factor (dim); AF = Adherance factor (mg/cm^2); AT = Averaging time (days); BW = Body weight (kg); CF = Units conversion factor; ED = Exposure duration (yrs); EF = Exposure frequency (days/yr); ET = Exposure time (hrs/day); IR = Intake rate (mg/day); POE = Point of exposure; SA = Skin exposure area (cm^2/day)

Site Name: DP793 - BACKYARDS Site Location: 4035 Park Blvd., Oakland, C Completed By: George Convers Date Completed: 9/23/1999

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

SOIL EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

SURFACE SOILS OR SEDIMENTS: INGESTION	Exposure Concentration	2) Exposure Multiolier (IRxCFxEFxED)/(BWxAT) (kg/kg-day)		3) Average Daily Intake Rate (mg/kg-day) (1) x (2)		TOTAL PATHWAY INTAKE (mg/kg-day) (Sum intake values from dermal & ingestion routes.)	
	1) Source Medium						
Constituents of Concern	Surface Soil Conc. (mg/kg)	On-Site Residential	On-Site Commercial	On-Site Residential	On-Site Commercial	On-Site Residential	On-Site Commercial
Benzene CA	5.0E-3	5.9E-7		2.9E-9		8.8E-8	
Ethylbenzene CA	5.0E-3	1.4E-6		6.8E-9		2.1E-7	
Hexane, n-	5.0E-3	1.4E-6		6.8E-9		2.1E-7	
Methyl t-Butyl Ether CA	5.0E-3	5.9E-7		2.9E-9		8.8E-8	
Toluene CA	5.0E-3	1.4E-6		6.8E-9		2.1E-7	
Xylene CA	1.0E-2	1.4E-6		1.4E-8		4.1E-7	

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequency (days/yr)
ET = Exposure time (hrs/day)
IR = Intake rate (mg/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

Site Name: DP793 - BACKYARDS | Site Location: 4035 Park Blvd., Oakland, California | Completed By: George Converse | Date Completed: 9/23/1999 | 3 OF 4

TIER 2 PATHWAY RISK CALCULATION

SOIL EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAYS ARE ACTIVE)

Constituents of Concern	(1) EPA Carcinogenic Classification	CARCINOGENIC RISK: (2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Residential	(2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Commercial	(3) Oral Slope Factor (mg/kg-day)^-1	(4) Individual COC Risk (2) x (3) On-Site Residential	(4) Individual COC Risk (2) x (3) On-Site Commercial	TOXIC EFFECTS: (5) Total Toxicant Intake Rate (mg/kg/day) On-Site Residential	(5) Total Toxicant Intake Rate (mg/kg/day) On-Site Commercial	(6) Oral Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6) On-Site Residential	(7) Individual COC Hazard Quotient (5) / (6) On-Site Commercial
Benzene CA	A	8.8E-8		1.0E-1	8.8E-9		2.1E-7		2.0E-2	1.0E-5	
Ethylbenzene CA							2.1E-7		1.0E-1	2.1E-6	
Hexane, n-							2.1E-7		6.0E-2	3.4E-6	
Methyl t-Butyl Ether CA	?	8.8E-8		1.7E-3	1.5E-10		2.1E-7		5.0E-3	4.1E-5	
Toluene CA	D						2.1E-7		1.1E-1	1.9E-6	
Xylene CA	D						4.1E-7		2.5E-1	1.6E-6	
Total Pathway Carcinogenic Risk =					9.0E-9	0.0E+0	*Total Pathway Hazard Index =*			6.0E-5	0.0E+0

Tier 2 Worksheet 8.1

Site Name: DP793 - BACKYARDS Site Location: 4035 Park Blvd., Oakland, California Completed By: George Convers Date Completed: 9/23/1999

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS

■ (CHECKED IF PATHWAY IS ACTIVE)

SOIL: LEACHING TO GROUNDWATER/ GROUNDWATER INGESTION

Exposure Concentration

Constituents of Concern	1) Source Medium: Soil Concentration (mg/kg)	2) NAF Value (L/kg) Receptor: On-Site Residential		3) Exposure Medium: Groundwater: POE Conc. (mg/L) (1)/(2) On-Site Residential		4) Exposure Multiplier: (IRxEFxED)/(BWxAT) (L/kg-day) On-Site Residential		5) Average Daily Intake Rate: (mg/kg-day) (3) x (4) On-Site Residential	
Benzene CA	1.1E+1	1.5E+0		7.2E+0		1.2E-2		8.4E-2	
Ethylbenzene CA	2.1E+1	2.6E+0		8.0E+0		2.7E-2		2.2E-1	
Hexane, n-	8.7E+2	1.5E+1		5.7E+1		2.7E-2		1.6E+0	
Methyl t-Butyl Ether CA	5.0E-3	8.4E-1		5.9E-3		1.2E-2		7.0E-5	
Toluene CA	6.2E+1	3.2E+0		1.9E+1		2.7E-2		5.3E-1	
Xylene CA	1.2E+2	5.0E+0		2.4E+1		2.7E-2		6.6E-1	

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body Weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/yr)
ET = Exposure time (hrs/day)
IR = Intake rate (L/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

Site Name: DP793 - BACKYARDS Site Location: 4035 Park Blvd., Oakland, California Completed By: George Converse Date Completed: 9/23/1999

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER: INGESTION

Constituents of Concern	Exposure Concentration: 1) Source Medium — Groundwater Conc. (mg/L)	2) NAF Value (dim) — Receptor: On-Site Residential		3) Exposure Medium — Groundwater: POE Conc. (mg/L) (1)/(2): On-Site Residential		4) Exposure Multiplier — (IRxEFxED)/(BWxAT) (L/kg-day): On-Site Residential		5) Average Daily Intake Rate — (mg/kg-day) (3) x (4): On-Site Residential		MAX. PATHWAY INTAKE (mg/kg-day) — (Maximum intake of active pathways: soil leaching & groundwater routes.): On-Site Residential	
Benzene CA	2.3E-1	1.0E+0		2.3E-1		1.2E-2		2.7E-3		8.4E-2	
Ethylbenzene CA	4.4E-1	1.0E+0		4.4E-1		2.7E-2		1.2E-2		2.2E-1	
Hexane, n-	2.6E+1	1.0E+0		2.6E+1		2.7E-2		7.2E-1		1.6E+0	
Methyl t-Butyl Ether CA	4.9E-3	1.0E+0		4.9E-3		1.2E-2		5.7E-5		7.0E-5	
Toluene CA	2.6E-1	1.0E+0		2.6E-1		2.7E-2		7.1E-3		5.3E-1	
Xylene CA	2.8E+0	1.0E+0		2.8E+0		2.7E-2		7.6E-2		6.6E-1	

NOTE: ABS = Dermal absorption factor (dim); AF = Adherance factor (mg/cm^2); AT = Averaging time (days); BW = Body weight (kg); CF = Units conversion factor; ED = Exposure duration (yrs); EF = Exposure frequency (days/yr); ET = Exposure time (hrs/day); IR = Intake rate (L/day); POE = Point of exposure; SA = Skin exposure area (cm^2/day)

RBCA SITE ASSESSMENT | **Tier 2 Worksheet 8.2**

Site Name: DP793 - BACKYARDS | Site Location: 4035 Park Blvd., Oakland, California | Completed By: George Converse | Date Completed: 9/23/1999

TIER 2 PATHWAY RISK CALCULATION

GROUNDWATER EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAYS ARE ACTIVE)

	CARCINOGENIC RISK						TOXIC EFFECTS			
Constituents of Concern	(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Residential		(3) Oral Slope Factor (mg/kg-day)^-1	(4) Individual COC Risk (2) x (3) On-Site Residential		(5) Total Toxicant Intake Rate (mg/kg/day) On-Site Residential		(6) Oral Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6) On-Site Residential	
Benzene CA	A	8.4E-2		1.0E-1	8.4E-3		2.0E-1		2.0E-2	9.8E+0	
Ethylbenzene CA							2.2E-1		1.0E-1	2.2E+0	
Hexane, n-							1.6E+0		6.0E-2	2.6E+1	
Methyl t-Butyl Ether CA	?	7.0E-5		1.7E-3	1.2E-7		1.6E-4		5.0E-3	3.2E-2	
Toluene CA	D						5.3E-1		1.1E-1	4.8E+0	
Xylene CA	D						6.6E-1		2.5E-1	2.7E+0	

Total Pathway Carcinogenic Risk = 8.4E-3 | 0.0E+0

Total Pathway Hazard Index = 4.6E+1 | 0.0E+0

Software: GSI RBCA Spreadsheet
Version: 1.0.1

Serial: G-443-CSX-444

RBCA SITE ASSESSMENT

Tier 2 Worksheet 8.3

Site Name: DP793
Completed By: George Converse
Site Location: WEST BRIGHTON AVE SEWER., Oakland Date Completed: 3/3/2004

TIER 2 BASELINE RISK SUMMARY TABLE

EXPOSURE PATHWAY	BASELINE CARCINOGENIC RISK: Individual COC Risk – Maximum Value	Individual COC Risk – Target Risk	Cumulative COC Risk – Total Value	Cumulative COC Risk – Target Risk	Risk Limit(s) Exceeded?	BASELINE TOXIC EFFECTS: Hazard Quotient – Maximum Value	Hazard Quotient – Applicable Limit	Hazard Index – Total Value	Hazard Index – Applicable Limit	Toxicity Limit(s) Exceeded?
OUTDOOR AIR EXPOSURE PATHWAYS										
Complete:	1.5E-7	1.0E-6	1.5E-7	N/A	☐	1.0E-2	1.0E+0	1.1E-2	N/A	☐
INDOOR AIR EXPOSURE PATHWAYS										
Complete:	1.2E-4	1.0E-6	1.2E-4	N/A	■	7.7E+0	1.0E+0	8.1E+0	N/A	■
SOIL EXPOSURE PATHWAYS										
Complete:	NC	1.0E-6	NC	N/A	■	NC	1.0E+0	NC	N/A	■
GROUNDWATER EXPOSURE PATHWAYS										
Complete:	7.7E-4	1.0E-6	7.7E-4	N/A	■	2.0E+0	1.0E+0	3.3E+0	N/A	■
CRITICAL EXPOSURE PATHWAY (Select Maximum Values From Complete Pathways)										
	7.7E-4	1.0E-6	7.7E-4	N/A	■	7.7E+0	1.0E+0	8.1E+0	N/A	■

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.1

Site Name: DP793
Site Location: WEST BRIGHTON AVE SEWER., Oakland, California

Completed By: George Converse
Date Completed: 3/3/2004

SURFACE SOIL SSTL VALUES (< 3.3 FT BGS)

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

☐ MCL exposure limit?
☐ PEL exposure limit?

Calculation Option: 2
Groundwater DAF Option: Elec. Acceptor Super. (One-directional vert. dispersion)

SSTL Results For Complete Exposure Pathways ("x" if Complete)

CONSTITUENTS OF CONCERN		Representative Concentration	X	Soil Leaching to Groundwater				Ingestion, Inhalation and Dermal Contact	X	Construction Worker	Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No.	Name	(mg/kg)		Residential: 2000 feet	Commercial: (on-site)	Regulatory(MCL): (on-site)		Residential: (on-site)	Commercial: (on-site)	Commercial: (on-site)	(mg/kg)	"■" If yes	Only if "yes" left
71-43-3	Benzene CA	5.0E-3		1.2E+0	2.7E-3	NA		NA	NA	3.3E+1	2.7E-3	■	2.0E+00
100-41-4	Ethylbenzene CA	5.0E-3		3.7E+1	1.6E+1	NA		NA	NA	>Res	1.6E+1	☐	<1
110-54-3	Hexane, n-	5.0E-3		>Res	>Res	NA		NA	NA	>Res	>Res	☐	<1
1634-04-4	Methyl t-Butyl Ether CA	5.0E-3		1.7E-1	8.8E-2	NA		NA	NA	1.9E+3	8.8E-2	☐	<1
108-88-3	Toluene CA	5.0E-3		4.8E+1	2.1E+1	NA		NA	NA	>Res	2.1E+1	☐	<1
1330-20-7	Xylene CA	1.0E-2		>Res	7.4E+1	NA		NA	NA	>Res	7.4E+1	☐	<1

>Res indicates risk-based target concentration greater than constituent residual saturation value

Software: GSI RBCA Spreadsheet
Version: 1.0.1

Serial: G-443-CSX-444

RBCA SITE ASSESSMENT | **Tier 2 Worksheet 9.2**

Site Name: DP793
Site Location: WEST BRIGHTON AVE SEWER., Oakland, California

Completed By: George Converse
Date Completed: 3/3/2004

SUBSURFACE SOIL SSTL VALUES (> 3.3 FT BGS)

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

☐ MCL exposure limit?
☐ PEL exposure limit?

Calculation Option: 2
Groundwater DAF Option: Elec. Acceptor Super. (One-directional vert. dispersion)

SSTL Results For Complete Exposure Pathways ("x" if Complete)

CONSTITUENTS OF CONCERN		Representative Concentration	X Soil Leaching to Groundwater			X Soil Volatilization to Indoor Air		X Soil Volatilization to Outdoor Air		Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No.	Name	(mg/kg)	Residential: 2000 feet	Commercial: (on-site)	Regulatory(MCL): (on-site)	Residential: (on-site)	Commercial: (on-site)	Residential: (on-site)	Commercial: (on-site)	(mg/kg)	"■" If yes	Only if "yes" left
71-43-3	Benzene CA	4.1E-1	1.2E+0	2.7E-3	NA	8.2E-3	NA	6.5E+0	NA	2.7E-3	■	1.5E+02
100-41-4	Ethylbenzene CA	8.7E-1	3.7E+1	1.6E+1	NA	>Res	NA	>Res	NA	1.6E+1	☐	<1
110-54-3	Hexane, n-	6.7E+1	>Res	>Res	NA	2.0E+1	NA	>Res	NA	2.0E+1	■	3.0E+00
1634-04-4	Methyl t-Butyl Ether CA	5.0E-3	1.7E-1	8.8E-2	NA	4.8E-1	NA	3.8E+2	NA	8.8E-2	☐	<1
108-88-3	Toluene CA	2.0E+0	4.8E+1	2.1E+1	NA	2.0E+1	NA	>Res	NA	2.0E+1	☐	<1
1330-20-7	Xylene CA	4.9E+0	>Res	7.4E+1	NA	3.0E+1	NA	>Res	NA	3.0E+1	☐	<1

>Res indicates risk-based target concentration greater than constituent residual saturation value

Software: GSI RBCA Spreadsheet Serial: G-443-CSX-444
Version: 1.0.1

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.3

Site Name: DP793
Site Location: WEST BRIGHTON AVE SEWER., Oakland, California

Completed By: George Converse
Date Completed: 3/3/2004

GROUNDWATER SSTL VALUES

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

☐ MCL exposure limit?
☐ PEL exposure limit?

Calculation Option: 2
Groundwater DAF Option: Elec. Acceptor Super. (One-directional vert. dispersion)

SSTL Results For Complete Exposure Pathways ("x" if Complete)

CONSTITUENTS OF CONCERN		Representative Concentration	X Groundwater Ingestion			X Groundwater Volatilization to Indoor Air		X Groundwater Volatilization to Outdoor Air		Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No.	Name	(mg/L)	Residential: 2000 feet	Commercial: (on-site)	Regulatory(MCL): (on-site)	Residential: (on-site)	Commercial: (on-site)	Residential (on-site)	Commercial: (on-site)	(mg/L	"■" If yes	Only if "yes" left
71-43-3	Benzene CA	2.2E+0	1.3E+0	2.9E-3	NA	3.4E-2	NA	2.4E+1	NA	2.9E-3	■	7.7E+02
100-41-4	Ethylbenzene CA	5.4E-1	2.3E+1	1.0E+1	NA	>Sol	NA	>Sol	NA	1.0E+1	☐	<1
110-54-3	Hexane, n-	1.2E+1	>Sol	6.1E+0	NA	2.8E+0	NA	>Sol	NA	2.8E+0	■	4.0E+00
1634-04-4	Methyl t-Butyl Ether CA	1.2E-2	3.2E-1	1.7E-1	NA	2.5E+0	NA	4.8E+2	NA	1.7E-1	☐	<1
108-88-3	Toluene CA	3.3E-1	2.5E+1	1.1E+1	NA	8.3E+1	NA	>Sol	NA	1.1E+1	☐	<1
1330-20-7	Xylene CA	6.4E-1	5.8E+1	2.6E+1	NA	1.3E+2	NA	>Sol	NA	2.6E+1	☐	<1

>Sol indicates risk-based target concentration greater than constituent solubility

Software: GSI RBCA Spreadsheet
Version: 1.0.1

Serial: G-443-CSX-444

RBCA TIER 1/TIER 2 EVALUATION

Output Table 1

Site Name: DP793 | Job Identification: DP793 -3 | Software: GSI RBCA Spreadsheet
Site Location: WEST BRIGHTON AVE SEW | Date Completed: 3/3/04 | Version: 1.0.1
Completed By: George Converse

NOTE: values which differ from Tier 1 default values are shown in bold italics and underlined.

Exposure Parameter	Definition (Units)	Residential Adult	Residential (1-6yrs)	Residential (1-16 yrs)	Commercial/Industrial Chronic	Commercial/Industrial Constrctn
ATc	Averaging time for carcinogens (yr)	70				
ATn	Averaging time for non-carcinogens (yr)	30	6	16	25	1
BW	Body Weight (kg)	70	15	35	70	
ED	Exposure Duration (yr)	30	6	16	25	1
t	Averaging time for vapor flux (yr)	30			25	1
EF	Exposure Frequency (days/yr)	350			250	180
EF.Derm	Exposure Frequency for dermal exposure	350			250	
IRgw	Ingestion Rate of Water (L/day)	2			1	
IRs	Ingestion Rate of Soil (mg/day)	100	200		50	100
IRadj	Adjusted soil ing. rate (mg-yr/kg-d)	1.1E+02			9.4E+01	
IRa.in	Inhalation rate indoor (m^3/day)	15			20	
IRa.out	Inhalation rate outdoor (m^3/day)	20			20	10
SA	Skin surface area (dermal) (cm^2)	5.8E+03		2.0E+03	5.8E+03	5.8E+03
SAadj	Adjusted dermal area (cm^2-yr/kg)	2.1E+03			1.7E+03	
M	Soil to Skin adherence factor	1				
AAFs	Age adjustment on soil ingestion	FALSE			FALSE	
AAFd	Age adjustment on skin surface area	FALSE			FALSE	
tox	Use EPA tox data for air (or PEL based)?	TRUE				
gwMCL?	Use MCL as exposure limit in groundwater?	FALSE				

Matrix of Exposed Persons to Complete Exposure Pathways		Residential	Commercial/Industrial Chronic	Commercial/Industrial Constrctn
Outdoor Air Pathways:				
SS.v	Volatiles and Particulates from Surface Soils	FALSE	FALSE	FALSE
S.v	Volatilization from Subsurface Soils	TRUE	FALSE	
GW.v	Volatilization from Groundwater	TRUE	FALSE	
Indoor Air Pathways:				
S.b	Vapors from Subsurface Soils	TRUE	FALSE	
GW.b	Vapors from Groundwater	TRUE	FALSE	
Soil Pathways:				
SS.d	Direct Ingestion and Dermal Contact	FALSE	FALSE	TRUE
Groundwater Pathways:				
GW.i	Groundwater Ingestion	TRUE	TRUE	
S.l	Leaching to Groundwater from all Soils	TRUE	TRUE	

Matrix of Receptor Distance and Location On- or Off-Site		Residential Distance	Residential On-Site	Commercial/Industrial Distance	Commercial/Industrial On-Site
GW	Groundwater receptor (cm)	6.1E+04	FALSE		TRUE
S	Inhalation receptor (cm)		TRUE		FALSE

Matrix of Target Risks		Individual	Cumulative
TRab	Target Risk (class A&B carcinogens)	1.0E-06	
TRc	Target Risk (class C carcinogens)	1.0E-05	
THQ	Target Hazard Quotient	1.0E+00	
Opt	Calculation Option (1, 2, or 3)	2	
Tier	RBCA Tier	2	

Surface Parameters	Definition (Units)	Residential	Constrctn
A	Contaminated soil area (cm^2)	***3.7E+06***	***3.7E+06***
W	Length of affect. soil parallel to wind (cm)	***1.5E+03***	***1.5E+03***
W.gw	Length of affect. soil parallel to groundwater (cm	***1.5E+03***	
Uair	Ambient air velocity in mixing zone (cm/s)	2.3E+02	
delta	Air mixing zone height (cm)	2.0E+02	
Lss	Thickness of affected surface soils (cm)	1.0E+02	
Pe	Particulate areal emission rate (g/cm^2/s)	6.9E-14	

Groundwater	Definition (Units)	Value
delta.gw	Groundwater mixing zone depth (cm)	***9.1E+01***
I	Groundwater infiltration rate (cm/yr)	***6.1E+01***
Ugw	Groundwater Darcy velocity (cm/yr)	***4.0E+03***
Ugw.tr	Groundwater seepage velocity (cm/yr)	***1.3E+04***
Ks	Saturated hydraulic conductivity(cm/s)	1.0E-03
grad	Groundwater gradient (cm/cm)	1.3E-01
Sw	Width of groundwater source zone (cm)	4.6E+03
Sd	Depth of groundwater source zone (cm)	4.6E+02
phi.eff	Effective porosity in water-bearing unit	3.0E-01
foc.sat	Fraction organic carbon in water-bearing unit	***1.9E-03***
BIO?	Is biattenuation considered?	TRUE
BC	Biodegradation Capacity (mg/L)	1.8E+00

Soil	Definition (Units)	Value		
hc	Capillary zone thickness (cm)	***4.6E+01***		
hv	Vadose zone thickness (cm)	***1.2E+02***		
rho	Soil density (g/cm^3)	***1.5***		
foc	Fraction of organic carbon in vadose zone	***0.0019***		
phi	Soil porosity in vadose zone	0.38		
Lgw	Depth to groundwater (cm)	***1.7E+02***		
Ls	Depth to top of affected subsurface soil (cm)	***1.2E+02***		
Lsubs	Thickness of affected subsurface soils (cm)	***2.4E+02***		
pH	Soil/groundwater pH	6.5		
		capillary	vadose	foundation
phi.w	Volumetric water content	0.342	0.12	0.12
phi.a	Volumetric air content	0.038	0.26	0.26

Building	Definition (Units)	Residential	Commercial
Lb	Building volume/area ratio (cm)	2.0E+02	3.0E+02
ER	Building air exchange rate (s^-1)	1.4E-04	2.3E-04
Lcrk	Foundation crack thickness (cm)	1.5E+01	
eta	Foundation crack fraction	0.01	

Transport Parameters	Definition (Units)	Residential	Commercial
Groundwater			
ax	Longitudinal dispersivity (cm)	9.8E+02	
ay	Transverse dispersivity (cm)	9.8E+01	
az	Vertical dispersivity (cm)	9.8E+00	
Vapor			
dcy	Transverse dispersion coefficient (cm)		
dcz	Vertical dispersion coefficient (cm)		

RBCA CHEMICAL DATABASE

Physical Property Data

CAS Number	Constituent	type	Molecular Weight (g/mole) MW	ref	Diffusion Coefficients in air (cm2/s) Dair	ref	Diffusion Coefficients in water (cm2/s) Dwat	ref	log (Koc) or log(Kd) (@ 20 - 25 C) log(l/kg)	ref	Henry's Law Constant (@ 20 - 25 C) (atm-m3/mol)	(unitless)	ref	Vapor Pressure (@ 20 - 25 C) (mm Hg)	ref	Solubility (@ 20 - 25 C) (mg/L)	ref	acid pKa	base pKb	ref
71-43-3	Benzene CA	O	78.1		9.30E-02		1.10E-05		1.58		5.29E-03	2.20E-01		9.52E+01		1.75E+03				
100-41-4	Ethylbenzene CA	O	106.2		7.60E-02		8.50E-06		1.98		7.69E-03	3.20E-01		1.00E+01		1.52E+02				
110-54-3	Hexane, n-	O	86.2	5	2.00E-01	4	7.77E-06	4	2.68	4	1.22E-01	5.07E+00	4	1.50E+02	4	1.30E+01	5			
1634-04-4	Methyl t-Butyl Ether CA	O	88.146		7.92E-02		9.41E-05		1.08		5.77E-04	2.40E-02		2.49E+02		4.80E+04				
108-88-3	Toluene CA	O	92.4		8.50E-02		9.40E-06		2.13		6.25E-03	2.60E-01		3.00E+01		5.15E+02				
1330-20-7	Xylene CA	O	106.2		7.20E-02		8.50E-06		2.38		6.97E-03	2.90E-01		7.00E+00		1.98E+02				

Site Name: DP793 Site Location: WEST BRIGHTON AVE Completed By: George Converse Date Completed: 3/3/2004

Software version: 1.0.1

RBCA CHEMICAL DATABASE

Toxicity Data

CAS Number	Constituent	Reference Dose (mg/kg/day) Oral RfD_oral	ref	Inhalation RfD_inhal	ref	Slope Factors 1/(mg/kg/day) Oral SF_oral	ref	Inhalation SF_inhal	ref	EPA Weight of Evidence	Is Constituent Carcinogenic ?
71-43-3	Benzene CA	2.00E-02		2.00E-02	30	1.00E-01		1.00E-01		A	TRUE
100-41-4	Ethylbenzene CA	1.00E-01		2.86E-01	30						FALSE
110-54-3	Hexane, n-	6.00E-02	A	5.71E-02	R	-		-			FALSE
1634-04-4	Methyl t-Butyl Ether CA	5.00E-03				1.73E-03		1.73E-03	31	?	TRUE OEHHA draft
108-88-3	Toluene CA	1.10E-01		5.70E-02	30					D	FALSE
1330-20-7	Xylene CA	2.50E-01		8.57E-02	30					D	FALSE

Site Name: DP793 Site Location: WEST BRIGHTON A Completed By: George Converse Date Completed: 3/3/2004

Software version: 1.0.1

RBCA CHEMICAL DATABASE

Miscellaneous Chemical Data

CAS Number	Constituent	Maximum Contaminant Level MCL (mg/L)	reference	Permissible Exposure Limit PEL/TLV (mg/m3)	ref	Relative Absorption Factors Oral	Dermal	Detection Limits Groundwater (mg/L)	ref	Soil (mg/kg)	ref	Half Life (First-Order Decay) (days) Saturated	Unsaturated	ref
71-43-3	Benzene CA	1.00E-03		3.20E+00		1	0.5	0.0005		0.005		720	720	
100-41-4	Ethylbenzene CA	7.00E-02		4.34E+02		1	0.5	0.0005		0.005		228	228	
110-54-3	Hexane, n-					1	0.5							
1634-04-4	Methyl t-Butyl Ether CA			1.44E+02		1	0.5	0.005		0.05				
108-88-3	Toluene CA	1.50E-01		1.47E+02		1	0.5	0.0005		0.005		28	28	
1330-20-7	Xylene CA	1.75E+00		4.34E+02		1	0.5	0.002		0.005		360	360	

Site Name: DP793 Site Location: WEST BRIGHTON AVE SEWER., Oakland, Cal Completed By: George Converse Date Completed: 3/3/200

Software version: 1.0.1

REPRESENTATIVE COC CONCENTRATIONS IN SOURCE MEDIA

(Complete the following table)

CONSTITUENT	Representative COC Concentration in Groundwater		in Surface Soil		in Subsurface Soil	
	value (mg/L)	note	value (mg/kg)	note	value (mg/kg)	note
Benzene CA	2.2E+0	UCL	5.0E-3		4.1E-1	I SW
Ethylbenzene CA	5.4E-1	UCL	5.0E-3		8.7E-1	I SW
Hexane, n-	1.2E+1	UCL	5.0E-3		6.7E+1	I SW
Methyl t-Butyl Ether CA	1.2E-2	UCL	5.0E-3		5.0E-3	
Toluene CA	3.3E-1	UCL	5.0E-3		2.0E+0	I SW
Xylene CA	6.4E-1	UCL	1.0E-2		4.9E+0	I SW

Site Name: DP793
Site Location: WEST BRIGHTON AVE SEWER., Oakland, California

Completed By: George Converse
Date Completed: 3/3/2004

RBCA SITE ASSESSMENT | **Input Screen 6.3**

CONSTITUENT MOLE FRACTIONS

(Complete the following table)

CONSTITUENT	Mole Fraction of Constituent in Source Material
Benzene CA	
Ethylbenzene CA	
Hexane, n-	
Methyl t-Butyl Ether CA	
Toluene CA	
Xylene CA	

Site Name: DP793
Site Location: WEST BRIGHTON AVE

Completed By: George Converse
Date Completed: 3/3/2004

RBCA SITE ASSESSMENT | **Input Screen 9.4**

GROUNDWATER DAF VALUES

(Enter DAF values in the grey area of the following table)

CONSTITUENT	Dilution Attenuation Factor (DAF) in Groundwater	
	Residential Receptor	Comm./Ind. Receptor
Benzene CA	1.6E+1	1.0E+0
Ethylbenzene CA	1.6E+1	1.0E+0
Hexane, n-	1.6E+1	1.0E+0
Methyl t-Butyl Ether CA	1.6E+1	1.0E+0
Toluene CA	1.6E+1	1.0E+0
Xylene CA	1.6E+1	1.0E+0

Site Name: DP793
Site Location: WEST BRIGHTON AVE SEWER., Oakl

Completed By: George Converse
Date Completed: 3/3/2004

RBCA SITE ASSESSMENT | Input Screen 9.1

CONSTITUENT HALF-LIFE VALUES

(Complete the following table)

CONSTITUENT	Half-Life of Constituent (day)
Benzene CA	
Ethylbenzene CA	
Hexane, n-	
Methyl t-Butyl Ether CA	
Toluene CA	
Xylene CA	

Site Name: DP793 Completed By: George Converse

Site Location: WEST BRIGHTON AVE S Date Completed: 3/3/2004

RBCA SITE ASSESSMENT

EXPOSURE LIMITS IN GROUNDWATER AND AIR

CONSTITUENT	Exposure Limits Applied to Receptors	
	Groundwater (MCL) (mg/L)	Air (Comm. only) (PEL/TLV) (mg/m^3)
Benzene CA		
Ethylbenzene CA		
Hexane, n-		
Methyl t-Butyl Ether CA		
Toluene CA		
Xylene CA		

Site Name: DP793 Completed By: George Converse
Site Location: WEST BRIGHTON AVE SEWER., Oakland, C Date Completed: 3/3/2004

Site Name: DP793 Site Location: WEST BRIGHTON AVE SEWER., Completed By: George Convers Date Completed: 3/3/2004

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ☐ (CHECKED IF PATHWAY IS ACTIVE)

SURFACE SOILS: VAPOR AND DUST INHALATION

Constituents of Concern	Exposure Concentration 1) Source Medium: Surface Soil Conc. (mg/kg)	2) NAF Value (m^3/kg) Receptor		3) Exposure Medium: Outdoor Air; POE Conc. (mg/m^3) (1) / (2)		4) Exposure Multiplier: (IRxEFxED)/(BWxAT) (m^3/kg-day)		5) Average Daily Intake Rate: (mg/kg-day) (3) X (4)	
Benzene CA	5.0E-3								
Ethylbenzene CA	5.0E-3								
Hexane, n-	5.0E-3								
Methyl t-Butyl Ether CA	5.0E-3								
Toluene CA	5.0E-3								
Xylene CA	1.0E-2								

NOTE: ABS = Dermal absorption factor (dim); AF = Adherance factor (mg/cm^2); AT = Averaging time (days); BW = Body weight (kg); CF = Units conversion factor; ED = Exposure duration (yrs); EF = Exposure frequencey (days/yr); ET = Exposure time (hrs/day); IR = Inhalation rate (m^3/day); POE = Point of exposure; SA = Skin exposure area (cm^2/day)

Site Name: DP793 Site Location: WEST BRIGHTON AVE SEWER., Completed By: George Convers Date Completed: 3/3/2004

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

SUBSURFACE SOILS: VAPOR INHALATION

Exposure Concentration

Constituents of Concern	1) Source Medium: Subsurface Soil Conc. (mg/kg)	2) NAF Value (m^3/kg) Receptor: On-Site Residential		3) Exposure Medium: Outdoor Air: POE Conc. (mg/m^3) (1) / (2) On-Site Residential		4) Exposure Multiplier: (IRxEFxED)/(BWxAT) (m^3/kg-day) On-Site Residential		5) Average Daily Intake Rate: (mg/kg-day) (3) X (4) On-Site Residential	
Benzene CA	4.1E-1	7.6E+4		5.4E-6		1.2E-1		6.3E-7	
Ethylbenzene CA	8.7E-1	7.6E+4		1.1E-5		2.7E-1		3.1E-6	
Hexane, n-	6.7E+1	7.6E+4		8.8E-4		2.7E-1		2.4E-4	
Methyl t-Butyl Ether CA	5.0E-3	7.6E+4		6.5E-8		1.2E-1		7.7E-9	
Toluene CA	2.0E+0	7.6E+4		2.6E-5		2.7E-1		7.2E-6	
Xylene CA	4.9E+0	7.6E+4		6.4E-5		2.7E-1		1.6E-5	

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/yr)
ET = Exposure time (hrs/day)
IR = Inhalation rate (m^3/day)
POE = Point of exposure
SA = Skin exposue area (cm^2/day)

Site Name: DP793 Site Location: WEST BRIGHTON AVE SE Completed By: George Converse Date Completed: 3/3/2004

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER: VAPOR INHALATION

Constituents of Concern	Exposure Concentration 1) Source Medium: Groundwater Conc. (mg/L)	2) NAF Value (m^3/L) Receptor: On-Site Residential		3) Exposure Medium: Outdoor Air: POE Conc. (mg/m^3) (1) / (2) On-Site Residential		4) Exposure Multiplier (IRxEFxED)/(BWxAT) (m^3/kg-day) On-Site Residential		5) Average Daily Intake Rate (mg/kg-day) (3) X (4) On-Site Residential		TOTAL PATHWAY INTAKE (mg/kg-day) (Sum intake values from surface, subsurface & groundwater routes.) On-Site Residential	
Benzene CA	2.2E+0	2.8E+5		7.8E-6		1.2E-1		9.1E-7		1.5E-6	
Ethylbenzene CA	5.4E-1	2.8E+5		1.9E-6		2.7E-1		5.2E-7		3.6E-6	
Hexane, n-	1.2E+1	1.0E+4		1.2E-3		2.7E-1		3.3E-4		5.7E-4	
Methyl t-Butyl Ether CA	1.2E-2	9.7E+4		1.3E-7		1.2E-1		1.5E-8		2.3E-8	
Toluene CA	3.3E-1	2.9E+5		1.1E-6		2.7E-1		3.1E-7		7.5E-6	
Xylene CA	6.4E-1	3.1E+5		2.1E-6		2.7E-1		5.7E-7		1.8E-5	

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/yr)
ET = Exposure time (hrs/day)
IR = Inhalation rate (m^3/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

RBCA SITE ASSESSMENT | Tier 2 Worksheet 8.2

Site Name: DP793 | Site Location: WEST BRIGHTON AVE SEWER., Oakland, | Completed By: George Converse | Date Completed: 3/3/2004 |

TIER 2 PATHWAY RISK CALCULATION

OUTDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAYS ARE ACTIVE)

	CARCINOGENIC RISK						TOXIC EFFECTS			
Constituents of Concern	(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Residential		(3) Inhalation Slope Factor (mg/kg-day)^-1	(4) Individual COC Risk (2) x (3) On-Site Residential		(5) Total Toxicant Intake Rate (mg/kg/day) On-Site Residential		(6) Inhalation Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6) On-Site Residential	
Benzene CA	A	1.5E-6		1.0E-1	1.5E-7		3.6E-6		2.0E-2	1.8E-4	
Ethylbenzene CA							3.6E-6		2.9E-1	1.3E-5	
Hexane, n-							5.7E-4		5.7E-2	1.0E-2	
Methyl t-Butyl Ether CA	?	2.3E-8		1.7E-3	3.9E-11						
Toluene CA	D						7.5E-6		5.7E-2	1.3E-4	
Xylene CA	D						1.8E-5		8.6E-2	2.1E-4	

Total Pathway Carcinogenic Risk = 1.5E-7 | 0.0E+0

Total Pathway Hazard Index = 1.1E-2 | 0.0E+0

RBCA SITE ASSESSMENT | **Tier 2 Worksheet 8.1**

Site Name: DP793 Site Location: WEST BRIGHTON AVE SEWER., Completed By: George Convers Date Completed: 3/3/2004

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

SUBSURFACE SOILS:
VAPOR INTRUSION TO BUILDINGS

Constituents of Concern	Exposure Concentration 1) Source Medium: Subsurface Soil Conc. (mg/kg)	2) NAF Value (m^3/kg) Receptor: On-Site Residential		3) Exposure Medium: Indoor Air: POE Conc. (mg/m^3) (1) / (2): On-Site Residential		4) Exposure Multiplier (IRxEFxED)/(BWxAT) (m^3/kg-day): On-Site Residential		5) Average Daily Intake Rate (mg/kg-day) (3) X (4): On-Site Residential	
Benzene CA	4.1E-1	7.2E+1		5.7E-3		8.8E-2		5.0E-4	
Ethylbenzene CA	8.7E-1	7.2E+1		1.2E-2		2.1E-1		2.5E-3	
Hexane, n-	6.7E+1	7.2E+1		9.3E-1		2.1E-1		1.9E-1	
Methyl t-Butyl Ether CA	5.0E-3	7.2E+1		6.9E-5		8.8E-2		6.1E-6	
Toluene CA	2.0E+0	7.2E+1		2.8E-2		2.1E-1		5.7E-3	
Xylene CA	4.9E+0	7.2E+1		6.8E-2		2.1E-1		1.4E-2	

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/yr)
ET = Exposure time (hrs/day)
IR = Inhalation rate (m^3/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

Site Name: DP793 Site Location: WEST BRIGHTON AVE SE Completed By: George Converse Date Completed: 3/3/2004

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER:

VAPOR INTRUSION TO BUILDINGS

Exposure Concentration

Constituents of Concern	1) Source Medium: Groundwater Conc. (mg/L)	2) NAF Value (m^3/L) Receptor: On-Site Residential		3) Exposure Medium: Indoor Air: POE Conc. (mg/m^3) (1) / (2) On-Site Residential		4) Exposure Multiplier: (IRxEFxED)/(BWxAT) (m^3/kg-day) On-Site Residential		5) Average Daily Intake Rate: (mg/kg-day) (3) X (4) On-Site Residential		TOTAL PATHWAY INTAKE (mg/kg-day) (Sum intake values from subsurface & groundwater routes.) On-Site Residential	
Benzene CA	2.2E+0	3.0E+2		7.5E-3		8.8E-2		6.6E-4		1.2E-3	
Ethylbenzene CA	5.4E-1	2.9E+2		1.9E-3		2.1E-1		3.8E-4		2.8E-3	
Hexane, n-	1.2E+1	1.0E+1		1.2E+0		2.1E-1		2.5E-1		4.4E-1	
Methyl t-Butyl Ether CA	1.2E-2	3.7E+2		3.3E-5		8.8E-2		2.9E-6		9.0E-6	
Toluene CA	3.3E-1	3.0E+2		1.1E-3		2.1E-1		2.3E-4		5.9E-3	
Xylene CA	6.4E-1	3.2E+2		2.0E-3		2.1E-1		4.1E-1		1.4E-2	

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/yr)
ET = Exposure time (hrs/day)
IR = Inhalation rate (m^3/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

RBCA SITE ASSESSMENT | **Tier 2 Worksheet 8.2**

Site Name: DP793 | Site Location: WEST BRIGHTON AVE SEWER., Oakland, | Completed By: George Converse | Date Completed: 3/3/2004 |

TIER 2 PATHWAY RISK CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAYS ARE ACTIVE)

Constituents of Concern	(1) EPA Carcinogenic Classification	CARCINOGENIC RISK: (2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Residential		(3) Inhalation Slope Factor (mg/kg-day)^-1	(4) Individual COC Risk (2) x (3) On-Site Residential		TOXIC EFFECTS: (5) Total Toxicant Intake Rate (mg/kg/day) On-Site Residential		(6) Inhalation Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6) On-Site Residential	
Benzene CA	A	1.2E-3		1.0E-1	1.2E-4		2.7E-3		2.0E-2	1.3E-1	
Ethylbenzene CA							2.8E-3		2.9E-1	1.0E-2	
Hexane, n-							4.4E-1		5.7E-2	7.7E+0	
Methyl t-Butyl Ether CA	?	9.0E-6		1.7E-3	1.6E-8						
Toluene CA	D						5.9E-3		5.7E-2	1.0E-1	
Xylene CA	D						1.4E-2		8.6E-2	1.7E-1	

Total Pathway Carcinogenic Risk = 1.2E-4 | 0.0E+0

Total Pathway Hazard Index = 8.1E+0 | 0.0E+0

Site Name: DP793 Site Location: WEST BRIGHTON AVE SEWER., Oakla Completed By: George Co Date Completed: 3/3/2004

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

SOIL EXPOSURE PATHWAYS ☐ (CHECKED IF PATHWAY IS ACTIVE)

SURFACE SOILS OR SEDIMENTS:

DERMAL CONTACT

Exposure Concentration

Constituents of Concern	1) Source Medium: Surface Soil Conc. (mg/kg)	2) Exposure Multiplier (SAxAFxABSxCFxEFxED)/(BWxAT) (kg/kg-day): On-Site Residential	2) Exposure Multiplier: On-Site Commercial	3) Average Daily Intake Rate (mg/kg-day) (1) x (2): On-Site Residential	3) Average Daily Intake Rate: On-Site Commercial
Benzene CA	5.0E-3				
Ethylbenzene CA	5.0E-3				
Hexane, n-	5.0E-3				
Methyl t-Butyl Ether CA	5.0E-3				
Toluene CA	5.0E-3				
Xylene CA	1.0E-2				

NOTE: ABS = Dermal absorption factor (dim); AF = Adherance factor (mg/cm^2); AT = Averaging time (days); BW = Body weight (kg); CF = Units conversion factor; ED = Exposure duration (yrs); EF = Exposure frequencey (days/yr); ET = Exposure time (hrs/day); IR = Intake rate (mg/day); POE = Point of exposure; SA = Skin exposure area (cm^2/day)

Site Name: DP793 Site Location: WEST BRIGHTON AVE SE Completed By: George Convers Date Completed: 3/3/2004

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

SOIL EXPOSURE PATHWAYS ☐ (CHECKED IF PATHWAY IS ACTIVE)

SURFACE SOILS OR SEDIMENTS:

INGESTION

Constituents of Concern	Exposure Concentration: 1) Source Medium — Surface Soil Conc. (mg/kg)	2) Exposure Multiplier (IRxCFxEFxED)/(BWxAT) (kg/kg-day) — On-Site Residential	2) Exposure Multiplier — On-Site Commercial	3) Average Daily Intake Rate (mg/kg-day) (1) x (2) — On-Site Residential	3) Average Daily Intake Rate — On-Site Commercial	TOTAL PATHWAY INTAKE (mg/kg-day) (Sum intake values from dermal & ingestion routes.) — On-Site Residential	TOTAL PATHWAY INTAKE — On-Site Commercial
Benzene CA	5.0E-3						
Ethylbenzene CA	5.0E-3						
Hexane, n-	5.0E-3						
Methyl t-Butyl Ether CA	5.0E-3						
Toluene CA	5.0E-3						
Xylene CA	1.0E-2						

NOTE: ABS = Dermal absorption factor (dim); AF = Adherance factor (mg/cm^2); AT = Averaging time (days); BW = Body weight (kg); CF = Units conversion factor; ED = Exposure duration (yrs); EF = Exposure frequencey (days/yr); ET = Exposure time (hrs/day); IR = Intake rate (mg/day); POE = Point of exposure; SA = Skin exposure area (cm^2/day)

RBCA SITE ASSESSMENT | **Tier 2 Worksheet 8.2**

Site Name: DP793 | Site Location: WEST BRIGHTON AVE SEWER., Oakland, | Completed By: George Converse | Date Completed: 3/3/2004 |

TIER 2 PATHWAY RISK CALCULATION

SOIL EXPOSURE PATHWAYS ☒ (CHECKED IF PATHWAYS ARE ACTIVE)

Constituents of Concern	(1) EPA Carcinogenic Classification	CARCINOGENIC RISK: (2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Residential	(2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Commercial	(3) Oral Slope Factor (mg/kg-day)^-1	(4) Individual COC Risk (2) x (3) On-Site Residential	(4) Individual COC Risk (2) x (3) On-Site Commercial	TOXIC EFFECTS: (5) Total Toxicant Intake Rate (mg/kg/day) On-Site Residential	(5) Total Toxicant Intake Rate (mg/kg/day) On-Site Commercial	(6) Oral Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6) On-Site Residential	(7) Individual COC Hazard Quotient (5) / (6) On-Site Commercial
Benzene CA	A			1.0E-1					2.0E-2		
Ethylbenzene CA									1.0E-1		
Hexane, n-									6.0E-2		
Methyl t-Butyl Ether CA	?			1.7E-3					5.0E-3		
Toluene CA	D								1.1E-1		
Xylene CA	D								2.5E-1		
Total Pathway Carcinogenic Risk =					0.0E+0	0.0E+0			***Total Pathway Hazard Index =***	0.0E+0	0.0E+0

Site Name: DP793 Site Location: WEST BRIGHTON AVE SEWER., O Completed By: George Convers Date Completed: 3/3/2004

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

SOIL: LEACHING TO GROUNDWATER/ GROUNDWATER INGESTION

Exposure Concentration

Constituents of Concern	1) Source Medium: Soil Concentration (mg/kg)	2) NAF Value (L/kg) Receptor: On-Site Commercial	2) NAF Value (L/kg) Receptor: Off-Site Residential	3) Exposure Medium: Groundwater: POE Conc. (mg/L) (1)/(2): On-Site Commercial	3) Exposure Medium: Groundwater: POE Conc. (mg/L) (1)/(2): Off-Site Residential	4) Exposure Multiplier (IRxEFxED)/(BWxAT) (L/kg-day): On-Site Commercial	4) Exposure Multiplier (IRxEFxED)/(BWxAT) (L/kg-day): Off-Site Residential	5) Average Daily Intake Rate (mg/kg-day) (3) x (4): On-Site Commercial	5) Average Daily Intake Rate (mg/kg-day) (3) x (4): Off-Site Residential
Benzene CA	4.1E-1	9.4E-1	1.5E+1	4.3E-1	2.8E-2	3.5E-3	1.2E-2	1.5E-3	3.3E-4
Ethylbenzene CA	8.7E-1	1.6E+0	2.4E+1	5.5E-1	3.6E-2	9.8E-3	2.7E-2	5.4E-3	9.8E-4
Hexane, n-	6.7E+1	9.3E+0	1.4E+2	7.2E+0	4.7E-1	9.8E-3	2.7E-2	7.1E-2	1.3E-2
Methyl t-Butyl Ether CA	5.0E-3	5.3E-1	8.2E+0	9.4E-3	6.1E-4	3.5E-3	1.2E-2	3.3E-5	7.1E-6
Toluene CA	2.0E+0	1.9E+0	2.9E+1	1.1E+0	6.8E-2	9.8E-3	2.7E-2	1.0E-2	1.9E-3
Xylene CA	4.9E+0	2.9E+0	4.5E+1	1.7E+0	1.1E-1	9.8E-3	2.7E-2	1.6E-2	3.0E-3

NOTE: ABS = Dermal absorption factor (dim); AF = Adherance factor (mg/cm^2); AT = Averaging time (days); BW = Body Weight (kg); CF = Units conversion factor; ED = Exposure duration (yrs); EF = Exposure frequencey (days/yr); ET = Exposure time (hrs/day); IR = Intake rate (L/day); POE = Point of exposure; SA = Skin exposure area (cm^2/day)

Site Name: DP793 Site Location: WEST BRIGHTON AVE SEWER., Oakland, Cali Completed By: George Converse Date Completed: 3/3/2004

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

GROUNDWATER EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER: INGESTION

Constituents of Concern	Exposure Concentration: 1) Source Medium — Groundwater Conc. (mg/L)	2) NAF Value (dim) — Receptor: On-Site Commercial	2) NAF Value (dim) — Receptor: Off-Site Residential	3) Exposure Medium — Groundwater: POE Conc. (mg/L) (1)/(2): On-Site Commercial	3) Exposure Medium — Groundwater: POE Conc. (mg/L) (1)/(2): Off-Site Residential	4) Exposure Multiplier (IRxEFxED)/(BWxAT) (L/kg-day): On-Site Commercial	4) Exposure Multiplier (IRxEFxED)/(BWxAT) (L/kg-day): Off-Site Residential	5) Average Daily Intake Rate (mg/kg-day) (3) x (4): On-Site Commercial	5) Average Daily Intake Rate (mg/kg-day) (3) x (4): Off-Site Residential	MAX. PATHWAY INTAKE (mg/kg-day) (Maximum intake of active pathways soil leaching & groundwater routes.): On-Site Commercial	MAX. PATHWAY INTAKE (mg/kg-day) (Maximum intake of active pathways soil leaching & groundwater routes.): Off-Site Residential
Benzene CA	2.2E+0	1.0E+0	1.6E+1	2.2E+0	1.4E-1	3.5E-3	1.2E-2	7.7E-3	1.7E-3	7.7E-3	1.7E-3
Ethylbenzene CA	5.4E-1	1.0E+0	1.6E+1	5.4E-1	3.5E-2	9.8E-3	2.7E-2	5.3E-3	9.5E-4	5.4E-3	9.8E-4
Hexane, n-	1.2E+1	1.0E+0	1.6E+1	1.2E+1	7.9E-1	9.8E-3	2.7E-2	1.2E-1	2.2E-2	1.2E-1	2.2E-2
Methyl t-Butyl Ether CA	1.2E-2	1.0E+0	1.6E+1	1.2E-2	8.0E-4	3.5E-3	1.2E-2	4.4E-5	9.4E-6	4.4E-5	9.4E-6
Toluene CA	3.3E-1	1.0E+0	1.6E+1	3.3E-1	2.1E-2	9.8E-3	2.7E-2	3.2E-3	5.8E-4	1.0E-2	1.9E-3
Xylene CA	6.4E-1	1.0E+0	1.6E+1	6.4E-1	4.1E-2	9.8E-3	2.7E-2	6.3E-3	1.1E-3	1.6E-2	3.0E-3

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/yr)
ET = Exposure time (hrs/day)
IR = Intake rate (L/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

Site Name: DP793 | Site Location: WEST BRIGHTON AVE SEWER., Oakland, | Completed By: George Converse | Date Completed: 3/3/2004 | 4 OF 4

TIER 2 PATHWAY RISK CALCULATION

GROUNDWATER EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAYS ARE ACTIVE)

		CARCINOGENIC RISK					TOXIC EFFECTS				
	(1) EPA Carcinogenic Classification	(2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Commercial	(2) Total Carcinogenic Intake Rate (mg/kg/day) Off-Site Residential	(3) Oral Slope Factor (mg/kg-day)^-1	(4) Individual COC Risk (2) x (3) On-Site Commercial	(4) Individual COC Risk (2) x (3) Off-Site Residential	(5) Total Toxicant Intake Rate (mg/kg/day) On-Site Commercial	(5) Total Toxicant Intake Rate (mg/kg/day) Off-Site Residential	(6) Oral Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6) On-Site Commercial	(7) Individual COC Hazard Quotient (5) / (6) Off-Site Residential
Constituents of Concern											
Benzene CA	A	7.7E-3	1.7E-3	1.0E-1	7.7E-4	1.7E-4	2.2E-2	3.9E-3	2.0E-2	1.1E+0	1.9E-1
Ethylbenzene CA							5.4E-3	9.8E-4	1.0E-1	5.4E-2	9.8E-3
Hexane, n-							1.2E-1	2.2E-2	6.0E-2	2.0E+0	3.6E-1
Methyl t-Butyl Ether CA	?	4.4E-5	9.4E-6	1.7E-3	7.5E-8	1.6E-8	1.2E-4	2.2E-5	5.0E-3	2.4E-2	4.4E-3
Toluene CA	D						1.0E-2	1.9E-3	1.1E-1	9.4E-2	1.7E-2
Xylene CA	D						1.6E-2	3.0E-3	2.5E-1	6.6E-2	1.2E-2
Total Pathway Carcinogenic Risk =					7.7E-4	1.7E-4	***Total Pathway Hazard Index =***			3.3E+0	6.0E-1

RBCA CHEMICAL DATABASE

Toxicity Data

CAS Number	Constituent	Reference Dose (mg/kg/day) Oral RfD_oral	ref	Inhalation RfD_inhal	ref	Slope Factors 1/(mg/kg/day) Oral SF_oral	ref	Inhalation SF_inhal	ref	EPA Weight of Evidence	Is Constituent Carcinogenic ?
71-43-3	Benzene CA	2.00E-02		2.00E-02	30	1.00E-01		1.00E-01		A	TRUE
100-41-4	Ethylbenzene CA	1.00E-01		2.86E-01	30						FALSE
110-54-3	Hexane, n-	6.00E-02	A	5.71E-02	R	-		-			FALSE
1634-04-4	Methyl t-Butyl Ether CA	5.00E-03				1.73E-03		1.73E-03	31	?	TRUE OEHHA draft
108-88-3	Toluene CA	1.10E-01		5.70E-02	30					D	FALSE
1330-20-7	Xylene CA	2.50E-01		8.57E-02	30					D	FALSE

Site Name: DP793 Site Location: WEST BRIGHTON A Completed By: George Converse Date Completed: 3/3/2004

Software version: 1.0.1

APPENDIX H

JOHNSON & ETTINGER VAPOR INTRUSION MODEL

DATA ENTRY SHEET

VERSION 1.2
September, 1998

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

YES [X]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES [ ]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C_R (µg/kg)	Chemical
71432		Benzene

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm²)
15	152.4	15.6	C		

ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm³)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm³/cm³)	ENTER Vadose zone soil organic carbon fraction, f_{oc}^V (unitless)
1.5	0.43	0.3	0.0019

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	70	350	1.0E-06	1

Used to calculate risk-based soil concentration.

Benzene Profile
Max concentration
at depth to 1E-6 TCR
5
10
15
20
25
30
205

The Johnson and Ettinger Model is part of the EPA health risk assessment protocol. It can be found at
www.epa.gov/superfund/programs/risk/airmodel/johnson_ettinger.htm

INTRODUCTION TO THE VAPOR INTRUSION MODEL THEORY AND APPLICATION

Volatilization of contaminants located in subsurface soils or in groundwater, and the subsequent mass transport of these vapors into indoor spaces constitutes a potential inhalation exposure pathway, which may need to be evaluated when preparing risk assessments. Likewise, this potential indoor inhalation exposure pathway may need evaluation when estimating a risk-based soil or groundwater concentration below which associated adverse health effects are unlikely.

Johnson and Ettinger (J&E) (1991) introduced a screening-level model that incorporates both convective and diffusive mechanisms for estimating the transport of contaminant vapors emanating from either subsurface soils or groundwater into indoor spaces located directly above the source of contamination. In their article, J&E reported that the results of the model were in qualitative agreement with published experimental case histories and in good qualitative and quantitative agreement with detailed three-dimensional numerical modeling of radon transport into houses.

The J&E Model is a one-dimensional analytical solution to convective and diffusive vapor transport into indoor spaces and provides an estimated attenuation coefficient that relates the vapor concentration in the indoor space to the vapor concentration at the source of contamination. The model is constructed as both a steady-state solution to vapor transport (infinite or non-diminishing source) and as a quasi-steady-state solution (finite or diminishing source). Inputs to the model include chemical properties of the contaminant, saturated and unsaturated zone soil properties, and structural properties of the building.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
8.80E-02	9.80E-06	5.56E-03	25	7,342	353.24	562.16	5.89E+01	1.75E+03	2.9E-05	6.0E-02

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
137.4	0.130	0.641	7.48E-10	0.599	4.48E-10	3,844	1	5.63E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization a e. groundwat temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)	Diffusion path length, L_d (cm)
9.24E+05	4.16E-04	15	8,065	3.57E-03	1.51E-01	1.77E-04	5.40E-04	137.4

Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm^3/g)	Source vapor conc., C_{source} (µg/m^3)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m^3)
15	1.12E-01	4.64E+02	0.10	4.28E-01	5.40E-04	3.84E+02	2.94E+13	6.80E-06	3.15E-03

Unit risk factor, URF (µg/m^3)$^{-1}$	Reference conc., RfC (mg/m^3)
2.9E-05	6.0E-02

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C_{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
1.14E+01	8.50E+03	1.14E+01	5.69E+05	1.14E+01

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

VLOOKUP TABLES

Soil Properties Lookup Table

SCS Soil Type	K_s (cm/h)	α (1/cm)	N (unitless)	M (unitless)	θ_s (cm^3/cm^3)	θ_r (cm^3/cm^3)	Mean Grain Diameter (cm)
C	0.20	0.008	1.09	0.083	0.38	0.068	0.0092
CL	0.26	0.019	1.31	0.237	0.41	0.095	0.016
L	1.04	0.036	1.56	0.359	0.43	0.078	0.020
LS	14.59	0.124	2.28	0.561	0.41	0.057	0.040
S	29.70	0.145	2.68	0.627	0.43	0.045	0.044
SC	0.12	0.027	1.23	0.187	0.38	0.100	0.025
SCL	1.31	0.059	1.48	0.324	0.39	0.100	0.029
SI	0.25	0.016	1.37	0.270	0.46	0.034	0.0046
SIC	0.02	0.005	1.09	0.083	0.26	0.070	0.0039
SICL	0.07	0.010	1.23	0.187	0.43	0.089	0.0056
SIL	0.45	0.020	1.41	0.291	0.45	0.067	0.011
SL	4.42	0.075	1.89	0.471	0.41	0.065	0.030

Chemical Properties Lookup Table

CAS No.	Chemical	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Pure component water solubility, S (mg/L)	Henry's law constant H' (unitless)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (°C)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
50293	DDT	2.63E+06	1.37E-02	4.95E-06	2.50E-02	3.32E-04	8.10E-06	25	533.15	720.75	11,000	9.7E-05	0.0E+00
50328	Benzo(a)pyrene	1.02E+06	4.30E-02	9.00E-06	1.62E-03	4.63E-05	1.13E-06	25	715.90	969.27	15,000	2.1E-03	0.0E+00
51285	2,4-Dinitrophenol	1.00E-02	2.73E-02	9.06E-06	2.79E+03	1.82E-05	4.44E-07	25	605.28	827.85	15,000	0.0E+00	7.0E-03
53703	Dibenz(a,h)anthracene	3.80E+06	2.02E-02	5.18E-06	2.49E-03	6.03E-07	1.47E-08	25	743.24	990.41	16,000	2.1E-03	0.0E+00
56235	Carbon tetrachloride	1.74E+02	7.80E-02	8.80E-06	7.93E+02	1.25E+00	3.05E-02	25	349.90	556.60	7,127	1.5E-05	0.0E+00
56553	Benz(a)anthracene	3.98E+05	5.10E-02	9.00E-06	9.40E-03	1.37E-04	3.34E-06	25	708.15	1004.79	15,000	2.1E-04	0.0E+00
57749	Chlordane	1.20E+05	1.18E-02	4.37E-06	5.60E-02	1.99E-03	4.85E-05	25	624.24	885.73	13,000	3.7E-04	0.0E+00
58899	gamma-HCH (Lindane)	1.07E+03	1.42E-02	7.34E-06	6.80E+00	5.74E-04	1.40E-05	25	596.55	839.36	13,000	3.7E-04	0.0E+00
60571	Dieldrin	2.14E+04	1.25E-02	4.74E-06	1.95E-01	6.19E-04	1.51E-05	25	613.32	842.25	13,000	4.6E-03	0.0E+00
65850	Benzoic Acid	6.00E-01	5.36E-02	7.97E-06	3.50E+03	6.31E-05	1.54E-06	25	720.00	751.00	10,000	0.0E+00	1.4E+01
67641	Acetone	5.75E-01	1.24E-01	1.14E-05	1.00E+06	1.59E-03	3.88E-05	25	329.20	508.10	6,955	0.0E+00	3.5E-01
67663	Chloroform	3.98E+01	1.04E-01	1.00E-05	7.92E+03	1.50E-01	3.66E-03	25	334.32	536.40	6,988	2.3E-05	0.0E+00
67721	Hexachloroethane	1.78E+03	2.50E-03	6.80E-06	5.00E+01	1.59E-01	3.88E-03	25	458.00	695.00	9,510	4.0E-06	0.0E+00
71363	Butanol	6.92E+00	8.00E-02	9.30E-06	7.40E+04	3.61E-04	8.80E-06	25	390.88	563.05	10,346	0.0E+00	3.5E-01
71432	Benzene	5.89E+01	8.80E-02	9.80E-06	1.75E+03	2.28E-01	5.56E-03	25	353.24	562.16	7,342	2.9E-05	6.0E-02
71556	1,1,1-Trichloroethane	1.10E+02	7.80E-02	8.80E-06	1.33E+03	7.05E-01	1.72E-02	25	347.24	545.00	7,136	0.0E+00	1.0E+00
72208	Endrin	1.23E+04	1.25E-02	4.74E-06	2.50E-01	3.08E-04	7.51E-06	25	718.15	986.20	12,000	0.0E+00	1.1E-03
72435	Methoxychlor	9.77E+04	1.56E-02	4.46E-06	4.50E-02	6.48E-04	1.58E-05	25	651.02	848.49	14,000	0.0E+00	1.8E-02
72548	DDD	1.00E+06	1.69E-02	4.76E-06	9.00E-02	1.64E-04	4.00E-06	25	639.90	863.77	14,000	6.9E-05	0.0E+00
72559	DDE	4.47E+06	1.44E-02	5.87E-06	1.20E-01	8.61E-04	2.10E-05	25	636.44	860.38	13,000	9.7E-05	0.0E+00
74839	Methyl bromide	1.05E+01	7.28E-02	1.21E-05	1.52E+04	2.56E-01	6.24E-03	25	276.71	467.00	5,714	0.0E+00	5.0E-03
75014	Vinyl chloride (chloroethene)	1.86E+01	1.06E-01	1.23E-06	2.76E+03	1.11E+00	2.71E-02	25	259.25	432.00	5,250	8.4E-05	0.0E+00
75092	Methylene chloride	1.17E+01	1.01E-01	1.17E-05	1.30E+04	8.98E-02	2.19E-03	25	313.00	510.00	6,706	4.7E-07	3.0E+00
75150	Carbon disulfide	4.57E+01	1.04E-01	1.00E-05	1.19E+03	1.24E+00	3.02E-02	25	319.00	552.00	6,391	0.0E+00	7.0E-01
75252	Bromoform	8.71E+01	1.49E-02	1.03E-05	3.10E+03	2.19E-02	5.34E-04	25	422.35	696.00	9,479	1.1E-06	0.0E+00
75274	Bromodichloromethane	5.50E+01	2.98E-02	1.06E-05	6.74E+03	6.56E-02	1.60E-03	25	363.15	585.85	7,000	1.8E-05	0.0E+00
75343	1,1-Dichloroethane	3.16E+01	7.42E-02	1.05E-05	5.06E+03	2.30E-01	5.61E-03	25	330.55	523.00	6,895	0.0E+00	5.0E-01
75354	1,1-Dichloroethylene	5.89E+01	9.00E-02	1.04E-05	2.25E+03	1.07E+00	2.61E-02	25	304.75	576.05	6,247	5.0E-05	0.0E+00
76448	Heptachlor	1.41E+06	1.12E-02	5.69E-06	1.80E-01	4.47E-02	1.09E-03	25	603.69	846.31	13,000	1.3E-03	0.0E+00
77474	Hexachlorocyclopentadiene	2.00E+05	1.61E-02	7.21E-06	1.80E+00	1.11E+00	2.71E-02	25	512.15	746.00	10,931	0.0E+00	7.0E-05
78591	Isophorone	4.68E+01	6.23E-02	6.76E-06	1.20E+04	2.72E-04	6.63E-06	25	488.35	715.00	10,271	2.7E-07	0.0E+00
78875	1,2-Dichloropropane	4.37E+01	7.82E-02	8.73E-06	2.80E+03	1.15E-01	2.80E-03	25	369.52	572.00	7,590	0.0E+00	4.0E-03
79005	1,1,2-Trichloroethane	5.01E+01	7.80E-02	8.80E-06	4.42E+03	3.74E-02	9.12E-04	25	386.15	602.00	8,322	1.6E-05	0.0E+00
79016	Trichloroethylene	1.66E+02	7.90E-02	9.10E-06	1.10E+03	4.22E-01	1.03E-02	25	360.36	544.20	7,505	1.7E-06	0.0E+00
79345	1,1,2,2-Tetrachloroethane	9.33E+01	7.10E-02	7.90E-06	2.97E+03	1.41E-02	3.44E-04	25	419.60	661.15	8,996	5.8E-05	0.0E+00
83329	Acenaphthene	7.08E+03	4.21E-02	7.69E-06	4.24E+00	6.36E-03	1.55E-04	25	550.54	803.15	12,155	0.0E+00	2.1E-01
84662	Diethylphthalate	2.88E+02	2.56E-02	6.35E-06	1.08E+03	1.85E-05	4.51E-07	25	567.15	757.00	13,733	0.0E+00	2.8E+00
84742	Di-n-butyl phthalate	3.39E+04	4.38E-02	7.86E-06	1.12E+01	3.85E-08	9.39E-10	25	613.15	798.67	14,751	0.0E+00	3.5E-01

85687	Butyl benzyl phthalate	5.75E+04	1.74E-02	4.83E-06	2.69E+00	5.17E-05	1.26E-06	25	660.60	839.68	13,000	0.0E+00	7.0E-01
86306	N-Nitrosodiphenylamine	1.29E+03	3.12E-02	6.35E-06	3.51E+01	2.05E-04	5.00E-06	25	632.28	890.45	13,000	1.4E-06	0.0E+00
86737	Fluorene	1.38E+04	3.63E-02	7.88E-06	1.98E+00	2.61E-03	6.37E-05	25	570.44	870.00	12,666	0.0E+00	1.4E-01
86748	Carbazole	3.39E+03	3.90E-02	7.03E-06	7.48E+00	6.26E-07	1.53E-08	25	627.87	899.00	13,977	5.7E-06	0.0E+00
87683	Hexachloro-1,3-butadiene	5.37E+04	5.61E-02	6.16E-06	3.23E+00	3.34E-01	8.15E-03	25	486.15	738.00	10,206	2.2E-05	0.0E+00
87865	Pentachlorophenol	5.92E+02	5.60E-02	6.10E-06	1.95E+03	1.00E-06	2.44E-08	25	582.15	813.20	14,000	3.4E-05	0.0E+00
88062	2,4,6-Trichlorophenol	3.81E+02	3.18E-02	6.25E-06	8.00E+02	3.19E-04	7.78E-06	25	519.15	749.03	12,000	3.1E-06	0.0E+00
91203	Naphthalene	2.00E+03	5.90E-02	7.50E-06	3.10E+01	1.98E-02	4.83E-04	25	491.14	748.40	10,373	0.0E+00	1.4E-01
91941	3,3-Dichlorobenzidine	7.24E+02	1.94E-02	6.74E-06	3.11E+00	1.64E-07	4.00E-09	25	560.26	754.03	13,000	1.3E-04	0.0E+00
95476	o-Xylene	3.63E+02	8.70E-02	1.00E-05	1.78E+02	2.13E-01	5.20E-03	25	417.60	630.30	8,661	0.0E+00	7.0E+00
95487	2-Methylphenol (o-cresol)	9.12E+01	7.40E-02	8.30E-06	2.60E+04	4.92E-05	1.20E-06	25	464.19	697.60	10,800	0.0E+00	1.8E-01
95501	1,2-Dichlorobenzene	6.17E+02	6.90E-02	7.90E-06	1.56E+02	7.79E-02	1.90E-03	25	453.57	705.00	9,700	0.0E+00	2.0E-01
95578	2-Chlorophenol	3.88E+02	5.01E-02	9.46E-06	2.20E+04	1.60E-02	3.90E-04	25	447.53	675.00	9,572	0.0E+00	1.8E-02
95954	2,4,5-Trichlorophenol	1.60E+03	2.91E-02	7.03E-06	1.20E+03	1.78E-04	4.34E-06	25	526.15	759.13	13,000	0.0E+00	3.5E-01
98953	Nitrobenzene	6.46E+01	7.60E-02	8.60E-06	2.09E+03	9.84E-04	2.40E-05	25	483.95	719.00	10,566	0.0E+00	2.0E-03
100414	Ethylbenzene	3.63E+02	7.50E-02	7.80E-06	1.69E+02	3.23E-01	7.88E-03	25	409.34	617.20	8,501	0.0E+00	1.0E+00
100425	Styrene	7.76E+02	7.10E-02	8.00E-06	3.10E+02	1.13E-01	2.76E-03	25	418.31	636.00	8,737	0.0E+00	1.0E+00
105679	2,4-Dimethylphenol	2.09E+02	5.84E-02	8.69E-06	7.87E+03	8.20E-05	2.00E-06	25	484.13	707.60	11,329	0.0E+00	7.0E-02
106423	p-Xylene	3.89E+02	7.69E-02	8.44E-06	1.85E+02	3.14E-01	7.66E-03	26	411.52	616.20	8,525	0.0E+00	7.0E+00
106467	1,4-Dichlorobenzene	6.17E+02	6.90E-02	7.90E-06	7.38E+01	9.96E-02	2.43E-03	25	447.21	684.75	9,271	0.0E+00	8.0E-01
106478	p-Chloroaniline	6.61E+01	4.83E-02	1.01E-05	5.30E+03	1.36E-05	3.32E-07	25	503.65	754.00	11,689	0.0E+00	1.4E-02
107062	1,2-Dichloroethane	1.74E+01	1.04E-01	9.90E-06	8.52E+03	4.01E-02	9.78E-04	25	356.65	561.00	7,643	2.6E-05	0.0E+00
108054	Vinyl acetate	5.25E+00	8.50E-02	9.20E-06	2.00E+04	2.10E-02	5.12E-04	25	345.65	519.13	7,800	0.0E+00	2.0E-01
108383	m-Xylene	4.07E+02	7.00E-02	7.80E-06	1.61E+02	3.01E-01	7.34E-03	25	412.27	617.05	8,523	0.0E+00	7.0E+00
108883	Toluene	1.82E+02	8.70E-02	8.60E-06	5.26E+02	2.72E-01	6.63E-03	25	383.78	591.79	7,930	0.0E+00	4.0E-01
108907	Chlorobenzene	2.19E+02	7.30E-02	8.70E-06	4.72E+02	1.52E-01	3.71E-03	25	404.87	632.40	8,410	0.0E+00	2.0E-02
108952	Phenol	2.88E+01	8.20E-02	9.10E-06	8.28E+04	1.63E-05	3.98E-07	25	455.02	694.20	10,920	0.0E+00	2.1E+00
111444	Bis(2-chloroethyl)ether	1.55E+01	6.92E-02	7.53E-06	1.72E+04	7.38E-04	1.80E-05	25	451.15	659.79	9,000	3.3E-04	0.0E+00
115297	Endosulfan	2.14E+03	1.15E-02	4.55E-06	5.10E-01	4.59E-04	1.12E-05	25	674.43	942.94	14,000	0.0E+00	2.1E-02
117817	Bis(2-ethylhexyl)phthalate	1.51E+07	3.51E-02	3.66E-06	3.40E-01	4.18E-06	1.02E-07	25	657.15	806.00	15,999	4.0E-06	0.0E+00
117840	Di-n-octyl phthalate	8.32E+07	1.51E-02	3.58E-06	2.00E-02	2.74E-03	6.68E-05	25	704.09	862.22	15,000	0.0E+00	7.0E-02
118741	Hexachlorobenzene	5.50E+04	5.42E-02	5.91E-06	6.20E+00	5.41E-02	1.32E-03	25	582.55	825.00	14,447	4.6E-04	0.0E+00
120127	Anthracene	2.95E+04	3.24E-02	7.74E-06	4.34E-02	2.67E-03	6.51E-05	25	615.18	873.00	13,121	0.0E+00	1.1E+00
120821	1,2,4-Trichlorobenzene	1.78E+03	3.00E-02	8.23E-06	3.00E+02	5.82E-02	1.42E-03	25	486.15	725.00	10,471	0.0E+00	2.0E-01
120832	2,4-Dichlorophenol	1.47E+02	3.46E-02	8.77E-06	4.50E+03	1.30E-04	3.17E-06	25	482.15	708.17	11,000	0.0E+00	1.1E-02
121142	2,4-Dinitrotoluene	9.55E+01	2.03E-01	7.06E-06	2.70E+02	3.80E-06	9.27E-08	25	590.00	814.00	13,467	1.9E-04	0.0E+00
124481	Chlorodibromomethane	6.31E+01	1.96E-02	1.05E-05	2.60E+03	3.21E-02	7.83E-04	25	416.14	678.20	8,000	2.4E-05	0.0E+00
127184	Tetrachloroethylene	1.55E+02	7.20E-02	8.20E-06	2.00E+02	7.54E-01	1.84E-02	25	394.40	620.20	8,288	5.8E-07	0.0E+00
129000	Pyrene	1.05E+05	2.72E-02	7.24E-06	1.35E-01	4.51E-04	1.10E-05	25	667.95	936.00	14,370	0.0E+00	1.1E-01
156592	cis-1,2-Dichloroethylene	3.55E+01	7.36E-02	1.13E-05	3.50E+03	1.67E-01	4.07E-03	25	333.65	544.00	7,192	0.0E+00	3.5E-02
156605	trans-1,2-Dichloroethylene	5.25E+01	7.07E-02	1.19E-05	6.30E+03	3.85E-01	9.39E-03	25	320.85	516.50	6,717	0.0E+00	7.0E-02
193395	Indeno(1,2,3-cd)pyrene	3.47E+06	1.90E-02	5.66E-06	2.20E-05	6.56E-05	1.60E-06	25	809.15	1078.24	17,000	2.1E-04	0.0E+00
205992	Benzo(b)fluoranthene	1.23E+06	2.26E-02	5.56E-06	1.50E-03	4.55E-03	1.11E-04	25	715.90	969.27	15,000	2.1E-04	0.0E+00
206440	Fluoranthene	1.07E+05	3.02E-02	6.35E-06	2.06E-01	6.60E-04	1.61E-05	25	655.95	905.00	13,815	0.0E+00	1.4E-01
207089	Benzo(k)fluoranthene	1.23E+06	2.26E-02	5.56E-06	8.00E-04	3.40E-05	8.29E-07	25	753.15	1019.70	16,000	2.1E-05	0.0E+00
218019	Chrysene	3.98E+05	2.48E-02	6.21E-06	1.60E-03	3.88E-03	9.46E-05	25	714.15	979.00	16,455	2.1E-06	0.0E+00
309002	Aldrin	2.45E+06	1.32E-02	4.86E-06	1.80E-01	6.97E-03	1.70E-04	25	603.01	839.37	13,000	4.9E-03	0.0E+00
319846	alpha-HCH (alpha-BHC)	1.23E+03	1.42E-02	7.34E-06	2.00E+00	4.35E-04	1.06E-05	25	596.55	839.36	13,000	1.8E-03	0.0E+00
319857	beta-HCH (beta-BHC)	1.26E+03	1.42E-02	7.34E-06	2.40E-01	3.05E-05	7.44E-07	25	596.55	839.36	13,000	5.3E-04	0.0E+00
542756	1,3-Dichloropropene	4.57E+01	6.26E-02	1.00E-05	2.80E+03	7.26E-01	1.77E-02	25	381.15	587.38	7,000	3.7E-05	2.0E-02
606202	2,6-Dinitrotoluene	6.92E+01	3.27E-02	7.26E-06	1.82E+02	3.06E-05	7.46E-07	25	558.00	770.00	12,938	1.9E-04	0.0E+00
621647	N-Nitrosodi-n-propylamine	2.40E+01	5.45E-02	8.17E-06	9.89E+03	9.23E-05	2.25E-06	25	509.60	746.87	11,000	2.0E-03	0.0E+00
1024573	Heptachlor epoxide	8.32E+04	1.32E-02	4.23E-06	2.00E-01	3.90E-04	9.51E-06	25	613.96	848.76	13,000	2.6E-03	0.0E+00
7439976	Mercury (elemental)	5.20E+01	3.07E-02	6.30E-06	5.62E-02	4.67E-01	1.14E-02	25	629.88	1750.00	14,127	0.0E+00	3.0E-04
8001352	Toxaphene	2.57E+05	1.16E-02	4.34E-06	7.40E-01	2.46E-04	6.00E-06	25	657.15	873.31	14,000	3.2E-04	0.0E+00
11096825	Aroclor 1260 (PCB-1260)	2.90E+05	1.38E-02	4.32E-06	8.00E-02	1.89E-01	4.60E-03	25	402.50	539.37	19,000	1.0E-04	0.0E+00
11097691	Aroclor 1254 (PCB-1254)	2.00E+05	1.56E-02	5.00E-06	5.70E-02	8.20E-02	2.00E-03	25	377.50	512.27	19,000	1.0E-04	0.0E+00
12674112	Aroclor 1016 (PCB-1016)	3.30E+04	2.22E-02	5.42E-06	4.20E-01	1.19E-02	2.90E-04	25	340.50	475.22	18,000	1.0E-04	0.0E+00
53469219	Aroclor 1242 (PCB-1242)	3.30E+04	2.14E-02	5.31E-06	3.40E-01	2.13E-02	5.20E-04	25	345.50	482.20	18,000	1.0E-04	0.0E+00

DATA ENTRY SHEET

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

VERSION 1.2
September, 1998

YES	X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES	

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C_R (µg/kg)	Chemical
71432		Benzene

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	304.8	15.6	C		

ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^v (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^v (cm^3/cm^3)	ENTER Vadose zone soil organic carbon fraction, f_{oc}^v (unitless)
1.5	0.43	0.3	0.0019

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	70	350	1.0E-06	1
				Used to calculate risk-based soil concentration.	

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($atm \cdot m^3/mol$)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
8.80E-02	9.80E-06	5.56E-03	25	7,342	353.24	562.16	5.89E+01	1.75E+03	2.9E-05	6.0E-02

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
289.8	0.130	0.641	7.48E-10	0.599	4.48E-10	3,844	1	5.63E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization a e. groundwat temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm·m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)	Diffusion path length, L_d (cm)
9.24E+05	4.16E-04	15	8,065	3.57E-03	1.51E-01	1.77E-04	5.40E-04	289.8

Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm^3/g)	Source vapor conc., C_{source} (µg/m^3)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m^3)
15	1.12E-01	4.64E+02	0.10	4.28E-01	5.40E-04	3.84E+02	2.94E+13	6.09E-06	2.82E-03

Unit risk factor, URF $(µg/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
2.9E-05	6.0E-02

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C_{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
1.27E+01	9.50E+03	1.27E+01	5.69E+05	1.27E+01

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

DATA ENTRY SHEET

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

VERSION 1.2
September, 1998

YES	X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES	

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C_R (µg/kg)	Chemical
71432		Benzene

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	457.2	15.6	C		

ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Vadose zone soil organic carbon fraction, f_{oc}^V (unitless)
1.5	0.43	0.3	0.0019

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	70	350	1.0E-06	1
				Used to calculate risk-based soil concentration.	

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($atm \cdot m^3/mol$)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
8.80E-02	9.80E-06	5.56E-03	25	7,342	353.24	562.16	5.89E+01	1.75E+03	2.9E-05	6.0E-02

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^v (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
442.2	0.130	0.641	7.48E-10	0.599	4.48E-10	3,844	1	5.63E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization a e. groundwat temperature, $\Delta H_{v,ts}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} ($atm \cdot m^3/mol$)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)	Diffusion path length, L_d (cm)
9.24E+05	4.16E-04	15	8,065	3.57E-03	1.51E-01	1.77E-04	5.40E-04	442.2

Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm^3/g)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)
15	1.12E-01	4.64E+02	0.10	4.28E-01	5.40E-04	3.84E+02	2.94E+13	5.51E-06	2.55E-03

Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
2.9E-05	6.0E-02

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C_{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
1.41E+01	1.05E+04	1.41E+01	5.69E+05	1.41E+01

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

DATA ENTRY SHEET

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

VERSION 1.2
September, 1998

YES [X]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES [ ]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C_R (µg/kg)	Chemical
71432		Benzene

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to top of contamination, L_1 (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	609.6	15.6	C		

ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^v (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^v (cm^3/cm^3)	ENTER Vadose zone soil organic carbon fraction, f_{oc}^v (unitless)
1.5	0.43	0.3	0.0019

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	70	350	1.0E-06	1
				Used to calculate risk-based soil concentration.	

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
8.80E-02	9.80E-06	5.56E-03	25	7,342	353.24	562.16	5.89E+01	1.75E+03	2.9E-05	6.0E-02

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^v (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
594.6	0.130	0.641	7.48E-10	0.599	4.48E-10	3,844	1	5.63E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization a e. groundwat temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} ($atm\text{-}m^3/mol$)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)	Diffusion path length, L_d (cm)
9.24E+05	4.16E-04	15	8,065	3.57E-03	1.51E-01	1.77E-04	5.40E-04	594.6

Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm^3/g)	Source vapor conc., C_{source} (µg/m^3)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe') (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m^3)
15	1.12E-01	4.64E+02	0.10	4.28E-01	5.40E-04	3.84E+02	2.94E+13	5.03E-06	2.33E-03

Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
2.9E-05	6.0E-02

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure scil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C_{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
1.54E+01	1.15E+04	1.54E+01	5.69E+05	1.54E+01

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

DATA ENTRY SHEET

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

VERSION 1.2
September, 1998

YES	X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES	

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C_R (µg/kg)	Chemical
71432		Benzene

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	762	15.6	C		

ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^v (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^v (cm^3/cm^3)	ENTER Vadose zone soil organic carbon fraction, f_{oc}^v (unitless)
1.5	0.43	0.3	0.0019

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	70	350	1.0E-06	1
				Used to calculate risk-based soil concentration.	

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu g/m^3$)$^{-1}$	Reference conc., RfC (mg/m^3)
8.80E-02	9.80E-06	5.56E-03	25	7,342	353.24	562.16	5.89E+01	1.75E+03	2.9E-05	6.0E-02

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
747	0.130	0.641	7.48E-10	0.599	4.48E-10	3,844	1	5.63E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization a e. groundwat temperature, $\Delta H_{v,ts}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{ts} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{ts} (unitless)	Vapor viscosity at ave. soil temperature, μ_{ts} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)	Diffusion path length, L_d (cm)
9.24E+05	4.16E-04	15	8,065	3.57E-03	1.51E-01	1.77E-04	5.40E-04	747

Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm^3/g)	Source vapor conc., C_{source} (µg/m^3)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe') (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m^3)
15	1.12E-01	4.64E+02	0.10	4.28E-01	5.40E-04	3.84E+02	2.94E+13	4.63E-06	2.15E-03

Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
2.9E-05	6.0E-02

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C_{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
1.67E+01	1.25E+04	1.67E+01	5.69E+05	1.67E+01

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

DATA ENTRY SHEET

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

VERSION 1.2
September, 1998

YES	X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES	

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C_R (µg/kg)	Chemical
71432		Benzene

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	914.4	15.6	C		

ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Vadose zone soil organic carbon fraction, f_{oc}^V (unitless)
1.5	0.43	0.3	0.0019

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	70	350	1.0E-06	1
				Used to calculate risk-based soil concentration.	

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
8.80E-02	9.80E-06	5.56E-03	25	7,342	353.24	562.16	5.89E+01	1.75E+03	2.9E-05	6.0E-02

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
899.4	0.130	0.641	7.48E-10	0.599	4.48E-10	3,844	1	5.63E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization a e. groundwat temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)	Diffusion path length, L_d (cm)
9.24E+05	4.16E-04	15	8,065	3.57E-03	1.51E-01	1.77E-04	5.40E-04	899.4

Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm^3/g)	Source vapor conc., C_{source} (µg/m^3)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m^3)
15	1.12E-01	4.64E+02	0.10	4.28E-01	5.40E-04	3.84E+02	2.94E+13	4.29E-06	1.99E-03

Unit risk factor, URF (µg/m^3)$^{-1}$	Reference conc., RfC (mg/m^3)
2.9E-05	6.0E-02

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C_{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
1.81E+01	1.35E+04	1.81E+01	5.69E+05	1.81E+01

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

DATA ENTRY SHEET

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

VERSION 1.2
September, 1998

YES	X

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES	

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C_R (µg/kg)	Chemical
71432		Benzene

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	1066.8	15.6	C		

ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Vadose zone soil organic carbon fraction, f_{oc}^V (unitless)
1.5	0.43	0.3	0.0019

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	70	350	1.0E-06	1
				Used to calculate risk-based soil concentration.	

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($atm\text{-}m^3/mol$)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
8.80E-02	9.80E-06	5.56E-03	25	7,342	353.24	562.16	5.89E+01	1.75E+03	2.9E-05	6.0E-02

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
1051.8	0.130	0.641	7.48E-10	0.599	4.48E-10	3,844	1	5.63E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization a e. groundwat temperature, $\Delta H_{v,ts}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{ts} (atm·m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{ts} (unitless)	Vapor viscosity at ave. soil temperature, μ_{ts} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)	Diffusion path length, L_d (cm)
9.24E+05	4.16E-04	15	8,065	3.57E-03	1.51E-01	1.77E-04	5.40E-04	1051.8

Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm^3/g)	Source vapor conc., C_{source} (µg/m^3)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m^3)
15	1.12E-01	4.64E+02	0.10	4.28E-01	5.40E-04	3.84E+02	2.94E+13	3.99E-06	1.85E-03

Unit risk factor, URF (µg/m^3)$^{-1}$	Reference conc., RfC (mg/m^3)
2.9E-05	6.0E-02

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C_{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
1.94E+01	1.45E+04	1.94E+01	5.69E+05	1.94E+01

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

DATA ENTRY SHEET

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

VERSION 1.2
September, 1998

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C_R (µg/kg)	Chemical
71432	3900	Benzene

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	723.9	15.6	C		

ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Vadose zone soil organic carbon fraction, f_{oc}^V (unitless)
1.5	0.43	0.3	0.0019

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	70	350	1.0E-06	1
				Used to calculate risk-based soil concentration.	

ON Site Soils, Highest Benzene = Sample # C11-23.75/24.

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($atm \cdot m^3/mol$)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
8.80E-02	9.80E-06	5.56E-03	25	7,342	353.24	562.16	5.89E+01	1.75E+03	2.9E-05	6.0E-02

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^v (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
708.9	0.130	0.641	7.48E-10	0.599	4.48E-10	3,844	3900	5.63E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization a e. groundwat temperature, $\Delta H_{v,Ts}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{Ts} ($atm \cdot m^3/mol$)	Henry's law constant at ave. groundwater temperature, H'_{Ts} (unitless)	Vapor viscosity at ave. soil temperature, μ_{Ts} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)	Diffusion path length, L_d (cm)
9.24E+05	4.16E-04	15	8,065	3.57E-03	1.51E-01	1.77E-04	5.40E-04	708.9

Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm^3/g)	Source vapor conc., C_{source} (µg/m^3)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m^3)
15	1.12E-01	1.81E+06	0.10	4.28E-01	5.40E-04	3.84E+02	2.94E+13	4.73E-06	8.54E+00

Unit risk factor, URF ($(\mu g/m^3)^{-1}$)	Reference conc., RfC (mg/m^3)
2.9E-05	6.0E-02

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C_{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	5.69E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
2.4E-04	3.2E-01

VLOOKUP TABLES

Soil Properties Lookup Table

SCS Soil Type	K_s (cm/h)	α (1/cm)	N (unitless)	M (unitless)	θ_s (cm^3/cm^3)	θ_r (cm^3/cm^3)	Mean Grain Diameter (cm)
C	0.20	0.008	1.09	0.083	0.38	0.068	0.0092
CL	0.26	0.019	1.31	0.237	0.41	0.095	0.016
L	1.04	0.036	1.56	0.359	0.43	0.078	0.020
LS	14.59	0.124	2.28	0.561	0.41	0.057	0.040
S	29.70	0.145	2.68	0.627	0.43	0.045	0.044
SC	0.12	0.027	1.23	0.187	0.38	0.100	0.025
SCL	1.31	0.059	1.48	0.324	0.39	0.100	0.029
SI	0.25	0.016	1.37	0.270	0.46	0.034	0.0046
SIC	0.02	0.005	1.09	0.083	0.26	0.070	0.0039
SICL	0.07	0.010	1.23	0.187	0.43	0.089	0.0056
SIL	0.45	0.020	1.41	0.291	0.45	0.067	0.011
SL	4.42	0.075	1.89	0.471	0.41	0.065	0.030

Chemical Properties Lookup Table

CAS No.	Chemical	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Pure component water solubility, S (mg/L)	Henry's law constant H' (unitless)	Henry's law constant at reference temperature, H ($atm \cdot m^3/mol$)	Henry's law constant reference temperature, T_R (°C)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
50293	DDT	2.63E+06	1.37E-02	4.95E-06	2.50E-02	3.32E-04	8.10E-06	25	533.15	720.75	11,000	9.7E-05	0.0E+00
50328	Benzo(a)pyrene	1.02E+06	4.30E-02	9.00E-06	1.62E-03	4.63E-05	1.13E-06	25	715.90	969.27	15,000	2.1E-03	0.0E+00
51285	2,4-Dinitrophenol	1.00E-02	2.73E-02	9.06E-06	2.79E+03	1.82E-05	4.44E-07	25	605.28	827.85	15,000	0.0E+00	7.0E-03
53703	Dibenz(a,h)anthracene	3.80E+06	2.02E-02	5.18E-06	2.49E-03	6.03E-07	1.47E-08	25	743.24	990.41	16,000	2.1E-03	0.0E+00
56235	Carbon tetrachloride	1.74E+02	7.80E-02	8.80E-06	7.93E+02	1.25E+00	3.05E-02	25	349.90	556.60	7,127	1.5E-05	0.0E+00
56553	Benz(a)anthracene	3.98E+05	5.10E-02	9.00E-06	9.40E-03	1.37E-04	3.34E-06	25	708.15	1004.79	15,000	2.1E-04	0.0E+00
57749	Chlordane	1.20E+05	1.18E-02	4.37E-06	5.60E-02	1.99E-03	4.85E-05	25	624.24	885.73	13,000	3.7E-04	0.0E+00
58899	gamma-HCH (Lindane)	1.07E+03	1.42E-02	7.34E-06	6.80E+00	5.74E-04	1.40E-05	25	596.55	839.36	13,000	3.7E-04	0.0E+00
60571	Dieldrin	2.14E+04	1.25E-02	4.74E-06	1.95E-01	6.19E-04	1.51E-05	25	613.32	842.25	13,000	4.6E-03	0.0E+00
65850	Benzoic Acid	6.00E-01	5.36E-02	7.97E-06	3.50E+03	6.31E-05	1.54E-06	25	720.00	751.00	10,000	0.0E+00	1.4E+01
67641	Acetone	5.75E-01	1.24E-01	1.14E-05	1.00E+06	1.59E-03	3.88E-05	25	329.20	508.10	6,955	0.0E+00	3.5E-01
67663	Chloroform	3.98E+01	1.04E-01	1.00E-05	7.92E+03	1.50E-01	3.66E-03	25	334.32	536.40	6,988	2.3E-05	0.0E+00
67721	Hexachloroethane	1.78E+03	2.50E-03	6.80E-06	5.00E+01	1.59E-01	3.88E-03	25	458.00	695.00	9,510	4.0E-06	0.0E+00
71363	Butanol	6.92E+00	8.00E-02	9.30E-06	7.40E+04	3.61E-04	8.80E-06	25	390.88	563.05	10,346	0.0E+00	3.5E-01
71432	Benzene	5.89E+01	8.80E-02	9.80E-06	1.75E+03	2.28E-01	5.56E-03	25	353.24	562.16	7,342	2.9E-05	6.0E-02
71556	1,1,1-Trichloroethane	1.10E+02	7.80E-02	8.80E-06	1.33E+03	7.05E-01	1.72E-02	25	347.24	545.00	7,136	0.0E+00	1.0E+00
72208	Endrin	1.29E+04	1.25E-02	4.74E-06	2.50E-01	3.08E-04	7.51E-06	25	718.15	986.20	12,000	0.0E+00	1.1E-03
72435	Methoxychlor	9.77E+04	1.56E-02	4.46E-06	4.50E-02	6.48E-04	1.58E-05	25	651.02	848.49	14,000	0.0E+00	1.8E-02
72548	DDD	1.00E+06	1.69E-02	4.76E-06	9.00E-02	1.64E-04	4.00E-06	25	639.90	863.77	14,000	6.9E-05	0.0E+00
72559	DDE	4.47E+06	1.44E-02	5.87E-06	1.20E-01	8.61E-04	2.10E-05	25	636.44	860.38	13,000	9.7E-05	0.0E+00
74839	Methyl bromide	1.05E+01	7.28E-02	1.21E-05	1.52E+04	2.56E-01	6.24E-03	25	276.71	467.00	5,714	0.0E+00	5.0E-03
75014	Vinyl chloride (chloroethene)	1.86E+01	1.06E-01	1.23E-06	2.76E+03	1.11E+00	2.71E-02	25	259.25	432.00	5,250	8.4E-05	0.0E+00
75092	Methylene chloride	1.17E+01	1.01E-01	1.17E-05	1.30E+04	8.98E-02	2.19E-03	25	313.00	510.00	6,706	4.7E-07	3.0E+00
75150	Carbon disulfide	4.57E+01	1.04E-01	1.00E-05	1.19E+03	1.24E+00	3.02E-02	25	319.00	552.00	6,391	0.0E+00	7.0E-01
75252	Bromoform	8.71E+01	1.49E-02	1.03E-05	3.10E+03	2.19E-02	5.34E-04	25	422.35	696.00	9,479	1.1E-06	0.0E+00
75274	Bromodichloromethane	5.50E+01	2.98E-02	1.06E-05	6.74E+03	6.56E-02	1.60E-03	25	363.15	585.85	7,000	1.8E-05	0.0E+00
75343	1,1-Dichloroethane	3.16E+01	7.42E-02	1.05E-05	5.06E+03	2.30E-01	5.61E-03	25	330.55	523.00	6,895	0.0E+00	5.0E-01
75354	1,1-Dichloroethylene	5.89E+01	9.00E-02	1.04E-05	2.25E+03	1.07E+00	2.61E-02	25	304.75	576.05	6,247	5.0E-05	0.0E+00
76448	Heptachlor	1.41E+06	1.12E-02	5.69E-06	1.80E-01	4.47E-02	1.09E-03	25	603.69	846.31	13,000	1.3E-03	0.0E+00
77474	Hexachlorocyclopentadiene	2.00E+05	1.61E-02	7.21E-06	1.80E+00	1.11E+00	2.71E-02	25	512.15	746.00	10,931	0.0E+00	7.0E-05
78591	Isophorone	4.68E+01	6.23E-02	6.76E-06	1.20E+04	2.72E-04	6.63E-06	25	488.35	715.00	10,271	2.7E-07	0.0E+00
78875	1,2-Dichloropropane	4.37E+01	7.82E-02	8.73E-06	2.80E+03	1.15E-01	2.80E-03	25	369.52	572.00	7,590	0.0E+00	4.0E-03
79005	1,1,2-Trichloroethane	5.01E+01	7.80E-02	8.80E-06	4.42E+03	3.74E-02	9.12E-04	25	386.15	602.00	8,322	1.6E-05	0.0E+00
79016	Trichloroethylene	1.66E+02	7.90E-02	9.10E-06	1.10E+03	4.22E-01	1.03E-02	25	360.36	544.20	7,505	1.7E-06	0.0E+00
79345	1,1,2,2-Tetrachloroethane	9.33E+01	7.10E-02	7.90E-06	2.97E+03	1.41E-02	3.44E-04	25	419.60	681.15	8,996	5.8E-05	0.0E+00
83329	Acenaphthene	7.08E+03	4.21E-02	7.69E-06	4.24E+00	6.36E-03	1.55E-04	25	550.54	803.15	12,155	0.0E+00	2.1E-01
84662	Diethylphthalate	2.88E+02	2.56E-02	6.35E-06	1.08E+03	1.85E-05	4.51E-07	25	567.15	757.00	13,733	0.0E+00	2.8E+00
84742	Di-n-butyl phthalate	3.39E+04	4.38E-02	7.86E-06	1.12E+01	3.85E-08	9.39E-10	25	613.15	798.67	14,751	0.0E+00	3.5E-01

85687	Butyl benzyl phthalate	5.75E+04	1.74E-02	4.83E-06	2.69E+00	5.17E-05	1.26E-06	25	660.60	839.68	13,000	0.0E+00	7.0E-01
86306	N-Nitrosodiphenylamine	1.29E+03	3.12E-02	6.35E-06	3.51E+01	2.05E-04	5.00E-06	25	632.28	890.45	13,000	1.4E-06	0.0E+00
86737	Fluorene	1.38E+04	3.63E-02	7.88E-06	1.98E+00	2.61E-03	6.37E-05	25	570.44	870.00	12,666	0.0E+00	1.4E-01
86748	Carbazole	3.39E+03	3.90E-02	7.03E-06	7.48E+00	6.26E-07	1.53E-08	25	627.87	899.00	13,977	5.7E-06	0.0E+00
87683	Hexachloro-1,3-butadiene	5.37E+04	5.61E-02	6.16E-06	3.23E+00	3.34E-01	8.15E-03	25	486.15	738.00	10,206	2.2E-05	0.0E+00
87865	Pentachlorophenol	5.92E+02	5.60E-02	6.10E-06	1.95E+03	1.00E-06	2.44E-08	25	582.15	813.20	14,000	3.4E-05	0.0E+00
88062	2,4,6-Trichlorophenol	3.81E+02	3.18E-02	6.25E-06	8.00E+02	3.19E-04	7.78E-06	25	519.15	749.03	12,000	3.1E-06	0.0E+00
91203	Naphthalene	2.00E+03	5.90E-02	7.50E-06	3.10E+01	1.98E-02	4.83E-04	25	491.14	748.40	10,373	0.0E+00	1.4E-01
91941	3,3-Dichlorobenzidine	7.24E+02	1.94E-02	6.74E-06	3.11E+00	1.64E-07	4.00E-09	25	560.26	754.03	13,000	1.3E-04	0.0E+00
95476	o-Xylene	3.63E+02	8.70E-02	1.00E-05	1.78E+02	2.13E-01	5.20E-03	25	417.60	630.30	8,661	0.0E+00	7.0E+00
95487	2-Methylphenol (o-cresol)	9.12E+01	7.40E-02	8.30E-06	2.60E+04	4.92E-05	1.20E-06	25	464.19	697.60	10,800	0.0E+00	1.8E-01
95501	1,2-Dichlorobenzene	6.17E+02	6.90E-02	7.90E-06	1.56E+02	7.79E-02	1.90E-03	25	453.57	705.00	9,700	0.0E+00	2.0E-01
95578	2-Chlorophenol	3.88E+02	5.01E-02	9.46E-06	2.20E+04	1.60E-02	3.90E-04	25	447.53	675.00	9,572	0.0E+00	1.8E-02
95954	2,4,5-Trichlorophenol	1.60E+03	2.91E-02	7.03E-06	1.20E+03	1.78E-04	4.34E-06	25	526.15	759.13	13,000	0.0E+00	3.5E-01
98953	Nitrobenzene	6.46E+01	7.60E-02	8.60E-06	2.09E+03	9.84E-04	2.40E-05	25	483.95	719.00	10,566	0.0E+00	2.0E-03
100414	Ethylbenzene	3.63E+02	7.50E-02	7.80E-06	1.69E+02	3.23E-01	7.88E-03	25	409.34	617.20	8,501	0.0E+00	1.0E+00
100425	Styrene	7.76E+02	7.10E-02	8.00E-06	3.10E+02	1.13E-01	2.76E-03	25	418.31	636.00	8,737	0.0E+00	1.0E+00
105679	2,4-Dimethylphenol	2.09E+02	5.84E-02	8.69E-06	7.87E+03	8.20E-05	2.00E-06	25	484.13	707.60	11,329	0.0E+00	7.0E-02
106423	p-Xylene	3.89E+02	7.69E-02	8.44E-06	1.85E+02	3.14E-01	7.66E-03	26	411.52	616.20	8,525	0.0E+00	7.0E+00
106467	1,4-Dichlorobenzene	6.17E+02	6.90E-02	7.90E-06	7.38E+01	9.96E-02	2.43E-03	25	447.21	684.75	9,271	0.0E+00	8.0E-01
106478	p-Chloroaniline	6.61E+01	4.83E-02	1.01E-05	5.30E+03	1.36E-05	3.32E-07	25	503.65	754.00	11,689	0.0E+00	1.4E-02
107062	1,2-Dichloroethane	1.74E+01	1.04E-01	9.90E-06	8.52E+03	4.01E-02	9.78E-04	25	356.65	561.00	7,643	2.6E-05	0.0E+00
108054	Vinyl acetate	5.25E+00	8.50E-02	9.20E-06	2.00E+04	2.10E-02	5.12E-04	25	345.65	519.13	7,800	0.0E+00	2.0E-01
108383	m-Xylene	4.07E+02	7.00E-02	7.80E-06	1.61E+02	3.01E-01	7.34E-03	25	412.27	617.05	8,523	0.0E+00	7.0E+00
108883	Toluene	1.82E+02	8.70E-02	8.60E-06	5.26E+02	2.72E-01	6.63E-03	25	383.78	591.79	7,930	0.0E+00	4.0E-01
108907	Chlorobenzene	2.19E+02	7.30E-02	8.70E-06	4.72E+02	1.52E-01	3.71E-03	25	404.87	632.40	8,410	0.0E+00	2.0E-02
108952	Phenol	2.88E+01	8.20E-02	9.10E-06	8.28E+04	1.63E-05	3.98E-07	25	455.02	694.20	10,920	0.0E+00	2.1E+00
111444	Bis(2-chloroethyl)ether	1.55E+01	6.92E-02	7.53E-06	1.72E+04	7.38E-04	1.80E-05	25	451.15	659.79	9,000	3.3E-04	0.0E+00
115297	Endosulfan	2.14E+03	1.15E-02	4.55E-06	5.10E-01	4.59E-04	1.12E-05	25	674.43	942.94	14,000	0.0E+00	2.1E-02
117817	Bis(2-ethylhexyl)phthalate	1.51E+07	3.51E-02	3.66E-06	3.40E-01	4.18E-06	1.02E-07	25	657.15	806.00	15,999	4.0E-06	0.0E+00
117840	Di-n-octyl phthalate	8.32E+07	1.51E-02	3.58E-06	2.00E-02	2.74E-03	6.68E-05	25	704.09	862.22	15,000	0.0E+00	7.0E-02
118741	Hexachlorobenzene	5.50E+04	5.42E-02	5.91E-06	6.20E+00	5.41E-02	1.32E-03	25	582.55	825.00	14,447	4.6E-04	0.0E+00
120127	Anthracene	2.95E+04	3.24E-02	7.74E-06	4.34E-02	2.67E-03	6.51E-05	25	615.18	873.00	13,121	0.0E+00	1.1E+00
120821	1,2,4-Trichlorobenzene	1.78E+03	3.00E-02	8.23E-06	3.00E+02	5.82E-02	1.42E-03	25	486.15	725.00	10,471	0.0E+00	2.0E-01
120832	2,4-Dichlorophenol	1.47E+02	3.46E-02	8.77E-06	4.50E+03	1.30E-04	3.17E-06	25	482.15	708.17	11,000	0.0E+00	1.1E-02
121142	2,4-Dinitrotoluene	9.55E+01	2.03E-01	7.06E-06	2.70E+02	3.80E-06	9.27E-08	25	590.00	814.00	13,467	1.9E-04	0.0E+00
124481	Chlorodibromomethane	6.31E+01	1.96E-02	1.05E-05	2.60E+03	3.21E-02	7.83E-04	25	416.14	678.20	8,000	2.4E-05	0.0E+00
127184	Tetrachloroethylene	1.55E+02	7.20E-02	8.20E-06	2.00E+02	7.54E-01	1.84E-02	25	394.40	620.20	8,288	5.8E-07	0.0E+00
129000	Pyrene	1.05E+05	2.72E-02	7.24E-06	1.35E-01	4.51E-04	1.10E-05	25	667.95	936.00	14,370	0.0E+00	1.1E-01
156592	cis-1,2-Dichloroethylene	3.55E+01	7.36E-02	1.13E-05	3.50E+03	1.67E-01	4.07E-03	25	333.65	544.00	7,192	0.0E+00	3.5E-02
156605	trans-1,2-Dichloroethylene	5.25E+01	7.07E-02	1.19E-05	6.30E+03	3.85E-01	9.39E-03	25	320.85	516.50	6,717	0.0E+00	7.0E-02
193395	Indeno(1,2,3-cd)pyrene	3.47E+06	1.90E-02	5.66E-06	2.20E-05	6.56E-05	1.60E-06	25	809.15	1078.24	17,000	2.1E-04	0.0E+00
205992	Benzo(b)fluoranthene	1.23E+06	2.26E-02	5.56E-06	1.50E-03	4.55E-03	1.11E-04	25	715.90	969.27	15,000	2.1E-04	0.0E+00
206440	Fluoranthene	1.07E+05	3.02E-02	6.35E-06	2.06E-01	6.60E-04	1.61E-05	25	655.95	905.00	13,815	0.0E+00	1.4E-01
207089	Benzo(k)fluoranthene	1.23E+06	2.26E-02	5.56E-06	8.00E-04	3.40E-05	8.29E-07	25	753.15	1019.70	16,000	2.1E-05	0.0E+00
218019	Chrysene	3.98E+05	2.48E-02	6.21E-06	1.60E-03	3.88E-03	9.46E-05	25	714.15	979.00	16,455	2.1E-06	0.0E+00
309002	Aldrin	2.45E+06	1.32E-02	4.86E-06	1.80E-01	6.97E-03	1.70E-04	25	603.01	839.37	13,000	4.9E-03	0.0E+00
319846	alpha-HCH (alpha-BHC)	1.23E+03	1.42E-02	7.34E-06	2.00E+00	4.35E-04	1.06E-05	25	596.55	839.36	13,000	1.8E-03	0.0E+00
319857	beta-HCH (beta-BHC)	1.26E+03	1.42E-02	7.34E-06	2.40E-01	3.05E-05	7.44E-07	25	596.55	839.36	13,000	5.3E-04	0.0E+00
542756	1,3-Dichloropropene	4.57E+01	6.26E-02	1.00E-05	2.80E+03	7.26E-01	1.77E-02	25	381.15	587.38	7,000	3.7E-05	2.0E-02
606202	2,6-Dinitrotoluene	6.92E+01	3.27E-02	7.26E-06	1.82E+02	3.06E-05	7.46E-07	25	558.00	770.00	12,938	1.9E-04	0.0E+00
621647	N-Nitrosodi-n-propylamine	2.40E+01	5.45E-02	8.17E-06	9.89E+03	9.23E-05	2.25E-06	25	509.60	746.87	11,000	2.0E-03	0.0E+00
1024573	Heptachlor epoxide	8.32E+04	1.32E-02	4.23E-06	2.00E-01	3.90E-04	9.51E-06	25	613.96	848.76	13,000	2.6E-03	0.0E+00
7439976	Mercury (elemental)	5.20E+01	3.07E-02	6.30E-06	5.62E-02	4.67E-01	1.14E-02	25	629.88	1750.00	14,127	0.0E+00	3.0E-04
8001352	Toxaphene	2.57E+05	1.16E-02	4.34E-06	7.40E-01	2.46E-04	6.00E-06	25	657.15	873.31	14,000	3.2E-04	0.0E+00
11096825	Aroclor 1260 (PCB-1260)	2.90E+05	1.38E-02	4.32E-06	8.00E-02	1.89E-01	4.60E-03	25	402.50	539.37	19,000	1.0E-04	0.0E+00
11097691	Aroclor 1254 (PCB-1254)	2.00E+05	1.56E-02	5.00E-06	5.70E-02	8.20E-02	2.00E-03	25	377.50	512.27	19,000	1.0E-04	0.0E+00
12674112	Aroclor 1016 (PCB-1016)	3.30E+04	2.22E-02	5.42E-06	4.20E-01	1.19E-02	2.90E-04	25	340.50	475.22	18,000	1.0E-04	0.0E+00
53469219	Aroclor 1242 (PCB-1242)	3.30E+04	2.14E-02	5.31E-06	3.40E-01	2.13E-02	5.20E-04	25	345.50	482.20	18,000	1.0E-04	0.0E+00

DATA ENTRY SHEET

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

VERSION 1.2
September, 1998

YES	

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES	X

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C_R (µg/kg)	Chemical
108883	15000	Toluene

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	723.9	15.6	C		

ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Vadose zone soil organic carbon fraction, f_{oc}^V (unitless)
1.5	0.43	0.3	0.0019

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	70	350	1.0E-06	1
				Used to calculate risk-based soil concentration.	

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($atm \cdot m^3/mol$)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
8.70E-02	8.60E-06	6.63E-03	25	7,930	383.78	591.79	1.82E+02	5.26E+02	0.0E+00	3.0E-01

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
708.9	0.130	0.641	7.48E-10	0.599	4.48E-10	3,844	15000	5.63E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization a e. groundwat temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)	Diffusion path length, L_d (cm)
9.24E+05	4.16E-04	15	9,094	4.02E-03	1.70E-01	1.77E-04	5.32E-04	708.9

Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm^3/g)	Source vapor conc., C_{source} (µg/m^3)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m^3)
15	3.46E-01	4.54E+06	0.10	4.28E-01	5.32E-04	3.84E+02	4.54E+13	4.70E-06	2.14E+01

Unit risk factor, URF (µg/m^3)$^{-1}$	Reference conc., RfC (mg/m^3)
NA	3.0E-01

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C_{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	2.95E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	1.6E-01

DATA ENTRY SHEET

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

VERSION 1.2
September, 1998

YES	

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES	X

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C_R (µg/kg)	Chemical
100414	4400	Ethylbenzene

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	723.9	15.6	C		

ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Vadose zone soil organic carbon fraction, f_{oc}^V (unitless)
1.5	0.43	0.3	0.0019

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	70	350	1.0E-06	1
				Used to calculate risk-based soil concentration.	

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($atm\text{-}m^3/mol$)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
7.50E-02	7.80E-06	7.88E-03	25	8,501	409.34	617.20	3.63E+02	1.69E+02	0.0E+00	1.0E+00

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^v (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
708.9	0.130	0.641	7.48E-10	0.599	4.48E-10	3,844	4400	5.63E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization a e. groundwat temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)	Diffusion path length, L_d (cm)
9.24E+05	4.16E-04	15	10,091	4.53E-03	1.91E-01	1.77E-04	4.59E-04	708.9

Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm^3/g)	Source vapor conc., C_{source} (µg/m^3)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m^3)
15	6.90E-01	9.27E+05	0.10	4.28E-01	4.59E-04	3.84E+02	7.11E+15	4.43E-06	4.11E+00

Unit risk factor, URF ($(\mu g/m^3)^{-1}$)	Reference conc., RfC (mg/m^3)
NA	1.0E+00

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C_{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	1.53E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	9.2E-03

DATA ENTRY SHEET

CALCULATE RISK-BASED SOIL CONCENTRATION (enter "X" in "YES" box)

VERSION 1.2
September, 1998

YES	

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL SOIL CONCENTRATION (enter "X" in "YES" box and initial soil conc. below)

YES	X

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial soil conc., C_R (µg/kg)	Chemical
108383	23000	m-Xylene

ENTER Depth below grade to bottom of enclosed space floor, L_F (15 or 200 cm)	ENTER Depth below grade to top of contamination, L_t (cm)	ENTER Average soil temperature, T_S (°C)	ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vadose zone soil vapor permeability, k_v (cm^2)
15	723.9	15.6	C		

ENTER Vadose zone soil dry bulk density, ρ_b^A (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)	ENTER Vadose zone soil organic carbon fraction, f_{oc}^V (unitless)
1.5	0.43	0.3	0.0019

ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)	ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)
70	30	70	350	1.0E-06	1
				Used to calculate risk-based soil concentration.	

CHEMICAL PROPERTIES SHEET

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($atm \cdot m^3/mol$)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
7.00E-02	7.80E-06	7.34E-03	25	8,523	412.27	617.05	4.07E+02	1.61E+02	0.0E+00	3.0E-01

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^v (cm^3/cm^3)	Vadose zone effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Floor-wall seam perimeter, X_{crack} (cm)	Initial soil concentration used, C_R (µg/kg)	Bldg. ventilation rate, $Q_{building}$ (cm^3/s)
708.9	0.130	0.641	7.48E-10	0.599	4.48E-10	3,844	23000	5.63E+04

Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization a e. groundwat temperature, $\Delta H_{v,ts}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)	Diffusion path length, L_d (cm)
9.24E+05	4.16E-04	15	10,190	4.19E-03	1.77E-01	1.77E-04	4.29E-04	708.9

Convection path length, L_p (cm)	Soil-water partition coefficient, K_d (cm^3/g)	Source vapor conc., C_{source} (µg/m^3)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ (µg/m^3)
15	7.73E-01	4.12E+06	0.10	4.28E-01	4.29E-04	3.84E+02	9.15E+16	4.30E-06	1.77E+01

Unit risk factor, URF (µg/m^3)$^{-1}$	Reference conc., RfC (mg/m^3)
NA	3.0E-01

RESULTS SHEET

RISK-BASED SOIL CONCENTRATION CALCULATIONS:

Indoor exposure soil conc., carcinogen (µg/kg)	Indoor exposure soil conc., noncarcinogen (µg/kg)	Risk-based indoor exposure soil conc., (µg/kg)	Soil saturation conc., C_{sat} (µg/kg)	Final indoor exposure soil conc., (µg/kg)
NA	NA	NA	1.59E+05	NA

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	1.3E-01

DATA ENTRY SHEET

GW-SCREEN
ersion 3.0; 04/0

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [X]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION
(enter "X" in "YES" box and initial groundwater conc. below)

YES [ ]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
71432		Benzene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)	ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)
15	121.92	C	15	

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
C			C	1.43	0.459	0.215

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

Benzene in Water Backyards RSS4/RSS10, ~~Brighton Ave~~, ~~Intercept~~ Trench
4 feet Depth to water, below surface

CHEMICAL PROPERTIES SHEET

ABC

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
8.80E-02	9.80E-06	5.54E-03	25	7,342	353.24	562.16	5.89E+01	1.79E+03	2.9E-05	6.0E-02

END

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^v (cm^3/cm^3)	Vadose zon effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
106.92	0.244	0.324	2.28E-09	0.821	1.87E-09	81.52	0.459	0.047	0.412	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,TS}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_v (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)
1.69E+04	1.00E+06	4.00E-04	15	8,071	3.45E-03	1.46E-01	1.77E-04	3.81E-03	3.26E-05	4.26E-05

Diffusion path length, L_d (cm)	Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe') (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
106.92	15	1.46E+02	0.10	1.86E+00	3.81E-03	4.00E+02	2.05E+05	1.94E-05	2.83E-03	2.9E-05	6.0E-02

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
2.97E+01	2.21E+04	2.97E+01	1.79E+06	2.97E+01

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
NA	NA

MESSAGE SUMMARY BELOW:
MESSAGE: The values of Csource and Cbuilding on the INTERCALCS worksheet are based on unity and do not represent actual values.

END

DATA ENTRY SHEET

GW-SCREEN ersion 3.0; 04/0

Reset to Defaults

CALCULATE RISK-BASED GROUNDWATER CONCENTRATION (enter "X" in "YES" box)

YES [ ]

OR

CALCULATE INCREMENTAL RISKS FROM ACTUAL GROUNDWATER CONCENTRATION (enter "X" in "YES" box and initial groundwater conc. below)

YES [X]

ENTER Chemical CAS No. (numbers only, no dashes)	ENTER Initial groundwater conc., C_W (µg/L)	Chemical
71432	8.20E+02	Benzene

MORE ↓

ENTER Depth below grade to bottom of enclosed space floor, L_F (cm)	ENTER Depth below grade to water table, L_{WT} (cm)	ENTER SCS soil type directly above water table	ENTER Average soil/ groundwater temperature, T_S (°C)
15	121.92	C	15

ENTER Average vapor flow rate into bldg. (Leave blank to calculate) Q_{soil} (L/m)

[ ]

MORE ↓

ENTER Vadose zone SCS soil type (used to estimate soil vapor permeability)	OR	ENTER User-defined vandose zone soil vapor permeability, k_v (cm^2)	ENTER Vadose zone SCS soil type (Lookup Soil Parameters)	ENTER Vadose zone soil dry bulk density, ρ_b^V (g/cm^3)	ENTER Vadose zone soil total porosity, n^V (unitless)	ENTER Vadose zone soil water-filled porosity, θ_w^V (cm^3/cm^3)
C			C	1.43	0.459	0.215

MORE ↓

ENTER Target risk for carcinogens, TR (unitless)	ENTER Target hazard quotient for noncarcinogens, THQ (unitless)	ENTER Averaging time for carcinogens, AT_C (yrs)	ENTER Averaging time for noncarcinogens, AT_{NC} (yrs)	ENTER Exposure duration, ED (yrs)	ENTER Exposure frequency, EF (days/yr)
1.0E-06	1	70	30	30	350

Used to calculate risk-based groundwater concentration.

Health Risk from Vaporizing Benzene in Groundwater "Intercept Trench"

CHEMICAL PROPERTIES SHEET

ABC

Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Henry's law constant at reference temperature, H ($atm \cdot m^3/mol$)	Henry's law constant reference temperature, T_R (°C)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Pure component water solubility, S (mg/L)	Unit risk factor, URF $(\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
8.80E-02	9.80E-06	5.54E-03	25	7,342	353.24	562.16	5.89E+01	1.79E+03	2.9E-05	6.0E-02

END

INTERMEDIATE CALCULATIONS SHEET

Source-building separation, L_T (cm)	Vadose zone soil air-filled porosity, θ_a^V (cm^3/cm^3)	Vadose zon effective total fluid saturation, S_{te} (cm^3/cm^3)	Vadose zone soil intrinsic permeability, k_i (cm^2)	Vadose zone soil relative air permeability, k_{rg} (cm^2)	Vadose zone soil effective vapor permeability, k_v (cm^2)	Thickness of capillary zone, L_{cz} (cm)	Total porosity in capillary zone, n_{cz} (cm^3/cm^3)	Air-filled porosity in capillary zone, $\theta_{a,cz}$ (cm^3/cm^3)	Water-filled porosity in capillary zone, $\theta_{w,cz}$ (cm^3/cm^3)	Floor-wall seam perimeter, X_{crack} (cm)
106.92	0.244	0.324	2.28E-09	0.821	1.87E-09	81.52	0.459	0.047	0.412	4,000

Bldg. ventilation rate, $Q_{building}$ (cm^3/s)	Area of enclosed space below grade, A_B (cm^2)	Crack-to-total area ratio, η (unitless)	Crack depth below grade, Z_{crack} (cm)	Enthalpy of vaporization at ave. groundwater temperature, $\Delta H_{v,ts}$ (cal/mol)	Henry's law constant at ave. groundwater temperature, H_{TS} (atm-m^3/mol)	Henry's law constant at ave. groundwater temperature, H'_{TS} (unitless)	Vapor viscosity at ave. soil temperature, μ_{TS} (g/cm-s)	Vadose zone effective diffusion coefficient, D^{eff}_V (cm^2/s)	Capillary zone effective diffusion coefficient, D^{eff}_{cz} (cm^2/s)	Total overall effective diffusion coefficient, D^{eff}_T (cm^2/s)
1.69E+04	1.00E+06	4.00E-04	15	8,071	3.45E-03	1.46E-01	1.77E-04	3.81E-03	3.26E-05	4.26E-05

Diffusion path length, L_d (cm)	Convection path length, L_p (cm)	Source vapor conc., C_{source} ($\mu g/m^3$)	Crack radius, r_{crack} (cm)	Average vapor flow rate into bldg., Q_{soil} (cm^3/s)	Crack effective diffusion coefficient, D^{crack} (cm^2/s)	Area of crack, A_{crack} (cm^2)	Exponent of equivalent foundation Peclet number, exp(Pe^f) (unitless)	Infinite source indoor attenuation coefficient, α (unitless)	Infinite source bldg. conc., $C_{building}$ ($\mu g/m^3$)	Unit risk factor, URF ($\mu g/m^3)^{-1}$	Reference conc., RfC (mg/m^3)
106.92	15	1.20E+05	0.10	1.86E+00	3.81E-03	4.00E+02	2.05E+05	1.94E-05	2.32E+00	2.9E-05	6.0E-02

RESULTS SHEET

RISK-BASED GROUNDWATER CONCENTRATION CALCULATIONS:

Indoor exposure groundwater conc., carcinogen (µg/L)	Indoor exposure groundwater conc., noncarcinogen (µg/L)	Risk-based indoor exposure groundwater conc., (µg/L)	Pure component water solubility, S (µg/L)	Final indoor exposure groundwater conc., (µg/L)
NA	NA	NA	1.79E+06	NA

MESSAGE SUMMARY BELOW:

END

INCREMENTAL RISK CALCULATIONS:

Incremental risk from vapor intrusion to indoor air, carcinogen (unitless)	Hazard quotient from vapor intrusion to indoor air, noncarcinogen (unitless)
2.8E-05	3.7E-02

VLOOKUP TABLES

Soil Properties Lookup Table

SCS Soil Type	K_s (cm/h)	α_1 (1/cm)	N (unitless)	M (unitless)	n (cm^3/cm^3)	θ_r (cm^3/cm^3)	Mean Grain Diameter (cm)	Bulk Density (g/cm^3)	θ_w (cm^3/cm^3	SCS Soil Name
C	0.61	0.01496	1.253	0.2019	0.459	0.098	0.0092	1.43	0.215	Clay
CL	0.34	0.01581	1.416	0.2938	0.442	0.079	0.016	1.48	0.168	Clay Loam
L	0.50	0.01112	1.472	0.3207	0.399	0.061	0.020	1.59	0.148	Loam
LS	4.38	0.03475	1.746	0.4273	0.390	0.049	0.040	1.62	0.076	Loamy Sand
S	26.78	0.03524	3.177	0.6852	0.375	0.053	0.044	1.66	0.054	Sand
SC	0.47	0.03342	1.208	0.1722	0.385	0.117	0.025	1.63	0.197	Sandy Clay
SCL	0.55	0.02109	1.330	0.2481	0.384	0.063	0.029	1.63	0.146	Sandy Clay Loam
SI	1.82	0.00658	1.679	0.4044	0.489	0.050	0.0046	1.35	0.167	Silt
SIC	0.40	0.01622	1.321	0.2430	0.481	0.111	0.0039	1.38	0.216	Silty Clay
SICL	0.46	0.00839	1.521	0.3425	0.482	0.090	0.0056	1.37	0.198	Silty Clay Loam
SIL	0.76	0.00506	1.663	0.3987	0.439	0.065	0.011	1.49	0.180	Silt Loam
SL	1.60	0.02667	1.449	0.3099	0.387	0.039	0.030	1.62	0.103	Sandy Loam

Chemical Properties Lookup Table

CAS No.	Chemical	Organic carbon partition coefficient, K_{oc} (cm^3/g)	Diffusivity in air, D_a (cm^2/s)	Diffusivity in water, D_w (cm^2/s)	Pure component water solubility, S (mg/L)	Henry's law constant H' (unitless)	Henry's law constant at reference temperature, H (atm-m^3/mol)	Henry's law constant reference temperature, T_R (°C)	Normal boiling point, T_B (°K)	Critical temperature, T_C (°K)	Enthalpy of vaporization at the normal boiling point, $\Delta H_{v,b}$ (cal/mol)	Unit risk factor, URF $(\mu g/m^3)^{-1}$
56235	Carbon tetrachloride	1.74E+02	7.80E-02	8.80E-06	7.93E+02	1.24E+00	3.03E-02	25	349.90	556.60	7,127	1.5E-05
57749	Chlordane	1.20E+05	1.18E-02	4.37E-06	5.60E-02	1.99E-03	4.85E-05	25	624.24	885.73	14,000	1.0E-04
58899	gamma-HCH (Lindane)	1.07E+03	1.42E-02	7.34E-06	7.30E+00	5.73E-04	1.40E-05	25	596.55	839.36	15,000	3.7E-04
60297	Ethyl ether	5.73E+00	7.82E-02	8.61E-06	5.68E+04	1.35E+00	3.29E-02	25	307.50	466.74	6,338	0.0E+00
60571	Dieldrin	2.14E+04	1.25E-02	4.74E-06	1.95E-01	6.18E-04	1.51E-05	25	613.32	842.25	17,000	4.6E-03
67641	Acetone	5.75E-01	1.24E-01	1.14E-05	1.00E+06	1.59E-03	3.87E-05	25	329.20	508.10	6,955	0.0E+00
67663	Chloroform	3.98E+01	1.04E-01	1.00E-05	7.92E+03	1.50E-01	3.66E-03	25	334.32	536.40	6,988	2.3E-05
67721	Hexachloroethane	1.78E+03	2.50E-03	6.80E-06	5.00E+01	1.59E-01	3.88E-03	25	458.00	695.00	9,510	4.0E-06
71432	Benzene	5.89E+01	8.80E-02	9.80E-06	1.79E+03	2.27E-01	5.54E-03	25	353.24	562.16	7,342	2.9E-05
71556	1,1,1-Trichloroethane	1.10E+02	7.80E-02	8.80E-06	1.33E+03	7.03E-01	1.72E-02	25	347.24	545.00	7,136	0.0E+00
72435	Methoxychlor	9.77E+04	1.56E-02	4.46E-06	1.00E-01	6.46E-04	1.58E-05	25	651.02	848.49	16,000	0.0E+00
72559	DDE	4.47E+06	1.44E-02	5.87E-06	1.20E-01	8.59E-04	2.09E-05	25	636.44	860.38	15,000	9.7E-05
74839	Methyl bromide	1.05E+01	7.28E-02	1.21E-05	1.52E+04	2.55E-01	6.22E-03	25	276.71	467.00	5,714	0.0E+00
74873	Methyl chloride (chloromethan	2.12E+00	1.26E-01	6.50E-06	5.33E+03	3.61E-01	8.80E-03	25	249.00	416.25	5,115	1.0E-06
74908	Hydrogen cyanide	3.80E+00	1.93E-01	2.10E-05	1.00E+06	5.44E-03	1.33E-04	25	299.00	456.70	6,676	0.0E+00
74953	Methylene bromide	1.26E+01	4.30E-02	8.44E-06	1.19E+04	3.52E-02	8.59E-04	25	370.00	583.00	7,868	0.0E+00
75003	Chloroethane (ethyl chloride)	4.40E+00	2.71E-01	1.15E-05	5.68E+03	3.61E-01	8.80E-03	25	285.30	460.40	5,879	8.3E-07
75014	Vinyl chloride (chloroethene)	1.86E+01	1.06E-01	1.23E-05	8.80E+03	1.10E+00	2.69E-02	25	259.25	432.00	5,250	8.8E-06
75058	Acetonitrile	4.20E+00	1.28E-01	1.66E-05	1.00E+06	1.42E-03	3.45E-05	25	354.60	545.50	7,110	0.0E+00
75070	Acetaldehyde	1.06E+00	1.24E-01	1.41E-05	1.00E+06	3.23E-03	7.87E-05	25	293.10	466.00	6,157	2.2E-06
75092	Methylene chloride	1.17E+01	1.01E-01	1.17E-05	1.30E+04	8.96E-02	2.18E-03	25	313.00	510.00	6,706	4.7E-07
75150	Carbon disulfide	4.57E+01	1.04E-01	1.00E-05	1.19E+03	1.24E+00	3.02E-02	25	319.00	552.00	6,391	0.0E+00
75218	Ethylene oxide	1.33E+00	1.04E-01	1.45E-05	3.04E+05	2.27E-02	5.54E-04	25	283.60	469.00	6,104	1.0E-04
75252	Bromoform	8.71E+01	1.49E-02	1.03E-05	3.10E+03	2.41E-02	5.88E-04	25	422.35	696.00	9,479	1.1E-06
75274	Bromodichloromethane	5.50E+01	2.98E-02	1.06E-05	6.74E+03	6.54E-02	1.60E-03	25	363.15	585.85	7,800	1.8E-05
75296	2-Chloropropane	9.14E+00	8.88E-02	1.01E-05	3.73E+03	5.93E-01	1.45E-02	25	308.70	485.00	6,286	0.0E+00
75343	1,1-Dichloroethane	3.16E+01	7.42E-02	1.05E-05	5.06E+03	2.30E-01	5.61E-03	25	330.55	523.00	6,895	0.0E+00
75354	1,1-Dichloroethylene	5.89E+01	9.00E-02	1.04E-05	2.25E+03	1.07E+00	2.60E-02	25	304.75	576.05	6,247	0.0E+00
75456	Chlorodifluoromethane	4.79E+01	1.01E-01	1.28E-05	2.00E+00	1.10E+00	2.70E-02	25	232.40	369.30	4,836	0.0E+00
75694	Trichlorofluoromethane	4.97E+02	8.70E-02	9.70E-06	1.10E+03	3.97E+00	9.68E-02	25	296.70	471.00	5,999	0.0E+00
75718	Dichlorodifluoromethane	4.57E+02	6.65E-02	9.92E-06	2.80E+02	1.40E+01	3.42E-01	25	243.20	384.95	9,421	0.0E+00
76131	1,1,2-Trichloro-1,2,2-trifluoroe	1.11E+04	7.80E-02	8.20E-06	1.70E+02	1.97E+01	4.80E-01	25	320.70	487.30	6,463	0.0E+00
76448	Heptachlor	1.41E+06	1.12E-02	5.69E-06	1.80E-01	6.05E+01	1.48E+00	25	603.69	846.31	13,000	1.3E-03
77474	Hexachlorocyclopentadiene	2.00E+05	1.61E-02	7.21E-06	1.80E+00	1.10E+00	2.69E-02	25	512.15	746.00	10,931	0.0E+00
78831	Isobutanol	2.59E+00	8.60E-02	9.30E-06	8.50E+04	4.83E-04	1.18E-05	25	381.04	547.78	10,936	0.0E+00
78875	1,2-Dichloropropane	4.37E+01	7.82E-02	8.73E-06	2.80E+03	1.15E-01	2.79E-03	25	369.52	572.00	7,590	1.9E-05
78933	Methylethylketone (2-butanon	2.30E+00	8.08E-02	9.80E-06	2.23E+05	2.29E-03	5.58E-05	25	352.50	536.78	7,481	0.0E+00
79005	1,1,2-Trichloroethane	5.01E+01	7.80E-02	8.80E-06	4.42E+03	3.73E-02	9.11E-04	25	386.15	602.00	8,322	1.6E-05

2/12/05

79016	Trichloroethylene	1.66E+02	7.90E-02	9.10E-06	1.47E+03	4.21E-01	1.03E-02	25	360.36	544.20	7,505	1.1E-04
79209	Methyl acetate	3.26E+00	1.04E-01	1.00E-05	2.00E+03	4.84E-03	1.18E-04	25	329.80	506.70	7,260	0.0E+00
79345	1,1,2,2-Tetrachloroethane	9.33E+01	7.10E-02	7.90E-06	2.96E+03	1.41E-02	3.44E-04	25	419.60	661.15	8,996	5.8E-05
79469	2-Nitropropane	1.17E+01	9.23E-02	1.01E-05	1.70E+04	5.03E-03	1.23E-04	25	393.20	594.00	8,383	2.7E-03
80626	Methylmethacrylate	6.98E+00	7.70E-02	8.60E-06	1.50E+04	1.38E-02	3.36E-04	25	373.50	567.00	8,975	0.0E+00
83329	Acenaphthene	7.08E+03	4.21E-02	7.69E-06	3.57E+00	6.34E-03	1.55E-04	25	550.54	803.15	12,155	0.0E+00
86737	Fluorene	1.38E+04	3.63E-02	7.88E-06	1.98E+00	2.60E-03	6.34E-05	25	570.44	870.00	12,666	0.0E+00
87683	Hexachloro-1,3-butadiene	5.37E+04	5.61E-02	6.16E-06	3.20E+00	3.33E-01	8.13E-03	25	486.15	738.00	10,206	2.2E-05
88722	o-Nitrotoluene	3.24E+02	5.87E-02	8.67E-06	6.50E+02	5.11E-04	1.25E-05	25	495.00	720.00	12,239	0.0E+00
91203	Naphthalene	2.00E+03	5.90E-02	7.50E-06	3.10E+01	1.98E-02	4.82E-04	25	491.14	748.40	10,373	0.0E+00
91576	2-Methylnaphthalene	2.81E+03	5.22E-02	7.75E-06	2.46E+01	2.12E-02	5.17E-04	25	514.26	761.00	12,600	0.0E+00
92524	Biphenyl	4.38E+03	4.04E-02	8.15E-06	7.45E+00	1.23E-02	2.99E-04	25	529.10	789.00	10,890	0.0E+00
95476	o-Xylene	3.63E+02	8.70E-02	1.00E-05	1.78E+02	2.12E-01	5.18E-03	25	417.60	630.30	8,661	0.0E+00
95501	1,2-Dichlorobenzene	6.17E+02	6.90E-02	7.90E-06	1.56E+02	7.77E-02	1.90E-03	25	453.57	705.00	9,700	0.0E+00
95578	2-Chlorophenol	3.88E+02	5.01E-02	9.46E-06	2.20E+04	1.60E-02	3.90E-04	25	447.53	675.00	9,572	0.0E+00
95636	1,2,4-Trimethylbenzene	1.35E+03	6.06E-02	7.92E-06	5.70E+01	2.52E-01	6.14E-03	25	442.30	649.17	9,369	0.0E+00
96184	1,2,3-Trichloropropane	2.20E+01	7.10E-02	7.90E-06	1.75E+03	1.67E-02	4.08E-04	25	430.00	652.00	9,171	5.7E-04
96333	Methyl acrylate	4.53E+00	9.76E-02	1.02E-05	6.00E+04	7.68E-03	1.87E-04	25	353.70	536.00	7,749	0.0E+00
97632	Ethylmethacrylate	2.95E+01	6.53E-02	8.37E-06	3.67E+03	3.44E-02	8.40E-04	25	390.00	571.00	10,957	0.0E+00
98066	tert-Butylbenzene	7.71E+02	5.65E-02	8.02E-06	2.95E+01	4.87E-01	1.19E-02	25	442.10	1220.00	8,980	0.0E+00
98828	Cumene	4.89E+02	6.50E-02	7.10E-06	6.13E+01	4.74E+01	1.16E+00	25	425.56	631.10	10,335	0.0E+00
98862	Acetophenone	5.77E+01	6.00E-02	8.73E-06	6.13E+03	4.38E-04	1.07E-05	25	475.00	709.50	11,732	0.0E+00
98953	Nitrobenzene	6.46E+01	7.60E-02	8.60E-06	2.09E+03	9.82E-04	2.39E-05	25	483.95	719.00	10,566	0.0E+00
100414	Ethylbenzene	3.63E+02	7.50E-02	7.80E-06	1.69E+02	3.22E-01	7.86E-03	25	409.34	617.20	8,501	1.1E-06
100425	Styrene	7.76E+02	7.10E-02	8.00E-06	3.10E+02	1.12E-01	2.74E-03	25	418.31	636.00	8,737	0.0E+00
100447	Benzylchloride	6.14E+01	7.50E-02	7.80E-06	5.25E+02	1.70E-02	4.14E-04	25	452.00	685.00	8,773	4.9E-05
100527	Benzaldehyde	4.59E+01	7.21E-02	9.07E-06	3.30E+03	9.73E-04	2.37E-05	25	452.00	695.00	11,658	0.0E+00
103651	n-Propylbenzene	5.62E+02	6.01E-02	7.83E-06	6.00E+01	4.37E-01	1.07E-02	25	432.20	630.00	9,123	0.0E+00
104518	n-Butylbenzene	1.11E+03	5.70E-02	8.12E-06	2.00E+00	5.38E-01	1.31E-02	25	456.46	660.50	9,290	0.0E+00
106423	p-Xylene	3.89E+02	7.69E-02	8.44E-06	1.85E+02	3.13E-01	7.64E-03	25	411.52	616.20	8,525	0.0E+00
106467	1,4-Dichlorobenzene	6.17E+02	6.90E-02	7.90E-06	7.90E+01	9.82E-02	2.39E-03	25	447.21	684.75	9,271	0.0E+00
106934	1,2-Dibromoethane (ethylene	2.50E+01	2.17E-02	1.19E-05	4.18E+03	3.04E-02	7.41E-04	25	404.60	583.00	8,310	2.2E-04
106990	1,3-Butadiene	1.91E+01	2.49E-01	1.08E-05	7.35E+02	3.01E+00	7.34E-02	25	268.60	425.00	5,370	2.8E-04
107028	Acrolein	2.76E+00	1.05E-01	1.22E-05	2.13E+05	4.99E-03	1.22E-04	25	325.60	506.00	6,731	0.0E+00
107062	1,2-Dichloroethane	1.74E+01	1.04E-01	9.90E-06	8.52E+03	4.00E-02	9.77E-04	25	356.65	561.00	7,643	2.6E-05
107131	Acrylonitrile	5.90E+00	1.22E-01	1.34E-05	7.40E+04	4.21E-03	1.03E-04	25	350.30	519.00	7,786	6.8E-05
108054	Vinyl acetate	5.25E+00	8.50E-02	9.20E-06	2.00E+04	2.09E-02	5.10E-04	25	345.65	519.13	7,800	0.0E+00
108101	Methylisobutylketone (4-meth	9.06E+00	7.50E-02	7.80E-06	1.90E+04	5.64E-03	1.38E-04	25	389.50	571.00	8,243	0.0E+00
108383	m-Xylene	4.07E+02	7.00E-02	7.80E-06	1.61E+02	3.00E-01	7.32E-03	25	412.27	617.05	8,523	0.0E+00
108678	1,3,5-Trimethylbenzene	1.35E+03	6.02E-02	8.67E-06	2.00E+00	2.41E-01	5.87E-03	25	437.89	637.25	9,321	0.0E+00
108872	Methylcyclohexane	7.85E+01	7.35E-02	8.52E-06	1.40E+01	4.22E+00	1.03E-01	25	373.90	572.20	7,474	0.0E+00
108883	Toluene	1.82E+02	8.70E-02	8.60E-06	5.26E+02	2.72E-01	6.62E-03	25	383.78	591.79	7,930	0.0E+00
108907	Chlorobenzene	2.19E+02	7.30E-02	8.70E-06	4.72E+02	1.51E-01	3.69E-03	25	404.87	632.40	8,410	0.0E+00
109693	1-Chlorobutane	1.72E+01	8.26E-02	1.00E-05	1.10E+03	6.93E-01	1.69E-02	25	351.60	542.00	7,263	0.0E+00
110009	Furan	1.86E+01	1.04E-01	1.22E-05	1.00E+04	2.21E-01	5.39E-03	25	304.60	490.20	6,477	0.0E+00
110543	Hexane	4.34E+01	2.00E-01	7.77E-06	1.24E+01	6.82E+01	1.66E+00	25	341.70	508.00	6,895	0.0E+00
111444	Bis(2-chloroethyl)ether	1.55E+01	6.92E-02	7.53E-06	1.72E+04	7.36E-04	1.80E-05	25	451.15	659.79	10,803	3.3E-04
115297	Endosulfan	2.14E+03	1.15E-02	4.55E-06	5.10E-01	4.58E-04	1.12E-05	25	674.43	942.94	14,000	0.0E+00
118741	Hexachlorobenzene	5.50E+04	5.42E-02	5.91E-06	5.00E-03	5.40E-02	1.32E-03	25	582.55	825.00	14,447	4.6E-04
120821	1,2,4-Trichlorobenzene	1.78E+03	3.00E-02	8.23E-06	4.88E+01	5.81E-02	1.42E-03	25	486.15	725.00	10,471	0.0E+00
123739	Crotonaldehyde (2-butenal)	4.82E+00	9.56E-02	1.07E-05	3.69E+04	7.99E-04	1.95E-05	25	375.20	568.00	9	5.4E-04
124481	Chlorodibromomethane	6.31E+01	1.96E-02	1.05E-05	2.60E+03	3.20E-02	7.81E-04	25	416.14	678.20	5,900	2.4E-05
126987	Methacrylonitrile	3.58E+01	1.12E-01	1.32E-05	2.54E+04	1.01E-02	2.46E-04	25	363.30	554.00	7,600	0.0E+00
126998	2-Chloro-1,3-butadiene (chloro	6.73E+01	8.58E-02	1.03E-05	2.12E+03	4.91E-01	1.20E-02	25	332.40	525.00	8,075	0.0E+00
127184	Tetrachloroethylene	1.55E+02	7.20E-02	8.20E-06	2.00E+02	7.53E-01	1.84E-02	25	394.40	620.20	8,288	5.9E-06
129000	Pyrene	1.05E+05	2.72E-02	7.24E-06	1.35E+00	4.50E-04	1.10E-05	25	667.95	936	14370	0.0E+00
132649	Dibenzofuran	5.15E+03	2.38E-02	6.00E-06	3.10E+00	5.15E-04	1.26E-05	25	560	824	66400	0.0E+00
135988	sec-Butylbenzene	9.66E+02	5.70E-02	8.12E-06	3.94E+00	5.68E-01	1.39E-02	25	446.5	679	88730	0.0E+00
141786	Ethylacetate	6.44E+00	7.32E-02	9.70E-06	8.03E+04	5.64E-03	1.38E-04	25	350.26	523.3	7633.66	0.0E+00
156592	cis-1,2-Dichloroethylene	3.55E+01	7.36E-02	1.13E-05	3.50E+03	1.67E-01	4.07E-03	25	333.65	544	7192	0.0E+00
156605	trans-1,2-Dichloroethylene	5.25E+01	7.07E-02	1.19E-05	6.30E+03	3.84E-01	9.36E-03	25	320.85	516.5	6717	0.0E+00
205992	Benzo(b)fluoranthene	1.23E+06	2.26E-02	5.56E-06	1.50E-03	4.54E-03	1.11E-04	25	715.9	969.27	17000	2.1E-04
218019	Chrysene	3.98E+05	2.48E-02	6.21E-06	6.30E-03	3.87E-03	9.44E-05	25	714.15	979	16455	2.1E-06

VLOOKUP TABLES

309002	Aldrin	2.45E+06	1.32E-02	4.86E-06	1.70E-02	6.95E-03	1.70E-04	25	603.01	839.37	15000	4.9E-03
319846	alpha-HCH (alpha-BHC)	1.23E+03	1.42E-02	7.34E-06	2.00E+00	4.34E-04	1.06E-05	25	596.55	839.36	15000	1.8E-03
541731	1,3-Dichlorobenzene	1.98E+03	6.92E-02	7.86E-06	1.34E+02	1.27E-01	3.09E-03	25	446	684	9230.18	0.0E+00
542756	1,3-Dichloropropene	4.57E+01	6.26E-02	1.00E-05	2.80E+03	7.24E-01	1.77E-02	25	381.15	587.38	7900	4.0E-06
630206	1,1,1,2-Tetrachloroethane	1.16E+02	7.10E-02	7.90E-06	1.10E+03	9.90E-02	2.41E-03	25	403.5	624	9768.282525	7.4E-06
1634044	MTBE	7.26E+00	1.02E-01	1.05E-05	5.10E+04	2.56E-02	6.23E-04	25	328.3	497.1	6677.66	0.0E+00
7439976	Mercury (elemental)	5.20E+01	3.07E-02	6.30E-06	2.00E+01	4.40E-01	1.07E-02	25	629.88	1750	14127	0.0E+00

Reference conc., RfC (mg/m^3)	URF extrapolated (X)	RfC extrapolated (X)
0.0E+00		
7.0E-04		
1.1E-03	X	X
7.0E-01		X
1.8E-04		X
3.5E-01		X
0.0E+00		
3.5E-03		X
6.0E-02		
2.2E+00		
1.8E-02		X
0.0E+00	X	
5.0E-03		
9.0E-02		
3.0E-03		
3.5E-02		X
1.0E+01	X	
1.0E-01		
6.0E-02		
9.0E-03		
3.0E+00		
7.0E-01		
0.0E+00		
7.0E-02		X
7.0E-02	X	X
1.0E-01		
5.0E-01		
2.0E-01		
5.0E+01		
7.0E-01		
2.0E-01		
3.0E+01		
1.8E-03		X
2.0E-04		
1.1E+00		X
4.0E-03	X	
1.0E+00		
1.4E-02		X

VLOOKUP TABLES

4.0E-02	X		
3.5E+00			X
2.1E-01			X
2.0E-02			
7.0E-01			
2.1E-01			X
1.4E-01			X
7.0E-04			X
3.5E-02			X
3.0E-03			
7.0E-02			X
1.8E-01			X
7.0E+00			X
2.0E-01			
1.8E-02			X
6.0E-03			
4.9E-03	X		
1.1E-01			X
3.2E-01			X
1.4E-01			X
4.0E-01			
3.5E-01			X
2.0E-03			
1.0E+00			
1.0E+00			
0.0E+00	X		
3.5E-01			X
1.4E-01			X
1.4E-01			X
7.0E+00			X
8.0E-01			
2.0E-04			
0.0E+00			
2.0E-05			
0.0E+00			
2.0E-03			
2.0E-01			
8.0E-02			
7.0E+00			X
6.0E-03			
3.0E+00			
4.0E-01			
6.0E-02			
1.4E+00			X
3.5E-03			X
2.0E-01			
0.0E+00			
2.1E-02			X
2.8E-03			X
2.0E-01			
0.0E+00	X		
7.0E-02	X		X
7.0E-04			
7.0E-03			
3.5E-02			
1.1E-01			X
1.4E-02			X
1.4E-01			X
3.2E+00			X
3.5E-02			X
7.0E-02			X
0.0E+00	X		
0.0E+00	X		

VLOOKUP TABLES

1.1E-04	X
0.0E+00	
1.1E-01	X
2.0E-02	
1.1E-01	X
3.0E+00	
3.0E-04	