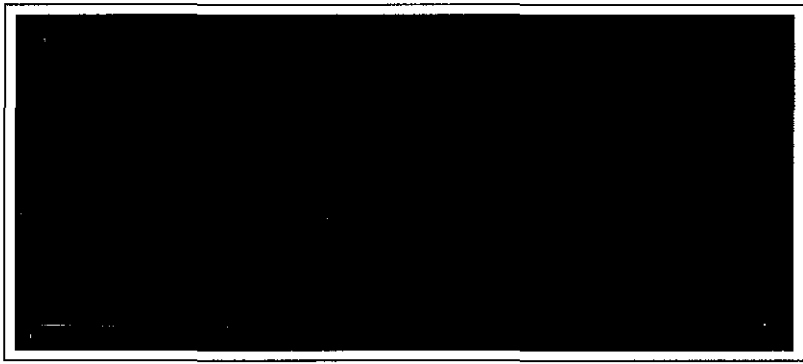


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1/96



January 8, 1996

Ms. Jennifer Eberle
 Alameda County Health Care Services
 1131 Harbor Bay Parkway, #250
 Alameda, California 94502-6577

RE: Environmental Assessment of the Diesel Spill Site, Union Pacific Railroad TOFC
 Railyard, Oakland, California

61 11/19 6-11/95
 RECEIVED
 1/10/96
 11/19/95

Dear Ms. Eberle,

On behalf of the Union Pacific Railroad (UPRR), I am enclosing this Environmental Assessment Report for the diesel spill site located near the UPRR TOFC railyard in Oakland, California. The report describes the environmental assessment activities performed by USPCI, a Laidlaw company (Laidlaw) in accordance with the Laidlaw letter-proposal dated October 17, 1995. Based on the conclusions of the environmental assessment Laidlaw recommends the following:

- Continue gauging of the monitor wells on a monthly basis for free-product and groundwater elevations.
- Immediately begin free-product recovery with a passive skimming canister if product is detected in the wells.
- Submit the results of the monthly well gauging and any future free-product recovery to Alameda County on a quarterly basis.

The overexcavation of hydrocarbon stained soil in the immediate area of the diesel release to a depth of 0.5 feet was conducted on Friday January 5, 1996. As soon as I receive further information from the soil excavation and disposal activities, I will send you copies of the appropriate documentation.

Please review the enclosed report and call me at (303) 938-5562 if you have any questions or comments.

Sincerely,

Kenneth V. Rose
 Laidlaw Geologist

cc: Jim Gorley, UPRR

**ENVIRONMENTAL ASSESSMENT
OF THE DIESEL SPILL SITE
UNION PACIFIC RAILROAD
TOFC RAILYARD PROPERTY
OAKLAND, CALIFORNIA**

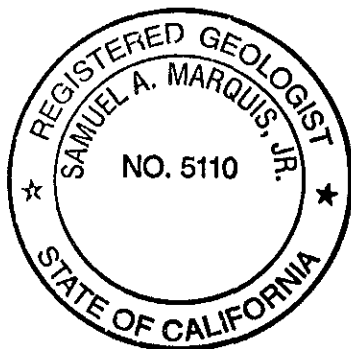
PREPARED FOR:

**UNION PACIFIC RAILROAD COMPANY
ENVIRONMENTAL MANAGEMENT GROUP
1416 DODGE STREET, ROOM 930
OMAHA, NEBRASKA 68179**

PREPARED BY:

Kenneth V. Rose

**KENNETH V. ROSE
PROJECT GEOLOGIST**



Samuel A. Marquis, Jr.

**SAMUEL A. MARQUIS, JR.
REGISTERED GEOLOGIST NO. 5110**

**USPCI/A LAIDLAW COMPANY
5665 FLATIRON PARKWAY
BOULDER, COLORADO 80301**

JANUARY 8, 1996

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APPENDIX C	LABORATORY DATA SHEETS AND CHAIN OF CUSTODY RECORDS

1.0 INTRODUCTION

This report describes the environmental assessment activities performed by USPCI, a Laidlaw Company (Laidlaw) for the Union Pacific Railroad (UPRR) at the diesel spill site located along UPRR tracks between Ferro Street and Middle Harbor Road in Oakland, California (Figure 1). The environmental assessment included the installation of three shallow groundwater monitor wells, development and gauging of the wells and the collection of groundwater samples for laboratory analyses. The work was conducted in accordance with the Laidlaw letter-proposal dated October 17, 1995.

This report includes a description of the scope of work, investigative results of drilling and sample analyses, investigative methodology (Appendix A), geologic logs and monitor well completion diagrams (Appendix B), and laboratory data sheets and chain of custody records (Appendix C). Investigative conclusions and recommendations are presented on the information obtained during this investigation.

1.1 PURPOSE AND SCOPE

1.1.1 Purpose

The purpose of this investigation was to:

- Assess the extent of diesel fuel contamination in the shallow soil and groundwater in the vicinity of the spill;
- Monitor the shallow groundwater at the site for the presence of free product and dissolved phase (TPH & BTEX) hydrocarbon contamination;
- Initiate free-product recovery, if possible;
- Develop an understanding of the hydrologic regime in the area, including the groundwater elevation and gradient; and,
- Develop remedial action options.

1.1.2 Scope

These objectives were addressed by conducting the following investigative tasks:

- Drilling soil borings and installation of three groundwater monitor wells in the immediate vicinity of the diesel spill (see locations on Figure 2);
- Maintaining a continuous log of soil types encountered during drilling and screening soils for organic vapors with an organic vapor meter (OVM);
- Development and gauging the newly installed monitor wells for hydrocarbon thickness and depth to water measurements;
- Monthly gauging of the monitor wells for hydrocarbon thickness and depth to water measurements;
- Laboratory analyses of groundwater samples from each of the three monitor well locations for total petroleum hydrocarbons (TPH by EPA Method 8015 Modified) and Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX by EPA Method 8020);
- Preparing a report summarizing hydraulic conditions and groundwater analytical results and our conclusions and recommendations based on the results of the investigation.

The results of the investigation are presented below. The procedures and methodologies followed during the investigation are described in Appendix A.

1.2 SITE DESCRIPTION

The project site is located within the industrial inner harbor area of the Port of Oakland (Figure 1). The diesel spill site (site) is located along a section of mainline railroad track in a narrow corridor that exits the UPRR Oakland Trailer On Freight Car (TOFC) Railyard. The spill occurred in a flat area that is covered with gravel and railroad ballast and contains a series of four active railroad tracks. During recent site visits conducted by Laidlaw, near continuous rail traffic was observed on the site property.

1.3 BACKGROUND INFORMATION

On October 1, 1995, approximately 750 gallons of diesel fuel were spilled along a 40 foot section of railroad track near the UPRR Oakland TOFC Railyard. The diesel fuel spilled from a locomotive fuel tank that was punctured during a minor derailment. The initial spill response activities included:

- Notification of the Oakland Fire Department and Alameda County Department of Environmental Health (Alameda County);
- Vacuum truck recovery of diesel fuel from the punctured tank;
- Placement of oil absorbent material to prevent diesel fuel from entering a storm sewer; and,
- Removal of the locomotive and repair of the track.

Following completion of the initial response activities, a hand auger soil boring was advanced to a depth of nine feet below ground surface within the center of the spill area. Groundwater was encountered in the soil boring at approximately 8 feet and a thin layer of diesel fuel (free-product) was observed on the groundwater surface.

Laidlaw personnel discussed site specific remedial options in a telephone conversation with Mr. Dale Klettke (Alameda County) on October 16, 1995. Mr. Klettke stressed that recovery of the free diesel product was the top priority for the site. Laidlaw submitted to Alameda County a letter proposal to install three monitor wells in the immediate vicinity of the diesel spill and to initiate free-product recovery, if present (Laidlaw, October 17, 1995). Following approval of the workplan by Alameda County on October 18, 1995, Laidlaw conducted the monitor well installation and environmental assessment activities.

On November 8, 1995, three shallow monitor wells were installed at the site (Figure 2). The wells were developed and gauged for hydrocarbon thickness and depth to groundwater measurements. No measurable levels of free-product (diesel fuel) were reported in the newly installed wells.

Groundwater samples were collected from each of the three well locations and analyzed for TPH and BTEX (by EPA 8015 Modified and EPA 8020, respectively). A brief description of the analytical results for the groundwater samples and the general environmental assessment findings is presented below.

2.0 RESULTS OF THE ENVIRONMENTAL ASSESSMENT

2.1 SITE GEOLOGY

The site property and surrounding area is flat and covered with gravel and railroad ballast rock. The stratigraphy underlying the site consists of a surface layer of artificial fill that is variable in thickness and composition, overlying a sequence of naturally deposited bay sediments. The surface fill generally consists of dark grayish brown sand and gravel with some concrete, asphalt, brick, and wood debris. The surface fill was observed at depths ranging from 2.5 feet to 5.0 feet below ground surface (BGS).

The natural bay sediments underlying the surface fill are generally laterally continuous and homogeneous. Layers of different lithology are distinguished on the basis of silt content and degree of sorting. Lithologies range from silty fine to medium sand to fairly clean well-sorted fine to medium sand. These sands can extend from fill contact to a depth of greater than 17.0 feet below grade.

2.2 SITE HYDROGEOLOGY

The site is located approximately 1,200 feet north of the Oakland Estuary, in the northern portion of the San Francisco Bay. The close proximity of the estuary to the site suggests the possibility of a hydraulic connection between the estuary and the groundwater underlying the site. However, groundwater records maintained since 1991 at the UPRR Oakland TOFC Railyard (approximately 1,000 feet west of the diesel spill site) indicate that direct tidal influences are detectable only in those monitor wells less than 200 feet from the Bay.

2.2.1 Local Gradient

Groundwater is typically encountered in this area at depths ranging from 6 to 8 feet BGS. The groundwater in this area is unconfined since there was little difference in the depths at which water was encountered during drilling to the static water levels recorded in the monitor wells. The local groundwater gradient dips gently to the south, southeast towards the estuary (Figure 3). The depth to groundwater measurements recorded by Laidlaw are presented on Table 1.

2.2.2 Municipal or Private Wells

A survey of registered wells in the Oakland inner-harbor area supplied by the County of Alameda Public Works Agency reported no active water wells within a one mile radius of the site.

Groundwater in the vicinity and region of the site is not used for drinking water or for municipal water supply (Caltrans, 1995). Water for drinking and municipal supply is drawn from surface water supplies located east of the region. The groundwater in this area is considered to be unsuitable for drinking purposes due to the presence of regional contamination and high salinity (Caltrans, 1995). Regional groundwater total dissolved solid (TDS) values for this aquifer range from 1,000 mg/L to 5,900 mg/L (USPCI, 1991, see laboratory data sheets in Appendix C).

2.3 GROUNDWATER SAMPLING AND ANALYSES

Groundwater samples were collected from the three monitor well locations and analyzed for TPH and BTEX. The results of the laboratory analyses are presented in Table 2, and the laboratory data sheets are presented in Appendix B.

During well development and sampling a petroleum hydrocarbon sheen was reported on the shallow groundwater surface in two monitor well locations (DSMW-1 and DSMW-2). No measurable thickness of free-phase hydrocarbon (<0.01 ft.) has been recorded in the four gaugings of the monitor wells. Measured groundwater levels are presented in Table 1 and a groundwater potentiometric surface map based on these measurements is presented in Figure 3.

2.3.1 TPH and BTEX in Groundwater

Variable concentrations of total petroleum hydrocarbons (TPH) were detected in groundwater samples collected from all three of the newly installed monitor wells. Low concentrations of TPH-volatiles (with a carbon chain range from C5-C12) were detected in monitor well DSMW-1 (0.06 mg/L) and DSMW-2 (0.12 mg/L). Low to moderate concentrations of TPH-extractables (C10-C50) were detected in monitor well DSMW-1 (0.6 mg/L), DSMW-2 (5.5 mg/L) and DSMW-3, (0.6 mg/L).

No BTEX were reported in groundwater samples collected from two of the three monitor well locations (DSMW-2 and DSMW-3). A very low concentration of total xylenes was reported in the monitor well installed in the immediate vicinity of the diesel spill (DSMW-1, 0.003 mg/L). The xylenes concentration reported in DSMW-1 is well below the California drinking water standard Maximum Contaminant Level (MCL) for xylenes of 1.75 mg/L (California, 1994).

3.0 SUMMARY AND CONCLUSIONS

The following summarizes results and conclusions of the environmental assessment conducted at the diesel spill site near the UPRR Oakland TOFC Railyard, in Oakland, California.

- No free-product has been detected in the three newly installed monitor wells to date. The wells continue to be gauged monthly for free-product and groundwater elevations.
- If free-product is detected in monitor wells, Laidlaw will immediately begin free-product recovery with a passive skimming canister (PetroTrap™).
- No BTEX was reported in groundwater samples collected from the two downgradient monitor wells (DSMW-2 and DSMW-3). A low concentration of total xylenes were reported in a groundwater sample from well DSMW-1 (0.003 mg/L). This reported xylenes concentration is well below the California drinking water MCL for xylenes (1.75 mg/L). Low to moderate levels of TPH was detected in groundwater samples collected from all three monitor well locations.
- There are no active water supply wells within a one mile radius of the site and the groundwater in this area is unsuitable for drinking purposes due to the presence of regional contamination and high salinity. Regional groundwater TDS values for this aquifer range from 1,000 mg/L to 5,900 mg/L.
- The physical and chemical properties of diesel fuel make it a fuel of comparatively low risk potential to public health or the environment. Diesel fuel has a low volatility, tends to sorb strongly to soil particles, is relatively insoluble in water, and is less dense than water. Diesel fuel is low in aromatic compounds, such as benzene, and consists of mostly low molecular weight polycyclic aromatic hydrocarbons (PAHs) such as naphthalene, methyl-naphthalene, anthracene, fluorene, and phenanthrene (Kreamer, 1990, and USEPA, 1988). These low molecular weight PAHs are not U.S. Environmental Protection Agency (USEPA) designated "human" or "potential human" carcinogens (USEPA, 1994; USEPA, 1995).
- Spilled diesel fuel will naturally degrade or naturally attenuate rapidly with time (Marquis and Dineen, 1994). The effects of natural attenuation, including adsorption, volatilization, and anaerobic and aerobic biological degradation will result in reduced soil and groundwater concentrations of the diesel fuel constituents at the site.
- The diesel release site is located in an industrial setting along an active mainline railroad track corridor that exits the UPRR Oakland TOFC Railyard.

+ adjacent to the
Estuary!

4.0 RECOMMENDATIONS

Based on the volume of the release, the active railyard setting, and the summary and conclusions of the environmental assessment, Laidlaw recommends the following:

- Continue gauging of the monitor wells on a monthly basis for free-product and groundwater elevations.
- Immediately begin free-product recovery with a passive skimming canister if product is detected in the wells.
- Submit the results of the monthly well gauging and any future free-product recovery to Alameda County on a quarterly basis.
- Overexcavate hydrocarbon stained soil in the immediate area of the diesel release to a depth of 0.5 feet and replace with clean backfill.

5.0 REFERENCES CITED

- Kreamer, D.K., Klaus, J.S., 1990, Development of a Standard, Pure-Compound Base Gasoline Mixture for Use as a Reference in Field and Laboratory Experiments, Groundwater Monitoring Review, Spring 1990.
- Lee, L.S., et al, 1992, Partitioning of Polycyclic Aromatic Hydrocarbons from Diesel Fuel Into Water, Environmental Science and Technology, Vol. 26, No. 11.
- Marquis, S.A., Dineen, D., 1994, Comparison Between Pump and Treat, Bioremediation, and Bioremediation/Pump and Treat Combined: Lessons from Computer Modeling, Groundwater Monitoring and Remediation, Spring, 1994
- California, 1994, Summary of California Drinking Water Standards, Standards and Technology Unit, Division of Drinking Water, November 10, 1994.
- USEPA, 1988, Characteristic Waste Designation of Soils Contaminated With Petroleum Products, EPA Contract No. 68-01-7381, February 5, 1988.
- EPA, 1994, Health Effects Assessment Summary Tables (HEAST), Office of Solid Waste and Emergency Response, PB94-921199, March.
- EPA, 1995, Integrated Risk Information System (IRIS) computer data base, Updated July, 1995.

TABLES

TABLE 1
WELL GAUGING DATA
DERAILMENT SITE, 1717 MIDDLE HARBOR RD.
OAKLAND, CALIFORNIA

WELL NO.	DATE	WELL HEAD ELEVATION (MSL)	DEPTH TO WATER *	WATER LEVEL ELEVATION	REMARKS
DSMW-1	11/09/95	6.95	6.17	0.78	
DSMW-1	11/11/95	6.95	6.16	0.79	
DSMW-1	12/15/95	6.95	5.98	0.97	
DSMW-1	12/27/95	6.95	5.88	1.07	
DSMW-2	11/09/95	8.24	7.98	0.26	
DSMW-2	11/11/95	8.24	7.77	0.47	
DSMW-2	12/15/95	8.24	7.59	0.65	
DSMW-2	12/27/95	8.24	7.59	0.65	
DSMW-3	11/09/95	8.33	8.37	-0.04	
DSMW-3	11/11/95	8.33	7.96	0.37	
DSMW-3	12/15/95	8.33	7.85	0.48	
DSMW-3	12/27/95	8.33	7.89	0.44	

* NOTE: NO FREE PRODUCT ENCOUNTERED DURING MONITOR WELL GAUGING

TABLE 2

GROUNDWATER ANALYTICAL RESULTS
 TOTAL PETROLEUM HYDROCARBONS
 DIESEL FUEL SPILL
 1717 MIDDLE HARBOR ROAD
 OAKLAND, CALIFORNIA
 NOVEMBER 1995

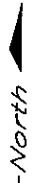
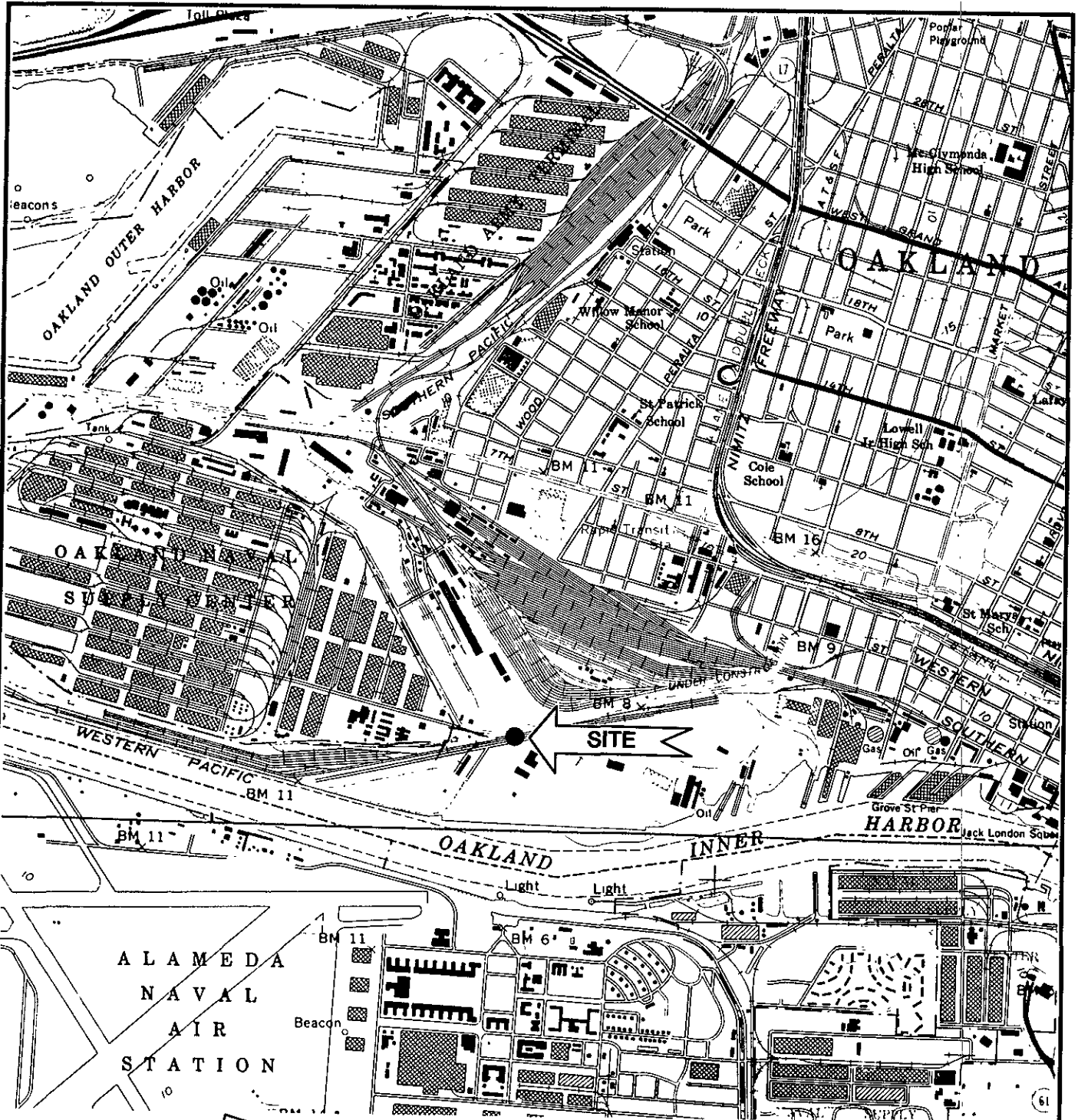
TPH_g

TPH_{d + m o}

SAMPLE NUMBER	C5 - C12 Hydrocarbons (mg/L)	TPH Gasoline (mg/L)	C10 - C50 Hydrocarbons (mg/L)	TPH DIESEL (mg/L)	BENZENE (mg/L)	ETHYLBENZENE (mg/L)	TOLUENE (mg/L)	XYLENES (mg/L)
MDL	0.05	0.05	0.5	0.5	0.002	0.002	0.002	0.002
DSMW-1	0.06	BDL	0.6	BDL	BDL	BDL	BDL	0.003
DSMW-2	0.12	BDL	5.5	BDL	BDL	BDL	BDL	BDL
DSMW-3	BDL	BDL	0.6	BDL	BDL	BDL	BDL	BDL

EPA 8015, CA Draft used for all Hydrocarbon analysis
 EPA 8020, used for BTEX analyses
 MDL = Method Detection Limit
 BDL = Below Detection Limit

FIGURES



USPCI

A **TRIDEL** COMPANY

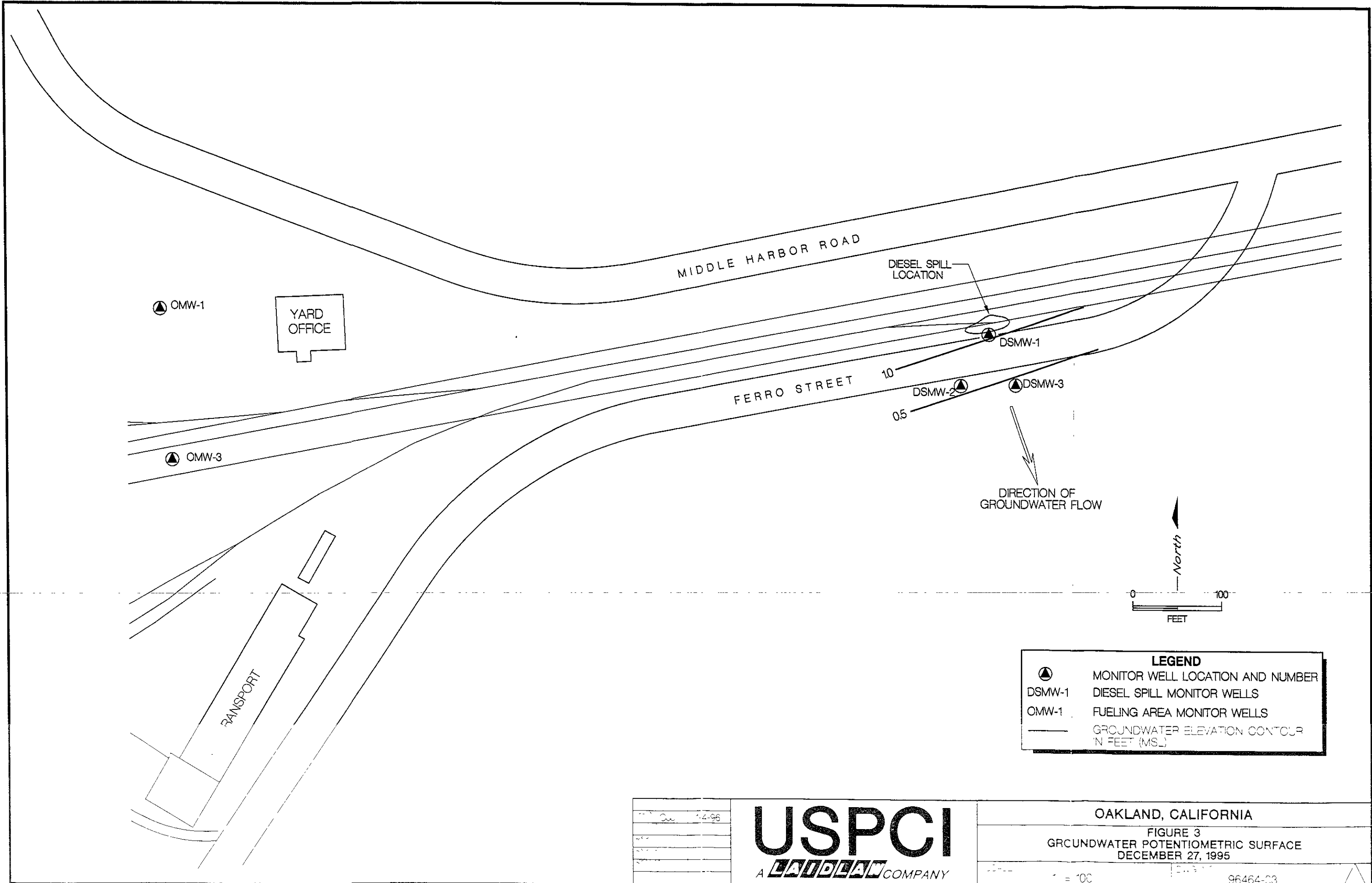
OAKLAND, CALIFORNIA

FIGURE 1
1717 MIDDLE HARBOR ROAD
SITE LOCATION MAP

SCALE 1" = 2000' DATE 10/16/95

LOCMAP

ADAPTED FROM USGS 7.5' OAKLAND WEST, CALIF. QUADRANGLE (1980)

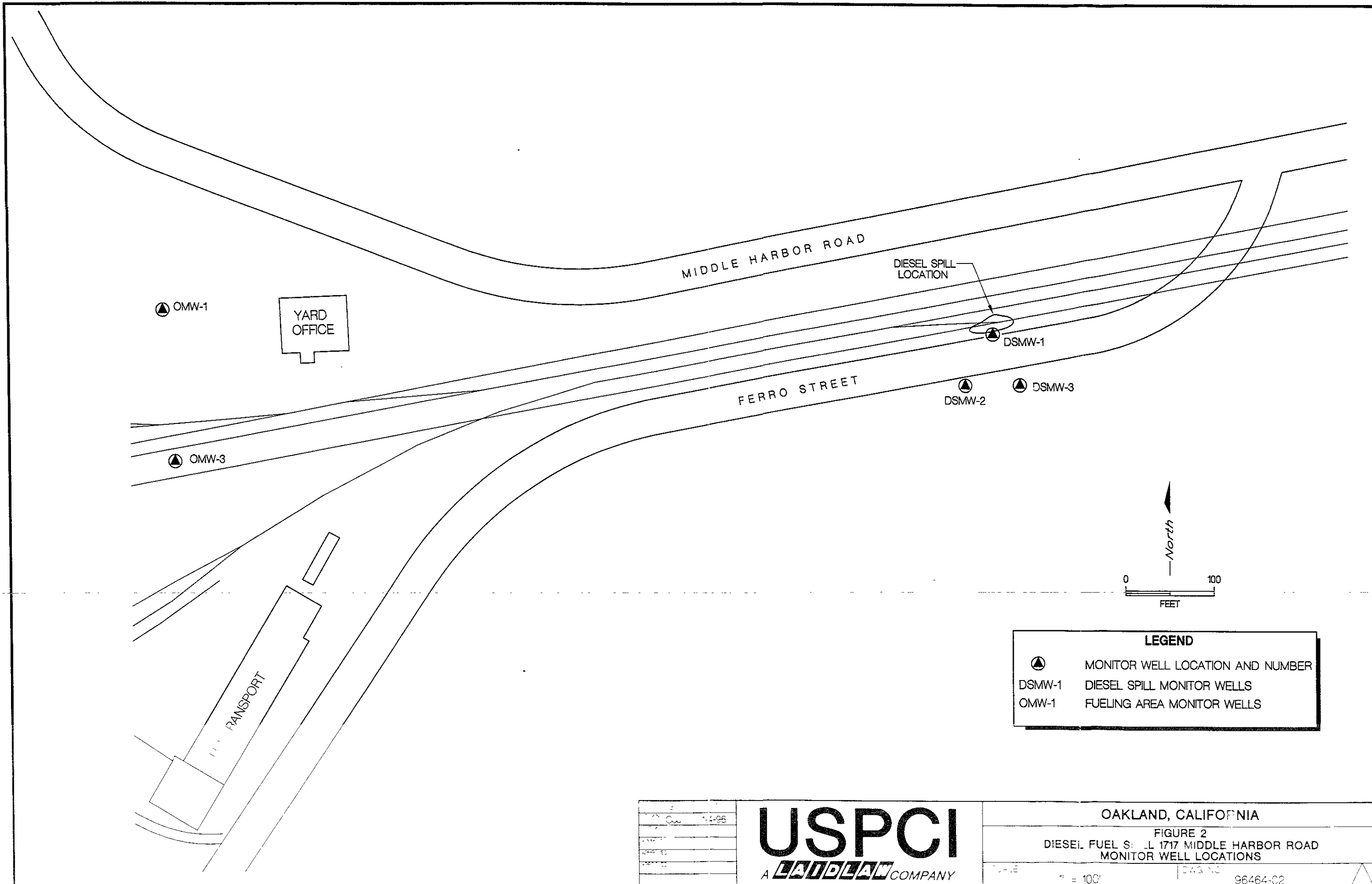


LEGEND	
	MONITOR WELL LOCATION AND NUMBER
DSMW-1	DIESEL SPILL MONITOR WELLS
OMW-1	FUELING AREA MONITOR WELLS
	GROUNDWATER ELEVATION CONTOUR IN FEET (MSL)

DATE	1-4-96
BY	
CHECKED	
APPROVED	
SCALE	

USPCI
 A **LANDPLAN** COMPANY

OAKLAND, CALIFORNIA
 FIGURE 3
 GROUNDWATER POTENTIOMETRIC SURFACE
 DECEMBER 27, 1995
 SCALE = 1" = 100'
 96464-03



LEGEND	
	MONITOR WELL LOCATION AND NUMBER
DSMW-1	DIESEL SPILL MONITOR WELLS
OMW-1	FUELING AREA MONITOR WELLS

DATE	1-4-96
SCALE	1" = 100'
PROJECT	
CLIENT	
DESIGNER	
CHECKER	
APPROVER	

USPCI
 A **LANDPLAN** COMPANY

OAKLAND, CALIFORNIA
 FIGURE 2
 DIESEL FUEL SPILL 1717 MIDDLE HARBOR ROAD
 MONITOR WELL LOCATIONS
 SCALE 1" = 100'
 DRAWING NO. 96464-02

APPENDIX A

INVESTIGATIVE METHODS

INVESTIGATIVE METHODS

DRILLING AND SOIL SAMPLING

All borings were advanced under the technical supervision of a Laidlaw geologist. The on-site geologist was present at all times during drilling to: 1) technically supervise the drilling subcontractor; 2) maintain a continuous log of materials penetrated by the borehole; 3) obtain and document soil samples; 4) test soil samples, drilling cuttings, and atmospheric conditions within the workplace with an organic vapor monitor (OVM); and 5) oversee implementation of Laidlaw's Health and Safety Plan.

Soil borings were performed using a truck-mounted drilling rig equipped with 8-inch diameter hollow-stem augers. This drilling method was performed without the introduction of drilling fluids and allowed for the collection of relatively undisturbed soil samples through the hollow stem of the auger.

During drilling, soil samples were obtained using an 18-inch split spoon soil sampler lowered through the hollow stem of the auger and advanced by the 30-inch drop of a 140 pound hammer. This method allowed for the monitoring of the soils penetrated during drilling. After retrieving the sampler, soils were screened in the field for organic vapor emissions using an OVM. The OVM was also used to monitor organic vapor emissions from drill cuttings during drilling. Organic vapor measurements were recorded on the boring logs.

Prior to initiating each boring, the downhole equipment, including auger sections and sampling equipment, was thoroughly steam cleaned. The split spoon sampling equipment was either steam cleaned or washed in a dilute trisodium phosphate (TSP) solution and rinsed in de-ionized water before retrieving each sample.

MONITORING WELL INSTALLATION AND SAMPLING

All three of the exploratory borings were completed as shallow groundwater monitoring wells (see Figure 2). The exploratory borings were completed and the monitoring wells installed at depths of ranging from 12 to 17 feet BGS. The wells were installed through the hollow stem of the auger. The well casing consists of 2-inch diameter flush threaded schedule 40 PVC. Well screen with 0.010-inch slot size was installed at each well location. The wells were constructed such that blank PVC casing extends approximately ten feet BGS, and slotted well screen extends to the bottom of the borehole (see Boring Logs Appendix B).

The annular space between the well screen and borehole was filled with pre-washed silica sand to a position approximately one to two feet above the top of the well screen to form a filter pack. A bentonite seal was then placed above the filter pack. The remainder of the borehole was then

backfilled to the ground surface with a cement-bentonite slurry. A flush mount steel protective cover was then installed over the well heads and the wells were secured with locking well caps.

The wells were developed using the surge and bail technique. Measurements of the pH and conductivity of the produced water were taken at regular intervals during development, and development proceeded until these parameters stabilized and the water was relatively free of sediment.

Groundwater samples collected from the five monitor wells were analyzed for TPH (EPA 8015 Modified) and BTEX (EPA 8020). No measurable levels of liquid hydrocarbon were present in the wells prior to sampling. The monitoring wells were purged prior to sample collection to obtain samples which represent groundwater in the formation rather than stagnant water standing in the well casing. Purging continued until three casing volumes had been removed and the field measured pH, conductivity, and temperature of the produced water had stabilized.

Water samples were collected from the wells using a disposable sampling bailer in a manner that minimized exposure of the samples to the atmosphere. Water samples were placed into the appropriate sample bottles for the specific analysis, as provided by the analytical laboratory. The water samples were properly labeled, chain of custody records maintained, and the sample bottles were placed in an ice chest cooled with ice for shipment to the laboratory by overnight courier.

HEALTH AND SAFETY PLAN

Prior to initiating field activities, a site-specific Health and Safety Plan was developed for the site. The plan was developed using the background information known about the Union Pacific property. The Health and Safety Plan was designed to: 1) identify and describe potentially hazardous substances that could be expected to be encountered during the field investigation; 2) specify protective equipment to be utilized during on-site activities; and 3) outline emergency measures to be implemented in the event unanticipated and/or potentially hazardous conditions are encountered during field activities. All Laidlaw personnel and subcontractors were required to review and sign the Health and Safety Plan prior to commencement of field activities.

APPENDIX B

**BORING LOGS AND
WELL COMPLETION DIAGRAMS**

CLIENT: <i>Union Pacific Railroad</i>			JOB NO.: <i>96464</i>		
PROJECT: <i>Derailment Site, 1717 Middle Harbor Rd.</i>			LOCATION: <i>Oakland, California</i>		
DRILLED BY: <i>Exploration Geoservices</i>		DRILLER: <i>Dave/Howard</i>		METHOD: <i>8" HSA</i>	
START DATE: <i>11/8/95</i>		COMP. DATE: <i>11/8/95</i>		SURF. EL.: <i>FT. est.</i>	TD: <i>17.0 FT. BGS</i>
LOGGED BY: <i>Ken Rose</i>			D. T. WATER: <i>8.0 FT. BGS</i>		

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	Blow Count
	0.0' to 2.0'	Gravel, lt. grayish brown w/ some sand, wood and metal debris (fill), damp, strong diesel odor	Fill			
	2.0' to 7.0'	Medum to coarse sand, lt. grayish brown w/ some gravel, trace silt, moist, strong diesel odor	SP			
	5	As above, v. moist, strong diesel odor				
	7.0' to 15.0'	Fine to medium sand, gray, greenish gray, w/ some silt, trace clay, wet at 8', strong diesel odor, Bay Mud	SW			
	10	As above, wet, slight diesel odor				
	15	15.0' to 17.0'	Clayey silt, gray, greenish gray w/ some fine sand, wet, no odor, Bay Mud	ML		
	20	Boring completed to 17.0' Groundwater encountered at 8.0' Monitor well installed to 17', 10' of 0.010" screen 7' of SCH 40 2" PVC blank 3.5 sacks of #10-20 silica, 1 bucket of bentonite pellets 8" Flush mount well cover				
	25					
	30					

CLIENT: <i>Union Pacific Railroad</i>			JOB NO.: <i>96464</i>		
PROJECT: <i>Derailment Site, 1717 Middle Harbor Rd.</i>			LOCATION: <i>Oakland, California</i>		
DRILLED BY: <i>Exploration Geoservices</i>		DRILLER: <i>Dave/Howard</i>		METHOD: <i>8" HSA</i>	
START DATE: <i>11/8/95</i>	COMP. DATE: <i>11/8/95</i>	SURF. EL.: <i>FT. est.</i>	TD: <i>12.0 FT. BGS</i>		
LOGGED BY: <i>Ken Rose</i>			D. T. WATER: <i>10.0 FT. BGS</i>		

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	Blow Count
	0.0' to 3.0'	Sand, lt. brown w/ some glass and organic debris (roots, leaves), damp, no odor or staining		SP		
	3.0' to 5.0'	Encounter gravel, cobbles and concrete debris		GW		
	5.0' to 10.0'	Fine to medium sand, brown, lt. brown w/ trace silt and gravel, slightly moist, no odor or staining		SP		
	10.0' to 12.0'	Clayey silt, gray, greenish gray w/ some fine sand, wet, no odor, encounter obstruction at 12.0' (City Water Main)		ML		
	12.0'	Boring completed to 12.0' Groundwater encountered at 10.0' Monitor well installed to 12', 5' of 0.010" screen 7' of SCH 40 2" PVC blank 2 sacks of #10-20 silica, 1 bucket of bentonite pellets Flush mount well cover				

CLIENT: <i>Union Pacific Railroad</i>			JOB NO.: <i>98464</i>		
PROJECT: <i>Derailment Site, 1717 Middle Harbor Rd.</i>			LOCATION: <i>Oakland, California</i>		
DRILLED BY: <i>Exploration Geoservices</i>		DRILLER: <i>Dave/Howard</i>		METHOD: <i>8" HSA</i>	
START DATE: <i>11/8/95</i>	COMP. DATE: <i>11/8/95</i>	SURF. EL.: <i>FT. est.</i>	TD: <i>12.0 FT. BGS</i>		
LOGGED BY: <i>Ken Rose</i>			D. T. WATER: <i>10.0 FT. BGS</i>		

WELL DIAGRAM	DPT	DESCRIPTION	GRAPHIC LOG USCS CODE	OVA ppm	SAMPLE NUMBER	Blow Count
		0.0' to 3.0' Sand, lt. brown w/ some glass and organic debris (roots, leaves), damp, no odor or staining		SP		
		3.0' to 5.0' Encounter gravel, cobbles and concrete debris		GW		
	5	5.0' to 10.0' Fine to medium sand, brown, lt. brown w/ trace silt and gravel, slightly moist, no odor or staining		SP		
	10	As above, becomes wet at 10.0'				
	10.0' to 12.0' Clayey silt, gray, greenish gray w/ some fine sand, wet, no odor, encounter obstruction at 12.0' (City Water Main)		ML			
	15	Boring completed to 12.0' Groundwater encountered at 10.0' Monitor well installed to 12', 5' of 0.010" screen 7' of SCH 40 2" PVC blank 2 sacks of #10-20 silica, 1 bucket of bentonite pellets Flush mount well cover				
	20					
	25					
	30					

APPENDIX C

**LABORATORY DATA SHEETS
AND CHAIN OF CUSTODY RECORDS**

USPCI

A **BAIRD** COMPANY

National Analytical
Laboratories

USPCI - REMEDIAL SERVICES
5665 FLATIRON PARKWAY
BOULDER CO 80301

ATTENTION: KEN ROSE

RE: PROJECT: 96464
USPCI-AS REPORT: 10891

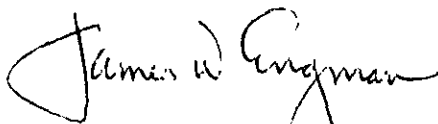
Under this cover USPCI Analytical Services is submitting the analytical data for the following samples:

<u>Lab Number</u>	<u>Customer Number</u>
50011913	DSMW-1
50011914	DSMW-2
50011915	DSMW-3

These samples were analyzed using EPA or other recognized methodology as specified in the report. Each test is performed under a rigorous QA/QC program including blanks, method controls and matrix spikes. All methods are calibrated using authentic reference materials with a minimum of a three point calibration curve as appropriate. All practical quantitation limits are validated and reflect method specific or project specific requirements. Some detection limits may be listed as higher than the targeted program limits due to sample specific interferences or limited sample size.

If you need help in evaluating the data or need further information please call the laboratory at 918-446-1162.

Respectfully submitted for
USPCI Analytical Services



James W. Engman
Laboratory Director



National Analytical Laboratories

22 Nov 95 PAGE 1
KEN ROSE
USPCI - REMEDIAL SERVICES
5665 FLATIRON PARKWAY
BOULDER CO 80301

SAMPLE IDENTIFICATION: 50011913
CUSTOMER IDENTIFICATION: DSMW-1

PROJECT NUMBER: 96464
REPORT NUMBER: 10891
DATE SAMPLED: 11/09/95
TYPE OF MATERIAL: WATER

DATE SUBMITTED: 11/13/95
DATE COMPLETED: 11/21/95

PARAMETER	REFERENCE METHOD	PRACTICAL QUANTITATION	LIMIT RESULT
TPH Volatiles			
Gasoline	SW 8015MOD	0.05 mg/l	BDL mg/l
C5 - C12 Hydrocarbons	SW 8015MOD	0.05 mg/l	0.06 mg/l
TPH Extractables			
C10 - C50 Hydrocarbons	SW 8015MOD	0.5 mg/l	0.6 mg/l
Diesel	SW 8015MOD	0.5 mg/l	BDL mg/l
Volatiles			
Benzene	SW 8020	0.002 mg/l	BDL mg/l
Ethylbenzene	SW 8020	0.002 mg/l	BDL mg/l
Toluene	SW 8020	0.002 mg/l	BDL mg/l
Xylenes	SW 8020	0.002 mg/l	0.003 mg/l

BDL = BELOW QUANTITATION LIMIT % REC = PERCENT RECOVERY (T) = TOTALS
J = VALUE REPORTED BELOW QUANTITATION LIMIT



National Analytical
Laboratories

SAMPLE IDENTIFICATION: 50011914
CUSTOMER IDENTIFICATION: DSMW-2

PROJECT NUMBER: 96464
REPORT NUMBER: 10891
DATE SAMPLED: 11/09/95
TYPE OF MATERIAL: WATER

22 Nov 95 PAGE 2
KEN ROSE
USPCI - REMEDIAL SERVICES
5665 FLATIRON PARKWAY
BOULDER CO 80301

DATE SUBMITTED: 11/13/95
DATE COMPLETED: 11/21/95

<u>PARAMETER</u>	<u>REFERENCE METHOD</u>	<u>PRACTICAL QUANTITATION LIMIT</u>	<u>RESULT</u>
TPH Volatiles			
Gasoline	SW 8015MOD	0.05 mg/l	BDL mg/l
C5 - C12 Hydrocarbons	SW 8015MOD	0.05 mg/l	0.12 mg/l
TPH Extractables			
C10 - C50 Hydrocarbons	SW 8015MOD	0.5 mg/l	5.5 mg/l
Diesel	SW 8015MOD	0.5 mg/l	BDL mg/l
Volatiles			
Benzene	SW 8020	0.002 mg/l	BDL mg/l
Ethylbenzene	SW 8020	0.002 mg/l	BDL mg/l
Toluene	SW 8020	0.002 mg/l	BDL mg/l
Xylenes	SW 8020	0.002 mg/l	BDL mg/l

BDL = BELOW QUANTITATION LIMIT % REC = PERCENT RECOVERY (T) = TOTALS
J = VALUE REPORTED BELOW QUANTITATION LIMIT



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22 Nov 95 PAGE 3
KEN ROSE
USPCI - REMEDIAL SERVICES
5665 FLATIRON PARKWAY
BOULDER CO 80301

SAMPLE IDENTIFICATION: 50011915
CUSTOMER IDENTIFICATION: DSMW-3

PROJECT NUMBER: 96464
REPORT NUMBER: 10891
DATE SAMPLED: 11/09/95
TYPE OF MATERIAL: WATER

DATE SUBMITTED: 11/13/95
DATE COMPLETED: 11/21/95

PARAMETER	REFERENCE METHOD	PRACTICAL QUANTITATION	LIMIT	RESULT
TPH Volatiles				
Gasoline	SW 8015MOD	0.05 mg/l		BDL mg/l
C5 - C12 Hydrocarbons	SW 8015MOD	0.05 mg/l		BDL mg/l
TPH Extractables				
C10 - C50 Hydrocarbons	SW 8015MOD	0.5 mg/l		0.6 mg/l
Diesel	SW 8015MOD	0.5 mg/l		BDL mg/l
Volatiles				
Benzene	SW 8020	0.002 mg/l		BDL mg/l
Ethylbenzene	SW 8020	0.002 mg/l		BDL mg/l
Toluene	SW 8020	0.002 mg/l		BDL mg/l
Xylenes	SW 8020	0.002 mg/l		BDL mg/l

BDL = BELOW QUANTITATION LIMIT % REC = PERCENT RECOVERY (T) = TOTALS
J = VALUE REPORTED BELOW QUANTITATION LIMIT

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22 Nov 95 PAGE 1
KEN ROSE
USPCI - REMEDIAL SERVICES
5665 FLATIRON PARKWAY
BOULDER CO 80301

SAMPLE IDENTIFICATION: 50011913
CUSTOMER IDENTIFICATION: DSMW-1

PROJECT NUMBER: 96464
REPORT NUMBER: 10891
DATE SAMPLED: 11/09/95
TYPE OF MATERIAL: WATER

DATE SUBMITTED: 11/13/95
DATE COMPLETED: 11/21/95

<u>PARAMETER</u>	<u>REFERENCE METHOD</u>	<u>RECOVERY LIMITS (%)</u>	<u>RESULT (%)</u>
TPH Volatiles-Surrogates Bromofluorobenzene	SW 8015MOD	72 - 134	106
TPH Volatiles-pH pH Preserved Sample	STRIP		<2. pH
TPH Extractables-Surrogates Terphenyl	SW 8015MOD	0 - 150	56
TPH Extractables-pH pH Preserved Sample	STRIP		<2. pH
Volatiles-Surrogates Bromofluorobenzene	SW 8020	72 - 134	106
Volatiles-pH pH Preserved Sample	STRIP		<2. pH

D indicates sample was diluted to a concentration in which surrogates cannot be accurately measured. The value listed reflects the dilution factor. Some compounds may be run less dilute for better detection.

I indicates interference of surrogate compound, recoveries indeterminable.

Surrogate recoveries flagged as either high (H) or low (L) indicates sample results may be biased either high or low respectively, and the sample results should be considered as estimates.



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22 Nov 95 PAGE 2
KEN ROSE
USPCI - REMEDIAL SERVICES
5665 FLATIRON PARKWAY
BOULDER CO 80301

SAMPLE IDENTIFICATION: 50011914
CUSTOMER IDENTIFICATION: DSMW-2

PROJECT NUMBER: 96464
REPORT NUMBER: 10891
DATE SAMPLED: 11/09/95
TYPE OF MATERIAL: WATER

DATE SUBMITTED: 11/13/95
DATE COMPLETED: 11/21/95

PARAMETER	REFERENCE METHOD	RECOVERY LIMITS (%)	RESULT (%)
TPH Volatiles-Surrogates Bromofluorobenzene	SW 8015MOD	72 - 134	115
TPH Volatiles-pH pH Preserved Sample	STRIP		<2. pH
TPH Extractables-Surrogates Dilution Factor	SW 8015MOD		10. D
TPH Extractables-pH pH Preserved Sample	STRIP		<2. pH
Volatiles-Surrogates Bromofluorobenzene	SW 8020	72 - 134	115
Volatiles-pH pH Preserved Sample	STRIP		<2. pH

D indicates sample was diluted to a concentration in which surrogates cannot be accurately measured. The value listed reflects the dilution factor. Some compounds may be run less dilute for better detection.

I indicates interference of surrogate compound, recoveries indeterminable.

Surrogate recoveries flagged as either high (H) or low (L) indicates sample results may be biased either high or low respectively, and the sample results should be considered as estimates.



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22 Nov 95 PAGE 3
KEN ROSE
USPCI - REMEDIAL SERVICES
5665 FLATIRON PARKWAY
BOULDER CO 80301

SAMPLE IDENTIFICATION: 50011915
CUSTOMER IDENTIFICATION: DSMW-3

PROJECT NUMBER: 96464
REPORT NUMBER: 10891
DATE SAMPLED: 11/09/95
TYPE OF MATERIAL: WATER

DATE SUBMITTED: 11/13/95
DATE COMPLETED: 11/21/95

<u>PARAMETER</u>	<u>REFERENCE METHOD</u>	<u>RECOVERY LIMITS (%)</u>	<u>RESULT (%)</u>
TPH Volatiles-Surrogates Bromofluorobenzene	SW 8015MOD	72 - 134	118
TPH Volatiles-pH pH Preserved Sample	STRIP		<2. pH
TPH Extractables-Surrogates Terphenyl	SW 8015MOD	0 - 150	54
TPH Extractables-pH pH Preserved Sample	STRIP		<2. pH
Volatiles-Surrogates Bromofluorobenzene	SW 8020	72 - 134	118
Volatiles-pH pH Preserved Sample	STRIP		<2. pH

D indicates sample was diluted to a concentration in which surrogates cannot be accurately measured. The value listed reflects the dilution factor. Some compounds may be run less dilute for better detection.

I indicates interference of surrogate compound, recoveries indeterminable.

Surrogate recoveries flagged as either high (H) or low (L) indicates sample results may be biased either high or low respectively, and the sample results should be considered as estimates.



A Subsidiary of
Union Pacific Corporation

CHAIN OF CUSTODY RECORD

No. 04871

TYPE OF ANALYSIS

Sampler Signature: K Rose

Date Sampled: 11/9/95

SAMPLE ID	DATE	TIME	COMP	GRAB	NO. OF CONTAINERS	TYPE OF ANALYSIS								COMMENTS		
						TPH-Diesel	TPH-Ext. & Adbl. S	BTEX (8020)								
DSMW-1	11/9/95	1500			1 Lamber 3 VOAs	X	X	X								Standard Turn
DSMW-2	11/9/95	1530			"	X	X	X								
DSMW-3	11/9/95	1600			"	X	X	X								for questions call Ken Rose at (303) 938 5562
																Job# 96464

Relinquished By (Signature) <u>K Rose</u>	Date <u>11/9/95</u>	Received By (Signature) <u>Carl Adelman</u>
(Printed Name) <u>Ken Rose</u>	Time <u>1700</u>	(Printed Name) <u>Carl Adelman 9254</u>
Relinquished By (Signature)	Date	Received By (Signature)
(Printed Name)	Time	(Printed Name)
Relinquished By (Signature)	Date	Received By (Signature)
(Printed Name)	Time	(Printed Name)

Relinquished By (Signature)	Date	Received By (Signature)
(Printed Name)	Time	(Printed Name)
Relinquished By (Signature)	Date	Received By (Signature)
(Printed Name)	Time	(Printed Name)
Relinquished By (Signature)	Date	Received By (Signature)
(Printed Name)	Time	(Printed Name)