R0441

Environmental Resources Management

1777 Botelho Drive
Suite 260
Walnut Creek, CA 94596
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6 September 2002

Ms. Susan Hugo
Hazardous Materials Specialist
Department of Environmental Health
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502

Subject: Underground Storage Tank Site Closure Request
Union Pacific Railroad Company
1450 Sherwin Street
Emeryville, California

Dear Ms. Hugo:

On behalf of Union Pacific Railroad Company (UPRR), Environmental Resources Management (ERM) has prepared the enclosed *Risk Management Plan* (RMP) for the former underground storage tank (UST) site at 1450 Sherwin Street in Emeryville, California.

On 20 November 2001, representatives of Alameda County, ERM, and UPRR met to discuss the closure process for the site. As discussed at the meeting and in the RMP, the six USTs have been removed and their impact to soil and ground water has been investigated. Although residual petroleum hydrocarbon contamination remains in soil, further excavation is infeasible due to site constraints, including the UPRR mainline to the west and the Sherwin-Williams bentonite containment wall to the east.

At the request of Alameda County, ERM contacted the City of Emeryville regarding enrollment of the site in their One Stop Interactive Resource Information System (OSIRIS) Map Server. The purpose of this enrollment was to make the environmental data for the site available, and keep the public informed regarding residual petroleum hydrocarbons in the unlikely event of future site development activities.

As detailed in the attached letter, the City of Emeryville requires submittal of the RMP in hardcopy and PDF form as well as electronic copies of the report tables in Excel format. We are submitting these documents and this letter to the City of Emeryville simultaneously.

Based on the 20 November 2001 meeting and the registration of the site with the OSIRIS, we believe that we have satisfied Alameda County's requirements for site closure and request that closure be granted as soon as possible. If you have any questions regarding this project, please contact either of us at (925) 946-0455.

Sincerely,

John O. Cavanaugh, R.G.
Program Director

Debbie S. Lind, R.G.
Project Manager

JOC/DSL/9332.50
Enclosures: Risk Management Plan
1 May 2002 letter from City of Emeryville to ERM

cc: Mike Grant – UPRR *(RMP hardcopy only)*
Ignacio Dayrit – City of Emeryville *(RMP in hardcopy and PDF format and RMP tables in Excel format)*

ENVIRONMENTAL RESOURCES MANAGEMENT

Union Pacific Railroad Company

Risk Management Plan

1450 Sherwin Street
Emeryville, California

6 September 2002

9332.50

John O. Cavanaugh, R.G.
Program Director

Debbie S. Lind, R.G.
Project Manager

Environmental Resources Management
1777 Botelho Drive, Suite 260
Walnut Creek, California 94596

ERM

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CITY OF EMERYVILLE
INCORPORATED 1896
1333 PARK AVENUE
EMERYVILLE, CALIFORNIA 94608-3517
TEL: (510) 596-4300 FAX: (510) 596-4389

May 1, 2002

Debbie S. Lind, R.G.
Environmental Resources Management
1777 Botelho Drive, Suite 260
Walnut Creek, CA 94596

Subject: APN 049-1041-026-10

Dear Ms. Lind:

This refers to the proposed closure of the subject parcel. Pursuant to our discussions, Ms. Susan Hugo of the Alameda County Department of Environmental Health will require your client to add information on the site into the City's OSIRIS (One Stop Interactive Resource Information System) Map Server. In order to include this information, this office will need the following:

1. A summary report in hardcopy and PDF format, with the following information:
   a. Text providing background, remedial action, if any, and risk management measures.
   b. Map showing the location of the following:
      i. groundwater monitoring wells and soil borings with residual contamination;
      ii. former underground tank;
      iii. Sherwin Williams slurry wall;
      iv. Railroad tracks/spurs; and
      v. Other notable landmarks, if any.
2. Table(s), in Excel format, which includes soil and groundwater information, including well/boring designation, constituents and levels of residual contamination in soil/groundwater.

The cost for incorporating this information into OSIRIS is $300. Please send your information and make your check to the City of Emeryville, attn: Ignacio Dayrit, at the address above. We also understand that you will be submitting a risk management plan to Ms. Hugo. Please submit one to our office as well.

Sincerely,

IGNACIO DAYRIT
Project Manager

cc. Susan Hugo, ACDEH

1.0 INTRODUCTION

On behalf of the Union Pacific Railroad Company (UPRR), Environmental Resources Management (ERM) has prepared this Risk Management Plan (RMP) for the railroad property located adjacent to the Sherwin Williams Plant at 1450 Sherwin Street, Emeryville, California (Figure 1). This RMP has been prepared to fulfill the Alameda County Health Care Services Agency's (Alameda County's) site closure requirements.

1.1 SITE DESCRIPTION

The site is an approximately 5,250 square foot area (35 feet wide by 150 feet long) that formerly contained six underground storage tanks (USTs). The parcel, formerly owned by Southern Pacific Transportation Company (SPTCo) and acquired by UPRR in 1997, is constrained by the UPRR mainline tracks to the west and a bentonite-slurry wall along the Sherwin Williams Plant perimeter to the east. The site is within UPRR's 25-foot safety envelope and is partially fenced to prevent pedestrian access. The current use of this property is limited to track maintenance access and, due to its location immediately adjacent to the UPRR mainline tracks, the future use of this land is not anticipated to change.

1.2 OBJECTIVE OF THE RISK MANAGEMENT PLAN

As stated above, the site's association with the UPRR mainline precludes it from future development activities. However, as requested by Alameda County and to address the potential for limited future site activities such as utility installation, this RMP has been prepared to summarize the residual contamination present at the site and to establish procedures to prevent unacceptable exposure to potential future site workers.

1.3 SITE HISTORY

According to SPTCo records, a fuel and water station was constructed at the site in 1930 to service steam locomotives used for transferring local customer freight in the Emeryville area. The station included a 17,000-gallon water tank, a pump house, and four USTs containing

Bunker C fuel oil. It is not known when the station was abandoned and/or demolished.

As shown on Figure 2, the site is adjacent to the Sherwin Williams Plant. This plant has been in operation since the early 1900s, manufacturing various types of coating products and lead-arsenate pesticides. The manufacturing of pesticides was discontinued in the late 1940s, and the conversion from producing oil-based products to water-based products occurred in 1987. After the dismantling of the Sherwin Williams oil and solvent tank facilities, two phases of soil and ground water investigation were conducted by Levine-Fricke on behalf of Sherwin Williams. During both phases of investigation, a series of monitoring wells was installed (LF-1 through LF-13) in the shallow aquifer (A-zone). The results of this investigation indicated that soil and ground water were impacted by volatile organic compounds (VOCs), petroleum hydrocarbons in the gasoline range (TPH-g), and arsenic.

In 1990, Sherwin Williams retained Levine-Fricke to develop interim remedial measures for the site. Levine-Fricke recommended a remedial alternative of containment coupled with ground water extraction and treatment. A multimedia cap would seal and stabilize impacted soil and impede the infiltration of additional ground water. Impacted ground water would be laterally contained with a bentonite slurry wall. These recommendations, as well as the results of both phases of soil and ground water investigation, were discussed in the *Evaluation of Interim Remedial Measures at the Sherwin Williams Facility, Emeryville, California* (Levine-Fricke, 1991).

On 28 January 1994, while conducting grading operations along the SPTCo/Sherwin Williams property line to improve an access road to the plant, contractors for Sherwin Williams encountered a UST containing a thick petroleum-like product. SPTCo subsequently contracted Terranext (then Industrial Compliance) to conduct investigation and removal of four USTs. This remedial action is summarized in Section 1.3.1.

In July 1995, during construction of the IRM bentonite slurry wall along the western Sherwin Williams property boundary, the Sherwin Williams contractors encountered two additional USTs. Each tank appeared to contain a heavy and viscous petroleum hydrocarbon. Although these USTs straddled the SPTCo/Sherwin Williams property line, they were suspected to be related to the four USTs removed by SPTCo the previous year. To prevent untimely delay to construction of the slurry wall, SPTCo

authorized Sherwin Williams to remove the USTs. This remedial action is summarized in Section 1.3.2.

1.3 *REMEDIAL ACTION*

1.3.1 *1994 UST Removal*

Due to access agreement negotiations between SPTCo and Sherwin Williams, UST removal activities were delayed until July 1994. Between 25 July and 5 August 1994, four USTs were located, evacuated of Bunker C, and removed. The locations of these USTs are shown on Figure 2 and a UST detail map is provided as Figure 3. Each UST measured approximately 30 feet in length and 6 feet in diameter, and were connected by a 12-inch diameter-piping manifold. Using steam, 30,450 gallons of Bunker C mixed with water was evacuated from the USTs. In addition, approximately 250 cubic yards of soil was excavated from around the USTs during removal activities. These activities resulted in an excavation approximately 80 feet long by 20 feet wide by 8 feet deep. Ground water was only encountered in the southern end of the excavation.

1.3.1.1 *Confirmation Sampling*

Upon completion of the excavation, eight sidewall confirmation samples were collected (Figure 3) and analyzed for the following:

- TPH-g, TPH as diesel (TPH-d), and TPH as Bunker C (TPH-b) by United States Environmental Protection Agency (USEPA) Method 8015 modified;
- Benzene, toluene, ethylbenzene, and xylenes (BTEX) by USEPA Method 8020;
- Oil and grease by USEPA Method 5520;
- Halogenated VOCs by USEPA Method 8010; and
- Semivolatile organic compounds (SVOCs) by USEPA Method 8270.

In addition to the soil samples, two ground water grab samples were collected from the southern end of the excavation. The ground water samples were composited by the laboratory and analyzed for the same suite of analytes listed above as well as the following:

- Barium, cadmium, chromium, and silver by USEPA Method 6010;
- Lead by USEPA Method 7421;
- Mercury by USEPA Method 7470; and
- Selenium by USEPA Method 7740.

The analytical results for the above soil and ground water samples are summarized in Section 2.1.

1.3.2 *1995 UST Removal*

1.3.2.1 *UST Removal and Initial Excavation*

UST investigation and removal activities were completed in July and August 1995 by Levine-Fricke on behalf of Sherwin Williams (Levine-Fricke, 1996). Prior to tank removal, product samples were collected from each tank and designated as North Tank and South Tank (Figure 4). Each sample was analyzed for the following:

- VOCs by USEPA Methods 8240/8260;
- RCRA 8 Metals by USEPA Methods 3010A/6010/7470;
- Polychlorinated biphenyls (PCBs) by USEPA Methods 3550/8080; and
- Extractable TPH by USEPA Methods 3510/8015.

Based on the above analyses VOCs, metals, and PCBs were not identified as compounds of concern in the product, and the product was characterized as motor oil (TPH-m). This product was removed and disposed of off-site prior to initiating UST removal activities.

Between 18 July and 2 August 1995, Levine-Fricke, on behalf of Sherwin Williams, oversaw the removal of the two USTs. Each tank had a capacity of approximately 270 gallons, measured 8 feet long with a diameter of 22 inches, and was constructed of heavy gauge steel. The bottom of each tank was approximately 4.5 feet below ground surface (bgs), and no apparent piping was observed attached to the USTs. After the tanks were removed, approximately 5 cubic yards of discolored soil was excavated. The extent of the excavation was limited by the SPTCo easement to the

west and the bentonite slurry wall to the east (Figure 3). The floor of the excavation was approximately 5 feet bgs.

1.3.2.2 *Confirmation Sampling*

Upon completion of the excavation, three sidewall confirmation samples (North, South, and West) and one floor confirmation sample (Floor) were collected (Figure 4). A confirmation sample was not collected from the eastern side of the excavation because that sidewall was the bentonite slurry wall. All four confirmation samples were analyzed for TPH-d, TPH as kerosene (TPH-k), and TPH-m by USEPA Method 8015 modified. In addition, the Floor sample was analyzed for SVOCs by USEPA Method 8270 and CAM-17 Metals by USEPA Method 3050. The confirmation soil samples are discussed in Section 2.2.

1.3.2.3 *Overexcavation*

As discussed in Section 2.2, the initial confirmation sampling results indicated that elevated concentrations of petroleum hydrocarbons were present in all four soil samples (North, South, West, and Floor). At the request of Alameda County, an additional 4 cubic yards of soil was excavated from the tank pit. The final overexcavation measured 14 feet long (east to west), 12 feet wide (north to south), and 6 feet deep. Consistent with the initial excavation, confirmation soil samples were collected from three of the sidewalls (North-OE, South-OE, and West-OE) and from the excavation floor (Floor-OE).

1.3.2.4 *Confirmation Sampling*

Upon completion of the overexcavation and consistent with the initial excavation, confirmation soil samples were collected from three of the sidewalls (North-OE, South-OE, and West-OE) and from the excavation floor (Floor-OE). All four confirmation samples were analyzed for TPH-d, TPH-k, and TPH-m by USEPA Method 8015 modified. In addition, the Floor-OE sample was analyzed for TPH by the California waste extraction test (WET) method using deionized water. The overexcavation confirmation soil samples are discussed in Section 2.0.

2.0 ANALYTICAL RESULTS

2.1 1994 UST REMOVAL CONFIRMATION SAMPLES

Analytical test results of collected soil and water samples are summarized in the following sections.

2.1.1 Confirmation Soil Samples

Confirmation soil samples reported the following compounds (Table 1):

- TPH-g from non-detect to 18 milligrams per kilogram (mg/kg) with no detections of BTEX;
- TPH-d from non-detect to 4,400 mg/kg;
- Oil and grease from non-detect to 7,700 mg/kg; and
- TPH-b from 8.4 mg/kg to 28,000 mg/kg.

In addition, one of the eight samples (T4) (Figure 3) reported minor concentrations of extractable organics (acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, and pyrene), which are common polynuclear aromatic hydrocarbons (PAHs) found in lower grade diesel fuels such as TPH-b.

In response to PAH detections, two samples (T2T4 and T1T3) were also analyzed by the WET method using deionized water and USEPA Method 8270. This analysis indicated that neither sample contained any detectable concentrations of extractable organics.

2.1.2 Confirmation Water Samples

One composite water sample was analyzed for organic and inorganic constituents (Table 1). Detected organic constituents included TPH-g, benzene, toluene, xylenes, TPH-d, TPH-b, and acenaphthene. Detected inorganic constituents included arsenic, barium, and lead, which reported concentrations of 0.018 milligrams per liter (mg/L), 0.16 mg/L, and 0.028 mg/L, respectively.

The highest concentration of hydrocarbons detected in the grab water sample collected from the excavation was 6.1 mg/L of TPH-b. This result

is suspected to be unrepresentative of true ground water conditions due to the method of collection and the potential for residual product from the tanks or soil to be collected with the sample. BTEX compounds were below California Maximum Contaminant Levels (MCLs) except for benzene (0.0012 mg/L), which exceeded the MCL by 0.0002 mg/L (Table 1).

2.2 *1995 UST REMOVAL CONFIRMATION SAMPLES*

Analytical results of soil samples are summarized in the following section. Water samples were not collected during this UST removal event.

2.2.1 *Confirmation Soil Samples*

TPH-m was identified as the compound of concern for these USTs based on the product analyses (Table 2). TPH-m was detected above laboratory detection limits in each soil sample analyzed (Table 2). TPH-m concentrations ranged from 810 mg/kg in sample North to 1,700 mg/kg in sample West-OE (Figure 4). TPH-k and TPH-d were detected in all of the selected soil samples analyzed for these constituents. Concentrations of TPH-k ranged from 110 mg/kg in sample North-OE to 530 mg/kg in sample West-OE. Concentrations of TPH-d ranged from 170 mg/kg in sample North-OE to 760 mg/kg in sample West-OE.

SVOCs and TPH were not detected above the laboratory detection limits when analyzed by the California WET method. In addition, none of the CAM-17 metals were detected above regulatory thresholds.

3.0 SUMMARY OF RESIDUAL CONTAMINATION

This section summarizes the residual contamination present in site soil and ground water.

3.1 RESIDUAL CONTAMINATION IN SOIL

3.1.1 1994 UST Removal

Field observations and the results of excavation confirmation sampling indicate that TPH-b-impacted soil remains on all sides of the excavation, with the highest concentrations detected in the eastern sidewall. As discussed previously, the limits of this excavation could not be expanded due to physical site constraints including railroad tracks to the west and the concrete slab and slurry wall to the east (Figure 3).

The exposure risk posed by the residual TPH-b contamination is low because the remaining TPH-b is below ground surface in an industrial area with limited access. In addition, the excavation was backfilled with clean fill and effectively capped with the access driveway to the Sherwin Williams property or by railroad track ballast.

The risk to ground water posed by the residual TPH-b is also low. TPH-b is relatively immobile in soil and insoluble in ground water. In addition, toxicological studies (Health Based Cleanup Levels for San Luis Obispo Site, July 1990, Terra, Inc.) have indicated that the health-based risks of exposure to TPH-b are minimal and soil cleanup levels, based on a one-in-one-million increase in cancer risk, have been calculated to be approximately 10,000 mg/kg. Furthermore, Method 8270 WET analyses performed on excavation soil samples indicated no detectable concentrations of semivolatile compounds, thus demonstrating the non-leachability and immobility of TPH-b in soil.

3.1.2 1995 UST Removal

The risk and occurrence of residual TPH contamination for the 1995 UST excavation is similar to the 1994 UST excavation. Field observations and the results of excavation confirmation sampling indicate that TPH-m-impacted soil remains on the north, west, and south sides of the excavation with the highest concentrations detected in the west sidewall.

As discussed previously, the limits of this excavation were constrained by the slurry wall to the east (comprised the eastern excavation sidewall) and the railroad tracks to the west (Figure 4).

The exposure risk posed by the residual TPH-m contamination is low, because the remaining TPH-m concentrations are low and below ground surface in an industrial area with limited access. In addition, the excavation was backfilled with clean fill and effectively capped with the access driveway to the Sherwin Williams property or by railroad track ballast.

The risk to ground water posed by the residual TPH-m is also low. TPH-m is relatively immobile in soil and insoluble in ground water. Furthermore, Method 8270 and 8015 WET analyses performed on excavation soil samples indicated no detectable concentrations of semivolatile compounds or TPH, thus demonstrating the non-leachability and immobility of the TPH-m in soil.

3.2 *RESIDUAL CONTAMINATION IN WATER*

Excavation ground water samples were only collected from the 1994 UST excavation. The highest concentration of hydrocarbons detected in the grab water sample collected from this excavation was 6.1 mg/L of TPH-b, which, as discussed previously, was not likely representative of true ground water conditions. In addition, low concentrations of benzene were detected in this sample.

As presented in the *Tank Closure Report, Southern Pacific Transportation Company, 1450 Sherwin Avenue, Emeryville, CA* (IC, 1994), ground water monitoring at the adjacent Sherwin Williams site is ongoing for petroleum hydrocarbons, solvents, and arsenic. A review of these ground water quality data as compared to the grab water sample collected from the excavation of the USTs indicated that the grab water sample concentrations are consistent with known upgradient contaminants.

3.3 *GROUND WATER MONITORING*

As mentioned above, ground water monitoring is ongoing at the adjacent Sherwin Williams site. In support of site investigation activities at that site, Levine-Fricke implemented a ground water monitoring program to evaluate the direction of ground water flow and concentrations of

contaminants in the ground water. Between 5 February and 5 April 1995, Levine-Fricke installed monitoring wells LF-20, LF-21, LF-23, LF-24, and LF-25 (Figure 2). LF-11, which was added to the monitoring program in March 1997 to improve the evaluation of potential upgradient sources, was installed by Levine-Fricke prior to 1991.

Based upon quarterly ground water elevation readings taken in the wells during first and second quarters 1997, the apparent ground water flow direction in the A-zone aquifer is to the northeast with an average hydraulic gradient ranging from 0.003 to 0.006 (Table 3, Figures 5 and 6). Prior to the placement of the slurry-bentonite cutoff wall, the flow direction was to the northwest with a 0.005 gradient.

Based on available TPH analytical results (ERM, 1997), residual TPH concentrations in site ground water are extremely low and likely a function of naturally occurring organic matter. As shown on Table 4, TPH-d was reported for wells LF-11, LF-20, LF-21, LF-23, and/or LF-25 between April 1996 and June 1997; however, the majority of these detections did not match the diesel chromatographic pattern. In addition, analysis of these samples after a silica gel cleanup reported low (less than 200 micrograms per liter) to nondetectable TPH-d concentrations. Silica gel cleanup procedures can be used prior to USEPA Method 8015 analyses to remove polar biogenic (non-petroleum hydrocarbon related) compounds that can result in false-positive TPH concentrations. The reduction/elimination of TPH-d detections following silica gel cleanup for the site ground water samples indicates that most of the hydrocarbons detected in site ground water are naturally occurring (i.e., degrading plant matter) rather than dissolved-phase petroleum hydrocarbons.

As shown on Figure 7, the distribution of TPH-d in ground water following silica gel cleanup is greatly reduced and limited to the area immediately adjacent to the bentonite slurry wall. In addition, as shown on Figure 6, the highest TPH-d concentrations are detected upgradient of the former UST excavations, indicating that these tanks were not a source of TPH to ground water. Furthermore, during four quarters of ground water monitoring, no heavy-end hydrocarbons such as those found in the excavated USTs (i.e., motor oil; Table 4) have been detected in site ground water.

3.4 *SUMMARY OF RISK*

The residual TPH present in site soil poses a low risk to human health and the environment for the following reasons:

- The former USTs have been removed and all impacted soil has been excavated to the extent possible given the site constraints.
- The residual TPH consists of Bunker C and motor oil, both of which are considered relatively immobile and insoluble such that they do not pose a significant risk to ground water.
- The former UST excavations, including the sidewalls with residual contamination, are effectively capped with either an asphalt driveway/parking lot or railroad ballast.

The low TPH concentrations in ground water, which are likely unrelated to the excavated USTs, also pose a low risk to human health and the environment for the following reasons:

- The potential soil source has been removed.
- Chemical concentrations for the UST excavation and monitoring wells are low and do not suggest a TPH plume.
- The majority of hydrocarbons detected in site ground water are polar biogenic and not dissolved petroleum hydrocarbons.
- The hydraulic gradient in the vicinity is relatively low (0.003 to 0.009), suggesting that migration rates in the Bay Mud should be minimal due to its relatively low conductivity.
- It is unlikely that the aquifer will be developed for beneficial use due to its shallow depth and the presence of and potential for contamination from the many industries in the area.
- The potential for shallow contaminants to migrate to a deeper ground water zone is minimal due to a 10- to 18-foot-thick, low-permeability confining layer (Levine-Fricke, 1994).

4.0 *RISK MANAGEMENT MEASURES*

As discussed previously, the site is within the UPRR mainline 25-foot safety envelope and is fenced to prevent pedestrian access. The current use of this property is limited to track maintenance access and, due to its location immediately adjacent to the UPRR mainline tracks, the future use of this land is not anticipated to change. However, at the request of Alameda County, risk management measures have been developed to prevent human exposure to the residual TPH contamination including the City of Emeryville's One Stop Interactive Resource Information System (OSIRIS) and UPRR environmental disclosure policy.

The OSIRIS is a Web application that allows landowners, developers, residents, and other interested parties to access land use zoning, property ownership, and environmental information on any parcel in Emeryville. Simultaneous with the submittal of this risk management plan, UPRR is registering the site with OSIRIS. It is anticipated that any future work on the site, such as utility installation, will require City of Emeryville approval, during which the environmental issues for the site with be disclosed.

In the unlikely case that UPRR sells or leases the site in the future, it is UPRR's policy in accordance with due diligence to disclose all environmental information for the site. If this parcel is sold or leased in the future, this risk management plan would be provided to the purchaser/lessee to document the residual site contamination.

5.0 REFERENCES

Environmental Resources Management. 1 December 1997. *First and Second Quarter 1997 Ground Water Monitoring Report. Southern Pacific Transportation Company, Emeryville, California.*

Industrial Compliance. 29 September 1994. *Tank Closure Report, Southern Pacific Transportation Company, 1450 Sherwin Avenue, Emeryville, California.*

Levine-Fricke. 20 December 1991. *Evaluation of Interim Remedial Measures at the Sherwin Williams Facility, Emeryville, California.*

Levine-Fricke. 10 June 1994. *Report of Semiannual Ground-Water Monitoring For the Period from July 1 through 31 December 1993, The Sherwin Williams Plant, Emeryville, California.*

Levine-Fricke. 15 March 1996. *Underground Storage Tank Removal Report, Sherwin Williams Facility, Emeryville, California.*

Terra, Inc. July 1990. *Health Based Cleanup Levels for Diesel Fuel Containing Soils at the San Luis Obispo Site, San Luis Obispo, California.*

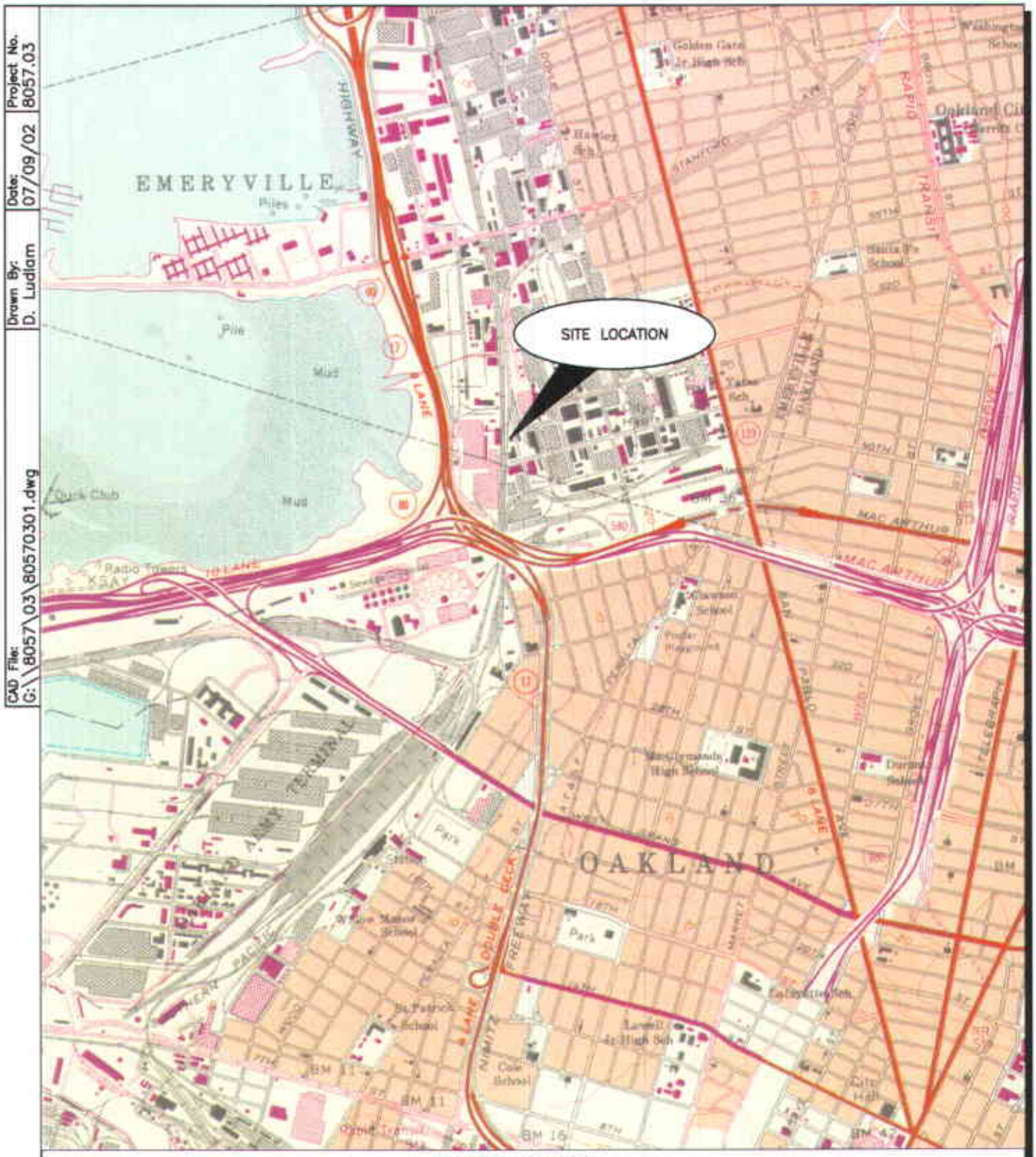


Figure 1

Site Location Map
Union Pacific Railroad
1450 Sherwin Street
Emeryville, CA

ERM 07/02

References:
U.S.G.S. 7.5 Minute Series (Topographic) Quadrangle,
Oakland West, California
Dated: 1959; Photorevised 1980

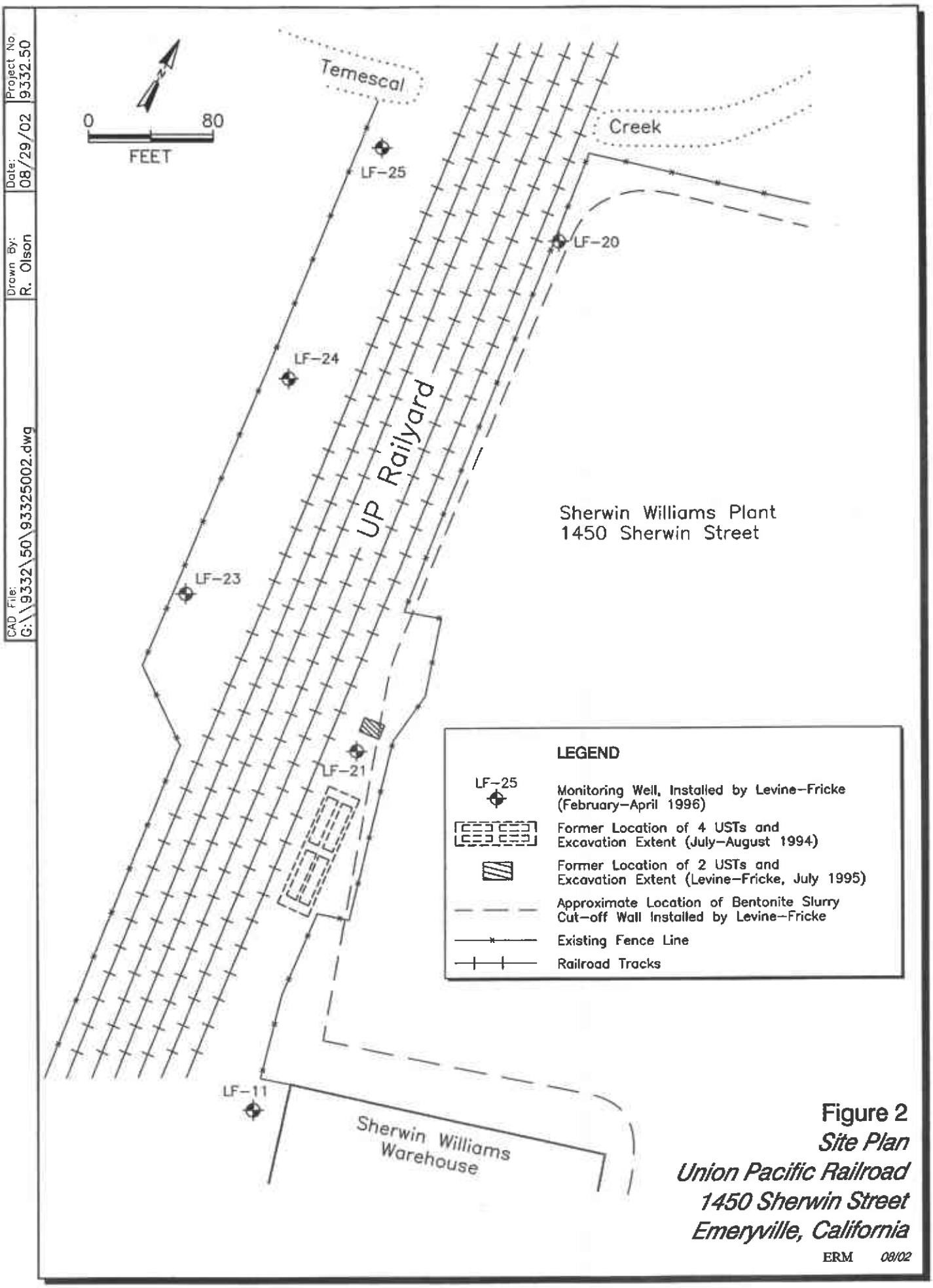


Figure 2
Site Plan
Union Pacific Railroad
1450 Sherwin Street
Emeryville, California
ERM 08/02

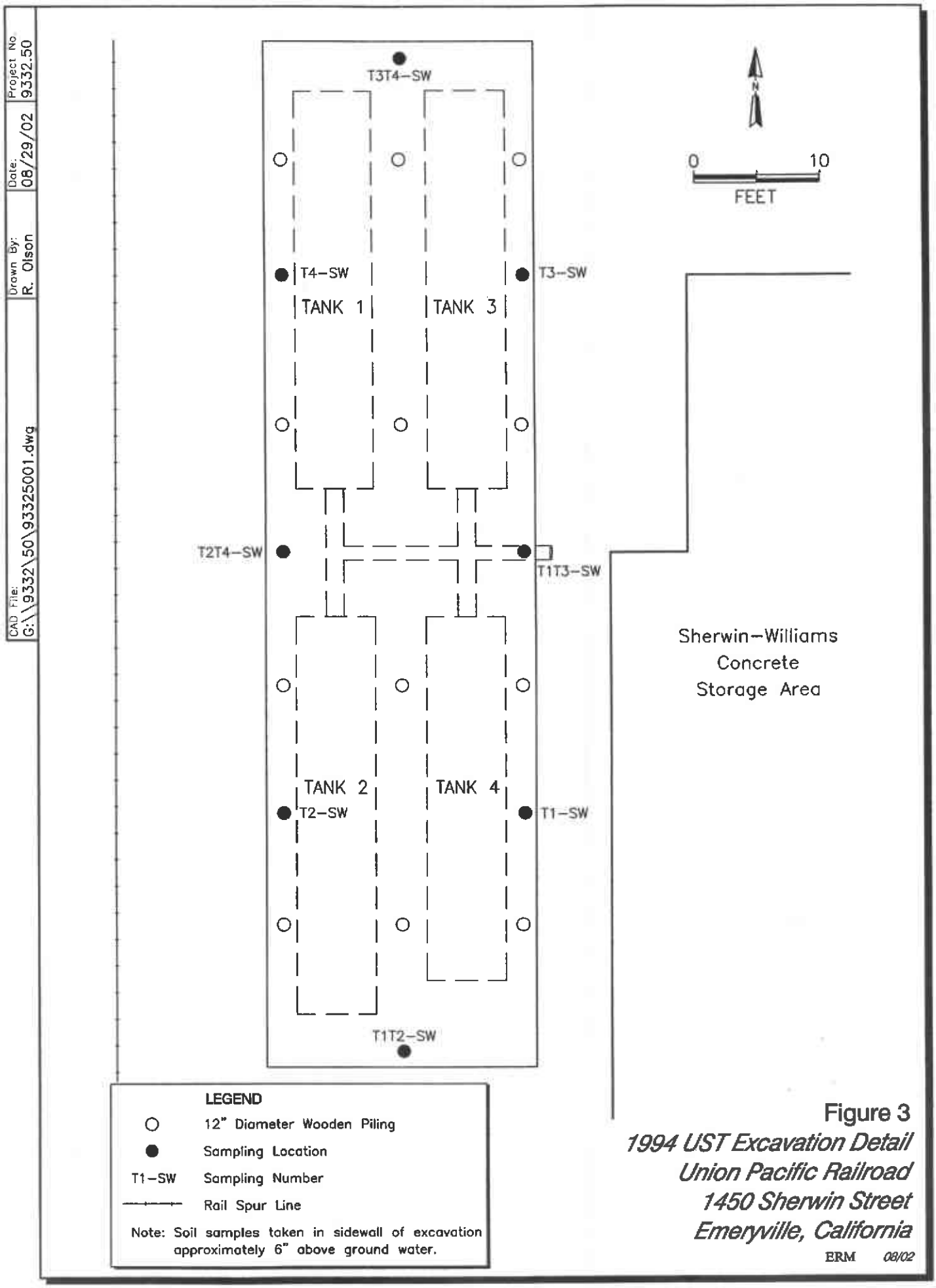
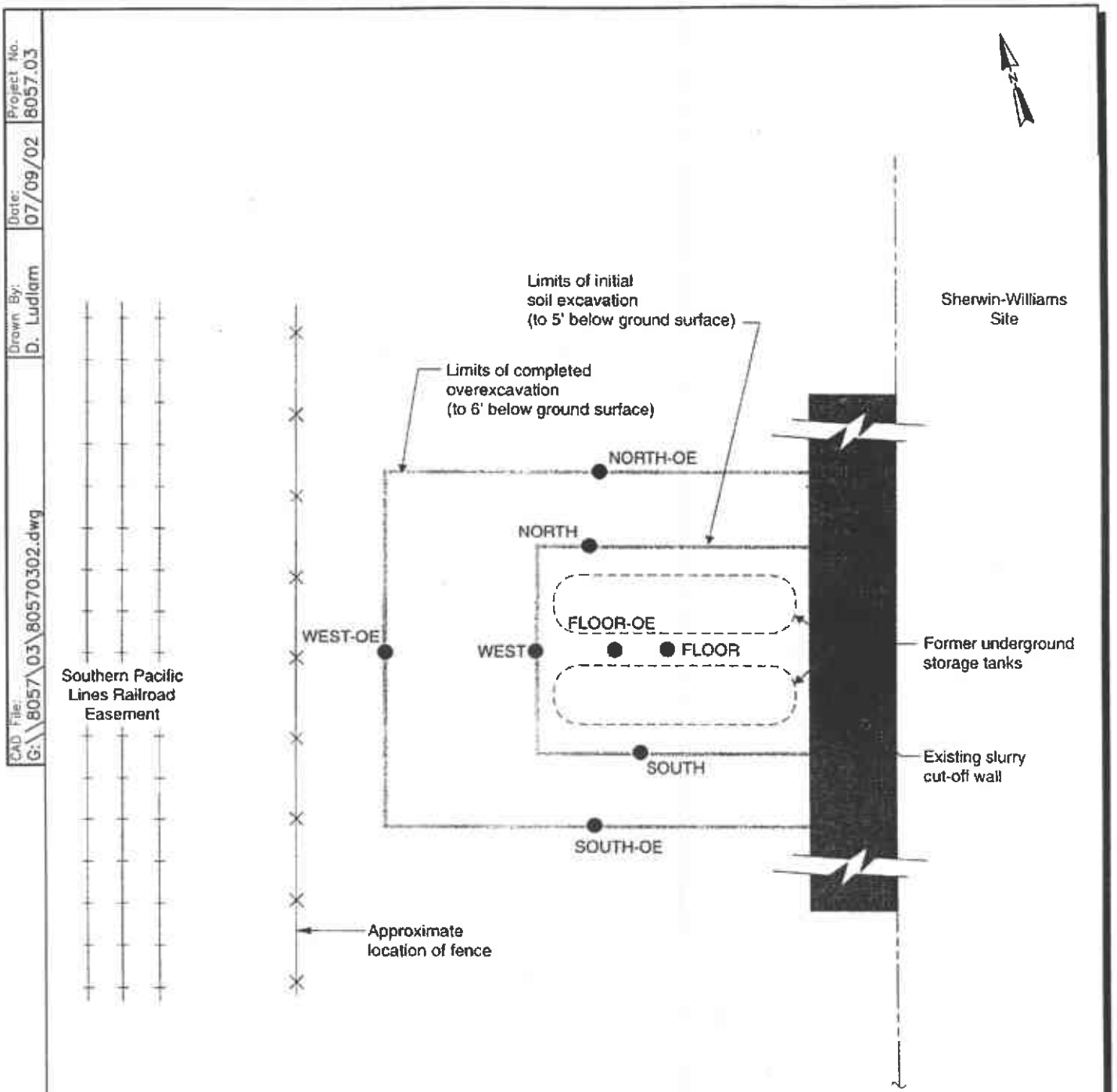


Figure 3

1994 UST Excavation Detail
Union Pacific Railroad
1450 Sherwin Street
Emeryville, California

ERM 08/02



Source: Levine Fricke, Underground Storage Tank Removal Report, March 15, 1996.

Figure 4

Excavation of USTs and Soil Sampling Locations
Union Pacific Railroad
1450 Sherwin Street
Emeryville, California

ERM 07/02

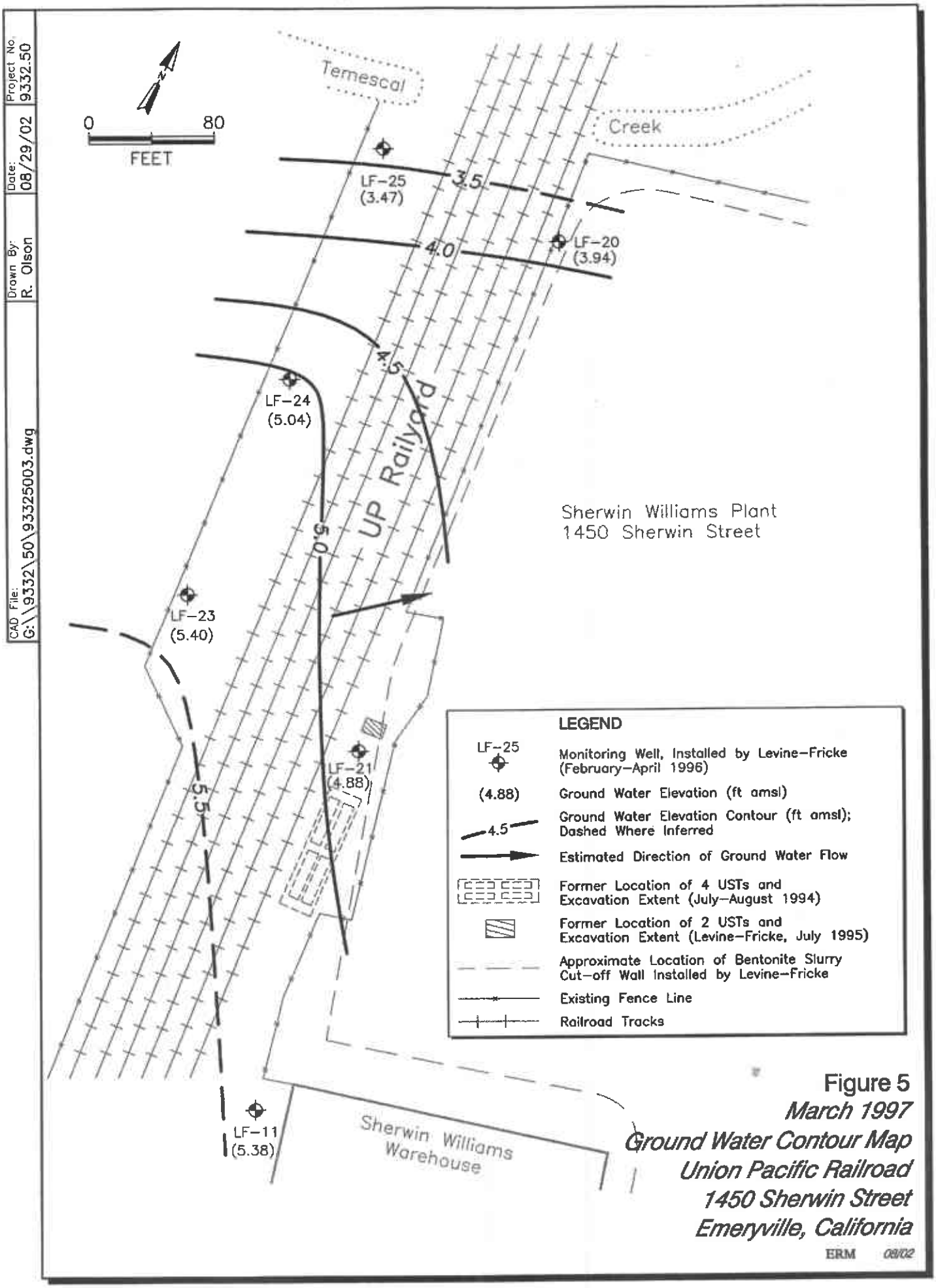


Figure 5
March 1997
Ground Water Contour Map
Union Pacific Railroad
1450 Sherwin Street
Emeryville, California

ERM 08/02

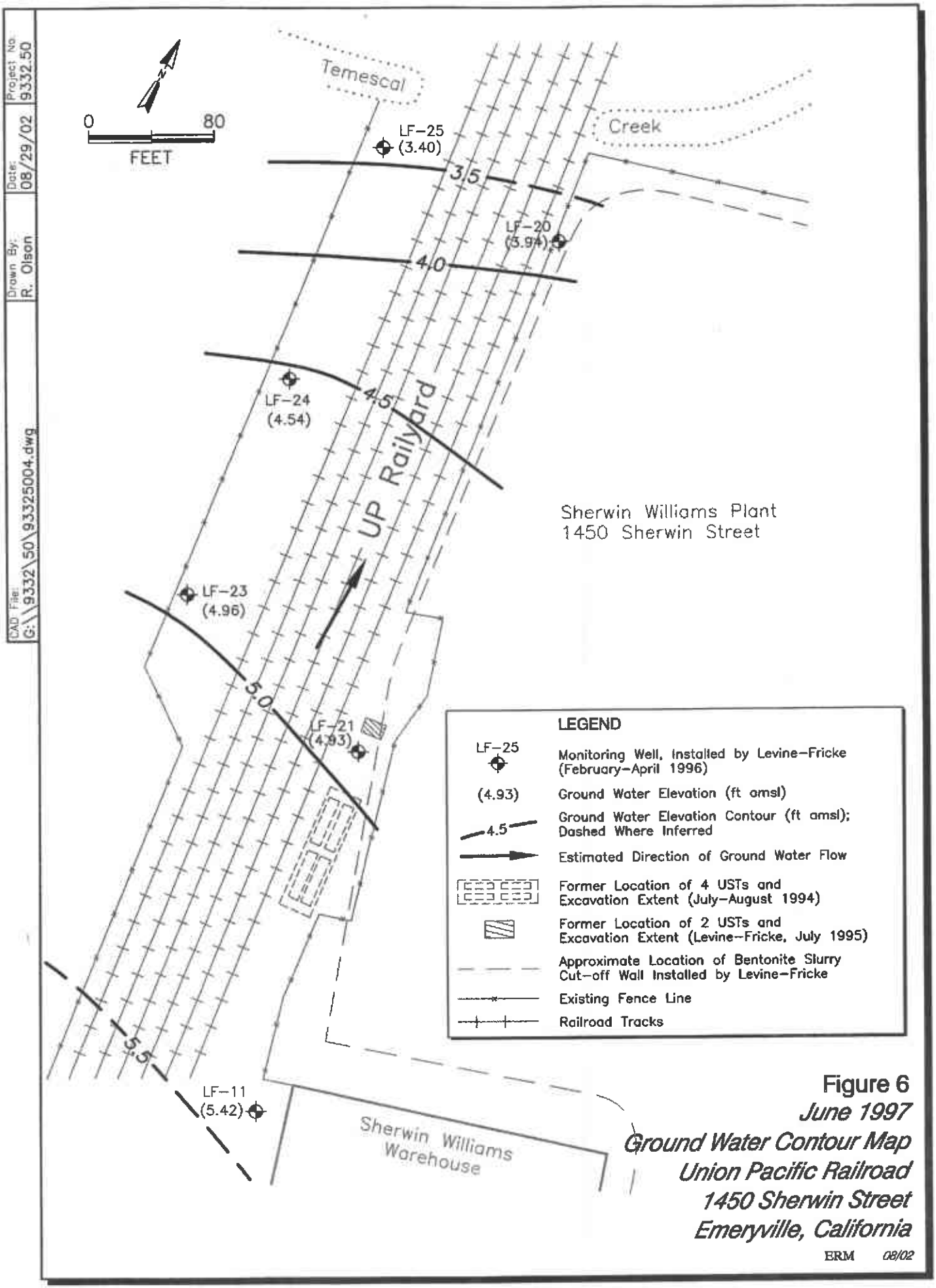


Figure 6
June 1997
Ground Water Contour Map
Union Pacific Railroad
1450 Sherwin Street
Emeryville, California

ERM 08/02

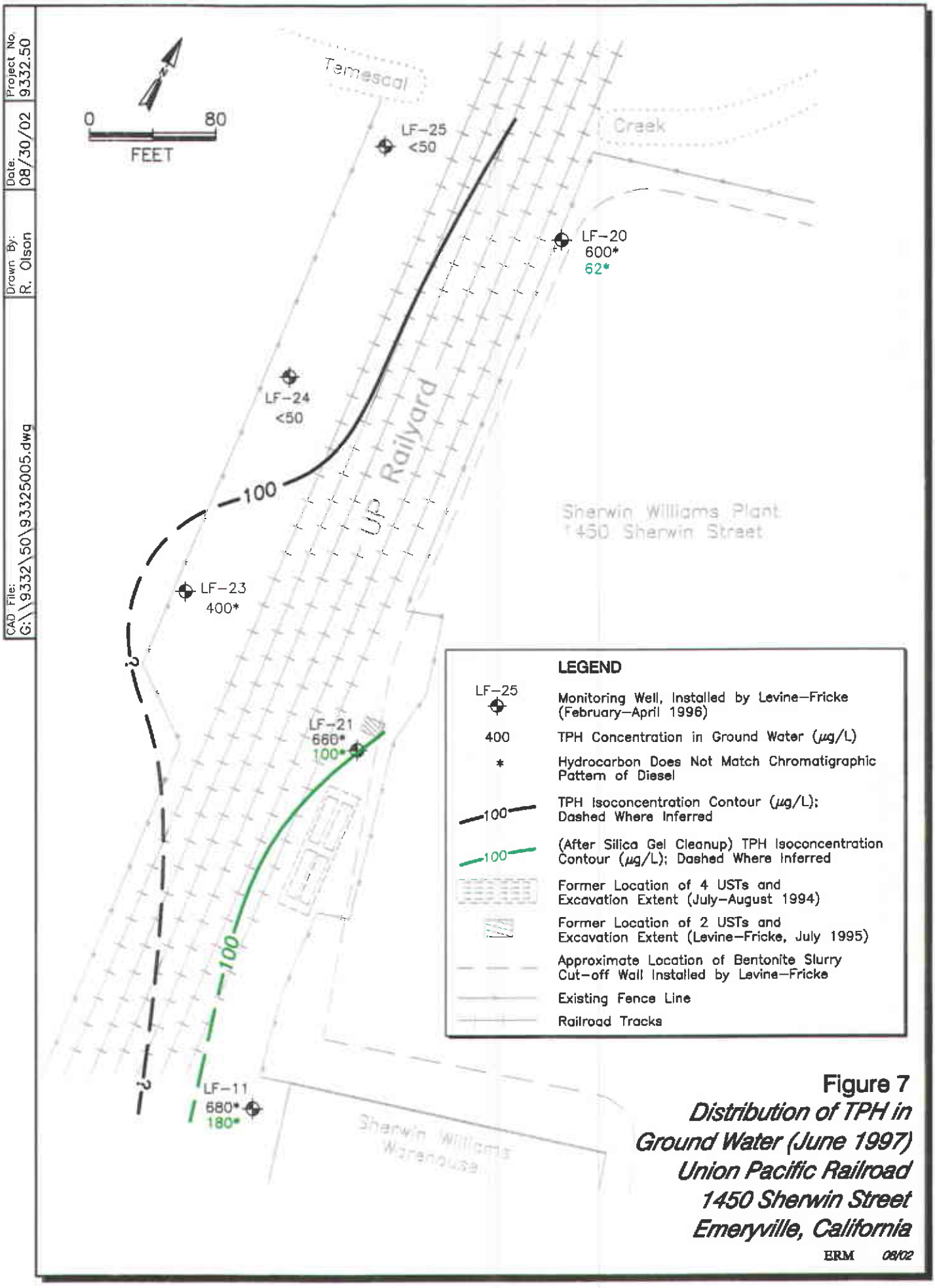


Figure 7
Distribution of TPH in Ground Water (June 1997)
Union Pacific Railroad
1450 Sherwin Street
Emeryville, California

ERM 08/02

Table 1
1994 UST Excavation Data
Union Pacific Railroad Company
1450 Sherwin Street
Emeryville, California

Sample Location	Date Sampled	Sample Type	Units	TPH-g	TPH-d	TPH-b	Oil and Grease	Benzene	Toluene	Ethylbenzene	Xylenes	Acenaphthene	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
T1T2, T1T3, T2T4, T3T4 - Sidewall	3 Aug 94	Soil Composite	mg/kg	na	na	na	na	na	na	na	na	na	3.9	82	<1	33	6.7	0.05	<0.5	<1
T2 - Sidewall	3 Aug 94	Grab Soil	mg/kg	<1	<5	8.4	<50	<0.005	<0.005	<0.005	<0.005	na	na	na	na	na	na	na	na	na
T2T4 - Sidewall	3 Aug 94	Grab Soil	mg/kg	<1	<5	37	110	<0.005	<0.005	<0.005	<0.005	na	na	na	na	na	na	na	na	na
T4 - Sidewall	3 Aug 94	Grab Soil	mg/kg	1.4	230	780	83	<0.005	<0.005	<0.005	<0.005	na	na	na	na	na	na	na	na	na
T3T4 - Sidewall	3 Aug 94	Grab Soil	mg/kg	<1	30	230	67	<0.005	<0.005	<0.005	<0.005	na	na	na	na	na	na	na	na	na
T3 - Sidewall	3 Aug 94	Grab Soil	mg/kg	2.5	540	1,800	880	<0.005	<0.005	<0.005	<0.005	na	na	na	na	na	na	na	na	na
T1T3 - Sidewall	3 Aug 94	Grab Soil	mg/kg	18	4,400	28,000	7,700	<0.005	<0.005	<0.005	<0.005	na	na	na	na	na	na	na	na	na
T1 - Sidewall	3 Aug 94	Grab Soil	mg/kg	4.3	1,700	7,400	2,800	<0.005	<0.005	<0.005	<0.005	na	na	na	na	na	na	na	na	na
T1T2 - Sidewall	3 Aug 94	Grab Soil	mg/kg	<1	<5	40	13	<0.005	<0.005	<0.005	<0.005	na	na	na	na	na	na	na	na	na
South end of pit	3 Aug 94	Grab Water	mg/L	0.15	3.2	6.1	<5.0	0.0012	0.0008	<0.005	0.0024	0.015	0.018	0.16	<0.005	<0.01	0.028	<0.0002	<0.005	<0.01

Sample Location	Date Sampled	Sample Type	Units	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Arsenic	Lead
T2 - Sidewall[1]	3 Aug 94	Grab Soil	µg/L	<330	<330	<330	<330	<330	<330	na	na
T2T4 - Sidewall[1]	3 Aug 94	Grab Soil	µg/L	<300	<330	<330	<330	<330	<330	na	na
T2T4 - Sidewall[2]	3 Aug 94	Grab Soil	µg/L	<17	<17	<17	<17	<17	<17	na	na
T4 - Sidewall[1]	3 Aug 94	Grab Soil	µg/L	540	430	1,400	370	990	750	na	na
T3T4 - Sidewall[1]	3 Aug 94	Grab Soil	µg/L	<330	<330	<330	<330	<330	<330	na	na
T3 - Sidewall[1]	3 Aug 94	Grab Soil	µg/L	<1,600	<1,600	<1,600	<1,600	<1,600	<1,600	na	na
T1T3 - Sidewall[1]	3 Aug 94	Grab Soil	µg/L	<33,000	<33,000	<33,000	<33,000	<33,000	<33,000	na	na
T1T3 - Sidewall[2]	3 Aug 94	Grab Soil	µg/L	<17	<17	<17	<17	<17	<17	na	na
T1 - Sidewall[1]	3 Aug 94	Grab Soil	µg/L	<1,600	<1,600	<1,600	<1,600	<1,600	<1,600	na	na
T1T2 - Sidewall[1]	3 Aug 94	Grab Soil	µg/L	<330	<330	<330	<330	<330	<330	na	na
Stockpile[3]	4 Aug 94	Soil Composite	µg/L	na	na	na	na	na	na	6	1.1

Notes:
All sidewall samples collected from 7 feet below ground surface
Table reproduced from Tables 1 through 6 of the *Tank Closure Report, Southern Pacific Transportation Company, 1450 Sherwin Avenue, Emeryville, California* (Industrial Compliance, 29 September 1994).

[1] Extracted by Waste Extraction Test (WET) and analyzed by United States Environmental Protection Agency (USEPA) Method 8270

[2] Extracted by WET using deionized water and analyzed by USEPA Method 8270

[3] Analyzed by Toxic Characteristic Leachability Procedure (TCLP)

Key:
mg/kg = Milligrams per kilogram
µg/L = Micrograms per liter
na = Not analyzed
mg/L = Milligrams per liter
< = Less than; not detected above reporting limit

Table 2
1995 UST Excavation Data
Union Pacific Railroad Company
1450 Sherwin Street
Emeryville, California

Sample ID	Date Sampled	Sample Type	Units	Kerosene	Diesel	Motor Oil
North Tank 1	13 Jul 95	Product	mg/kg	<600	<600	<6,000[1]
South Tank 2	13 Jul 95	Product	µg/L	<5,000	<5,000	370,000
Floor	3 Aug 95	Soil	mg/kg	150	400	1,400
South	3 Aug 95	Soil	mg/kg	na	na	1,000
North	3 Aug 95	Soil	mg/kg	na	na	810
West	3 Aug 95	Soil	mg/kg	na	na	1,200
North-OE	11 Aug 95	Soil	mg/kg	110	170	910
South-OE	11 Aug 95	Soil	mg/kg	150	280	940
West-OE	11 Aug 95	Soil	mg/kg	530	760	1,700

Notes:

[1] Unknown hydrocarbon in the motor oil range of 34,000 mg/kg.

Table reproduced from Tables 1 and 2 of the *Underground Storage Tank Removal Report, Sherwin Williams Facility, Emeryville, California* (Levine-Fricke, 15 March 1996).

Product samples were also tested for the presence of PCBs, VOCs, and metals. PCBs were non-detect. Metals were not detected above regulatory thresholds. VOCs were non-detect except the North Tank, which had low levels of benzene (0.22 mg/kg), toluene (0.26 mg/kg), and total xylenes (1.7 mg/kg).

Key:

mg/kg = Milligrams per kilogram
µg/L = Micrograms per liter
na = Not analyzed

Table 3
Ground Water Elevation Data
Union Pacific Railroad Company
1450 Sherwin Street
Emeryville, California

Well ID	Date Measured	Top of Casing Elevation (feet MSL)	Depth to Ground Water (feet below TOC)	Ground Water Elevation (feet MSL)
LF-11	18 Mar 97	10.05	4.67	5.38
	11 Jun 97		4.63	5.42
LF-20	24 Apr 96	11.77	7.55	4.22
	21 Nov 96		7.90	3.87
	18 Mar 97		7.83	3.94
	11 Jun 97		7.83	3.94
LF-21	24 Apr 96	10.37	3.65	6.72
	21 Nov 96		5.33	5.04
	18 Mar 97		5.49	4.88
	11 Jun 97		5.44	4.93
LF-23	24 Apr 96	10.64	4.08	6.56
	21 Nov 96		4.54	6.10
	18 Mar 97		5.24	5.40
	11 Jun 97		5.68	4.96
LF-24	24 Apr 96	10.22	4.40	5.82
	21 Nov 96		5.35	4.87
	18 Mar 97		5.18	5.04
	11 Jun 97		5.70	4.52
LF-25	24 Apr 96	11.31	7.15	4.16
	21 Nov 96		7.29	4.02
	18 Mar 97		7.84	3.47
	11 Jun 97		7.91	3.40

Notes:
MSL = Mean sea level
TOC = Top of Casing

Table 4
Monitoring Well Analytical Summary
Union Pacific Railroad Company
1450 Sherwin Street
Emeryville, California

Monitoring Well	Date Sampled	Diesel (µg/L)	Motor Oil (µg/L)	Diesel w/ Silica Gel Cleanup (µg/L)
LF-11	18 Mar 97	290[a]	<500	<50
	11 Jun 97	680[a]	<500	180[a]
LF-20	12 Apr 96	1,000[b]	NQ	82
	21 Nov 96	1,800	<540	na
	18 Mar 97	240[a]	<500	nd[c]
	11 Jun 97	600[a]	<500	62[a]
LF-21	10 Apr 96	910[b]	NQ	<50
	21 Nov 96	1,100	<590	na
	18 Mar 97	360[a]	<500	<50
	11 Jun 97	660[a]	<500	100[a]
LF-23	10 Apr 96	340[b]	NQ	<50
	21 Nov 96	420	<540	na
	18 Mar 97	1,200[a]	<500	<50
	11 Jun 97	400	<500	<50
LF-24	12 Apr 96	<50	<50	na
	21 Nov 96	<50	<530	na
	18 Mar 97	<50	<500	na
	11 Jun 97	<50	<500	na
LF-25	12 Apr 96	88[b]	<530	<50
	21 Nov 96	<53	<500	na
	18 Mar 97	<50	<500	na
	11 Jun 97	<50	<500	na

Notes:

[a] Reported hydrocarbons in the diesel range do not match chromatographic diesel pattern.

[b] Unknown hydrocarbon mixture atypical of diesel fuel in the carbon range of C10 to C32. Hydrocarbons from C10 to C24 were quantified based on comparison with a diesel standard.

[c] Due to laboratory contamination during the 8015 analysis with silica gel cleanup of sample LF-20, the removal of hydrocarbons in the C10 to C13 range by silica gel cleanup cannot be verified and a reporting limit cannot be provided.

Key:

< = Less than; not detected above reporting limit
µg/L = Micrograms per liter
na = Not analyzed
nd = Not detected
NQ = Hydrocarbons in the motor oil range (>C24) were not quantified.