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29 December 1992
Project 1736.11

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Ms. Juliet Shin
Alameda County Health Care Services Agency
Division of Hazardous Materials
Department of Environmental Health
80 Swan Way, Room 200
Oakland, CA 94621

Subject: Groundwater Monitoring Program
1301 Marina Village Parkway
Marina Village Development
Alameda, California

Dear Ms. Shin:

On behalf of Alameda Real Estate Investments, Inc. (AREI), Geomatrix Consultants, Inc. (Geomatrix), has prepared a groundwater monitoring program that involves installing one monitoring well and conducting quarterly groundwater monitoring at the subject property in the Marina Village Development in Alameda, California (Figure 1). The purpose of the program is to comply with Alameda County Department of Environmental Health (ACDEH) requirements for closure of underground storage tank (UST) sites.

Based on discussions with you and Mr. Rich Hiett of the Regional Water Quality Control Board during our meeting of 3 September 1992, we developed this groundwater monitoring program specifically to evaluate groundwater quality downgradient of two former USTs at the subject site and to obtain data for eventual site closure.

BACKGROUND

Background information on removing the two tanks and remediating soil at the site was summarized in our letter to you dated 1 September 1992. A copy of that letter is appended to this work plan as Attachment A. The tanks, which apparently were installed in the 1940s by former property owners, were used to store diesel fuel. AREI removed the tanks in 1988, as described in the Levine•Fricke, Inc. 5 October 1988 report entitled "Removal of Petroleum Affected Soils from the Field Area South of the Powerhouse, Alameda Marina Village, Alameda, California."

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SCOPE OF WORK

To meet ACDEH requirements for eventual site closure, we propose the following scope of work.

- Task A: Install and Develop One Groundwater Monitoring Well
- Task B: Measure Groundwater Elevations, Sample Groundwater, and Chemically Analyze Groundwater Samples
- Task C: Prepare Four Quarterly Monitoring Reports

These tasks are described below in detail.

Task A: Install and Develop One Groundwater Monitoring Well

We propose to install one well downgradient of the former tanks, at the location shown on Figure 2. This location is also downgradient of a former soil excavation area, which is described in Attachment A. The proposed well location is based on groundwater gradient information obtained elsewhere on the site and in the site vicinity, which indicates that groundwater flows in a northwesterly direction. The well will be installed after obtaining a monitoring well installation permit from the Alameda County Flood Control and Waste Conservation District, Zone 7, and after conducting an underground utility check at the proposed well location.

Should collect water level measurements before installing well.

The monitoring well will be installed according to Geomatrix protocol No. 5, which appears in Attachment B. The boring for the monitoring well will be drilled to a maximum depth of 15 feet using an 8-inch-diameter hollow-stem auger. The well will be constructed using 2-inch-diameter, flush-threaded, schedule-40 polyvinyl chloride (PVC) pipe. A 10-foot-long screened section of the PVC pipe, having 0.010-inch slots, will be positioned to intersect the surface of the groundwater, which is expected to be encountered about 5 to 10 feet below current grade. The well annulus will be backfilled with a filter pack of Lonestar 0/30 sand to one foot above the slotted section, and a minimum 6-inch-thick bentonite seal will be placed above the filter pack. The remaining annulus will be backfilled with a 10-percent bentonite grout seal to protect against surface water infiltration through the sandpack. A locking cap and traffic-rated cover will be placed over the monitoring well at the ground surface.

Make sure screen is above water level

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After allowing the well seal to set (approximately 72 hours), we will develop the monitoring well to loosen debris, stabilize the sandpack, and establish communication with the surrounding water bearing sediments. The well will be developed in accordance with Geomatrix protocol No. 6 (included in Attachment B), which prescribes pumping, bailing, and/or surging until the well produces little or no fines or until water quality parameters (pH, conductivity, temperature) stabilize. Groundwater purged from the monitoring well during development will be stored on site in 55-gallon drums and will be appropriately disposed of after analytical test results are received.

Following well completion, the top of the well casing will be surveyed by a licensed land surveyor, and its elevation tied into the elevations of other nearby shallow groundwater monitoring wells (LF-2, WC-3, and GMW-1, Figure 2).

Task B: Measure Groundwater Elevations, Sample Groundwater, and Chemically Analyze Groundwater Samples

At least 72 hours after developing the new well, we will perform the first of four quarterly monitoring events. Groundwater levels will be measured in the new well and existing monitoring wells LF-2, GMW-1, and WC-3. Groundwater elevations will be determined in accordance with Geomatrix protocol No. 6 by measuring the distance from the top of the well casings to the groundwater surface with a Teflon or steel tape graduated in increments of one-tenth of a foot. Groundwater levels will be measured to the nearest 0.01 foot. Direction of groundwater flow will be estimated by interpolation between the four wells.

A groundwater sample then will be collected from the new monitoring well in accordance with Geomatrix protocol No. 7 (included in Attachment B). Before sampling, at least three well casing volumes of groundwater will be purged from the well, and water temperature, pH, and specific conductance will be measured periodically with field equipment. A submersible pump or a positive air-displacement pump will be used to purge groundwater from the monitoring well casing. Samples will be collected only when the temperature, pH, and specific conductance stabilize. Sampling procedures will include using a Teflon bailer or a stainless steel positive-displacement Teflon bladder pump with Teflon tubing to collect water samples for chemical analysis. Samples will be collected in one-liter amber glass bottles for analysis of total petroleum hydrocarbons as diesel (TPHd) and in 40-ml volatile organic analysis vials for analysis of volatile organic compounds (VOCs).

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Groundwater generated during sampling and well development will be temporarily stored on site in 55-gallon drums; AREI will be responsible for appropriate disposal based on analytical results.

After groundwater samples are collected from the wells, they will be transported under Geomatrix chain-of-custody procedures to a state-certified analytical laboratory. As agreed during our 3 September 1992 meeting, the samples will be analyzed for TPHd by U.S. Environmental Protection Agency (EPA) Modified Method 8015, and for aromatic VOCs by EPA Method 8020. As requested by ACDEH, we will instruct the analytical laboratory to report dichlorobenzenes as part of the EPA Method 8020 analysis.

Task C: Prepare Quarterly Monitoring Reports

On behalf of AREI, Geomatrix will prepare an initial letter report that describes the drilling, well installation, well development, and first quarter sampling activities and results. A site plan, potentiometric surface map, and tables presenting the ground water level measurements and analytical results will be included. Following the initial report, letter reports will be prepared and forwarded to the ACDEH after each quarterly sampling event to summarize direction of groundwater flow and chemical analytical data collected during each event. At the end of four quarters of monitoring, the need for additional periodic monitoring will be evaluated.

SITE HEALTH AND SAFETY PLAN

As required by California's Occupational Safety and Health Administration (OSHA), all work at the site will be performed under a site health and safety plan (HSP). The HSP will incorporate safeguards against chemical and physical hazards associated with drilling and sampling. Personnel working on the site will be required to read and adhere to the plan. The Project Manager will be responsible for implementing the HSP.

SCHEDULE

We anticipate initiating the groundwater monitoring program at the beginning of January 1993. The initial report will be submitted to the ACDEH in February 1993. Subsequent quarterly sampling will be performed in April, July, and October 1993; quarterly reports will be submitted to the ACDEH in May, August, and November 1993.

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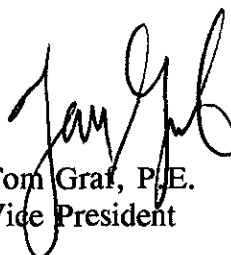
If you have any questions regarding this groundwater monitoring program, please call either of the undersigned.

Sincerely,

GEOMATRIX CONSULTANTS, INC.



Elizabeth Nixon
Project Manager

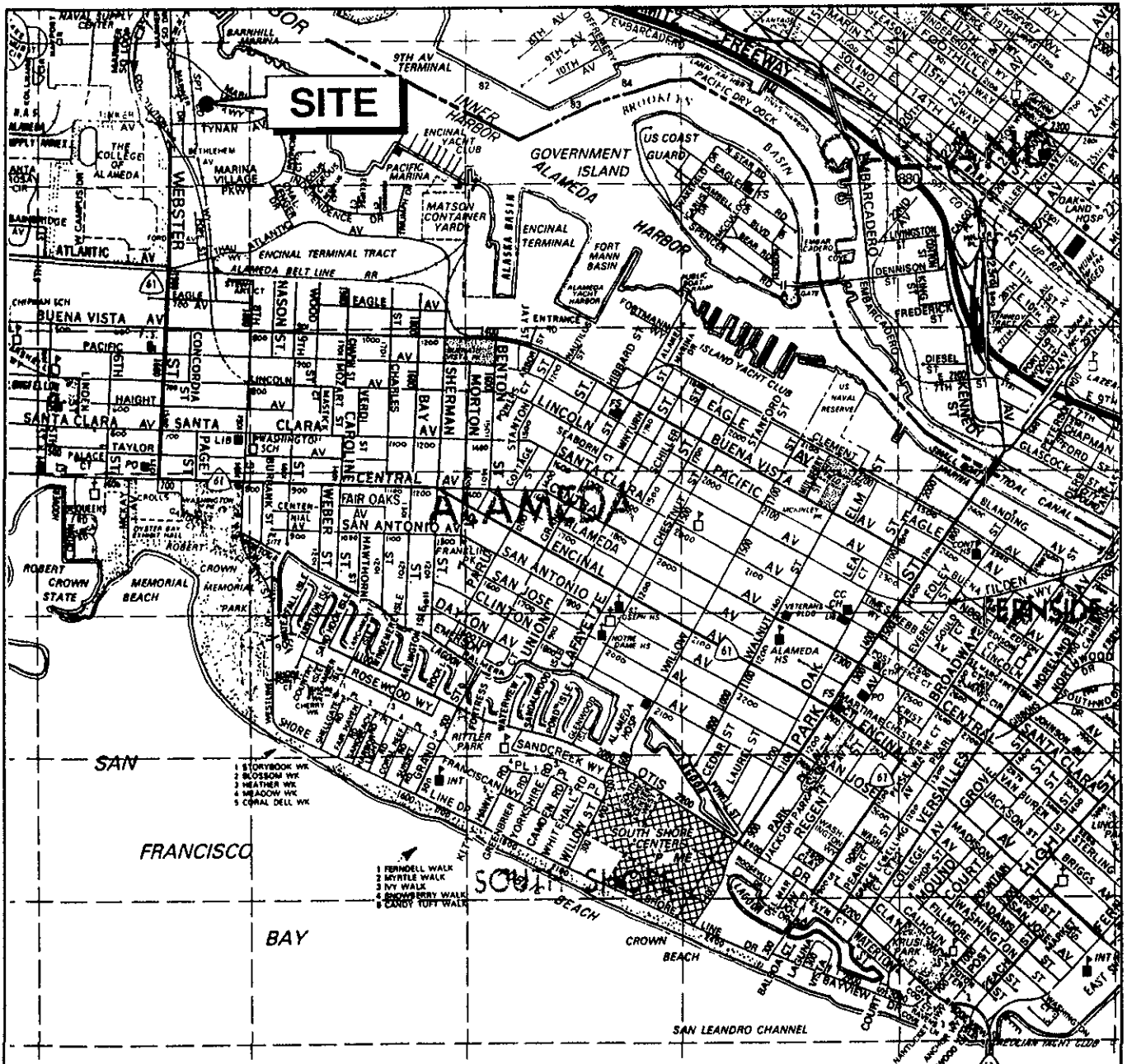


Tom Graf, P.E.
Vice President

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Attachments: A - Geomatrix letter to ACDEH dated 1 September 1992
B - Geomatrix Protocols

cc: Ms. Cathy Luck, AREI

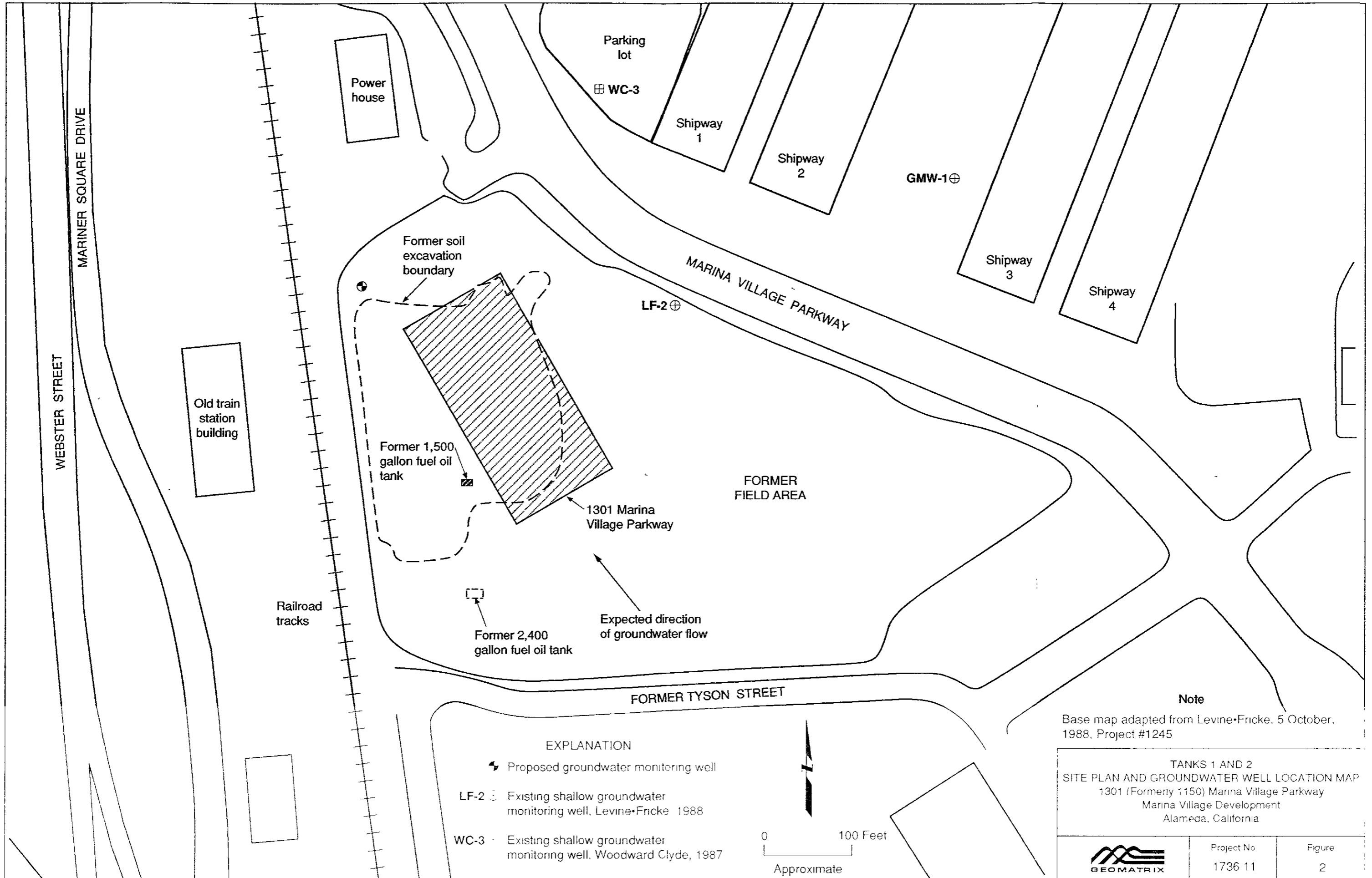


SITE VICINITY MAP
 1301 (Formerly 1150) Marina Village Parkway
 Marina Village Development
 Alameda, California



Figure
 1
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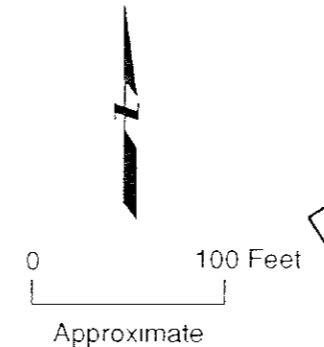
Figure
 1
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Note
 Base map adapted from Levine-Fricke, 5 October, 1988, Project #1245

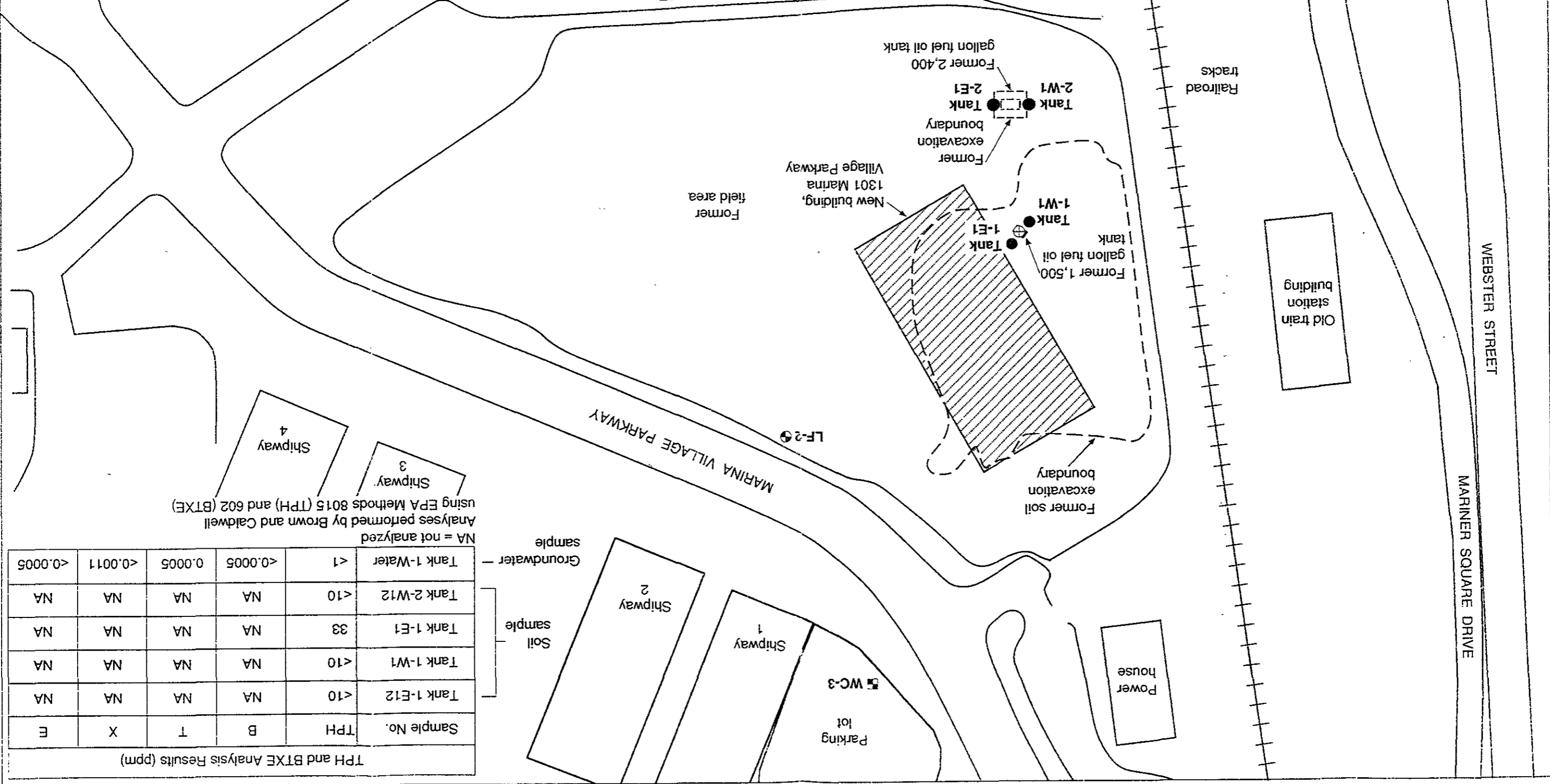
TANKS 1 AND 2
 SITE PLAN AND GROUNDWATER WELL LOCATION MAP
 1301 (Formerly 1150) Marina Village Parkway
 Marina Village Development
 Alameda, California

- EXPLANATION**
- ⊕ Proposed groundwater monitoring well
 - LF-2 ⊕ Existing shallow groundwater monitoring well, Levine-Fricke 1988
 - WC-3 ⊕ Existing shallow groundwater monitoring well, Woodward Clyde, 1987

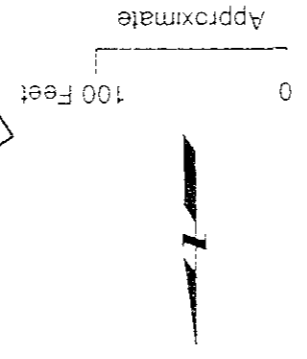


	Project No	Figure
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Base map adapted from Levine-Frncke, 5 October, 1988 Project #1245
 Note



- EXPLANATION**
- Soil sample location, July 1983
 - Groundwater sample location, July 1988
 - ◄ Shallow groundwater monitoring well, Levine-Frncke, 1988
 - ◄ Shallow groundwater monitoring well, Woodward Clyde 1987



TPH and BTXE Analysis Results (ppm)

Sample No.	TPH	B	T	X	E
Tank 1-E12	<10	NA	NA	NA	NA
Tank 1-W1	<10	NA	NA	NA	NA
Tank 1-E1	33	NA	NA	NA	NA
Tank 2-W12	<10	NA	NA	NA	NA
Tank 1-Water	<1	<0.0005	0.0005	<0.0011	<0.0005

NA = not analyzed
 Analyses performed by Brown and Caldwell using EPA Methods 8015 (TPH) and 602 (BTXE)

Shipway 1
 Shipway 2
 Shipway 3
 Shipway 4

Former soil excavation boundary
 Former fuel oil tank
 Former 1,500 gallon fuel oil tank
 Tank 1-E1
 Tank 1-W1
 Former 2,400 gallon fuel oil tank
 Tank 2-E1
 Former excavation boundary
 Former Village Parkway
 New building, 1301 Marina Village Parkway
 Former field area
 Former house
 Parking lot WC-3
 Old train station building
 Railroad tracks
 WEBSTER STREET
 MARINER SQUARE DRIVE