

ALAMEDA COUNTY
HEALTH CARE SERVICES

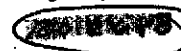
AGENCY
DAVID J. KEARS, Agency Director



SPID 3843

Ro 1001

SPID NA



November 3, 1997

Mr. Rahn Verhaeghe
Alameda Real Estate Investments
1150 Marina Village Parkway, Suite 100
Alameda, Ca - 94501

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION DEPT
1151 Harbor Bay Parkway Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

Ref: Parcel H, Marina Village Development, 1150 Marina Village Pkwy, Alameda, CA

Dear Mr. verhaeghe:

In response to your request for closure for the above referenced site, this Department has reviewed all the pertinent documents.

During site development, the fill material on site, extending five feet above the native soil was found to contain high boiling point petroleum hydrocarbons. In April 1992, two groundwater monitoring wells, and one piezometer were installed. Also, in November 1992, soil samples were collected randomly from the fill material and the concentrations of petroleum hydrocarbons present in the fill material was measured to be 90 to 1200 ppm. A risk assessment performed for the referenced property was approved by Ravi Arulanantham, staff toxicologist at the San Francisco Regional Water Quality Control Board (RWQCB) in a letter dated February 4, 1993. The risk assessment identified the asphalt in the fill material as the likely source of the petroleum hydrocarbons and that it is very unlikely to cause a risk to public health. Site development was approved based on the condition that long term groundwater monitoring and leachability study be conducted to verify that the contamination present on site were not adversely affecting the groundwater

As per the site management plan, dated June 1993, an additional groundwater monitoring well was installed and groundwater monitoring was conducted on a quarterly frequency from February 1993 to December 1993. No significant concentrations of petroleum hydrocarbons were found in the groundwater samples. *Based on the leachability studies, the results of the groundwater monitoring conducted on the site, and the risk assessment approved by this Department, the site does not appear to pose a threat to public health and no further action, including groundwater monitoring is required. The groundwater monitoring wells can be destroyed as per the RWQCB's guidelines.*

If you have any questions, you may reach me at (510) 567-6764.

Sincerely,

A handwritten signature in cursive script that reads "Madhulla Logan". The signature is written in black ink and is positioned above the printed name and title.

Madhulla Logan
Hazardous Material Specialist

C: Elizabeth Nixon, Geomatrix, 100 Pine St, Suite 1000, San Francisco, CA - 94111
Ravi Arulanantham, San Francisco Regional Water Quality Control Board, Oakland, CA

ALAMEDA COUNTY
HEALTH CARE SERVICES

AGENCY
DAVID J. KEARS, Agency Director



R0#2680

REMEDIAL ACTION COMPLETION CERTIFICATION

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION (LOP)
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

February 14, 1997

Mr. Rahn Verhaeghe
Alameda Real Estate Investments
1150 Marina Village Pkwy., Ste 100
Alameda, CA 94501

Re: Northwest Area, located at 1150 Marina Village, Alameda, CA 94501
STID: [SLIC 3843]

Dear Mr. Verhaeghe,

This letter confirms the completion of site investigation and remedial action for the above site. Enclosed is the Case Closure Summary for the referenced site for your records.

Based on information in the above-referenced file and with the provision that the information provided to this agency was accurate and representative of site conditions, there appears to be no current threat to human health or the environment resulting from the site, and no further investigations will be required at this time. However, due to the remaining soil and groundwater contaminants at the site, this office has requested that the site follow a Site Management Plan, which is outlined in the attached Case Closure Summary.

Please be aware that this closure does not free present and future landowners or operators from cleanup responsibilities in the event that new information indicates a pollutant problem on the site or originating from the site.

If you have any questions or comments, please contact our office at (510) 567-6700.

Sincerely,


Juliet Shin
Senior Hazardous Materials Specialist

Attachment

cc: Elizabeth Nixon, Geomatrix Consultants, 100 Pine St., 10th Fl.,
S.F., CA 94111
Acting Chief, ACDEH

CASE CLOSURE SUMMARY

I. AGENCY INFORMATION

Date: December 17, 1996

Agency name: Alameda County-HazMat Address: 1131 Harbor Bay Pkwy.
City/State/Zip: Alameda, CA 94502 Phone: (510) 567-6700
Responsible staff person: Juliet Shin Title: Senior HMS

II. CASE INFORMATION

Site facility name: Northwest Area (Parcel C) Mariner Square Develop.
Site facility address: 1150 Marina Village, Alameda, CA 94501
RB LUSTIS Case No: N/A Local Case No./LOP Case No.: 3843

<u>Responsible Parties:</u>	<u>Addresses:</u>	<u>Phone Numbers:</u>
Rahn Verhaeghe Alameda Real Estate Investments	1150 Marina Village Pkwy. Ste. 100 Alameda, CA 94501	(510) 337-7404

III. RELEASE AND SITE CHARACTERIZATION INFORMATION

Cause and type of release: Possibly due to fill materials.

Site characterization complete? YES

Date approved by oversight agency: December 18, 1996

Monitoring Wells installed? YES Number: 9

Proper screened interval? YES. Wells screened from roughly from 3- to 5-foot bgs down to 13- to 15-foot bgs.

Highest GW depth below ground surface: 4.25 feet Lowest depth: 10.5 feet

Flow direction: north to east (towards the Oakland Inner Harbor)

Most sensitive current use: Commercial

Are drinking water wells affected? NO Aquifer name: Unknown

Is surface water affected? NO Nearest affected SW name: Alameda & Oakland Inner Harbor

Off-site beneficial use impacts (addresses/locations): None

Report(s) on file? YES Where is report(s) filed? Alameda County
1131 Harbor Bay Pkwy.
Alameda, CA 94502

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III. RELEASE AND SITE CHARACTERIZATION INFORMATION (Continued)

Maximum Documented Contaminant Concentrations - - Before and After Cleanup

Contaminant	Soil (ppm)		Water (ppb)	
	Before ¹	After	Before	After ²
TPH (Gas)	NA		ND	
TPH (Diesel)	2,000		62,000	
TPH motor oil	260		NA	
TPH as waste oil	24,000		33,000	
Benzene	ND		ND	
Toluene	ND		1	
Xylene	ND		14	
Ethylbenzene	ND		7	
Lead	520		ND	
Trichloroethene	0.38		NA	
Tetrachloroethene	NA		1	
chloroform	NA		3	

NA-Not Analyzed

1-These soil concentrations were not excavated and remain in-place at the site.

2-Product remains in Well LF-8 and LF-9. However, all other wells, including the wells located downgradient of Well LF-8 and LF-9 have not detected any TPHd, TPHmo, or BTEX in the last two quarters of monitoring, after they began applying the silica gel cleanup to eliminate interference from any biogenic materials.

IV. CLOSURE

Does completed corrective action protect "Existing" beneficial uses per the Regional Board Basin Plan? It appears that the only current beneficial use of groundwater at the site is the groundwater recharge to the Inner Harbor. According to the groundwater samples collected from downgradient wells, it appears that the Inner Harbor has not been impacted by the site.

Does completed corrective action protect "Potential" beneficial uses per the Regional Board Basin Plan? The Regional Board's Basin Plan does not list any "Potential" beneficial uses for the East Bay Plain.

Does corrective action protect public health for current land use? YES

Site management requirements:

As part of the Responsible Party's (RP) proposal for closure, the RP has agreed to a Site Management Plan (SMP), which is as follows:

"It is our understanding that the future development plans for the site will be similar to other commercial developments in the Marina Village Area. Under this expected development plan, the stockpiled soil will be used as fill material and, along with the subsurface soil, will be covered by one or more buildings, asphalt or concrete paving, and/or landscaping. In addition, groundwater at the site is not considered to be a potential drinking water source and shall not be used for any purposes unless express approval is obtained from Alameda County Environmental Protection Division and/or the Regional Water Quality Control Board. Therefore, the SMP for this site addresses construction safety

measures, buyer notification, potential off-site disposal, and future changes to the expected site construction and redevelopment plans. The property owners and operators will prohibit the creation of potential vertical conduits before, during, and after development.

Construction Safety Measures

Prior to any significant construction activities at the site, the contractor must prepare a site-specific health and safety plan. The plan should describe the construction activities and address standard safety precautions such as protective measures for workers, dust control, odor control, and soil handling issues, as appropriate.

Buyer Notification

The environmental conditions at the Site must be disclosed to all future buyers of the property to the extent required by law. The disclosure must contain information regarding the nature and extent of petroleum hydrocarbons in the soil and reference the various reports that contain chemical data and assess potential human health risks. The disclosure also must specify that during possible future excavation work, exposed soil should be prevented from eroding away from the Site and that off-site disposal be in accordance with applicable regulations.

Future Off-Site Disposal

Should future work at the Site generate soil that requires off-site disposal, the soil will need to be tested appropriately and disposed of at a facility licensed for such disposal.

Changes to Future Construction or Redevelopment Plans

The results of this risk evaluation indicate that soil containing residual levels of petroleum hydrocarbons and lead at the Site should not pose a significant health hazard to future building occupants or future maintenance workers assuming future development of the Site for commercial purposes. However, in the event that there is a land use change that could result in additional exposure pathways, the potential health risks associated with residual petroleum hydrocarbons and lead in soil at the Site would need to be reevaluated."

Monitoring wells Decommissioned: NO Will be decommissioned upon receipt of case closure.

List enforcement actions taken: None

V. LOCAL AGENCY REPRESENTATIVE DATA

Name: Juliet Ship Title: Senior HMS
Signature: *Juliet Ship* Date: 2/4/97

VI. RWQCB NOTIFICATION

Date Submitted to RB: 2/12/97 RB Response: Concur *[Signature]*
RWQCB Staff Name: SUMADHU ARIGALA Title: SEA Date: 2/12/97

VII. ADDITIONAL COMMENTS, DATA, ETC.

This site is located in the northwest corner of the Marina Village Development in Alameda, California. The area is located northwest of the Shipway buildings and in the vicinity of the Powerhouse building, and is comprised of property subparcels 1,2,5, and 6, and the Powerhouse parcel. The site currently consists of undeveloped areas and paved parking lots. The site is bounded to the east by Oakland Inner Harbor and boat docks, to the west by Marina Village Parkway, to the south by four former shipways that currently are developed as office space, and to the north by an adjacent property owned by Barnhill Construction Company. A sheet pile wall extends from the shipways westward and northward along the boat docks as shown on the attached site figure. The historical direction of the hydraulic gradient at the site generally has been toward Oakland Inner Harbor, and may be influenced by the presence of the sheet pile wall (refer to attached site location map and site plan).

Subsurface soils at the site consist of 3- to 8- feet of silty, sandy, or gravelly clay fill with variable amounts of large rocks and debris (wood, brick, concrete, and asphalt) underlain by 2- to 5-feet of green-gray sand, silty to clayey sand, sandy and silty clay or gravelly fill containing variable amounts of shells and wood fragments. Green Bay Mud was consistently encountered underneath this fill material.

On February 17, 1988 four preliminary test pits (NWPIT, RR8, RR9, and WEB) were dug by a backhoe on and around the site to assess whether the area was contaminated. Previous to the investigation of these test pits, Woodward Clyde installed one well, WC3, at this site, however, no information is available on the intent of installing this well. Test pit NWPIT was located within the study area. The other three pits were located outside the study area west of the Powerhouse and near the railroad tracks (pits RR8, RR9, and WEB). One soil sample was collected from test pit WEB from 4- to 5-feet below ground surface (bgs), and one "grab" groundwater sample was collected from test pit RR9. The "grab" groundwater sample, RR9(-200)-W, was analyzed for benzene, toluene, ethylbenzene, total xylenes (BTEX), Total Petroleum Hydrocarbons as gasoline (TPHg), TPH as diesel (TPHd), TPH as waste oil, and chlorinated hydrocarbons (VOCs). Analysis of this sample identified 1ppb toluene, 3ppb chloroform, and 1ppb tetrachloroethene (PCE). The soil sample collected from test pit WEB was analyzed for TPHd and TPH as waste oil. Analysis of this sample did not identify any contaminants above detection limits.

On March 14 through 17, 1988 an additional 15 test pits (pits 1 through 15) were dug on subparcels 1 and 5 and west of subparcel 1 on Work Street and along the railroad tracks to further assess the extent and severity of contamination. Eleven soil samples were collected from nine of these pits (Pits 2,4,5,7,8,9,10,11, and 12), from depths ranging from 4.5- to 10-feet bgs (refer to attached table). These samples were analyzed for one or more of the following: TPH as motor oil, volatile organics (using Method 8240), and/or semi-volatile organics (using Method 8270). Analysis results of all eleven soil samples identified up to 260ppm TPH as motor oil and 0.38ppm trichloroethene (TCE). No other contaminants were identified above detection limits (refer to attached sample results table).

On June 23, 1988 three more test pits, 16 through 18, were dug at subparcels 1 and 5 for further delineation of the observed contamination. No samples were collected from these pits, but visual observations were noted. Free product was observed seeping from the excavation sidewalls of Pit 16 from the sandy unit above the Bay Mud. The vertical extent of the petroleum product appeared to be bounded by the Bay Mud layer. Free product was also observed seeping from the sidewalls of some of the previously excavated test pits at the water table (NWPIT, 11, 12, 13, 13A, RR8, and RR9). Wood debris, coarse gravel, or abandoned piping routes were noted to be associated with the product. Black oily material or Bay Mud mottled with black were noted at ~6-feet bgs in Pits 17 and 18. In addition to these pits, several other previous test pits contained lightly to moderately stained soil with oily residue and wood debris near the groundwater surface (test pits 1,2,3, and 4).

Between March 22 and 23, 1988, five monitoring wells were installed at the site (LF6 through LF10). All five wells were screened from 5- to 15-feet bgs (refer to attached well logs). The depth to groundwater at the time of well installation ranged from 7- to 11-feet bgs. Free petroleum product was observed in a 2- to 3-foot thick layer of sediments (mostly gravel) in well borings LF8, LF9, and LF10. Groundwater samples were collected from these wells on March 29, 1988, and a groundwater sample was collected from the already existing well, WC3, on March 31, 1988. The groundwater samples collected from all the wells were analyzed for TPHd and volatile organics (using Method 624). The groundwater sample collected from LF8 was additionally analyzed for semi-volatile organics (using Method 625). Analysis of groundwater samples collected from Wells LF8, LF9, and LF10 identified TPHd at 62,000 parts per billion (ppb), 54,000ppb, and 43,000ppb. No other contaminants were identified in any of the water samples during this sampling event (refer to attached site plan for well locations and the attached table for analytical results).

Between February 17 through March 13, 1989, 16 additional soil borings (borings 5NW1 through 5NW14, 1NW1, and 1NW2) and three additional monitoring wells (LF-11, LF-12, and LF-13) were drilled at the site (refer to attached figure for locations). Stained soils were consistently noted in these borings between the groundwater surface (6- to 8-feet bgs) to the boundary of the underlying Bay Mud (9- to 15-feet bgs). The observed thickness of petroleum affected soils ranged from approximately 2- to 8-feet. Well LF-11 and LF-12 were screened from 4- to 14-feet bgs, and Well LF-13 were screened from 3- to 13-feet bgs.

Soil samples were collected from these borings between 6.5- to 13-feet bgs. Soil samples 5NW-1A, 5NW-2A-2B, 5NW-3A, 5NW-4B, and 5NW-5A were analyzed for TPHd, waste oil, and BTEX. Up to 2,000ppm weathered diesel and 28,000ppm waste oil was identified from these soil samples. Soil samples 5NW6 through 5NW14, and soil samples collected from LF11-LF13, were analyzed for diesel and waste oil only. Analysis identified up to 8,000ppm waste oil in these samples. Soil sample 5NW-4B was also analyzed for PCB and 5NW-4B and 5NW-6 were analyzed for metals. No PCBs were identified, however, lead was identified at 520ppm in 5NW-4B, exceeding 10 times the STLC for lead (5ppm) (refer to attached tables for sample results).

"Grab" water samples collected from 5NW2, 5NW3, 5NW4, 5NW5 were analyzed for 8240 constituents and none of these constituents were identified. Water samples from 5NW-1, 5NW-2, 5NW-3, and 5NW-5 were also analyzed for diesel and waste oil. Up to 25,000ppb weathered diesel and 33,000ppb waste oil were identified from these samples. Water samples collected from wells WC-3, LF-6, LF-7, LF-8, LF-9, LF-10, and LF-11 through LF-14 were analyzed for diesel, waste oil, and BTEX. Up to 7,800ppb waste oil and 12,000ppb diesel were identified in these water samples.

Soil samples collected from three borings (2NW2, 2NW3, and 2NW5), that were drilled as part of a separate investigation on the adjacent Parcel 2, identified commensurate levels of TPH (up to 14,000ppm) as samples collected from this site (The locations of these off-site borings are noted in the attached figure).

In total, groundwater samples were collected and analyzed from Wells LF-6, LF-7, LF-8, and WC3 for six separate monitoring events between March 1988 and April 1996, and Wells LF-9, LF-10, LF-11, LF-12, and LF-13 were monitored on five separate occasions between these dates (please refer to attached table). Although groundwater samples collected from these wells initially identified very elevated levels of TPHd and motor oil, concentrations went down to Non Detect in all wells, except for LF-8 and LF-9 which contain product, after applying the silica gel cleanup to eliminate any interference from biogenic materials. Based on the fact that wells downgradient of LF-8 and LF-9 are not identifying any contaminants, it appears that the product observed in LF-8 and LF-9 are limited in extent and cannot readily migrate.

In July 1996, four additional soil samples, TP-1 through TP-4, were collected from 0- to 4-foot bgs and analyzed for lead, due to the previously detected lead concentration in soil at 520ppm lead in Sample 5NW-4B (refer to attached figure for sample locations). Analysis results identified a range of 33ppm to 400ppm lead. A human health risk assessment conducted for the site in September 1996 determined that these levels of lead, along with the historically detected levels of TPH in both groundwater and soil at the site would not pose a threat to human health for the planned use of the site, which is commercial. The risk assessment also addressed the proposal to reuse stockpiled soil on the site, which contained a range of 85ppm to 370ppm TPHd, and low levels of toluene (0.018ppm) and lead (200ppm). It was determined that this soil would not pose a threat if it was used beneath the proposed buildings and some in the planter boxes in the planned parking lot, on the condition that there would be at least one foot of clean fill placed on top of the reused soil in the planter boxes and that only small plants, and no trees, would be placed in these planter boxes.

In summary, this office is recommending the site for closure, based on the following:

- o Residual degraded medium- to high-boiling petroleum hydrocarbons remaining in site soil from historical activities are not an ongoing source to groundwater. Groundwater monitoring data from 1995 and 1996 for wells downgradient of the affected soil shows that petroleum hydrocarbons are not present in groundwater.
- o The extent of impacted soil and groundwater at the site has been characterized. Petroleum hydrocarbons generally have not been detected in groundwater monitoring wells at the perimeter of the affected soil area.
- o Groundwater has been monitored at the site since 1988. Dissolved petroleum constituents generally have not been detected in monitoring wells. Detections, when present, have been sporadic and at similar concentrations. These data and the age of the petroleum hydrocarbons present (several decades) strongly suggest that the impact to groundwater, if any, is insignificant.
- o The groundwater at the site exceeds 3,000ppm Total Dissolved Solids and is therefore not potable.
- o The absence of significant petroleum hydrocarbons in groundwater from perimeter wells along the Oakland Inner Harbor shoreline indicate that this surface water body is not likely to be impacted.

TABLE 2
 SOIL SAMPLE CHEMICAL ANALYSIS DATA
 TOTAL PETROLEUM HYDROCARBONS (TPH)
 (All concentrations expressed in ppm)

Sample No.	Depth (feet)	Date Sampled	TPH
NWPIT2 - 9'	9	3/14/88	<10
NWPIT2 - 9-7'	7 - 9	3/14/88	52
NWPIT4 - 9-10'	9 - 10	3/14/88	260
NWPIT5 - 7.5'	7.5	3/14/88	<10
NWPIT7 - 5-6'	5 - 6	3/14/88	<10
NWPIT8 - 5-6'	5 - 6	3/14/88	<10
NWPIT9 - 4.5'	4.5	3/14/88	110
NWPIT10 - 7'	7	3/14/88	<10
NWPIT11 - 6.5'	6.5	3/15/88	720
NWPIT11 - 8'	8	3/15/88	11,000
NWPIT12 - 6'	6	3/15/88	1,000
WEB *	4-5	2/17/88	<10

Notes: Sampling analyses performed by Anatec Laboratories, using EPA Method 8015 (extraction).

* Sample WEB was analyzed by Med-Tox Associates, using EPA Method 8015.

FIGURES

TABLE 3

HISTORICAL GROUNDWATER ANALYTICAL RESULTS¹

Northwest Area
Marina Village
Alameda, California

Concentrations in milligrams per liter (mg/l)

Well Number	Date Sampled	TPHd ²	TPHmo ³	Benzene	Toluene	Ethylbenzene	Xylenes	Total Lead	Petroleum Product ¹ Thickness (inches)
LF-6	3/29/88	<0.05	<0.05	<0.004	<0.006	<0.007	NA	NA	
	3/28/89	<0.3	<0.5	<0.0005	<0.0005	<0.0005	<0.002	NA	
	8/3/89	<0.3	<0.5	NA	NA	NA	NA	NA	
	1/1/90	NA	NA	NA	NA	NA	NA	NA	
	7/12/95	<0.05	<0.2	NA	NA	NA	NA	NA	
	4/15/96	<0.05	<0.25	NA	NA	NA	NA	NA	
LF-7	3/29/88	<0.05	<0.05	<0.004	<0.006	<0.007	NA	NA	
	3/28/89	<0.3	1.8	<0.0005	<0.0005	<0.0005	<0.002	NA	
	8/3/89	<0.3	<0.5	NA	NA	NA	NA	NA	
	1/31/90	<0.3	3.3	<0.0005	0.003	0.001	0.007	NA	
	7/13/95	<0.05	<0.2	<0.0005	<0.0005	<0.0005	<0.002	NA	
	4/15/96	<0.05	<0.25	0.0007/<0.0005	0.0007/<0.0005	<0.0005/<0.0005	<0.0005/<0.0005	NA	
LF-8	3/29/88	62.0	NQ	<0.004	<0.006	<0.007	NA	NA	<0.1
	3/28/89	NA	NA	<0.003	<0.003	<0.003	<0.010	NA	Approx. 2
	8/3/89	NA	NA	NA	NA	NA	NA	NA	Approx. 5
	1/31/90	NA	NA	NA	NA	NA	NA	NA	Approx. 7
	7/11/95	NA	NA	NA	NA	NA	NA	NA	Approx. 6
	4/15/96	NA	NA	NA	NA	NA	NA	NA	Approx. 2
LF-9	3/29/88	54.0	NQ	<0.004	<0.006	0.007	NA	NA	
	3/28/89	12.0	6.0	<0.0005	<0.0005	<0.0005	<0.002	NA	
	8/3/89	79.0	67.0	NA	NA	NA	NA	NA	
	1/31/90	15.0/12.0	17.0/15.0	0.003/0.003	<0.0005/<0.0005	0.007/0.006	0.014/0.012	NA	

TABLE 3

HISTORICAL GROUNDWATER ANALYTICAL RESULTS¹

Well Number	Date Sampled	TPHd ²	TPHmo ³	Benzene	Toluene	Ethylbenzene	Xylenes	Total Lead	Petroleum Product ⁴ Thickness (inches)
LF-10	3/29/88	43.0	NQ	<0.004	<0.006	<0.007	NA	NA	
	3/28/89	<0.2	7.8	<0.0005	<0.0005	<0.0005	<0.002	NA	
	8/3/89	<0.3/<0.3	8.3/7.6	NA/NA	NA/NA	NA/NA	NA/NA	NA	
	1/31/90	<0.3	17.0	<0.0005	<0.0005	<0.0005	<0.002	NA	
	7/14/95	0.06/0.06	<0.2/<0.2	NA/NA	NA/NA	NA/NA	NA/NA	NA	
	7/14/95 (filtered)	0.07	<0.2	NA	NA	NA	NA	NA	
	4/15/96	<0.05	<0.25	NA	NA	NA	NA	NA	
LF-11	3/28/89	<0.3	1.0	<0.0005	<0.0005	<0.0005	<0.002	NA	
	8/3/89	<0.3	0.9	NA	NA	NA	NA	NA	
	1/31/90	<0.3	1.2	<0.0005	<0.0005	<0.0005	<0.002	NA	
	7/12/95	<0.05	<0.2	NA	NA	NA	NA	NA	
	4/15/96	<0.05	<0.25	NA	NA	NA	NA	<0.005	
LF-12	3/28/89	<0.3	1.1	<0.0005	<0.0005	<0.0005	<0.002	NA	
	8/3/89	<0.3	2.0	NA	NA	NA	NA	NA	
	1/31/90	<0.3	1.4	<0.0005	<0.0005	<0.0005	<0.002	NA	
	7/13/95	<0.05	<0.2	NA	NA	NA	NA	NA	
	4/15/96	<0.05	<0.25	NA	NA	NA	NA	<0.005	
LF-13	3/28/89	<0.3	4.4	<0.0005	<0.0005	<0.0005	<0.002	NA	
	8/3/89	<0.3	3.0	NA	NA	NA	NA	NA	
	1/31/90	<0.3	6.1	0.004	0.001	<0.0005	<0.002	NA	
	7/14/95	NR	NR	<0.0005	<0.0005	<0.0005	<0.002	NA	
	7/14/95	<0.05	<0.2	NA	NA	NA	NA	NA	
	4/15/96	<0.05	<0.25	<0.0005	<0.0005	<0.0005	<0.0005	NA	

TABLE 3

 HISTORICAL GROUNDWATER ANALYTICAL RESULTS¹

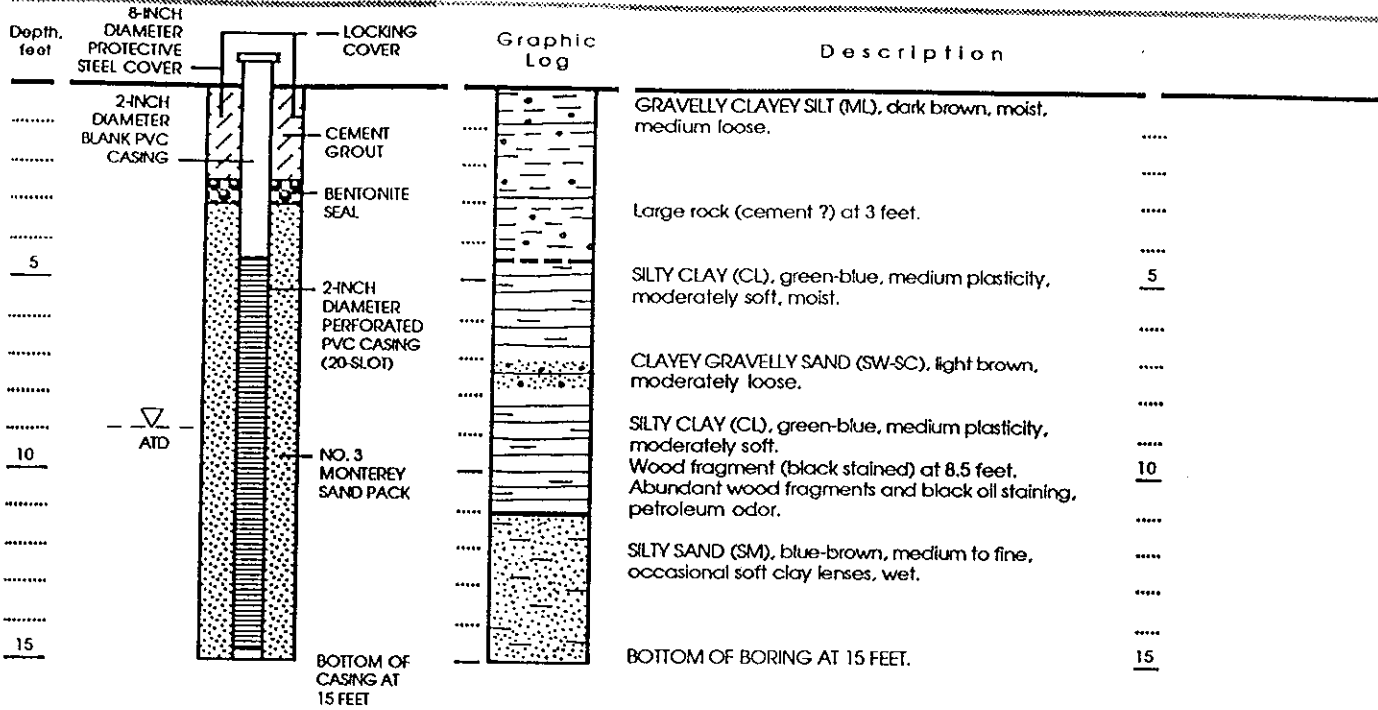
Well Number	Date Sampled	TPHd ²	TPHmo ³	Benzene	Toluene	Ethylbenzene	Xylenes	Total Lead	Petroleum Product ⁴ Thickness (inches)
WC-3	3/31/88	<0.05	<0.05	<0.004	<0.006	<0.007	NA	NA	
	3/28/89	<0.3	3.2	<0.0005	<0.0005	<0.0005	<0.002	NA	
	8/3/89	<0.3	1.0	NA	NA	NA	NA	NA	
	1/31/90	<0.3	5.7	<0.0005	<0.0005	<0.0005	<0.002	NA	
	7/14/95	<0.05	<0.2	NA	NA	NA	NA	NA	
	4/15/96	<0.05	<0.25	NA	NA	MA	NA	NA	
GMW-2	4/29/92	0.2	0.4	NA	NA	NA	NA	NA	
	7/12/95	<0.05	<0.2	NA	NA	NA	NA	NA	
	4/15/96	<0.05	<0.25	NA	NA	NA	NA	NA	

Notes:






- / Indicates duplicate sample.
- ¹ Samples analyzed for total petroleum hydrocarbons as diesel and motor oil by EPA Method 8015, and for benzene, toluene, ethylbenzene, and xylenes by EPA Method 602. In 1995, silica gel cleanup was performed prior to all 8015 analyses, and samples from wells LF-10, LF-13, and WC-3 were filtered prior to analysis. In 1996, all samples were filtered and a silica gel cleanup was performed prior to 8015 analysis.
- ² TPHd = total petroleum hydrocarbons as diesel.
- ³ TPHmo = total petroleum hydrocarbons as motor oil.
- ⁴ Product characterized as crude oil.
- NQ Indicates extractable TPH detected in samples was not quantified against motor oil standard.
- NA Indicates not analyzed.
- NR Not reported due to insufficient silica gel cleanup on the sample.

WELL CONSTRUCTION

LITHOLOGY



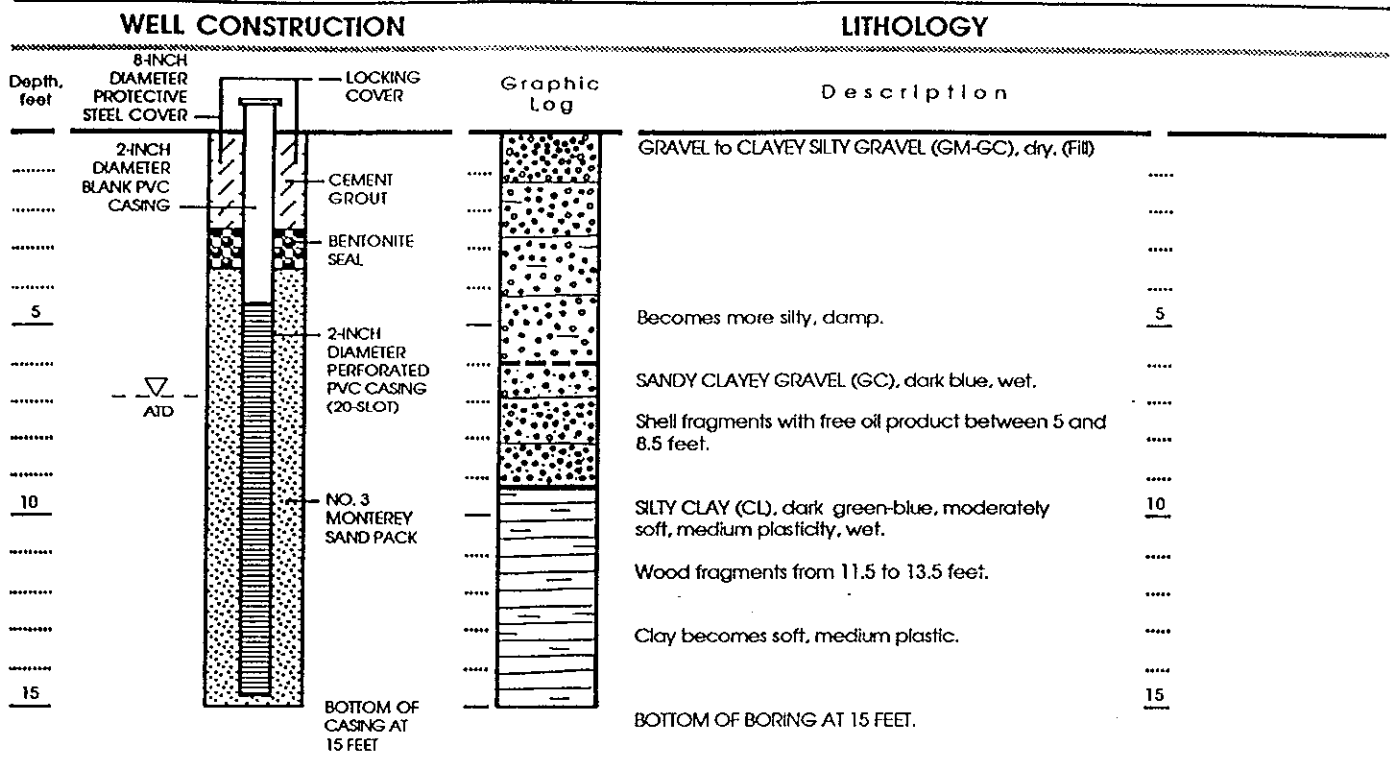
EXPLANATION

-  Clay
-  Silt
-  Sand
-  Gravel
-  Water level at time of drilling

Well Permit No. 88063
 Date well drilled: 22 March 1988
 LF Geologist: Scott Seyfried






Approved by: *ADA* 4267

Figure B2 : WELL CONSTRUCTION AND LITHOLOGY FOR WELL LF-7



Well Permit No. 88063
 Date well drilled: 22 March 1988
 LF Geologist: Scott Seyfried

EXPLANATION

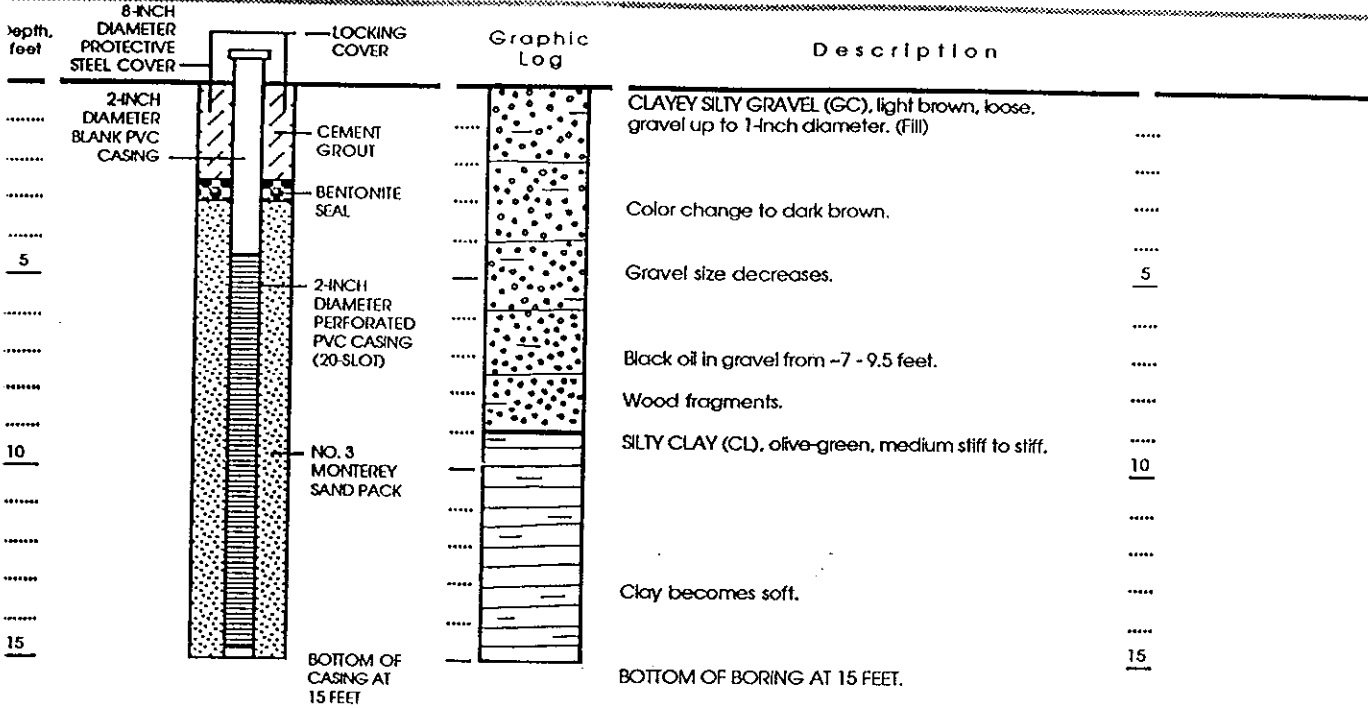
-  Clay
-  Silt
-  Sand
-  Gravel
-  Water level at time of drilling

Approved by: *ADA* 4267





Figure B3 : WELL CONSTRUCTION AND LITHOLOGY FOR WELL LF-8

WELL CONSTRUCTION

LITHOLOGY



EXPLANATION

-  Clay
-  Silt
-  Sand
-  Gravel

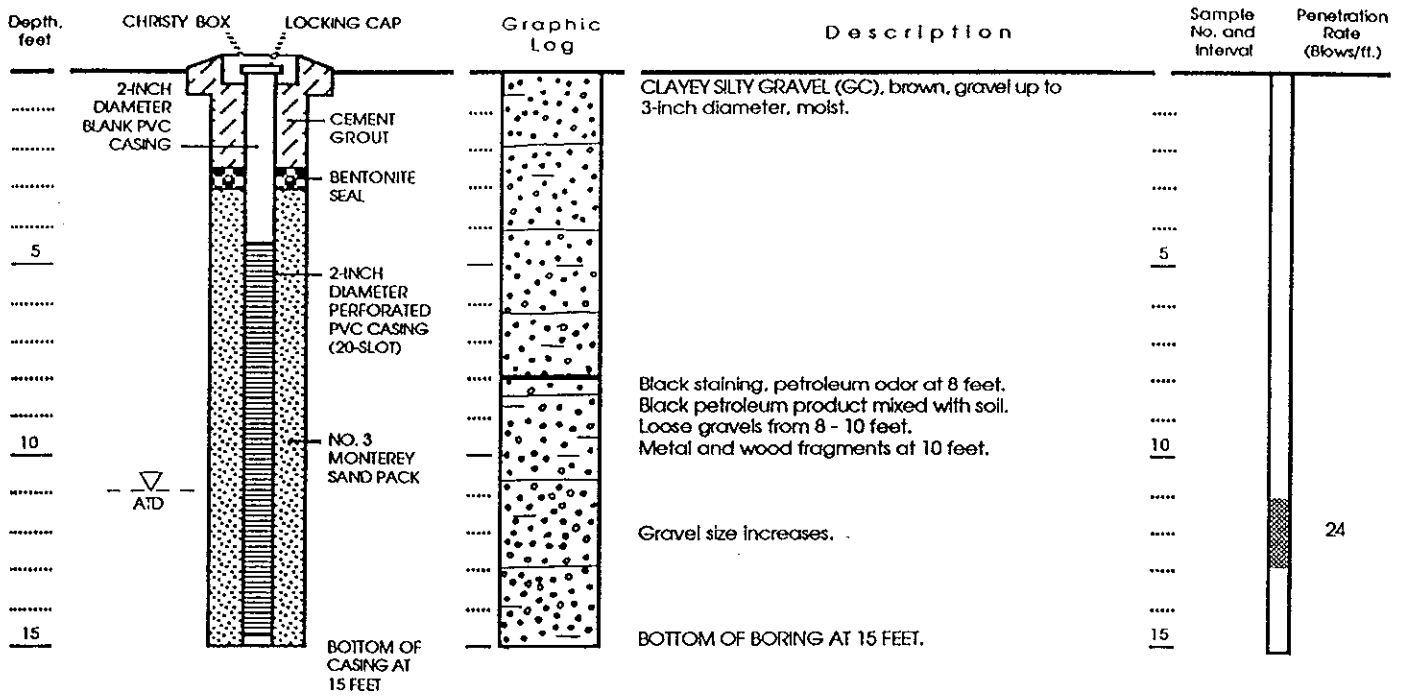
Well Permit No. 88063
 Date well drilled: 22 March 1988
 LF Geologist: Scott Seyfried

Approved by: *ADD 4267*

Figure B4 : WELL CONSTRUCTION AND LITHOLOGY FOR WELL LF-9

WELL CONSTRUCTION

LITHOLOGY



Well Permit No. 88063
 Date well drilled: 23 March 1988
 LF Geologist: Scott Seyfried

EXPLANATION

- Clay
- Silt
- Sand
- Gravel
- Water level at time of drilling

Approved by: *AAA 4267*

Figure B5 : WELL CONSTRUCTION AND LITHOLOGY FOR WELL LF-10

TABLE 2

SOIL CHEMICAL ANALYSIS DATA
 TOTAL PETROLEUM HYDROCARBONS AND BENZENE, TOLUENE, XYLENES AND ETHYLBENZENE
 (Results expressed in ppm)

what carbon range?

Sample Number	Depth (feet)	Date Sampled	TPH - EPA Method 8015		EPA METHOD 8020/8240			
			Diesel	Waste Oil	Benzene	Toluene	Xylenes	Ethyl-Benzene
Parcel 2								
2NW2	8-9.5	15-Aug-88	150	NQ	<0.005	0.016	<0.010	<0.005
2NW3	7-7.5	15-Aug-88	<10	NQ	NA	NA	NA	NA
	8.5-9	15-Aug-88	37	NQ	NA	NA	NA	NA
2NW5	7-7.5	15-Aug-88	<10	NQ	NA	NA	NA	NA
	10-10.5	15-Aug-88	120	NQ	NA	NA	NA	NA
Parcel 1								
1NW1	3-3.5/4-4.5 *	13-Mar-89	<200	1,600	NA	NA	NA	NA
1NW2	7-7.5/8.5-9 *	13-Mar-89	<200	5,700	NA	NA	NA	NA
LF12	7.5-8/8-8.5 *	09-Mar-89	<20	140	NA	NA	NA	NA
LF13	6-6.5/7.5-8 *	10-Mar-89	<4,000	8,000	NA	NA	NA	NA

Notes: * - Composite Sample.

- Sample contains higher molecular weight hydrocarbons than those typically contained in diesel fuel.

NQ - Not quantified against waste oil standard.

NA - Not analyzed.

Analyses performed by Med-Tox Associates of Pleasant Hill, California.

TABLE 2

SOIL CHEMICAL ANALYSIS DATA
 TOTAL PETROLEUM HYDROCARBONS AND BENZENE, TOLUENE, XYLENES AND ETHYLBENZENE
 (Results expressed in ppm)

Sample Number	Depth (feet)	Date Sampled	TPH - EPA Method 8015		EPA METHOD 8020/8240			Ethyl-Benzene
			Diesel	Waste Oil	Benzene	Toluene	Xylenes	
Parcel 5								
5NW1-A	7.5-8	17-Feb-89	2,000 #	<100	<0.500	0.700	<1.000	<0.500
5NW2-A	7-7.5	17-Feb-89	NA	NA	<0.001	0.045	<0.003	<0.001
5NW2/A-B	7-8 *	17-Feb-89	<10	710	NA	NA	NA	NA
5NW3-A	7-7.5	17-Feb-89	<10	<20	<0.001	0.023	<0.003	<0.003
5NW4-B	8-8.5	17-Feb-89	<5,000	28,000	NA	NA	NA	NA
5NW5-A	7-7.5	17-Feb-89	<500	4,600	<0.003	0.460	<0.008	<0.003
5NW6	7-7.5/8.5-9 *	09-Mar-89	<30	150	NA	NA	NA	NA
	10-10.5/11.5-12 *	09-Mar-89	<300	910	NA	NA	NA	NA
	13-13.5	09-Mar-89	<600	2,000	NA	NA	NA	NA
5NW7	7.5-8	09-Mar-89	<20	510	NA	NA	NA	NA
	10-10.5	09-Mar-89	<10	73	NA	NA	NA	NA
5NW8	8-8.5/10-10.5 *	09-Mar-89	<500	1,400	NA	NA	NA	NA
5NW9	8-8.5/9.5-10*	09-Mar-89	<1,000	4,600	NA	NA	NA	NA
5NW10	10.5-11	09-Mar-89	<10	120	NA	NA	NA	NA
5NW11	6.5-7/7-7.5 *	09-Mar-89	<20	1,500	NA	NA	NA	NA
5NW12	9.5-10	09-Mar-89	<10	260	NA	NA	NA	NA
	11-11.5	09-Mar-89	<10	280	NA	NA	NA	NA
5NW13	7-7.5/8.5-9 *	10-Mar-89	<20	740	NA	NA	NA	NA
5NW14	9.5-10/11-11.5/ 12.5-13 *	13-Mar-89	<20	280	NA	NA	NA	NA
LF11	7.5-8/7-7.5 *	10-Mar-89	<10	32	NA	NA	NA	NA

TABLE 3

GROUND-WATER CHEMICAL ANALYSIS DATA - SOIL BORINGS, PARCEL 5
 TOTAL PETROLEUM HYDROCARBONS
 (Results expressed in mg/l)

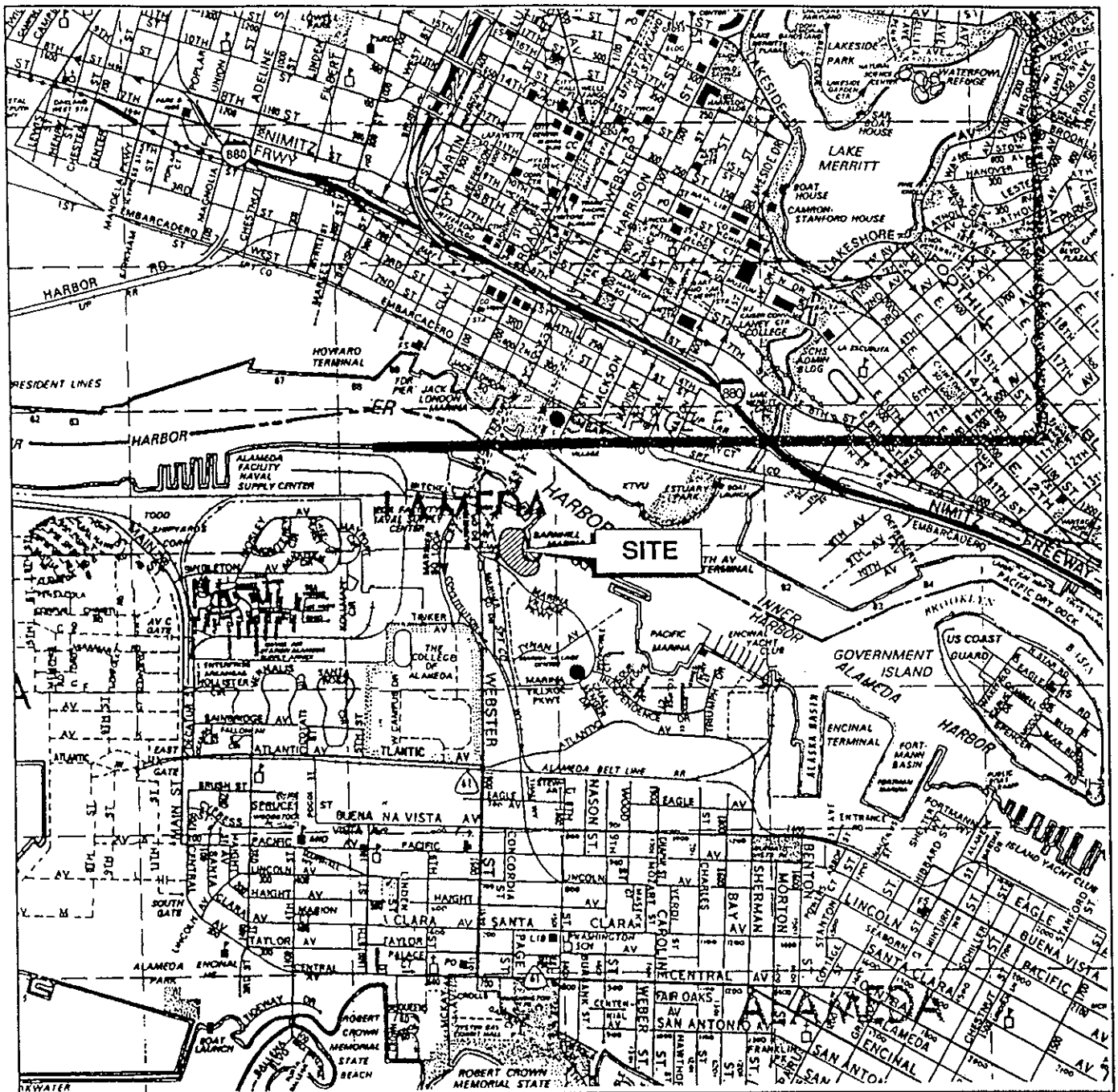
=====				
TPH - EPA Method 8015				
Well No.	Date	Analytical Lab.	Diesel	Waste Oil

5NW-1	17-Feb-89	M-T	25 #	33
5NW-2	17-Feb-89	M-T	0.3 #	<0.5
5NW-3	17-Feb-89	M-T	13 #	<0.5
5NW-4	17-Feb-89	M-T	0.9	<0.5
5NW-5	17-Feb-89	M-T	<1	8.7
=====				

Notes:

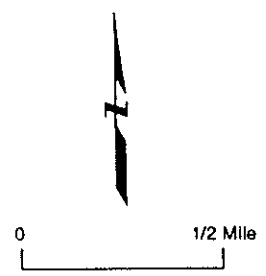
M-T = Med-Tox Associates of Pleasant Hill, California.

- Sample contains higher molecular weight hydrocarbons than those typically contained in a diesel fuel.



Map Source: The Thomas Guide, Alameda County Street Guide and Directory, 1993

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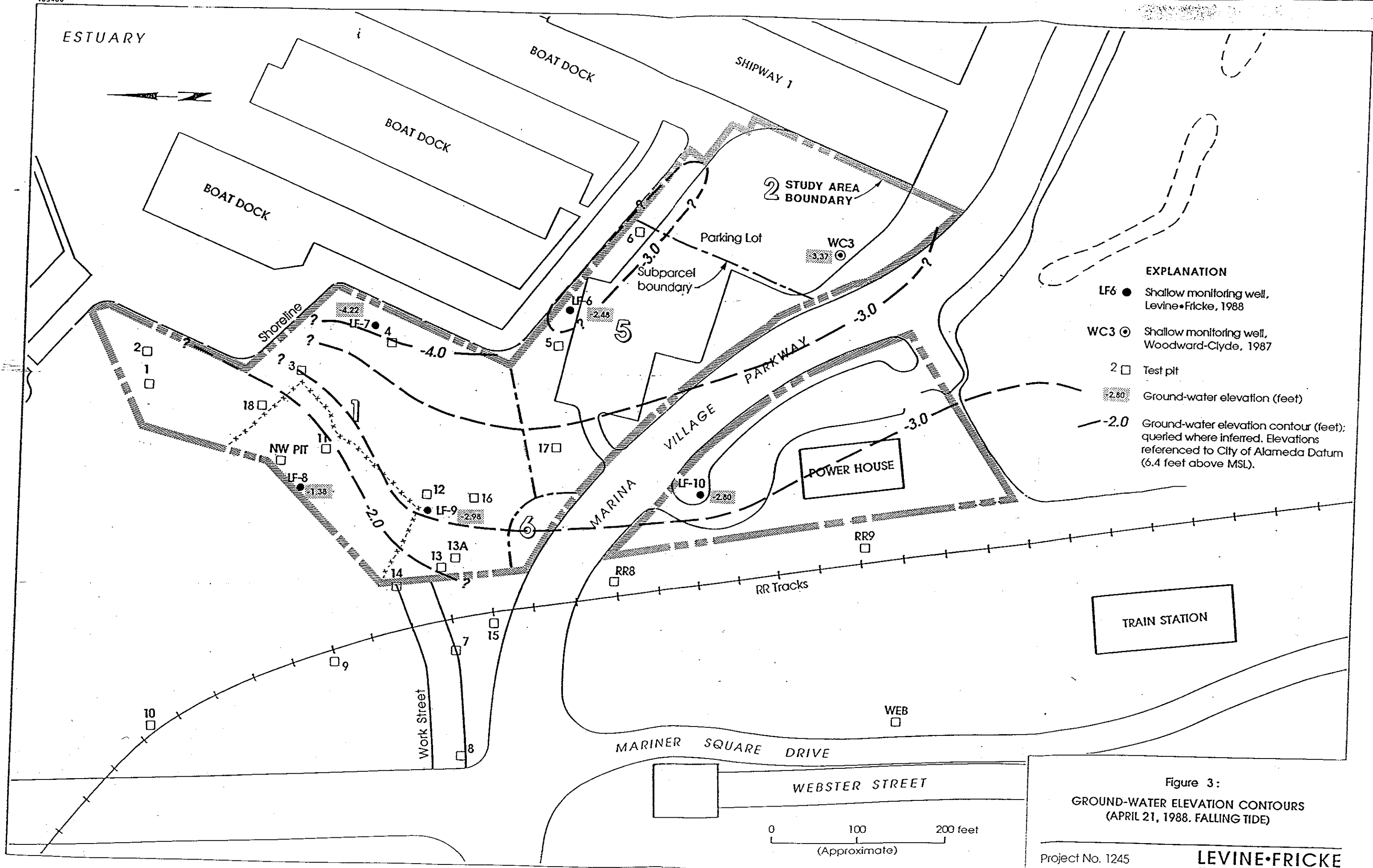


1736.14.002



SITE LOCATION MAP
Marina Village
Alameda, California

Figure
1
Project No.
1736.14



- EXPLANATION**
- LF6 ● Shallow monitoring well, Levine•Fricke, 1988
 - WC3 ⊙ Shallow monitoring well, Woodward-Clyde, 1987
 - Test pit
 - 2.80 Ground-water elevation (feet)
 - 2.0 Ground-water elevation contour (feet); queried where inferred. Elevations referenced to City of Alameda Datum (6.4 feet above MSL).

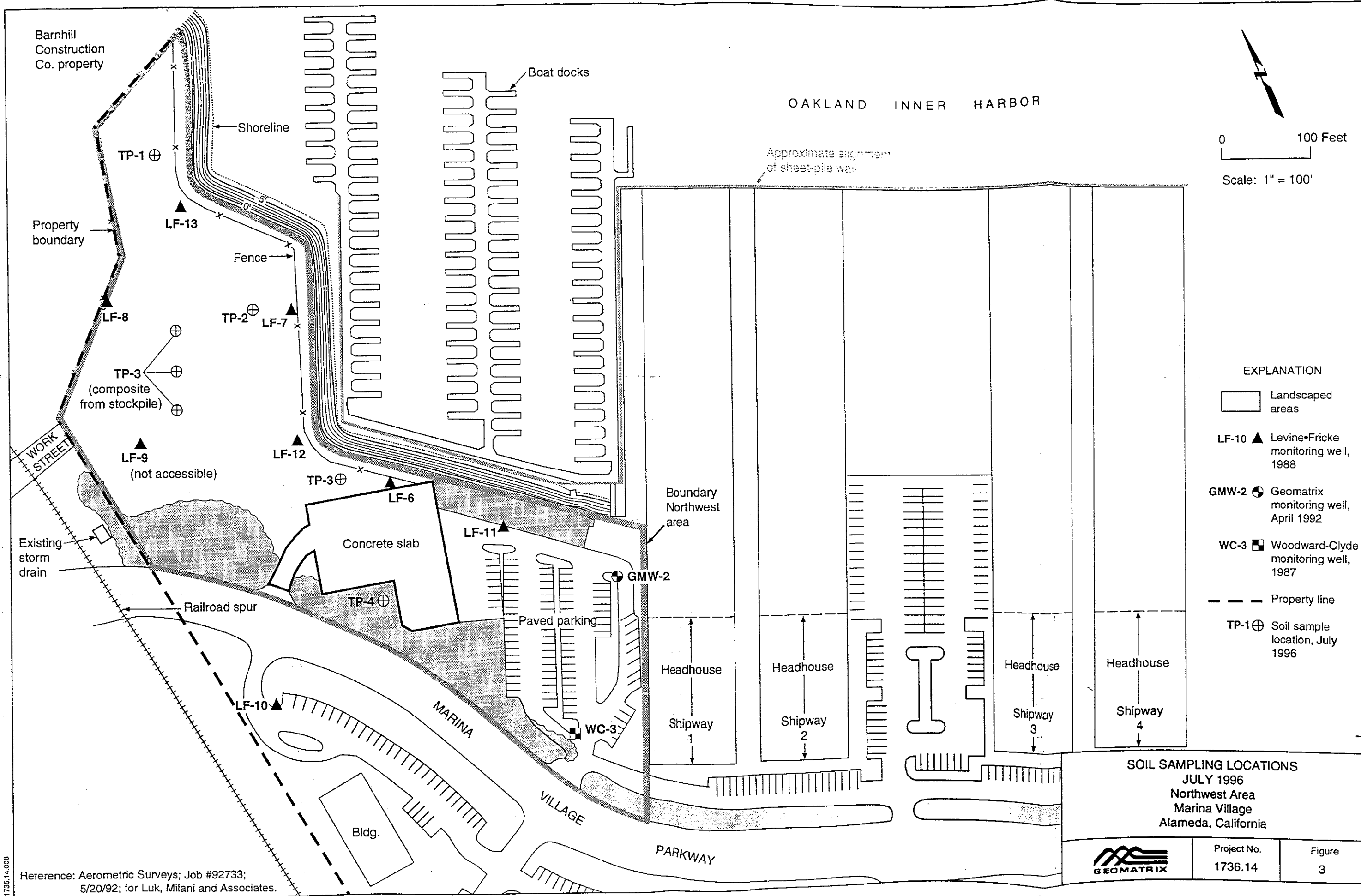
0 100 200 feet
(Approximate)

Figure 3:
GROUND-WATER ELEVATION CONTOURS
(APRIL 21, 1988, FALLING TIDE)

Project No. 1245

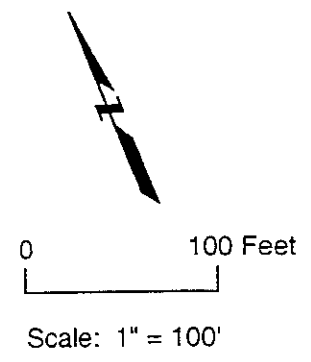
LEVINE•FRICKE
CONSULTING ENGINEERS AND HYDROGEOLOGISTS

EAN10AUG88JM



Barnhill
Construction
Co. property

OAKLAND INNER HARBOR



EXPLANATION

- Landscaped areas
- LF-10 Levine-Fricke monitoring well, 1988
- GMW-2 Geomatrix monitoring well, April 1992
- WC-3 Woodward-Clyde monitoring well, 1987
- Property line
- TP-1 Soil sample location, July 1996

SOIL SAMPLING LOCATIONS
JULY 1996
Northwest Area
Marina Village
Alameda, California



Project No. 1736.14	Figure 3
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Reference: Aerometric Surveys; Job #92733;
5/20/92; for Luk, Milani and Associates.

1736.14.008