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**Work Plan to Install
One Ground-Water Monitoring Well
and Conduct Quarterly Monitoring
Bashland Property
Emeryville, California**

**December 15, 1992
1649.10**

**Prepared for
Catellus Development Corporation
201 Mission Street
San Francisco, California**



LEVINE·FRICKE



LEVINE•FRICKE

ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

92 OCT 27 11 31 AM '92



LF 1649.10

Ms. Susan Hugo
Alameda County Health Care Services Agency
80 Swan Way, Suite 200
Oakland, California 94621

Subject: ~~Work Plan to Install One Ground-Water Monitoring~~
Well and Conduct Quarterly Monitoring, Bashland
Property, Emeryville, California

Dear Susan:

Enclosed is a work plan to install one ground-water monitoring well and conduct quarterly monitoring at the Bashland Property, located at the Yerba Buena Project Site in Emeryville, California. This work plan has been prepared on behalf of Catellus Development Corporation, contractor for the redevelopment project at the Yerba Buena Project Site, in accordance with recommendations presented in Levine•Fricke's report entitled "Tank Removal Report, Bashland Property, 4015 Hollis Street" and in accordance with your October 20, 1992 letter to Stevens Condie, Esq., legal counsel for Bashland Incorporated, the property owner.

The work plan describes the proposed investigation activities and outlines the quarterly monitoring program to be implemented for the Bashland Property beginning with the first quarter of 1993 (January through March 1993), pending receipt of written approval of the work plan from the Alameda Health Care Services Agency. The objective of the quarterly sampling program is to monitor the possible future impact of petroleum-affected soil in the vicinity of the former underground storage tanks on shallow ground-water quality beneath the Bashland Property. Following one year of quarterly monitoring, data for the Bashland Property will be re-evaluated to assess whether a semiannual monitoring program is appropriate for the property.

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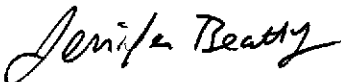
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Additionally, a task to collect soil samples for chemical analysis from beneath the retaining wall, along the northern edge of the former tank excavation/property line, has been included in this work plan. These samples will be collected when the wall is removed from the Bashland Property during proposed site development. The soil samples will be collected to evaluate the possible presence of petroleum hydrocarbons in the vicinity of the retaining wall.

Please call me if you have any questions or comments regarding this work plan.

Sincerely,



Jenifer Beatty
Project Hydrogeologist

cc: Lester Feldman, RWQCB
Ric Notini, Catellus
Pat Cashman, Catellus
Don Marini, Catellus
Kimberly Brandt, Catellus

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December 15, 1992

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**WORK PLAN TO INSTALL ONE MONITORING WELL
AND CONDUCT QUARTERLY MONITORING
BASHLAND COMPANY PROPERTY
EMERYVILLE, CALIFORNIA**

1.0 INTRODUCTION

This work plan describes the tasks necessary to install one additional ~~ground-water monitoring well~~ and conduct quarterly ground-water monitoring at the Bashland Property ~~located at~~ ~~Figure 1~~ ~~of the Yerba Buena Project Site in~~ Emeryville, California. Also included in this work plan is a task to collect soil samples for chemical analysis from beneath the retaining wall, along the northern edge of the former tank excavation/property line, when the wall is removed from the Bashland Property during proposed site development. The soil samples will be collected and analyzed to evaluate the possible presence of petroleum hydrocarbons in the vicinity of the wall.

The scope of work presented in this work plan is proposed in accordance with recommendations presented in the June 24, 1992 report entitled "Tank Removal Report, Bashland Property, 4015 Hollis Street," prepared by Levine-Fricke on behalf of Catellus Development Corporation ("Catellus"), contractor for the redevelopment project at the Yerba Buena Project Site, and in response to the October 20, 1992 letter from the Alameda County Health Care Services Agency (ACHA) to Stevens Condie, Esq., legal counsel for Bashland Incorporated, the property owner.

2.0 BACKGROUND AND PREVIOUS INVESTIGATIONS

Between March 23 and May 7, 1992, one 1,000-gallon ~~oil~~ ~~and~~ ~~two~~ ~~500-gallon~~ ~~oil~~ ~~tanks~~ were removed from the Bashland Property by Trumpp Brothers, Inc., of San Jose, California, under permits from the City of Emeryville (permit number B-4278-492), the Emeryville Fire Department (EFD), and the ACHA. Ms. Susan Hugo, Senior Hazardous Materials Specialist of the ACHA, Mr. Ron Owcarz, Hazardous Specialist of the ACHA, and a representative of the EFD were on site to observe tank removal and soil sampling activities. Holes were observed in two of the three tanks removed.

2/3/93
1,500 ppm TPH oil
was over H contained
L to groundwater from
to backfilling
4/27/92

To assess the possible presence of residual petroleum hydrocarbons in the soil after the tanks were removed, ~~excavation sidewall and two excavation floor soil samples~~ were collected from locations approved by ACHA staff. Chemical analysis results for soil samples collected from the excavation sidewalls indicated low concentrations (below detection limits to 2 parts per million [ppm]) of petroleum product or associated constituents. Total petroleum hydrocarbons as oil (TPHo) were detected in ~~one of the three~~ samples at a concentration of 1,500 ppm but were below laboratory detection limits in the ~~other~~ samples. Based on these results, the excavation was backfilled using 3/4-inch drain rock and clean imported fill material on May 6 and 7, 1992, upon approval of the ACHA.

During excavation, ground water was encountered at approximately ~~13~~ feet below ground surface (bgs); the total depth of the excavation was approximately ~~13~~. Ground water that collected in the bottom of the excavation was purged and allowed to recharge. Analysis of two grab samples of ground water collected from the vicinity of the former ~~20,000-gallon capacity tanks~~ indicated low concentrations of TPH as diesel (TPHD) and TPHo (less than 5 ppm). Chlorinated solvents, dichloroethylene (1,2-DCE) and trichloroethylene (TCE) were detected in the ground-water sample at low concentrations (less than ~~0.005 ppm and 0.011 ppm or less,~~ respectively).

Chlorinated solvents were not detected in the three soil samples analyzed for solvents. Therefore, it appears that the ~~source for the solvents is upgradient and off site because (1) TCE was detected in ground water upgradient from the tank excavation and (2) DCE and 1,2-DCE were not detected in soil samples collected from the tank excavation or during installation of monitoring well~~ formerly located just north of the tanks.

3.0 PROPOSED SCOPE OF WORK

To evaluate whether petroleum hydrocarbons have impacted ground water in the vicinity of the former tanks, shallow ground-water monitoring well ~~will~~ be installed downgradient from and with ~~the~~ ~~east~~ of the former tank location. It is anticipated that the well will be installed during the first quarter of 1993 (January through March 1993) and that a quarterly monitoring program will be implemented at Bashland beginning with the first quarter of 1993.

Task 1: Well Installation and Development

The proposed location for monitoring well LF-31 is shown on Figure 2. Field methods to be used during installation and development are presented below.

Borehole Drilling

Before drilling begins, the appropriate permits will be obtained from the Alameda County Flood Control and Water Conservation District, Zone 7.

Drilling activities will be conducted under the supervision of a California Registered Geologist. All downhole drilling and sampling equipment will be steam cleaned before use. The borehole for the monitoring well will be drilled by a licensed well drilling contractor using a truck-mounted drilling rig equipped with 10-inch outside-diameter hollow augers. The anticipated total depth of the borehole is 20 to 25 feet bgs. The depth to first ground water, encountered in May 1992 during drilling at the Yerba Buena Project Site, located across Hollis Street from the Bashland Property, ranged between 12 and 16 feet bgs.

Soil Sampling

Soil samples will be collected for lithologic description at 2.5-foot-depth intervals by driving a brass-tube-lined split-spoon sampler ahead of the auger into undisturbed soil. Soil samples will be field screened with a hand-held organic vapor meter (OVM) and described using the Unified Soil Classification System. Lithologic descriptions and OVM measurements will be recorded in the field on borehole log forms. Soil samples will be selected for chemical analysis based on OVM measurements and visual observations.

Well Construction

Monitoring well LF-31 will be constructed of flush-threaded, 4-inch-diameter polyvinyl chloride (PVC) casing with factory-made slotted well screen. The length of slotted and PVC casings will be selected based on sediments observed during drilling. Using the previously collected water-level and lithologic data for the Bashland Property, we anticipate the length of well screen will be 10 feet, with 0.02-inch-wide slots.

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The well casing will be placed in the completed borehole through the hollow auger. A filter pack consisting of appropriately graded sand will be poured into the annular space between the hollow auger and the slotted PVC well casing as the auger is gradually removed from the borehole. The filter pack will extend approximately 2 feet above the top of the slotted PVC casing. Prehydrated bentonite slurry will be placed above the sand pack to isolate the perforated interval from material above and prevent the entrance of grout into the sand pack. A cement-bentonite grout will then be placed above the bentonite to the land surface to seal the remainder of the borehole interval from surface-water infiltration. The well will be completed above grade with a locking cap and a steel field monument set in concrete to protect the well from surface water and damage.

The elevation of the newly installed monitoring well will be surveyed to the nearest 0.01-foot by a licensed surveyor.

Well Development

Well LF-31 will be developed after installation by purging the well to remove sediment from around the screened interval and enhance hydraulic communication with the surrounding formation. The well will be purged using a centrifugal pump or clean Teflon bailer. Approximately 10 well casing volumes of ground water will be removed from the well during well development. Parameters such as pH, temperature, specific conductance, quantity, and clarity of water withdrawn will be measured and recorded during this process.

Reporting

A report describing well installation activities will be prepared following completion of field work. It is anticipated that this report can be combined with the first quarterly report, tentatively scheduled for submittal to the ACHA by April 30, 1993.

Task 2: Periodic Monitoring

Quarterly monitoring of proposed well LF-31 will be conducted in conjunction with existing wells located in other areas of the Yerba Buena Project Site to assess regional ground-water flow direction and quality. Proposed well LF-31 will be monitored for a minimum of one year. Following the collection of one year of quarterly monitoring, data for the Bashland Property will be re-evaluated to assess whether a semiannual monitoring program may be appropriate for the property.

Quarterly Monitoring

A quarterly ground-water monitoring program will be initiated beginning with the first quarter of 1993 (January through March 1993). The monitoring program will consist of collecting water-level measurements and ground-water samples for chemical analysis on a quarterly basis. Two ground-water samples, a primary sample and a duplicate sample, will be collected for chemical analysis during each monitoring event for quality assurance/quality control (QA/QC) purposes. The duplicate sample will be analyzed on a semiannual basis.

Ground-water samples will be submitted to a state-certified laboratory for analysis of TPH as gasoline (TPHg) and TPHd using modified EPA Method 8015, for oil and grease using Standard Method 5520, for benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8020, volatile organic compounds using EPA Method 8010, semivolatile organic compounds using EPA Method 8270, and for lead, nickel, cadmium, zinc, and chromium. Analysis may be modified based on analytical results from the initial round of sampling and analysis, if appropriate. A schedule for sampling and analysis is presented in Table 1.

Ground-Water Sampling Methodology

Water-Level Measurements

The top-of-casing elevation of the newly installed well will be surveyed relative to mean sea level by a state-licensed land surveyor. Depth to water will be measured in well LF-31 in conjunction with water-level measurements for all existing wells at the Yerba Buena Project Site using an electric water-level sounding probe to the nearest 0.01 foot, relative to the top of the PVC well casing. These data will be presented on tables and figures included in the quarterly reports, discussed on page 6.

Sampling Procedures

The well will be purged using a submersible or centrifugal pump. Approximately three to five well casing volumes of water will be removed from the well before a water sample is collected. Specific conductance, pH, and temperature will be measured during this purging process to aid in evaluating overall ground-water quality. These parameters will be recorded in the field on water-quality sampling forms. Samples will be collected after these parameters have stabilized to within 15 percent of previous measurements.

If the well cannot sustain a yield (i.e., the well pumps dry), it will be allowed to recover to 80 percent of the original, static water level. A ground-water sample will then be collected after the well has recovered to 80 percent of the original water level or within two hours of pumping the well dry.

Ground-water samples will be collected using a clean Teflon bailer. Samples collected for TPHg/BTEX analyses will be placed into laboratory-supplied, 40-milliliter glass vials preserved with hydrochloric acid. The glass vials will be filled to capacity, capped, and checked for trapped air bubbles. If an air bubble is observed, the vial will be discarded and a new vial filled with additional water from the well. Samples collected for TPHd and oil and grease analyses will be poured into laboratory-supplied 1-liter amber bottles. Samples will be placed in an ice-chilled cooler immediately after collection for transportation under chain-of-custody protocols to a state-certified laboratory for appropriate chemical analysis.

Quarterly Reporting

A report presenting monitoring results will be prepared and submitted quarterly to the ACHA and the RWQCB in accordance with the proposed schedule outlined in Table 1. These reports will include the following:

- a discussion of ground-water elevation data collected at the Bashland Property and a ground-water elevation map for the Yerba Buena Project Site
- a discussion of ground-water quality data collected for the Bashland Property during the quarterly period
- tables presenting ground-water elevation data and chemical analysis results

In addition, a discussion and figures documenting construction of well LF-31 will be included in the first quarterly report, anticipated to be submitted by April 30, 1993.

At the end of one year, hydrogeologic data for the Bashland Property will be re-evaluated to review the trend in water-quality data for the Bashland Property during the previous year and to assess whether a semiannual monitoring program may be appropriate for the property.

Task 3: Collection of Soil Samples from Beneath the Retaining Wall Located North of the Former Tank Excavation

To evaluate the possible presence of petroleum hydrocarbons in the vicinity of the retaining wall, soil samples will be collected from beneath the retaining wall, along the northern edge of the former tank excavation, when the wall is removed during proposed site development (Figure 2).

Soil samples will be collected using a hand-driven sampler lined with clean brass tubes. The ends of the brass tubes will be covered with aluminum foil or Teflon tape, capped with tight-fitting plastic end caps, and appropriately labeled. Soil samples will be placed into an ice-chilled cooler for transportation to the analytical laboratory under strict chain-of-custody protocol.

It is anticipated that approximately 4 to 6 soil samples will be submitted for analysis of TPHg and BTEX using modified EPA Methods 8015/8020; TPHd using EPA Method 3510; oil and grease (O&G) using Standard Method 5520e; and for volatile organic compounds using EPA Method 8010. *to include 5 metals Pb Cd. Cr Zn Ni if TOG 7100 ppm*

The analytical results of soil samples collected from beneath the retaining wall will be evaluated to assess whether additional soil removal activities in the vicinity of the wall are warranted.

4.0 SCHEDULE

Table 1 presents a quarterly monitoring schedule, detailing sampling periods, analyses to be performed, and report submittal dates.

It is anticipated that well LF-31 will be installed in January 1993 and that periodic monitoring will begin in the first quarter of 1993 (January through March 1993), pending receipt of written approval of the work plan from the ACHA.

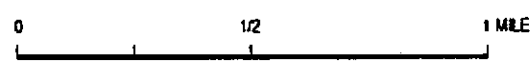
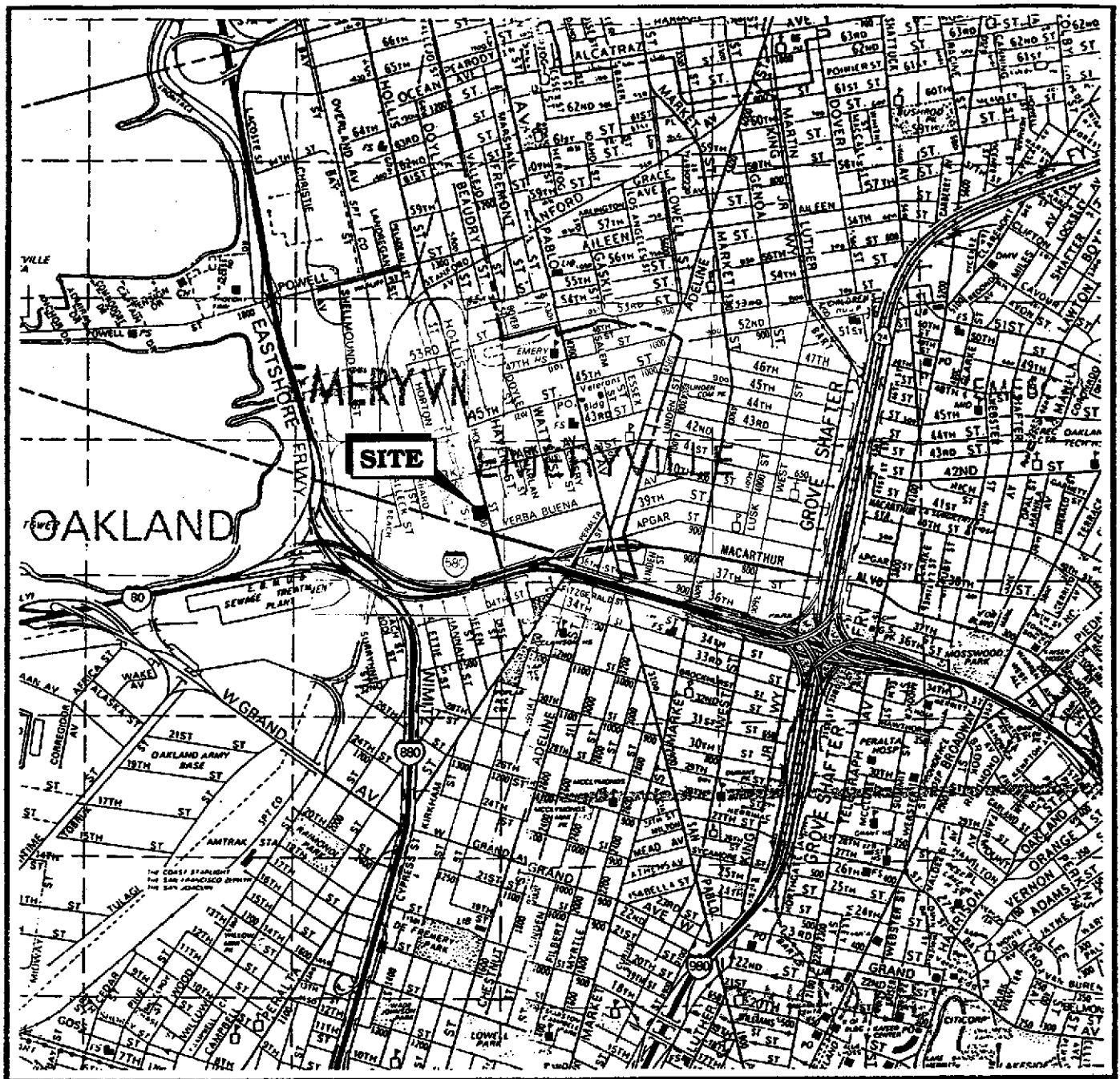
TABLE 1

GROUND-WATER MONITORING SCHEDULE
 JANUARY 1993 THROUGH DECEMBER 1993*
 BASHLAND PROPERTY
 EMERYVILLE, CALIFORNIA

Quarter	Quarterly Period	Analysis	Report Submittal Date
First+	January-March	Modified EPA Method 8015; EPA Method 8020; Standard Method 5520; lead, nickel, cadmium, zinc, and chromium	April 30, 1993
Second	April-June	Modified EPA Method 8015; EPA Method 8020; Standard Method 5520; lead, nickel, cadmium, zinc, and chromium	July 30, 1993
Third	July-September	Modified EPA Method 8015; EPA Method 8020; Standard Method 5520; lead, nickel, cadmium, zinc, and chromium	October 29, 1993
Fourth	October-December	Modified EPA Method 8015; EPA Method 8020; Standard Method 5520; lead, nickel, cadmium, zinc, and chromium	January 31, 1994

* Ground-water quality results will be reviewed at the end of one year to evaluate an appropriate frequency for future monitoring.

+ Quarterly monitoring is anticipated to begin in January 1993.



MAP SOURCE:
Alameda & Contra Costa Counties,
Thomas Bros. map, 1990 Edition

Figure 1 : SITE LOCATION MAP
BASHLAND PROPERTY SITE

Project No. 1649.08

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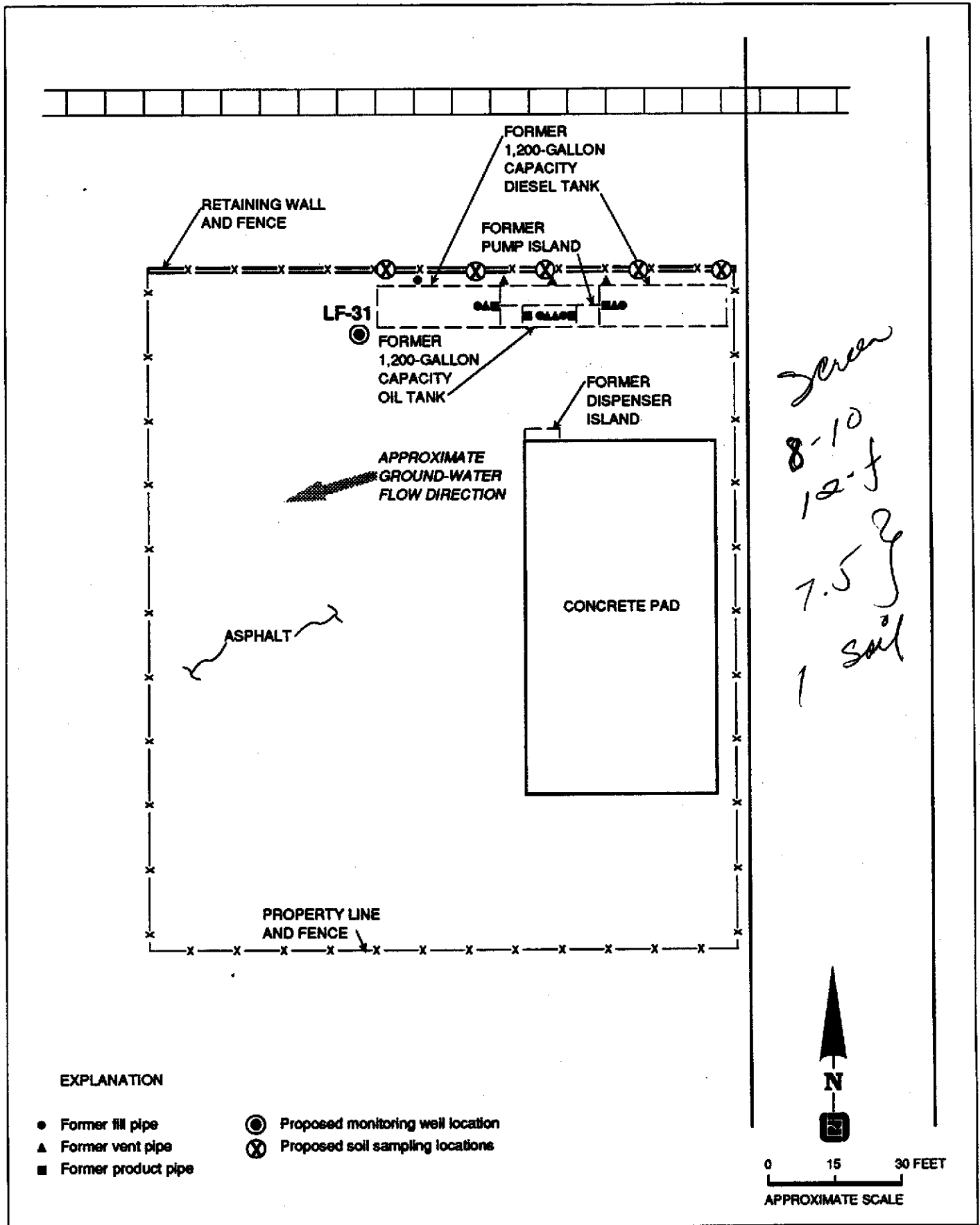


Figure 2 : SITE PLAN AND TANK LOCATIONS