CROWLEY MARINE SERVICES, INC.

February 5, 1996

Mr. Dale Klettke, CHMM
Hazardous Materials Specialist
Hazardous Materials Division
Department of Environmental Health
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway
Alameda, CA 94502

Reference: Work Plan Addendum Pacific Dry Dock and Repair Company Yard I

Dear Mr. Klettke:

Per our discussions please find enclosed the revised work plan addendum for the Crowley Marine Services' facility referenced above, located at 1441 Embarcadero in Oakland.

If you have any questions or comments regarding this matter please contact me at (206) 443-8042.

Sincerely,

Stephen Wilson
Manager, Environmental Affairs

Enclosure

cc: PDD I Correspondence w/o enclosure
Beth Hamilton w/ enclosure
Paul Graff w/o enclosure

Post Office Box 2287, Seattle, Washington 98111-2287 - (206) 443-8100 - Telex 6838207 - Fax (206) 443-8072
Pier 41 (Red & White Fleet), San Francisco, California 94133 - (415) 546-2800 - Fax (415) 546-2623 (Admin & Sales)
Pier D, Berths D47-D49, Long Beach, California 90802-1098 - (310) 491-4700 - Fax (310) 491-4790 (Admin) - Fax (310) 491-4789 (Operations)
4300 B Street, Suite 507, Anchorage, Alaska 99503-5997 - (907) 563-1114 - Telex 6732564 - Fax (907) 762-3330
Pier 54, San Francisco, California 94107 - (415) 546-2684 - Fax (415) 546-2606 (Admin)
Post Office Box 2110, Jacksonville, Florida 32203-2100 - (904) 727-2200 - Telex 4611037 - Fax (904) 727-2401

Versar INC.

January 26, 1996

Mr. Stephen Wilson
Manager, Environmental Compliance
Crowley Marine Services, Inc.
2401 Fourth Avenue
P.O. Box 2287
Seattle, WA 98111

Reference: Revised Workplan Addendum for the former Pacific Dry Dock and Repair Company Yard I, 1441 Embarcadero, Oakland, California; Versar Project No. 2722

Dear Mr. Wilson:

Versar, Inc. (Versar) is submitting this letter to document the referenced workplan addendum revisions. The revisions are based on the January 9, 1996, site meeting between Mr. Stephen Wilson of Crowley Marine Services, Inc. (Crowley), Mr. Paul Graff of Versar, and Mr. Dale Klettke of the Alameda County Health Care Services Agency (the County).

A workplan addendum for well and boring installation titled, "Addendum to Work Plan for Site Investigation," was submitted to the County in October 1995. The work has been delayed pending County review and approval. Upon reviewing the workplan and previous site work and reports, Mr. Klettke requested a site visit and meeting to discuss the proposed work. This revised workplan addendum is the result of the meeting.

Purpose

The purpose of the proposed work is to accomplish the following objectives:

- Assess groundwater conditions with a monitoring well downgradient and within 10 feet of the removed underground storage tank (UST), formerly located within the eastern portion of the site.

- Assess the extent and source of lead in soil and groundwater beneath the site with soil borings and filtered grab groundwater samples, especially near the lead-impacted soil excavations.

- Assess groundwater conditions in other areas within the eastern portion of the site, using filtered grab groundwater samples.

- Sample all the existing wells on the western portion of the site to confirm previously identified low-to-nondetectable petroleum hydrocarbon concentrations in groundwater, in anticipation of reduced groundwater sampling and site closure.

Background

Crowley is conducting a soil and groundwater investigation at the referenced facility (Figures 1 and 2). The activities and results have been submitted to the County in various reports and other correspondence. Two USTs have been removed from the site. Approximately 80 soil borings have been drilled and sampled at the site since 1989. Soil and groundwater samples collected from these borings have identified areas containing lead and petroleum hydrocarbon constituents, typically total petroleum hydrocarbons as diesel (TPH-D) and total oil and grease.

Five groundwater monitoring wells were installed on the western portion of the site in July 1993. These wells were located in areas where previous soil sampling had identified elevated petroleum hydrocarbon concentrations. Nine groundwater sampling events have been conducted since then (see Versar's "Quarterly Groundwater Monitoring Report" dated September 7, 1995"). Low concentrations of petroleum hydrocarbon constituents have occasionally been detected, but the concentrations were low enough that the County agreed to discontinue sampling of wells MW2, MW4, and MW5 after July 1994. Wells MW1 and MW3 are still sampled on a quarterly basis.

On the eastern portion of the property, several areas containing elevated petroleum hydrocarbon and lead concentrations in soil were identified based on data collected from 33 soil borings in 1992. Two areas where lead concentrations were above California TTLC (Total Threshold Limit Concentrations) and STLC (Soluble Threshold Limit Concentrations) hazardous waste levels were excavated in June and July 1995 (BH18 and BH32 excavations on Figure 3).

Scope of Work

The work proposed in this addendum includes the drilling and sampling of one groundwater monitoring well and eight soil borings (Figures 2 and 3). Grab groundwater samples will be collected from four of the soil borings. All drilling will be performed with hollow-stem augers. The work will be conducted consistent with the provisions of the original workplan, which was approved by the County in March 1992, and the subsequent addenda, where applicable. The activities to be addressed under this revised addendum are presented as the following tasks:

1. Monitoring Well Installation

Versar proposes to install a 2-inch-diameter, 15-foot-deep groundwater monitoring well to assess potential groundwater impairment from a former UST removed from the northeast corner of the site. The well will be located within 10 feet of the former UST, in the estimated downgradient direction. Because the soil has been characterized by previous borings, no soil samples will be submitted for laboratory analysis. Monitoring well installation procedures will be in accordance with the protocol presented in the March 1992 workplan. After installation and development, the well elevation will be surveyed relative to the other wells on site.

2. Soil Borings and Grab Groundwater Sampling

Eight soil borings will be drilled to groundwater (approximately 8 to 11 feet below ground surface [(bgs]). Grab groundwater samples will be collected from four of the borings (HP1 through HP4 on Figures 2 and 3). Soil borings will be located approximately 5 and 10 feet from the two lead-impacted soil excavations to establish the extent of lead in the soil. The two borings located approximately 5 feet from the excavations (HP1 and HP4) will be continuously sampled to more fully characterize the subsurface materials, particularly relative to a lead source. Soil samples will be collected and analyzed for total lead at depths of 2, 5, and 8 feet (estimated depth to groundwater) bgs, or where indicated by significant lithology changes and depth to groundwater. Soil sampling intervals in the other borings will be based on those in borings HP1 and HP4.

Because the soil has been characterized for petroleum hydrocarbons during previous investigations, no soil samples will be submitted for these analyses. Selected soil samples collected from the six borings that will not be continuously sampled will be analyzed for

total lead if indicated by analytical results from the HP1 and HP4 soil samples. Soluble lead analyses may be performed on selected soil samples containing elevated total lead concentrations.

All of the grab groundwater samples will be collected from inside of the augers using a peristaltic pump and filtered in the field. This method should allow for quicker and higher-volume groundwater sampling than would be achieved when using a HydroPunch™ system. The groundwater samples collected will be analyzed for TPH as gasoline (TPH-G), TPH-D, total lead, and benzene, toluene, ethylbenzene, total xylenes (BTEX), and MTBE by the appropriate state-approved methods.

3. Groundwater Sampling

Following installation, the new well (MW6) will be developed and surveyed. After which the new well and the five existing wells will be measured, purged, and sampled in accordance with standard procedures. A groundwater sample will be collected from each well, filtered in the field, and analyzed for TPH-G, TPH-D, lead, BTEX, and MTBE. The new well will continue to be sampled quarterly. Groundwater depth measurements will be made in all wells quarterly.

4. Soil and Water Disposal

Soil generated during this phase of work will be stockpiled on and covered with plastic, and characterized for proper disposal at a later date. Equipment rinse, well development and well purging water will be stored on site in labeled drums pending characterization and disposal.

5. Report Preparation and Site Evaluation

Versar will prepare a report documenting investigation procedures and results. The report will include an evaluation of site health and environmental risks. The draft report will be submitted to Crowley for review within 30 days of completing the field work.

Schedule

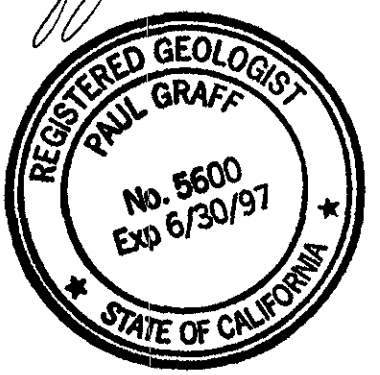
Field activities will commence upon approval of this addendum by the County. All aspects of the work will be conducted under the guidance of a registered professional. The proposed schedule is as follows:

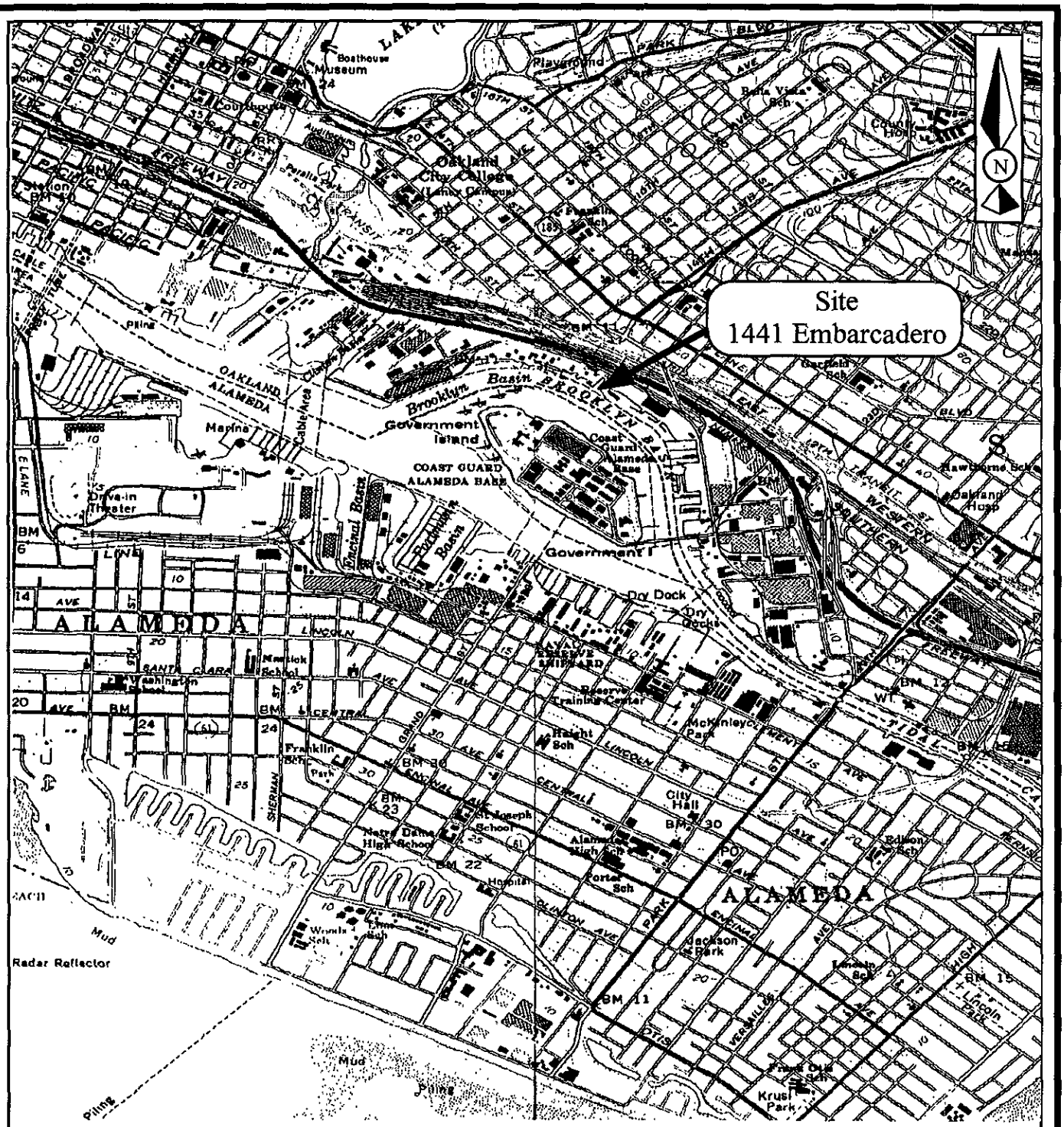
Field Work Implementation	February 1996
Report Submittal	March 1996

If you have any questions or require additional clarification regarding the project, please contact me at (916) 863-9323.

Sincerely,

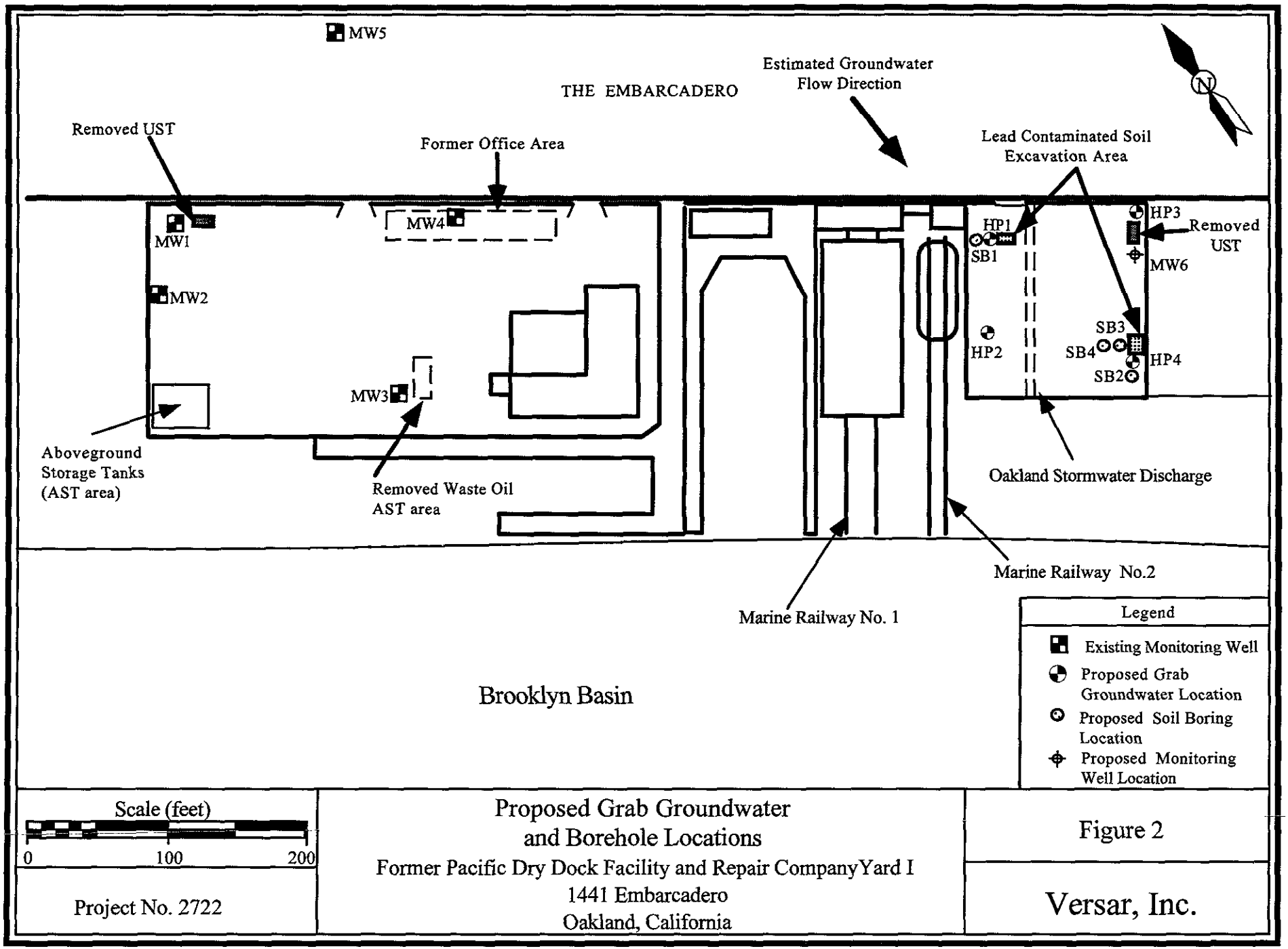
Paul Graff, R.G.
Senior Geologist
Project Manager





SOURCE: USGS TOPO 1959

Scale (miles) 0 0.25 0.50	Site Location	Figure 1
Project No. 2722	Pacific Dry Dock and Repair Company Yard I Oakland, California	Versar, Inc.



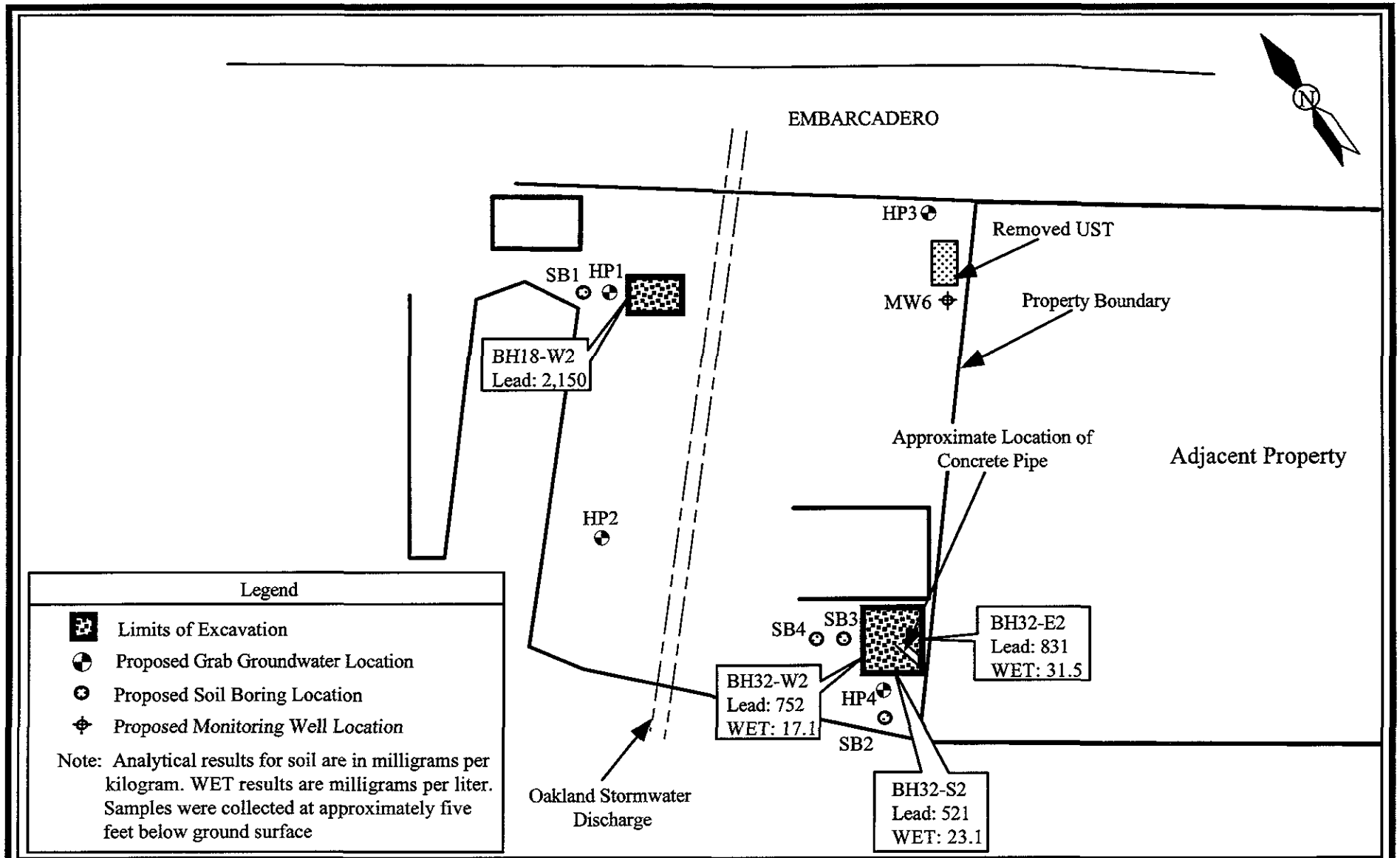
Project No. 2722

Proposed Grab Groundwater and Borehole Locations

Former Pacific Dry Dock Facility and Repair CompanyYard I
1441 Embarcadero
Oakland, California

Figure 2

Versar, Inc.



Current Soil Excavation Limits and Proposed Grab Groundwater and Boring Locations

Figure 3

Former Pacific Dry Dock Company and Repair Yard I
1441 Embarcadero--Oakland, California

Project No. 2722

Versar Inc.