

September 16 1994 11:30

Mr. Thomas Peacock
Alameda County Health Care Services Agency
Department of Environmental Health
Hazardous Materials Division
1131 Harbor Bay Parkway
Alameda, California 94502

Reference: Addendum to Phase II Site Investigation Work Plan, Pacific Dry Dock Yard I,
1441 Embarcadero, Oakland, California; Versar Project No. 2722-012

Dear Mr. Peacock:

The purpose of this letter is to serve as an addendum to the Phase II Site Investigation Work Plan for Pacific Dry Dock Yard I, located at 1441 Embarcadero, Oakland, California (the site). The following addendum describes additional soil and groundwater investigation work necessary to produce a preliminary assessment report (PAR) for the site.

WORK PLAN BACKGROUND

On March 12, 1992, Versar, Inc. (Versar) submitted a Phase II Site Investigation Work Plan for Pacific Dry Dock and Repair Yard I, Western Section (work plan) to the Alameda County Health Care Services Agency (ACHCSA). The original work plan included a site description, proposed immediate source-removal methods and procedures, and proposed site investigation methods and procedures. In a letter dated March 20, 1992, ACHCSA approved the work plan with minor revisions.

An initial addendum to the work plan was submitted to ACHCSA on September 18, 1992. The September 1992 addendum described the results of an investigation of the eastern portion of the site and described an underground storage tank (UST) identified near the northeast corner. Proposed changes to the work plan included removal of the UST and alterations to the proposed immediate source-removal methodology.

A second addendum to the work plan was submitted to ACHCSA on December 30, 1992. This second addendum proposed several changes to the work plan, including cancelling the immediate source removal, addressing the east and west sides of the site as a single site, changing the proposed locations of the monitoring wells, conducting additional soil coring, and performing additional laboratory analysis of soil and groundwater samples. In a letter dated February 1, 1993, ACHCSA deemed the addendum acceptable as written.

The 500-gallon UST described in the September 1992 addendum was removed from the northeast corner of the site on February 17, 1994. A permit for the UST removal was obtained from ACHCSA before the removal. The findings of the UST removal identified petroleum hydrocarbons in the soil beneath the east end of the UST and in the groundwater at the excavation site.

SCOPE OF WORK FOR WORK PLAN ADDENDUM

The following Scope of Work will be conducted under Versar's work plan dated March 12, 1992. The purpose of the work is to supplement existing data as necessary prior to preparation of a PAR for the site.

Soil Investigation

Additional soil sampling will be conducted on a limited basis to provide data necessary to address petroleum hydrocarbon migration at the site. During the investigation, Versar will gather a series of soil samples at the locations shown in Figure 1 using a combination of hand auger, hydraulic coring, and hollow-stem auger techniques. The sampling will be conducted as follows:

- Borehole SB1 will be located near the existing aboveground storage tank (AST) area. One soil sample will be collected from two feet below ground surface (bgs) in the vadose soils where concentrations of total petroleum hydrocarbons as gasoline (TPH-G); total petroleum hydrocarbons as diesel (TPH-D); and benzene, toluene, ethylbenzene, and xylenes (BTEX) were identified previously. A second sample will be collected from the surface of the bay muds at eight feet bgs where the highest concentrations of petroleum hydrocarbons were identified. This sampling will be conducted to determine whether or not these petroleum hydrocarbons have the potential to impact groundwater. Each of these samples will be analyzed for TPH-D, TPH-G, and BTEX, by California Waste Extraction Test (WET).
- Borehole SB2 will be located in the old waste oil AST area. Soil samples will be collected at two feet bgs in the vadose soils and from the capillary fringe located at approximately five feet bgs. TPH-D and BTEX were identified previously at these locations. This sampling will be conducted to determine whether or not these petroleum hydrocarbons have the potential to impact

groundwater. Each of these samples will be analyzed for TPH-D and BTEX by WET.

- Borehole SB3 will be located in the former office area. Soil samples will be collected from five feet bgs in the vadose soils where concentrations of TPH-G, TPH-D, BTEX, and total oil and grease (TOG) (exceeding 1,000 mg/kg) were identified during well drilling, and from the surface of the bay muds at approximately eight feet bgs where high concentrations of petroleum hydrocarbons were identified during previous soil coring. This sampling will be conducted to determine whether or not these petroleum hydrocarbons have the potential to impact groundwater. The samples will be analyzed for TPH-D, TPH-G, BTEX, and TOG by WET.

Groundwater Investigation

To complete the groundwater characterization, Versar will install four groundwater monitoring wells constructed of 2-inch-diameter PVC with 0.010-inch-slot-size well screen. This will increase the number of groundwater monitoring wells proposed for the site in the Phase II Work Plan from eight to nine. Well boreholes will be advanced using a hollow-stem auger drill rig to a depth of approximately 15 feet bgs. Drill cuttings from the boring process will be placed in 55-gallon steel drums and left onsite until the final site characterization and PAR are complete. The proposed well locations are shown in Figure 2. Figure 3 shows the groundwater monitoring well construction.

The wells will be numbered MW6 through MW9. The well locations and rationale are as follows:

- MW6 will be placed in the verified downgradient direction within 10 feet of the former gasoline UST location on the west side of the site. This placement is necessary to comply with Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites.
- MW7 will be placed in the northwest corner of the east side of the site, between previous soil coring locations BH18E and BH19E. The purpose of this well is to determine whether the groundwater beneath the site has been effected by the TPH-G, TPH-D, benzene, bis-2-ethylhexyl phthalate, or lead identified in soil samples collected from BH18E and BH19E.

- MW8 will be placed near the southwest edge of the east side of the site, near previous soil coring location BH20E. The purpose of this well is to determine whether TPH-G, TPH-D, BTEX, and bis-2-ethylhexyl phthalate concentrations identified in a previously collected grab-water sample are actually present in the groundwater or whether they were adsorbed to soil particles in the grab sample.
- MW9 will be placed near the southeast corner of the site, near soil coring location BH32E. The purpose of this well is to determine whether the TPH-D, TPH-G, and lead identified in the five-foot-bgs soil sample collected from BH32E have affected the groundwater beneath the site.

To better define the lithology of the site, each well will be continuously cored and logged. Because the soil at each of these locations has been characterized previously, soil sampling for laboratory analysis will not be conducted except as described below:

- Soil samples will be collected for laboratory analysis from proposed monitoring well locations MW7 and MW9 to help determine if the lead concentration previously identified near those locations is localized and if lead concentrations vary vertically through the soil column. Soil samples will be collected from two feet, five feet, and eight feet bgs at each location and analyzed for total lead. If concentrations of lead exceeding ten times the Soluble Threshold Limit Concentration (STLC) are identified by laboratory analysis, a maximum of two soil samples (one from each borehole) will be analyzed for lead by WET.
- One soil sample will be collected for laboratory analysis from proposed monitoring well location MW8 to determine if the previously identified lead extends south from BH18E to this location. The sample will be collected from five feet bgs. If the laboratory analytical results for total lead indicate a concentration exceeding 10 times the STLC, the sample will be analyzed for lead by WET.



Site Survey

After the groundwater monitoring wells are installed, each well will be surveyed by a licensed land surveyor or a California registered civil engineer to establish horizontal and vertical control. The survey will accurately determine the elevation and location of each groundwater monitoring well (new and existing) and major physical features of the site referenced to a permanent site marker.

Groundwater samples will then be collected from each of the newly installed wells. These groundwater samples will be sent to a California-certified laboratory for analysis. The rationale for the groundwater sampling and analysis is as follows:

- Groundwater samples will be collected following installation of the five wells and analyzed for TPH-D, TPH-G, and BTEX. Sampling for total lead in the groundwater will also be conducted as necessary, based on the results of soil sample analysis.
- Groundwater sampling will be conducted on a quarterly basis for one year. After one year of sampling, a determination will be made regarding the necessity of continued monitoring at the site.

Tidal Study

To better understand the dynamics of the contaminant migration at the site, Versar will conduct a limited tidal study of the project area. This tidal study will include monitoring and recording the bay-water elevations and the static water levels in a minimum of four monitoring wells for a minimum period of 48 hours during a monthly maximum high tide. These data will be recorded at 15-minute intervals using an eight-channel data logger. In addition, water level measurements in the monitoring wells and the bay reference point will be collected manually to calibrate the equipment and provide reference measurements.

In addition to the tidal study, Versar will perform an aquifer slug test on each monitoring well at the site. These slug tests will be used to estimate the hydraulic characteristics surrounding each well. Versar will perform a slug test at each well because of the expected variations in conductivity between wells.



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Preliminary Assessment Report

Using the data collected from past investigations and from those outlined in this addendum, Versar will develop a PAR for the site. The PAR will be prepared according to the Tri-Regional Board Staff Recommendations for Preliminary Investigation and Evaluation of Underground Tank Sites, Appendix A - Reports. A schedule for the work to be conducted is included as Figure 4.


If you have any questions or comments about the contents of this work plan addendum or require further information, please call Mr. Stephen Wilson of Crowley Marine Services, Inc. at (206) 443-8100.

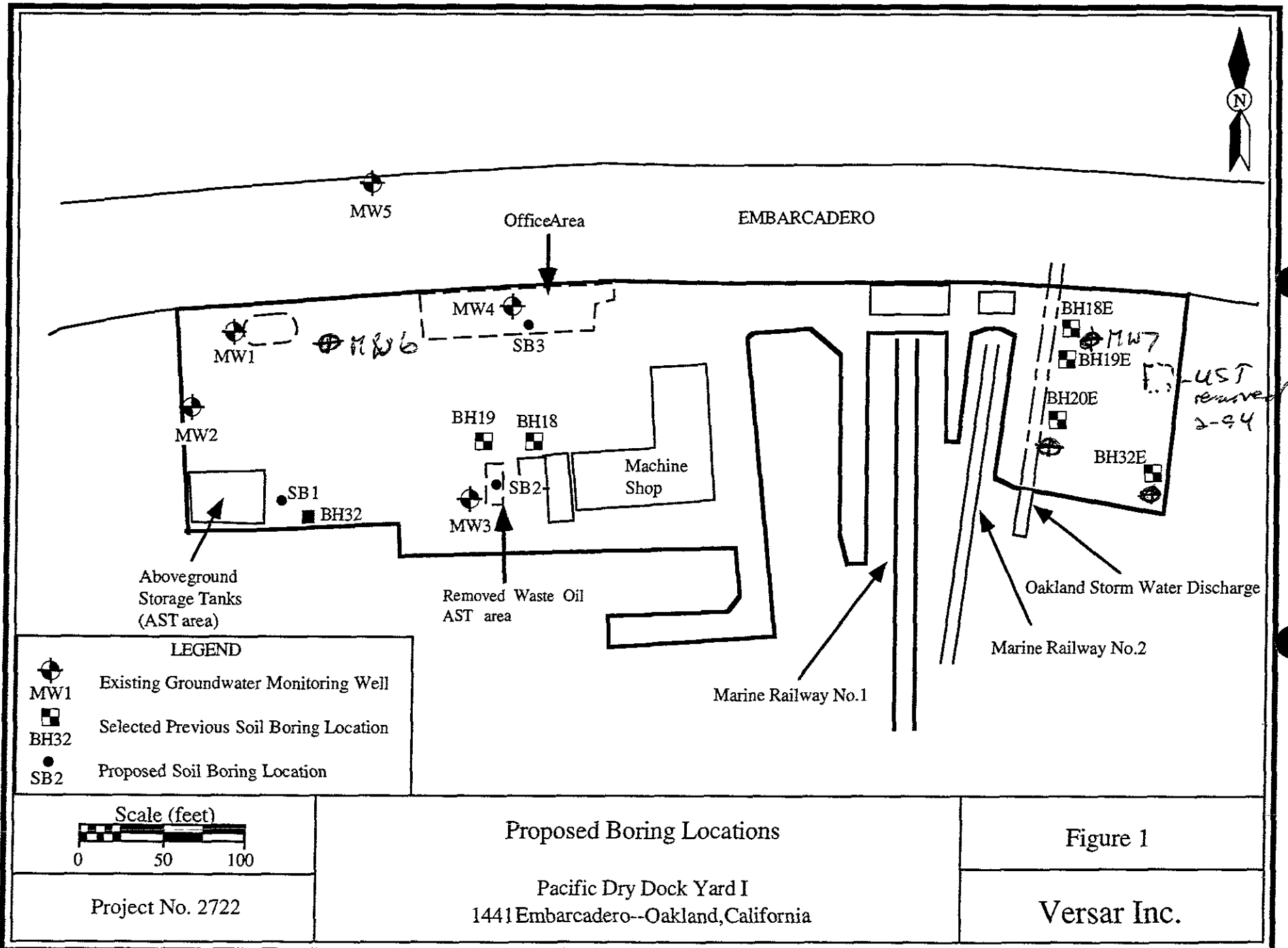
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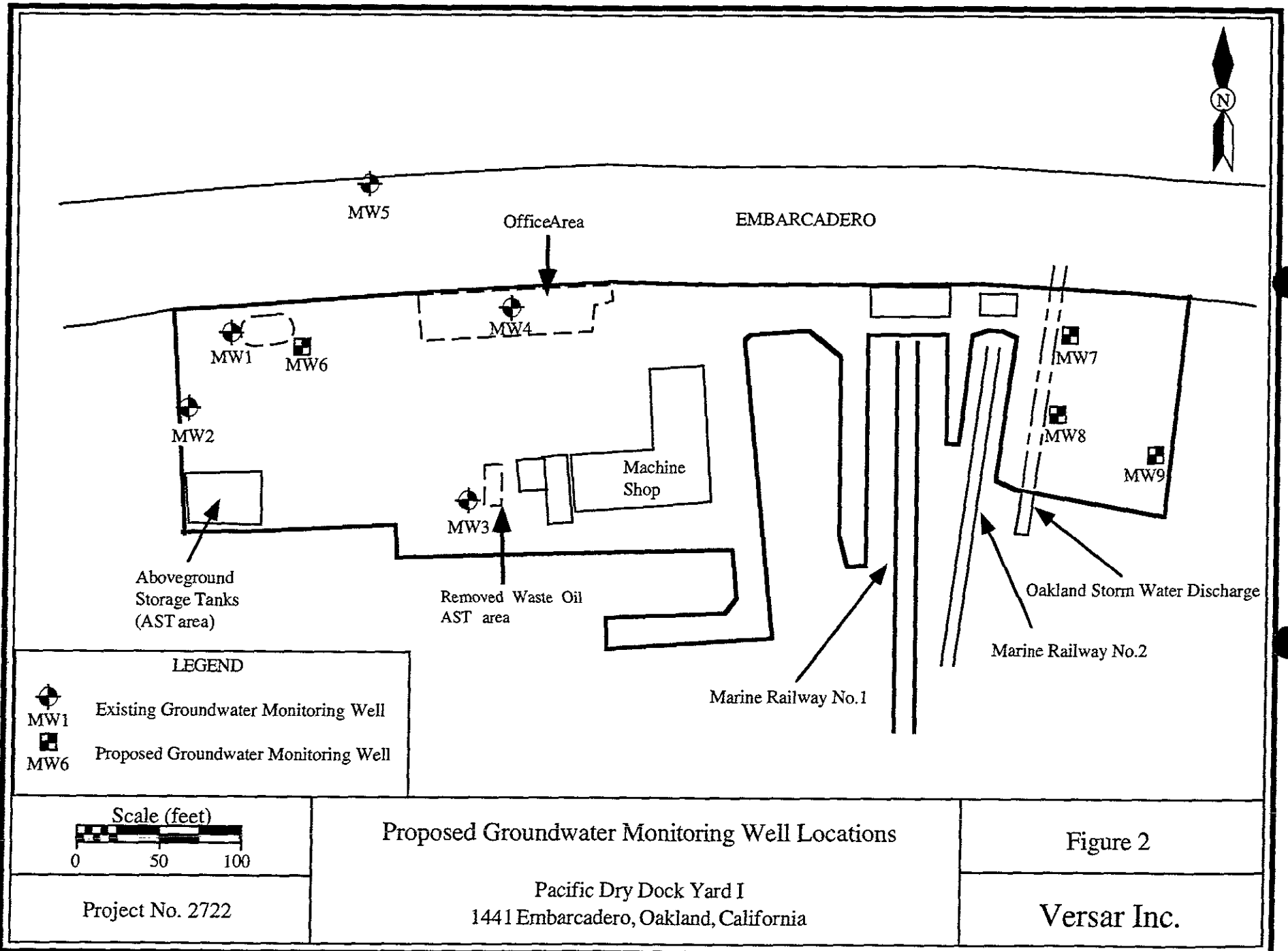

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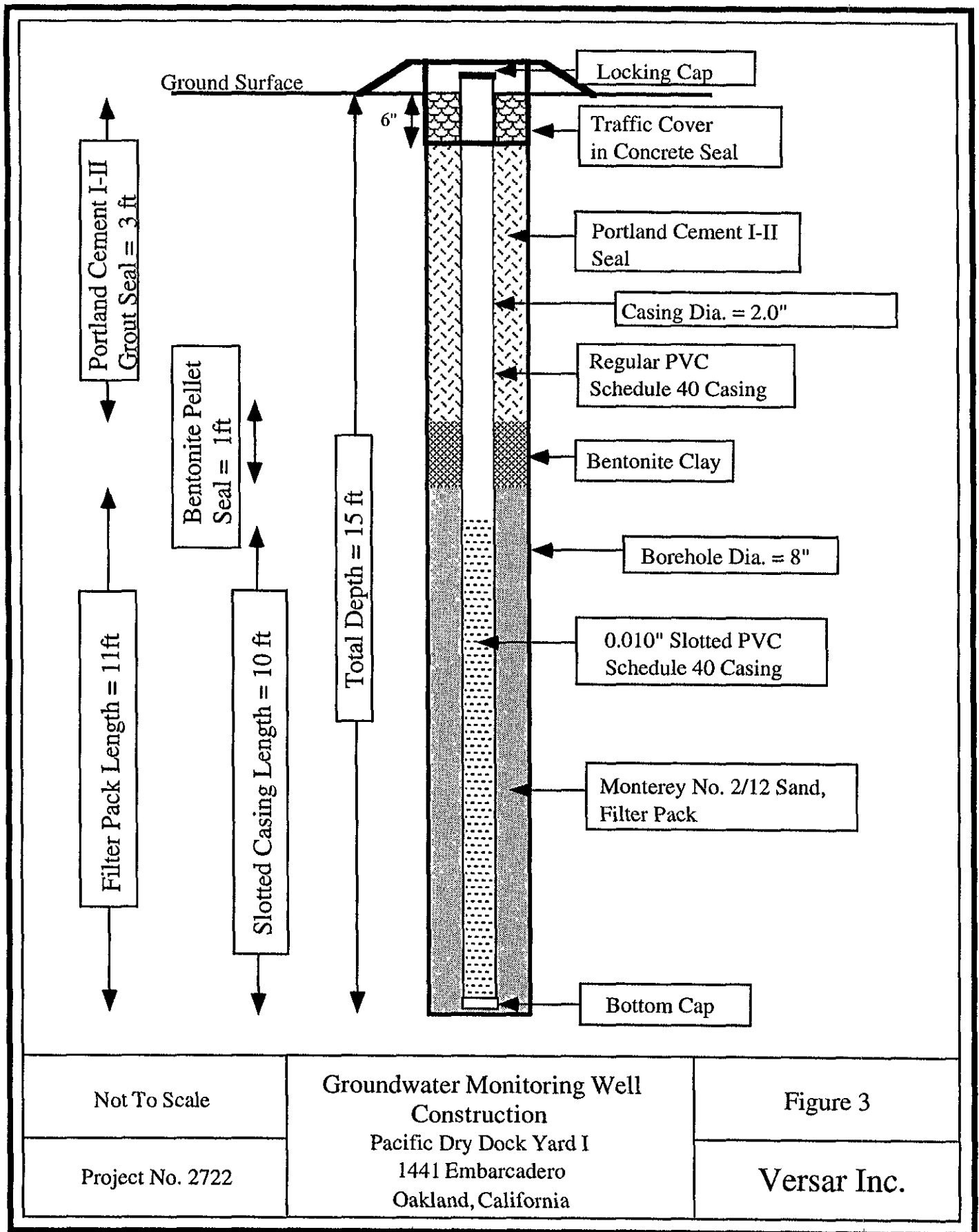


Proposed Groundwater Monitoring Well Locations

Pacific Dry Dock Yard I
 1441 Embarcadero, Oakland, California

Figure 2

Versar Inc.



Not To Scale

Project No. 2722

Groundwater Monitoring Well
Construction
Pacific Dry Dock Yard I
1441 Embarcadero
Oakland, California

Figure 3

Versar Inc.

Crowley Marine Services, Inc.
Pacific Dry Dock Yard I

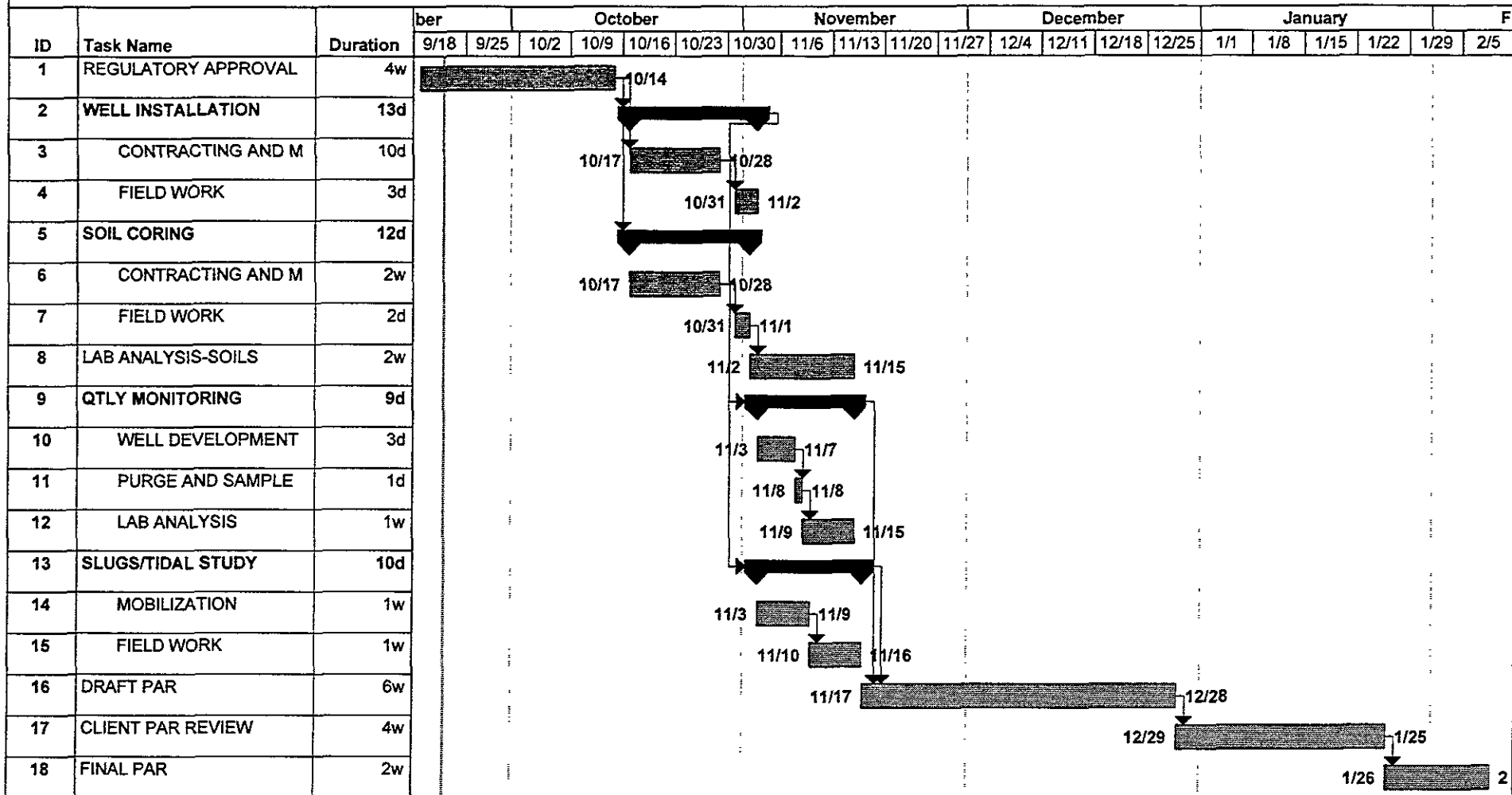


Figure 4

