

September 19, 1994

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SECOR

Ms. Madhulla Logan
Alameda County Health Services Agency
Department of Environmental Health
470 27th Street, Room 324
Oakland, California 94612

**WORK PLAN ADDENDUM, FURTHER SUBSURFACE INVESTIGATION AND MONITORING,
2099 GRAND STREET, ALAMEDA, CALIFORNIA**

Dear Ms. Logan:

Science & Engineering Analysis Corporation (*SECOR*) is pleased to submit this Work Plan for further subsurface investigation and monitoring at 2099 Grand Street in Alameda, California (the site) for your review.

SECOR conducted an Additional Site Investigation as summarized in our April 8, 1994 report which was submitted to the Alameda County Health Services Agency (ACHSA). Subsequent meetings with you resulted in an agreement to further assess groundwater conditions at apparently downgradient portions of the site adjacent to Oakland Harbor, as well as at an apparently upgradient location adjacent to Grand Street.

During our June 8, 1994 meeting, the approximate well locations, duration of monitoring and reporting, and purpose of the generated data were discussed. The primary points of agreement were that: 1) several of the existing on-site wells would be abandoned, 2) additional wells would be installed and, in conjunction with existing wells, used to monitor groundwater conditions for one year on a quarterly basis, 3) *SECOR* would perform a tidal influence study using the existing and newly-installed wells, and 4) *SECOR* would use the generated data to assess the need for and type of on-site remedial activities. This agreement was documented in an August 12, 1994 Letter of Comment sent to you. The following text describes our proposed scope of work in fulfillment of our agreement.

SCOPE OF SUBSURFACE INVESTIGATION AND MONITORING

SECOR proposes to further investigate the extent of hydrocarbons in the subsurface by implementing the following Tasks 1 through 6.

TASK 1 - PRELIMINARY FIELD ACTIVITIES

Prior to conducting field investigation activities and upon ACHSA approval of this Work Plan, *SECOR* will revise the existing site-specific health and safety plan (HASP) and obtain monitoring well permits from the Alameda County Flood Control and Water Conservation District (ACFCWCD). Proposed well locations will be cleared with respect to underground utilities and other obstructions by a professional utility locator; Underground Service Alert (USA) will be notified. Existing wells which have been buried or difficult to locate will also be located using ground penetrating radar.

TASK 2 - NEW WELL INSTALLATION

The installation of additional wells will be conducted to assess groundwater conditions between the former above ground tank (AGT) farm and Oakland Harbor, as well as at an apparently upgradient on-site location. The well installation, development, sounding, and sampling procedures are described below.

Drilling and Soil Sampling

SECOR will supervise the installation of four groundwater monitoring wells at the locations indicated on Figure 2. Wellbores will be advanced utilizing a truck-mounted drill rig equipped with 8-inch and 10-inch diameter hollow-stem augers. Wellbores will be drilled to approximately 10 feet below the first encountered groundwater or five feet into any continuous clay layer located below the first encountered groundwater. Relatively undisturbed soil samples will be continuously sampled during drilling using continuous coring or Modified California Split-Spoon Sampler lined with three 6-inch long brass tubes.

A *SECOR* geologist will describe the soils encountered according to the Unified Soil Classification System (USCS) and will maintain a boring log of these descriptions. Each collected soil sample will be screened in the field for the presence of volatile organic compounds (VOCs) using an organic vapor meter (OVM). The OVM readings will be documented on the boring logs. At a minimum, *SECOR* will select two soil samples from each wellbore for chemical analysis. Samples for chemical analysis will be collected directly above the water table surface and from the vadose zone at shallower depths. Additional soil samples may be selected for chemical analysis on the basis of OVM field screening and field observations.

The ends of the brass tubes containing the soil samples will be covered with aluminum foil or teflon sheeting, capped with tight fitting plastic end caps, labeled, sealed in plastic bags, and stored in an ice-filled cooler. The samples selected for chemical analysis will be delivered to a California state-certified testing laboratory with completed chain-of-custody record. Selected soil samples will be submitted for analysis for total petroleum hydrocarbons as gasoline (TPHg), diesel (TPHd) and benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Methods 8015 modified and 8020 and total oil and grease (TOG).

Groundwater Monitoring Well Installation

Upon reaching total depth, the wellbores will be converted to groundwater monitoring wells. Wellbores will be reamed out utilizing the 10-inch auger. A flush threaded, capped 2-inch diameter Schedule 40 PVC casing will be installed in the open wellbore for each groundwater monitoring well. The wells will be completed utilizing 0.020-inch machine slotted screen from the base of the borehole to approximately three feet below surface and finished with blank casing to the surface. An expandable locking well cap will be placed on the well head. A filter pack consisting of graded sand (Monterey #3) will be placed in the annular space between the wall of the borehole and casing to a height of one foot above the screened interval. One foot of bentonite pellets will be placed above the sand and hydrated. A cement mixture (5% bentonite) will then be tremied above the bentonite to ground surface. Each well will be

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completed with an above-grade PVC riser within a locking standpipe cover. Figure 3 shows a typical well construction diagram.

Well Development and Sampling

The cement surface seal will be allowed to set for a minimum of 48 hours before the groundwater monitoring wells are developed. The wells will be developed by alternately pumping, bailing, and surging. Well development will continue until the groundwater is reasonably free of sediment. During well development, measurements and observations of pH, electrical conductivity, temperature, color, and turbidity will be recorded. A minimum of ten casing volumes of water will be removed from each groundwater monitoring well during development.

Following development, *SECOR* will collect groundwater samples from the newly-installed groundwater monitoring wells for chemical analysis. Prior to sampling, the wells will be allowed to recover to 80 percent of their initial water level prior to development. Groundwater samples will be collected using a disposable PVC or stainless steel bailer and transferred directly into laboratory-supplied sample containers. Each of the sample containers will be properly labeled, sealed in plastic bags, and placed in an ice-filled cooler.

Samples will be submitted to a California state-certified testing laboratory along with completed chain-of-custody record. Groundwater samples collected during the investigation will be analyzed for TPHg, TPHd, BTEX, and TOG.

Well Surveying and Water Level Measurements

The newly-installed and existing wells will be surveyed to within 0.01 foot and referenced to a USGS datum by a California-licensed land surveyor. Groundwater level and free product thickness measurements, if present, will be obtained prior to well development or purging and collection of groundwater samples. The well survey data and groundwater-level measurements will be used to assess the local groundwater flow direction and gradient.

Decontamination and Material Containment

To minimize the potential for cross contamination between wells or sampling points, all downhole drilling and sampling equipment will be decontaminated between drilling and sampling locations. The hollow-stem augers will be steam cleaned before drilling commences and between each boring location. Soil and groundwater sampling equipment will be washed in a low-phosphorous soap solution and double rinsed in potable and deionized water between sampling locations.

Soil cuttings generated from field activities will be stockpiled and covered with visqueen at an on-site location. All groundwater generated during well development, sampling and decontamination will be placed in 55-gallon drums, labeled, and stored on-site.

TASK 3 - WELL ABANDONMENT

SECOR will abandon five of the existing groundwater monitoring wells (W-1 through W-5) which no longer provide useful groundwater monitoring data. Well abandonment permits will first be obtained from ACFCWCD.

Monitoring well abandonment will be accomplished by over-drilling the monitoring wells using 10-inch diameter hollow-stem augers. The monitoring well will be drilled to three feet beyond the recorded total depth and the PVC well casing will be removed intact. After the hole has been drilled to below the bottom of the monitoring wells, the augers will be turned until all non-native materials have been circulated to the surface and all cuttings have been completely removed from the borehole. Following over-drilling, the open borehole will be filled with a bentonite slurry through a tremie pipe. Well casing material, cement from the sanitary seal, and soil will be segregated to the extent possible and disposed appropriately. The ACFCWCD will be contacted to inspect the well abandonment activities.

TASK 4 - TIDAL INFLUENCE STUDY

After installation of the additional on-site monitoring wells, *SECOR* will measure groundwater levels over a thirty-six hour period utilizing several groundwater monitoring wells to evaluate the tidal influence at the site. Groundwater levels will be monitored using a datalogger/pressure transducer system (Instrumentation Northwest DL8A). A gauging station will also be installed at the Grand Marina pier to measure tidal fluctuations in Oakland Harbor.

A *SECOR* scientist will periodically check the gauging equipment for proper operation, and manually check groundwater levels to verify the accuracy of data collected with the data logger/pressure transducer system. After monitoring, water level data will be reduced and analyzed to estimate tidal influence in the area.

TASK 5 - QUARTERLY GROUNDWATER MONITORING

During groundwater monitoring, *SECOR* will sound each on-site groundwater monitoring well using an electronic water-level indicator. The depth to water and total depth will be measured and recorded for each well. The water-level indicator will be rinsed with deionized water between the sounding of each well to prevent cross-contamination. The well soundings will be conducted monthly for a one-year period. Each well will also be sampled on a quarterly basis for one year.

Prior to monitoring well sampling, each well will be purged of three wellbore volumes of water using a PVC bailer and/or centrifugal pump and dedicated PVC tubing. During purging, pH, temperature, and specific conductivity will be measured and the groundwater visually inspected for color and turbidity and recorded on Groundwater Sample Field Data Sheets. Upon removal of the appropriate purge volume and stabilization of the measured parameters, samples will be collected from each monitoring well using a disposable bailer. Groundwater samples will be decanted into pre-labeled laboratory-supplied glassware, placed in an ice-filled cooler, accompanied by a completed chain-of-custody form, and transported to a

summarized in Quarterly Monitoring Reports (QMRs) submitted to the ACHSA. A total of three QMR's will be submitted in addition to the Summary Report.

SCHEDULE

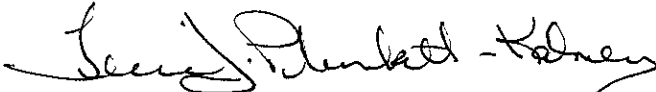
We anticipate that the well installation and abandonment activities will require approximately two weeks to perform after ACHSA approval of this Work Plan Addendum including procurement of well permits, revision of the HASP, and installation and abandonment of the groundwater monitoring wells. The well development and sampling activity will require an additional one week to perform, while the tidal influence study will require approximately three days to perform. Preparation of a Summary Report will require approximately three weeks upon receipt of the chemical analytical results.

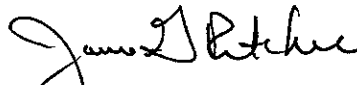
SECOR is prepared to begin work within one week of obtaining approval of the Work Plan from the ACFCWCD and the ACHSA. All field work will be scheduled with ACHSA a minimum of five days in advance. In the event that we have not received approval or comments from your office by October 3, 1994, we will proceed with the Work Plan implementation.

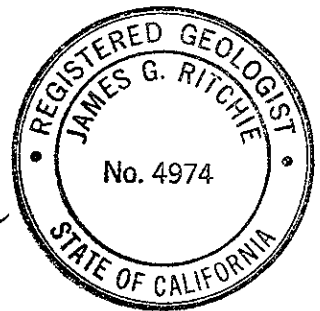
Please do not hesitate to contact us with any questions at (415) 882-1548.

Sincerely yours,

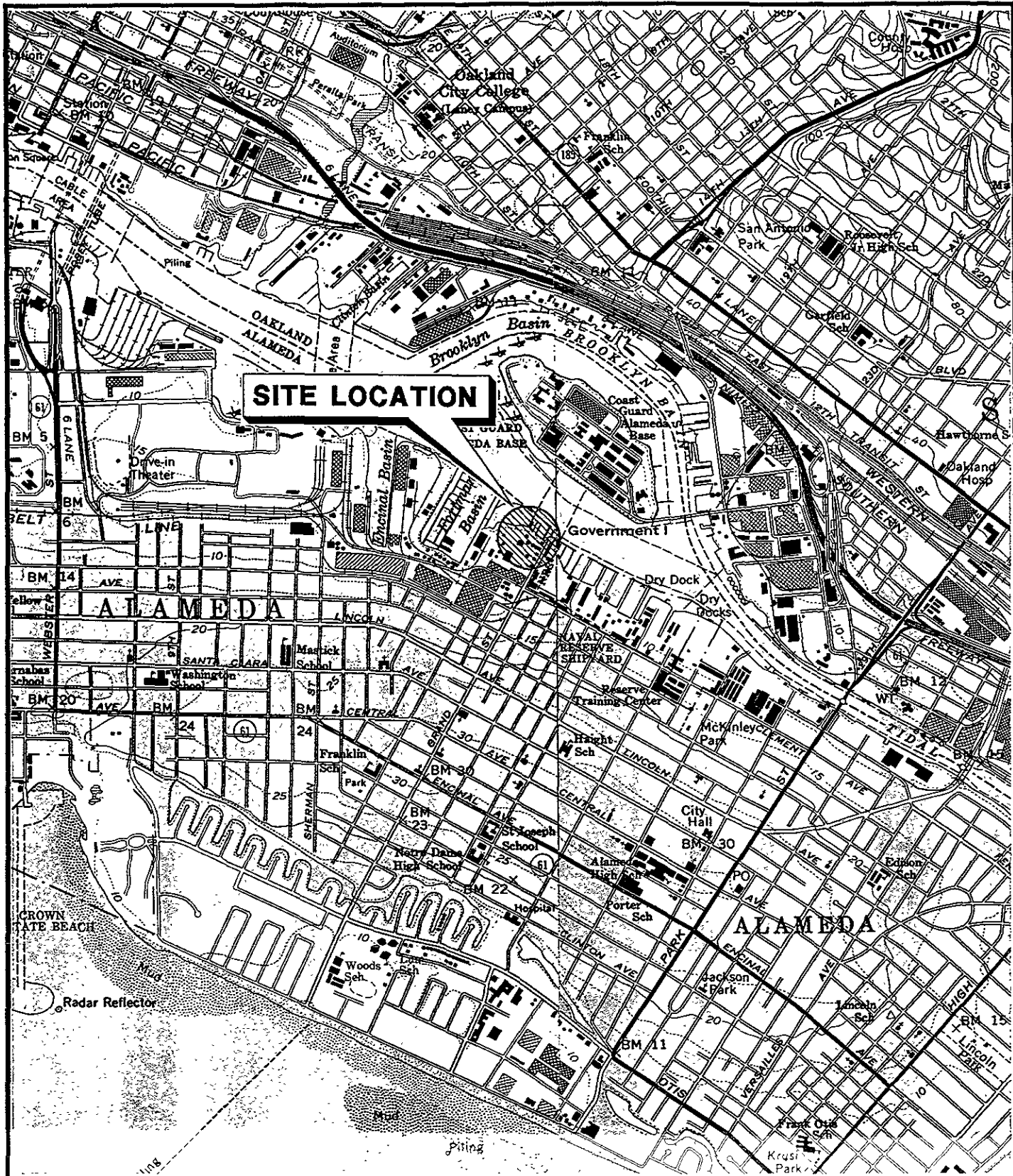
Science & Engineering Analysis Corporation


Terri J. Plunkett-Kalmey
Project Geologist


James G. Ritchie, R.G.
Principal Geologist



Attachments



SOURCE: BASE MAP FROM U.S.G.S. OAKLAND EAST/WEST CA QUADRANGLES. 7.5 MINUTE SERIES PHOTOGRAPHIC MAP, PHOTOREVISED 1980.

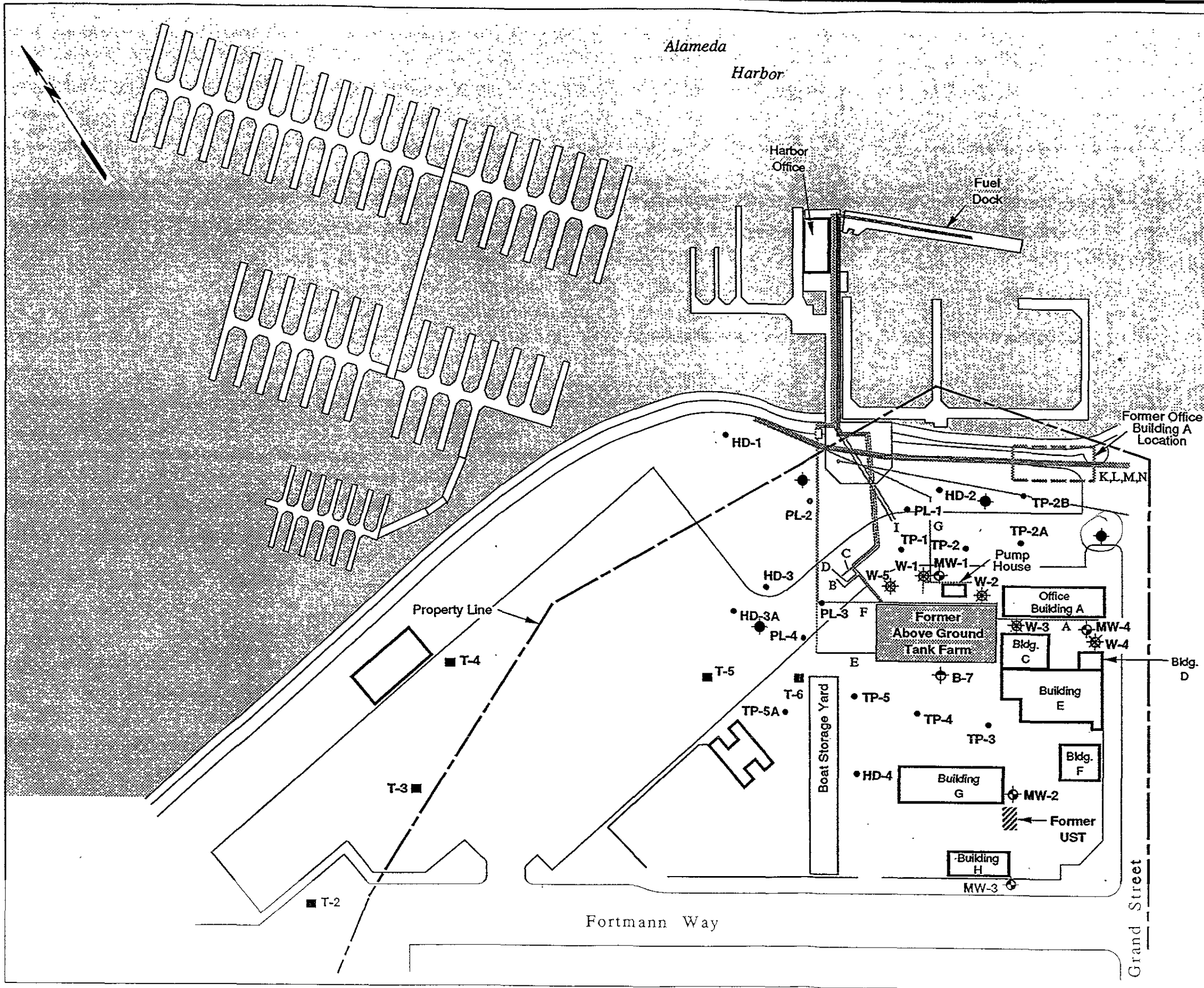


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SEACOR
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DATE	07SEP94
JOB NO	50085-001-01

FIGURE 1
GRAND MARINA FACILITY
ALAMEDA, CALIFORNIA
SITE LOCATION MAP

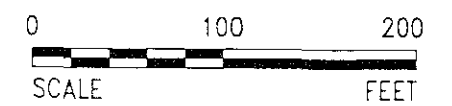


LEGEND

- ◆ Proposed Monitoring Well
- Borings (SEACOR, 10/93)
- ⊕ Monitoring Well (Zaccor, 5/92)
- ⊕ Monitoring Well (Harding-Lawson, 6/87)
- ⊗ Monitoring Well To Be Abandoned (Crowley Environmental Services, 4/87)
- Test Trench (Harding-Lawson, 6/87)

KEY FOR UTILITIES

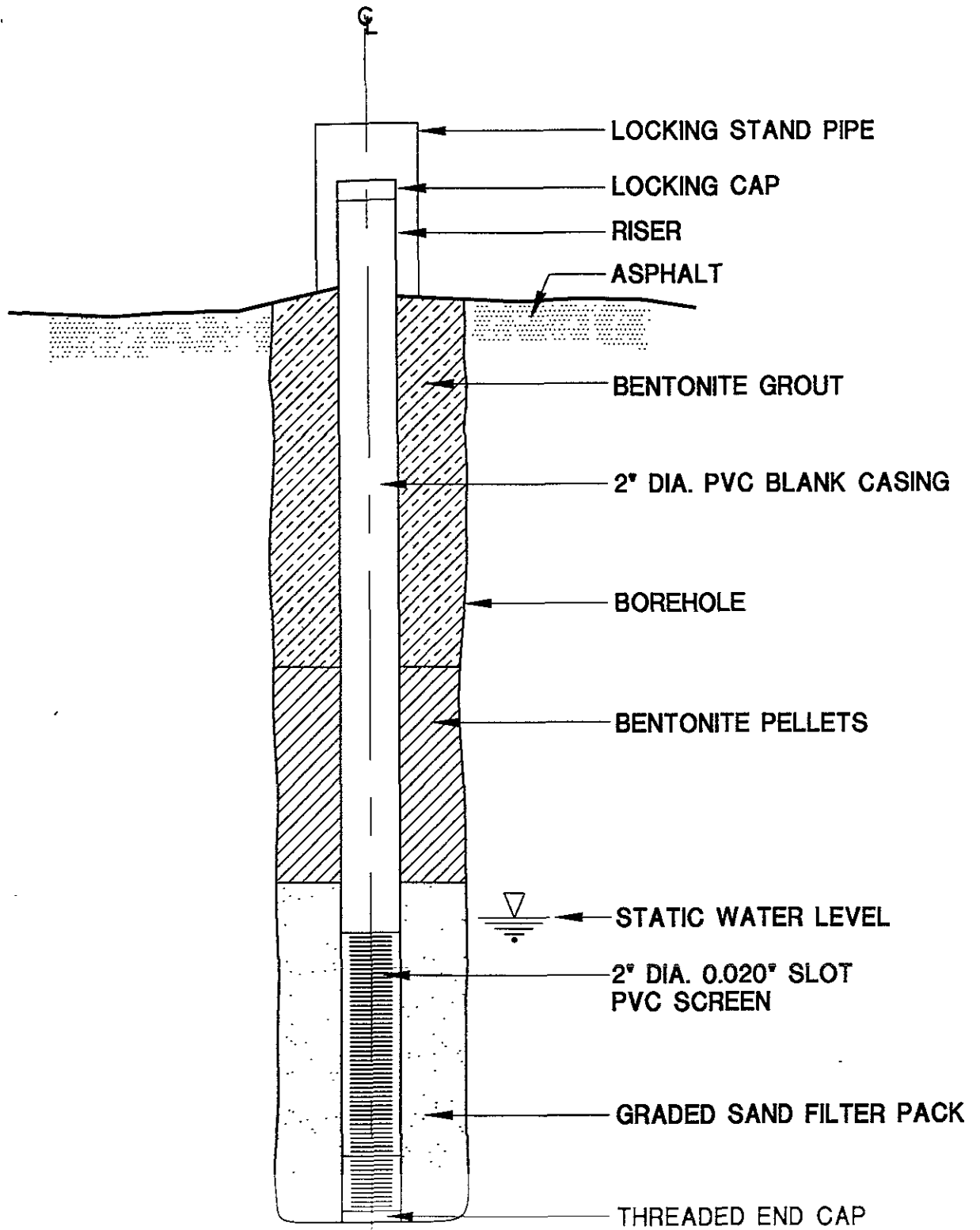
- A 3" Commercial Diesel Line
 - B Diesel Vent Line
 - C Gasoline Line
 - D Diesel Line
 - E Abandoned Bilge/Sludge Line (4")
 - F Abandoned Diesel Line (4")
 - G Abandoned Lube Oil (3")
 - H 8" Concrete Storm Drain
 - I 3" Copper Pump-up Fire Hydrants
 - J 6" Sewer V.C.P.
 - K 2 x 3" High Voltage Electrical
 - L 4" Electrical Secondary
 - M 2 x 3" Telephone
 - N 2 x 2" Cable T.V.
- Proposed Secondary Pipe Enclosure Chase for Future Use



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FIGURE 2
 GRAND MARINA FACILITY
 ALAMEDA, CALIFORNIA
**SITE PLAN AND PROPOSED
 MONITORING WELL LOCATIONS**



NOT TO SCALE

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FIGURE 3
GRAND MARINA FACILITY
ALAMEDA, CALIFORNIA

TYPICAL WELL DESIGN