SMITH-EMERY GEOSERVICES
A MEMBER OF THE SMITH-EMERY COMPANIES, ESTABLISHED 1904
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May 11, 1995

SEG File No. 90404
SEG Report No. SF 95-154

Alameda County Department of Environmental Health
UST Local Oversight Program
1131 Harbor Bay Parkway
Alameda, California 94502

3506

Attention: Mr. Barney Chan

Gentlemen:

On behalf of our client, we herewith submit for your review and comments one copy of our "Tank/Groundwater Investigation Workplan, 3925 Alameda Avenue, Oakland, California." The goal of this investigation is to initiate an assessment of the quality of the groundwater beneath this site in relationship to the previous leaking underground storage tanks and local geohydrological conditions. The following report was reviewed in the preparation of this workplan:

> "Report on Soil and Ground-Water Sampling With Laboratory Testing for 3925 Alameda Avenue, Oakland, California," prepared by Engeo Incorporated, dated March 24, 1994.

If you have any questions regarding the contents of this report please contact our office at (415) 330-3000.

Respectfully Submitted,
SMITH-EMERY GEOSERVICES

RICK WIDEBROOK
Staff Geologist

Reviewed and Approved by

KRIS JOHNSON, R.G. 5932, C.E.G. 1915
Chief Geologist/Environmental Manager

CC: Smooke and Sons Investment Company

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SMITH-EMERY GEOSERVICES

TANK/GROUNDWATER MONITORING WORKPLAN
3925 Alameda Avenue
Oakland, California

Prepared By

SMITH-EMERY GEOSERVICES
San Francisco, California

May 11, 1995
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INTRODUCTION

The subject site is located just west of the intersection of the I-880 Freeway and High Street in southern Oakland as shown on the Vicinity Map, Plate 1. Two underground storage tanks were removed from this site in March 10, 1988. Samples of the soil at the time of the tank removal indicated that the site was contaminated with hydrocarbons as gasoline, and diesel. In 1994, a subsequent investigation was performed by Engeo, Inc. within the former tank locations. The Engeo investigation further characterized the contaminates as gasoline, diesel, and kerosene, and determined that the backfill and shallow groundwater beneath the site had been impacted by these contaminates. The following report was reviewed in the preparation of this workplan:

> "Report on Soil and Ground-Water Sampling With Laboratory Testing for 3925 Alameda Avenue, Oakland, California," prepared by Engeo Incorporated, dated March 24, 1994.

HYDROGEOLOGY

VADOSE CONDITIONS

This information is based on our site reconnaissance and on documentation we have reviewed from Engeo, Inc. The four soil borings from the Engeo investigation, shown on Plate 2, ranged in depth from 12 feet to 15 feet below ground surface. The surface condition in the area of the tank excavation is a pavement of asphalt overlying the tank pit backfill. Below the pavement section, the soils in this vicinity are typically fine-grained cohesive sediments. The Engeo borings indicate that the former tank area is underlain by shallow ground water that has its upper surface at or above the bottom of the tank excavation, observed at depths between 9.5 and 12 feet during the Engeo investigation of 1994.

GROUNDWATER

Shallow groundwater was reported in all four of the Engeo soil borings at approximately 9.5 to 12 feet below the surface. The piezometric water surface lies at approximately 10 feet below the surface, depending on the current geohydrological conditions. Following the drilling, the water level in the first boring was observed to continue rising for a period of three hours. This shallow, unconfined

aquifer apparently lies in the permeable soils at the depths below approximately ten feet. The groundwater gradient in this vicinity is anticipated to be a shallow slope to the south-southwest.

FIELD PROCEDURES

GW elevation concern ?

To investigate the extent of the groundwater contamination, three monitoring wells to a depth of 20 feet will be installed with a truck-mounted hollow stem auger drill rig in the locations specified on the attached Plot Plan, Plate 2. In relationship to the backfilled tank excavation, one well will be placed upgradient, one well downgradient, and one well within the backfilled zone. Each boring will be logged in the field by an experienced geologist using the Unified Soil Classification System working under the direct supervision of a California Registered Geologist who will certify the boring logs. The following procedures will be used in the field during this investigation. A typical well construction diagram is included as Plate 3.

DRILLING AND SAMPLING PROCEDURES

1. Soil samples are routinely obtained at every 5 foot interval. Additional samples are taken whenever a change in lithology occurs or if any other reason suggests that they may be useful.

2. When the hollow stem auger or hand auger reaches the sampling depth, a split spoon sampler (California Modified or Standard Penetration) equipped with three six inch brass or stainless steel tubes is driven 18 inches by repeatedly dropping a 140 pound weight a distance of 30 inches onto the sampler rods. The number of blows each for three consecutive 6 inch increments is recorded.

3. Soils brought up by the auger flights during drilling, and soil recovered by the split spoon sampler are classified according to the Unified Soil Classification System (USCS) and recorded on a standard boring log form by a geologist under the direct supervision of a State Registered Geologist. In addition to the USCS classification, the soil is described by color, moisture content, strength, odor, and any other notable characteristics.

4. Soil from the driving tip and upper tube is inspected for the soil description. The middle tube is typically retained for screening for volatile organic vapors by head space analysis. Unless otherwise noted, the lower tube is designated for chemical analysis.

5. Any indication of odor from the fresh soil samples as they are removed from the split spoon sampler is recorded on the boring log. A more quantitative field screen for volatile organic vapors in soil is obtained by soil head space analysis as described below.

6. All samples designated for analysis are sealed at each end with Teflon sheets and plastic caps. Care is taken to retain the samples with a minimum of disturbance and flush with the ends of the tube if possible. The samples are immediately labeled, sealed with tape, and placed in a chilled cooler with blue ice. Care is taken to prevent freezing of samples.

7. A detailed Chain-of-Custody record is kept with the samples. The samples are kept in the custody of the geologist who obtained them until he signs them over to the next custodian of record. The samples are either kept within sight of the custodian, or in a locked place. Samples are delivered to the laboratory within 24 hours of collection.

at least one / boring (all)

8. The number of samples designated for analysis is dictated by the job specifications, field observations and agency involvement. Based on the previous sampling results, we anticipate analyzing six soil samples from the borings located north and south of the tank excavation. Samples for analysis will be chosen based on field PID readings for the purpose of confirming the estimated size of the plume. All samples collected are held in refrigeration by the lab for further analysis if initial test results indicate that more analyses may be useful.

9. All sampling equipment is decontaminated after each sampling interval by complete disassembly of the sampler and wet brush cleaning of all parts in a nonphosphate solution bath, followed by a

clear water rinse and a final rinse in deionized or distilled water. The hollow stem auger flights and bits are steam cleaned before arrival on site and between borings and prior to leaving the site.

10. All soil cuttings generated during the drilling of the borings and wash water/soil rinsate generated during decontamination are collected in 55 gallon drums which are sealed, labeled with the date, boring identification, and contents. The drums are stored onsite pending laboratory analysis of the soil, which will determine the appropriate disposal of the contents.

SOIL HEAD SPACE SCREENING

1. Soil suspected of containing concentrations of volatile organic compounds are screened in the field by head space analysis of a sample retained in a closed container.

2. Soil from the middle sampling tube or drive shoe is transferred to a plastic ziplock bag and left at ambient temperature for a period of time (5-10 minutes).

3. After approximately 10 minutes, the tip of a flame ionization detector (FID) or Photoionization Detector (PID) is inserted through the side of the bag.

4. The FID is calibrated to a 50 ppmv Methane standard. The PID would be calibrated to a 100 ppmv Isobutylene standard.

5. The maximum reading is recorded on the soil boring log as the concentration in parts per million-vapor (ppmv). highest readings S/B run in lab

WELL CONSTRUCTION PROCEDURES

Permits for the installation of ground water monitoring wells and/or vapor extraction wells are obtained from the appropriate agency prior to construction. For this project, permits will be obtained from the Zone 7 Water Agency

1. Unless otherwise specified, ground water monitoring wells and vapor extraction wells are constructed of flush-jointed, threaded, Schedule 40, 4-inch PVC casing and factory-slotted PVC screen. No glues are used in constructing the wells.

2. The well construction will follow the format as outlined on the typical well diagram, Plate 3. The well screen and casing is installed through the hollow stem of the auger flights. The well screen and casing is set with a standard, clean, washed filter sand. For this site, Lonestar #2/12 sand and a 0.010-inch factory slotted casing will be used. The screen will be set 5 feet above the piezometric surface and 10 feet below. The wells will not be allowed to penetrate into another confined water bearing unit other than the first target water bearing zone.

3. Well construction materials i.e. sand pack, bentonite chips, and backfill grout are placed through tremie pipes or via the annulus between the hollow stem auger and the well casing to prevent bridging.

4. The screened filter zone below ground water is surged to maximize settlement and prevent bridging prior to placement of the bentonite seal. If necessary, additional filter sand is placed to meet design requirements. Alternatively, a filter overpack of smaller-grained sand may be placed above the filter pack to prevent the bentonite seal from entering the sand pack and the screen slots.

5. Bentonite chips placed above the sand pack are hydrated in place as they are added. The remainder of the annular space is then backfilled with a cement/bentonite grout to within 24 inches of the surface. The remaining 2 feet of the well is set in concrete.

6. The surface of the well is completed with a locking expansion plug and a water tight, traffic-rated well housing set in concrete. The well box is set slightly above the surrounding grade to prevent surface drainage from entering the well box.

7. A permanent mark is made at the top of the casing to indicate the top of casing measuring point for groundwater level surveys.

Survey to MSL.

8. The wells are located by a licensed surveyor or engineer for vertical and horizontal control. The survey will be tied into an on-site or nearby benchmark to determine the water level elevations.

9. Groundwater monitoring well design criteria, i.e. length and placement of well screen, thickness of bentonite seal, etc., will be detailed on the well construction diagrams provided with the well installation report.

WELL DEVELOPMENT

1. The well is developed after a minimum of 48 hours following placement of grout, backfill and surface housing to allow the cement and cement/bentonite to set.

2. The well is surged at least 20 minutes over 5-foot intervals with a 4-inch diameter stainless steel surge block or pump system to remove fines from the filter zone and create a gradation between filter materials and native soils.

3. Each well is then bailed to remove fine sediments drawn into the well by surging. A minimum of 5 casing volumes are removed from the well.

4. The temperature, pH, turbidity, and conductivity of the water is monitored periodically during development. The turbidity (content of fines) is monitored by either withdrawing 1000 ml samples of bailed water and allowing the fines to settle in an Imhoff cone, or by direct readings with an electronic turbidity meter. Final Imhoff cone readings are taken after 45 minutes of settlement.

5. The water quality parameters, volume of water extracted, and observable water quality conditions such as visual or olfactory evidence of contamination are recorded on field monitoring logs.

6. Development continues until water quality parameters stabilize and Imhoff cone readings are less than 10 ml/1000 ml.

7. All development water is drummed, labeled and stored on site pending disposal.

GROUND WATER SAMPLING PROCEDURES

1. Prior to sampling, the depths to water and to the bottom of the well are measured with respect to the reference notch at the top of the casing using an electronic water level meter.

2. When sampling ground water suspected of being contaminated by light nonaqueous-phase liquids (LNAPLs) such as gasoline or diesel fuel, a sample of the uppermost standing water in the well is collected prior to purging using a clear disposable bailer to check for free product.

3. Groundwater monitoring wells are purged of at least 3 casing volumes of water, unless slow recharge to the well makes this impossible to accomplish in one day. Very slow recharging wells are purged of at least the water content of the casing and filter pack, pumped or bailed dry, and allowed to recover. The wells are purged by either hand bailing with a decontaminated PVC bailer or with a downhole pump.

4. The purged water is periodically monitored for pH, temperature, specific conductivity and turbidity (NTU's). Dissolved oxygen and oxidation-reduction potential may also be monitored. No sample is taken until water quality parameters stabilize to no more than a 10% difference between two successive readings and turbidity is lower than 5 NTU.

5. At the completion of purging, the wells are allowed to recover to at least 80% of their static water level, or for a maximum period of 24 hours.

6. A groundwater sample is then obtained using a Teflon bailer with a control valve. Either a new, disposable Teflon bailer is used for each well, or a reusable bailer is used. If a reusable bailer is chosen to obtain the samples, it will be decontaminated between each well by washing with a non-phosphate solution bath and double rinsing with deionized water.

7. In some pumping wells, collecting the sample using a bailer may not be possible, and the sample must be taken from a discharge outlet at the surface.

+ 1000 ml amber for diesel

8. Groundwater samples to be analyzed are collected in EPA approved 40 ml vials capped with teflon-backed septums. The sample is taken such that the entire vial is filled and the meniscus overtops the vial, with no air bubbles or head space. Samples for organic analysis are not filtered or chemically preserved.

9. Three 40 ml vials are collected for each analysis. Each vial is appropriately labeled, placed in a ziplock bag, and preserved in an ice chest at a temperature of 4 degrees Celsius.

10. Sampling data is recorded on appropriate forms. In addition to time, date, and location of sample, the physical condition of the sample, such as color, presence of free product, suspended material or air bubbles, is noted on the sampling form.

(9) PAGE

All samples for laboratory analysis are logged on Chain-of-Custody forms and delivered in a chilled state to a certified laboratory within 24 hours of sampling. For this project, water samples from each well will be analyzed for a hydrocarbon range by DHS-modified EPA Method 8015 and for BTEX (Benzene, Toluene, Ethylbenzene, and Xylenes) by EPA Method 602.

specify

11. The purge pump is cleaned prior to use and between wells. All sampling will proceed from the areas assumed to be the least impacted and finishing where the groundwater is likely to be the most impacted. All monitoring and sampling equipment is washed in a nonphosphate solution bath

and triple rinsed between wells. Triple rinsing consists of a double rinse in clean water, followed by a final rinse in deionized or distilled water.

REPORT PREPARATION

At the conclusion of the investigation, a report will be prepared for submittal to the RWQCB. The report will include:

- Brief summary of the site history;
- Description of the site hydrogeology, along with detailed boring logs;
- Scaled plot plan showing well locations, property improvements, and nearest streets;
- Plot plan showing groundwater contours, gradient, and thickness of free product (if any);
- Description of all field procedures;
- Summary tables of water quality parameter results from the well development and purging;
- Analytical summary tables from the soil sample and groundwater sample results;
- Discussion of the analytical and geological findings;
- Conclusions and recommendations based on the analytical and geological findings;
- Copies of all original laboratory report and QA/QC data;
- Signature by a California Registered Geologist.

If you have any further questions or concerns regarding the proposed procedures for this investigation, please contact the undersigned at (415) 330-3000, extension 126.

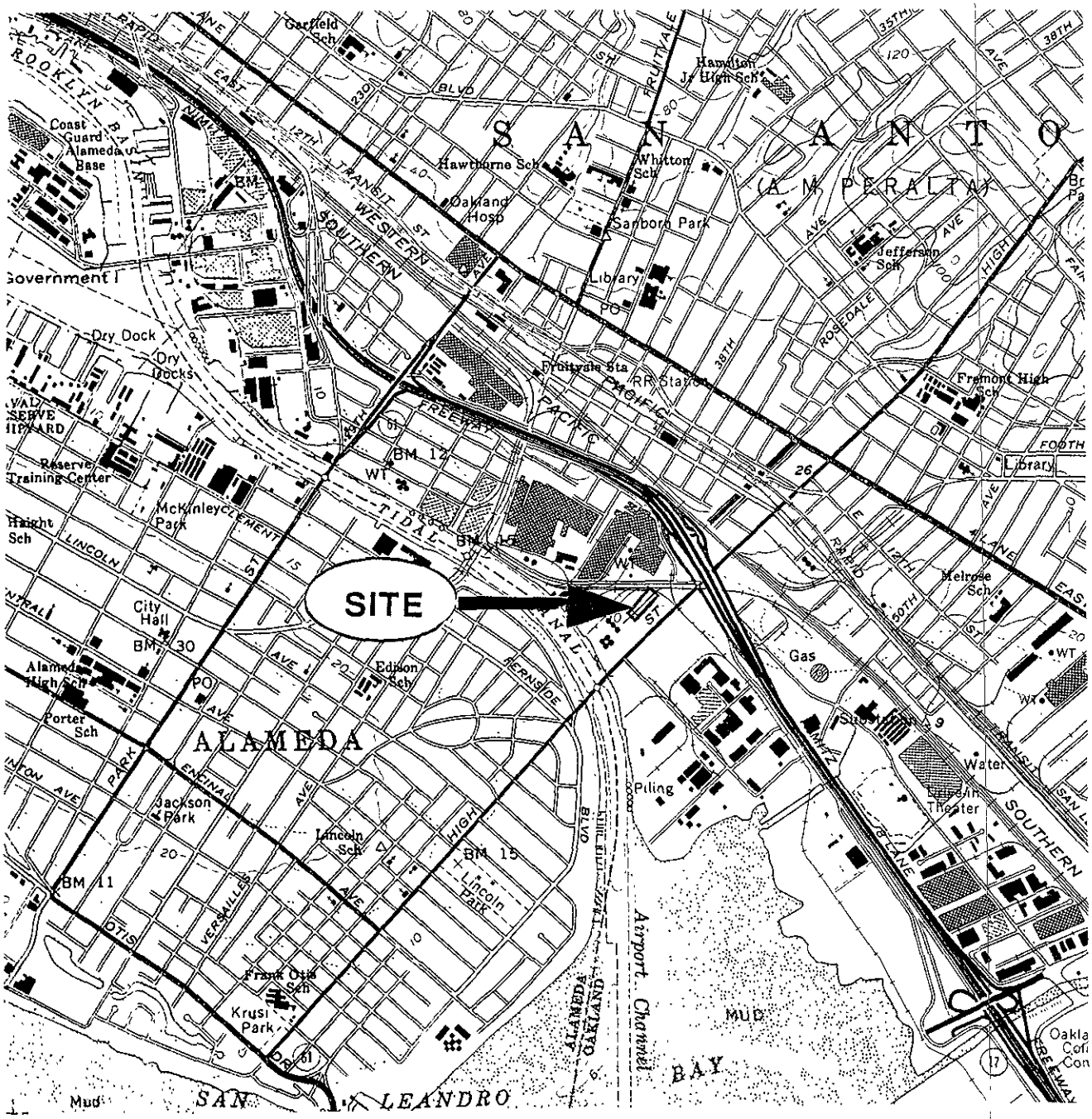
Respectfully Submitted,
SMITH-EMERY COMPANY

RICK WIDEBROOK
Staff Geologist
Project Manager

Reviewed and Approved by

KRIS JOHNSON, R.G. 5932, C.E.G. 1915
Vice President

SCALE: 1" = 2000'



REFERENCE:
U.S.D.I. - GEOLOGICAL SURVEY
SAN JOSE WEST AND MILPITAS QUADRANGLES
SANTA CLARA COUNTY, CALIFORNIA

VICINITY MAP

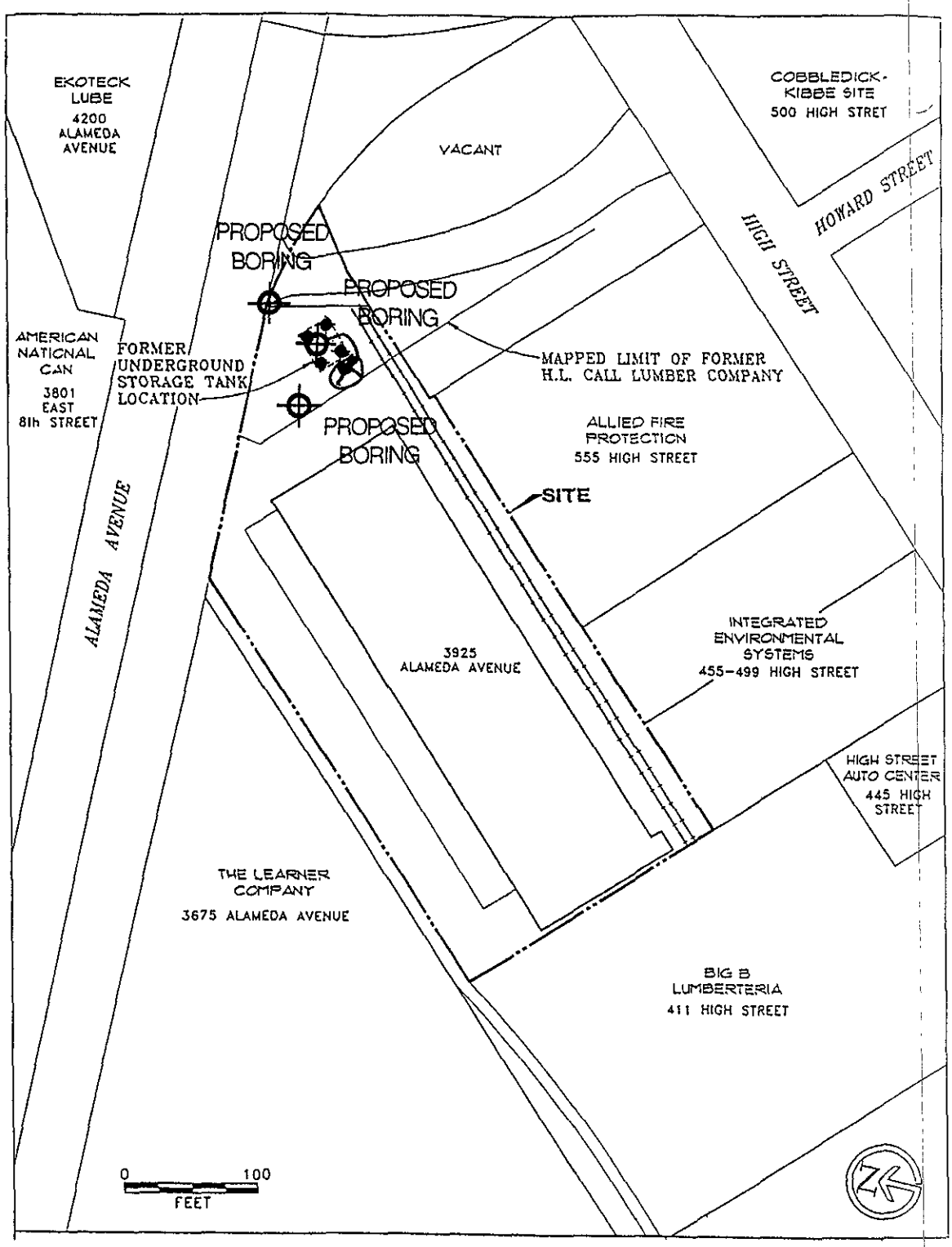
FILE NO. 90147

BEEM ENTERPRISES
1365 NORTH TENTH STREET
SAN JOSE, CALIFORNIA

SMITH-EMERY GEOSERVICES

TECHNICAL ILLUSTRATION BY P.M.

PLATE 1



Reference: Engeo Incorporated
Work Plan for Subsurface Investigation
3925 Alameda Avenue
Oakland, California
Report No. 3614-F4

PLOT PLAN

FILE NO. 90404

SMOOKE AND SONS
3925 ALAMEDA AVENUE
OAKLAND, CALIFORNIA

SMITH-EMERY GEOSERVICES

TECHNICAL ILLUSTRATION BY P.M. | PLATE 2

TYPICAL WELL DIAGRAM

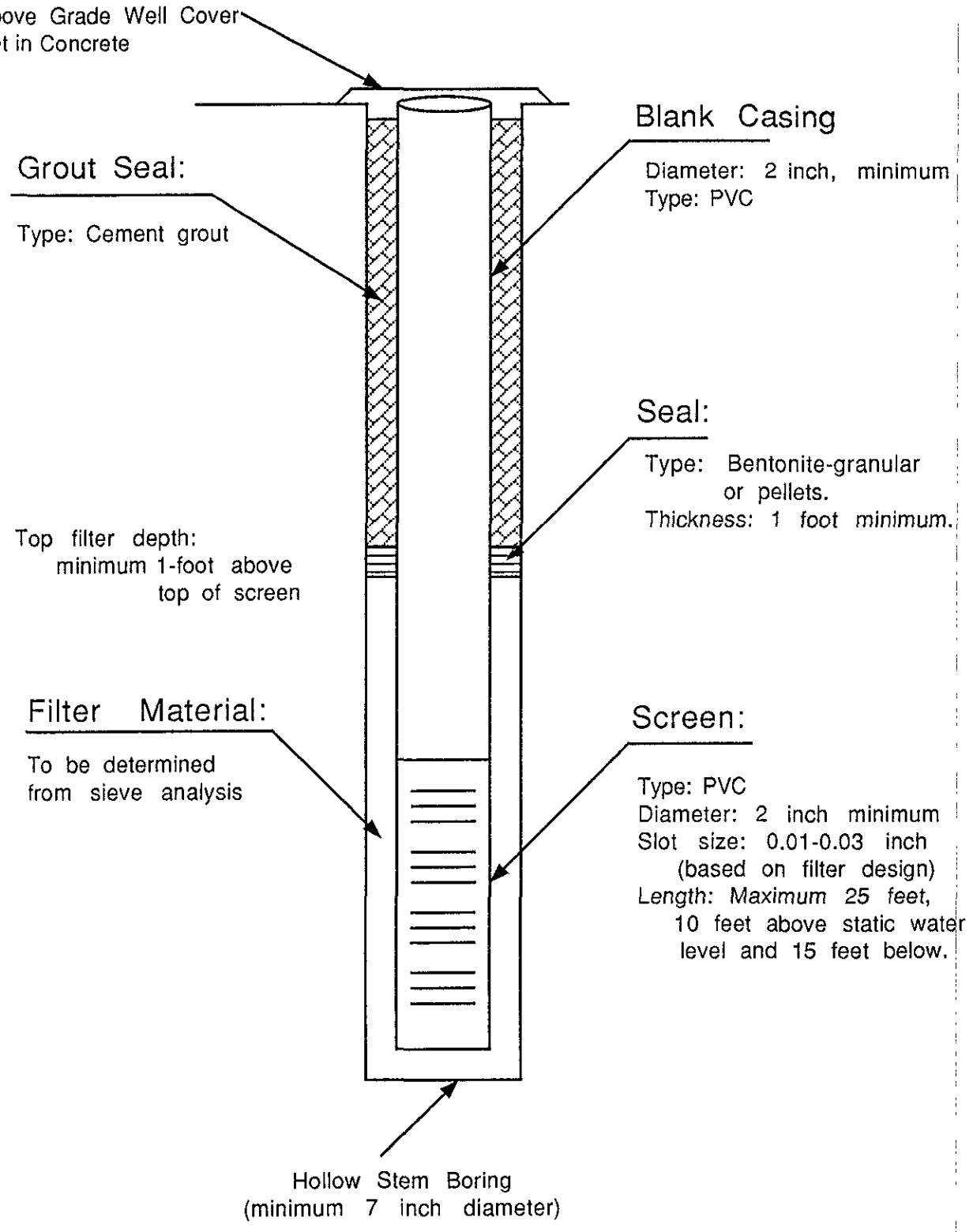


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PLATE 3