Environmental
Science &
Engineering, Inc.

A CILCORP Company

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HAZMAT

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April 7, 1994

Mr. Scott O. Seery, CHMM
Alameda County Health Care Services Agency
Division of Hazardous Materials
80 Swan Way, Room 350
Oakland, California 94621

SUBJECT: WORKPLAN FOR ADDITIONAL SITE INVESTIGATION
ENGINEER'S HILL
SANTA RITA CORRECTIONAL FACILITY
DUBLIN, CALIFORNIA
ESE PROJECT NO. 6-93-5073

Dear Mr. Seery:

Environmental Science & Engineering, Inc. (ESE) has been selected by the Alameda County General Services Agency (GSA) to conduct additional site investigation activities at the subject site (Figure 1 - Location Map), and presents this workplan for your approval. The objectives of our scope of work are to (1) determine the vertical and lateral extent of petroleum hydrocarbons in soil beneath the site toward the west, and (2) identify sediment stratigraphy and potential product migration routes. Site history and the proposed scope of work are described in the following sections.

SITE HISTORY

The subject site is owned and managed by the GSA. At the site, the GSA formerly operated one 1,000-gallon-capacity underground storage tank (UST) containing diesel fuel, identified as UST 2942-23, at Engineer's Hill (Figure 2 - Site Plan). The UST was constructed of single-walled carbon-steel and fueled a boiler formerly located in a building adjacent to the UST location. The installation date of the UST is unknown.

Under permit from the Alameda County Health Care Services Agency (HCSA) and the Doherty Regional Fire Authority (DRFA), ESE removed and disposed of the UST on May 18, 1992. Personnel from the HCSA and DRFA witnessed the UST removal activities and subsequent soil sampling. No fluids were found in the UST prior to removal.

ESE personnel collected one soil sample from the base of the excavation. The sample was submitted to a state-certified laboratory where it was analyzed for total petroleum hydrocarbons quantified as diesel fuel (TPH-D), benzene, toluene, ethylbenzene, and total xylenes (BTEX), and oil and grease (O&G). The sample was found to contain 190 milligrams per kilogram (mg/kg) TPH-D. BTEX constituents and O&G were not detected (ESE, 1992). ESE submitted a UST closure report to the HCSA on June 25, 1992.

ESE supervised overexcavation of the former UST location on November 8, 1992. At 9 feet below ground surface (bgs), ESE personnel observed grey discoloration in a pebbly sand sediment and noted a diesel fuel odor. The impacted soil was observed to extend to the limit of equipment's reach at 22 feet bgs. One sample (T23-1-SP), collected by ESE from the impacted soil at 22 feet bgs, was submitted to a state-certified laboratory and found to contain TPH-D (1,400 mg/kg) and BTEX constituents (ESE, 1993a).

To determine the areal extent of impacted soil, three test pits were excavated to maximum depths of 22 feet bgs at locations approximately 10 to 25 feet east, west, and south of the former UST location. No soil discoloration or petroleum hydrocarbon odors were noted at these locations. Ground water was not found in these excavations (ESE, 1993a). Results of the excavation activities were documented in a report to the GSA dated January 7, 1993.

ESE performed a subsurface investigation at the site on November 4 and 5, 1993. The investigation consisted of augering five soil borings at locations including the UST backfill (EH1), topographically downgradient from the UST backfill toward the southwest (EH2), topographically downgradient from the UST backfill toward the west (EH3), topographically downgradient from the UST backfill toward the southeast (EH4), and topographically upgradient from the UST backfill toward the north (EH5), as shown in Figure 2. The borings were drilled to depths of 56 to 80 feet bgs. Results of the investigation indicated that the UST backfill material and formational sediments located beneath the backfill material to an approximate depth of 40 feet bgs are impacted with diesel fuel (ESE, 1994). In addition, findings indicated that the petroleum hydrocarbon plume has migrated toward the west in an apparently dipping pebbly sand layer. The extent of petroleum hydrocarbon migration toward the west in the unsaturated zone remains unknown.

Ground water saturation has not been observed to a boring depth of 80 feet bgs (EH2) at the site (ESE, 1994). The presence of a nonimpacted, "tight", clay layer of 15 feet minimum thickness beneath the impacted pebbly sand layer suggests that the petroleum hydrocarbon plume has not migrated to ground water beneath the site. Results of the site investigation activities were documented in a report to the GSA dated February 1, 1994.

SCOPE OF WORK

To accomplish the objectives outlined in the introduction of this workplan, ESE proposes to conduct the following work at the site:

TASK 1 - DRILLING AND SOIL SAMPLING

All workers will attend a safety meeting at the site immediately prior to beginning the fieldwork. The purpose of this meeting is to review the site-specific health and safety plan (HASP) prepared for the drilling activities to be performed (ESE, 1993b). During the meeting the site safety officer will identify hazards associated with the proposed fieldwork, safety practices to minimize all identified hazards, and will review the emergency contingency plan procedures.

To determine the lateral extent and vertical extent of petroleum hydrocarbon migration toward the west of the UST backfill, ESE will supervise the drilling of three soil borings to the west of EH3 (Figure 3 - Proposed Soil Boring Locations). The first boring will be drilled at a location approximately 20 to 30 feet west of boring EH3. The locations of the remaining two borings are to be considered tentative and may be modified in the field based on findings from the first boring. If the pebbly sand lens is intersected in the first boring and is noted to be impacted with petroleum hydrocarbons, the remaining two borings will be drilled at locations further to the west. If the pebbly sand lens is intersected in the first boring and no petroleum hydrocarbon impact is detected, the remaining two borings will be drilled at locations further to the east toward boring EH3. All borings will be terminated at a depth of approximately 60 feet in nonimpacted sediments beneath the apparently dipping pebbly sand layer.

All drilling and soil sampling activities will be conducted in accordance with ESE Standard Operating Procedure (SOP) No. 1 for soil borings and soil sampling with hollow-stem augers in unconsolidated formations (Attachment 1) with the exception that soil samples will be collected at ten-foot intervals over the complete depth of each boring and continuously sampled through the apparently dipping pebbly sand layer. All samples will be logged by an ESE geologist according to the Unified Soil Classification System (USCS), labeled, and placed in a cooler with ice for transport to McCampbell Analytical (a State-certified laboratory) of Pacheco, California under chain of custody documentation.

All soil samples will be analyzed for TPH-D using EPA Method 8015 (modified per CA LUFT). Samples containing greater than 10 parts per million (ppm) of volatile organic compounds (VOCs) in headspace during field screening with a photoionization detector (PID), will be submitted for BTEX analysis using EPA Method 8020.

All decontamination rinseates will be placed in labeled, 55-gallon capacity, Department of Transportation (DOT)-rated, steel drums and left at the site pending analytical results. All drill cuttings will be stockpiled on and under plastic sheeting and left at the site pending receipt of analytical results.

TASK 2 - REPORT PREPARATION

ESE will prepare a report of findings for submittal to the HCSA in accordance with Tri-Regional Water Quality Control Board recommendations (RWQCB, 1990). The report will present site maps, boring logs, schematic cross-sections, and analytical data. The report will also include recommendations for future work, if necessary.

REFERENCES

Environmental Science & Engineering, Inc., 1992. Unpublished Letter Report for Closure of UST 2942-23 Located at Engineer's Hill, Santa Rita Correctional Facility, Dublin, California; dated June 25, 1992.

Environmental Science & Engineering, Inc., 1993a. Unpublished Letter Report of Overexcavation Activities at Engineer's Hill, Santa Rita Correctional Facility, Dublin, California; dated January 7, 1993.

Environmental Science & Engineering, Inc., 1993b. Unpublished Letter Workplan For Soil and Ground Water Investigation, Engineer's Hill, Santa Rita Correctional Facility, Dublin, California; dated June 29, 1993.

Environmental Science & Engineering, Inc., 1994. Unpublished Site Assessment Report, Engineer' Hill, Santa Rita Correctional Facility, Dublin, California; dated February 1, 1994.

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ESE will proceed with permitting and scheduling activities immediately upon receipt of HCSA approval of this workplan. We expect to begin fieldwork within approximately two weeks of receipt of your approval. ESE will notify you of any scheduled fieldwork at the site at least 48 hours in advance.

Please feel free to contact Bart Miller at (510) 685-4053 with any questions or comments pertaining to this workplan.

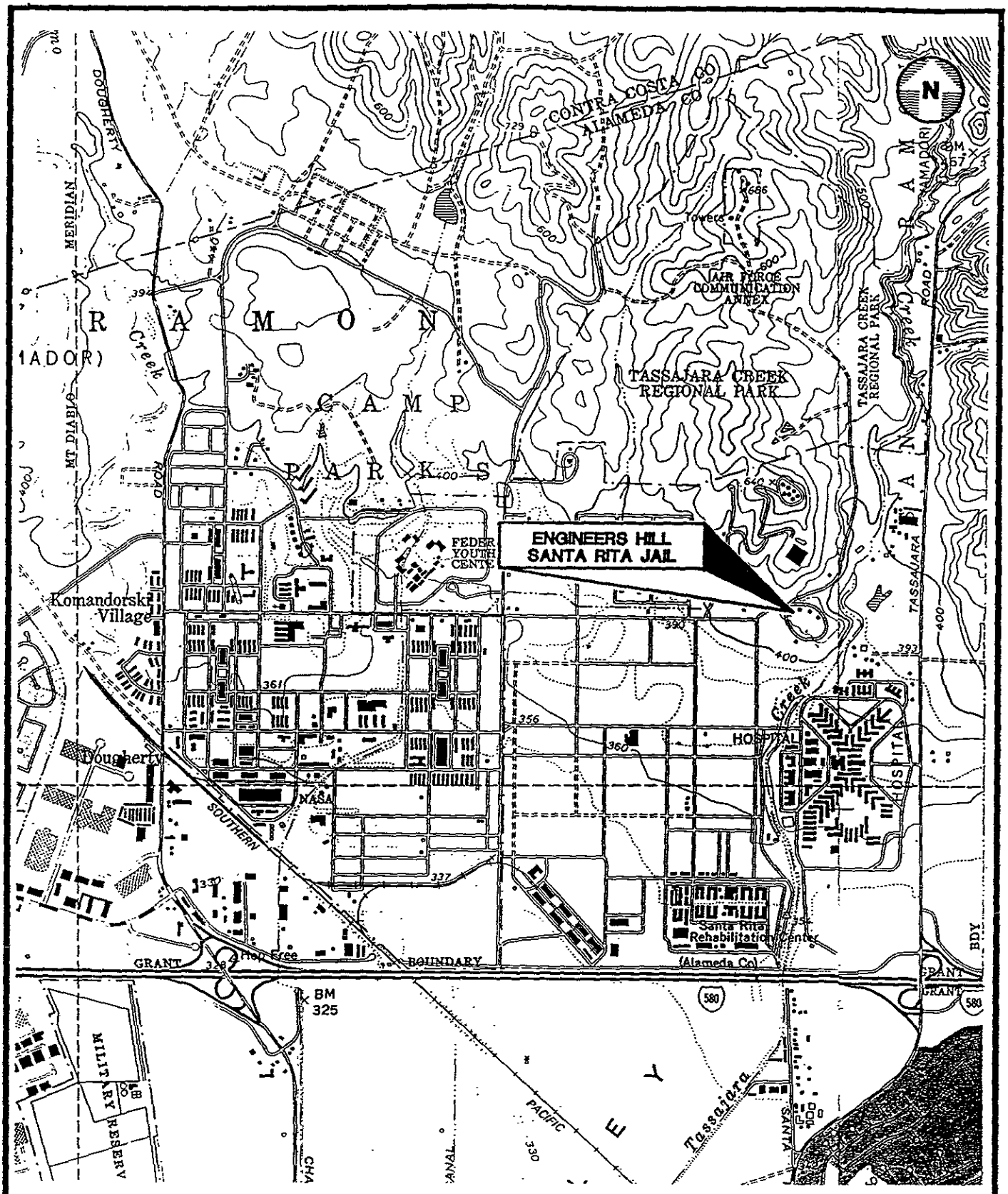
Sincerely,
ENVIRONMENTAL SCIENCE & ENGINEERING, INC.

Bart S. Miller
Project Geologist

Michael E. Quillin, R.G.
Senior Hydrogeologist
California Registered Geologist No. 5315

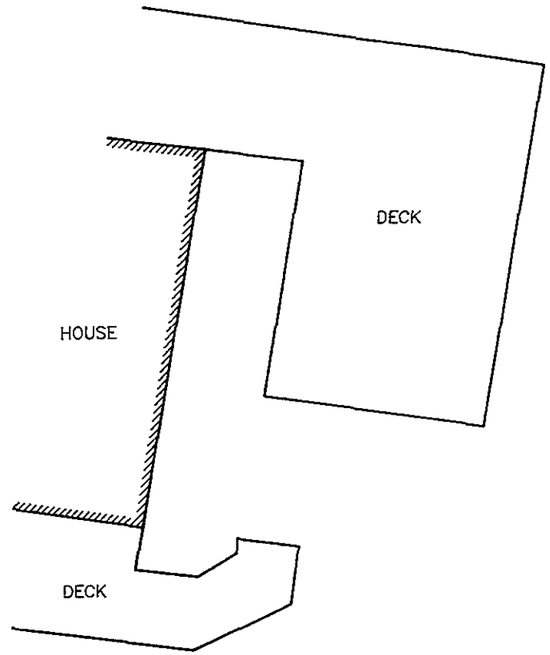
Attachments: Figures (x3)
ESE SOP No. 1

FIGURES

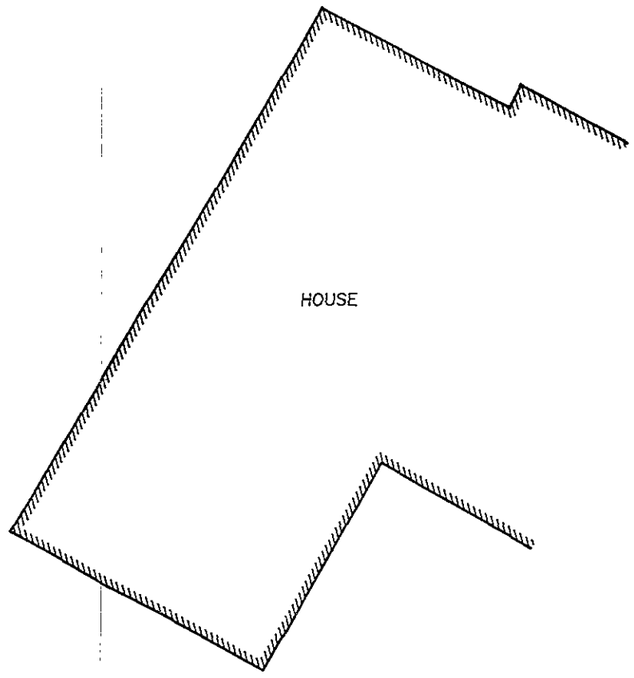


Adapted From USGS 7.5 Minute Dublin and Livermore Topographic Quadrangles (1980)

Environmental Science & Engineering, Inc. A CILCORP Company	DATE 6/93	PROJ. NO. 6-93-5073	ALAMEDA COUNTY GENERAL SERVICE AGENCY SANTA RITA CORRECTIONAL FACILITY DUBLIN, CALIFORNIA
	DRAWN BY CVS	CAD FILE 50731001	
4090 NELSON AVENUE, SUITE J CONCORD, CA 94520	APPROVED BY	REVISED	FIGURE 1 LOCATION MAP



EH5



LIMITS OF FORMER 1,000 GALLON DIESEL UST EXCAVATION

EH3

EH1

FORMER BOILER ROOM STRUCTURE

EH4

LEGEND

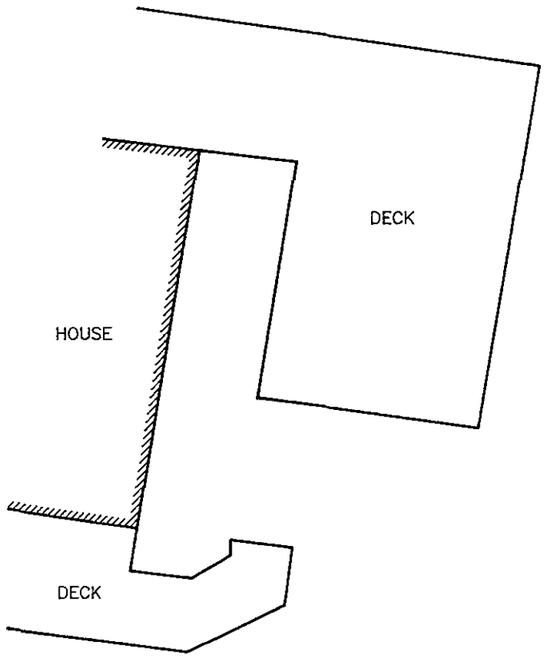
EH SOIL BORING LOCATION

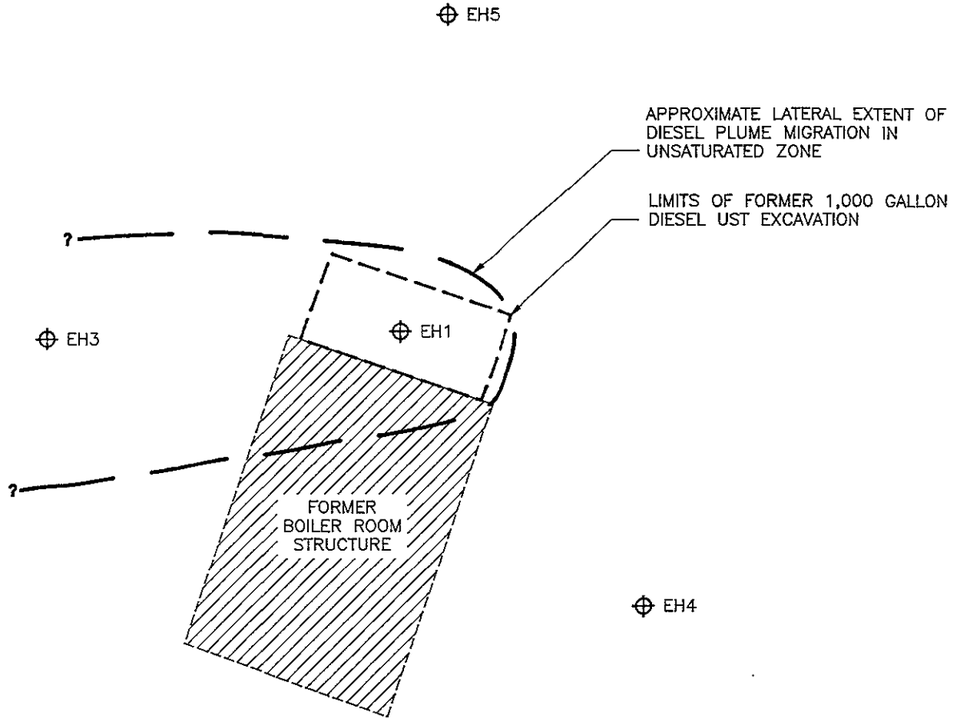
EH2

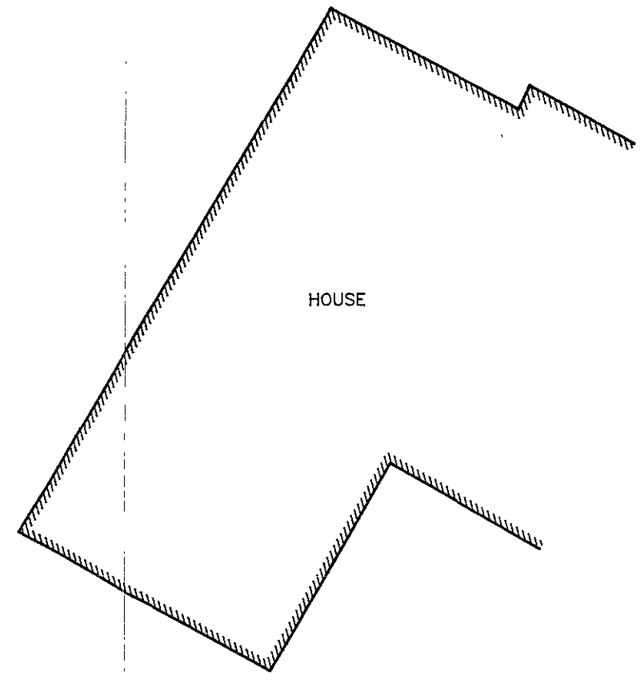
SCALE

0 10 FEET

ESE A CILCORP Company — Environmental Science & Engineering, Inc. 4090 NELSON AVENUE, SUITE J CONCORD, CA 94520	DATE 1/94 REVISED CAD FILE 50731003	SITE PLAN ALAMEDA COUNTY GENERAL SERVICES AGENCY SANTA RITA CORRECTIONAL FACILITY DUBLIN, CALIFORNIA	FIGURE NO. 2 PROJ. NO. 6-93-5073







LEGEND

⊕ SOIL BORING LOCATION

⊗ PROPOSED SOIL BORING

SCALE 0 10 FEET

ESE Environmental Science & Engineering, Inc. (A CILCORP Company) 4090 NELSON AVENUE, SUITE J CONCORD, CA 94520	DATE 2/94 REVISED 4/94 BSM CAD FILE 50731009	PROPOSED SOIL BORING LOCATIONS ALAMEDA COUNTY GENERAL SERVICES AGENCY SANTA RITA CORRECTIONAL FACILITY DUBLIN, CALIFORNIA	FIGURE NO. 3 PROJ. NO. 6-93-5073

ATTACHMENT 1

ESE STANDARD OPERATING PROCEDURE NO. 1

ENVIRONMENTAL SCIENCE & ENGINEERING, INC.
CONCORD, CALIFORNIA OFFICE

STANDARD OPERATING PROCEDURE NO. 1
FOR SOIL BORINGS AND SOIL SAMPLING WITH HOLLOW-STEM AUGERS IN UNCONSOLIDATED FORMATIONS

Environmental Science & Engineering, Inc. (ESE) typically drills soil borings using a truck-mounted, continuous-flight, hollow-stem auger drill rig. The drill rig is owned and operated by a drilling company possessing a valid State of California C-57 license. The soil borings are conducted under the direct supervision and guidance of an experienced ESE geologist. Prior to drilling, the ESE geologist will clear the borehole location with a hand auger to a depth of five feet. The ESE geologist logs each borehole during drilling in accordance with the Unified Soil Classification System (USCS). Additionally, the ESE geologist observes and notes the soil color, relative density or stiffness, moisture content, odor (if obvious) and organic content (if present). The ESE geologist will record all observations on geologic boring logs.

Soil samples are collected during drilling at a minimum of five-foot intervals by driving an 18-inch long Modified California Split-spoon sampler (sampler), lined with new, thin-wall brass sleeves, through the center of and ahead of the hollow stem augers, thus collecting a relatively undisturbed soil sample core. The brass sleeves are typically 2-inches in diameter and 6-inches in length. The sampler is driven by dropping a 140-pound hammer 30-inches onto rods attached to the top of the sampler. Soil sample depth intervals and the number of hammer blows required to advance the sampler each six-inch interval are recorded by the ESE geologist on geologic boring logs. The ends of one brass sleeve are covered with Teflon sheeting, then covered with plastic end caps. The end caps are sealed to the brass sleeve using duct tape. Each sample is then labeled and placed on ice in a cooler for transport under chain of custody documentation to the designated analytical laboratory. A portion of the remaining soil in the sampler is placed in either a new Ziploc® bag or a clean Mason Jar® and set in direct sunlight to enhance the volatilization of any Volatile Organic Compounds (VOCs) present in the soil. After approximately 15-minutes that sample is screened for VOCs using a photoionization detector (PID). The PID measurements will be noted on the geologic boring logs. The PID provides qualitative data for use in selecting samples for laboratory analysis. Soil samples from the saturated zone (beneath the ground-water table) are collected as described above, are not screened with the PID, and are not submitted to the analytical laboratory. The samples from the saturated zone are used for descriptive purposes. Soil samples from the saturated zone may be retained as described above for physical analyses (grain size, permeability and porosity testing).

If the soil boring is not going to be completed as a well, then the boring is typically terminated upon penetrating the saturated soil horizon or until a predetermined interval of soil containing no evidence of contamination is penetrated. This predetermined interval is typically based upon site specific regulatory or client guidelines. The boring is then backfilled using either neat cement, neat cement and bentonite powder mixture (not exceeding 5% bentonite), bentonite pellets, or a sand and cement mixture (not exceeding a 2:1 ratio of sand to cement). However, if the boring is to be completed as a monitoring well, then the boring is continued until either a competent, low estimated-permeability, lower confining soil layer is found or 10 to 15-feet of the saturated soil horizon is penetrated, whichever occurs first. If a low estimated-permeability soil layer is found, the soil boring will be advanced approximately five-feet into that layer to evaluate its competence as a lower confining layer, prior to the termination of that boring.

All soil sampling equipment is cleaned between each sample collection event using an Alconox® detergent and tap water solution followed by a tap water rinse. Additionally, all drilling equipment and soil sampling equipment is cleaned between borings, using a high pressure steam cleaner, to prevent cross-contamination. All wash and rinse water is collected and contained onsite in Department of Transportation approved containers (typically 55-gallon drums) pending laboratory analysis and proper disposal/recycling.