ES ENGINEERING-SCIENCE

LETTER OF TRANSMITTAL

DATE	JOB NO.
2 September 1993	NC367.05

ATTENTION: Ms. Juliette Shin

East Bay Regional Parks District-
Redwood Regional Park Corporation
Yard UST Site

TO Alameda County Health Care Services Agency
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, CA 94621

93 SEP -3 AM 11:49

GENTLEMEN:

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

Dated _____

COPIES	DATE	NO.	DESCRIPTION
1			(Draft) Workplan for Site Characterization at East Bay Regional
			Parks District - Redwood Regional Park Corporation Yard

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ For checking ☐ Resubmit _____ copies for approval

☐ For your use ☐ Approved as submitted ☐ Design only, not for construction

☐ As requested ☐ Approved as noted ☐ Return _____ corrected prints

☒ For review and comment ☐ Returned for corrections ☐ _____

☐ For Your Action

REMARKS: _____

COPY TO Warren Gee: EBRPD

SIGNED: Bruce M. Rucker

If enclosures are not as noted, please notify us at once. Bruce M. Rucker, Proj. Mgr.

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DRAFT

3 September 1993
Ref: NC367.05.01

Alameda County Health Care Services Agency
Division of Hazardous Materials
80 Swan Way
Oakland, California 94621

Attention: Ms. Juliette Shin

Subject: Workplan for Site Characterization at Redwood Regional Park Corporation Yard, Oakland, California

Dear Ms. Shin:

Enclosed is the draft workplan for the site characterization at the Redwood Regional Park Corporation Yard underground storage tank (UST) site in Oakland, California. On behalf of East Bay Regional Parks District (EBRPD) we respectfully request that your agency review this document and approve or provide comments. Following your review, we will incorporate appropriate comments then submit copies of the final version to your agency and to the San Francisco Bay Region of the California Regional Water Quality Control Board (RWQCB).

We trust that this submittal meets your needs. Should you have any questions or require further information, please call.

Very Truly Yours,

ENGINEERING-SCIENCE, INC.

Bruce M. Rucker

Bruce M. Rucker
Project Manager

REGISTERED GEOLOGIST
FREDERICK T. STANIN
No. 5248
Exp. 6/94
STATE OF CALIFORNIA

Fred T. Stanin, R.G. (No. 5248)
Senior Geologist

BMR/dka/44-48L.R0

Attachments
cc: W. Gee, EBRPD
D. Diamond, ES

DRAFT

Workplan for Site Characterization at

EAST BAY REGIONAL PARKS DISTRICT
REDWOOD REGIONAL PARK CORPORATION YARD
OAKLAND, ALAMEDA COUNTY, CALIFORNIA

Prepared For

East Bay Regional Parks District
Parklands Design Department
P.O. Box 5381
Oakland, California 94605-0381

August 1993

Prepared by

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PLANNING • DESIGN • CONSTRUCTION MANAGEMENT
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OFFICES IN PRINCIPAL CITIES
NC367/44-48

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DRAFT

INTRODUCTION

This workplan describes proposed site characterization activities to be conducted at the East Bay Regional Park District (EBRPD) Redwood Regional Park Corporation Yard in Oakland, Alameda County, California (project site). The proposed work primarily addresses concerns regarding fuel contamination detected during removal of two site underground fuel storage tanks (UFSTs).

The format of this workplan has been prepared in general accordance with guidance documents published by the California Regional Water Quality Control Board (RWQCB) for investigating fuel tank leaks (RWQCB 1990a, 1990b).

Alameda County Health Care Services Agency - Division of Hazardous Materials (ACHCSA-DHM) is the local implementing agency (LIA) for the site investigation, and is therefore the principal contact for this project regarding technical environmental issues. ES anticipates that the San Francisco Bay Region of the California Regional Water Quality Control Board (RWQCB) will provide technical oversight of ACHCSA-DHM decisions and will therefore be included in all technical correspondence for the proposed investigation.

BACKGROUND AND OUTLINE OF SCOPE

Two UFSTs (a gasoline UFST and a diesel UFST) were removed from the project site on 23 April 1993. Additional soil excavations were conducted on 10, 11 and 14 June 1993. Soil excavation activities were halted due to groundwater infiltrating into the excavation, the presence of significant facility constraints (utilities and roads) and the potential for landslides at the eastern edge of the excavation. A detailed discussion of these remedial actions is presented in the following subsection "Previous Remedial Actions."

On behalf of EBRPD, ES will implement an exploratory borehole drilling, sampling and analysis program at the project site. The objective of this program is to evaluate the spatial extent and magnitude of residual soil and groundwater contamination, and will be accomplished by conducting the following activities:

Regulatory agency interaction and permit acquisition

Implementation of exploratory borehole drilling program

Collection of soil and "grab" groundwater samples from selected borings

Laboratory analysis of collected samples

Preparation of a Site Characterization Report

SITE DESCRIPTION

General

The Redwood Regional Park Corporation Yard (project site) is located in Redwood Regional Park, north of Redwood Road in Oakland, California (Figures 1 and 2). The former UFSTs were located directly north of the park office and adjacent to (east) the park entrance road.

Former UFST Usage

The UFSTs were reportedly installed prior to 1974. The gasoline UFST was a converted steel channel buoy purchased from the Navy. No other information regarding UFST usage was available (Gee 1993).

Geology and Hydrogeology

No formal geologic or hydrogeologic evaluation has been conducted at the UFST site. Observations during UFST removal and soil excavations indicate that shallow site soils are predominantly clayey with variable silt and sand. Cobbles and boulders in a clay matrix were noted at approximately 22 feet below grade (relative to the eastern excavation edge). A spring was observed during UFST removals at approximately eight feet below grade in the southeast corner of the UFST excavation. **First occurrence of groundwater was encountered at approximately 22 feet below grade (relative to the eastern excavation edge). Due to local surface topography, depth to groundwater may be variable in the vicinity of the excavation.**

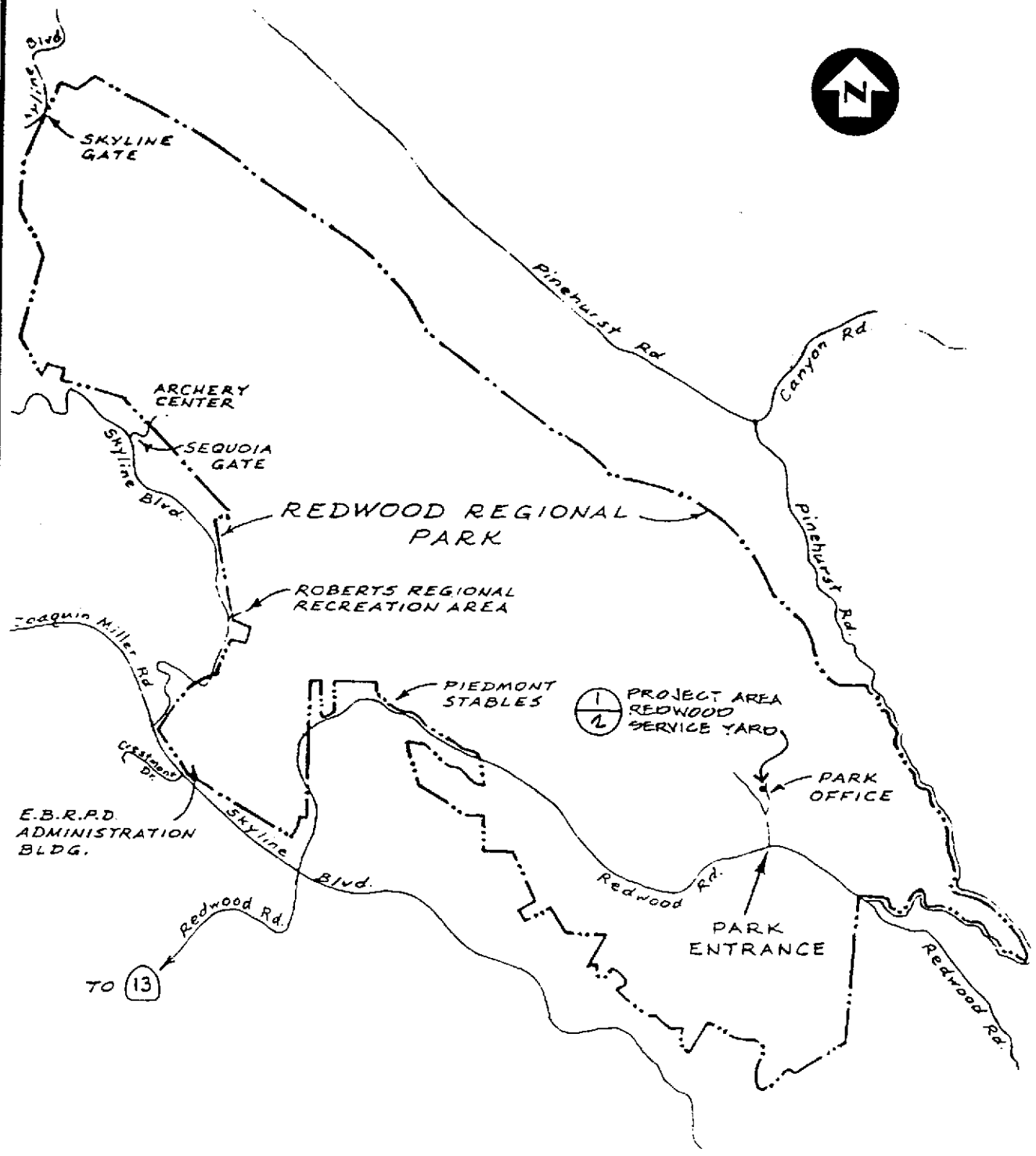
PREVIOUS REMEDIAL ACTIONS

The two project site UFSTs (2,000-gallon diesel fuel and 5,000-gallon unleaded gasoline) were removed from the project site on 23 April 1993 from a single excavation (Figure 2). Neither UFST had visible holes or other damage. However, discolored soil was noted directly beneath the gasoline UFST. Soil samples were analyzed for the following constituents:

- TPH as gasoline California Department of Toxic Substances Control Leaking Underground Fuel Tank (DTSC LUFT) Manual method
- TPH as diesel and kerosene by DTSC LUFT Manual method
- Benzene, toluene, total xylenes and ethylbenzene (BTXE) by EPA Method 8020
- Total lead by EPA Method 7420

Soil samples collected beneath the gasoline UFST (approximate depth 12 feet) contained maximum concentrations of 2,200 mg/kg total petroleum hydrocarbons as gasoline (TPH-g), 434 mg/kg total aromatic hydrocarbons (including benzene, toluene, total xylenes and ethylbenzene, or BTXE) and 10 mg/kg total lead. TPH as diesel (TPH-d) was detected in soil samples collected beneath the diesel UST (approximately depth of 10 feet) at a maximum concentration of 4 mg/kg. Soil sampling locations are shown on Figure 2. Table 1 summarizes analytical results of soil sampling at the site.

FIGURE 1



LOCATION MAP

REDWOOD REGIONAL PARK
CORPORATION YARD SITE

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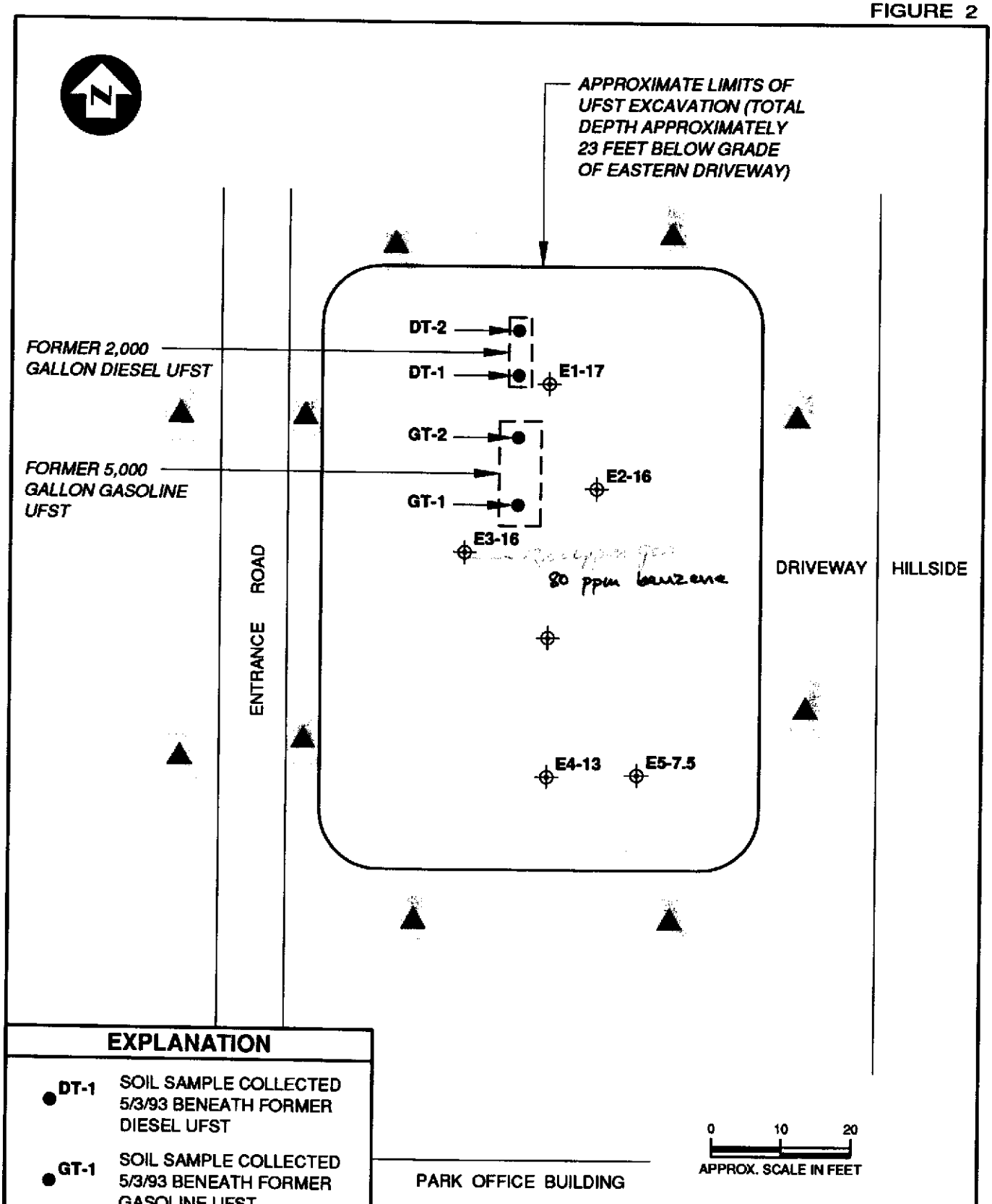
FIGURE 2



FORMER UFST AND EXPLORATORY BOREHOLE SOIL SAMPLING LOCATIONS

REDWOOD REGIONAL PARK CORPORATION YARD OAKLAND, CALIFORNIA

REV. 2 C258-36.DWG 08/31/93

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TABLE 1
UFST Soil Sampling Analytical Results
Redwood Regional Park Corporation Yard
Oakland, CA

Initial Samples (a)	Depth (feet below grade)	TPH–G	TPH–K	TPH–D	Benzene	Toluene	Total Xylenes	Ethyl–benzene	Lead (total)
		concentrations in mg/kg							
DT–1	10	NA	**	4	< 0.005	< 0.005	< 0.005	< 0.005	NA
DT–2	10	NA	< 1	3	< 0.005	< 0.005	< 0.005	< 0.005	NA
GT–1	12	800	NA	NA	6.3	43	94	18	10
GT–2	12	2,200	NA	NA	19	120	250	45	9
Confirmation Excavation Samples (b)									
E1–17	17	< 1	NA	NA	< 0.005	< 0.005	< 0.005	< 0.005	5
E2–16	16	< 1	NA	NA	< 0.005	< 0.005	< 0.005	< 0.005	5
E3–16	16	12,000	NA	NA	80	390	1,100	230	8
E4–13	13	6*	NA	NA	0.37	0.006***	0.38	1.0	6
E5–7.5	7.5	< 1	NA	NA	< 0.005	< 0.005	< 0.005	< 0.005	8

Notes:
TPH–G: Total Petroleum Hydrocarbons as Gasoline
TPH–D: Total Petroleum Hydrocarbons as Diesel Fuel
TPH–K: Total Petroleum Hydrocarbons as Kerosene
UFST: Underground Fuel Storage Tank
< 1 : Not detected above method reporting limit of 1 mg/kg
NA : Not Analyzed
* : Pattern does not match gasoline standard.
** : Kerosene Range not reported due to overlap of hydrocarbon range.
*** : Presence of this compound confirmed by second column;
however, the confirmation differed from the reported result by more than a factor of two.
(a) : Samples collected 3 May 1993 from directly beneath the UFSTs
(b) : Samples collected 15 June 1993 from excavation base and sidewalls

redyd.wk1"
09/01/93

Additional soil excavations were conducted on 10, 11 and 14 June 1993. Approximately 600 cubic yards of contaminated soil were excavated and stockpiled on site for aeration. The excavation covers a surface area of approximately 1,200 square feet and had a maximum depth of approximately 25 feet (below grade relative to the eastern edge of the excavation). Soil excavation activities were halted due to the potential for landslides and the presence of significant facility constraints (utilities and roads). Confirmation excavation samples of the excavation base and sidewalls were collected on 15 June 1993. No visible soil discoloration was noted in the excavation base or sidewalls during confirmation sampling. However, confirmation soil samples contained up to approximately 1,700 ppm total ionizable vapors as measured with a PID. The excavation was subsequently partially backfilled with clean (as evidenced by PID readings) excavated spoils to approximately 15 feet below ground surface (at eastern excavation edge) which is approximately level with the road at the western edge of the excavation. Re-use of clean overburden was approved by ACHCSA-DHM (Shin 1993).

Potential impacts to groundwater associated with the documented soil contamination are unknown.

SCOPE OF WORK

Excavation confirmation sampling delineated the magnitude of residual soil contamination in the excavation base and sidewalls associated with the former UFSTs (Table 1). The scope of work described herein is designed to evaluate the spatial extent and magnitude of soil and groundwater contamination in the vicinity of the UFST excavation, and to evaluate local geology and hydrogeology. The following subsections describe specific scope tasks. Specific sampling protocols and analysis methods are described in Appendix A.

Approvals and Permits

After ACHCSA-DHM and RWQCB approval of this workplan, permits for soil borings will be acquired from Alameda County Flood Control and Water Protection District - Zone 7 prior to the initiation of soil boring activities.

Evaluation of Contamination

Soil and groundwater samples will be collected for laboratory analysis to evaluate the spatial extent and magnitude of residual contamination associated with the former UFSTs. Based on site soil sample analytical data (Table 1), it is inferred that the documented soil contamination is predominantly the result of leakage from the gasoline UFST, and that the contaminants of concern include **TPH-g and BTXE.** All soil and water samples collected during the proposed investigation will therefore be analyzed for these contaminants. **A limited number of soil and water samples will also be analyzed for TPH-d/k** to confirm that these contaminants have not impacted groundwater and residual soils.

Two soil samples will be collected from each of up to 15 soil boreholes drilled to depths of approximately 25 feet in the vicinity of the UFST excavation. Approximate locations for each of the initial eight proposed boreholes are shown on Figure 2; exact

borehole locations will be determined in the field based on facility constraints. The depths of soil samples collected for laboratory analysis will be determined in the field based on headspace screening of soil samples by photoionization detector (PID) and total hydrocarbon vapor analyzer (THVA) and visual observation. Additional boreholes will be drilled and sampled as necessary to define the limits of soil contamination, and will be located based on field data. Boreholes will be geologically logged using the Unified Soils Classification System (USCS). Borehole drilling, geologic logging and soil sampling protocols and methodologies are discussed in detail in Appendix A.

To establish whether groundwater quality has been impacted in the vicinity of the former UFSTs, "grab" groundwater samples will be collected in five of the boreholes. It is anticipated that grab water samples will be collected in each of four boreholes located on each side of the excavation (two samples collected in downgradient (west) boreholes). The boreholes from which grab water samples will be collected will be determined in the field based on the results of PID/THVA headspace measurements and visual observation of soil samples. Temporary screened PVC well casings will be installed into each of these boreholes, and "grab" groundwater samples will be collected according to protocols described in Appendix A. In the event that results of the work proposed here indicate the presence of groundwater contamination, or sufficient soil contamination to constitute a potential threat to groundwater quality, installation of permanent monitoring wells will be proposed in a supplement to this document.

Evaluation of Groundwater Gradient

In order to assess local groundwater flow direction and to establish appropriate locations of any monitoring wells that may potentially be installed at the site, water levels will be measured in all borings drilled for "grab" groundwater sampling according to protocols described in Appendix A. As surface elevations at temporary well points will not be surveyed, exact groundwater elevations will not be determined. However, a general assessment of groundwater flow direction will be made.

Report Preparation

The results of the investigation will be submitted to ACHCSA-DHM and RWQCB as a site characterization report. The format and content of the report will follow RWQCB reporting guidelines where applicable (e.g. RWQCB 1990a, 1990b)

The report will be signed and stamped with the seal of a California Registered Geologist (RG), Certified Engineering Geologist (CEG) or Professional Engineer (PE).

QUALITY ASSURANCE

Field Quality Assurance

The quality of the data collected during this study will be assured by following the soil and groundwater sampling procedures detailed in Appendix A of this workplan. In addition, the following Quality Control (QC) samples will be collected to assess reproducibility and representativeness of analytical results:

Field Duplicate Samples

Approximately one duplicate sample will be collected per twenty field samples for each media type. At least one duplicate will be collected per sampling round if less than twenty samples are collected. The need to collect representative soil samples does not allow use of sample splitting methods using the same sampling tube, so soil "duplicates" will be collected from adjacent sampling tubes. Therefore, "duplicate" results may in part reflect heterogeneity of contaminant distribution and soil type. Field duplicate samples will be analyzed for volatile constituents (TPH-g and BTXE).

Rinsate Blanks (groundwater only)

One rinsate blank will be collected per sample shipment whenever groundwater samples are submitted for analysis. The rinsate blank will be collected from the water sampling tool after tool decontamination. The rinsate blank will be held by the laboratory and will analyzed for any analytes that are detected in groundwater samples.

Trip Blanks (groundwater only)

One trip blank per water sample shipment will be prepared by the laboratory and carried into the field during water sampling activities. The trip blank will be held by the laboratory, and will be analyzed only if contamination is detected in the rinsate blank.

Laboratory Quality Assurance

All samples delivered to the laboratory will be maintained under strict custody procedures. All laboratory analyses will be conducted by a laboratory certified by the California-Environmental Protection Agency (Cal-EPA) Environmental Laboratory Accreditation Program (ELAP) for each required analytical method. Method detection limits for groundwater samples will be lower than drinking water standards for each analyte. Laboratory QC samples will be analyzed according to the requirements of the specific EPA methods utilized.

HEALTH AND SAFETY

ES has prepared a site specific Health and Safety Plan (HASP) for proposed field activities at the project site that complies with Federal Occupational Safety and Health Administration (OSHA) regulations governing hazardous waste site activities (29 CFR 1910.120). The provisions of the HASP will be mandatory for all site personnel. All ES subcontractors shall be responsible for the health and safety of their own personnel, and prior to start of work, will be required to develop a HASP that meets or exceeds the requirements of the ES HASP. In addition, all ES and subcontractor personnel will be enrolled in a medical monitoring surveillance program that meets the requirements of 29 CFR 1910.120. Copies of the ES and subcontractor HASPs will be readily available at the site during field activities.

QUALIFICATIONS

Engineering-Science, Inc. (ES) is a California-based international multidisciplinary consulting firm providing a broad range of environmental engineering, planning and

design services. ES has conducted environmental engineering and environmental science projects throughout the United States and abroad for over 45 years, including over 15 years of direct hazardous waste management experience. ES maintains all current licenses, certifications, training and insurance required for hazardous waste operations in the State of California, including:

- State of California Contractors State License Board General Engineering Contractor (A), General Buildings Contractor (B) and Hazardous Substances Removal and Remedial Actions (HAZ) Certifications.
- Federal Occupational Safety and Health Administration (OSHA) 40-hour health and safety training for hazardous waste operations (29 CFR 1910.120) certifications for all site workers.
- Federal Occupational Safety and Health Administration (OSHA) 8-hour supervisory training for hazardous waste operations (29 CFR 1910.120) certifications for site supervisors.
- Workers compensation insurance.

This workplan has been prepared, and the proposed scope of work will be conducted, under the supervision of Mr. Fred T. Stanin. Mr. Stanin is a California Registered Geologist (No. 5248), and has over 14 years professional experience as a geologist, including 3 years of directly applicable experience serving as a principal investigator and/or technical director on hazardous waste site investigations. Regulatory agencies will be notified in the event of any substitution for the principal scientist responsible for supervising technical issues on the project, and any substituted staff member will possess the required California professional registration (Registered Geologist or Registered Professional Engineer) and have an equivalent experience level.

The soil boring/sampling contractor selected by ES will have the following certifications and training:

- Class C-57 Contractor's License
- Federal Occupational Safety and Health Administration (OSHA) 40-hour health and safety training for hazardous waste operations (29 CFR 1910.120) certifications for all site workers.
- Federal Occupational Safety and Health Administration (OSHA) 8-hour supervisory training for hazardous waste operations (29 CFR 1910.120) certifications for the site supervisor.

REFERENCES

Department of Toxic Substances Control (DTSC) 1993, Program Administrative Support Division, Technical Services Branch, State of California Department of Health Services, 1990, Scientific and Technical Standards for Hazardous Waste Sites (Draft) Volume I: Site Characterization, August.

Regional Water Quality Control Board (RWQCB), 1990a, Tri-regional board staff recommendations for preliminary evaluation and investigation of underground tank sites.

RWQCB, 1990b, memorandum "A Suggested Method of Review of Workplans and Reports submitted to comply with the Regional Board Staff Requirements", 30 March.

Shin, Juliette 1993, Hazardous Materials Specialist: ACHCSA-DHM, personal communication with Henry Pietropaoli of ES, 16 June.

APPENDIX A

FIELD PROTOCOLS

SOIL BORING/SAMPLING

Soil boreholes will be advanced by using a hydraulic drive-sampler. The boreholes will be geologically logged by an ES geologist using the Unified Soil Classification System (USCS). Samples will be screened with a photoionization detector (PID) and total hydrocarbon vapor analyzer (THVA). Screening will be accomplished by placing soil samples that are not being submitted for laboratory analysis into sealed plastic bags, then inserting the PID/THVA probe through an opening into the bag after allowing several minutes for volatilization. Boreholes will be continuously logged and screened by PID/THVA.

All soil samples will be collected by driving stainless-steel sampling tubes into undisturbed soil using the hydraulic drive-sampler for subsurface samples. For samples submitted for laboratory analysis, sampling tubes will be capped with Teflon-tape and plastic caps immediately after collection, then labelled and transferred to an iced sample cooler for delivery to the laboratory.

"GRAB" GROUNDWATER SAMPLING

Groundwater samples will be collected by either inserting a screened temporary PVC well-casing into the borehole and sampling with a Teflon bailer, or by using a hydropunch-type sampler. For samples collected using a temporary well-casing, the well will be surged, then purged of approximately three well volumes prior to sampling. Water samples will be immediately transferred from the sampling device to appropriate containers (i.e. as per DTSC 1993) supplied by the analytical laboratory. Temperature, pH and electrical conductivity will be measured in the field using temperature, pH and EC meters.

WATER LEVEL MEASUREMENT

Water levels will be measured with an electric indicator at least 3 times over a 30 minute period in each borehole drilled below the water table to allow for equilibration. If the last two consecutive measurements differ, then water levels will be measured every 10 minutes until two consecutive measurements are in agreement, or until an hour has elapsed. If water levels have not equilibrated, that observation will be noted in the field

notebook. The presence of floating petroleum product will be determined using an electric indicator.

BOREHOLE CLOSURE

Upon completion of the sampling procedures, the total depth of each borehole will be backfilled from the bottom up with a mixture of 95% Portland cement and 5% bentonite.

DECONTAMINATION PROCEDURES

Prior to drilling each borehole, all downhole drilling equipment will be thoroughly decontaminated by steam cleaning or washing with Alconox solution and then rinsing with deionized water. All sampling equipment will be decontaminated prior to collecting each sample by scrubbing with Alconox solution, then rinsing three times with deionized water.

FIELD QUALITY CONTROL PROCEDURES

Field Documentation

All field activities and any information pertinent to sampling (e.g. sample numbers, locations, etc.) will be documented on a daily basis in a bound field notebook. All entries will be filled out in ink. Erroneous entries will be crossed-out and initialled.

Standard field forms will be utilized for tabulation and documentation of relevant data (e.g. soil boring logs, air monitoring data forms).

Sample Labels

Sample labels will be filled out in waterproof ink at the time of sample collection and before the sample is placed in the cooler. Label entries will include: sample ID; date and time; sample location; analysis; preservative, if any; samplers' initials; and, project number.

Sample Custody

Immediately after collection, soil and groundwater samples will be labeled and placed in an iced cooler for delivery or shipment to the laboratory. A chain-of-custody record will be filled out as soil and/or groundwater samples are collected. The record will be checked for completeness at the end of the day and signed by the sampler. It will then be hand-delivered with the samples to the laboratory, or placed in a sealable plastic bag and taped to the inside lid of the cooler, if shipped. All samples will be analyzed as soon as possible, without exceeding the prescribed holding time.

Waste Storage and Disposal

All soil cuttings, temporary well development purge water and decontamination rinsate fluids generated during this investigation will be containerized in labeled, DOT-approved, 55-gallon drums pending analysis. East Bay Regional Parks District will dispose of any contaminated materials at an appropriate licensed waste disposal facility

based on analytical results. Uncontaminated materials may be disposed of either at a licensed waste disposal facility, or on-site.