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From: Commanding Officer, Engineering Field Activity, West, Naval Facilities Engineering Command

Subj: REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS) FOR
NAVAL STATION TREASURE ISLAND (NAVSTA TI)

Encl: (1) Revised Final Technical Memorandum for Sampling, Analyses, and Delineation of TPH
Contaminated Soil at Site 12 (Building Unit 1311) dtd 18 March 1999

1. Enclosure (1) is provided for your information. This revised document incorporates the comments received from the RWQCB.
2. Thank you for your guidance and involvement in this project. For further information, please call me at (650) 244-2560.



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Remedial Project Manager
By direction

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**Technical Memorandum for Sampling, Analyses, and Delineation of TPH
Contaminated Soil at Building Unit 1311, Treasure Island, California.**

Revised March 18, 1999.

INTRODUCTION

The purpose of this technical memorandum is to describe the scope of the sampling investigation to assess the lateral and vertical distribution of total petroleum hydrocarbon (TPH) contamination in soil, and the depth and fluctuation of groundwater, at building unit 1311 (see Figure 1). The results of this investigation will be used to calculate the limits of excavations to remove TPH contaminated soils at the site, currently scheduled for spring 1999. Excavation limits will be calculated using data regarding the presence of TPH exceeding clean up criteria, depth to groundwater, and obstructions such as buildings, levees and roadways.

BACKGROUND

The site is part of Site 12 - Old Bunker Area near the northeastern corner of NAVSTA TI. The site is currently occupied by vacant one-story fourplex residential units, carports, streets, fenced yards, overhead power lines, and underground utilities. The site is scheduled for residential use by the city and county of San Francisco.

The site was investigated by Tetra Tech EM Inc. (TtEMI) and determined to have residual hydrocarbon contamination in soil. Two groundwater monitoring wells, MW-21 and MW-22, were installed at the site by TtEMI. TPH soil contamination in the area has been quantified at up to 12,550 mg/kg. The Navy has established a cleanup goal of 447 mg/kg TPH for the site. The groundwater at the site is affected by tidal influence and has been observed as shallow as 2 ft below ground surface (bgs) at near shore locations on Treasure Island.

SAMPLING PLAN

Samples will be taken by a hydraulic "geoprobe" and/or from hand-dug holes in areas where geoprobe is not accessible. As much as practical, the vertical distribution of petroleum hydrocarbons will be assessed to depths at which visual or field instrument (photo-ionization detector - PID) indications no longer indicate the presence of petroleum hydrocarbons.

Sample Collection Objectives. Soil samples will be collected and analyzed to assess the dispersion of TPH contamination and thereby support future removal actions at the site.

Of interest are soil samples:

- at horizons which are most contaminated, as evidenced by visual observation or PID readings, and
- at the practical limit of excavation which would be the lowest stand of the tidally fluctuating groundwater table.
- at other horizons of noticeable contamination within the vadose zone, the zone of water table fluctuations, and the saturated zone.

Samples will be analyzed for TPH-extractables quantified as diesel fuel and motor oil and TPH-purgeables quantified as gasoline. IT will use the results of the observations and analyses to delineate the limits of TPH contamination and to assess the feasibility of using vacuum extraction as a remediation technique at some inaccessible areas.

Locations and depths of soil samples to be collected. Samples will be obtained at 12 locations shown on Figure 1. At each location, a minimum of two samples will be obtained: a sample at the lower level of the tidal-influenced groundwater zone, a sample showing maximum evidence of petroleum contamination and, where warranted, other visibly contaminated horizons within the vadose zone, the zone of water table fluctuation, and the saturate zone. Evidence of petroleum contamination will be from visual observation or from "head-space" PID readings of hand-augered cuttings or material sampled from the sleeve of a hydraulically-pushed (Geoprobe) sample. Visual classification, lithology, water depths, sample depths, instrument readings of the soil will be conducted and documented on a boring log for each location.

Groundwater elevation monitoring. Because groundwater elevations are influenced by tidal action, IT will assess groundwater fluctuation over the course of several daily tidal cycles. Groundwater levels will be measured in three monitoring wells, (MWs-21 and -22 at this site and MW-18 near Building 1207) using an electronic data logger, prior to starting the sampling activities. Sampling depths will be adjusted as groundwater fluctuations is better understood.

Utility Location. The site will be surveyed for underground utilities. The purpose of the survey will be to define underground utilities for both sampling and removal excavation activities. Underground utilities will be located using electromagnetic and sonic subsurface geophysical instruments. The scope of the survey will cover yards and driveways between and 10 feet beyond the sample locations shown on Figure 1. The survey will not include carport or street areas.

Permits. Drilling permits are not required from the County of San Francisco Department of Public Health because the Site 12 is considered a CERCLA remediation site.

Sampling procedures. Some sample holes will be advanced by hand augering. If subsurface conditions (e.g. loose soil and/or high tidally-influenced groundwater) interfere with efficient sampling, the affected sample locations will be sampled using direct push (Geoprobe) technology. For holes advanced by hand auger, discreet samples will be obtained using a slide hammer equipped with 2-inch x 6-inch stainless steel sleeves in accordance with IT's SOP 3.1. Each sample will be taken with a freshly decontaminated sampler. From hand-augered holes, samples will be retrieved from an interval depth just above the anticipated lower limit of the fluctuating groundwater level and from a zone where cuttings are most contaminated with petroleum hydrocarbons. From Geoprobated holes, the samples will be taken using a 4-ft long core sampler fitted with a 1.5-inch diameter, clear PVC sleeve. At each location, two consecutive sample runs will be taken (to a depth of 8 feet). If petroleum contamination is present at the

bottom of the 4-to-8 foot sample, a third sample will be taken from 8 to 12 feet. Two samples will be retrieved from each hole, one from a depth near the lowest stand of the fluctuating ground water table, and a "deep" sample taken from a horizon judged to be the most contaminated based on visual observations or PID "head-space" readings of cuttings. Additional samples will be taken if other significantly contaminated horizons are discovered within the vadose zone, the zone of water table fluctuation, and in the saturated zone. To obtain the samples, two 6-inch long sections will be cut from the soil-filled PVC sleeve using a utility knife or hacksaw. Samplers will cover the ends of the sample with Teflon sheeting and cap the ends of the sleeve.

Head space analyses. The samplers will assess head-space volatiles of the sampled soil by placing freshly sampled soil in a plastic bag with air, allowing the sample to equilibrate for several minutes, and then sampling head space gasses with a PID.

Sample labeling. Samples will be labeled and numbered in accordance with IT SOPs 17.1 and 17.2. Labels will contain the following information: project number, sample number, sample location sample depth, date and time of collections, parameters for analysis, and sampler's initials. Samples numbers will be of the following format: 1311DS001 where the first four digits indicate the site location, DS indicates a delineation soil sample, and the last three digits are sequential.

Sample preservation. Sample tubes and/or jars will be taped with custody tape. Samples will be preserved on cold packs within coolers and shipped to the laboratory at the end of the day.

Decontamination Procedures. Samplers will decontaminate all reusable sampling equipment before initial use on site, before collecting discrete samples and between each sample location. Decontamination procedures are described in IT SOP 6.1. Equipment will be washed using laboratory-grade detergent, rinsed with potable water, and rinsed with deionized water. Methanol and hexane will be used for decontamination only if necessary to remove oily residues from sampling equipment.

Sample Hole Grouting. Because the site soils are loose sands, it is expected that sample holes will collapse on themselves upon extricating the samplers. At the end of each day's

sampling effort, the open portions of all sampling holes will be backfilled with a bentonite and sand (up to 50%) grout and capped with about 6 inches of topsoil.

Investigation Derived Waste. Any excavated soil will be collected in 5-gallon buckets and transferred to an on-site 55-gallon drum. Decontamination rinsate will be accumulated in a separate 55-gallon drum. The drums will be labeled as "Investigation Derived Waste (IDW) Soil" with project name, project number, accumulation date, sampler's name, and company's name, address and phone number. It is anticipated that the IDW will be properly disposed to a landfill during the removals phase of this Delivery

order. If the IDW remains on site more than 90 days, it will be relocated to the TI Environmental Office at Building 570 for storage.

Documentation. Sample collection activities will be documented on Boring Logs, Sample Collection Logs and Field Activity Daily Logs as specified in IT SOP 3.1. Sample locations will be flagged with a sample number written on the flag for future reference during remediation. Sample locations will be field measured to within 1 ft accuracy referenced to a nearby building.

ANALYSES

Samples will be analyzed at a state certified and Navy approved laboratory for TPH-E and TPH-P in accordance with USEPA Method 8015 modified. Analyses will be conducted on an expedited one-week turn around time. Analytical data will be reviewed by the project manager or designated technical personnel to evaluate the TPH concentrations in the soil and delineate the extent of future removal actions.

RESULTS

Results of the analyses will be used to delineate the lateral and vertical extent of removal actions. If perimeter samples indicate contamination extends beyond the areas sampled, further "step-out" sampling will be recommended.

With the extent of contamination adequately defined, IT will develop a Removal Actions Work Plan delineating the vertical and horizontal extent of removals. The work plan will consider obstructions such as existing underground utilities and the stability of levees and structural foundations. If necessary, fences, and sidewalks will be removed and reconstructed. This work plan will be submitted to the Navy for review in March 1999.

QUALITY CONTROL

Source blanks, equipment rinsates, and field duplicates will be collected during the sampling event. One source blank will be collected. One equipment rinsate sample will be collected for each day of decontamination activities. Field duplicates will be collected at a frequency of 10% of field samples and analyzed for TPH-E and TPH-P by USEPA Method 8015 Modified.

SCHEDULE

A proposed project schedule is attached to this memo. IT can mobilize within one week of Navy and Agency reviews of this memorandum, whichever date comes later. Laboratory analyses are likely to require one week and reporting results will require one additional week.

HEALTH & SAFETY

A site specific sampling Health and Safety Plan is attached and incorporated into this memorandum by reference.

FINAL
TECHNICAL MEMORANDUM SAMPLING PLAN AND
HEALTH AND SAFETY PLAN, DELINEATION SAMPLING
TOTAL PETROLEUM HYDROCARBON CONTAMINATED SOIL
REMOVAL ACTION
SITE 12

DATED 01 MARCH 1999

IS RECORD NO. N60028_000968

FINAL
TECHNICAL MEMORANDUM
SAMPLING PLAN, DELINEATION SAMPLING
TOTAL PETROLEUM HYDROCARBON CONTAMINATED SOIL
ADDENDUM 1
SITE 12

DATED 14 MAY 1999

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