

ATTACHMENT

Response to Department of Health Services (DHS) Comments on the
The Soil Gas Survey, Second Addendum to Proposed Phase II
Reconnaissance Activities¹

DHS Comment:

1. Page 2 contains two potentially conflicting statements. The first paragraph states "Sampling probes will be driven to approximately 3 feet below ground surface". However, bullet 3 states probes will only be inserted 1.5 feet below surface. Please clarify this discrepancy.

Response:

The first paragraph on page 2 was in error. The sample access hole will be drilled to a depth of approximately 3 feet and the sampling probe inserted approximately 1.5 feet below ground surface. Within the probe, a smaller diameter sample access tube will extend from approximately the top to the bottom of the access hole.

DHS Comment:

2. In reference to bullet 7 on page 2, an equilibration period of 1/2 hour should be allowed prior to sampling the probe.

¹ DHS Comments dated October 13, 1988; Navy addendum letter dated September 30, 1988.

Response:

Because of the coarse grained surface soils found at HPA, a 15 minute equilibration period prior to sample measurement is expected. However, the actual equilibration period will be decided upon after preliminary field measurements are evaluated using 15 and 30 minute equilibration periods.

DHS Comment:

3. **Regarding bullet 8, the OVA probe should sample from near the bottom of the gas sampling probe.**

Response:

The sample access tube (which extends inside the sample probe from ground surface to approximately 3 feet in depth) will be slotted, so that a soil gas sample representative of the entire 3-foot soil gas profile will be collected.

DHS Comment:

4. **Two OVAs should be used at the Oil Reclamation Ponds: one calibrated for aliphatic hydrocarbons, the other for aromatics.**

Response:

Two OVAs will be used at the Oil Reclamation Ponds as stated.

DHS Comment:

5. In addition to the replicate analyses, 10% of the sampling sites should be analyzed at random with a portable gas chromatograph. This is in addition to using the portable GC to quantify any discovered anomalies.

Response:

After the qualitative soil gas measurements and associated 10% replicates are completed, the data will be reduced and contoured in order to select soil gas quantification locations (for collection of portable gas chromatograph samples). Approximately 20 additional sites, other than the ones identified as anomalies, will be chosen at random for soil gas quantification.

lk/CMM/005b

ATTACHMENT
SECOND ADDENDUM
PROPOSED PHASE II RECONNAISSANCE ACTIVITIES

This document is the second addendum to the Navy's letter dated March 25, 1988, which described proposed reconnaissance activities for the Naval Station, Treasure Island, Hunters Point Annex (HPA). This addendum describes the use of soil gas survey techniques at HPA as requested in a conference phone conversation between representatives of the California Department of Health Services (DHS), Harding Lawson Associates (HLA), and the Navy on July 20, 1988 (*DHS, 1988*). This version also incorporates comments from the DHS dated October 13, 1988.

Soil Gas Analysis as a Qualitative Screening Tool

The use of soil gas analysis as a screening tool for volatile organic compounds has been proven in numerous case studies (*Glaccum, Noel, Evans, and McMillan [1983]; Jacot [1983]*). There are several soil gas sampling techniques; most entail introducing a hollow sampling probe to a specified depth in the unsaturated soil and then removing a soil gas sample by using a vacuum pump. Qualitative analysis of the soil gas sample is then performed using a portable photoionization detector.

Application of Soil Gas Analysis at Hunters Point Annex

A qualitative screening of volatile organic compounds by soil gas analysis at HPA will enable more precise placement of exploratory borings. All field work conducted during this investigation will be in compliance to the HPA Site Safety Plan (*HLA, 1988b*). The sampling strategy is based on the following information:

- Group I sites have been identified as areas suspected of containing volatile organic compounds
- Depth to ground water at these sites is between 5 and 7 feet below ground surface

A grid pattern with 100-foot centers will be established across each work site.

The soil gas grid will be tied into the existing California coordinate system 200-foot grid established during a previous reconnaissance task. The grid corner markers will be located and marked so that sampling locations can be mapped accurately and resampled if necessary. If a "hotspot" is detected, closer spacing of sampling points will be required to investigate the areal extent of each "hotspot". Interference from ground water will be avoided by keeping the probe intake at least 2 feet above the water table.

Soil gas sampling will consist of the following steps:

- Stake grid corners; lay out 100-foot grid pattern
- Drill a 3-foot deep access hole with a 1 1/2 to 4-inch-diameter solid flight auger gasoline- or hydraulic-powered drill at each grid location
- Insert hollow, 2-foot long sampling probe into access hole to depth of approximately 1.5 feet below ground surface; the diameter of the probe will approximately equal the diameter of the boring
- A sample access tube will extend from the top of the sampling probe to the bottom of the access hole. The top, middle, and bottom of the tube will be slotted to obtain a soil gas sample representative of the entire access hole
- Seal annular space at surface of the access probe with drill cuttings or sealing collar
- Place vacuum on sampling probe utilizing sample access tubing
- Remove two sampling-probe volumes of soil gas and seal access tube
- Initially, equilibration times of 15 and 30 minute time periods will be performed to evaluate the time needed to obtain representative results. The 30-minute equilibration period will be discontinued if it is determined not to be necessary.

- In general, one organic vapor analyzer (OVA) will be used for sample measurement. For sampling the probes at the Oil Reclamation Ponds, two OVAs will be used; one will be calibrated for aromatic hydrocarbons and the other for aliphatic hydrocarbons
- Insert OVA probe into soil gas sampling access tube and monitor readings for 1 to 2 minutes; record highest measurement
- Pull out OVA probe, and purge OVA sampler prior to next reading

Calibration of the OVA prior to use is necessary to correlate the results. The OVA will be calibrated as described in Section 12 of the HPA Quality Assurance Project Plan (QAPP) (*HLA, 1988a*) prior to use each day and at the end of each field day. Additional calibrations will be made if conditions warrant. Background air quality will be recorded prior to each soil gas sampling event. Care will be taken so that no exhaust or vapor contamination from gas-powered engines interferes with soil gas analytical results. Replicate analyses will be performed at 10 percent of the qualitative sampling sites. Replicate analyses will consist of repetition of the soil gas probe purging, equalization, and OVA measurement. It is our experience that reproducible results can be achieved using this process. However, subsurface soil and soil pore moisture conditions may cause variations in measurements after additional soil gas is extracted from sample probe.

Following the qualitative soil gas screening, the data will be entered into a computer database and contoured to delineate anomalous areas that may need further characterization. Anomalous areas will be further investigated with 25- to 50-foot grids, depending on the size and concentration of each anomaly.

Once the extent of each anomaly is known, portable gas-chromatograph soil gas quantification will be conducted using methods described in Section 5.3 and Appendix B of the HPA QAPP (*HLA, 1988a*). The quantification of each anomaly will serve as an indication of the type of volatile chemicals present in the ground water/soils at the Group I sites. Approximately 20 additional probe locations (randomly chosen) will also

be analyzed with a portable gas chromatograph to confirm the results of the OVA survey. These data can then be used to adjust boring and well locations and the numbers of borings and wells that will be installed during the Remedial Investigation.

REFERENCES

- Department of Health Services, 1988a. Personal Communications with Bill Owen, James Frampton, John Harris.
- Department of Health Services, 1988b. Letter to Navy regarding Review of Soil Gas Addendum to Reconnaissance Plan. October 13.
- Glaccum, R., Noel, M., Evans, R., and McMillan, L., 1983. *Correlation of Geophysical and Organic Vapor Analyzer Data Over a Conductive Plume Containing Volatile Organics*, pp. 421-427, In Proc. Third Natl. Sump. Aquifer Restoration and Ground-Water Monitoring, Columbus, Ohio, May 25-27, 1983, National Water Well Association, Worthington, Ohio.
- Harding Lawson Associates, 1988a. *Quality Assurance Project Plan (QAPP), Naval Station, Treasure Island, Hunters Point Annex, San Francisco, California.* May 1988.
- Harding Lawson Associates, 1988b. *Site Safety Plan (SSP), Naval Station, Treasure Island, Hunters Point Annex, San Francisco, California.* January 1988.
- Jacot, B.J., 1983. *OVA Field Screening at a Hazardous Waste Site*, pp. 76-78, In Natl Conf. Proc. Management of Uncontrolled Hazardous Waste Sites, October 31, 1983, Hazardous Material Control Research Institute (HMCRI), Washington, D.C.
- U.S. Navy, 1988. Letter to Department of Health Services regarding Proposed Soil Gas Survey Investigation, Naval Station, Treasure Island, Hunters Point Annex. September 30.