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ensco environmental services, inc.

a subsidiary of environmental system company

July 17, 1989

Alameda County Health Department
Department of Environmental Services
80 Swan Way, Room 200
Oakland, CA 94621

Attention: Mr. Gil Westar

Subject: Proposed Supplemental Soil Investigation
Shell Service Station
230 MacArthur Boulevard, Oakland, California
Project No. 1847G

Dear Mr. Westar:

Ensco Environmental Services, Inc. (EES) is pleased to submit this plan for additional work at the above referenced site that reflects your concerns expressed during your April 11th phone conversation with Steve Costello. The original work plan proposed the installation of three groundwater monitoring wells at the site.

EMCON Associates drilled soil borings around the old tank complex in April 1986. Laboratory analysis of those samples showed a maximum total hydrocarbon concentration of 5,700 parts per million (ppm). W.W. Irwin, Inc. conducted a soil gas survey in December 1986, which indicated high soil gas concentrations in the storage tank fills and near the pump islands nearest MacArthur Boulevard. After, Wayne Perry Construction, Inc. used a soil venting process for remediation from April through November 1987, the tanks were removed and soil samples were taken from beneath the tanks. The maximum total hydrocarbon concentration was 480 ppm.

In July 1988, EES installed three groundwater monitoring wells and began a monthly monitoring program in October 1988. The results of the monitoring well sampling analysis for the past eight months indicate that the contaminant concentrations in the groundwater beneath the site have decreased to below detection limits.

The locations of the monitoring wells (Figure 2) serve to monitor the contamination from the old tank complex, but do not cover any possible contamination from the aforementioned pump islands. For this reason, EES proposes to drill two shallow soil borings adjacent to the pump islands at the locations shown in Figure 2 to determine whether the hydrocarbon concentrations indicated by the soil gas survey may be present.

The drilling will be performed by a Mobile B-34 drill rig with hollow-stem augers. Soil samples will be collected from the borings at approximately 5-foot intervals using the attached EES soil sampling protocol. The last sample will be collected from a depth just above where groundwater is anticipated, at about 15 feet. The first sample in each boring will be taken near the surface to determine shallow piping leaks. The shallowest samples will be analyzed separately and the deeper samples will be composited to one sample before analysis. Upon completion of the sampling, the boreholes will be backfilled with neat cement grout.

Soil samples will be analyzed at a state-certified laboratory for total petroleum hydrocarbons as gasoline (TPHG) and benzene, toluene, ethyl benzene and xylenes (BTEX). If the soil sample analyses indicate significant levels (LUFT field manual, May 1988, p. 29) of contamination within five feet of the water table, EES proposes to install a down-gradient monitoring well as an additional phase of work.

Upon your approval of this work plan, we will schedule a drill rig. If you have any questions, please call (415) 659-0404.

Sincerely,
Ensco Environmental Services, Inc.

Kay Pannell
Staff Geologist

Neil H. Zickefoose, C.E.G. 398
Senior Program Geologist

Attachment

cc: Ms. Diane Lundquist
Mr. Reuben Chow

LEGEND:

SITE LOCATION

BASE: USGS 7.5 MINUTE TOPOGRAPHIC SHEET

0 1

SCALE IN MILES

ensco environmental services, inc.

SITE LOCATION MAP

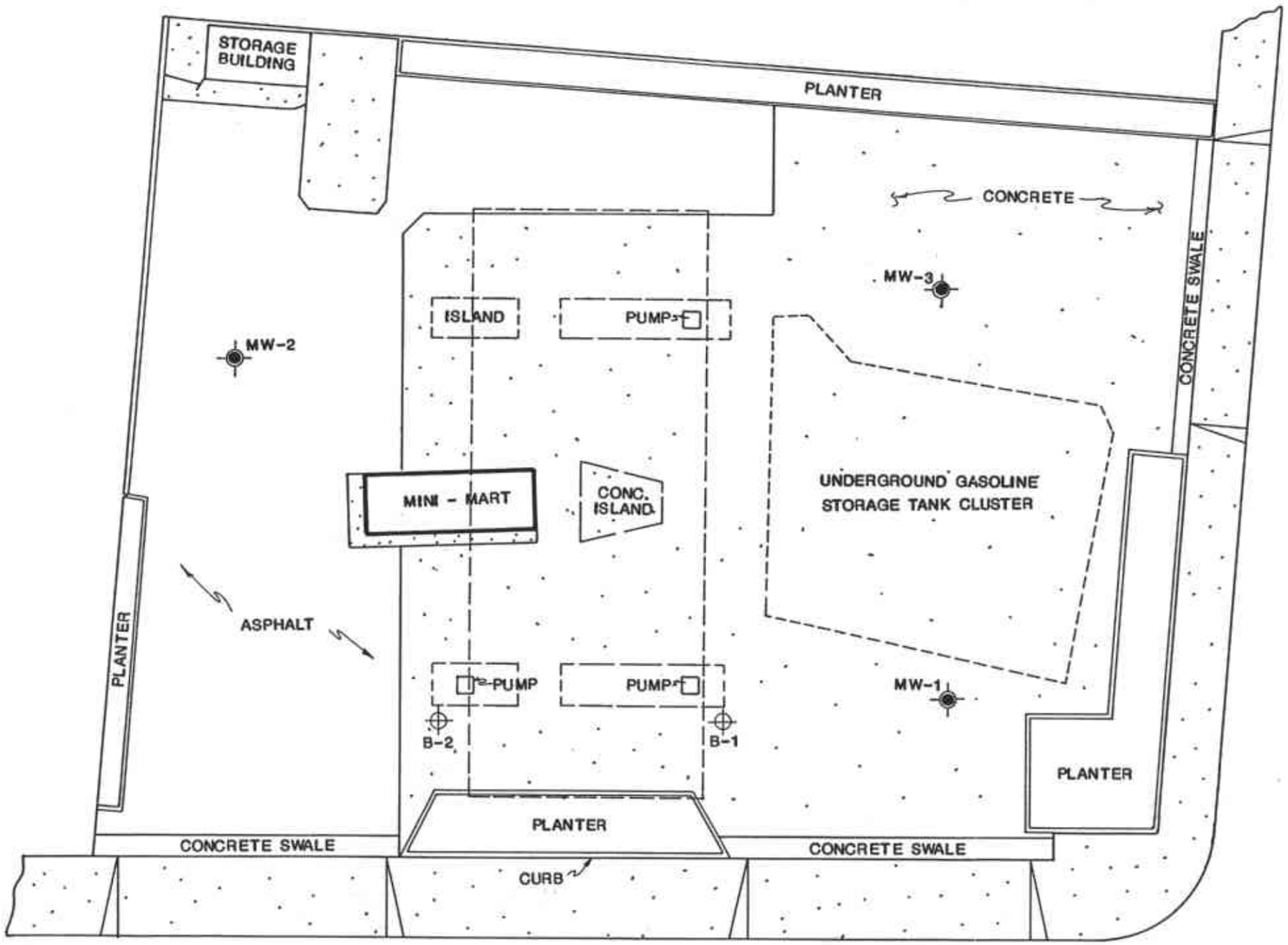
SHELL SERVICE STATION

230 MacARTHUR BOULEVARD

OAKLAND, CALIFORNIA

REVIEWED BY:	APPROVED BY:
K.P.	NZ
JOB # 1847G	DRAWN BY SLS
DATE: 9-16-88	DRAWING # FIG: 1

A-1847G-1



LEGEND

MW-1 GROUNDWATER MONITORING WELL

B-1 PROPOSED EXPLORATORY BORING

N

0 20

APPROX. SCALE IN FEET

ensco environmental services, inc.

PROPOSED EXPLORATORY BORING LOCATIONS

SHELL SERVICE STATION

230 Mac ARTHUR BOULEVARD

OAKLAND, CALIFORNIA

REVIEWED BY:	APPROVED BY:
K.P.	NZ
JOB #: 1847G	DRAWN BY: J.C.
DATE: 7-14-89	DRAWING #: FIG. 2

ENSCO ENVIRONMENTAL SERVICES, INC.

SOIL SAMPLING PROTOCOL

SOIL SAMPLING PROTOCOL

I. SOIL SAMPLING BY DRILLING RIG

1) Review site proposal for boring locations and special instructions. Confirm boring locations in field with client. Have Underground Service Alert (USA) mark utilities in area prior to drilling.

2) Prior to initiating an exploratory boring, all equipment to be used during drilling and sampling operation is steam cleaned. Such equipment includes, but is not limited to, augers, bits, drilling rod, samplers, and brass sampler liners. Additionally, between sampling intervals, the sampler is thoroughly cleaned with a dilute trisodium phosphate solution and rinsed with clean tap water or distilled water.

3) Each exploratory boring is drilled with a truck-mounted drilling rig using either solid flight or hollow stem augers. The boring is advanced to the desired sampling depth and the sampler is lowered to the bottom of the hole. The sampler is driven a maximum of 18 inches into the undisturbed soils ahead of the auger by a 140-pound, rig-operated hammer falling 30 inches. The number of blows required to drive the sampler the final 12 inches is recorded on the boring log. When necessary, the sampler may be pushed by the drill rig hydraulics. In this case, the pressure exerted (in pounds per square inch) is recorded. After the sampler has penetrated the full depth, it is retrieved to the surface.

4) The samplers commonly used are either a California modified sampler (3 inch or 2.5 inch O.D.) or a standard penetrometer (2 inch O.D.). The standard penetrometer does not contain sample liners and is used to determine soil strength characteristics and visually characterize the subsurface materials. If samples are collected for laboratory analysis the California modified sampler, equipped with brass liners, is used except when the analysis will include copper or zinc. In this instance, the sample should be taken with the standard penetrometer and placed in a labeled plastic bag.

Upon retrieval, the sampler is disassembled into its component parts. One or more of the liners is selected for chemical analysis. The ends of the selected liner(s) are sealed with aluminum foil or teflon tape, capped with plastic caps, labeled, logged on chain-of-custody forms and stored in a chilled ice chest for preservation in the field and during transport to the analytical laboratory. All labels are pre-written with indelible ink to minimize handling time.

5) Samples are checked for the presence of contamination in the field by the geologist. Any discoloration or odor is noted on the boring log. Each sample is classified in the field by a geologist using the Unified Soil Classification System and a Munsell soil color chart. In addition, samples may also be field-screened with a photo ionization detector (calibrated daily) or threshold limit value sniffer. In either case, the instrument probe is held adjacent to freshly crumbled soil and the stabilized reading value is recorded on the log. Other visual screening techniques include examination of the sample under hand-lens magnification as-well-as floating sheen inspection resulting from immersion in water.

6) Samples are held in the possession of Ensco Environmental Services personnel until transferred to the analytical laboratory. Transfer to the laboratory is accomplished with either delivery by Ensco Environmental Services personnel, pick-up by laboratory personnel, or transfer by a personal delivery service. Each transfer of responsibility is recorded on a chain-of-custody log that accompanies the sample.

II. SOIL SAMPLING BY HAND

1) Some situations require that samples be collected by hand without the assistance of a drill rig (e.g., soil stock piles, excavation sidewall sampling, etc.). When possible, soil samples will be collected using a steel core sampler equipped with clean brass liners which is advanced into the soil with a slide hammer. In other cases, the outer surface of the soil is removed and a brass liner is driven into the soil by hand or with a hammer. To avoid damaging the liner, a block of wood is held next to the liner so that the hammer strikes the block rather than the liner. The liner is removed and handled as described above. In deep excavations where safety factors preclude the direct sampling of the bottom or side wall, soil is retrieved by a backhoe bucket and this soil is sampled.