Environmental
Science &
Engineering, Inc.
A CILCORP Company

December 16, 1992

Project No. 6-92-5005

Ms. Juliet Shin
Hazardous Materials Specialist
Alameda Health Care Services Agency
Department of Environmental Health
80 Swan Way, #200
Oakland, CA 94621

SUBJECT: **Workplan for Preliminary Site Assessment at Bill Chun Service Station located at 2301 Santa Clara Avenue, Alameda, Alameda County, California**

Dear Ms. Shin,

Environmental Science & Engineering, Inc. (ESE) presents the subject workplan for a Preliminary Site Assessment (PSA) at the subject site. The objective of the scope of work outlined herein is to estimate the ground water gradient beneath the site and to determine if ground water at the site has been impacted by petroleum hydrocarbons. Tasks associated with these objectives are described below. All aspects of the work described in this workplan will be conducted under the direct oversight of a California-Registered Geologist.

BACKGROUND

Investigation at the subject site (see Figure 1 - Location Map) was initiated on July 31, 1992 when three steel gasoline tanks (two 550-gallon and one 285-gallon) were removed from the site. The consultant of record (Parker Environmental Services) reported that the 285-gallon tank was observed to have a two-inch diameter hole at its base.

One soil sample was collected from beneath each tank and from beneath the former fuel island, and two soil samples were collected from the stockpile resulting from tank excavation (see Figure 2 - Site Map). Analytical results for soil samples reported concentrations of Total Petroleum Hydrocarbons as Gasoline (TPH-G) ranging from 2.1 to 16,000 milligrams per Kilogram (mg/Kg) or parts per million (ppm). Concentrations of Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX) were shown to range from 0.011 to 1,400 ppm. The soil stockpile contains an estimated 50 cubic yards of soil and is still present at the site. No further investigation at the site has been reported.

SCOPE OF WORK

ESE will perform three tasks as part of the subject PSA. These tasks are:

- Prepare a workplan and site health and safety plan,
- Install three ground water monitoring wells at the site, and
- Prepare a report of findings.

Activities associated with each task are described below.

Task 1 - Prepare a Workplan and Health & Safety Plan

In accordance with requirements of the Alameda County Department of Health Services Environmental Health Division (Alameda County) and the City of Alameda Fire Department (City), ESE will prepare a workplan describing the proposed investigation. Specifically, the workplan will address well locations, drilling and soil sampling procedures, well construction and development details, ground water sampling procedures, and appropriate analytical methodologies for soil and ground water samples. ESE will submit the workplan to Alameda County and the City for review and comment, and will incorporate their revisions as appropriate prior to implementing the work.

To ensure the safety of ESE field personnel and representatives of the client, Alameda County, and the City, ESE will prepare a site specific health & safety plan that addresses potential physical and chemical hazards associated with the proposed work. The plan will be reviewed and approved by ESE's Concord Office Health & Safety Officer prior to its implementation. All personnel who are to be present during any of the proposed activities will be required to review the plan and acknowledge its receipt and review before being allowed within the work zone.

Task 2 - Install Monitoring Wells

Three ground water monitoring wells will be installed at locations shown in Figure 2 to estimate the ground water gradient beneath the site and to determine if ground water at the site has been impacted by petroleum hydrocarbons. ESE will obtain the appropriate well permits from the Alameda County Flood Control and Water Conservation District (Zone 7) and secure clearance from underground utilities using Underground Service Alert (USA) prior to implementing the drilling phase of this PSA.

Due to site constraints, it will be necessary to remove the referenced soil stockpile before one of the three proposed wells (Task 3) can be installed (see Figure 2). Based on

analytical results presented in Parker's August 4, 1992 report, the soil may require disposal as hazardous waste in an appropriate Class I impoundment. However, ESE believes that the soil may have aerated since July sufficient to qualify for disposal as non-hazardous into a Class III landfill in Mountain View, California. To confirm this, ESE will collect a composite sample from the stockpile and have it analyzed for petroleum hydrocarbon content and for reactivity, corrosivity, and ignitability (RCI), which is required for soil profiling prior to disposal. If petroleum hydrocarbon concentrations in the soil are still sufficiently high to preclude disposal as nonhazardous waste, ESE will evaluate other options for disposal.

Upon receipt of analytical results, ESE will coordinate with Balch Petroleum of Milpitas, California, a licensed waste hauler, to have the stockpiled soil removed from the site under appropriate manifest procedures. Documentation for soil disposal will be incorporated as an appendix to the report of findings described below (Task 3).

Borings for monitoring wells will be drilled in accordance with ESE Standard Operating Procedure (SOP) No. 1 for Soil Borings and Soil Sampling with Hollow-Stem Augers in Unconsolidated Formations, which is presented in Attachment A. ESE estimates that ground water will be found at approximately 15 feet below ground surface, and will Excavate borings to depths of approximately 20 feet. Soils Exploration Services (SES) of Vacaville, California, a licensed drilling contractor, will perform the drilling for ESE.

ESE will collect soil samples at five-foot intervals while drilling to visually evaluate soil characteristics and to screen soil for organic vapors using a photoionization detector (PID). One soil sample from immediately above the occurrence of ground water in each well will be preserved for analysis and analyzed for TPH-Gas, Total Petroleum Hydrocarbons as Diesel (TPH-D), and BTEX using a fuel fingerprinting analysis (EPA Method 8240/8260). Because leaded gasoline was presumable stored in at least one of the tanks, ESE will also request analysis for total lead using EPA Method 7420/7421. Sample analysis will be conducted by Coast to Coast Analytical Services (CCAS), a State-certified analytical laboratory in Benicia, California.

Upon completing the drilling phase, ESE will direct the installation of two-inch diameter monitoring wells in the borings in accordance with ESE SOP No. 2 for Monitoring Well Installation and Development (Attachment A). The procedures described therein are consistent with California Well Standards established by the Department of Water Resources.

After the new wells have been developed as described in ESE SOP No. 2, ESE will purge the wells and collect ground water samples in accordance with ESE SOP No. 3 for Ground Water Monitoring and Sampling from Monitoring Wells (Attachment A). Samples will be preserved for analysis, and submitted to CCAS to be analyzed for TPH-G, TPH-D, and BTEX using EPA Method 8240/8260.

ESE will conduct a level survey of the new wells and tie their elevations to that of an established benchmark. This will allow calculation of ground water elevations for individual wells, from which the magnitude and direction of ground water from beneath the site will be estimated.

Soil and ground water recovered during drilling and well development operations will be appropriately stored onsite pending receipt of laboratory analyses. Upon receiving analytical results, ESE will coordinate disposal of these materials with Balch Petroleum. Documentation for disposal will be incorporated with the report of findings.

Task 3 - Prepare a Report of Findings

ESE will prepare a report of findings documenting the results of the PSA. The report will contain a description of methodologies used for well drilling and installation and analytical procedures. Analytical data for soil and ground water samples, as well as ground water elevation data, will be presented in tabular form. Maps showing locations of new wells, the approximate ground water gradient, and the estimated extent of petroleum hydrocarbons in ground water will also be presented. All documentation associated with this investigation (manifests for soil and ground water disposal, field reports, well purging and sampling sheets, analytical reports, and chain of custody documentation) will be presented as appendices to the report.

PROGRESS AND REPORTING SCHEDULE

ESE will perform the referenced tasks in a timely manner subject to the schedule presented in Table 1. Note that some tasks will be conducted concurrently with others, and that some activities are currently under way or have been completed.

TABLE 1
PROGRESS AND REPORTING SCHEDULE
Bill Chun Texaco Service
2301 Santa Clara Avenue
Alameda, California

Task	Activity	Estimated Finish Date
1	• Prepare Workplan	12/14/92
	• Prepare Health & Safety Plan	12/31/92
2	• Obtain Permits/ USA Clearance	12/31/92
	• Coordinate Disposal of Stockpiled Soil	12/31/92
	• Drill Soil Borings	01/05/93
	• Install/Develop/Sample Monitoring Wells	01/08/93
	• Coordinate Disposal of Soil/Purge Water	01/29/93
3	• Prepare Report of Findings	02/05/93

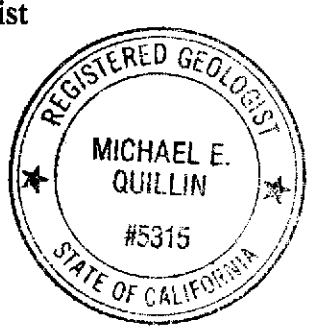
If you have any questions or require additional information regarding this workplan, please contact Mike Quillin at (510) 685-4053.

Sincerely,

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.

Chris Valcheff
Staff Geologist

Michael E. Quillin, RG 5315
Senior Hydrogeologist



Attachments

cc: Mr. Wayne Chun
Mr. Richard Hiett, RWQCB
Mr. Richard Quarante, Alameda Fire Department

ATTACHMENT A

ESE
STANDARD OPERATING PROCEDURES

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. 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.

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STANDARD OPERATING PROCEDURE NO. 2
FOR MONITORING WELL INSTALLATION AND DEVELOPMENT
PAGE 1

Environmental Science & Engineering, Inc. (ESE) typically installs ground-water monitoring wells in unconsolidated sediments drilled using a truck-mounted hollow-stem auger drill rig. The design and installation of all monitoring wells is performed and supervised by an experienced ESE geologist. Figure A - Typical ESE Monitoring Well Construction Diagram (attached) graphically displays a typical ESE well completion. Prior to the construction of the well, the portion of the borehole that penetrates a lower confining layer (if any) is filled with bentonite pellets. The monitoring well is then constructed by inserting polyvinylchloride (PVC) pipe through the center of the hollow stem augers. The pipe (well-casing) is fastened together by joining the factory threaded pipe ends. ESE typically uses two-inch or four-inch diameter pipe for ground-water monitoring wells. The diameter of the borehole is typically 6-inches greater than that of the diameter of the well-casing, but is at least four-inches greater than that of the well casing. The lowermost portion of the well-casing will be factory perforated (typically having slot widths of 0.010-inch or 0.020-inch). The slotted portion of the well-casing will extend from the bottom of the boring up to approximately five-feet above the occurrence of ground water. A PVC slip or threaded cap will be placed at the bottom end of the well-casing, and a locking expandable well cap will be placed over the top (or surface) end of the well-casing. A sand pack (typically No. 2/12 or No. 3 Monterey sand) will be placed in the borehole annulus, from the bottom of the well casing up to one to two-feet above the top of the slotted portion, by pouring the clean sand through the hollow stem augers. One to two-feet of bentonite pellets will be placed on top of the sand pack. The bentonite pellets will then be hydrated with three to four-gallons of potable water, to protect the sand pack from intrusion during the placement of the sanitary seal. The sanitary seal (grout) will consist of either neat cement, a neat cement and bentonite powder mixture (containing no more than 5% bentonite), or a neat cement and sand mixture (containing no more than a 2:1 sand to cement ratio). If, the grout seal is to be greater than 30-feet in depth or if standing water is present in the boring on top of the bentonite pellet seal, then the grout mixture will be tremied into the boring from the top of the bentonite seal using either a hose, pipe or the hollow-stem augers, which serve as a tremie. The well will be protected at the surface by a water tight utility box. The utility box will be set into the grout mixture so that it is less than 0.1-foot above grade, to prevent the collection of surface water at the well head. If the well is set within the public right of way, then the utility box will be Department of Transportation (DOT) traffic rated, and the top of the box will be set flush to grade. If the well is constructed in a vacant field a brightly painted metal standpipe may be used to protect the well from traffic. If a standpipe is used, it will be held in place with a grout mixture and will extend one to two-feet above ground surface. All well completion details will be recorded by the ESE geologist on the geologic boring logs.

Subsequent to the solidification of the sanitary seal of the well (a minimum of 72 hours) the new well will be developed by an ESE geologist or field technician. Well development will be performed using surging, bailing and overpumping techniques. Surging is performed by raising and lowering a surge block through the water column within the slotted interval of the well casing. The surge block utilized has a diameter just smaller than that of the well casing, thus, forcing water flow through the sand pack due to displacement and vacuum caused by the movement of the surge block. Bailing is performed by lowering a bailer to the bottom of the well and gently bouncing the bailer off of the well end cap, then removing the full bailer and repeating the procedure. This will bring any material (soil or PVC fragments) that may have accumulated in the well into suspension for removal. Overpumping is performed by lowering a submersible pump to the bottom of each well and pumping at the highest sustainable rate without completely evacuating the well casing. Effective well development will settle the sand pack surrounding the well-casing, which will improve the filtering properties of the sand pack and allow water to flow more easily through the sand pack; improve the communication between the aquifer and the well by aiding the removal of any smearing of fine sediments along the borehole penetrating the aquifer; and, remove fine sediments and any foreign objects (PVC fragments) from the well casing. The ESE geologist or

technician will monitor the ground water purged from the well during development for clarity, temperature, pH and conductivity. Development of the well will proceed until the well produces relatively clear, sand-free water with stable temperature, pH and conductivity measurements. At a minimum, 10 well-casing volumes of ground water will be removed during the development process. Measurements of temperature, conductivity, pH and volume of the purged water and observations of purge water clarity and sediment content will be recorded on the ESE Well Development Data Forms. All equipment used during the well development procedure will be cleaned using an Alconox® detergent and tap water solution followed by a tap water rinse prior to use in each well. All ground water purged during the well development process and all equipment rinse water will be collected and contained onsite in DOT approved containers (typically 55-gallon drums) pending analytical results and proper disposal or recycling.

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STANDARD OPERATING PROCEDURE NO. 3
FOR GROUND-WATER MONITORING AND SAMPLING FROM MONITORING WELLS

Environmental Science & Engineering, Inc. (ESE) typically performs ground-water monitoring at project sites on a quarterly basis. As part of the monitoring program an ESE staff member will first gauge the depth to water and free product (if present) in each well, then collect ground-water samples from each well. Depth to water measurements are taken by lowering an electric fiberglass tape measure into the well and recording the occurrence of water in feet below a fixed datum set on the top of the well-casing. If free-phase liquid hydrocarbons (free product) are known or suspected to be present in the well, then an electric oil/water interface probe is used to determine the depth to the occurrence of ground-water and the free product in feet below the fixed datum on the top of the well-casing. Depth to water and depth to product measurements are measured and recorded within an accuracy of 0.005-foot. The electric tape and the electric oil/water interface probe are washed with an Alconox® detergent and tap water solution then rinsed with tap water between uses in different wells.

Ground-water samples are collected from a well subsequent to purging a minimum of three to four well-casing volumes of ground water from the well, if the well bails dry prior to the removal of the required minimum volume, then the samples are collected upon the recovery of the ground water in that well to 80% of its initial static level. Ground water is typically purged from monitoring wells using either a hand-operated positive displacement pump, constructed of polyvinylchloride (PVC); a new (precleaned), disposable polyethylene bailer; or, a variable-flow submersible pump, constructed of stainless steel and Teflon®. The hand pumps and the submersible pumps are cleaned between each use with an Alconox® detergent and tap water solution followed by a tap water rinse. During the well purging process the conductivity, pH and temperature of the ground water are monitored by the ESE staff member. Ground-water samples are collected from the well subsequent to the stabilization of the of the conductivity, pH and temperature of the purge water, and the removal of four well-casing volumes of ground-water (unless the well bails dry). The parameters are deemed to have stabilized when two consecutive measurements are within 10% of each other, for each respective parameter. The temperature, pH, conductivity and purge volume measurements, and observations of water clarity and sediment content will be documented by the ESE staff member on ESE Ground-Water Sampling Data Forms.

Ground-water samples are collected by lowering a new (precleaned), disposable polyethylene bailer into the well using new, disposable nylon cord. The filled bailer is retrieved, emptied, then filled again. The ground water from this bailer is decanted into appropriate laboratory supplied glassware and/or plastic containers (if sample preservatives are required, they are added to the empty containers at the laboratory prior to the sampling event). The containers are filled carefully so that no headspace is present to avoid volatilization of the sample. The filled sample containers are then labeled and placed in a cooler with ice for transport under chain of custody documentation to the designated analytical laboratory. The ESE staff member will document the time and method of sample collection, and the type of sample containers and preservatives (if any) used. These facts will appear on the ESE Ground-Water Sampling Data Forms. ESE will collect a duplicate ground-water sample from one well for every ten wells sampled at each site. The duplicate will be a blind sample (its well designation will be unknown to the laboratory). The duplicate sample is for Quality Assurance and Quality Control (QA/QC) purposes, and provides a check on ESE sampling procedures and laboratory sample handling procedures. When VOCs are included in the laboratory analyses, ESE will include a trip blank, if required, in the cooler with the ground-water samples for analysis for the identical VOCs. The trip blank is supplied by the laboratory and consists of deionized water. The trip blank is for QA/QC purposes and provides a check on both ESE and laboratory sample handling and storage procedures. Since disposable bailers are used for sample collection, and are not reused, no equipment blank (rinsate) samples are collected.