ARCO Products Company
2000 Alameda de las Pulgas
Mailing Address: Box 5811
San Mateo, California 94402
Telephone 415 571 2400

3/31/89

ALAMEDA COUNTY
DEPT. OF ENVIRONMENTAL HEALTH
HAZARDOUS MATERIALS

March 26, 1989

Ms. Mary Jo Meyers-Barnes
Dept. of Environmental Health
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, Ca. 94621

Re: Work Plan for further site investigation, ARCO Station #374,
6407 Telegraph Avenue, Oakland, California.

Dear Ms. Barnes:

This letter responds to the Alameda County Health Care Services (ACHCS) letter to me dated March 15, 1989. ARCO Products Company (ARCO) has submitted reports of two environmental assessments as well as one work plan for further site assessment at the subject station in 1988. The first report, Report, Limited Environmental Site Assessment by Applied Geosystems (AGS) was submitted June 15, 1988. This report presents the results of a drilling program performed at ARCO's request prior to the scheduled tank replacement. The second report, Report, Environmental Investigation related to Underground Tank Removal by AGS was submitted August 1, 1988. This report presents the results of soil samples taken during the tank removal. A work plan Work Plan, Supplemental Subsurface Environmental Investigation by AGS was submitted September 11, 1988 in order to assess groundwater contamination at and downgradient of the station. ARCO believes that the September 11, 1988 is still a viable workplan, with minor modification, which addresses RWQCB recommendations to define the extent of soil and groundwater contamination. The remainder of this letter addresses these modifications and your concerns presented in the March 15, 1989 letter.

1) Vertical extent of unsaturated soil contamination will be performed by drilling soil borings at the locations shown on attachment A. The borings located near Alcatraz Avenue will be drilled by a hand-held auger machine due to the presence of high voltage lines overhead. Soil samples will be analyzed for $TPH_{gasoline}$ and BETX compounds at 5-foot intervals above the water table by laboratory analyses specified in the RWQCB staff recommendations.

2) Hydraulic gradient will be established by surveyed water surface elevations from wells W-1, W-2, W-3, W-4, and wells MW-1, MW-2, MW-4, and MW-3 if ARCO can get permission from Oakland to drill it (see attachment B for locations). ARCO has attempted to gain permission to drill MW-3 since September 3, 1988. The MW wells on ARCO property are planned to be installed once ARCO gets permission from the ACHCS.

3) All wells will be sampled for water quality.

4) Definition of free product and dissolved product plumes will be aided by the installation of the MW wells. An optical probe will be used to detect the presence of floating product. If product plumes extend off-site ARCO will attempt to gain permission from the owner of the property immediately west of the ARCO station to install wells on that property. The City of Oakland has already notified ARCO's consultant that it will not allow ARCO to install monitoring wells along Alcatraz Avenue. Therefore ARCO assumes that the City of Oakland will define and clean-up soil and/or groundwater contamination present under it's property as required by State law.

5) Interpretation of hydrogeologic data will be presented in quarterly monitoring reports.

6) Munincipal and domestic water wells in the vicinity of the station will be documented. Beneficial uses of the groundwater in such an urbanized area as Oakland is nil.

7) Development of a remediation plan will be based on information gathered in future site assessments. Soils will be remediated to less than 100 ppm while groundwater will be remediated to contaminant levels which equal levels entering the ARCO site or at levels determined by the RWQCB.

8) This item follows ARCO's standard procedures.

9) Permission will be obtained from the Air Board if required.

Procedures for drilling of boreholes, soil and water sampling, and well installation may be found on pages 9 through 16 (copies attached) of the September 11, 1988 work plan by Applied Geosystems. This work plan was previously sent to the Environmental Health Department.

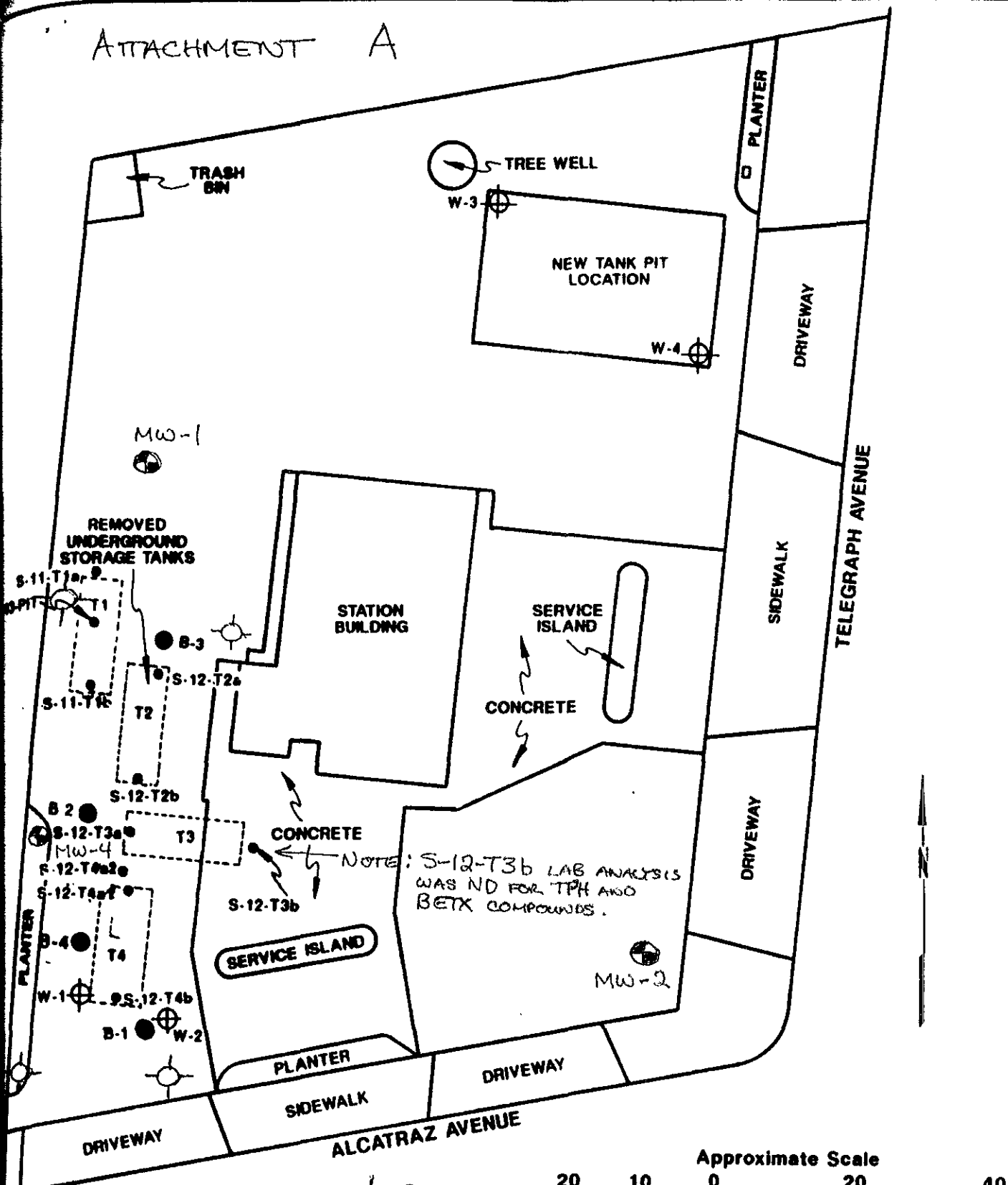
Please submit a letter of explanation describing your request for a $500 advance fee. It is not explained how ARCO will be reimbursed if this sum if it

is not exceeded or what the fee schedule with associated labor rates is that the ACHCS intends to charge ARCO. Section 25360 of the Health and Safety Code states that the ARCO shall reimburse the State Water Resources Control Board for all direct and indirect costs incurred by any and all state and local agencies while overseeing the cleanup of underground storage tank sites. Could you please clarify these questions for me.

Sincerely,

Kyle A. Christie
Environmental Engineer

ATTACHMENT A

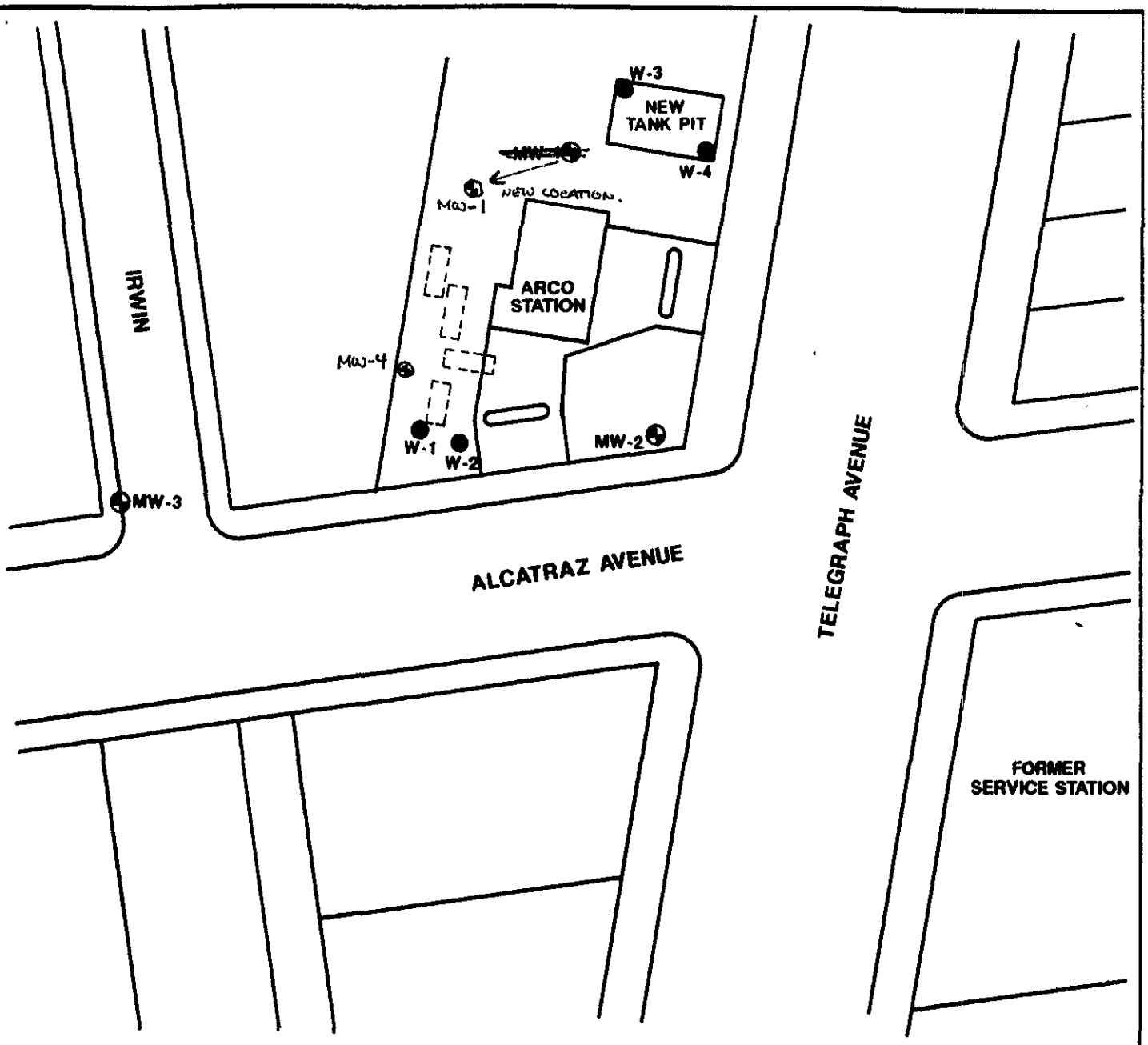


Applied GeoSystems

PROJECT NO. 18039-2

GENERALIZED SITE PLAN
ARCO Station No. 374
Telegraph and Alcatraz Avenues
Oakland, California

PLATE
P - 2



▭ = Former underground tank

⊕ = Proposed monitoring well location

● = Well location

Source: Modified from Assessor's maps and ARCO site plan

N

Approximate Scale

50 25 0 50 100

feet

ATTACHMENT B

Applied GeoSystems

PROJECT NO. 18039-3

PROPOSED MONITORING WELL LOCATIONS
ARCO Station No. 0374
Telegraph and Alcatraz Avenues
Oakland, California

PLATE
P - 3

2. Collect and classify relatively undisturbed soil samples taken at 5-foot intervals from the ground surface to total depth of each the boring.

3. Submit the soil sample with the highest OVM reading and the deepest unsaturated soil sample collected from each boring to a State-certified laboratory to be analyzed for hydrocarbon constituents.

4. Construct and develop a 4-inch-diameter ground-water monitoring well in each borehole.

5. Purge the newly constructed wells and one of the tank-pit wells and collecting water samples.

6. Submit one water sample from each newly constructed well and the purged tank-pit well to a State-certified laboratory to be analyzed for total petroleum hydrocarbons (TPH) and the hydrocarbon constituents benzene, ethylbenzene, toluene, and total xylene isomers (BETX).

7. Evaluate the elevation of each well and calculate the local ground-water gradient using relative ground-water elevations.

8. Interpret field and laboratory data and preparing a report summarizing our findings, conclusions, and recommendations.

Soil Boring

Each boring will be drilled with a 10-inch-diameter, hollow-stem auger using a Mobile B-57 (or equivalent) truck-mounted drill rig. The augers will be steam-cleaned prior to drilling each boring to minimize the possibility of cross-contamination.

The boring will be drilled until first ground water is encountered. Each boring will extend into the aquifer either 15 feet or to a competent clay layer or aquitard. To test the competence of the aquitard or clay layer, the borehole will be drilled up to 5 feet into the clay. The excess hole will be backfilled with either bentonite or neat cement placed using a tremie method, and the monitoring well will be completed in the aquifer above this backfill. If the first saturated material is greater than 15 feet thick, the boring (and ground-water monitoring well) will be completed at a depth of 15 feet below the top of the saturated material.

A geologist will log the materials encountered in the boring during drilling on a field borehole log; examples of the field borehole log and the Log of Boring plate used in our report are attached to this Work Plan.

Drill cuttings subjectively evaluated as having hydrocarbon contamination levels greater than 100 ppm will be separated from those subjectively evaluated as having hydrocarbon contamination levels less than 100 ppm. Subjective evaluation will be based on the presence of soil discoloration and on measurements from the OVM. Field instruments such as the OVM are capable of evaluating relative concentrations of vapor content but cannot be used to

measure levels of contamination. Drill cuttings will be aerated onsite and disposed of at an appropriate landfill.

Soil Sampling

Soil samples will be collected at 5-foot intervals in the borings. The relative vapor content of the soil samples will be measured using an OVM and recorded on the boring logs. Soil samples will be collected by advancing the boring to a point immediately above the sampling depth and then driving a California-modified, split-spoon sampler into the soil through the hollow center of the auger. The sampler will be driven 18 inches with a standard 140-pound hammer repeatedly dropped 30 inches. The number of blows to drive the sampler each successive 6 inches will be counted and recorded to evaluate the relative consistency of the soil.

The soil samples will be removed from the sampler and immediately sealed in their brass sleeves with aluminum foil, plastic caps, and airtight tape. The samples will then be labeled, placed in iced storage, and delivered to a laboratory that is certified by the State of California to perform the types of analyses requested. Chain of Custody Records for the samples tested will be included with the final report; an example of a Chain of

Custody Record is attached to this Work Plan.

Monitoring Well Construction and Development

A 4-inch-diameter well will be constructed in each soil boring to evaluate and monitor ground-water conditions at the site. The well will be completed to a depth of approximately 15 feet below the first occurrence of ground water.

The well will be constructed of thread-jointed, polyvinyl chloride (PVC) casing. No chemical cements, glues, or solvents will be used in well construction. The bottom of the casing will have a threaded end plug, and the top will have a slip cap. The screened portion of the well will consist of factory-perforated casing with 0.020-inch-wide slots. The well screen will extend from the total depth of the well to approximately 5 feet above the upper zone of saturation to allow monitoring during seasonal fluctuations of ground-water levels.

The annular space of the well will be packed with sorted and washed sand to approximately 2 feet above the perforated interval. A 1-foot-thick bentonite plug will be placed above the sand as a seal against cement entering the sand pack. The remaining annulus will be backfilled with a slurry of water, neat

cement, and bentonite to approximately 1 foot below grade. A graphical log of the well construction will be provided on the boring logs in the final report.

An aluminum utility box with a PVC apron will be placed over each well head and secured in place with concrete set flush with the surrounding ground surface. The well-head cover will have a watertight seal to protect the ground-water monitoring well against surface-water infiltration and will require a specially designed spanner wrench to open. This design discourages vandalism and reduces the possibility of accidental disturbance of the well.

Ground-Water Sampling

The well will be developed by air-jetting or surge pumping. The wells will be allowed to equilibrate after developing. A bailer will then be used to obtain a sample from the surface of the water in each of the newly constructed wells and tank-pit well W-1 for subjective evaluation prior to purging. If floating hydrocarbon product is detected, the thickness of the product will be measured and the well will not be purged. If floating product is not observed, the well will then be purged of approximately four well volumes of water before collecting a

water sample for laboratory analysis.

Following ground-water recovery to static conditions, a water sample will be retrieved from each well that does not contain floating product by using a Teflon bailer. The bailer will be cleaned with distilled water and Alconox between each sampling to prevent cross-contamination. The water samples will be sealed in laboratory-cleaned glass containers with Teflon-lined lids, labeled and immediately placed in iced storage. Chain of Custody Records will be initiated by the geologist and will accompany the samples to a State-certified analytical laboratory. Copies of the Chain of Custody Records will be included in our final report; an example of a Chain of Custody Record is attached to this Work Plan.

The purged water will be pumped into 55-gallon holding drums and temporarily stored onsite. Based on the results of the laboratory analyses, the water will be disposed of in a manner acceptable to the Alameda County Department of Environmental Health.

Evaluation of Ground-Water Gradient

Ground-water elevations will be measured to evaluate the ground-water gradient. The elevation of the top of each well casing will be referenced to National Geodetic Vertical Datum by a certified surveyor. The static-water levels will be measured with the water-level indicator to the nearest 0.01-foot, to calculate the differences in water-level elevations between the wells. The elevation differences will be used to construct a ground-water potentiometric surface map of the site. The ground-water gradient will be measured and direction of ground-water flow will be evaluated from this map.

Analytical Methods

Soil samples selected for testing will be analyzed for TPH in accordance with Environmental Protection Agency (EPA) Method 8015 modified for gasoline. Water samples will be analyzed for TPH and BTEX using EPA Methods 8015 and 602, respectively. Detection limits suitable for the tests requested will be stated on the laboratory analytical reports. Analyses will be facilitated through solvent extraction, gas chromatography separation, and photoionization and flame-ionization detection.

Report Preparation

A report will be provided to ARCO Products Company summarizing soil stratigraphy, field and laboratory procedures, well construction details, laboratory results, our interpretations regarding the source and extent of contamination, and recommendations for further work. Information gathered during the work will be considered confidential and released only with the authorization of ARCO Products Company.

PROJECT STAFF

Ms. Gillian S. Holmes, a Registered Geotechnical Engineer (G.E. 2023) in the State of California, will be in overall charge of this project. Mr. John Lambert, Project Geologist, will manage field and office operations for the work. Applied GeoSystems employs a staff of geologists and technicians who will be used as needed to see the project to completion.

REFERENCE CITED

Helley, E.S., Lajoie, K.R., Spangle, W.E., and Blair, M.L., 1979, Flatland deposits of the San Francisco Bay region, California, U.S. Geological Survey Professional Paper 943, 87p.