GeoStrategies Inc.
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HAYWARD, CALIFORNIA 94545
(415) 352-4800

November 14, 1989

Gettler-Ryan Inc.
1992 National Avenue
Hayward, California

Attn: Mr. John Werfal

Re: **PROPOSED SCOPE OF WORK**
ARCO Service Station #601
712 Lewelling Boulevard
San Leandro, California

Gentlemen:

This letter presents an outline of environmentally related work to be performed at the above referenced location as requested by the San Leandro Fire Department (SLFD) (see Plate 1).

Petroleum hydrocarbons were observed in the shallow soils adjacent to the underground storage tank complex during a preliminary soil investigation conducted by Applied GeoSystems (Report dated November 9, 1989).

In response to these findings, the following work is proposed to assess the extent of potential soil and ground-water contamination:

1) GeoStrategies Inc. (GSI) will observe site activities during the tank replacement work. This will include inspecting the old tanks as they are removed, directing the excavation of contaminated soil, and sampling the soils in the excavations, stockpiles and pipe trenches as specified by Leaking Underground Fuel Tank Manual (LUFT, latest edition) and SLFD. Water samples may be taken in lieu of soil samples in deeper excavations where accumulated water is present. Every effort will be made to remove as much contaminated soil as possible from the excavation and the piping trenches. Additional soil samples will be collected at the maximum depth of the excavation for presence of hydrocarbon contamination.

2) All excavated soils will be stockpiled and sampled on site. Stockpiled soils will be disposed at an appropriate facility upon receipt of chemical analytical data.

3) The new storage tanks will be relocated in a new excavation. Soils from this new excavation will be stockpiled separate from other soils and analyzed for hydrocarbons. Samples will also be collected from the new tank excavation prior to tank installation in order to characterize the hydrocarbon concentration in that area of the site, if any. Upon receipt of analytical data, stockpiled soil will be disposed in accordance with state and local regulations.

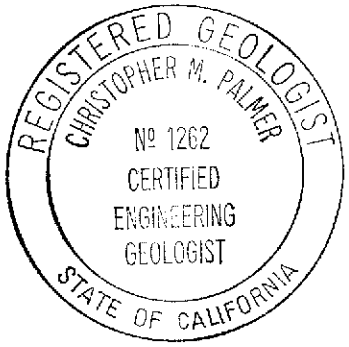
4) Subsequent to tank replacement, [redacted] using the attached GSI Field Methods and Procedures. These borings will be lithologically logged and soil samples collected for chemical analysis at 5 foot depth intervals as a minimum. This will assist in ascertaining the vertical distribution of hydrocarbons in the unsaturated zone. Ground-water monitoring wells will then be installed in the boreholes. The wells will be used to monitor ground-water elevations, calculate a local gradient, and collect samples to assess site ground-water quality. Upon receipt of chemical analytical data from the ground-water samples, additional wells may be proposed for plume delineation. Pending review of initial investigation results, additional scopes of work will be proposed in a separate document if needed. The monitoring wells will be sampled on a quarterly schedule.

A report will be prepared documenting the results of these activities.

If you have any questions, please call.

GeoStrategies Inc. by,

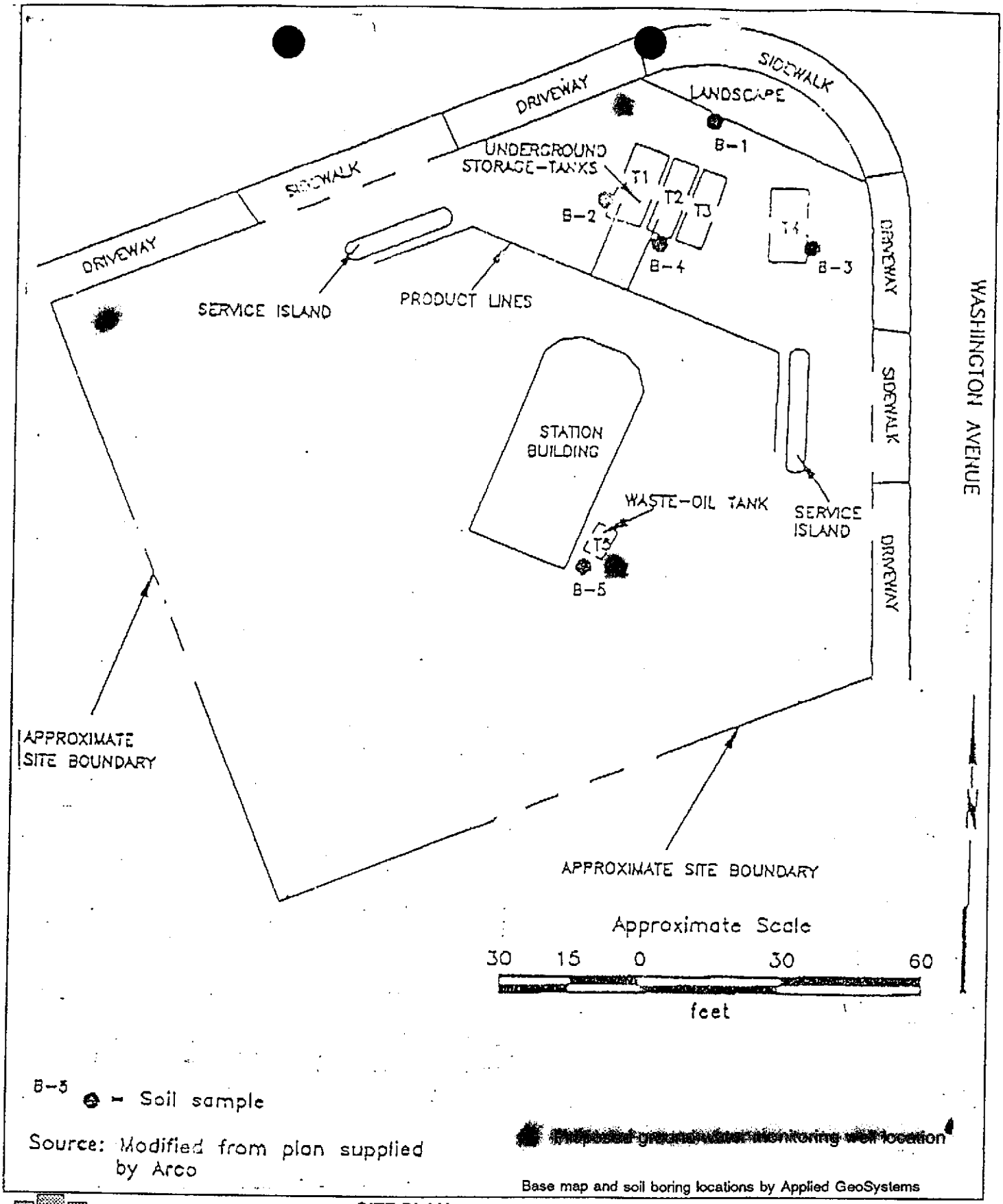
Melissa L. Wann
Project Geologist



Christopher M. Palmer
Senior Geologist
C.E.G. 1262, R.E.A. 285

MLW/CMP/kjj

Site Plan, ARCO Service Station #601



Source: Modified from plan supplied by Arco

Base map and soil boring locations by Applied GeoSystems

GeoStrategies Inc.

SITE PLAN

ARCO Service Station #601
Washington Avenue and Lewelling Boulevard
San Leandro, California

PLATE

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7918	RWP CEG 1262			

FIELD METHODS AND PROCEDURES

EXPLORATION DRILLING

Mobilization

Prior to any drilling activities, GSI will verify that necessary drilling permits have been secured.

Utility locations will be located and drilling will be conducted so as not to disrupt activities at a project site. GSI will obtain and review available public data on subsurface geology and if warranted, the location of wells within a half-mile of the project site will be identified. Drillers will be notified in advance so that drilling equipment can be inspected prior to performing work.

Drilling

The subsurface investigations are typically performed to assess the lateral and vertical extent of petroleum hydrocarbons present in soils and ground water. Drilling methods will be selected to optimize field data requirements as well as be compatible with known or suspected subsurface geologic conditions.

Monitoring wells are installed using a truck-mounted hollow-stem auger drill rig or mud-rotary drill rig. Typically, the hollow-stem rig is used for wells up to 100 feet, if subsurface conditions are favorable. Wells greater than 100-feet deep are typically drilled using mud-rotary techniques. When mud rotary drilling is used, an electric log will be performed for additional lithological information. Also during mud rotary drilling, precautions will be taken to prevent mud from circulating contaminants by using a conductor casing to seal off contaminated zones. Samples will be collected for lithologic logging by continuous chip, and where needed by drive sample or core as specified by the supervising geologist.

Soil Sampling

Shallow soil borings will be drilled using a truck-mounted hollow-stem auger drilling rig, unless site conditions favor a different drilling method. Drilling and sampling methods will be consistent with ASTM Method D-1452-80. The auger size will be a minimum 6-inch nominal outside-diameter (O.D). No drilling fluids will be used during this drilling method. The augers and other tools used in the bore hole will be steam cleaned before use and between borings to minimize the possibilities of cross-contamination between borings.

Soil samples are typically collected at 5-foot intervals as a minimum from ground surface to total depth of boring. Additional soil samples will be collected based on significant lithologic changes and/or potential chemical content. Soil samples from each sampling interval will be lithologically described by a GSI geologist (Figure 1). Soil colors will be described using the Munsell Color Chart. Rock units will be logged using appropriate lithologic terms, and colors described by the G.S.A. Rock Color Chart.

Head-space analyses will be performed to check for the evidence of volatile organic compounds. Head-space analyses will be performed using an organic vapor analyzer; either an OVA, HNU, or OVM. Organic vapor concentrations will be recorded on the GSI field log of boring (Figure 1). The selection of soil samples for chemical analysis are typically based on the following criteria:

1) Soil discoloration
2) Soil odors
3) Visual confirmation of chemical in soil
4) Depth with respect to underground tanks (or existing grade)
5) Depth with respect to ground water
6) OVA reading

Soil samples (full brass liners) selected for chemical analysis are immediately covered with aluminum foil and the liner ends are capped to prevent volatilization. The samples are labeled and entered onto a Chain-of-Custody form, and placed in a cooler on blue ice for transport to a State-certified analytical laboratory.

Soil cuttings are stockpiled on-site. Soils are sampled and analyzed for site-specific chemical parameters. Disposition of soils is dependent of chemical analytical results of the samples.

Soil Sampling - cont.

Soil borings not converted to monitoring wells will be backfilled (sealed) to ground surface using either a neat cement or cement-bentonite grout mixture. Backfilling will be tremied by continuously pumping grout from the bottom to the top of the boring where depth exceeds 20' or as required by local permit requirements.

All field and office work, including exploratory boring logs, are prepared under the direction of a registered geologist.

Monitoring Well Installation

Monitoring well casing and screen will be constructed of Schedule 40, flush-joint threaded polyvinylchloride (PVC). The well screen will be factory mill-slotted unless additional open area is required (eg. conversion to an extraction well in a low-yield aquifer). The screen length will be placed adjacent to the aquifer material to a minimum of 2-feet above encountered water. No screen shall be placed in a borehole that potentially creates hydraulic interconnection of two or more aquifer units. Screen slot size and well sand pack will be compatible with encountered aquifer materials, as confirmed by sieve analysis.

Monitoring wells will be completed below grade (Figure 2) unless special conditions exist that require above-grade completion design. In the event a monitoring well is required in an aquifer unit beneath an existing aquifer, the upper aquifer will be sealed off by installing a steel conductor casing with an annular neat cement or cement-bentonite grout seal. This seal will be continuously tremied pumped from the bottom of the annulus to ground surface.

The monitoring well sand pack will be placed adjacent to the entire screened interval and will extend a recommended minimum distance of 2-feet above the top of the screen. No sand pack will be placed that interconnects two or more aquifer units. A minimum 2-foot bentonite pellet or bentonite slurry seal will be placed above the sand pack. Sand pack, bentonite, and cement seal levels will be confirmed by sounding the annulus with a calibrated weighted tape. The remaining annular space above the bentonite seal will be grouted with a bentonite-cement mixture and will be tremie-pumped from the bottom of the annular space to the ground surface. The bentonite content of the grout will not exceed 5 percent by weight. A field log of boring and a field well completion form will be prepared by GSI for each well installed.

Decontamination of drilling equipment before drilling and between wells will consist of steam cleaning, and/or Alconox wash.

Well Development

Monitoring wells will be developed using a submersible pump, bladder pump or bailer. All well developing equipment will be decontaminated prior to development using a steam cleaner and/or Alconox detergent wash. Wells will be developed until discharge water is visibly clear and free of sediment. The adequacy of well development will be assessed by the GSI geologist. Indicator parameters (pH, specific conductance, and temperature) will be monitored and recorded during well development. Field instrument calibrations will be performed according to manufacturer's specifications.

Well Surveying

Monitoring wells will be surveyed to obtain top of box elevations to the nearest ±0.01 foot. Water level measurements will be recorded to the nearest ±0.01 foot and referenced to mean sea level (MSL). If additional wells are required, then existing and newly installed wells are surveyed relative to MSL.