Texaco Refining
and Marketing Inc

10 Universal City Plaza
Universal City CA 91608

ALCO
HAZMAT

94 MAR -3 PM 3:48

February 25, 1994

ENV - SERVICE STATIONS
Work Plan - Core Hole Program
1127 Lincoln Avenue
Alameda, California

Ms. Juliet Shin
Alameda County Department of
Environmental Protection
80 Swan Way, Room 200
Oakland, CA 94621

Dear Ms. Shin:

Enclosed is a copy of a work plan prepared by RESNA for additional assessment work to be performed for the above site. Please approve the plan and we will instruct RESNA to proceed, contact me at (818) 505-2476 if you have any questions or wish to discuss this work plan further.

Very truly yours,

Bob Robles
Environmental Protection Coordinator
TEXACO ENVIRONMENTAL SERVICES

RR:rr
w:\rr\1127lin1.reg

cc: Mr. Leo Pagano
Mr. Richard Hiett, CRWQCB
RRZielinski

ALCO HAZMAT

94 MAR -3 PM 3:48

RESNA
Working To Restore Nature

3315 Almaden Expressway, Suite 34
San Jose, CA 95118
Phone: (408) 264-7723
FAX: (408) 264-2435

February 22, 1994

Ms. Juliet Shin
Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

Subject: Work Plan to Perform a Core-Hole Program and Install Two Groundwater Monitoring Wells (MW-9 and MW-10)
Former Bay Street Texaco Service Station
1127 Lincoln Avenue, Alameda, California.

Ms. Shin:

As requested by the Alameda County Health Care Services Agency (ACHCSA) in a letter to Mr. Robert Robles of Texaco Refining and Marketing Company, dated January 12, 1994, RESNA Industries Inc. (RESNA) has prepared this work plan to perform a core-hole program and subsequently install two groundwater monitoring wells (MW-9 and MW-10) at the subject site. The locations of the proposed well(s) will be based on the results of the core-hole program.

The core-hole program uses a continuous coring system to make pilot holes for groundwater sampling. The hole is advanced to a predetermined depth and the continuous coring tool is removed from the hole. The groundwater sample is collected with a ½-inch diameter teflon bailer. Refer to Artesian Environmental Consultants standard operating procedure in Attachment B.

The former Bay Street Texaco Station, located at 1127 Lincoln Avenue in Alameda, California, is now an operating auto repair shop which uses the building and facilities of the former service station and is situated in a commercial and residential area. The site location is shown on Plate 1, Site Vicinity Map. A plant nursery borders the site on the west, residential property border the site to the north, and commercial and residential properties border the site across Lincoln Avenue and Bay Street to the south and east. The site is on a relatively flat asphalt-covered lot at an elevation of approximately 17 feet above mean sea level. Two 4,000-gallon gasoline-underground storage tanks (USTs) were formerly located in the middle of the site, two 1,000-gallon gasoline USTs were formerly located on the eastern side of the site, and one 550-gallon waste-oil-UST was formerly located in the western portion of the site as shown on Plate 2, Generalized Site Plan.

The purpose of the proposed work is to perform a core-hole program to evaluate the most suitable location to install in the downgradient flow direction (towards the north to northwest) well(s) in order to further delineate the contaminant plume. The core-hole program will consist of approximately six corings in the general downgradient direction of the site, along Bay Street and Pacific Avenue. The locations of the proposed corings are shown on Plate 3, Proposed Coring Locations. The number and locations of the corings may change based on subsurface conditions and/or locations of the underground utilities.

The purposed work includes: 1) acquiring the proper Alameda County Water District Permits and encroachment permits from the City of Alameda; 2) advancing approximately six soil corings to depths of approximately 10 feet below ground surface (bgs); 3) collecting soil samples continuously for the entire 10 feet of each boring for possible analyses and subsequently a groundwater "grab" sample for analyses based on the results of the core-hole program; 4) backfilling each coring with cement grout to the surface; 5) submitting selected soil and groundwater "grab" samples collected from the corings for laboratory analysis for the gasoline constituents benzene, toluene, ethylbenzene, and total xylenes (BTEX) using Environmental Protection Agency (EPA) Methods 5030/8020M, total petroleum hydrocarbons as gasoline (TPHg) using EPA Methods 5030/8015M on a 24-hour response time; and 6) subsequently installing two groundwater monitoring wells.

Based on the results of the laboratory analyses from the core-hole program, install two groundwater monitoring wells (MW-9 and MW-10) in the locations where the laboratory analyses of the groundwater "grab" samples indicated non-detectable levels for the gasoline constituents BTEX and TPHg. This will be accomplished by drilling two borings (B-9 and B-10) to a maximum depth of 20 feet below the ground surface (approximately 10 feet below first encountered groundwater, which is at a depth of approximately 10 feet) in the downgradient direction of the site to delineate further the lateral extent of gasoline hydrocarbons in soil and evaluate potential subsurface pathways beneath the site. Collect soil samples from the borings at approximate 5 foot intervals for laboratory analysis. Subjectively analyze soil samples collected from each coring during drilling for the presence of gasoline hydrocarbons, using visual observations and an organic vapor meter (OVM). Subsequently install two groundwater monitoring wells (MW-9 and MW-10) in the locations where the laboratory analyses of the groundwater "grab" samples indicated non-detectable levels for the gasoline constituents BTEX and TPHg.

Subsequent to their installation, develop each well, survey wellhead elevation, and dispose of the soil cuttings and well purge water.

This proposed work is scheduled to begin in early April 1994.

If you should have any questions or comments regarding this work plan, please call (408) 264-7723.

Sincerely,
RESNA Industries Inc.

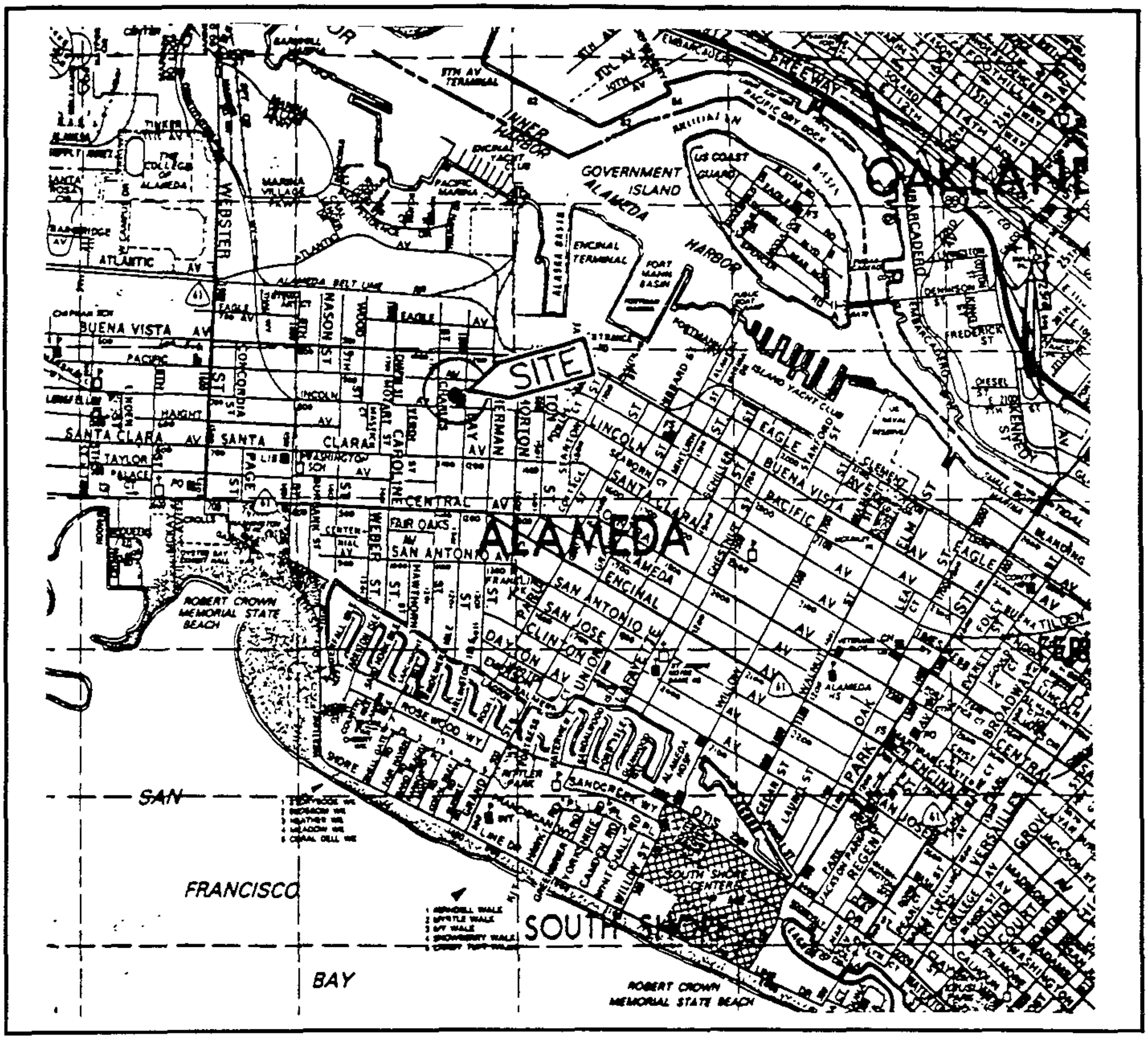
Philip J. Mayberry
Project Geologist

REGISTERED GEOLOGIST
JAMES LEWIS NELSON
No. 1463
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

James L. Nelson, C.E.G
Senior Project Geologist

Enclosure:	Plate 1:	Site Vicinity Map
	Plate 2:	Generalized Site Plan
	Plate 3:	Proposed Coring Locations
	Attachment A:	Field Protocol
	Attachment B:	Artesian Environmental Consultants Standard Operating Procedure

cc: Mr. Robert Robles, Texaco Environmental Services



Base: The Thomas Bros. Guide
Alameda/Contra Costa County
Alameda, California
Photorevised 1988

N

LEGEND

(•) = Site Location

Approximate Scale

2200 1100 0 2200 4400

feet

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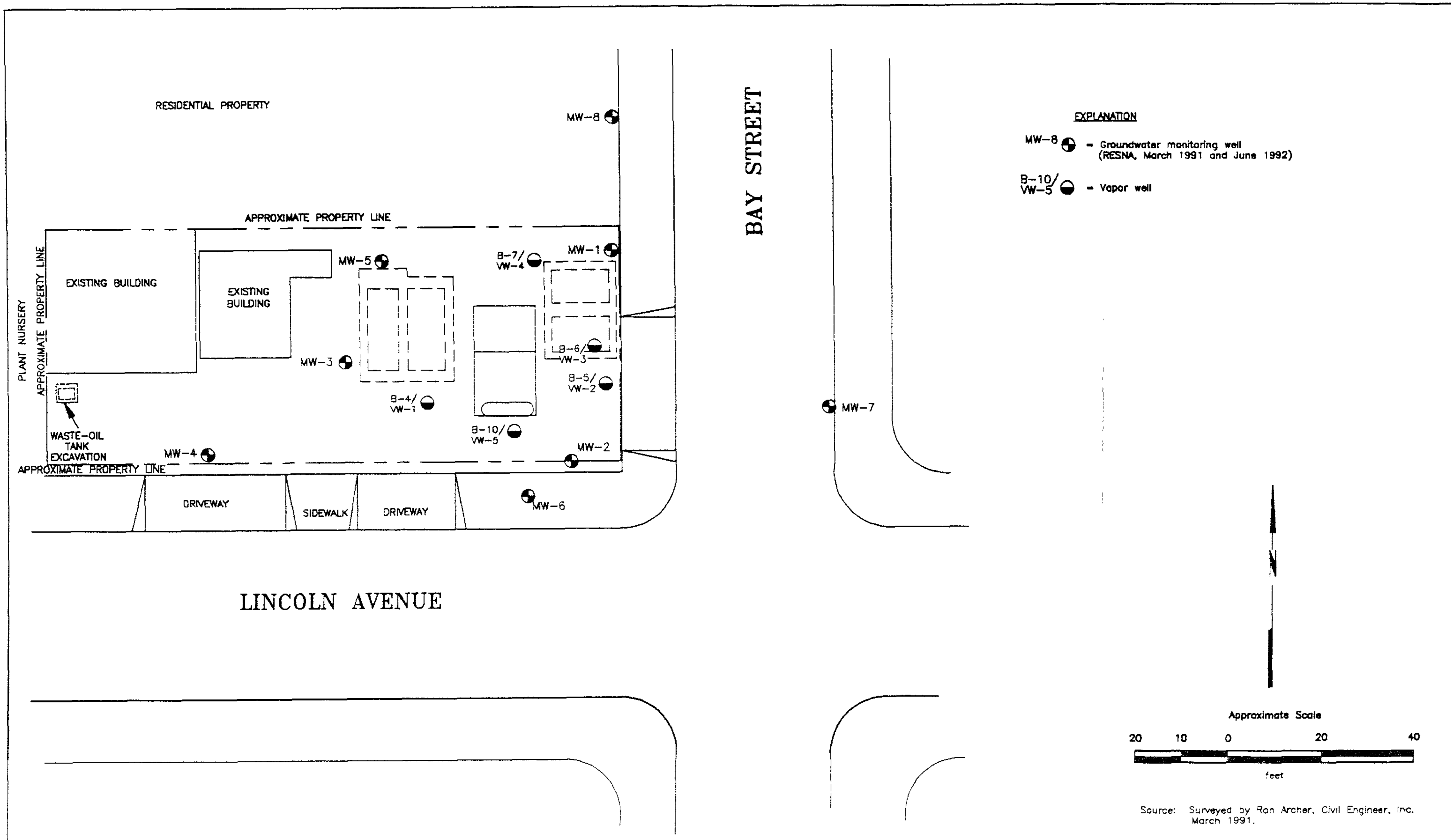
SITE VICINITY MAP
Former Texaco Station
1127 Lincoln Avenue
Alameda, California

PLATE

1

PROJECT 62074.04



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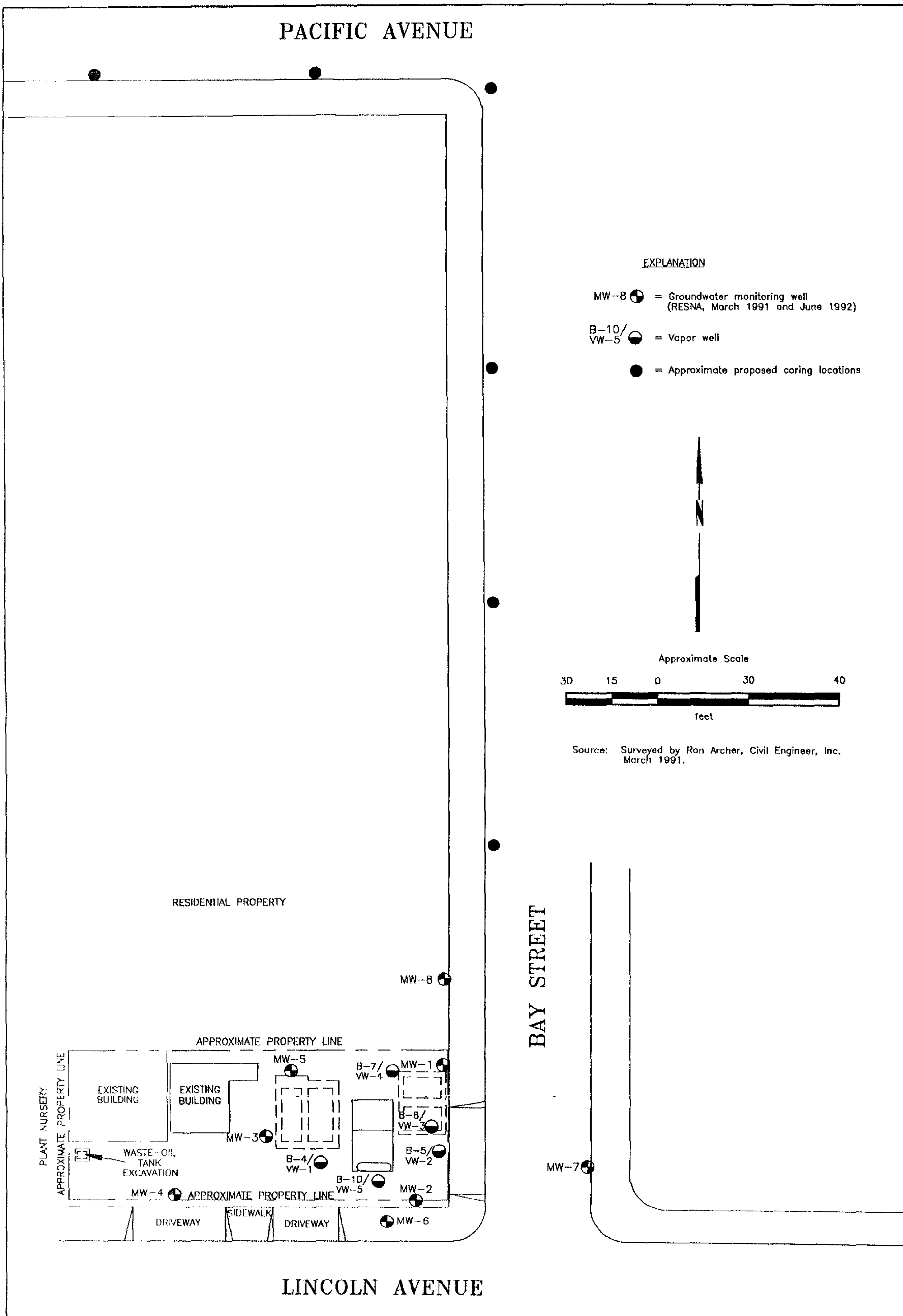
PROJECT 62074.04

GENERALIZED SITE PLAN
Former Bay Street Texaco Station
1127 Lincoln Avenue
Alameda, California

PLATE 2



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PROJECT 62074.04

PROPOSED CORING LOCATIONS
Former Bay Street Texaco Station
1127 Lincoln Avenue
Alameda, California

PLATE
3

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ATTACHMENT A

FIELD PROTOCOL

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FIELD PROTOCOL

The following presents RESNA Industries' field protocol for a typical site investigation involving gasoline hydrocarbon-impacted soil and/or groundwater.

Site Safety Plan

The Site Safety Plan describes the safety requirements for the evaluation of gasoline hydrocarbons in soil, groundwater, and the vadose-zone at the site. The site Safety Plan is applicable to personnel of RESNA Industries and its subcontractors. RESNA Industries personnel and subcontractors of RESNA Industries scheduled to perform the work at the site are briefed on the contents of the Site Safety Plan before work begins. A copy of the Site Safety Plan is available for reference by appropriate parties during the work. A site Safety Officer is assigned to the project.

Soil Excavation

Permits are acquired prior to the commencement of work at the site. Excavated soil is evaluated using a field calibrated (using isobutylene) Thermo-Environmental Instruments Model 580 Organic Vapor Meter (OVM). This evaluation is done upon arrival of the soil at the ground surface in the excavator bucket by removing the top portion of soil from the bucket, and then placing the intake probe of the OVM against the surface of the soil in the bucket. Field instruments such as the OVM are useful for measuring relative concentrations of vapor content, but cannot be used to measure levels of gasoline hydrocarbons with the accuracy of laboratory analysis. Samples are taken from the soil in the bucket by driving laboratory-cleaned brass sleeves into the soil. The samples are sealed in the sleeves using aluminum foil, plastic caps, and plastic zip-lock bags or aluminized duct tape; labeled; and promptly placed in iced storage. If field subjective analyses suggest the presence of gasoline hydrocarbons in the soil, additional excavation and soil sampling is performed, using similar methods. If groundwater is encountered in the excavation, groundwater samples are collected from the excavation using a clean Teflon® bailer. The groundwater samples are collected as described below under "Groundwater Sampling". The excavation is backfilled or fenced prior to departure from the site.

Sampling of Stockpiled Soil

One composite soil sample is collected for each 50 cubic yards of stockpiled soil, and for each individual stockpile composed of less than 50 cubic yards. Composite soil samples are obtained by first evaluating relatively high, average, and low areas of hydrocarbon concentration by digging approximately one to two feet into the stockpile and placing the intake probe of a field calibrated OVM against the surface of the soil; and then collecting one sample from the "high" reading area, and three samples from the "average" areas. Samples are collected by removing the top one to two feet of soil, then driving laboratory-cleaned brass sleeves into the soil. The samples are sealed in the sleeves using aluminum foil, plastic caps, and plastic zip-lock bags or aluminized duct tape; labeled; and promptly placed in iced storage for transport to the laboratory, where compositing is performed.

Soil Borings

Prior to the drilling of borings and construction of monitoring wells, permits are acquired from the appropriate regulatory agency. In addition to the above-mentioned permits, encroachment permits from the City or State are acquired if drilling of borings offsite on City or State property is necessary. Copies of the permits are included in the appendix of the project report. Prior to drilling, Underground Service Alert (USA) is notified of our intent to drill, and known underground utility lines and structures are approximately marked.

The borings are drilled by a truck-mounted drill rig equipped with 8- or 10-inch-diameter, solid-stem or hollow-stem augers. Other methods such as rotary or casing hammer may be used if special conditions are encountered. The augers, sampling equipment and other equipment that comes into contact with the soil are steam-cleaned prior to drilling each boring to minimize the possibility of cross-contamination. Sampling equipment is cleaned with a trisodium phosphate solution and rinsed with clean water between samples. After drilling the borings, monitoring wells are constructed in the borings, or neat-cement grout with bentonite is used to backfill the borings to the ground surface.

Borings for groundwater monitoring wells are drilled to a depth of no more than 20 feet below the depth at which a saturated zone is first encountered, or a short distance into a stratum beneath the saturated zone which is of sufficient texture, moisture, and consistency to be judged as a perching layer by the field geologist, whichever is shallower. Drilling into a deeper aquifer below the shallowest aquifer is begun only after a conductor casing is properly installed and allowed to set, to seal the shallow aquifer.

Drill Cuttings

Drill cuttings subjectively evaluated as containing gasoline hydrocarbons at levels greater than 100 parts per million (ppm) are separated from those subjectively evaluated as containing gasoline hydrocarbons at levels less than 100 ppm. Evaluation is based either on subjective evidence of soil discoloration, or on measurements made using a field calibrated OVM. Readings are taken by placing a soil sample into a ziplock-type plastic bag and allowing volatilization to occur. The intake probe of the OVM is then inserted into the headspace created in the plastic bag immediately after opening it. The drill cuttings from the borings are placed in labeled 55-gallon drums approved by the Department of

Transportation, or on plastic at the site, and covered with plastic. The cuttings remain the responsibility of the client.

Soil Sampling in Borings

Soil samples are collected at no greater than 5-foot intervals from the ground surface to the total depth of the borings. The soil samples are collected by advancing the boring to a point immediately above the sampling depth, and then driving a California-modified, split-spoon sampler containing brass sleeves through the hollow center of the auger into the soil. (A standard penetrometer, which does not contain liners, may be used to collect samples when laboratory analysis for volatile components is not an issue. The sampler and brass sleeves are laboratory-cleaned, steam-cleaned, or washed thoroughly with Alconox® and water, prior to each use. The sampler is driven with a standard 140-pound hammer repeatedly dropped 30 inches. The number of blows to drive the sampler each successive six inches are counted and recorded to evaluate the relative consistency of the soil. 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.

The samples selected for laboratory analysis are removed from the sampler and quickly sealed in their brass sleeves with aluminum foil, plastic caps, and plastic zip-lock bags or aluminized duct tape. The samples are then labeled, promptly placed in iced storage, and delivered to a laboratory certified by the State of California to perform the analyses requested.

One of the samples in brass sleeves not selected for laboratory analysis at each sampling interval is tested in the field using an OVM that is field calibrated at the beginning of each day it is used. This testing is performed by inserting the intake probe of the OVM into the headspace in the plastic bag containing the soil sample as described in the Drill Cuttings section above. The OVM readings are presented in Logs of Borings included in the project report.

Logging of Borings

A geologist is present to log the soil cuttings and samples using the Unified Soil Classification System. Samples not selected for chemical analysis, and the soil in the sampler shoe, are extruded in the field for inspection. Logs include texture, color, moisture, plasticity, consistency, blow counts, and any other characteristics noted. Logs also include subjective evidence for the presence of gasoline hydrocarbons, such as soil staining, noticeable or obvious product odor, and OVM readings.

Monitoring Well Construction

Monitoring wells are constructed in selected borings using clean 2- or 4-inch-diameter, thread-jointed, Schedule 40 polyvinyl chloride (PVC) casing. No chemical cements, glues, or solvents are used in well construction. Each casing bottom is sealed with a threaded end-plug, and each casing top with a locking plug. The screened portions of the wells are constructed of machine-slotted PVC casing with 0.020-inch-wide (typical) slots for initial site wells. Slot size for subsequent wells may be based on sieve analysis and/or well development data. The screened sections in groundwater monitoring wells are placed to allow monitoring during seasonal fluctuations of groundwater levels.

The annular space of each well is backfilled with No. 2 by 12 sand or similar sorted sand (groundwater monitoring wells), or pea gravel (vapor extraction wells) to approximately two feet above the top of the screened casing for initial site wells. The sand pack grain size for subsequent wells may be based on sieve analysis and/or well development data. A 1- to 2-foot-thick bentonite plug is placed above the sand as a seal against cement entering the filter pack. The remaining annulus is then backfilled with a slurry of water, neat cement, and bentonite to approximately one foot below the ground surface.

An aluminum utility box with a PVC apron is placed over each wellhead and set in concrete placed flush with the surrounding ground surface. Each wellhead cover has a seal to protect the monitoring well against surface-water infiltration and requires a special wrench to open. The design discourages vandalism and reduces the possibility of accidental disturbance of the well.

Groundwater Monitoring Well Development

The monitoring wells are developed by bailing or over-pumping and surge-block techniques. The wells are either bailed or pumped, allowed to recharge, and bailed or pumped again until the water removed from the wells is determined to be clear. Turbidity measurements (in NTUs) are recorded during well development and are used in evaluating well development. The development method used, initial turbidity measurement, volume of water removed, final turbidity measurement, and other pertinent field data and observations are recorded. The wells are allowed to equilibrate for at least 48 hours after development prior to sampling. Water generated by well development is stored in 17E Department of Transportation (DOT) 55-gallon drums on site, and remains the responsibility of the client.

Groundwater Sampling

The static water level in each well is measured to the nearest 0.01-foot using a Solinst® electric water-level sounder or oil/water interface probe (if the wells contain floating product) cleaned with Alconox® and water before use in each well. The depth of each well is also measured. The liquid in the wells is examined for visual evidence of gasoline hydrocarbons by gently lowering approximately half the length of a Teflon® bailer (cleaned with Alconox® and water) past the air/water interface. The sample is then retrieved and inspected for floating product, sheen, emulsion, color, sediment, and clarity. Obvious product odor is recorded if noted. If floating product is present in the well, the thickness of floating product is measured using an oil/water interface probe and is recorded to the nearest 0.01 foot. Floating product is removed from wells on site visits.

Groundwater samples from the wells are collected in approximate order of increasing product concentration, as best known or estimated. Wells which do not contain floating product are purged using a submersible pump. Equipment which comes in contact with the interior of the well or the groundwater is cleaned with Alconox® and deionized or distilled water prior to use in each well. The wells are purged until withdrawal is of sufficient duration to result in stabilized pH, temperature, and electrical conductivity of the water. These parameters are measured to the nearest 0.1 pH unit, 0.1 degree F, and 10 umhos/cm, respectively, using portable meters calibrated daily to a buffer and conductivity standard, according to the manufacturer's specifications. A minimum of four well volumes is purged from each well. If the well becomes dewatered, the water level is allowed to recover to at least 80 percent of the initial water level. When recovery of the water level has not reached at least 80 percent of the static water level after two hours, a groundwater sample will be collected when sufficient volume is available to fill the sample container. Prior to the collection of each groundwater sample, the Teflon® bailer is cleaned with Alconox® and rinsed with tap water and deionized water, and the latex gloves worn by the sampler changed. Hydrochloric acid is added to the sample vials as a preservative (when applicable). Sample containers remain sealed until usage at the site. A sample method blank is collected by pouring distilled water into the bailer and then into sample vials. Method blanks are analyzed periodically to verify effective cleaning procedures. A sample of the formation water is then collected from the surface of the water in each of the wells using the Teflon® bailer. The water samples are then gently poured into laboratory-cleaned, 40-milliliter (ml) glass vials, 500 ml plastic bottles or 1-liter glass bottles (as required for specific laboratory analysis), sealed with Teflon®-lined caps, and inspected for air bubbles to check for headspace, which would allow volatilization to occur. If a bubble is evident, the cap is removed, more sample is added, and the bottle resealed. The samples are then labeled and promptly placed in iced storage, and the wellhead is secured. A field log documenting sampling procedures and parameter monitoring is maintained. Water generated by the purging of wells is stored in 17E DOT 55-gallon drums, and floating product bailed from the wells is stored in double containment onsite; this water and product remains the responsibility of the client.

Vadose-Zone Monitoring and Vapor Well Purging

Vapor readings are made with a field-calibrated OVM, which has a lower detection limit of 0.1 ppm. After the OVM is turned on, it is allowed sufficient warm-up time for stabilization. Prior to purging each vadose-zone monitoring well, a well cap with a hose barb drilled and tapped into the well cap is secured to the well. The inlet of the vacuum pump is connected to the hose barb with tubing. OVM readings are taken from the exhaust port of the vacuum pump as the well is purged. Each well is purged for approximately 2 to 5 minutes or until about five well volumes of air have been removed. Ambient readings of the air at the site are taken with the OVM after each well is purged.

Air Sampling

The vacuum pump is first purged with ambient air. Vadose-zone monitoring is then performed as described above. A new Tedlar sample bag is then placed on the outlet port of the vacuum pump with the valve closed. The valve is then opened to allow filling of the bag with an air sample. The valve is closed when the sample bag is 3/4-full (to allow for expansion of gas due to temperature changes), and the bag is removed. The sample pump is purged with ambient air after each sample is taken. A field log documenting sampling procedures is maintained. The samples are transported to the laboratory without exposure to sunlight or cooling, for analysis with 72-hour turnaround.

Sample Labeling and Handling

Sample containers are labeled in the field with the job number, unique sample location, depth, and date, and promptly placed in iced storage for transport to the laboratory. A Chain of Custody Record is initiated by the field geologist and updated throughout handling of the samples, and accompanies the samples to a laboratory certified by the State of California for the analyses requested. Samples are transported to the laboratory promptly to help ensure that recommended sample holding times are not exceeded. Samples are properly disposed of after their useful life has expired.

Aquifer Testing

The initial water levels in wells to be used during the test are measured prior to commencement of pumping. The flow rate of the pump is adjusted to the desired pumping rate, and water levels allowed to recover to initial levels. Pumping then begins, and the starting time of pumping is recorded. Drawdowns in observation wells are recorded at intervals throughout pumping using pressure transducers and manual methods. Evacuated water is stored in a storage tank at the site and remains the responsibility of the client. After the pump is shut off, recovery measurements are taken in the wells until recovery is at least 80 percent of the initial water level. Barometric pressure and tidal information (if appropriate) are collected for the time interval of the pumping test to allow evaluation of possible effects of atmospheric pressure and tidal fluctuations on the groundwater levels.

Quality Assurance/Quality Control

The sampling and analysis procedures employed by RESNA for groundwater sampling and monitoring follow regulatory guidance for quality assurance/quality control (QA/QC). Quality control is maintained by site-specific field protocols and quality control checks performed by the laboratory. Laboratory and field handling of samples may be monitored by including QC samples for analysis. QC samples may include any combination of the following. The number and types of QC samples are selected and analyzed on a project-specific basis.

Trip blanks - Trip blanks are sent to the project site, and travel with project site samples. They are not opened, and are returned from a project site with the samples for analysis.

Field blank - Prepared in the field using organic-free water. Field blanks accompany project site samples to the laboratory and are analyzed periodically for specific chemical compounds present at the project site where they were prepared.

Duplicates - Duplicate samples are collected from a selected well and project site. They are analyzed at two different laboratories, or at the same laboratory under different labels.

Equipment blank - Periodic QC samples are collected from field equipment rinsate to verify adequate cleaning procedures.

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ATTACHMENT B

ARTESIAN ENVIRONMENTAL'S STANDARD OPERATING PROCEDURE

ARTESIAN ENVIRONMENTAL CONSULTANTS

Standard Operating Procedures

Continuous Coring Tool-Soil Sampling

Continuous soil cores will be obtained by Artesian Environmental Consultants (Artesian), a licensed drilling company (C-57: 624461) located in San Rafael, California. Artesian uses a continuous coring system to obtain soil cores for lithologic, hydrologic and possible chemical analyses. The Artesian drilling system uses a portable, electric roto-hammer and continuous sampling tools to collect continuous cores.

The 1-inch diameter stainless steel continuous coring tool is driven continuously for four feet using an impact rotary hammer. As the sampler is advanced, the soil samples are collected in approximately 0.75-inch diameter nonreactive PETG plastic liners. The soil sampler is then extracted from the borehole. The transparent liner containing the soil sample is removed from the sampler. Upon removal from the sampler, the entire core is visually inspected for staining and logged by the geologist or engineer. The sampler is then refitted with a new transparent sampling tube and re-inserted into the borehole. The sampler is driven an additional three feet to a total depth of seven feet below ground surface and extracted from the borehole. This procedure is repeated to the total depth of the boring. The six inches of the sample tube selected for analyses are cut off and sealed with Teflon tape and plastic end caps. Each soil sample is then hermetically sealed in a zip-lock plastic bag, labeled and stored and transported in a refrigerated environment of crushed ice under chain-of-custody procedures to a state certified laboratory.

The above mentioned procedures minimize the potential for cross-contamination and volatilization of volatile organic compounds (VOC) prior to chemical analysis. The sampler is rinsed with Alconox detergent between samples and steam-cleaned with all the other drilling

ARTESIAN ENVIRONMENTAL CONSULTANTS

Standard Operating Procedures

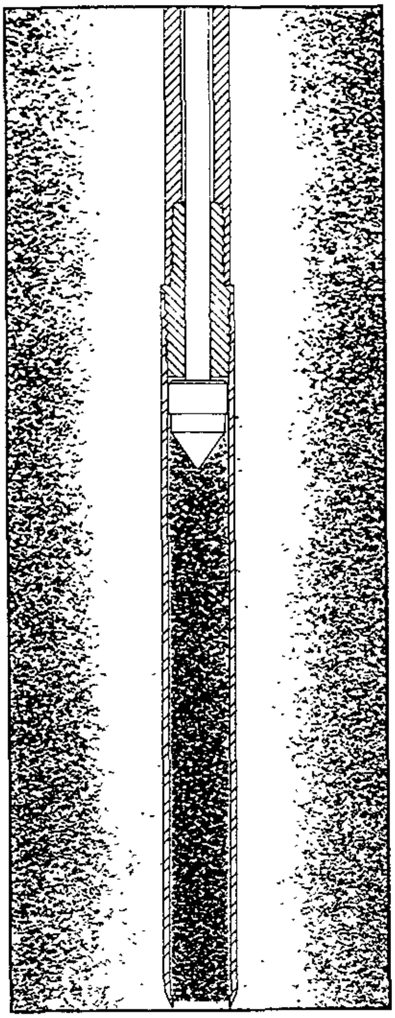
Continuous Coring Tool-Water Sampling

Artesian Environmental Consultants (Artesian) uses a continuous coring system to make a pilot hole for water sampling. The hole is advanced to the target depth in the water-bearing zone. The continuous coring tool is removed from the hole. The water sample can be obtained by inserting small-diameter PVC pipe to serve as temporary piezometers or monitoring points, allowing for water table elevation measurements. Groundwater samples are collected with a 1/2-inch diameter Teflon or stainless steel bailer.

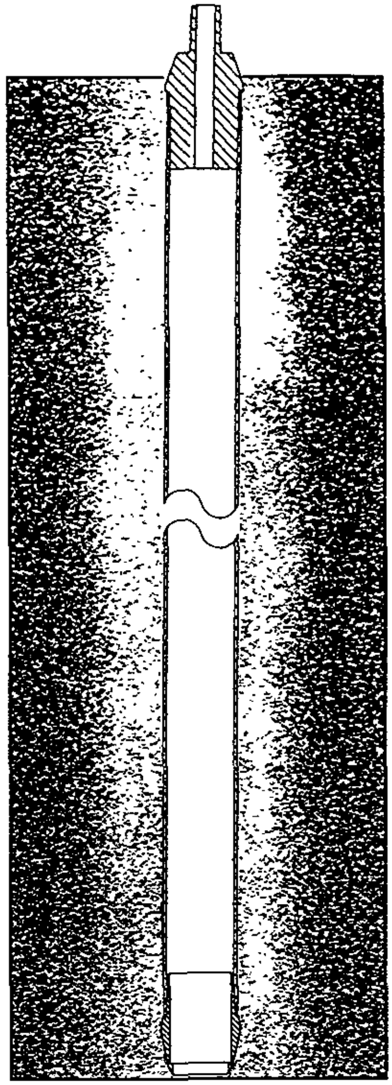
Another method for water sampling uses a stainless steel well point which is inserted into a pilot hole. The stainless steel well point is then driven at the end of a 3/8-inch diameter hardened steel pipe to the target depth in the water-bearing zone. The well point is connected to 3/16-inch outer diameter polyethylene tubing which is anchored on the surface. A water meter designed to fit into the 3/16-inch tubing will read water levels to depths of approximately 25 feet below ground surface.

Groundwater is drawn under a vacuum to the surface. In order to comply with the EPA sampling standards for the presence of volatile organics in groundwater, groundwater samples drawn by vacuum must not have an air-water interface at any stage of the sampling procedure, and the sample must not be collected from the exit port of a pump. A hand activated vacuum pump or a peristaltic pump is used to draw the groundwater to the surface. Two in-line receiving jars are first completely filled with groundwater. The receiving jars are connected with 1/4-inch PVC tubing and a valve is located about half way between the receiving jars. Air is removed from the line and from the first receiving jar by elevating the second receiving jar and allowing the air to escape through the valve in the tubing into the second receiving jar. At this point if the system has been purged of air correctly, there is no air in the system from the well point to the valve. Since there is no air in the first receiving jar, there is no air-water interface at this point. The valve between the two receiving jars is opened and additional water is purged until the sediment level in the water is minimized. After the groundwater pH, temperature and conductivity have stabilized, a groundwater sample can be collected from the first receiving jar

Groundwater samples to be analyzed are decanted into laboratory-prepared, 40-milliliter volatile organic analysis (VOA) vials and in 1 liter bottles The VOA vials are filled completely, leaving no headspace, and are capped, sealed with Teflon-lined lids, labeled, and stored in a refrigerated environment of crushed ice and delivered under chain-of-custody to a state-certified hazardous materials testing laboratory.



Discrete Sampling: After the probe is driven to the selected sampling depth, the point is retracted and the probe is driven down to obtain a discrete soil sample.



Continuous Core Sampling: Samples are obtained from the initial insertion of the sampling tool down to the full extent of the boring. The clear PETG sample tubes are then cut to the desired size for analysis.

The Large Bore Sampler obtains a 22" X 1-1/16" core up to depths of 30' below ground surface.
The Macro-Core Sampler obtains a 45" X 1.5" core up to 20' below ground surface.
The Continuous Core Sampler obtains a continuous 1" diameter sample for the entire drilling depth.
The clear PETG sample tubes used in each method can be cut to any desired length for analyses.
Soil disposal is not required with any of these methods.

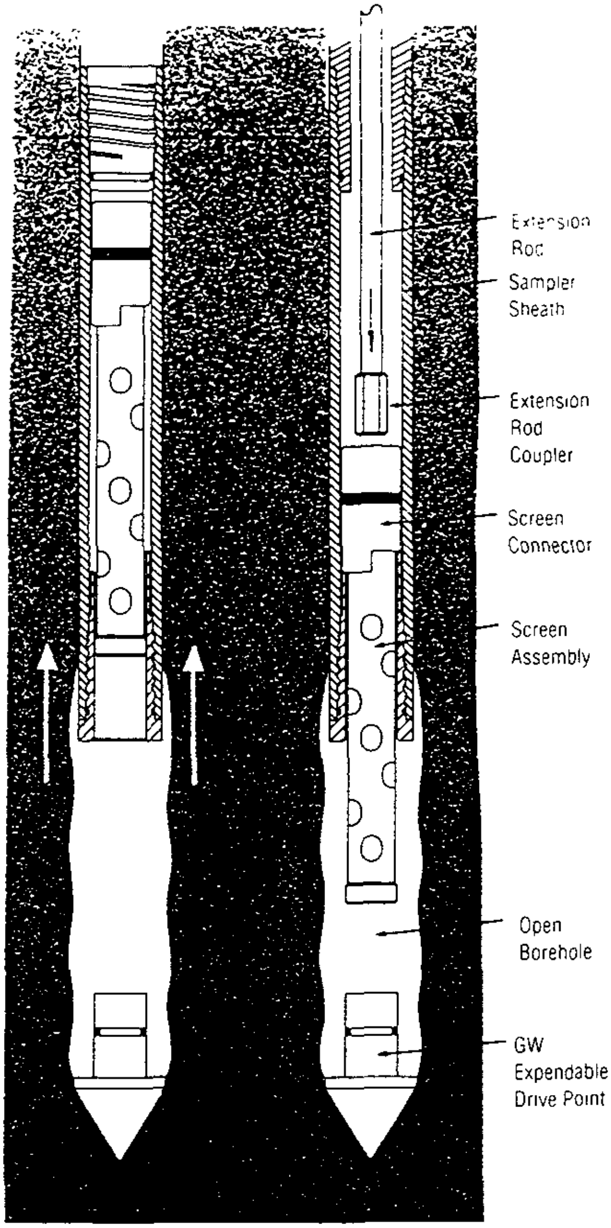
Artesian Environmental Consultants is a general engineering contracting firm certified for drilling and hazardous waste removal (A, C57, Haz Waste #624461)

Artesian Environmental Consultants uses proprietary drilling equipment as well as Geoprobe, Clements Mobile Drill, and Arts Manufacturing

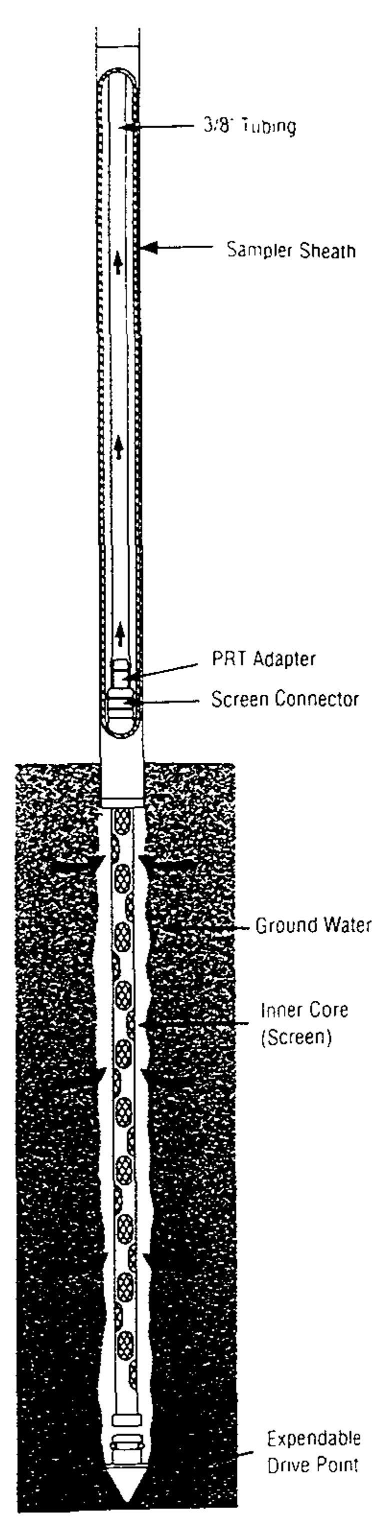
Soil Sampling System

Artesian Environmental Consultants

3175 Kerner Blvd., Suite E, San Rafael, California 94901 Ph (800) 959-4801 Fax (415) 257-4805



Pushing out the screen assembly with the extension rods in preparation for groundwater sampling.



With the groundwater sampling system in place, a vacuum is applied to the system and a water sample is removed.

Artesian Environmental Consultants is a general engineering contracting firm certified for drilling and hazardous waste removal (A, C57, Haz Waste #624461)

Artesian Environmental Consultants uses proprietary drilling equipment as well as Geoprobe, Clements, Mobile Drill, and Arts Manufacturing

Groundwater Sampling System

Artesian Environmental Consultants

3175 Kerner Blvd., Suite E, San Rafael, California 94901 Ph (800) 959-4801 Fax (415) 257-4805