ARTESIAN ENVIRONMENTAL

#2118

September 10, 1999

Ms. Farah Naz c/o
Mr. Muhammad Jamil
40092 Davis Street
Fremont, CA 94538

RE: Soil Remediation Pilot Study and Well Installation Workplan
Eagle Gas
4301 San Leandro Street
Oakland, California
Artesian Project # 422-001-01
StID # 2118

Dear Mr. Jamil:

Artesian Environmental Consultants (Artesian) was retained by Reliance Petro Chem (RPC) on behalf of the Ms. Farah Naz (Client) to perform Underground Storage Tank Removal (UST) at 4301 San Leandro Street in Oakland, California (Site) (Figures 1 and 2, contained in Attachment A). Following confirmation of an unauthorized release of petroleum from the remove UST system, Artesian was contracted directly by the Client to provide soil remediation services. Following soil remediation activities, sampling of soils collected from excavation walls and product piping trenches confirmed that soils impacted with Methyl Tertiary Butyl Ether (MTBE) remain in place below and adjacent to onsite and offsite structures and in the vicinity of product piping trenches. At the request of the Alameda County Department of Environmental Health (ACDEH), Artesian prepared recommendations for remediating MTBE present in site soils. Recently the ACDEH issued a letter requiring that specific remedial activities be conducted before new USTs are installed. This workplan provides detail of the methods and procedures which Artesian intends to utilize in order to meet ACDEH remediation requirements.

INTRODUCTION

Scope of Work

- Obtain permits as needed, including Permit Fees: Alameda County Public Works Agency (ACPWA) and notify appropriate regulatory authorities;
- Prepare Site Safety Plan;
- Prepare Site-specific Spill Prevention Control and Countermeasures Plan;
- Notify Underground Services Alert prior to drilling;
- Install 3 groundwater monitoring wells and 2 UST basin dewatering wells;
- Conduct a pilot study to determine the effectiveness of direct oxidation of MTBE on site soils;
- Arrange for certified laboratory analysis of soil and groundwater samples;
- Arrange for transportation and disposal of approximately 50 tons of petroleum impacted soils to an appropriate land disposal facility; and
- Prepare a report of field activities, findings, conclusions, and recommendations as appropriate based on results of the field work.

ARTESIAN ENVIRONMENTAL
(Lic. 624461: A, B, Haz., Asb, C-57) • e-mail: augerpro@jps.net
229 Tewksbury Ave. • Point Richmond, CA 94801 • TEL (510) 307-9943 • FAX (510) 232 2823

Site Location

The subject site is located in the southern portion of Oakland, California at the south corner of San Leandro Street and High Street approximately 1,000 feet east of Interstate Highway 880. The site is surrounded by commercial properties and the Bay Area Rapid Transit (BART) railway. The site is bounded by commercial property to the southeast, southwest, and northwest, and by the BART tracks to the northeast.

Site History

In December, 1998, the property owner temporarily abandoned the USTs at the site until they could be removed and replaced with new ones. Reliance Petro Chem of Bakersfield, California then began the permitting process for removal of the old USTs and replacement with new ones. Artesian was contracted to permanently close 5 USTs at the site by removal (completed on April 22, 1999). Artesian collected confirmational soil samples from the UST excavation for laboratory analysis. Results of the analysis of confirmational soil samples confirmed an unauthorized release of petroleum had occurred.

In response to the confirmed release of petroleum, a letter from the ACDEH, dated May 10, 1999, was issued recommending that soil be remediated by over-excavation / land disposal and that "as much groundwater as possible" be pumped from the excavation. Artesian was then retained directly by the Client to conduct soil and groundwater remediation at the Site. **Artesian excavated a total of approximately 800 tons of** petroleum impacted soil and disposed it as Class II non-hazardous waste. **Less than 1,000 gallons of petroleum impacted groundwater was pumped from the excavation and did not recharge.** Following soil remediation activities, soil samples collected from the excavation walls and product piping trenches indicated that some soils remaining at the site are impacted with petroleum and MTBE.

Impacted soils could not be excavated below the onsite structure or below offsite structures and remain in place. Soils in the product piping trench areas also remain in place due to site space constraints which would significantly increase the cost of excavation and land disposal as a remediation method for these soils. Impacted soils have not been excavated from the product piping trench areas in anticipation that in-situ direct oxidation of MTBE may prove (during the next phase of work) to be a more cost-effective method for remediating these soils than excavation and land disposal.

After reviewing results of soil confirmation sampling, the ACDEH requested that options be evaluated for remediating MTBE impacted soils remaining at the site prior to installation of new USTs. Artesian evaluated various remediation methods and prepared recommendations for remedial action which can feasibly be conducted prior to installation of new USTs. In response to Artesian recommendations, the ACDEH required that groundwater ~~monitoring~~ extraction and monitoring wells be installed at the site, a pilot study be conducted to determine the effectiveness of in-situ direct oxidation of MTBE in site soils, and slotted piping be installed for possible soil vapor extraction if direct oxidation is not successful. The following provides detail of the methods and procedures which Artesian intends to utilize in order to meet ACDEH remediation requirements.

ARTESIAN ENVIRONMENTAL
(Lic. 624461: A, B, Haz., Asb, C-57) • e-mail: augerpro@jps.net
229 Tewksbury Ave. • Point Richmond, CA 94801 • TEL (510) 307-9943 • FAX (510) 232 2823

DETAILED SCOPE OF WORK

Permitting

Artesian will obtain a groundwater monitoring well installation permit from the ACPWA and notify the ACDEH when field work is planned. Underground utilities will be located by Underground Service Alert (USA) prior to drilling and soil treatment.

Field Activities

HEALTH AND SAFETY

A site-specific health and safety plan (SSP) has been prepared and will be kept onsite during any field activities. Any subcontractors who will be working near potentially impacted soil or groundwater will be provided a copy of the SSP, will be required to be familiar with its requirements, and will be required to comply with all of its procedures and provisions. Artesian will conduct daily "tailgate" health and safety meetings at the beginning of each work day.

A Spill Prevention Control and Countermeasures (SPCC) Plan will be prepared to address additional safety issues specific to the project. The plan includes general information regarding chemicals at the site, organizational structure, emergency response, waste management, labeling, handling, spill response procedures, emergency equipment, notification procedures, and evacuation plan. The SPCC Plan will be reviewed by site personnel before the start of the project.

SOIL REMEDIATION PILOT STUDY

Artesian will conduct a pilot study to determine the effectiveness of chemical oxidation of MTBE in site soils. The pilot study will consist of three phases: baseline soil sampling, injection of hydrogen peroxide, and confirmational soil sampling.

Baseline and Confirmational Soil Sampling

Artesian will collect one soil sample from each of four borings advanced within the treatment area using direct push methods. One soil sample will be collected for laboratory analysis from each of the four borings from a depth of approximately 8 feet to 12 feet below ground surface (bgs). The soil sample to be analyzed from each boring will be selected based on field screening and other indications of contamination such as petroleum odor and discoloration. At each boring, soils will be logged continuously and screened in the field using a photoionization detector (PID). Artesian will screen vapors in the soil samples on 4 foot intervals. Soil sampling will be conducted in accordance with Artesian standard operating procedures contained in Attachment

Basic Process Description

The chemical oxidation process is driven by the formation of a hydroxyl free radical (OH•) via Fenton's reaction chemistry. The preferred reaction is : $Fe^{2+} + H_2O_2 \longrightarrow Fe^{3+}$ OH• + OH^-. The transition metal catalyst (Fe^{2+}) is normally provided by iron

(Lic. 624461: A, B, Haz., Asb, C-57) • e-mail: augerpro@jps.net
229 Tewksbury Ave. • Point Richmond, CA 94801 • TEL (510) 307-9943 • FAX (510) 232 2823

oxides within the soil. The hydroxyl free radical generated during the intermediate reaction product is a very strong (second to fluorine) oxidant that non-selectively oxidizes organic compounds both at the soil interface and within interstitial groundwater (if present). During the reaction sequence, organic compounds are successively converted to shorter chain organic compounds that are further degraded into carbon dioxide and water by subsequent reactions. Residual hydrogen peroxide not used by the reaction rapidly decomposes to water and oxygen in the subsurface environment due to its unstable characteristics.

The hydrogen peroxide solution is injected in the subsurface using a high-pressure lance injection system. The trailer-mounted injection system primarily consists of solution holding tanks, injection pump, pump engine, liquid transfer hoses, and injection lances. Process controls are operated manually to adjust flow rates and injection pressures both at the pump and at the injection lances. High-pressure gauges are used to monitor and manage the injection process. The lance is manually advanced into the subsurface by utilizing the water pressure supplied by the injection of the solution through a vertical orifice in the lance tip. As the lance is advanced from the surface to the desired depth, a column of subsurface soil is treated by the injection solution. Lateral injection orifices in the injection lance tip provide a horizontal radius of influence of approximately two to five feet for dispersion of the injection solution while maximizing contact of the injection solution with the target constituents. Using this approach, the solution can be accurately injected into the impacted areas at low flow to optimize the usage of the hydrogen peroxide solution, which is generally the primary cost component in the treatment. Solution catalysts and amendments can also be injected through the lance along with the hydrogen peroxide solution if necessary. Minimal air emissions are anticipated for the injection points and any residual material exuding from the injection points will be contained and collected for proper disposal.

During the oxidation of MTBE by hydrogen peroxide, some by-products may be generated. By-products which may be of concern are Tertiary Butyl Alcohol (TBA), Formaldehyde, and Methanol. Artesian will analyze soil samples before and after hydrogen peroxide injection to detect elevated concentrations of these potential by-products. Tertiary Butyl Formate (TBF) is another potential by-product of the oxidation of MTBE, however, no known standard method of analysis exists. Due to its chemical similarities to other chemicals which are analyzed using EPA Method 8260, it is expected to be quatifiable using that Method. Artesian will arrange to evaluate whether TBF can be accurately quantified using EPA Method 8260 and analyze for TBA in the baseline and confirmation soil samples if successful.

Soil Treatment

Artesian proposes to treat an area which is 10 feet wide by 18 feet long during the pilot study. A total of 60 injection points will be spaced on a 2 foot grid and used to deliver a total of approximately 1,200 gallons of a solution of 20% hydrogen peroxide in water. The total treatment depth will be based on the vertical extent of impacted soils identified during the baseline soil sampling.

Injection of hydrogen peroxide solution will occur using the RIP™ lance system. If deemed necessary, an iron solution may be injected into the test area prior to addition of hydrogen peroxide if naturally occurring iron concentrations are not sufficient to support the Fentons reaction. Generally, two lance operators will manually advance the lance into the subsurface through an injection port (1/2-inch to 4-inches in diameter) created in concrete or asphalt as necessary. A system manager will operate the injection system controls and keep notes regarding injection pressures, time of injections, gallons of solution added, and field observations at each injection point.

GROUNDWATER MONITORING / DEWATERING WELL INSTALLATIONS

Artesian will install two UST basin dewatering wells within the basin backfill as it is placed around the tanks. Each dewatering well will consist of 4-inch diameter schedule 40 PVC with 0.010-inch slots. The anticipated screened interval for each dewatering well is from 5 feet BGS to 13 feet BGS with riser pipe to the surface. As these wells will be installed during backfilling of the UST excavation around the new USTs, drilling equipment will not be necessary for the installation.

Artesian will install three groundwater monitoring wells at the site to determine if the groundwater has been impacted by the onsite release of petroleum and to determine the direction and magnitude of hydraulic gradient. The specific construction for each well will be determined in the field by the onsite geologist due to the uncertainty of depth to groundwater. Artesian anticipates that total depth for the monitoring wells will be approximately 25 feet. Each well will be constructed with approximately 10 feet of 2-inch diameter, schedule 40 PVC screen with 0.010-inch slots. For accurate calculation of hydraulic gradient, Artesian will arrange for each top of casing elevation to be surveyed to the nearest 0.01 foot. Groundwater monitoring wells will be installed using a hollow stem auger drilling rig in accordance with Artesian standard operating procedures, contained in Attachment B. Figure 1, contained in Attachment A shows the location of each of the dewatering and monitoring wells in relation to major features at the site.

Artesian will collect one soil sample from each of the three borings advanced for installation of groundwater monitoring wells. The Artesian field geologist will select the soil sample exhibiting the highest PID reading or a sample collected from the vadose zone for laboratory analysis. After installation, each well will be developed by surging and pumping at least 3 wetted casing volumes of water from the well. After development, the wells will be allowed to rest 72 hours before being purged and samples of groundwater collected for laboratory analysis. All soil and groundwater samples will be handled in accordance with Artesian standard operating procedures (contained in Attachment B).

LABORATORY ANALYSES

Soil and Groundwater samples collected in association with groundwater monitoring wells will be submitted for Total Petroleum Hydrocarbons as gasoline (TPHg) and TPH as diesel (TPHd) by EPA Method 8015; benzene, toluene, ethylbenzene, and total xylenes (BTEX) and MTBE by EPA Method 8020.

Baseline and confirmational soil samples collected from the treatment area will be submitted for BTEX, MTBE and TBA by EPA Method 8260 (TBF if possible); Formaldehyde by EPA Method 8315; TPHg, TPHd, and Methanol by EPA Method 8015; and Total Oil and Grease by EPA Method 413.1.

REPORT PREPARATION

Following completion of field activities and receipt of the laboratory results, Artesian will prepare a written report describing field activities and results of soil remediation activities. The report will include: topographic site location map, site map with sample locations, laboratory reports, chain-of-custody records, laboratory quality control documents, and tabulated laboratory results. This report will also include conclusions of the proposed remediation as well as recommendations for further activities, if appropriate.

Please call Artesian at (510) 307-9943 if you have any questions.

Sincerely,
Artesian Environmental

CERTIFIED HYDROGEOLOGIST
JAMES A. JACOBS
NO. 88
STATE OF CALIFORNIA

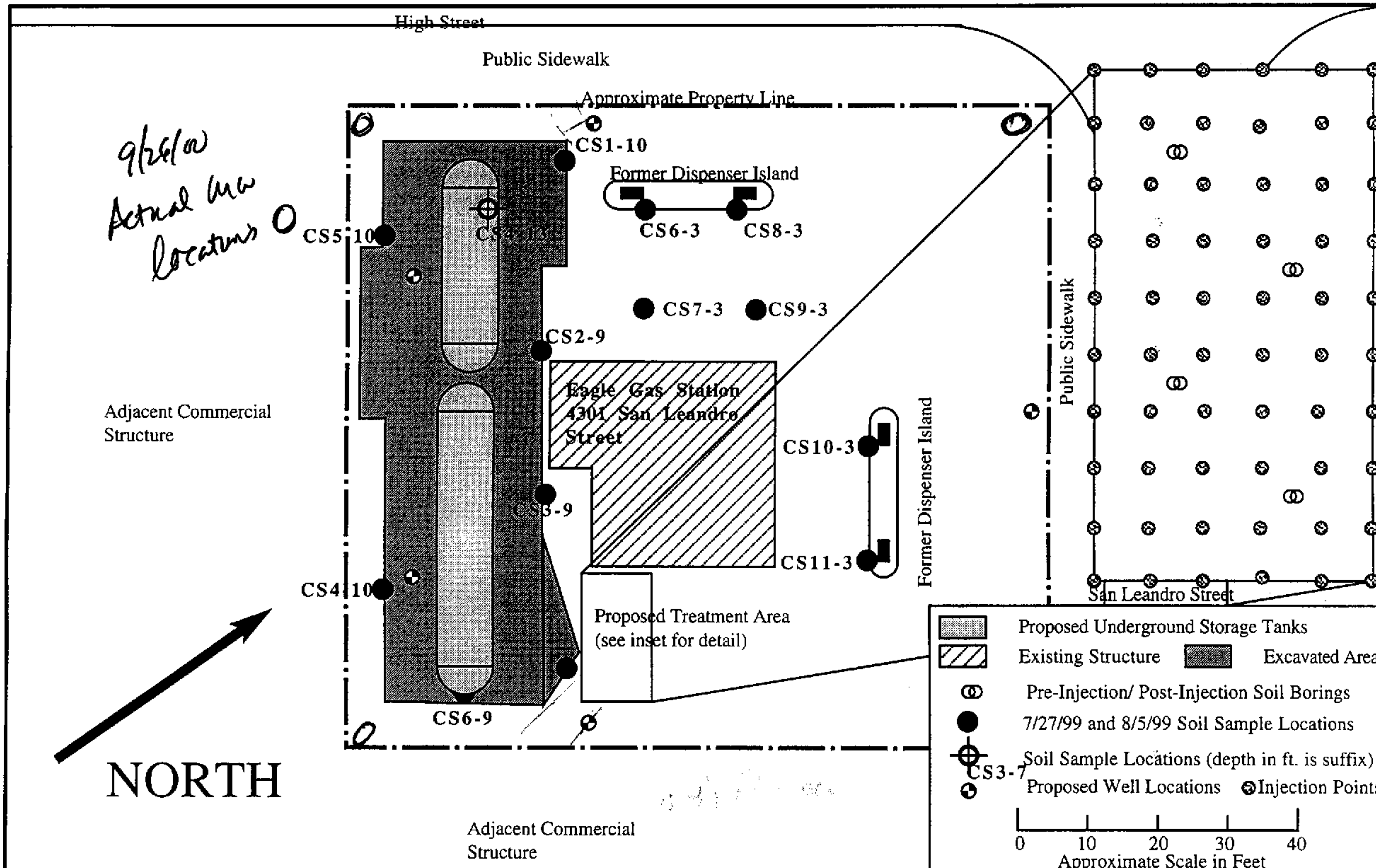
Paul E. Jones
Project Geologist

James A. Jacobs, RG, REA, CHG #88
President / Certified Hydrogeologist

cc:
Mr. Barney Chan, ACDEH
Inspector Hernan Gomez, Oakland Fire
Mr. Don Montgomery, Advanced Financial Services
Ms. Annie Beal, RPC

ARTESIAN ENVIRONMENTAL
(Lic. 624461: A, B, Haz., Asb, C-57) • e-mail: augerpro@jps.net
229 Tewksbury Ave. • Point Richmond, CA 94801 • TEL (510) 307-9943 • FAX (510) 232 2823

ATTACHMENT A:
FIGURES



ARTESIAN ENVIRONMENTAL 229 Tewksbury Avenue Point Richmond, California 94801 Phone (510) 307-9943 Fax (510) 232-2823	**Proposed Well and Pilot Study Locations** **Eagle Gas** 4301 San Leandro Street Oakland, California

Project No.: 422-001-01	Date: 09/07/99	Prepared by: P. Jones	Figure 1

ATTACHMENT B:
STANDARD OPERATING PROCEDURES

ARTESIAN ENVIRONMENTAL
(Lic. 624461: A, B, Haz., Asb, C-57) • e-mail: augerpro@jps.net
229 Tewksbury Ave. • Point Richmond, CA 94801 • TEL (510) 307-9943 • FAX (510) 232 2823

ARTESIAN ENVIRONMENTAL

Standard Operating Procedures

Direct Push Technology - Soil Sampling
Direct push technology, also called drive point sampling and soil probing, uses portable and limited access hydraulic or pneumatic probing methods to sample soils. Artesian uses hardened stainless steel soil sampling tools. The tools are designed for discrete or continuous coring.

Piston Probe-Drive Sampler
The 2-foot to 4-foot long Probe-Drive piston sampler remains completely sealed with disposable, rubber o-rings, while it is pushed or driven to the desired sampling depth. After the sampler has been driven to the target depth, a piston stop-pin at the trailing end of the sampler is removed using steel extension rods inserted down the inside diameter of the hollow probe rods. The piston tip retracts into the sample tube as it is displaced approximately 2 feet by the soil while the sample is being collected. Soil samples are usually collected in a 2 foot long inert PETG liners (clear plastic). The liners can be cut easily with a knife. Brass, stainless steel or Teflon liners are also available to suit various sampling requirements.

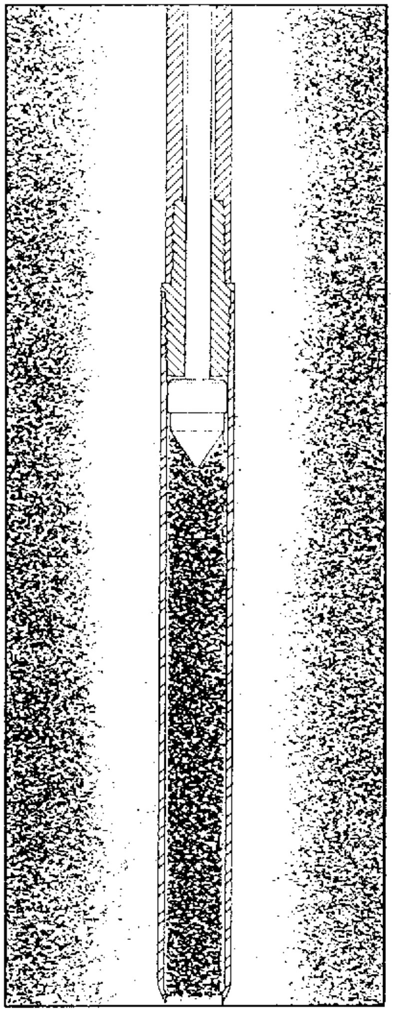
Continuous Coring Tools
Artesian uses continuous coring tools ranging from 0.5 inches to 2.0 inches in diameter. The soil sampling tools range from 1.0 feet to 4.0 feet in length. The continuous coring tool contains an inner liner composed of PETG (clear plastic), brass, stainless steel or Teflon.

Drive Points
Solid, hardened steel drive points are designed to pre-probe holes or be used where difficult drilling is encountered due to hard pan soils, penetrating frost or asphalt layers. After the hard zone has been penetrated, the drive point is removed and replaced with a coring tool.

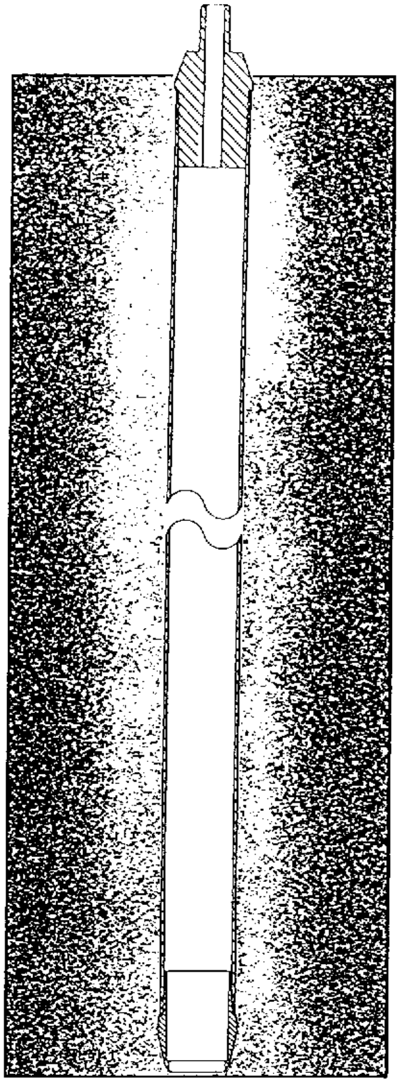
Sample Preparation
The sampler is extracted from the borehole to the surface using the Direct Push Technology (DPT) rig, a truck mounted crane, or a portable probe extractor. The sample liner containing the soil sample is removed from the sampler. The soil sample is generally logged for hydrogeologic and lithologic characteristics by a geologist or engineer under the direction and supervision of a state-registered geologist or state-registered engineer using the Unified Soil Classification System (USCS). Soil samples may be screened using an organic vapor analyzer (OVA) or a photoionization detector (PID).

After the soil samples have been logged, the portions of the soil sample selected for analysis are immediately capped on both open ends with Teflon tape, trimmed and capped with plastic caps. The samples are then labeled and placed in individual see-through zip-lock plastic bags. The samples are stored in an ice chest with crushed ice. A thermometer is kept in the ice chest to ensure that the proper temperature is maintained. The samples are then delivered under chain-of-custody to a state-certified hazardous materials testing laboratory. The above mentioned procedures minimize the potential for cross-contamination and volatilization of volatile organic compounds (VOC) prior to chemical analysis.

Decontamination
All sampling equipment is cleaned either with a hot water pressure washer or with a phosphate-free detergent wash and two de-ionized water rinses between samples and between borings to prevent cross-contamination. The sampler is then refitted with a new soil liner and re-inserted into the borehole. The sampler is driven to the next target zone. This procedure is repeated until the total depth of the borehole is reached. Since all materials generated using direct push technology are actual samples, soil disposal in not required.



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
229 Tewksbury Avenue • Point Richmond, CA 94801
TEL (510) 307-9943 FAX (510) 232-2823

ARTESIAN ENVIRONMENTAL

Standard Operating Procedures

Auger Drilling Methods and Soil Sampling

During hollow stem augering and solid flight augering, the drill stem is rotated at the surface by either top head or rotary table drives. With hollow stem auger (HSA) rigs, the soil samples are collected through the hollow center. To collect the soil samples through HSA, the augers are rotated and pressed to the target sampling depth. Flight augers are removed from the borehole prior to soil sampling. A sampler is placed on the lower end of the drill rods or down a wire line to the bottom of the borehole. The hardened steel split-spoon or thin-wall samplers are commonly 1.5 to 2-inches in diameter and are 18-inches long. The sampler is driven to collect a sample from the soils immediately below the cutting head of the hollow stem auger.

Sampling Methods

The sampler is driven its entire length using a drop hammer, typically 140 pounds, which falls approximately 30 inches per blow. The blow counts are recorded to define the relative density of the soil. During drilling, discrete soil samples are collected for lithologic and hydrogeologic characterization and possible chemical analysis at 5 foot depth intervals unitl the top of groundwater is reached. Soil samples for chemical analysis are collected in pre-cleaned, thin-walled stainless steel or brass tubes, 6-inches long and 1.5 to 2-inch in the outside diameter. Three of these sample tubes are set in a 1.5 to 2-inch inside diameter, 18-inch modified California split-barrel sampler. The sampler is extracted from the borehole and the stainless steel or brass tubes, containing the soil samples are removed. The soil samples are lithologically logged by a geologist or engineer using the Unified Soil Classification System (USCS). All field activities are performed under the direction and supervision of a state-registered geologist or state-registered engineer.

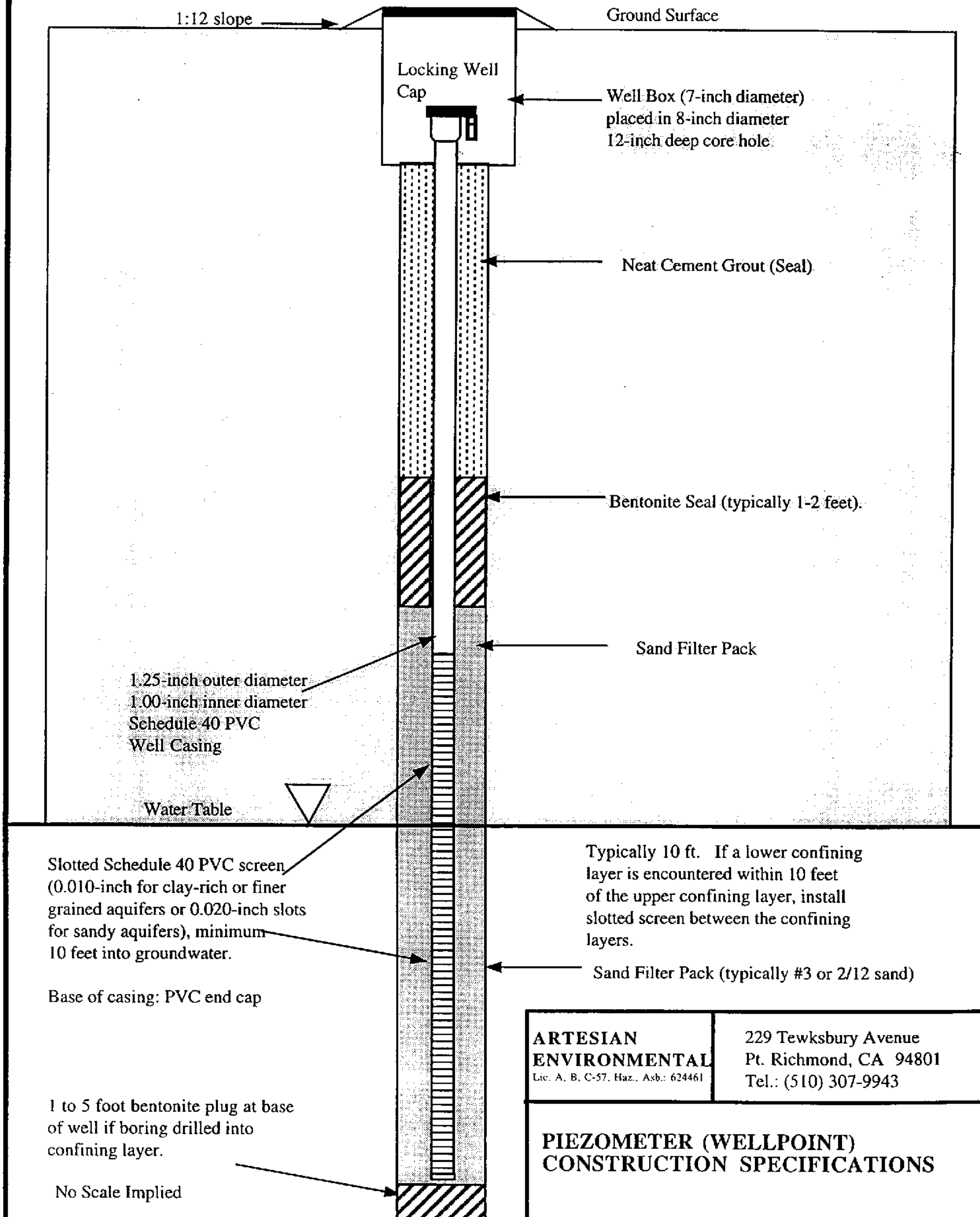
The first two sample tubes may be submitted for chemical analysis. The third soil sample tube is screened in the field immediately after retrieval from the split-barrel sampler using an organic vapor analyzer (OVA) or a photoionization detector (PID). For procedures, please refer to the Artesian Environmental Standard Operating Procedures for Collecting Organic Vapor Data from Soil Samples. Soil sampling is performed in accordance with California Regional Water Quality Control Board (RWQCB) procedures described in the *Leaking Underground Fuel Tank (LUFT) Field Manual*, the *Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites*, and local regulatory guidelines.

After the soil samples have been logged, the brass or stainless steel tubes selected for analysis are immediately capped on both open ends with Teflon tape, trimmed and capped with plastic caps. The samples are then labeled and placed in individual see-through zip-lock plastic bags. The samples are stored in an ice chest with crushed ice to maintain a constant temperature of 4 degrees Celsius. A thermometer is kept in the ice chest to ensure that the proper temperature is maintained. The samples are then delivered under chain-of-custody to a state-certified hazardous materials testing laboratory.

The above mentioned procedures minimize the potential for cross-contamination and volatilization of volatile organic compounds (VOC) prior to chemical analysis.

The sampling equipment is cleaned with a phosphate-free detergent wash and two de-ionized water rinses between samples and steam-cleaned along with all the other drilling equipment between borings to prevent cross-contamination.

PIEZOMETER (WELLPOINT) CONSTRUCTION SPECIFICATION



ARTESIAN ENVIRONMENTAL
Lic. A, B, C-57, Haz., Asb.: 624461

229 Tewksbury Avenue
Pt. Richmond, CA 94801
Tel.: (510) 307-9943

PIEZOMETER (WELLPOINT) CONSTRUCTION SPECIFICATIONS

Artesian Environmental Consultants, Inc.

Standard Operating Procedures

GROUNDWATER MONITOR / EXTRACTION WELL INSTALLATION AND DEVELOPMENT

WELL INSTALLATION

The boreholes for monitor / extraction wells are drilled using a truck-mounted hollow-stem auger drill rig. The diameter of the borehole is a minimum of four inches larger than the outside diameter of the casing when installing the well screen (DWR Publication 74-81). The hollow-stem auger provides minimal interuption of drilling while permitting soil sampling at the desired intervals. All wells are installed by state-licensed drillers.

The monitor / extraction wells are cased with threaded, factory-slotted, blank schedule 40 polyvinyl chhloride (PVC). The perforated interval consists of slotted casing, generally 0.020-inch wide by 1.5-inch long slot size, with 42 slots per foot. A threaded PVC cap is fastened to the bottom of the casing. Centering devices may be fastened to the casing to assure even distribution of filter material and grout within the borehole annulus. The well casing is thoroughly washed and steam-cleaned prior to installation.

After setting the casing inside the hollow stem, sand or gravel filter material is poured into the annular space to fill from the bottom of the boring to 1 foot above the slotted interval. A 1 to 2 foot thick bentonite plug is placed above the filter material to prevent the grout from infiltrating down into the filter material. Neat cement, containing about 5% bentonite, is then tremied into the annular space from the top of the bentonite plug to the surface. A lockable PVC cap is placed on each wellhead. Traffic-rated flush-mounted steel covers are installed around wellheads for wells in parking lots and driveways, while steel stove pipes are usually set over wellheads in landscaped areas.

WELL DEVELOPMENT

After installation, the wells are thoroughly developed to remove residual drilling materials from the wellbore, and to improve well performance by removing any fine material in the filter pack that can pass from the formation into the well. Well development is performed in accordance with California Regional Water Quality Control Board (RWQCB) procedures described in the *Leaking Underground Fuel Tank (LUFT) Field Manual*, the *Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites* , and local regulatory guidelines. Well development techniques include pumping, bailing, surging, swabbing, jetting, flushing, and airlifting. During well development from three to ten well volumes are evacuated from the well, allowing pH, specific conductivity, temperature and sediment content of the water to stabilize. All development water and rinseate is collected for temporary storage in labeled 55-gallon containers or proper storage tanks, and is then disposed of properly depending on analytical results. To assure that cross-contamination does not occur between wells during drilling and development, all development equipment is either steam cleaned or cleaned using Alconox and rinsed twice with dionized water.