ARTESIAN ENVIRONMENTAL

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March 09, 1999

Albany Unified School District
c/o Mr. Richard Vila
Vila Construction Company
590 South 33rd Street
Richmond, CA 94804
Phone: (510) 236-9111
Fax: (510) 236-4979

RE: Preliminary Site Assessment Workplan
Albany Unified School District
603 Key Route Boulevard
Albany, California
Artesian Project # 378-002-02
StID 4602

Dear Mr. Vila:

Artesian Environmental Consultants (Artesian) has been retained by Vila Construction Company (Vila) on behalf of the Albany Unified School District (AUSD) to perform a Preliminary Site Assessment at 603 Key Route Boulevard in Albany, California (site) (Figures 1 and 2). The AUSD is the current owner of the site. The purpose of the work is to assess soil and groundwater conditions in the vicinity of one former underground storage tank (UST). In October, 1998, Artesian removed one 2,000 gallon heating oil UST and subsequently conducted exploration trenching to determine the extent of soil contamination. Analyzed soil samples collected from the vicinity of the UST excavation indicate that petroleum hydrocarbons were released into the subsurface. In response to the confirmed release of petroleum, the Alameda County Health Services Agency, Department of Environmental Health Services (ACDEH), has required that the extent of petroleum impacted soil and groundwater be assessed in the form of a Preliminary Site Assessment.

INTRODUCTION

SCOPE OF WORK

- Obtain notification and permits as needed, (including Permit Fees: Alameda County Public Works Agency) and notification of appropriate regulatory authorities;
- Prepare Site Safety Plan;
- Notify Underground Services Alert prior to drilling.
- Advance between 5 and 12 borings to collect soil and groundwater samples.
- Collect static water level data for use in calculating magnitude and direction of hydraulic gradient.
- Arrange for Certified Laboratory Analysis of Samples.
- Review sample results and prepare report of methods and findings, certified by a registered geologist

SITE LOCATION

The subject site is located in the northern portion of Albany, California at the southeast corner of Key Route Boulevard and Thousand Oaks Boulevard approximately 1 mile east of Interstate Highway 80. The site is surrounded by residential properties and other AUSD property. The site is bounded by AUSD property to the east and south and by residences to the north and west.

SITE HISTORY

In the fall of 1998, Vila Construction began site preparation activities for the construction of a new structure at the subject site. AUSD records indicated that one or two USTs had been used at the site to contain heating oil which was used to fuel furnaces in the former building. Vila then conducted exploratory excavations to confirm the presence or absence of the tank(s). Vila located a single UST and confirmed that no tank was present at the second suspected location. Artesian was then contracted to remove the UST and prepare a report of field activities.

On October 14, 1998, Artesian removed one 2,000 gallon heating oil UST and collected soil samples from below the UST for laboratory analysis. Soils below the UST were obviously impacted with petroleum and soils excavated from the vicinity of UST until the excavation was approximately 20 feet long by 20 feet wide by 14 feet deep. After over-excavating impacted soils, Artesian began exploration trenching to determine the extent of petroleum impacted soils with the intent of remediating soils by excavation and land disposal. Trenching activities confirmed that the extent impacted soils exceeds a volume which can be feasibly remediated by excavation and land disposal. Artesian submitted to the ACDEH a Underground Storage Tank Removal/ Soil Remediation Report dated February 5, 1999, which documents field activities.

A letter from the ACDEH, dated February 17, 1999 was issued requiring that a Preliminary Site Assessment be conducted to delineate the extent of petroleum impacted soil and groundwater. This workplan is designed to meet that requirement.

DETAILED SCOPE OF WORK

PERMITTING

Artesian will obtain a soil boring permit from the Alameda County Public Works Agency and notify the ACDEH that soil borings will be drilled. Underground utilities will be located by Underground Service Alert (USA) prior to drilling. Artesian can provide additional limited magnetic and induction line locating services to aid in locating buried pipes and other utilities prior to drilling

FIELD ACTIVITIES

Soil Sampling

To assess subsurface conditions, Artesian will drill 5 to 12 borings to depths of approximately ~~14 feet~~ below ground surface (bgs) to collect one soil sample from each boring using Geoprobe® direct penetration technology (DPT) equipment. Proposed boring locations are shown on Figure 2. Field work will proceed following approval of this workplan by the ACDEH.

to 20' bgs

Borings SB-6 through SB-12 will be drilled on an as-needed basis to further delineate any petroleum impacted soil or groundwater encountered in borings SB-1 through SB-5. The need for borings SB-6 through SB-12 will be based upon indications of contamination such as obvious staining, odor, and photoionization detector (PID) readings. Soil samples will be screened for organic vapors using a PID to assist in the characterization of the vadose zone. The drilling will be done with direct penetration technology (DPT) equipment. Soil samples will be collected continuously using a drive sampler equipped with polyethylene terephthalate glycol (PETG) liners. The ends of the liners will be sealed with Teflon tape and plastic caps before being placed in an iced cooler for transportation to the laboratory.

The borings will be logged by a geologist under the supervision of a California Registered Geologist using the Unified Soils Classification System (ASTM D248890). The site geologist will supervise the drilling activities, collect soil and groundwater samples, and document field activities.

Groundwater Sampling

Groundwater samples will be collected from borings SB-1 through SB-4 for laboratory analysis. Approximately ten feet of new one-inch polyvinyl chloride (PVC) screen will lowered down each open ~~borehole~~ to form temporary groundwater sampling points. Groundwater samples will be collected with a 0.75 inch disposable bailer and new nylon string. The groundwater samples will be decanted from the bailer into labeled bottles supplied by the analytical laboratory. Groundwater and soil samples will then be stored on ice, and transported under chain-of-custody control to a California State Certified Laboratory. Artesian will field screen groundwater samples for dissolved oxygen (DO), oxidation reduction potential (ORP), pH, conductivity (Cond.), temperature (Temp.), and ferrous iron (Fe) to assist in determining the potential for natural attenuation of residual petroleum hydrocarbons in groundwater at the site.

use socks or other filter/screen packing around spacer

check this at nearby sites 10-20'

Based on a Underground Storage Tank Removal/ Soil Remediation Report dated February 5, 1999, prepared by Artesian, petroleum appears to be migrating predominantly in the vadose zone and impacting over-lying soils in areas distal to the former UST. Because the source of soil contamination distal to the former UST appears to be the vadose zone, Artesian will determine a preliminary direction of hydraulic gradient so that additional borings (as needed) may be placed where they will be most useful in delineating impacted soil and groundwater

How long – a few hours of a day or two? recommend purge wells before sampling

To obtain a preliminary direction of hydraulic gradient, Artesian will allow the water level at each groundwater sampling point to stabilize before measuring static water levels relative to the top of the PVC casing. Artesian will then survey the top of casing elevation at each groundwater sampling location relative to an arbitrary site bench mark. Static water elevations will then be derived from this data and used to calculate hydraulic gradient and direction relative to the arbitrary site bench mark.

If wait to collect water sample after flow direction determined, could reduce # of GW samples needed

Grouting and Decontamination Procedures

All drilling and sampling equipment will be decontaminated by steam cleaning before and after drilling as well as between borings. Decontamination water and soil cuttings will be stored onsite in labeled DOT-approved containers, pending analytical results. The temporary well screen and casing will be withdrawn from the borings and disposed offsite. The borings will then be grouted to the surface with a neat cement 3% bentonite grout on the same day. If sampling points do not produce sufficient water for sampling, they may be allowed to recharge over-night before sampling. Artesian's standard operating procedures for DPT soil and groundwater sampling; and decontamination procedures are contained in Attachment B.

LABORATORY ANALYSES

A total of at least 5 soil samples and 5 groundwater samples will be submitted to a state certified laboratory for analyses. Soil samples will be field screened using a PID. A vadose zone sample, or the sample displaying the highest PID reading from each boring will be submitted for analysis.

Soil and groundwater (and MtBE) samples will be submitted for Total Petroleum Hydrocarbons as gasoline (TPHg) by EPA Method 8015 and benzene, toluene, ethyl benzene, and total xylenes (BTEX) by EPA Method 8020, TPH as diesel (TPHd) by EPA Method 8015, and Total Oil and Grease (TOG) by EPA Method 418.1 or 413.1. – highest TPHd in soil + GW have analyzed for PNAs

To assist in determining the potential for natural attenuation/ biodegradation of petroleum hydrocarbons in site groundwater, Artesian will also analyze one up-gradient sample and each sample which exhibits indications of contamination for alkalinity by EPA Method 310.1, carbon dioxide by EPA Method 406A, nitrate by EPA Method 353.1, and Sulfate by EPA Method 375.4.

OK – GW w/in plume & outside plume should be analyzed for

also collect soil sample from vadose zone for TOC / bulk density, porosity, water content, etc

SITE SAFETY PLAN

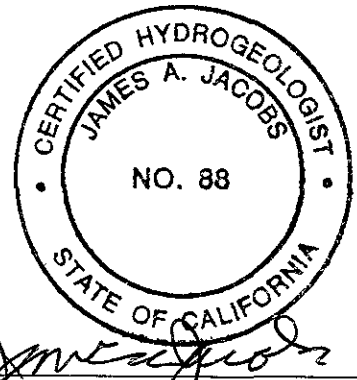
The Site Safety Plan (SSP) for this work will been prepared and will be onsite during all field activities. All persons working in the exclusion zone and the contamination reduction zone will be familiar with the SSP and will be required to comply with its provisions.

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 site investigation. The report will include: boring location map, boring logs, laboratory reports, chain-of-custody records and laboratory quality control documents, tabulated laboratory results and groundwater data. Site and boring location maps will be prepared, as well as recommendations for further activities, as appropriate.

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

Sincerely,
Artesian Environmental



Paul E. Jones
Project Geologist

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

cc: Ms. Eva Chu, ACDEH

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ATTACHMENT A:
FIGURES

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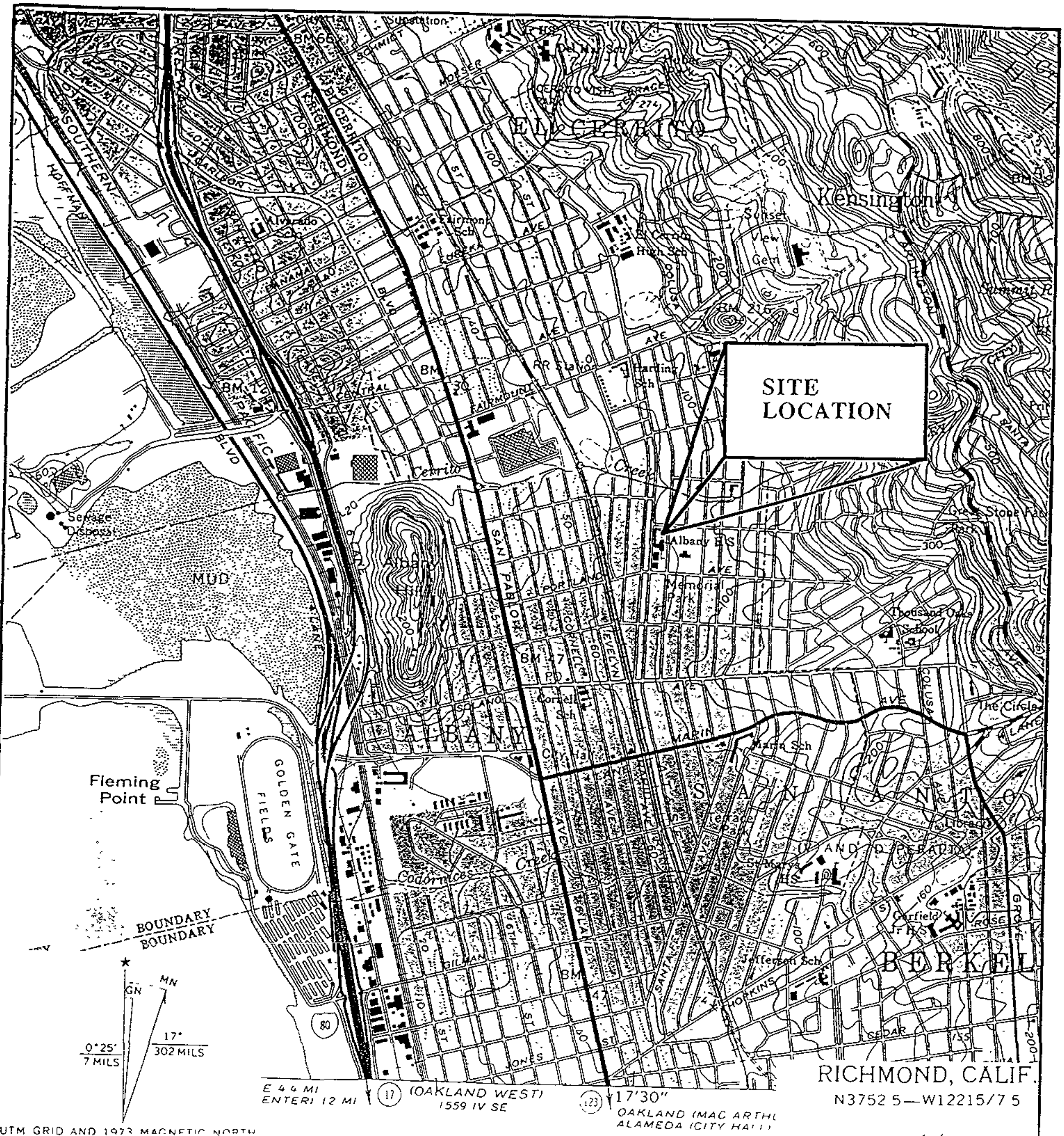
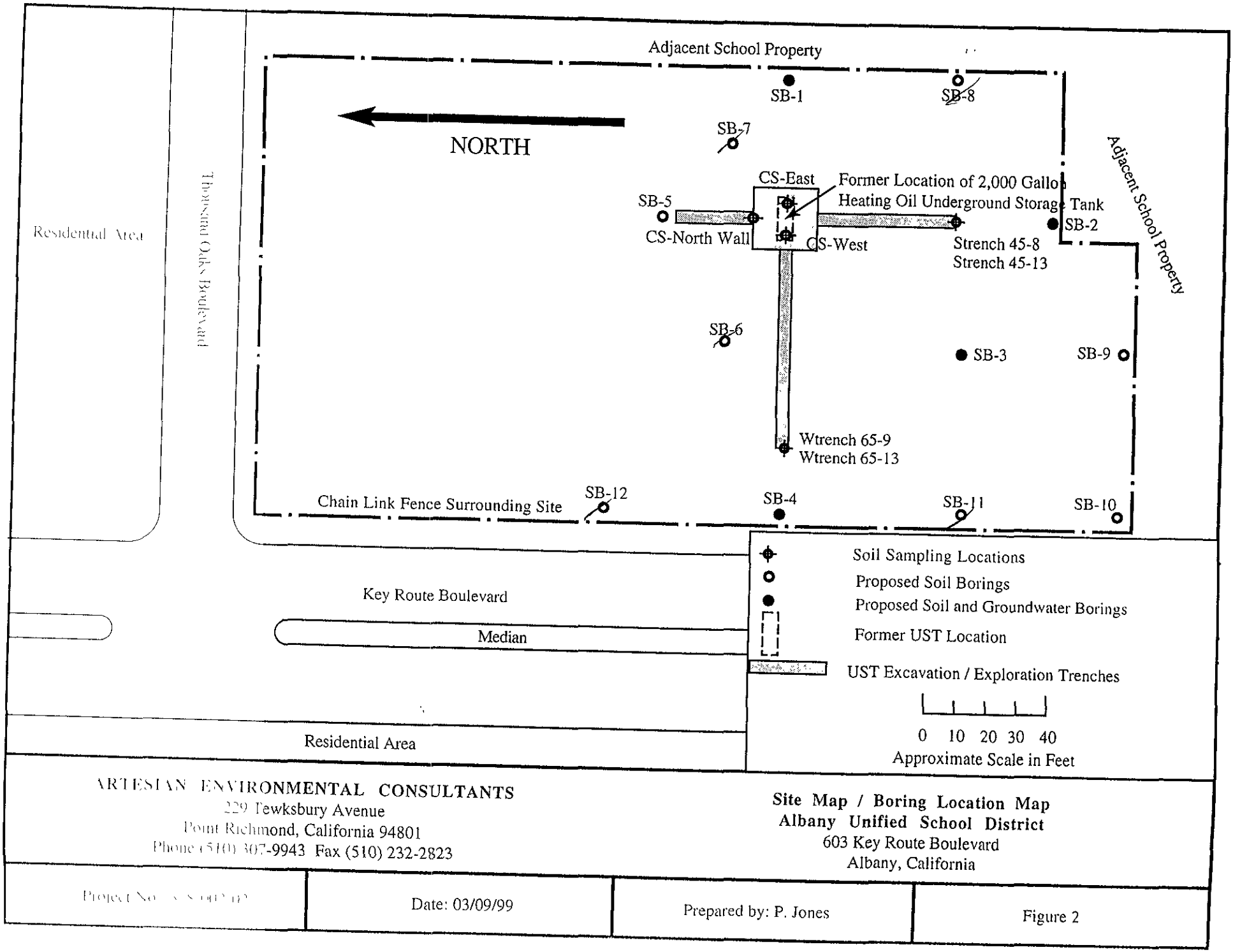


ARTESIAN ENVIRONMENTAL	SITE LOCATION MAP Albany Unified School District



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Site Map / Boring Location Map
Albany Unified School District
603 Key Route Boulevard
Albany, California

Project No. [illegible]	Date: 03/09/99	Prepared by: P. Jones	Figure 2

ATTACHMENT B:
STANDARD OPERATING PROCEDURES

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Artesian Environmental Consultants

Standard Operating Procedures:

Installing PVC Monitoring Well-Points With DPT Equipment

Small-diameter (not exceeding 1.5-inch outside diameter (OD)) PVC well screen and casing can be installed in borings using a Geoprobe® direct penetration technology (DPT) drill rig. The casing can be installed either as temporary well screens for collection of grab graoundwater samples, or as permanent groundwater monitoring well-points or air sparging points. The simplest and quickest method is to simply place the PVC well screen and casing in the open boring following continuous coring with DPT equipment. If the well-point is to be permanent, a sand filter pack, bentonite and grout seal would be addedthrough the boring annulus. The subsurface formation must be stable enough for the boring to remain open for this method to be practical, which is usually the case only in clayey formations.

For unstable formations where a cased-hole system is desired, two additional optional methods of installing the well casing with DPT equipment can be used:The monitoring well-point casing will consist of 1-inch outside diameter (OD) by 0.84-inch inside-diameter (ID) Schedule 40 PVC with a screened interval to intersect the shallow saturated zone as determined by hydrogeologic conditions in the field.

1) The Geoprobe® well method uses an outer drive casing with an expendable plastic end seal and PVC point. The drive casing is driven into the pre-cored borehole with the Geoprobe® DPT rig. Since the OD of the drive casing is slightly smaller than the OD of the continuous core sampler, disturbance and compaction of the formation around the annulus is minimized. The PVC well casing and screen are placed in the drive casing, the sand pack is installed to 1 foot above the top of the screen, and a 1-foot thick hydrated 1/4-inch bentonite pellet seal and 3% bentonite/cement grout seal are then added above the sand pack to the surface.

2) A second method uses the GeoInsight, Inc. PowerPunch™ system, which consists of a 1-inch outside diameter (OD) by 0.84-inch inside-diameter (ID) Schedule 40 PVC well screen and casing driven by an expendible stainless steel drive cone and PowerPunch™ body. While the PowerPunch™ system can be driven into soft formations without pre-drilling, it is desirable that the borehole be continuously cored prior to the well-point installation to minimize disturbance and compaction of the formation around the annulus. The PowerPunch™ assembly is driven into the borehole to the desired depth using the Geoprobe® DPT rig, then the drive rod and PowerPunch™ body are retracted to expose the desired length of well screen. The PowerPunch™ body remains in place in the borehole to form a seal between the well casing and the borehole annulus. A 1-foot thick hydrated bentonite pellet seal and 3% bentonite/cement grout seal are then added above the PowerPunch™ body to the surface. Since it is not possible to add a filter pack to the screened interval with this method, a 0.010-inch slot size will be used for the well screen. The natural formation will collapse around the well screen when the drive rod and PowerPunch™ body are retracted

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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.

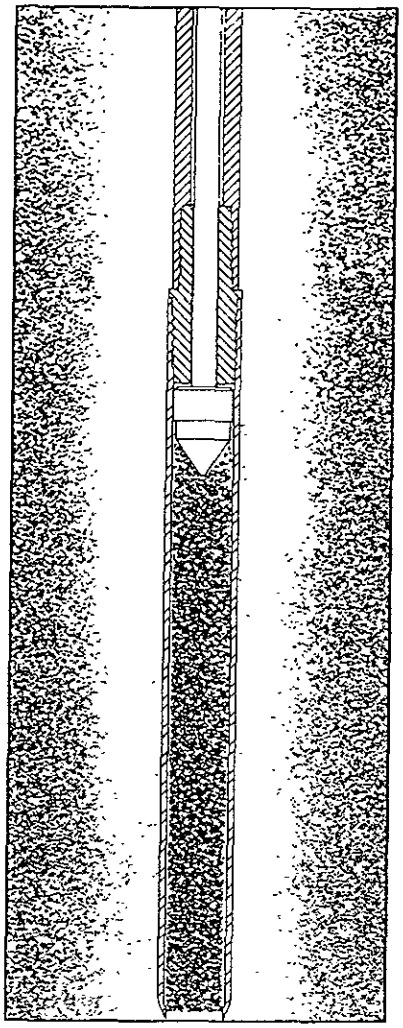
Continuous Coring Tools
Artesian uses continuous coring tools ranging from 0.5 inches to 2.0 inches in diameter. The soil sampling tools range from 1.0 feet to 4.0 feet in length. The continuous coring tool contains an inner liner composed of PETG (clear plastic), brass, stainless steel or Teflon.

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.

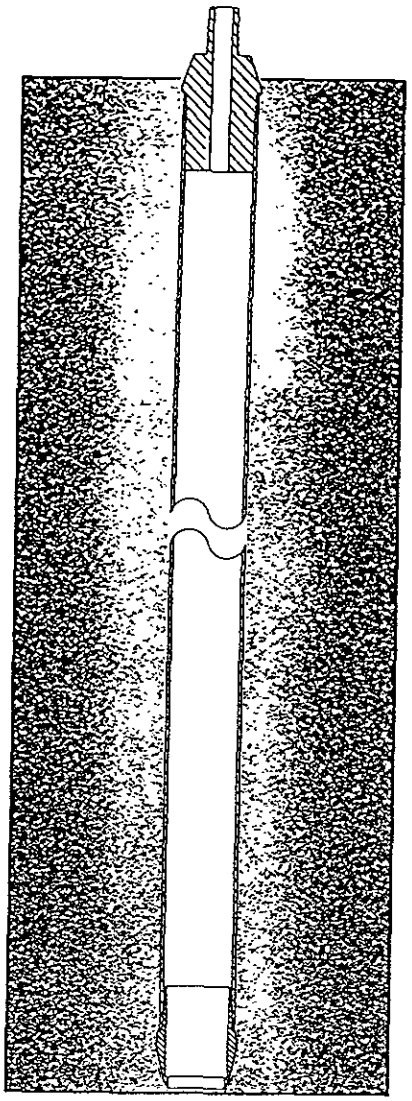
Sample Preparation
The sampler is extracted from the borehole to the surface using the Direct Push Technology (DPT) rig, a truck mounted crane, or a portable probe extractor. The sample liner containing the soil sample is removed from the sampler. The soil sample is generally logged for hydrogeologic 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 (CA C57 Haz Waste #623461).

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

Soil Sampling System

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