ARTESIAN ENVIRONMENTAL CONSULTANTS

2623

GROUNDWATER SAMPLING WORKPLAN

MINOR PROPERTY
4341 HOWARD STREET
OAKLAND, CALIFORNIA

AEC Job No. 1617
AEC Library No. 100-001-07

Prepared For:

Mr. Jim Minor
P. O. Box 726
Diablo, California 94528

May 24, 1995

Thomas Fortner
Project Geologist

Kent Aue C.E.G. #1446
Principal Hydrogeologist

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C O N S U L T A N T S

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Darrell Scott Taylor
Geologist

1.0 INTRODUCTION

Artesian Environmental Consultants (Artesian) has been retained by Mr. Jim Minor, owner of the property at 4341 Howard Street, Oakland, California (site)(see Figures 1 and 2), to install and sample three groundwater sampling points. Mr. Barney Chan of the Alameda County Health Care Services Agency Department of Environmental Health has requested the installation of these temporary groundwater sampling points to delineate the downgradient extent of a chlorinated solvent (VOC) plume in shallow groundwater. Bank of America, owner of the former Cobbledick-Kibbe property, has proposed that their property, the former El Monte RV site, and the Dailey Body site be considered as a single Non-Attainment Area for the purpose of compliance with applicable environmental regulations. The former EL Monte R.V. Service Center was located on the southeast portion of Mr. Minor's property. Bank of America has retained Blymyer Engineers, Inc. as their consultant.

2.0 SITE SETTING

The subject site is located off High Street in Oakland between U.S. Highway 880 and Alameda. The site is approximately 280,000 square feet in area and has several structures; the remainder of the site is paved. The site is currently occupied by Dailey Body, which builds and installs customized truck bodies. There are two residences on Howard Street adjacent to the site; other surrounding properties are light industrial facilities. The Bank of America property is located east of the site across Howard Street.

3.0 BACKGROUND

On November 15, 1991, a 1,000 gallon underground gasoline storage tank (UST) was removed from the site by Zaccor Corp. of Menlo Park, California. Soil samples taken at the time of the tank removal contained up to 8,200 milligrams per kilogram (mg/kg) (equivalent to parts per million (ppm)) total petroleum hydrocarbons as gasoline (TPH-g), 33000 micrograms per liter (µg/kg) (equivalent to parts per billion (ppb)) benzene (B), 93000 ppb toluene (T), 75 ppb ethylbenzene (E), and 330 ppb total xylenes (X). After removal of the tank the excavation was backfilled with clean imported fill material. Excavated soil was stockpiled and left on-site.

On June 24, 1994, Artesian overexcavated additional gasoline-impacted soil; removing about 110 yards of soil and producing an excavation approximately 15' X 20' X 10' deep. The impacted soil excavated was stockpiled on-site. On August 19, 1993 the excavation was backfilled with clean imported soil.

On August 31, 1993 Artesian supervised the removal of the stockpiled soil. The soil was transported to Gibson Environmental of Bakersfield, California, by Caballero Trucking of San Jose, California, for recycling.

On June 25, 1993 Artesian installed groundwater monitoring well MW-1. Monitoring well MW-1 was placed approximately 10 feet from the edge of the UST excavation in the presumed downgradient direction. The estimated westerly groundwater flow direction was based on wells at the adjacent Bank of America site. Blymyer Engineers refers to MW-1 on the Minor property as MW-7.

Groundwater sampling from MW-1 has been conducted on July 7, 1993, April 27,1994, July 29, 1994, October 25, 1994, and March 23, 1995. For the last sampling event, groundwater samples were analyzed for TPH-g by EPA Method 5030 and modified Method 8015, and BTEX by EPA Method 602/8020. The groundwater was reported to contain 0.08 ppm TPH-g and 1.6 ppb benzene. Other target analytes were not detected in the groundwater sample (reporting limit 0.5 ppb).

The latest groundwater sample was also analyzed for purgeable halocarbons by EPA Method 8010 at the request of the client. Results of this analysis indicate 12 ppb trans-1,2-dichloroethene (trans-1,2 DCE), 36 ppb cis-1,2-dichloroethene (cis-1,2-DCE), and 220 ppb trichloroethene (TCE) were present in the sample. All other target analytes were reported to be below the laboratory detection limits for this method. Blymyer Engineering also sampled MW-1 for the last three quarters and their analytical results indicate detectable concentrations of VOCs. Blymyer has received permission to sample this well from Mr. Minor to investigate the extent of a VOC release on the adjacent upgradient Bank of America site.

4.0 PERMITTING

A drilling permit will be obtained from the Zone 7 Water Agency prior to conducting field activities. Underground utility lines will be located by Underground Service Alert (USA) prior to drilling. Artesian will also provide limited magnetic and induction line locating services to aid in locating buried pipes and utilities on site prior to drilling.

5.0 HEALTH and SAFETY PLAN

Artesian will prepare a site specific Health and Safety Plan and the document will be on-site during all field activities. All persons in close proximity of the drilling equipment be informed of the safety regulations on-site and will read the Health and Site Safety Plan and sign the site safety forms.

6.0 FIELD ACTIVITIES

6.1 Soil Borings

Based upon quarterly monitoring well MW-1, anticipated depth to groundwater is approximately 5 to 8 feet below ground surface (bgs). Artesian will advance three continuous-core soil borings (B-1, B-2, and B-3) to approximately 12 feet bgs. The soils from the borings will be logged using ASTM D2488-90 visual classification criteria under the Unified Soil Classification System (USCS). The borings will be advanced by Artesian (C-57 license # 624461) utilizing a truck-mounted 5400 Geoprobe drill rig. Proposed boring locations are shown in Figure 2.

Ten feet of one-inch PVC screen and five feet of threaded blank will lowered down the open borehole and sealed at the surface with a bentonite plug to form three temporary groundwater sampling points. All of the sampling points will be located on site in the general downgradient direction from monitoring well MW-1. Boring B-1 will be located approximately 150 feet northwest of MW-1 near the northern house on Howard Street.

Boring B-2 will be located approximately 90 feet west of MW-1 near the southern house on Howard Street. Boring B-3 will be located approximately 90 feet southeast of MW-1 near the former El Monte R. V. Service Center.

Prior to groundwater sampling, each sampling point will be purged by evacuating a minimum of three casing volumes of groundwater or until the boring runs dry. After allowing sufficient time for the borings to recharge, they will be purged again. Groundwater will be sampled when the borings have recovered about 80 percent after the second purging. Groundwater samples will be collected using a variable speed peristaltic pump with Teflon tubing and dispensed into labeled 40-milliliter volatile organic analysis (VOA) vials supplied by the analytical laboratory. New tubing will be used at each sampling point. The VOA vials will be filled completely, leaving no head space. The samples will then be labeled, stored on ice, and transported under chain-of-custody control to a California State Certified Laboratory. Artesian's standard operating procedures for groundwater sampling using direct push technology are included in the Appendix.

All drilling and sampling equipment will be decontaminated by steam cleaning prior to and following use at each sampling point. Decontamination water will be stored on site in labeled DOT-approved containers, pending results of laboratory analysis. The Geoprobe direct-push sampling method produces no soil cuttings. At the conclusion of groundwater sampling activities the PVC casing will be withdrawn and disposed of, and all three borings will be grouted with a tremie pipe to ground surface with a neat cement/bentonite grout.

7.0 LABORATORY ANALYSES

Groundwater samples from groundwater sampling points B-1, B-2, and B-3 will be analyzed for purgeable halocarbons using EPA Method 8010 by Chroma Lab, Inc. of Pleasanton, California.

8.0 REPORT PREPARATION

A written report describing the field activities and summarizing the laboratory results will be prepared following receipt of the analytical reports. The report will be prepared under the supervision of a California Registered Geologist and will include boring logs, laboratory reports, the chain-of-custody record, laboratory quality control documents, and description of field activities.

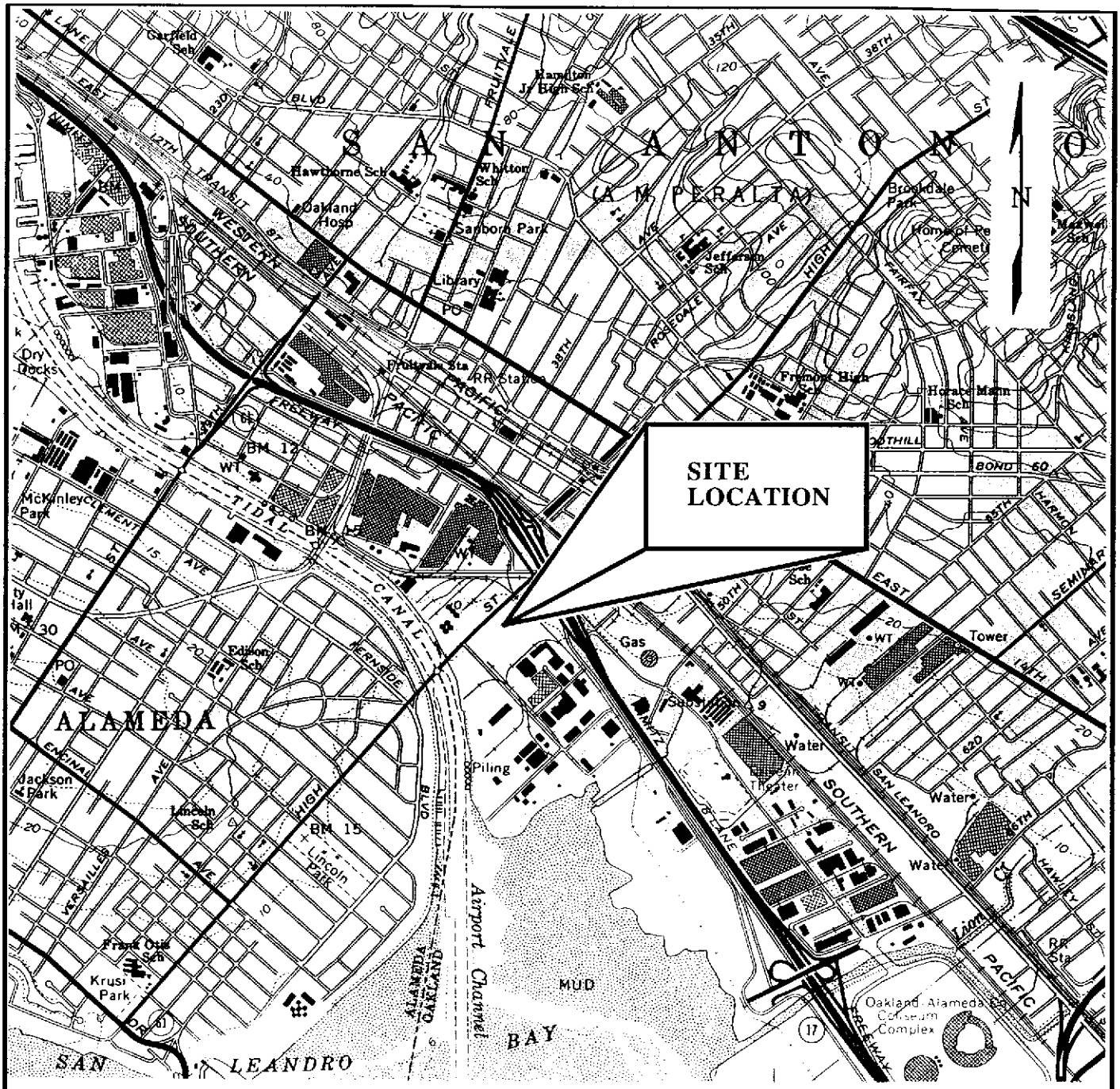
9.0 DISTRIBUTION

Artesian will submit copies of this workplan to the following:

Mr. Jim Minor
P.O. Box 726
Diablo, California 94528

Mr. Barney Chan
Alameda County of Environmental Health
1131 Harbor Bay Parkway
Alameda, California 94502-6577

Mr. Sum Arigala
Regional Water Quality Control Board
San Francisco Bay Region
2101 Webster Street, Suite 500
Oakland, California 94612



OAKLAND EAST, CALIF.

SW/4 CONCORD 15' QUADRANGLE

N3745—W12207.5/7.5

1959

PHOTOREVISED 1980

DMA 1559 I SW-SERIES V895

CONTOUR INTERVAL 20 FEET

QUADRANGLE LOCATION

ARTESIAN ENVIRONMENTAL CONSULTANTS
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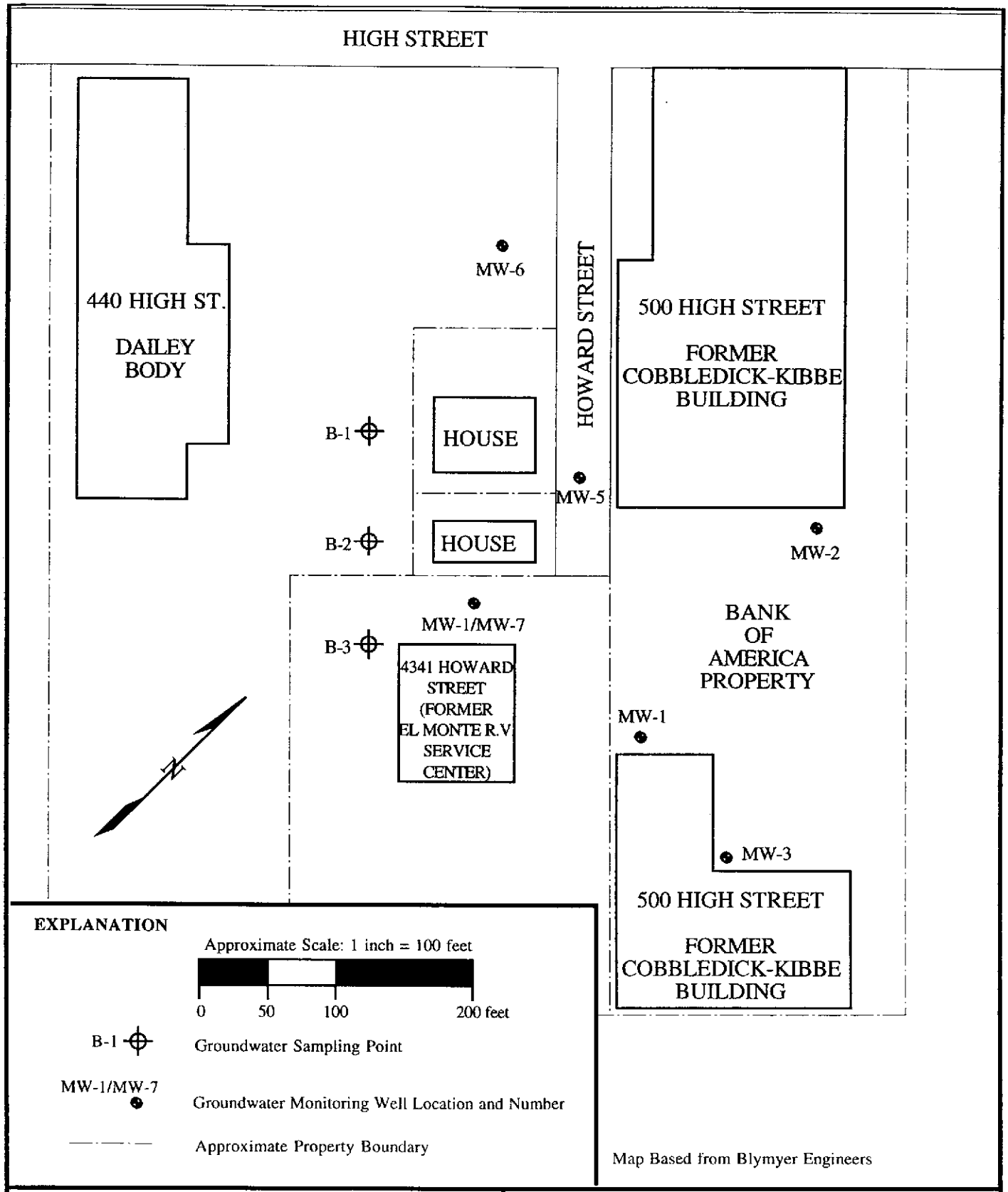
Phone (415) 257-4801 Fax (415) 257-4805

SITE LOCATION MAP
4341 Howard Street
Oakland, California

Project No.: 1617	Date: 5/10/95	Prepared by: T. Fortner	Figure 1



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GROUNDWATER SAMPLING POINTS
4341 Howard Street
Oakland, California

Project No.: 1617	Date: 5/23/95	Prepared by: T. Fortner	Figure 2

APPENDIX

STANDARD OPERATING PROCEDURES FOR GROUNDWATER SAMPLING

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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 proprietary, as well as Geoprobe, Clements and Arts Manufacturing hardened stainless steel soil sampling tools. The tools are designed for discrete sampling or continuous coring.

Probe Drive Sampler
The 2-foot long Probe-Drive 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 by mean of 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 and 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 steamed cleaned or cleaned 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.

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Standard Operating Procedures

Groundwater Sampling Tools - Bailers and Tubing & Check Valve Systems

Artesian Environmental uses a push driven sampling method to advance a water sampling device (such as Artesian, Geoprobe or other samplers) to the target depth. After the top of the water bearing zone is encountered, the water sampling device is pushed an additional 2 to 3 feet into the aquifer. The water sampling rod consists of a steel inner core well screen nested inside a steel outer sampler sheath. The sampler is kept sealed by o-ring connections while being driven to the desired sampling depth. When the desired sampling depth is reached, the sampler is pulled up approximately 2 feet which exposes the open borehole to the inner core steel well screen, creating a temporary well from which to sample. A groundwater sample can then be collected by one of the following methods:

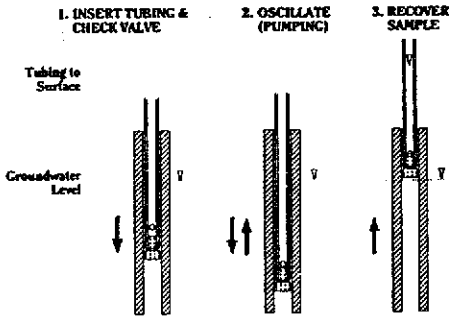
GROUNDWATER SAMPLING - Bailers

Grab groundwater samples are collected using miniature 1/2-inch diameter Teflon or stainless steel bailers. The bailers are lowered through the hollow centers of the drilling probe rods into the screened groundwater sampling device. The bailers are properly decontaminated between borings.

Groundwater Sampling with a Miniature Bailer

GROUNDWATER SAMPLING - Tubing & Check Valves

Tubing with a bottom check valve is another method of grab groundwater sampling. The 1/4-inch inner diameter polyethylene tubing with a 3/8-inch outer diameter is mounted with a stainless steel bottom check valve. The tubing, with check valve in place, is lowered down the hollow center of the drilling probe rod into the water column. An oscillating motion pumps the water column up into the tubing. The tubing recovers 9.65 ml per foot. Tests in sandy aquifers have recovered 0.5 liters of water per minute from a depth of 25 feet using the 1/4-inch inner diameter tubing and the bottom check valve.



Groundwater Sampling with a Tubing and Bottom Check Valve

Groundwater samples to be analyzed are decanted into laboratory-prepared, 40-milliliter volatile organic analysis (VOA) vials and 1 liter bottles. The VOA vials are filled completely, leaving no headspace, and are capped with septum topped 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.