Technology, Engineering & Construction, Inc.
35 South Linden Avenue • South San Francisco, CA 94080-6407
Tel: (650) 952-5551 • Fax: (650) 952-7631 • Contractor's Lic. #762034

December 19, 2000

Ms. Eva Chu
Hazardous Materials Specialist
Alameda County Health Agency
Division of Environmental Protection
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

SUBJECT: **WORKPLAN FOR PERFORMING AN OFFSITE SUBSURFACE INVESTIGATION AND A RISK-BASED-CORRECTIVE-ACTION (RBCA) AT FORMER SERVICE STATION, 1435 WEBSTER STREET IN ALAMEDA, CALIFORNIA**

Dear Ms. Chu:

As you requested in your letter dated December 8, 2000, TEC Accutite is pleased to submit this workplan for performing an offsite subsurface investigation at the former gasoline service station located at 1435 Webster Street in Alameda, California. TEC Accutite will continue the quarterly monitoring of the existing six monitoring wells. Once the offsite borings are completed and the analytical results from the soil and groundwater are obtained, TEC Accutite will perform a Tier 1 Risk-Based-Corrective-Action study at the site. The attached Figure 1 shows the location of the site on a topographic map. Below, we present the site background, the purpose of the investigation, and the work description.

BACKGROUND AND PURPOSE

For the latest on the site background, please see Accutite's report dated November 29, 2000, titled "Quarterly Groundwater Monitoring, Sensitive Receptor Survey, and Site Conceptual Model". Based on this report, further subsurface investigation to define the plume offsite is needed. The tasks below describe the proposed work:

SCOPE OF WORK

Accutite proposes to execute the following tasks:

TASK #1 WORK PLAN PREPARATION

The first task includes the preparation of this work plan.

TASK #2: HEALTH AND SAFETY PLAN

Prior to conducting field activities, a Health and Safety Plan will be prepared. Development of a written site safety plan helps ensure that all safety aspects of site operations are thoroughly examined prior to commencing fieldwork. The site safety plan will be modified as needed for every stage of site activity.

TASK #3 PERMITTING AND CLEARING UTILITIES

Once this workplan is approved by the Alameda County Environmental Health Services (ACEHS), TEC Accutite will obtain drilling permits from Alameda County Public Works and from Caltrans. Underground Service Alert (USA) will be contacted to locate the underground utilities.

TASK #4: SUBSURFACE INVESTIGATION BY ADVANCING FIVE EXPLORATORY PUNCH BORING

This task calls for the installation of five offsite punch borings (BO1 through BO5). The attached Figure 2 shows the location of the proposed borings. The borings will be advanced using the Geoprobe system to a depth of approximately 15 feet below surface grade. Please see the attached standard procedures. One soil sample will be collected from each boring at the soil-groundwater interface. The soil will be logged according to the Unified Soil Classification system and a boring log will be prepared for each borehole. One groundwater sample will be collected from each boring. Once the sampling is complete, Accutite will grout all borings with cement grout.

TASK #5 SOIL AND GROUNDWATER ANALYSIS

Stain, odor or any sign of petroleum hydrocarbons contamination will be noted from the collected soil samples. The soil and groundwater samples from all borings will be analyzed for TPH-D, TPH-G, BTEX, and MTBE. MTBE will be confirmed by the GC/MS, EPA Method 8260. Since all oxygenates, except MTBE were non-detect in the last quarterly monitoring, with your permission, analysis for oxygenates will no longer be performed at this site.

ok, but continue to quantify for MTBE w/ 8020.

TASK #6 CONTINUING THE QUARTERLY GROUNDWATER MONITORING

TEC Accutite will continue the quarterly sampling and analysis of the groundwater from the existing monitoring wells at the site. The six wells will be purged and sampled quarterly in the year 2001. The groundwater samples from each quarter will be analyzed for TPH-D, TPH-G, BTEX, and MTBE. MTBE will be confirmed by the GC/MS, EPA Method 8260. Since all oxygenates, except MTBE were non-detect in the last quarterly monitoring, with your permission, analysis for oxygenates will no longer be performed at this site.

TASK #7 COMPLETING A TIER 1 RBCA STUDY

The first tier of the RBCA process involves comparison of site constituent concentrations to generic Risk-Based Screening Levels (RBSLs) to determine whether further evaluation is required. RBSL values are derived from conservative fate and transport algorithms, default input parameters, standard exposure equations, and reasonable maximum exposure factors per USEPA guidelines. If Tier I limits are not exceeded, the site may proceed directly to compliance monitoring and/or no further action. However, if these generic screening levels are exceeded, the affected media may be addressed by conducting a Tier II evaluation to develop site-specific

remediation goals. In general, the Tier I evaluation serves to identify chemicals, exposure scenarios, and locations within a site requiring further action.

Selection of Chemicals of Potential Concern: The Chemicals of Potential Concern (COPCs) to be considered for RBCA are TPH-G, BTEX, MTBE, and TPH-D.

Identification of Potential Exposure Pathways and Receptors: based on the available data, the following exposure scenarios associated with onsite and offsite receptors will be quantitatively evaluated in the RBCA analysis:

- Inhalation of volatiles from soil to ambient air (onsite residential receptor);
- Inhalation of volatiles from groundwater to ambient air (onsite residential receptor);
- Inhalation of volatiles from soil to indoor air (possible future onsite residential receptor);
- Inhalation of volatiles from groundwater to indoor air (possible future onsite residential receptor); and
- Ingestion, inhalation, and dermal contact with soils (onsite construction worker).
- surface water impact

Among the Data to be considered:

Target Carcinogenic Risk Level:	1E-06	Lowest target risk level defined by the USEPA, ASTM, and API
Target Non-Carcinogenic Hazard Quotient:	1.0	Consistent with USEPA, ASTM, and API guidelines
Benzene Carcinogenic Slope Factor	0.1 $(mg/kg/day)^{-1}$	Conservative value defined by Cal-EPA

TASK #8 **REPORT PREPARATION AND REGULATORY LIAISON**

Accutite will submit a report summarizing the analytical findings from the proposed borings, the first quarterly monitoring for the year 2001 of the six wells, and the findings from the RBCA Tier 1 study.

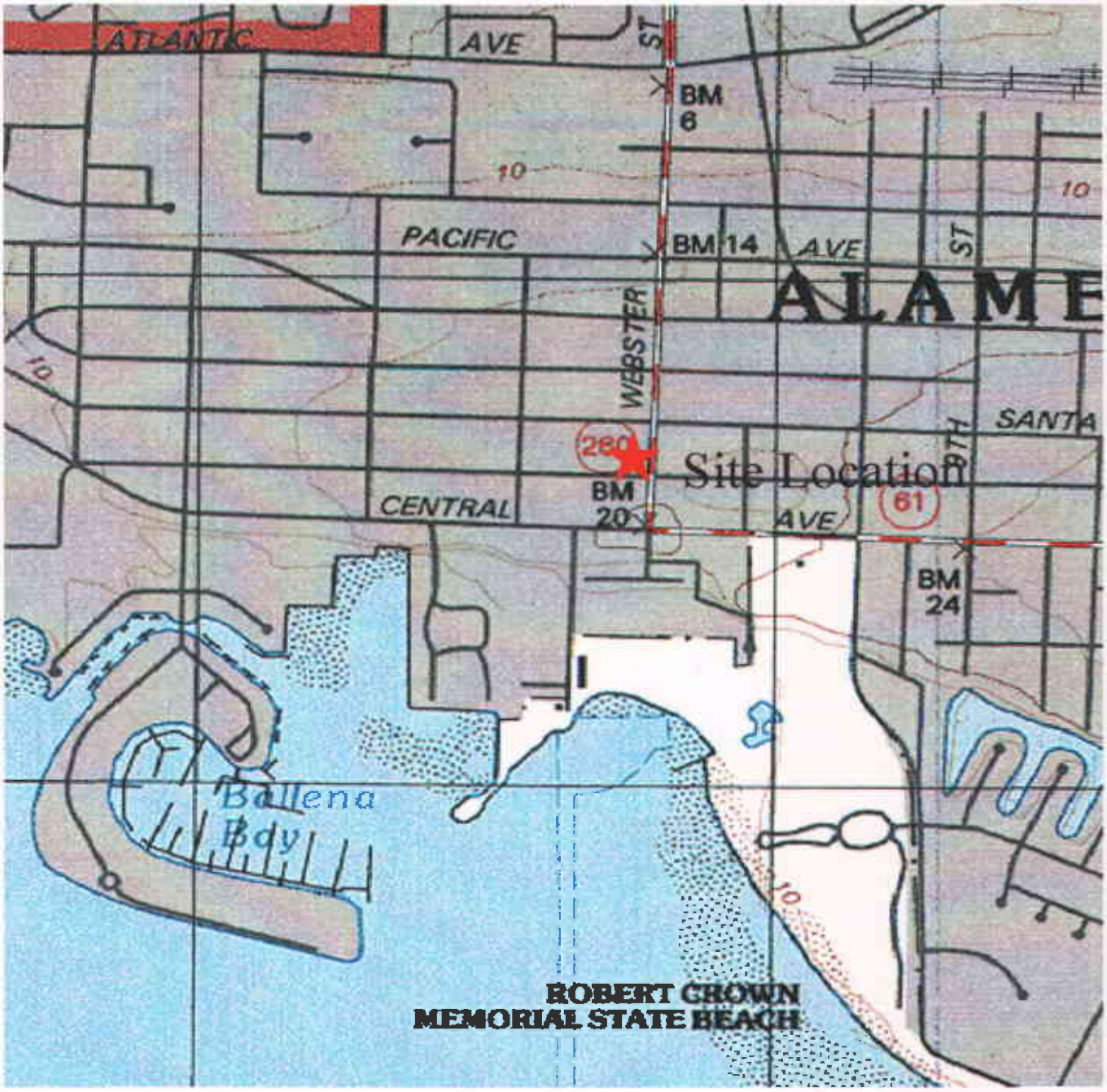
Thank you for your cooperation. If you have any questions, please call me at (650) 952-5551, Ext. 209.

Sincerely,
TEC Accutite

Sami Malaeb, P.E., R.E.A.
Environmental Director

REGISTERED PROFESSIONAL ENGINEER
SAMI M. MALAEB
No. 60888
Exp. 12/31/04
CIVIL
STATE OF CALIFORNIA

Cc: Mr. Dan Koch, Olympian, 260 Michelle Court, South San Francisco, CA 94080
Mr. David Harris, Esq., Trump, Alioto, Trump & Prescott, LLP, 2280 Union Street, San Francisco, CA 94123
Mr. Jeff Farrar, P.O. Box 1701, Chico, CA 95927



	DATE 11/17/00	PAGE 1 of 1
N	SCALE: SHOWN ABOVE	
	LEGEND:	

ACCUTITE

35 SOUTH LINDEN AVENUE
SOUTH SAN FRANCISCO

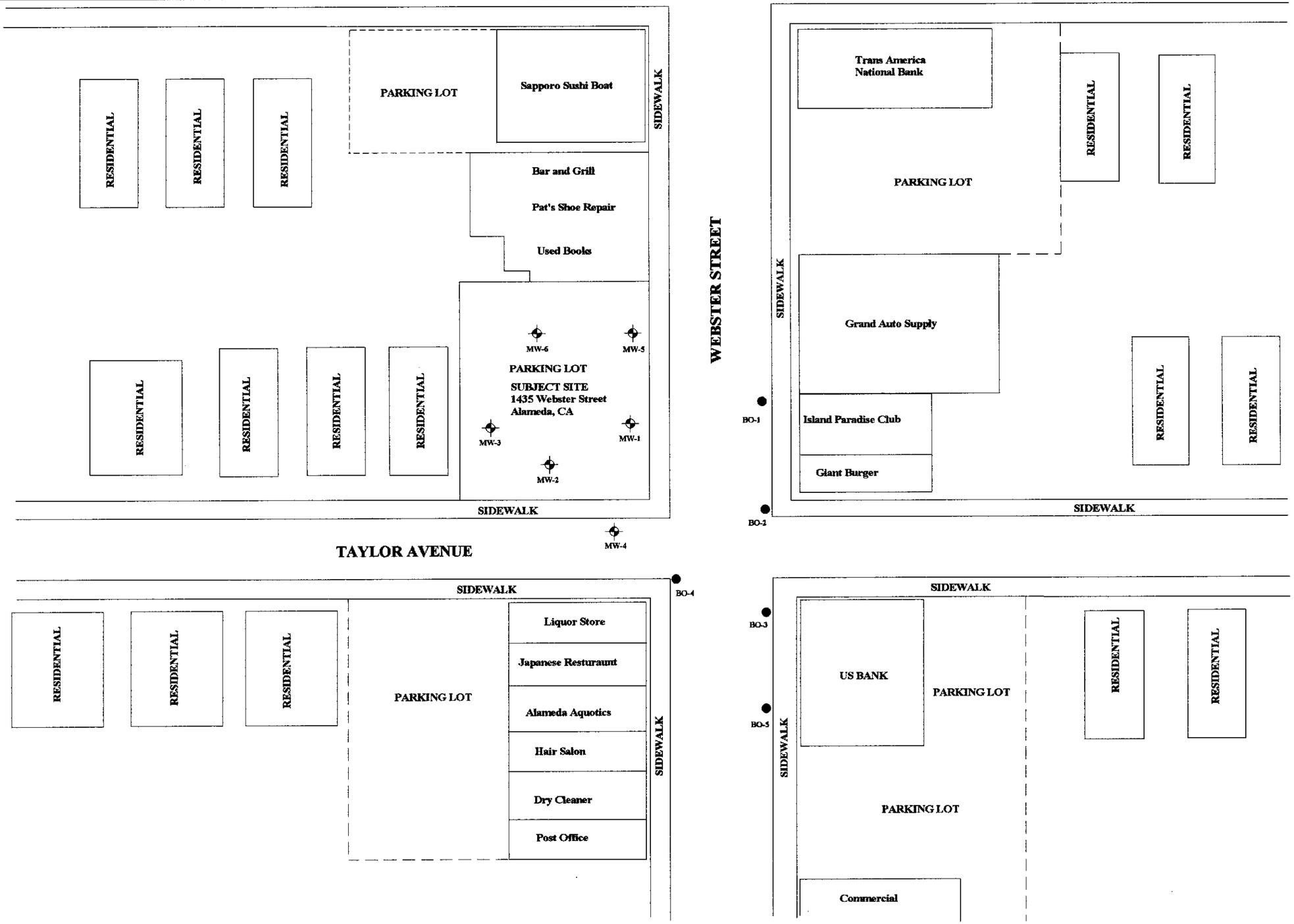
FIGURE 1

SITE VICINITY MAP

srs2.tcw

SITE:

1435 WEBSTER STREET
ALAMEDA, CA



N
SCALE: 1:60

Legend:
- Monitoring Well
- Proposed soil boring location

Drawn by: D Gregory
Date: 12/18/00
File:borprop.tcw

TEG ACCUTITE
35 SOUTH LINDEN AVENUE
SOUTH SAN FRANCISCO

Former Olympian Station
1435 Webster Street,
Alameda, CA

FIGURE 2:

Proposed Soil Boring Locations

ATTACHMENT

STANDARD PROCEDURES

SOIL SAMPLING THROUGH ADVANCING HYDROPUNCH BORINGS

The borings are completed as follows:

1) A concrete breaking auger is connected to an extension rod. The auger is turned and pushed down by hydraulic pressure, created by the truck mounted motor. This process is used to break the top layer of concrete.

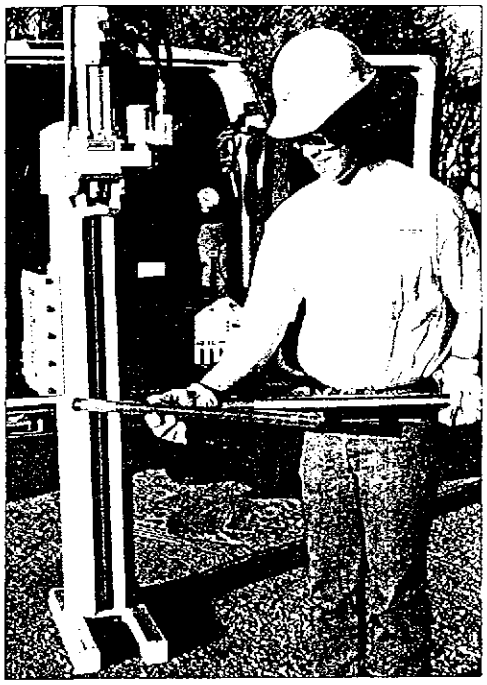
2) Once the auger breaks the concrete, the soil sample is collected through a larger bore sampler operation. The attached pages explain in details the sample retrieving methods.

3) Once the soil is retrieved, the soil is classified using the Unified Soil Classification System. Lithologies encountered, changes in lithologies, and sampling locations are noted on the boring logs.

4) Once the soil is retrieved, a soil sample is collected in a 1" x 6" brass tube. Each end of the tube is covered with Teflon liner and then capped with a polyethylene lid, taped, and labeled. The samples are placed in a 4°C ice chest and delivered to a State Certificate Environmental Laboratory.

5) Following sampling, all borings are sealed with cement/ 5% bentonite.

Large Bore Sampler Operation



The Large Bore Sampler recovers a 22-in. long x 1.0625-in. diameter (559 mm x 27 mm) core, 320 mL in volume from depths of over 60 feet (18 m).

Large Bore Sampler – Operation

Assembly

After cleaning parts thoroughly, assemble the Large Bore Sampler (Figure 1). All parts must fit tightly. The stop-pin should be tightened down with a wrench so that it exerts pressure against the piston rod (Figure 2). Damage to the stop-pin or drive head could occur during driving if the stop-pin is not tight. NOTE: The piston stop-pin uses an O-ring to prevent vibration from loosening the stop-pin threads. **Use a new O-ring each time you assemble the sampler.**

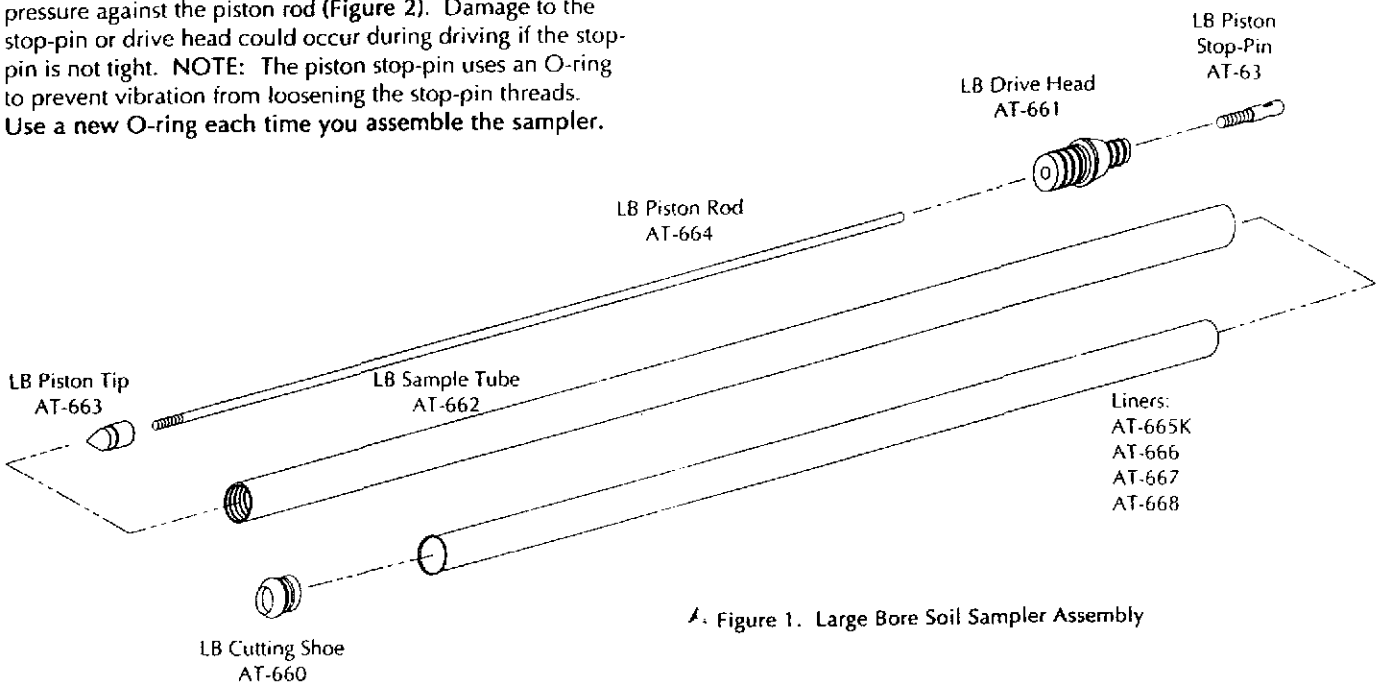
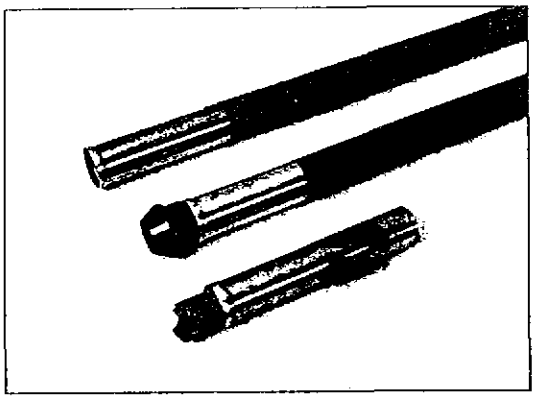


Figure 1. Large Bore Soil Sampler Assembly



Samples can be collected using Large Bore Brass Liners (AT-666) which separate into 6-in. (152 mm) sections.

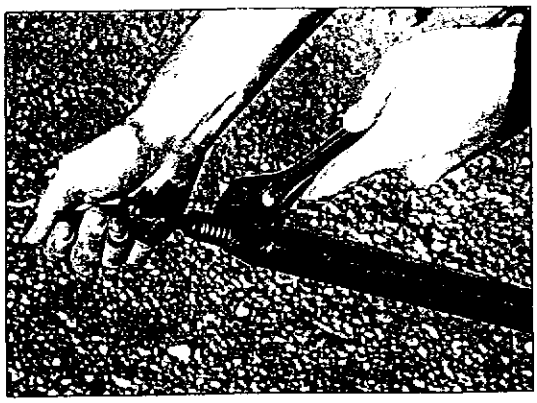


Figure 2. Securely tighten the Piston Stop-Pin in the Large Bore Drive Head.

Large Bore Sampler – Operation

Stop-Pin Removal

1. If using a Geoprobe machine, move the probe rods [illegible] from the top of the probe rods to allow for [illegible].

2. Remove the drive cap. Lower a series of extension rods coupled together, sufficient to reach depth, down the inside diameter of the probe rods (Figure 1).

3. Attach the extension rod handle to the top extension rod and rotate the handle clockwise (Figure 2). The male threads on the leading end of the extension rods engage the female threads on the top end of the stop-pin. A slight resistance will be felt when the stop-pin begins to disengage. Continue to rotate the handle until the resistance ends. Lift up on the handle to check that the threads are completely disengaged.

4. Remove the extension rods from the probe rods (Figure 3). The Stop-Pin should be attached to the end extension rod upon removal.

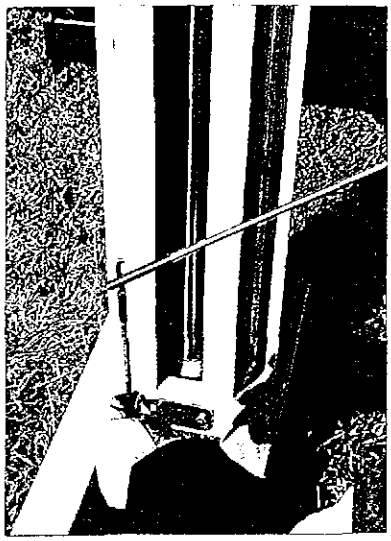


Figure 1. Join extension rods together with Extension Rod Quick Links and lower down inside diameter of probe rods.

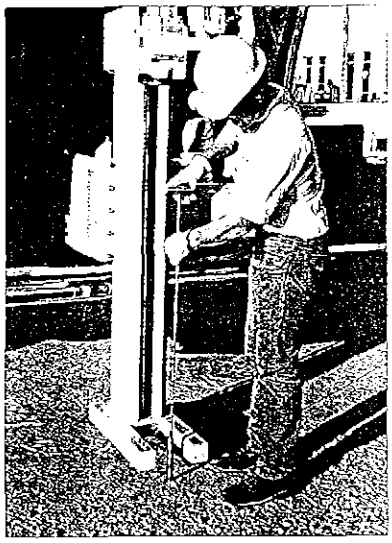


Figure 2. Rotate extension rod handle clockwise to disengage Stop-Pin.

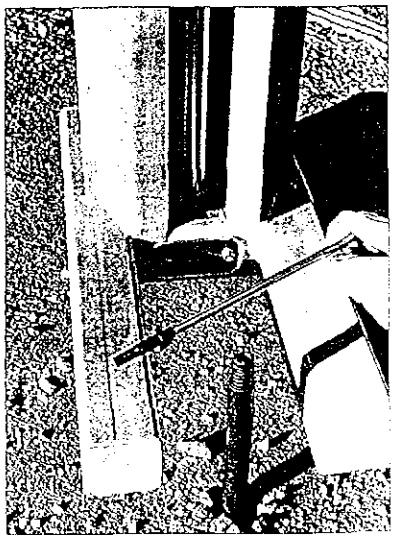


Figure 3. Stop-Pin should be attached to the end extension rod upon removal.

Large Bore Sampler – Operation

Sample Extrusion

Large Bore Liners are usually removed from the sample tube by simply unscrewing the cutting shoe, either by hand or with the LB Shoe Wrench (Figure 1) and pulling out the liner (Figure 2). In some cases, it may be necessary to remove the drive head and push the liner and sample out. Teflon and Plastic (PTFE and CAB) liners may be cut open lengthwise with a utility knife to recover the sample. Brass and Stainless Steel Liners come with plastic cladding on the outside of the liner to keep four 6 inch (152 mm) sections aligned. Remove the cladding and cut the sections apart with a knife. Sections may be extruded using the LB Manual Extruder (Figure 3).

CAUTION: Use extreme care when using the Large Bore Manual Extruder. Gradually apply down pressure on slow speed. Use of excessive force could result in injury to operator or damage of tools. Additional instructions may be found on page 6.

Figure 1. Loosen cutting shoe by hand or with LB Shoe Wrench to remove sample from Large Bore Sample Tube.

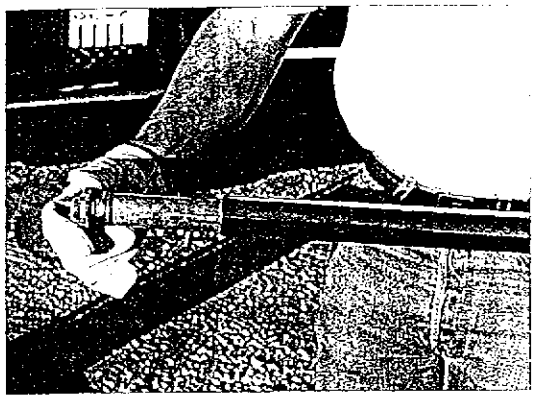


Figure 2. Remove sample liner from Large Bore Sample Tube.

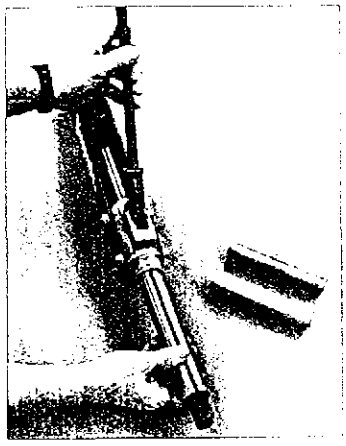


Figure 3. Large Bore Manual Extruder may be used to remove soil from metal liners.

Dual Wall Sampling System

Dual Wall Sampling System
by: John McAssey, Vironex©

The dual wall sampling system is an excellent method for collecting discrete soil core, continuous soil core and/or groundwater samples when collapsing holes or cross contamination are a concern. Using our extensive fleet of Geoprobe Systems® and other Direct Push Technology (DPT) equipment, Vironex® is able to simultaneously advance an outer drive casing with an inner split spoon sample barrel. As these tools are advanced, the inner split spoon collects the soil core sample. This sampler is then retrieved while the outer casing remains in place, protecting the integrity of the hole. A new sampler is lowered into place, and advanced further to collect the next soil core. Soil core samples are collected in expendable liners; either clear acetate, brass or stainless steel

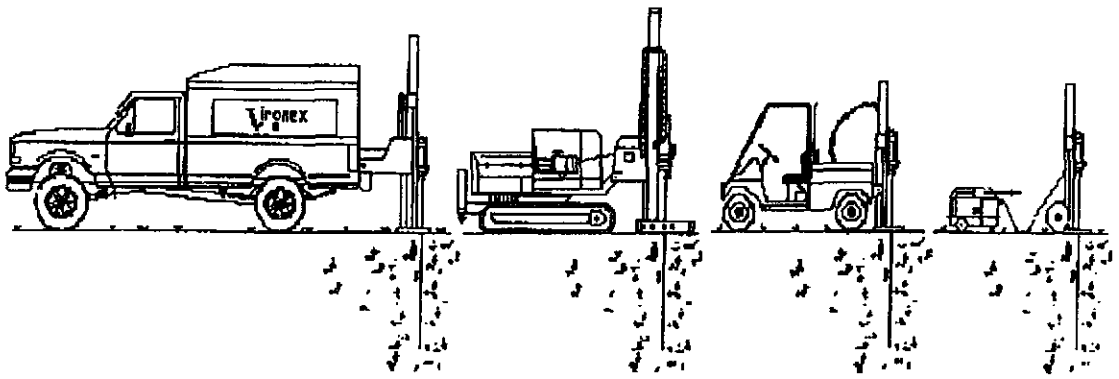
The dual wall sampling system also provides discrete depth soil sampling. Using a locked drive point, the dual wall sampling system is advanced, separating the soil until the desired depth is reached. The locked drive point is then released. By advancing the soil sampler an additional two feet, Vironex is able to collect a discrete depth soil sample.

Groundwater sampling can be done in tandem with continuous soil cores and discrete soil cores, or independently of both. In addition, the dual wall system allows Vironex to install narrow diameter wells in all soil conditions, including collapsing soils These wells typically measure 1", ¾" or ½", and are used for monitoring, sparging, or temporary sampling points.

The casing dimensions are as follows:

Outer casing.. . . . . ..2" O.D./1.45" I.D.
Inner Sample Barrel .. . . . .1.25" O.D./1" I.D.

Vironex© can modify and customize any of the above methods and techniques to meet our client's specific needs and applications.



Vironex's Direct-Push Equipment

By: Mark Kluger and Crystal Dousay-Christmas, Vironex®

Vironex operates more than twenty (20) Geoprobe® direct-push rigs in a variety of configurations to meet your subsurface sampling requirements. Vironex's equipment resides on five (5) types of platforms: Ford F-250 4WD pick-up trucks, two (2) types of track-mounted vehicles, Kawasaki Mules (all-terrain vehicles) and hand-pushed truck dollies for limited access applications. All of the equipment is capable of soil core, soil gas and groundwater sampling.

- The F-250 pick-up trucks represent the mainstay of Vironex's fleet. The highly capable Geoprobe 5400 Systems are mounted on the beds of these 4 wheel drive vehicles. Vironex has successfully advanced tooling to135 feet below grade using these rigs.
- The 66DT is the newest, most advanced Geoprobe direct-push sampling system available. It has outriggers on the opposite end of the vehicle that insure that the maximum weight possible is over the tool string. Because it is track-mounted and has a narrow profile, the 66DT easily maneuvers into tight areas. It also has a larger hammer than the 5400 System and a beefed-up hydraulic system, allowing it to advance larger diameter tooling to greater depths at faster rates. Lithological conditions, such as caliche lenses, that would normally inhibit the use of direct push rigs generally pose no problem for the 66DT. Using this powerhouse, Vironex has pushed 3.25" casing and installed 2" wells.
- The 541.T is another track-mounted vehicle and is smaller than the 66DT. It, too, is a highly capable probing unit.
- The Mule is an all-terrain vehicle frequently used at industrial facilities and other limited access areas.
- The Badger is a direct-push system that is mounted on a truck dolly, which makes it ideal for accessing sites through narrow openings, such as a standard door frame. Vironex has used the Badger in dry cleaners by simply wheeling it to the back of the store. Like the Mule, the Badger is capable of pushing sampling tools to fairly significant depths. Furthermore, you can bolt the Badger to many flooring surfaces for additional stability and leverage.

Platform	Dimensions	Clearance	Typical Depth	Pulling Force	Pushing Force	Angle Boring
Badger	5.1'H x 2.1'W x 2.6'L	8 feet	30 to 40 feet	18,000 lbs.	16,000 lbs.	20 degrees
Mule	6.2'H x 4.7'W x 9'L	8 feet	30 to 40 feet	18,000 lbs.	16,000 lbs	30 degrees
541.T	5.3'H x 2.9'W x 7.5'L	5.3 feet	40 to 50 feet	25,000 lbs.	18,000 lbs.	45 degrees
66DT	6.2'H x 4.0W x 7.6'L	13 feet	60 to 80 feet	40,000 lbs.	30,000 lbs.	45 degrees
5400	7.5'H x 6.75'W x 18'L	10 feet	40 to 50 feet	25,000 lbs.	18,000 lbs.	45 degrees

GROUNDWATER SAMPLING THROUGH ADVANCING HYDROPUNCH BORINGS

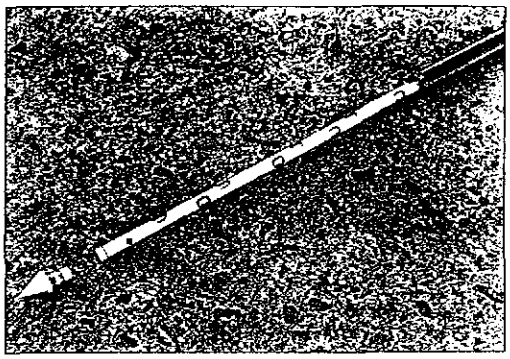
1) A concrete breaking auger is connected to an extension rod. The auger is turned and pushed down by hydraulic pressure, created by the truck mounted motor. This process is used to break the top layer of concrete.

2) Once the auger breaks the concrete, the water sample is collected through a screen point ground water sampler. The sampler is then collected to a plastic tubing, inserted in the ground, through the Geoprobe. A tubing bottom check valve and check ball are connected to the bottom of the tubing. The attached pages explain in details the water sample retrieving methods.

3) Once the water sample is retrieved, the sample is collected in a 40 ml vial tube, 1 liter amber bottle, and/or a 1 liter plastic bottle. Upon being filled, the vial and bottle are sealed with Teflon-lined screw caps, labeled, immediately placed in a 4°C ice chest, and delivered to a State Certificate Environmental Laboratory for analysis.

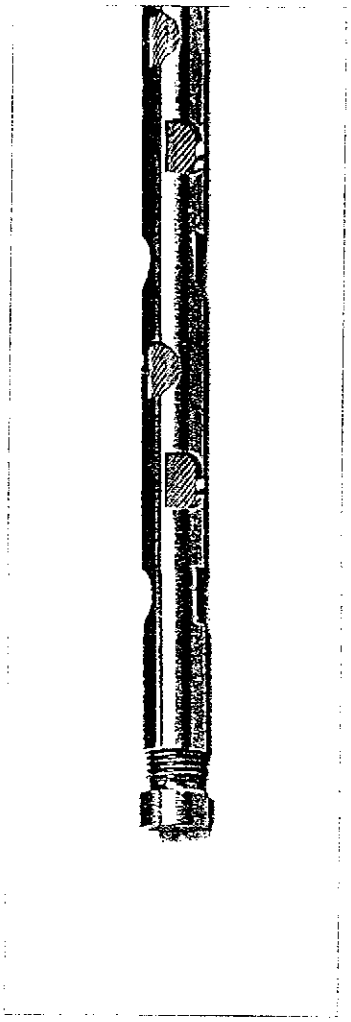
4) Following sampling, all borings are sealed with cement/ 5% bentonite.

Screen Point Ground Water Sampler Operation



After the Screen Point Ground Water Sampler is driven to depth, the rods are retracted and the screen insert is pushed out into the formation.

Screen Point Ground Water Sampler – Operation



Wire mesh stainless steel Screen Insert inside stainless steel Screen Sleeve. Screen Insert has 0.145-mm pore openings which filter out sediment.

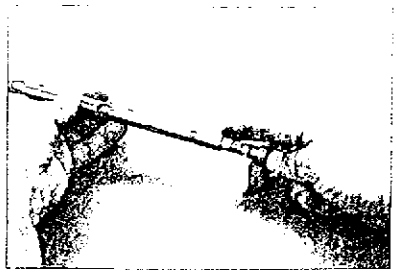


Figure 1. Push the Screen Insert and Plug into Screen Sleeve.

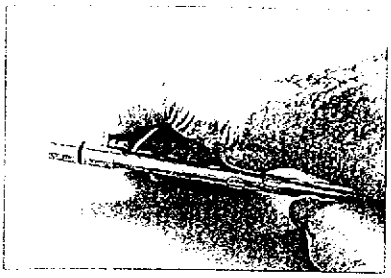


Figure 2. Push the Screen Connector Pin into place.

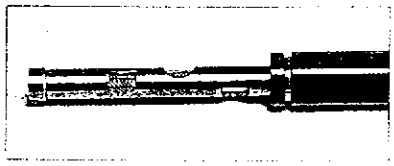


Figure 3. Insert Screen Sleeve halfway into Screen Point Sampler Sheath.

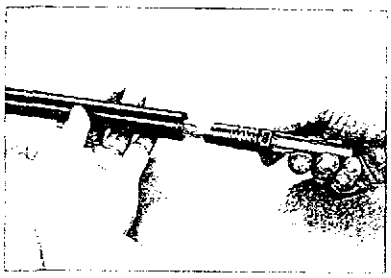


Figure 4. Slide Drive Point Seat over end of Screen Sleeve and screw into Sampler Sheath.

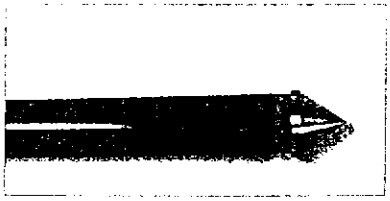


Figure 5. Insert Expendable Drive Point into Drive Point Seat.

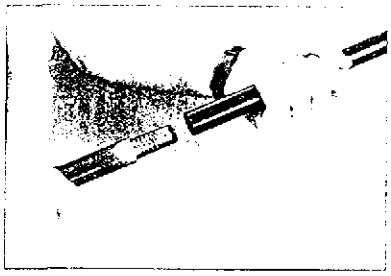
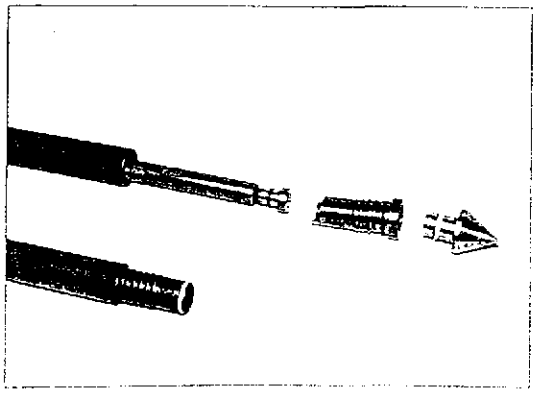
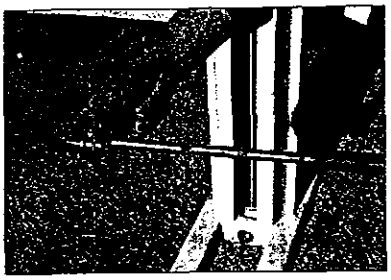


Figure 6. Screw O-ring end of Drive Head into top of Sampler Sheath.

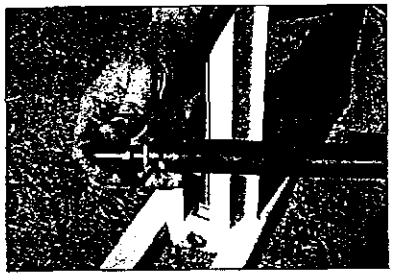


Partially assembled Screen Point Sampler (GW-440K).

Screen Point Ground Water Sampler – Operation

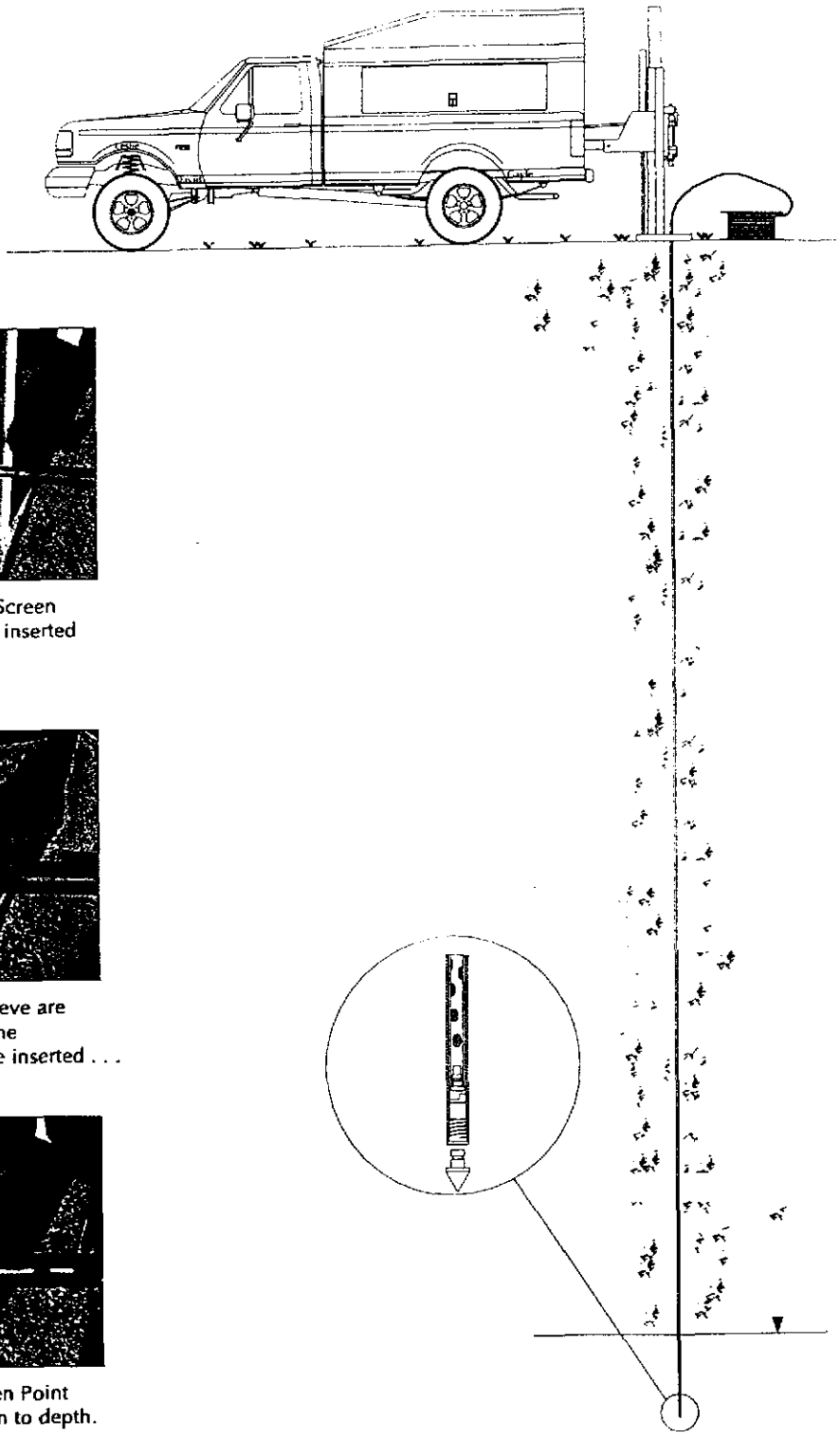


An Expendable Drive Point, Screen Insert, and Screen Sleeve are inserted into Sampler Sheath . . .



. . . the Screen Insert and Sleeve are inserted just far enough for the Expendable Drive Point to be inserted . . .

. . . and the assembled Screen Point Sampler is ready to be driven to depth.



Screen Point Sampler at depth using Tubing Bottom Check Valve system for retrieving groundwater sample.

Screen Point Ground Water Sampler – Operation

Probing

Place a drive cap on the assembled sampler and drive it into the subsurface (Figure 1). Continue driving by adding Geoprobe probe rods until the sampler tip has been driven about one foot (1225 mm) below the target sampling depth (Figure 2). Once that depth has been reached, disengage the expendable drive point by replacing the drive cap with a pull cap and pulling the rods back a distance of about 2 ft (1 m) (Figure 3).

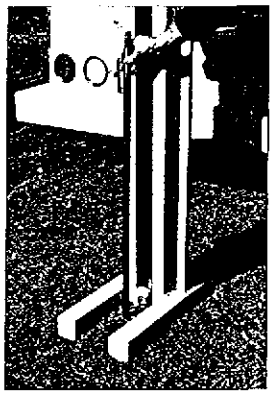


Figure 1. Assembled Screen Point Sampler is driven to depth.

Exposing the Screen

In stable formations, the screen assembly may be pushed out into the open borehole by lowering 3/8-in. tubing affixed with a PRT Adapter (TB-25L and PR-25S) to the top end of the screen assembly (Figure 4). The threads on the PRT adapter are engaged with the threads on the Screen Connector by pushing gently downward on the tubing and rotating it counterclockwise. When properly connected, the screen assembly can be pushed out of the Sampler Sheath by pushing down on the tubing. A water sample can be drawn through the tubing.

In unstable formations, the screen assembly may have to be pushed out of the Sampler Sheath by means of extension rods coupled together and inserted down the inside of the probe rods (Figure 5). The leading end of the extension rods should be equipped with an extension rod coupler to protect the threads on the Screen Connector. A steady push is sufficient. Excessive hammering on the rods should be avoided. After pushing the screen into the formation, the extension rods need to be removed in order to begin sampling.

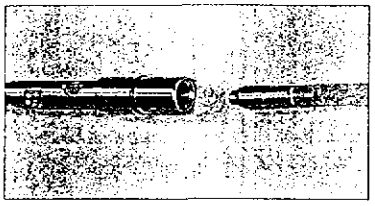


Figure 4. PRT-Adapter (PR-25S) inserted in tubing (TB-25L) prior to connection down-hole with Screen Connector.

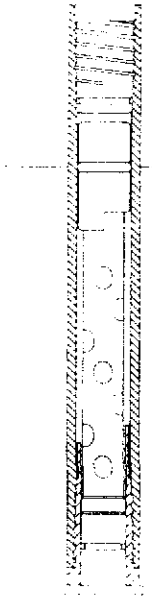


Figure 2. Sample Depth is Reached.

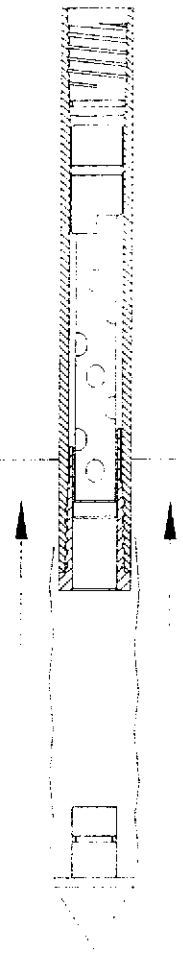


Figure 3. Pull Back Sampler 2 ft. (1 m).

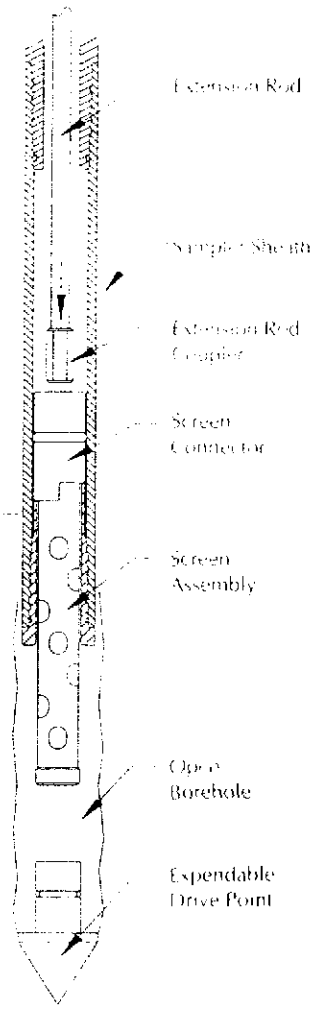


Figure 5. Push Out Screen Assembly with Extension Rods.

Screen Point Ground Water Sampler – Operation

Sampling

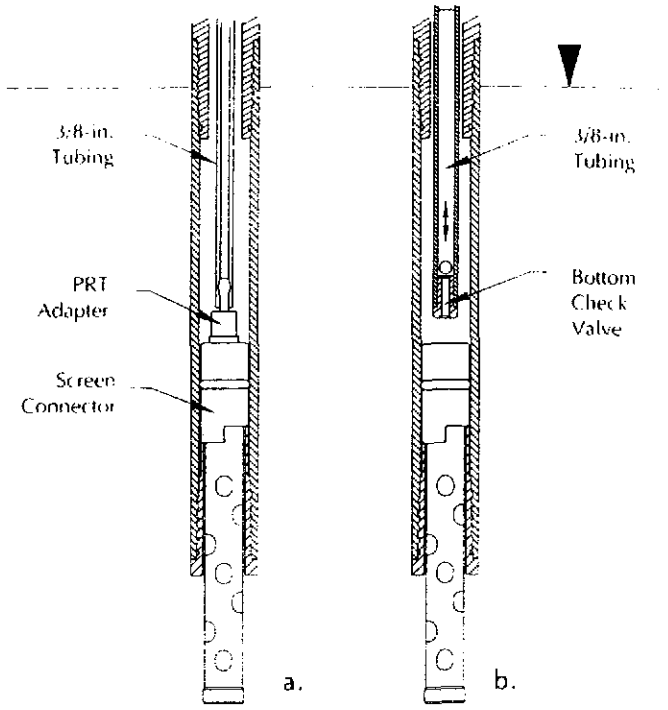
Water sampling may be accomplished by using 3/8-inch tubing and a stainless steel PRT adapter as previously described (TB-25L and PR-25S). Once the PRT adapter has made connection with the Screen Connector, a vacuum may be applied to the top of the tubing (Figure 6a). This may be done with a peristaltic pump (Figure 7) or by using a vacuum pump with an in-line trap.

If the PRT system is not used, the same tubing equipped with a Tubing Bottom Check Valve (GW-42) may be used (Figures 8 and 9). The tubing is oscillated up and down and the water sample is pushed upward into the tubing as the ball repeatedly lifts and seats (Figure 6b). The tubing will begin to feel heavier as it fills with several feet of water. It can then be lifted out of the probe rods, cut, and the water poured into a vial for analysis. This same tubing/check valve arrangement has been used to pump multi-liter samples from the probe rod.

Removal

When the sampling procedure is finished, the probe rods and sampler may be extracted. If the PRT system is used, remove the tubing by pulling up firmly on it until it disconnects from the PRT adapter down-hole. The PRT adapter will remain attached to the Screen Connector.

After the sampler has been recovered, examine all parts for wear, damage, or contamination. Thoroughly clean all parts, replace all O-rings, and prepare for the next sample.



Figures 6a and 6b. Sampling options.

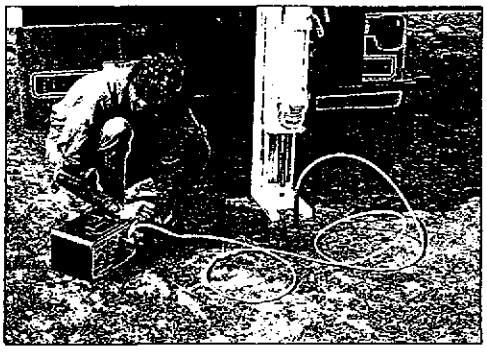


Figure 7. Using a peristaltic pump to collect a groundwater sample using the Screen Point Sampler.

Figure 8. Tubing Bottom Check Valve and Check Ball are installed onto Tubing . . .

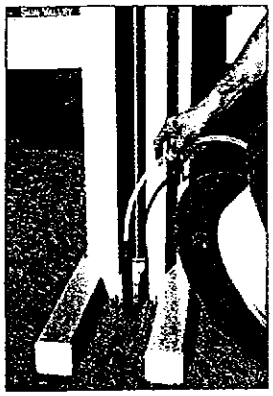


Figure 9. . . . and are then fed through the diameter of the probe rods to retrieve the water sample.