

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

SCOPE OF WORK
AIR SPARGING/HOT SPOT RESPONSE
January 26, 2008/CP

BISHOP TUBE SITE
East Whiteland Twp., Chester Co.

Prepared by:
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Hazardous Sites Cleanup Program
Southeast Regional Office

I. Site Description and Background

The Bishop Tube Site ("Site") is located on Malin Road, south of U.S. Route 30, in Frazier, East Whiteland Township, Chester County. The Site is situated at latitude 40° 02' 24" N and longitude 75° 32' 13" W, and appears on the Malvern, PA 7.5 Minute Series Quadrangle. A Site location map is attached to this document (Figure 1). The Site was utilized from the 1950s until 1999 for the manufacture and processing of metal alloy tubes and associated equipment. Several companies conducted these operations during this period. Tube production concentrated on seamless stainless steel products for much of the period of operation. Hazardous substances were employed in the manufacturing processes throughout the history of manufacturing at the site. Most notably trichloroethene (TCE) was utilized in two vapor degreasers, processed in onsite distillation units and stored in an above ground tank at the site. Investigations conducted on behalf of a former site owner revealed extremely high levels of TCE in groundwater at the site. The Department's GTAC contractor, Baker Environmental, has conducted an investigation of on site soil, sediment, surface water and groundwater. In addition to TCE, fluoride, chromium (total) and nickel have been found in on-site groundwater at levels exceeding the Pennsylvania residential Medium Specific Concentrations (MSCs).

The 13.7 acre Bishop Tube property is currently owned by Constitution Drive Partners Ltd., which purchased it from the Central and Western Chester County Industrial Development Authority (C&WCCIDA) in 2005, with the intention of redeveloping the property for commercial/light industrial use. C&WCCIDA acquired the property from Christiana Metals in early 2000. Two adjoining manufacturing buildings on the site occupy 3.2 acres. The remainder of the property primarily consists of paved and gravel storage/parking areas, with limited undeveloped grass and wooded areas. Topography slopes from 500 ft mean sea level (MSL) at the southern property boundary to 350 ft MSL at the northern property boundary. Considerable cutting and filling were conducted at the site to accommodate the building and parking areas. The Bishop Tube property is

currently not occupied. However, the recent purchaser of the site is developing plans for the site. The developer has agreed to address the three soil "hot-spots" identified during the Department's site characterization.

The area of the Site is in the town of Frazier, which is characterized by mixed commercial and residential land uses. Public water is available in the area of the Bishop Tube Site. However, one home, located down gradient of the site, is supplied by a private well. A full house carbon filtration system equipped with an ultraviolet light for disinfection was installed at the affected residence in 1999, at the expense of Christiana Metals. The General Warren Village residential area borders the site to the east across Little Valley Creek from the former manufacturing plant. Little Valley Creek is designated as an Exceptional Value stream under the Department's Water Quality Regulations. Rail lines border the site to the north (Norfolk Southern) and south (Amtrak). A drainage swale is present adjacent to the property on the Norfolk Southern right-of-way. An Exxon Mobil bulk fuel storage terminal is located just west of the site across Malin Road. A figure depicting the layout of the site is attached to this document (Figure 2).

The site was initially discovered by the Department when fluoride contamination was detected in a stream discharge in the early 1980's. TCE was detected in monitoring wells at the site in 1987 in the course of a Site Inspection conducted by NUS Corp. for the US EPA. Monitoring wells were installed at the site in 1981, 1987, 1992, and 1993 as part of a voluntary site characterization by Christiana Metals. The extent of off-site contamination is not fully known. The contaminated home well is located along Conestoga Road, approximately 1500 feet northwest of the site. TCE has been detected in wells located at the Worthington Steel facility located approximately 1 ¼ mile east northeast of Bishop Tube. An additional well installed at 30 Conestoga Road was found to contain TCE at approximately 9 mg/l. Because of the contamination, the well has not been used as a drinking water supply.

Baker Environmental (Baker) has conducted a three phased environmental investigation on behalf of the Department. These investigations have focused on soil, surface water, and groundwater conditions on the Bishop Tube property. Three main areas of soil contamination were identified at the site including, areas beneath former vapor degreasers in the upper and lower buildings and under a former drum storage area. Baker has concluded that dense non-aqueous phase liquids (solvent mixtures also known as DNAPLs) have migrated through the soil and into the fractured bedrock in these areas. Baker installed eight additional wells at the site, including four wells screened in three discreet water-bearing intervals. In addition to the wells installed for monitoring at the site, Baker has sampled the well at 30 Conestoga Road for four consecutive quarters. Maximum concentrations of TCE have been detected in monitoring well MW-26C, which monitors a deep bedrock water-bearing zone near the northeast corner of the site. This finding is consistent with published information concerning regional groundwater flow.

Presently, Baker is conducting a Feasibility Study aimed at evaluating potential remedial options for addressing shallow groundwater, which is impacting surface water just downgradient from the former manufacturing area. Baker is also providing technical assistance to the Department in evaluating design information submitted on behalf of the new property owner (Constitution Drive Partners, LLP. or "CDP"). The new owner reached a Prospective Purchaser Agreement (PPA) with the Department on March 17, 2005. The PPA required the new owner to implement active remedial measures to address three unsaturated soil hotspot areas. CDP has proposed remediation of soils in the hotspot areas by Soil Vapor Extraction (SVE), and proposed an effort to partner with the Department to address saturated-zone soils and groundwater contamination beneath the former Plant 8 TCE vapor degreaser, distillery, and pipeline. CDP hopes to benefit from this partnership by resolving sub floor remediation in a more timely and efficient manner. Such a partnership could benefit the Department by providing infrastructure and meeting design needs for our anticipated action(s) in the same areas.

The Department has been involved in negotiations with CDP to determine a strategy to off-set their costs associated with the air sparging component of the remedy as well as a mechanism for continued system operation to address the saturated zone soils after unsaturated zone soils are remediated. As a result of these negotiations, the Department has agreed to perform certain components of system installation and to assume responsibility for system operation to balance these costs. The Department intends to perform this work as an Interim Response Action.

II. Objectives

The purpose of this document is to summarize the Scope of Work (SOW) necessary to implement a coordinated response action to address contaminated hot spots at the Bishop Tube site. The planned work will include installation of air sparging and soil vapor extraction wells, an operation oversight period, and operation and maintenance of the Air Sparging/Soil Vapor Extraction (AS/SVE) system. This specified work will be conducted in close collaboration with the Department's General Technical Assistance Contractor and contractors retained by the property owner/developer.

The Department in consultation with our contractors will develop performance metrics to evaluate system operation and to determine operational strategies to reach performance goals. The Department may determine that an alternate treatment technology should be employed (i.e. biological remediation or *in situ* chemical oxidation) to enhance or complete the remediation. The selected IRRSC contractor would be involved in the implementation of an alternate remedial strategy, if needed.

III. Tasks

A scoping meeting, file review, and site visit will be scheduled upon assignment. This will provide contractor personnel an opportunity to become familiar with the site and the characterization information collected by the Department. This meeting may also involve representatives of the site owner's consultant and the Department's GTAC contractor. After the visit/meeting the contractor shall prepare a brief Work Plan and Cost Estimate.

This work plan shall include plans for implementing the tasks described below. The Department will review the Work Plan and Cost Estimate and provide comments (if necessary). After receiving any Department comments the contractor will submit a final Work Plan and Cost Estimate for our approval. Upon issuance of a Notice to Proceed, the contractor will implement the tasks outlined in the Work Plan. The Department anticipates that installation of AS/SVE wells will need to be initiated quickly, because it is a critical path item for system installation.

The following tasks will be completed under this requisition:

Soil Vapor Extraction Well Installation

The selected contractor will utilize a well driller licensed by the Chester County Health Department to install approximately 41 soil vapor extraction wells at locations selected by the Department in consultation with our contractors and representatives of the site owner. Because of the complexities associated with this work, the Department recommends that prospective contractors attend a mandatory pre-bid meeting/walk at the site. Wells will be installed using hollow-stem auger drilling methodology in three areas contaminated by chlorinated solvents. Two of these areas are located within former manufacturing buildings at the site. Figure 3 depicts the anticipated locations of the proposed SVE wells. Figure 4 depicts the anticipated design of the SVE wells. Because of high contaminant concentrations, the driller must be prepared to upgrade to Level C respiratory protection. Air monitoring during the drilling operation will be the responsibility of the assigned IRRSC contractor. Heavy-duty steel 12" manholes with collars will be required for some of the wells. These flush-mounted access ports will be installed when the site owner installs concrete flooring to accommodate use of the building(s). Other SVE wells may be completed above grade, depending on the anticipated operating time and occupancy schedule. The driller will be responsible for decontaminating all equipment prior to mobilization, between each well location, and prior to demobilization from the site.

Detailed construction logs will be prepared and submitted to the Department for all SVE wells.

The contractor will be responsible for containerizing all cuttings, well fluids, decontamination fluids/materials, and PPE wastes (commonly known as IDW) generated during the well drilling activities. These materials will be staged at a centralized location on site for characterization, in preparation for transportation and treatment/disposal at an approved off-site facility. Depending on the owner's plan for removal of portions of the slab in the Plant 8 vapor degreaser area, soil cuttings may be incorporated into the SVE remedy for this area.

Air Sparging Well Installation

The selected contractor will utilize a well driller licensed by the Chester County Health Department to install approximately ten Air Sparging (AS) wells at locations selected by the Department in consultation with our contractors and representatives of the site owner. Because of the complexities associated with this work, the Department recommends that prospective contractors attend a mandatory pre-bid meeting/walk at the site. Wells will be advanced to refusal (bedrock) using hollow-stem auger and/or air rotary drilling methodology in a single area contaminated by chlorinated solvents. Split-spoon samples will be collected at three of these locations. Use of air-rotary drilling may be required depending on field conditions and the nature of the weathered bedrock interval. The area to be treated by air sparging is located within the former manufacturing building (Plant 8) at the site. The locations of the proposed AS wells will be determined based upon ongoing pilot testing performed by consultants for the site owner. Because of high contaminant concentrations, the driller must be prepared to upgrade to Level C respiratory protection. Air monitoring during the drilling operation will be the responsibility of the assigned IRRSC contractor. Heavy-duty steel 12" manholes with collars will be required for all air sparging wells. These flush-mounted access ports will be installed when the site owner installs concrete flooring to accommodate use of the building. Figure 5 depicts the anticipated design of the AS wells. The driller will be responsible for decontaminating all equipment prior to mobilization, between each well location, and prior to demobilization from the site.

The contractor will prepare and submit detailed well construction logs for all AS wells. Where split spoon samples are collected, the contractor will prepare and submit detailed soil/geologic logs.

The contractor will be responsible for containerizing all IDW generated during the well drilling activities. These materials will be staged at a centralized location on site for characterization, in preparation for transportation and treatment/disposal at an approved off-site facility. Depending on the owner's plan for removal of portions of the slab in the Plant 8 vapor degreaser area, soil cuttings may be incorporated into the SVE remedy for this area.

Electrical Connection

The contractor will be responsible for connecting the remediation system plant to the nearby PECO power line. This work will be done in coordination with contractors for the site owner, who will be responsible for internal plant wiring.

IDW Waste – Transportation and Disposal

The selected contractor will arrange for transportation and treatment and/or disposal of all IDW waste generated (by work performed under this requisition) at a Department approved facility.

Remedial System Construction/Prove-out Period Oversight

The selected contractor will provide oversight during installation and initial operation of the treatment system. Initially, a contractor retained by the site owner will operate the system. This oversight will help assure the quality of the system and compliance with design standards. The contractor will use this oversight to gain operational knowledge of the system. During this period the contractors retained by the site owner will be preparing an Operations and Maintenance Manual for the remediation system. The selected IRRSC contractor will be involved in the review of this document along with the Department.

The prove-out oversight period will serve as a training period for the selected contractor. After the owner completes the prove-out period, the IRRSC contractor will operate the remedial system until performance criteria are achieved or an alternate remedial strategy is selected.

Remediation System Operations, Maintenance, and Monitoring

The selected contractor will be responsible for operating the treatment system and performing regular maintenance in a manner, which maximizes remedial system performance efficiency. System performance will be measured by the selected contractor on a regular basis or continuously through collection/screening of air influent and effluent volume and concentration data. This data will be used to calculate mass removal from each hot spot area. Influent data (overall system or well specific) will be used to determine if adjustments are required to improve system effectiveness. Effluent data will be used to assess the performance of emissions treatment equipment, which must be maintained to prevent transfer of site contaminants to the air. System operation may involve change-out, handling and off-site treatment/disposal of treatment media (i.e. spent activated carbon) if a destructive treatment method is not chosen for the system effluent.

In addition to the day-to-day operation of the system, the contractor will be responsible for monitoring to assess system performance, perform adjustments, and ultimately to establish that remediation has been completed. This monitoring may involve, groundwater sampling and/or soil sampling. The contractor will consult with the Department and potentially with a GTAC contractor to evaluate the system. If the system's performance proves to be unsatisfactory, and an alternate remedial strategy (preferably using the same infrastructure) is selected, the IRRSC contractor will be responsible for implementation of the selected remedial strategy.

System Shutdown and Close-out

Upon attainment of remedial objectives, the Department will direct the contractor to discontinue system operations. This shutdown may involve abandonment of some AS and SVE wells, conversion of some wells into monitoring points, and removal of treatment media or other equipment. When system shutdown is appropriate, the Department will work with the facility owner to determine the tasks to be assigned to the IRISC contractor.

Reporting

The contractor will be responsible for preparing monthly reports to document system performance, adjustments, maintenance, sampling, and other activities. A report format will be developed in consultation with the Department, and reports will be submitted to the Department electronically.

At the conclusion of the project the contractor will prepare an End-of-Project Report summarizing the activities conducted at the site. In addition to the narrative summary, the report will include performance monitoring data and data collected to verify attainment of remedial objectives.

IV. Special Requirements

The assigned contractor and the Department will be required to coordinate our activities in close consultation with the site owner. The assigned contractor will also be working in consultation with the Department's GTAC contractor during the project. The GTAC contractor will be evaluating remedial options for addressing contaminated groundwater within the fractured bedrock beneath and down-gradient from the former Bishop Tube plant.

V. Deliverables:

The following is a list of deliverable documents to be provided under this Statement of Work:

<u>Document</u>	<u>Number of Copies</u>	
	<u>Region</u>	<u>Central Office</u>
Draft Work Plan/Cost Estimate	2	1
Final Work Plan / Cost Estimate	3	1
Draft End-of-Project Report	2	1
Final End-of-Project Report	3	1
Monthly Progress Reports	(email)	(email)

The contractor will prepare the appropriate number of hardcopies of each deliverable for review by the Department. In addition to the hardcopies specified above, final versions of the Work Plan/Cost Estimate and End-of-Project Report will be submitted in electronic format (read-only) on CD-ROM to the Region and Central Office. The copies shall be delivered as follows:

Regional Copies:

Dustin A. Armstrong
 Pennsylvania Department of Environmental Protection
 2 East Main St.
 Norristown, PA 19401

Central Office:

Contract Manager
 Pennsylvania Department of Environmental Protection
 Division of Remediation Services
 P.O. Box 8471
 Harrisburg, PA 17104-8471

VI. Conflict of Interest Determination

The contractor shall evaluate the following list of parties to determine if any conflict of interest exists. The contractor shall notify the Department if any exist.

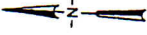
Christiana Metals
125 Strafford Ave., Suite 100
Wayne, PA 19087

Alloy Steel Corporation
21 Seneca St.
Oil City, PA 16301

Marcegaglia USA Damascus Division
795 Reynolds Industrial Park Rd.
Greenville, PA 16125

Whittaker Corporation
1955 N. Surveyor Ave.
Simi Valley, CA 93063

Johnson Matthey, Inc.
460 E. Swedesford Rd.
Wayne, PA 19087



LEGEND

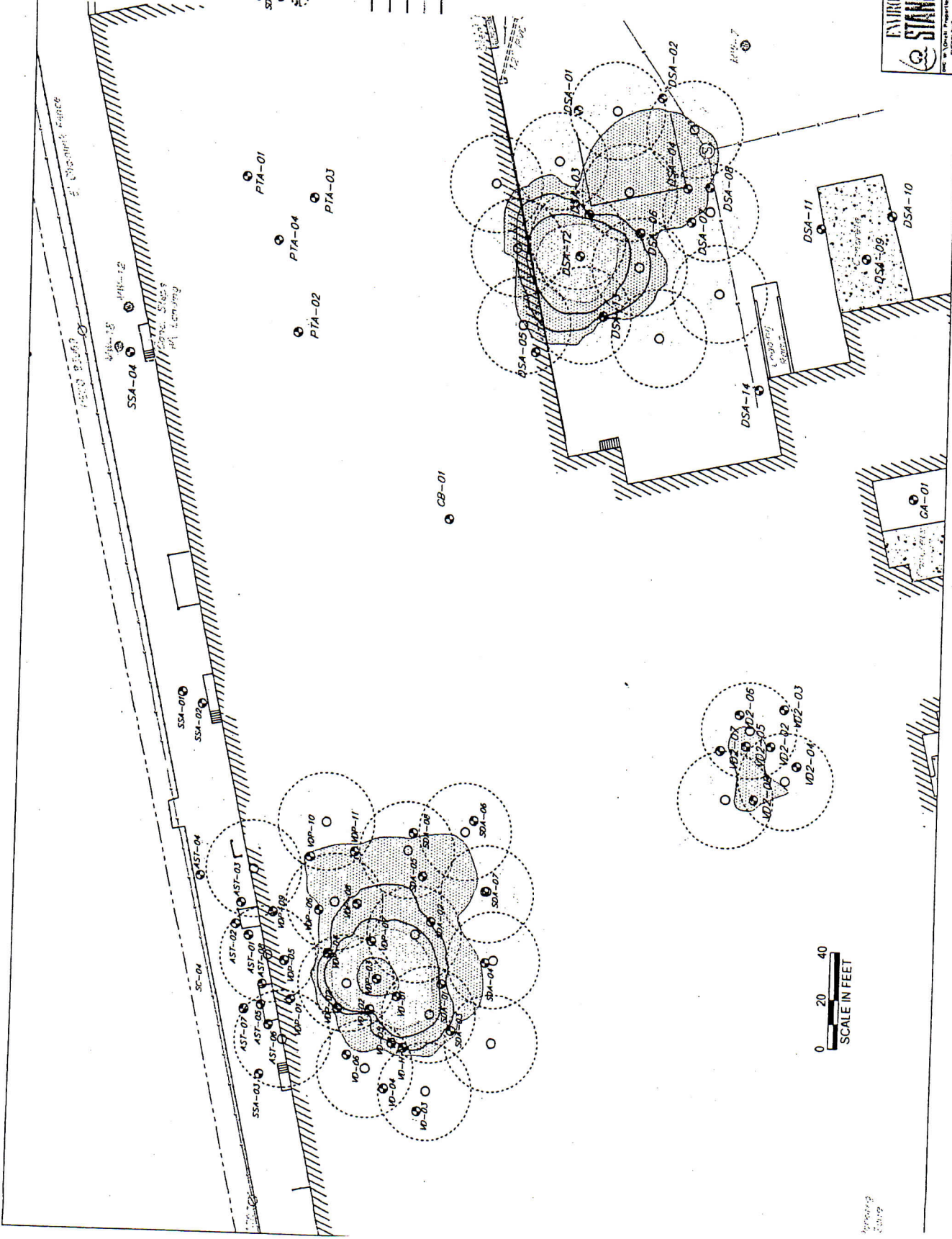
- SOIL BORING LOCATION
- SVE WELL LOCATION
- SVE WELL RADIUS OF INFLUENCE
- SVE SYSTEM PIPING

TCE CONCENTRATIONS (µG/KG)

500
10,000
100,000
500,000
1,000,000
5,000,000

SCOPE OF WORK
FIGURE 3

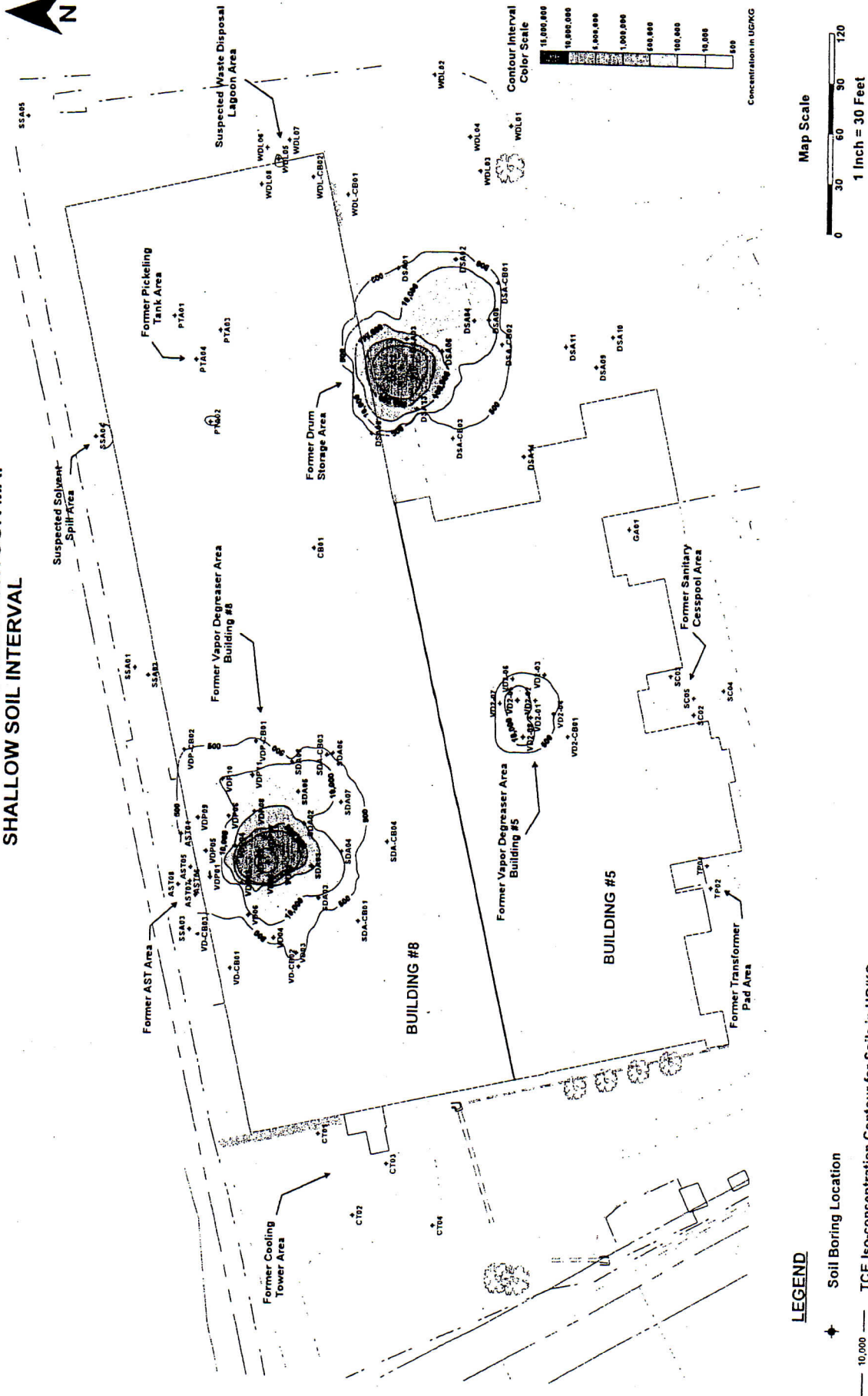
ENVIRONMENTAL STANDARDS
 FIGURE 1: SVE PRELIMINARY DESIGN AND TCE ISOCONCENTRATIONS
 DATE: 01/10/05
 SHEET: 0



0 20 40
SCALE IN FEET

FIGURE 3
BISHOP TUBE SITE

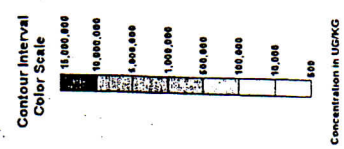
TCE SOIL ISO-CONCENTRATION CONTOUR MAP
SHALLOW SOIL INTERVAL



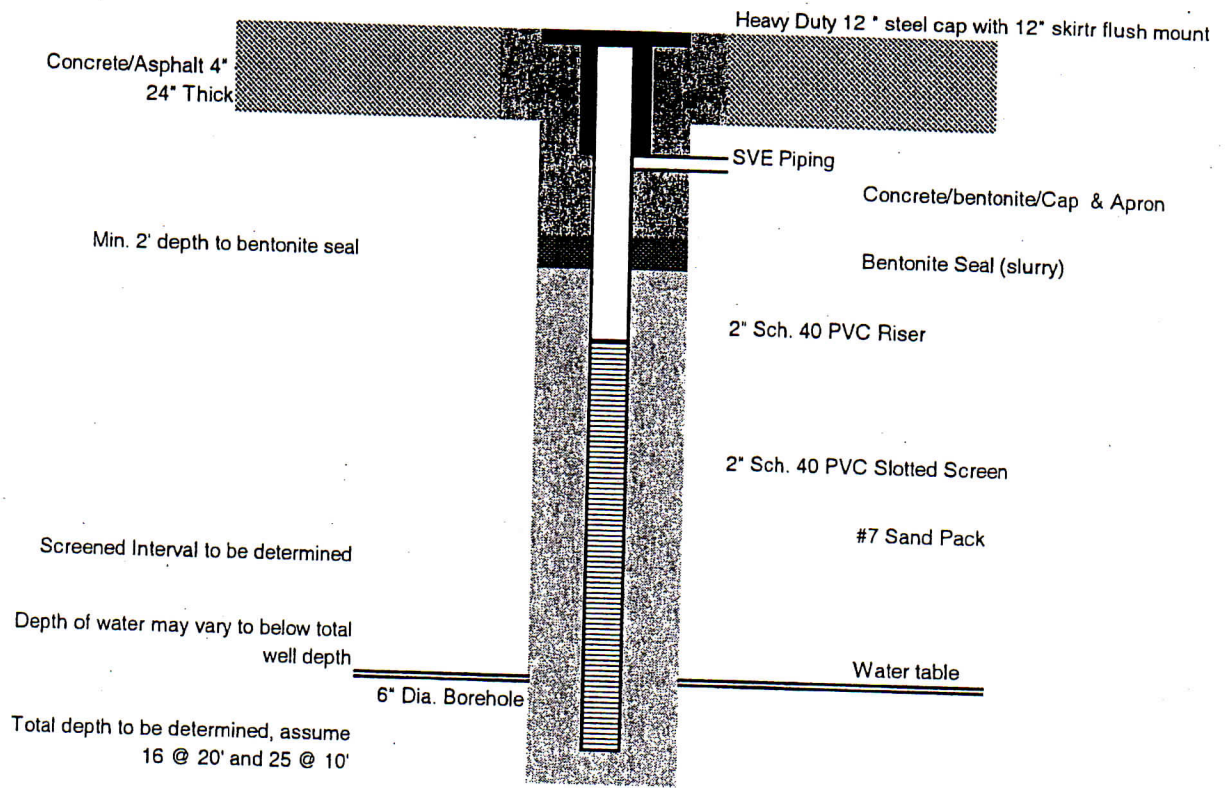
SCOPE OF WORK
FIGURE 2

LEGEND

- ◆ Soil Boring Location
- 10,000 TCE Iso-concentration Contour for Soils in US/KG
- Areas Covered by Concrete

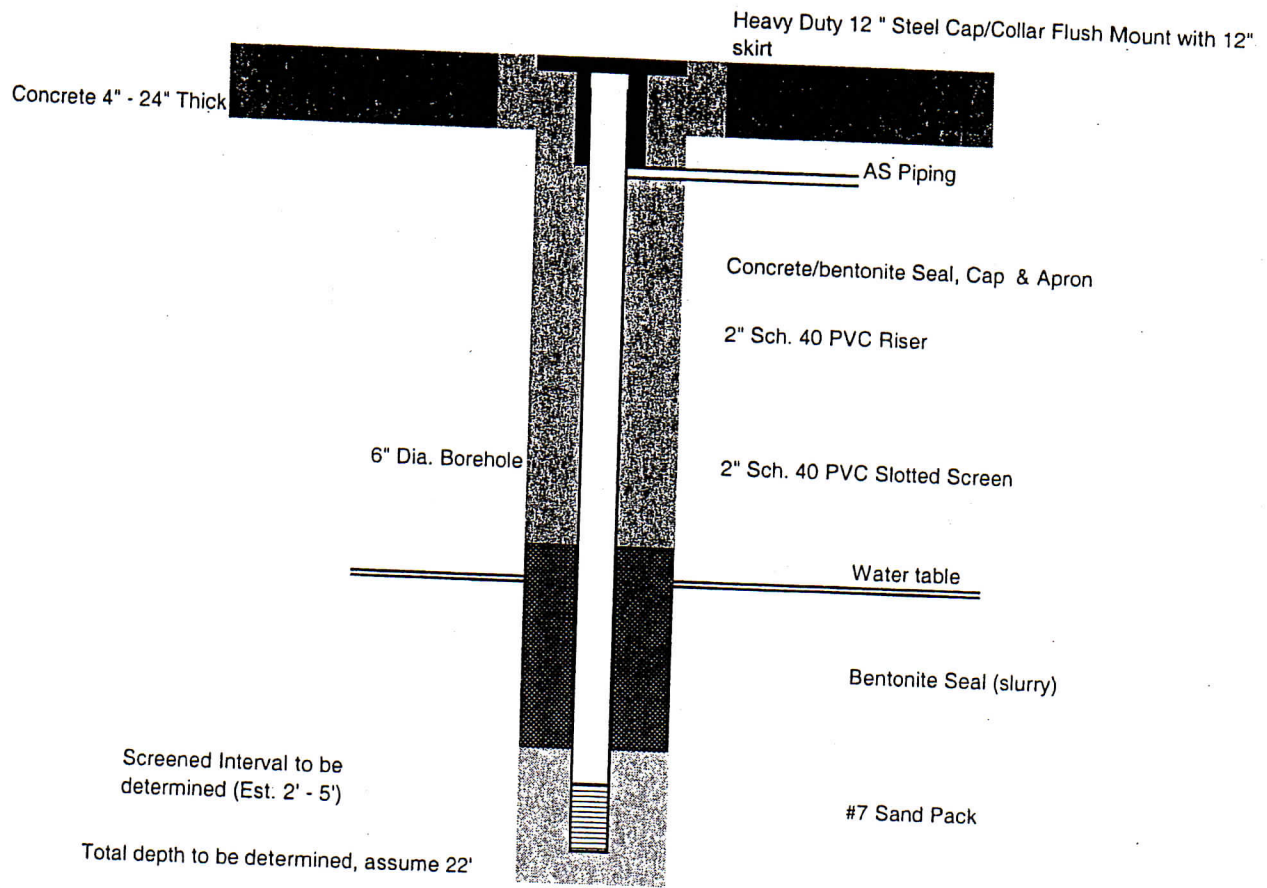


TCE Concentrations Based Upon Analytical Results for Soil Samples Collected from Borings Drilled Using Hydraulic-Push Technology.



Not to scale

Figure 4
Typical SVE Well Construction



Not to scale

Figure 5
 Typical AS Well Construction