"Engineering Evaluation/Cost Analysis (EE/CA)", Aerovox, Inc., New Bedford, Massachusetts, prepared by Blasland, Bouck & Lee, Inc. (BBL), Syracuse, New York, at the request of Ropes & Gray, attorneys for Aerovox, dated August 1998.

With the exception of *Section 1, Introduction*, only sections or parts of this report containing information used by the EPA On-Scene Coordinator in determining activities for the current time-critical removal action at this site are included in this Administrative Record File. All other sections, tables, figures, and attachments are omitted. (Aerovox completed this Engineering Evaluation/Cost Analysis (EE/CA) in November 1998, pursuant to the National Contingency Plan (NCP), 40 C.F.R. 300.415, with the intention of performing the cleanup at the site as a non-time-critical removal action.)

TECHNICAL REPORT

Engineering Evaluation/ Cost Analysis (EE/CA)

Aerovox, Inc.
New Bedford, Massachusetts

August 1998

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1. Introduction

1. Introduction

1.1 General

This report presents the Engineering Evaluation/Cost Analysis (EE/CA) for implementation of a non-time critical removal action to address chemicals of concern at the Aerovox, Inc. (Aerovox) facility (the site) located in New Bedford, Massachusetts. This EE/CA has been prepared by Blasland, Bouck & Lee, Inc. (BBL) at the request of Ropes & Gray, attorneys for Aerovox, and presents an analysis of removal action alternatives for the site.

The United States Environmental Protection Agency (USEPA) has determined that a removal action is appropriate for the Aerovox facility pursuant to Section 106 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and that at least six months of planning time exists before on-site removal activities must be initiated. Accordingly, the removal action to be implemented is non-time critical [40 CFR 300.415(b)(4)].

As presented in USEPA's *Guidance on Conducting Non-Time Critical Removal Actions Under CERCLA* (August 1993), non-time critical removal actions may be interim or final actions depending upon the conditions of the site and the specific goals and objectives of the removal action. The National Contingency Plan (NCP) [40 CFR 300.415(e)] provides some examples of removal actions, including measures that limit access; reduce migration and prevent contact through containment or capping; remove materials that contain chemicals of concern; excavate/consolidate source materials; or provide treatment, disposal or incineration.

1.2 Purpose and Scope of this EE/CA

The purpose and scope of this EE/CA is to identify the objectives and goals of the removal action for the Aerovox facility and to analyze the effectiveness, implementability, and cost of appropriate removal action alternatives that satisfy these objectives. This EE/CA also provides a vehicle for public involvement, as it will be made available for public comment in accordance with 40 CFR 300.415(n). Additionally, this EE/CA, along with other documents/information which form the basis for the removal action to be implemented at the Aerovox facility, will be part of the USEPA's Administrative Record File. As detailed in 40 CFR 300.820(a), the Administrative Record File shall be made available for public inspection when the EE/CA is made available for public comment.

1.3 Removal Action Process

The USEPA issued a July 15, 1998 Approval Memorandum (Memorandum) to initiate the EE/CA process. This Memorandum justifies conducting an EE/CA by documenting that the site conditions at the Aerovox facility meet the NCP criteria for initiating a removal action and that the proposed action is non-time critical. A copy of this Memorandum is provided as Attachment 1.

Prior to the start of the non-time critical removal action public comment period, the USEPA will publish a Notice of Availability and a brief description of the EE/CA. This notice will announce the public comment period during which the public has the opportunity to review and comment on the EE/CA and the proposed removal action. A written response to each significant comment received during the public comment period will be produced and included as the Responsiveness Summary in the Action Memorandum. The results of the EE/CA, along with the USEPA's response decision, will be summarized in the Action Memorandum. Once the Action Memorandum and the Responsiveness Summary are prepared, the removal action will be initiated. An Administrative Record File for the removal action will be established and made available for public inspection as specified in the NCP (Sections 300.820 and 300.825). The non-time critical removal action process is presented on Figure 1.

1.4 Report Organization

This EE/CA report is organized as follows:

- Section 2.0 presents the site characterization, including a summary of the site location and physical setting, regional geology, site history, recently completed removal investigation activities, and a streamlined risk evaluation. This section also presents a summary of information regarding the geology/hydrogeology of the site;
- Section 3.0 identifies the potentially applicable or relevant and appropriate requirements (ARARs) associated with a removal action at the site;
- Section 4.0 identifies the scope, goals, and objectives of the removal action;
- Section 5.0 identifies and presents an analysis of removal action alternatives; and
- Section 6.0 presents a comparative analysis of the removal action alternatives and the recommended removal action.

2. Site Characterization

2. Site Characterization

2.1 General

This section, consistent with USEPA guidance, presents the site characterization information that supports the scope and selection of an appropriate removal action. Accordingly, this section consists of the following subsections:

- Location and Physical Setting;
- Regional Geology;
- Site History;
- Recently Completed Removal Investigation Activities (including a site-specific summary of geology/ hydrogeology information); and
- Streamlined Risk Evaluation.

Much of the information presented in this section regarding location and physical setting, and site history was obtained from the *Building Demolition Alternative Report* (BBL, April 1998) and the *Soil Sampling Plan* (BBL, April 1998). This section also briefly summarizes previous investigations conducted at the facility including the November 1997 PCB Building Material/Equipment Investigation and the February 1998 soil sampling conducted beneath the concrete floor slab of the manufacturing building. A more detailed discussion of these activities and investigation results is presented in the *Building Demolition Alternative Report.*

This section also presents a description and the results of soil and ground-water sampling conducted at the facility during May 1998, in accordance with requirements set-forth in the *Soil Sampling Plan,* as revised to incorporate comments presented in a May 6, 1998 letter from Ms. Kimberly N. Tisa of the USEPA-Region 1 Office. The information associated with these additional sampling activities has not been previously reported; therefore, a detailed summary of these soil and ground-water sampling activities and analytical results is presented herein (Section 2.5.3).

2.2 Location and Physical Setting

The Aerovox facility is located on an approximately 10 acre parcel at 740 Belleville Avenue in New Bedford, Massachusetts. The location of the site is shown on Figure 2. The facility consists of one three-story building currently used to manufacture capacitors and related products. A parking lot is located south of the manufacturing building. Aerovox and various predecessor companies have occupied the site for over 80 years. During 1995, Aerovox purchased a small parcel located west of the original property (opposite Belleville Avenue) which has been used for additional parking space. The site is located within a highly developed urban/industrial area of New Bedford, Massachusetts. The Acushnet River borders the site to the east. The ground surface at the site slopes gently from the west to the east. The elevation along Belleville Avenue at the West edge of the original property is approximately 14 feet above mean sea level (MSL) while the elevation toward the eastern edge of the property (prior to reaching a seawall constructed along the bank of the Acushnet River) is generally between 4 and 7 feet above MSL.

The Aerovox manufacturing building, shown on Figure 3, encompasses approximately 450,000 square feet and consists of a western section that contains two floors and an eastern section that contains three floors. The exterior walls of the building are brick while the roof is constructed of wood. The first floor in the western section of the

building is estimated to be approximately 6 feet below grade while the first floor in the eastern section of the building is estimated to be approximately 1½ feet below grade. The first floor in both the eastern and western sections of the building is constructed of concrete. Structural components of the building include interior wood columns and steel I-beam floor joists. Wooden floors are present on the second floor of the western section of the building.

2.3 Regional Geology

The site is located in southeastern Massachusetts, near the northern extremity of the Acushnet River estuary, upstream of Apponagansett Bay which opens into the Rhode Island Sound and the Atlantic Ocean. The regional geology is characterized by crystalline bedrock, eroded and contoured by Pleistocene glaciation into a series of low amplitude valleys and ridges. Glaciation is also responsible for the majority of the unconsolidated sediments overlying the bedrock. These glacial deposits range from dense till to highly permeable outwash sand and gravel. A summary of site-specific geology/hydrogeology is presented in Section 2.5.3.2.

2.4 Site History

An investigation of the site was conducted during July and August 1982 pursuant to a Consent Order entered into by Aerovox in May 1982 with the USEPA under Section 106 of CERCLA, 42 U.S.C. 9606. Aerovox also entered into a similar Consent Order with the Massachusetts Department of Environmental Quality Engineering [now known as, and referred to hereafter, as the Massachusetts Department of Environmental Protection (MDEP.)] at the same time. The investigation focused on an unpaved area at the eastern end of the site bordering the Acushnet River and an unpaved strip of land to the north of the manufacturing building. Combined, these areas represent approximately a ½-acre area. The results of the investigation are presented in the *Report of Sampling and Analysis Program at the Aerovox Property, New Bedford, Massachusetts*, prepared by GHR, dated October 7, 1982. The results of the investigation indicated that polychlorinated biphenyls (PCBs) were present in soil at concentrations exceeding 50 parts per million (ppm) and PCBs were also present within the shallow, perched ground-water system at the site.

An evaluation of remedial action alternatives for the Aerovox property was prepared by GHR in accordance with the Consent Orders entered into by Aerovox in May 1982 with the USEPA and the MDEP. The final remedial action alternative selected for the property (as described in an article entitled *On-Site Containment of PCB-Contaminated Soils at Aerovox, Inc., New Bedford, Massachusetts,* prepared by John J. Gushue and Robert S. Cummings) consisted of capping the impacted soil areas (by paving with hydraulic asphalt concrete) and installing a steel sheet pile cutoff wall to serve as a vertical barrier to ground water and tidal flow into and out of the impacted soils. The approximate location of this vertical sheet pile wall is shown on Figure 3. Construction of the final remedial action alternative was started in October 1983 and completed in June 1984. In a letter dated September 21, 1984, the USEPA advised that Aerovox had fully complied with the Consent Order.

An assessment of soil and ground water at and in the vicinity of a former concrete oil containment bunker located south of the manufacturing building boiler room (shown on Figure 3) was conducted during July 1988 by GHR. The assessment was conducted following removal of two 10,000-gallon No. 6 fuel oil storage tanks and one 250-gallon condensate collection tank from the bunker during June and July 1988 by Clean Harbors, Inc. The assessment was conducted pursuant to a request from the MDEP after Aerovox reported that a release of petroleum had occurred at the property. The assessment involved the installation/sampling of soil borings and monitoring wells to determine the extent of petroleum in the vicinity of the former concrete oil containment bunker. An additional assessment of soil and ground water in the vicinity of the former concrete oil containment bunker was conducted during February and March 1989 to provide additional information required by the MDEP.

As required by the MDEP, a short-term measure was implemented at the facility to eliminate (or at a minimum, significantly reduce) the potential for further oil migration by removing the source material from the vicinity of the former concrete oil containment bunker. The short-term measure included the following work: 1) removing petroleum product and water from the concrete oil containment bunker; 2) excavating petroleum-impacted soils for on-site treatment and recycling into an asphalt base course for the parking lot; 3) constructing an oil-water separator to control and recover floating petroleum product; and 4) performing post-construction monitoring of the oil-water separator system to confirm the effectiveness of the short-term measure. Construction activities associated with the short-term measure were completed during November and December 1990. The MDEP determined that no further remedial action was necessary for this matter by a letter dated July 26, 1993.

An inspection of the manufacturing building was conducted by the USEPA during June 1997. As part of that inspection, the USEPA collected wood shaving samples from floor areas inside the manufacturing building and collected oil samples from various oil storage tanks/degreaser operations for PCB analysis. The USEPA data indicated the presence of PCBs in the wood floor samples at concentrations exceeding 50 ppm. PCBs were not detected above laboratory detection limits in the oil samples collected from tanks/equipment at the Aerovox facility. In October 1997, a consultant for Aerovox (East Coast Engineering, Inc.) under USEPA oversight collected wipe samples for PCB analysis. The analytical results indicated the presence of PCBs at concentrations greater than the USEPA-recommended cleanup criteria of 10 micrograms (ug) per 100 square centimeters (cm^2) for low- and high-contact interior surfaces as presented in the USEPA PCB Spill Cleanup Policy (40 CFR Part 761.120).

Subsequent to the June 1997 inspection conducted by the USEPA, BBL conducted additional investigation activities to support the USEPA-required removal action at the Aerovox facility. These activities are described in the following section.

2.5 Recently Completed Removal Investigation Activities

The recently completed removal investigation activities completed at the Aerovox facility are as follows:

- PCB Building Material/Equipment Investigation (November 1997);
- Soil Sampling Beneath Concrete Floor Slab (February 1998); and
- Soil and Ground-Water Sampling Activities (May and June 1998).

Presented below is a summary of the November 1997 PCB Building Material/Equipment Investigation and the February 1998 soil sampling conducted beneath the concrete floor slab of the manufacturing building; a more detailed discussion of these activities and investigation results is presented in the *Building Demolition Alternative Report.* Those summaries are followed by a detailed description and the results of soil and ground-water sampling activities conducted at the facility during May 1998, as this information has not been previously reported. A summary of site-specific geology/hydrogeology is also presented in this section.

2.5.1 PCB Building Material/Equipment Investigation

BBL conducted a PCB Building Material/Equipment Investigation in November 1997. The investigation included the additional sampling of building materials/equipment [i.e., full-core building material samples (wood, brick, and concrete), composite scrape samples of dust/dirt from elevated surfaces, wipe samples from non-porous building material surfaces (tile floor, painted walls, steel surfaces), and wipe samples from equipment]. The purpose of the additional sampling of building materials/equipment was to supplement the existing PCB data base, determine the

approximate extent of impacted building materials, develop information regarding the approximate quantities of different building materials, and characterize PCB concentrations on equipment surfaces inside the building.

Table 1 presents the analytical results for each full core sample and each dust/dirt scrape sample along with the sample identification number and building material type (wood, concrete, etc). Table 2 presents the analytical results for each wipe sample collected from non-porous building materials, appurtenances, and equipment inside the building.

The analytical results of full core samples collected during the investigation indicated that PCBs were present at concentrations greater than 50 ppm in samples collected from the following locations:

- The wood floor on the second and third levels of the eastern section of the building;
- The wood floor on the second level in the western section of the building; and
- The concrete floor on the second level in the western section of the building.

PCBs were also detected at concentrations greater than 50 ppm in each of the 12 dust and dirt scrape samples. Seventeen of the 18 wipe samples collected from non-porous building materials and appurtenances (electrical conduits and light fixtures) contained PCBs at concentrations greater than the Toxic Substances Control Act (TSCA) PCB Spill Cleanup Policy cleanup level of 10 ug/100 cm^2 for high- and low-contact surfaces. Ten of the 13 wipe samples collected from the surfaces of equipment at the Aerovox facility contained PCBs at concentrations greater than 10 ug/100 cm^2.

2.5.2 Soil Sampling Beneath Concrete Floor Slab

BBL conducted soil sampling activities beneath the concrete floor slab of the manufacturing building during February 1998. The purpose of the soil sampling was to characterize PCB concentrations in soil located directly beneath the concrete floor slab inside the building. Fifteen soil samples were collected from beneath the concrete floor slab at a depth of 0 to 2 inches beneath the concrete slab for PCB analysis. In addition, soil samples were collected at a depth of 2 to 6 inches beneath the concrete floor slab at 14 of the 15 soil sampling locations. The soil samples collected from the 2- to 6-inch depth interval were submitted to the laboratory and archived until the PCB analytical results for the samples from the 0- to 2-inch depth interval were determined.

The analytical results of the soil samples indicate that 5 of the 15 soil samples collected from the 0- to 2-inch depth interval contained PCBs at concentrations greater than 50 ppm. The 2- to 6-inch soil samples collected from two of these 5 soil sampling locations (which were initially archived) were analyzed for PCBs. The analytical results indicate that each of these samples also contained PCBs at concentrations greater than 50 ppm. Table 3 presents the analytical results for each soil sample analyzed. The location of each soil sample along with the associated PCB analytical result is shown on Figure 4.

2.5.3 Soil and Ground-Water Sampling Activities

This section presents a description of the investigation activities completed during May 1998 to characterize the soil and ground water that currently exist at the Aerovox facility. These investigation activities were conducted in support of the removal action and included the following:

- Soil Investigation; and

- Ground-Water Investigation.

Detailed descriptions of these soil and ground-water investigation activities and results, and a summary of site-specific geology/hydrogeology are presented below.

2.5.3.1 Soil Investigation

The soil investigation activities were conducted in accordance with the USEPA-approved *Soil Sampling Plan*, as revised to incorporate comments presented in a May 6, 1998 letter from Ms. Kimberly N. Tisa of the USEPA-Region 1 office.

The soil investigation activities consisted of the following:

- Collecting additional soil samples from beneath the floor of the manufacturing building from two sampling locations which exhibited elevated PCB concentrations during previous investigation activities conducted during February 1998; and

- Completing 17 soil borings in order to collect samples to characterize the soil located beneath the parking lot area outside of the manufacturing building.

Soil samples collected as part of the removal investigation activities were handled, labeled, packaged, and shipped in accordance with the protocols outlined in the *Soil Sampling Plan.* Soil samples selected for laboratory analysis were submitted to Galson Laboratories, Inc. (Galson) for laboratory analysis for polychlorinated biphenyls (PCBs) and/or Target Compound List (TCL) volatile organic compounds (VOCs) using the following methods:

Parameter	Analytical Method
PCBs	USEPA SW-846 Method 8082
VOCs	USEPA SW-846 Method 5035/8260

A detailed discussion of the soil investigation activities is presented below.

Soil Investigation Beneath the Concrete Floor Slab

As detailed in the *Building Demolition Alternative Report* and summarized above, 15 soil samples were previously collected from the 0- to 2-inch depth interval beneath the concrete floor slab of the manufacturing building and submitted for laboratory analysis for PCBs. In addition, soil samples were collected from the 2- to 6-inch depth interval beneath the concrete floor slab and submitted for laboratory analysis for PCBs from 14 of the 15 sampling locations. The highest concentrations of PCBs in soil samples collected from beneath the concrete floor slab were detected at sampling locations IB-6 and ID-7 (within the pump room, see Figure 4), where samples from the 0-to 2-inch depth interval contained PCBs at concentrations of 18,000 ppm and 14,000 ppm, respectively. Additional soil investigation activities were conducted in order to further characterize the concentrations of PCBs at the maximum feasible depth beneath the concrete floor slab at sampling locations IB-6 and ID-7. A description of these activities is presented below, followed by a discussion of the associated laboratory results.

Soil Located Beneath the Concrete Floor Slab Sampling Activities

Prior to collecting additional soil samples at soil sampling locations IB-6 and ID-7 (shown on Figure 5), a jackhammer and "Hilti" hammer drill equipped with a pulverizing bit were utilized to remove approximately 4- to 5-inches of cement/bentonite grout which was placed over the sampling locations following the previous investigation activities within the manufacturing building conducted during February 1998. Soil samples were collected using a 1¼-inch outer diameter steel casing (e.g. direct push sampling method) equipped with a dedicated polyethylene liner which was retracted from the outer casing at 4-foot intervals in order to retrieve the soil samples. The sampling device was manually driven into the soil using a pneumatic hammer device. The outer steel casing of the sampling device was decontaminated between sampling locations. Due to the presence of compact soil at both soil boring locations (IB-6 and ID-7), refusal of the sampling device was reached at two feet below ground surface for soil sampling location IB-6 and at four feet below ground surface for soil sampling location ID-7.

At sampling location IB-6, soil samples were collected from depths of 0.5- to 1-foot and 1- to 2-feet. The soil sample collected from the 0.5- to 1-foot depth interval was placed in a jar and archived for future laboratory analysis, if considered necessary. The soil sample collected from the 1- to 2-foot depth interval was submitted to Galson for laboratory analysis for PCBs using USEPA SW-846 Method 8082. No ground water was encountered while conducting sampling activities at soil boring location IB-6.

At sampling location ID-7, soil samples were collected from depths of 1- to 2-feet, and 3- to 4-feet. No soil sample was retrieved from the 2- to 3-foot depth after the sampling tube liner was destroyed during sampling activities. A soil sample was collected from the 3- to 4-foot depth interval using a 4-foot long inner sampling tube and pushing the tube from the 3- to 4-foot depth. The sample collected from this depth was submitted to Galson for laboratory analysis for PCBs using USEPA SW-846 Method 8082. The soil sample collected from the 1- to 2-foot depth interval was placed in a jar and archived for future laboratory analysis, if considered necessary. Following coring activities, a shovel was used to remove soil to a depth of approximately 1.4 feet below the concrete floor surface. Based on the presence of a noticeable odor, a grab sample was collected at the direction of the USEPA and submitted to Galson for laboratory analysis for TCL VOCs using USEPA SW-846 Method 8260. Because this VOC grab sample was not part of the original scope, it was collected in a glass sampling jar which was not equipped with a teflon lined cap or a septum. Ground water was encountered at sampling location ID-7 at a depth of three feet below ground surface.

Excess soil removed during sampling activities was replaced and a cement/bentonite grout was placed in the sampling locations to restore the floor to the original grade. Detailed field notes describing the activities conducted during the additional investigation of the soil located beneath the floor of the manufacturing building are included as Attachment 2.

Soil Located Beneath the Concrete Floor Slab Sampling Results

Analytical results obtained for the laboratory analysis of soil samples collected from beneath the concrete floor slab within the manufacturing building for PCBs and TCL VOCs are presented below. The discussion includes a comparison of the analytical results obtained from the laboratory analysis of the soil samples with MDEP Soil Category S-3 & GW-3 Standards presented in the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000, effective October 31, 1997.

PCBs

Analytical results obtained for the laboratory analysis of soil samples collected from beneath the concrete floor slab of the manufacturing building for PCBs are listed in Table 4 and shown on Figure 6. Total PCBs were detected in soil samples IB-6 (1-2') and ID-7 (3-4') at concentrations of 4,100 and 2,000 ppm, respectively. Both of these concentrations exceed the MDEP Soil Category S-3 & GW-3 Standards of 2 ppm for PCBs presented in MCP 310 CMR 40.0000.

VOCs

Analytical results obtained for the laboratory analysis of the subsurface soil sample collected from ID-7 for TCL VOCs are listed in Table 5 and shown on Figure 7. Analytical results obtained for the analysis of the soil sample for TCL VOCs are summarized below.

Detected Constituent	Detected Concentration (ppm)	MDEP S-3 & GW-3 Soil Standard (ppm)
Trichloroethylene	30	500
Tetrachloroethylene	1.2	100
1,2,3-Trichlorobenzene	0.7	-
1,2,4-Trichlorobenzene	1.5	800

Notes:
1) MDEP Soil Category S-3 & GW-3 Standards were obtained from MCP 310 CMR 40.0000.
2) "-" indicates that an MDEP Soil Category S-3 & GW-3 Standard value was not listed for that particular constituent.

The results indicate that the soil sample collected from ID-7 does not contain TCL VOCs at concentrations which exceed the MDEP Soil Category S-3 & GW-3 Standards presented in MCP 310 CMR 40.0000.

Soil Samples Beneath the Parking Lot

A discussion of the activities conducted during the investigation of soil located beneath the parking area outside of the manufacturing building is presented below followed by a discussion of the results of the soil and composite asphalt samples which were collected as a part of the investigation activities.

Boring/Sampling Activities

A total of 16 soil borings (soil borings SB-1 to SB-8 and SB-10 to SB-17) were completed within the area outside of the manufacturing building (see Figure 5) to facilitate the collection of soil samples for analysis of PCBs and TCL VOCs. In addition, based on the request of the USEPA, soil boring location SB-18 (shown on Figure 5) was added to investigate the soil in the vicinity of a PCB-oil fill pipe located along the north side of the manufacturing building. Preliminary sampling locations were chosen systematically by overlaying a 120-foot by 120-foot grid across the parking area south of the building. Utilizing this systematic sampling location scheme, 16 individual grid cells were mapped over the parking area on the site map and preliminary sampling locations were chosen in

a manner which gave a representative distribution across the parking area. The distances from each soil boring location to at least two prominent physical features at the site were measured and recorded on a field site map, and the physical tie distances were used to create a sample location map to help determine the distribution of the samples within the parking area and identify soil boring locations in the future, if necessary. Soil boring SB-9 was marked on a preliminary sampling location figure; however, the proposed soil boring location was eliminated based on the presence of underground electrical lines. Soil boring SB-17 was added south of the manufacturing building to investigate the soil in the vicinity of a waste trough which formerly conveyed waste material from the facility toward the Acushnet River to the east of the site.

Soil borings were completed by BBL's drilling subcontractor, Environmental Drilling, Inc. (Environmental Drilling) using a the hollow-stem auger drilling method. Soil borings were advanced using a truck-mounted drill rig in accordance with the protocols presented in the Soil Sampling Plan. Continuous soil samples were obtained from each soil boring using a two-foot long, two-inch outer diameter split-spoon sampling device as described in American Society for Testing and Materials (ASTM) Method D-1586/Split Barrel Sampling (Standard Method for Penetration Test and Split-Barrel Sampling of Soils ASTM D-1586-84) by driving the split spoon device with a 140-lb hammer dropped 30 inches.

Soil sampling for TCL VOCs was conducted in accordance with the USEPA Region 1 document entitled, *Standard Operating Procedure for Soil Sample Collection and Handling for the Analysis of Volatile Organic Compounds* (March 1997). Immediately after recovering the split spoon device, one soil sample was collected for TCL VOCs from the most visually stained portion of each two-foot soil sampling interval using an Encore™ sampling device. One soil sample collected from each soil boring was submitted to Galson for laboratory analysis for TCL VOCs using USEPA SW-846 Method 5035/8260. Samples collected from the remaining sampling intervals which wer not selected for laboratory analysis were archived by the laboratory for future analysis, if considered necessary. A representative portion of each two-foot soil sampling interval was then placed in a screening jar for headspace screening using a photoionization detector (PID). Each two-foot soil sample was then split into one-foot sections and one soil sample was collected (where feasible) from each one-foot section for PCB analysis. At least one sample from each soil boring (more if staining was observed in more than one section of soil recovered from the bore hole) was submitted to Galson for laboratory analysis for PCBs using USEPA SW-846 Method 8082. If no areas of visible staining were observed in a particular soil boring, the PCB sample was submitted from the one-foot section of soil located immediately beneath the asphalt. Samples collected from each one-foot soil segment which were not submitted for laboratory analysis were archived by the laboratory for future analysis, if considered necessary.

Each soil boring was completed to the depth of bedrock or the water table, whichever was encountered first. Upon completion of each soil boring, Environmental Drilling hand shoveled grout into each borehole to the original grade using a cement/bentonite grout mixture (based on the relatively shallow depth of the bore holes, tremie grouting was not considered necessary). Subsurface conditions encountered at each boring location are detailed on the soil boring logs included as Attachment 3, and depicted on geologic cross sections that are presented in the following section.

As part of the soil investigation activities, composite samples of the asphalt pavement from the parking area were collected and submitted for laboratory analysis for PCBs. A total of four composite samples were collected by combining discrete asphalt pavement samples collected at each of the boring locations. Composite samples COMP-1, COMP-2, and COMP-3 were each comprised of discrete samples collected from four borings and composite sample COMP-4 was comprised of two discrete asphalt samples.

Detailed field notes describing these investigation activities are presented in Attachment 4.

Parking Area Soil Sampling Results

Analytical results obtained for the laboratory analysis of the soil and composite asphalt samples collected during the soil investigation activities for PCBs and TCL VOCs are presented below. The discussion includes a comparison of the analytical results obtained from the laboratory analysis of the soil and asphalt samples with the MDEP Soil Category S-3 & GW-3 Standards presented in MCP 310 CMR 40.0000.

PCBs

PCB analytical results obtained for the laboratory analysis of soil samples are listed in Table 6 and shown on Figure 6. Total PCBs were detected in each soil sample at concentrations ranging from 0.05 ppm in sample SB-3-2 (1-2') to 2,900 ppm in sample SB-7-5 (4-5'). As presented in MCP 310 CMR 40.0000, the MDEP Soil Category S-3 & GW-3 Standard for PCBs is 2 ppm. As indicated in Table 6, this standard was exceeded in 12 samples that were analyzed for PCBs as part of the soil investigation activities.

Analytical results obtained for the laboratory analysis of composite asphalt samples for PCBs are listed in Table 7. The concentrations of PCBs within the composite asphalt samples ranged from 1.13 ppm in COMP-4 to 140 ppm in COMP-2.

VOCs

Analytical results obtained for the laboratory analysis of subsurface samples for TCL VOCs are listed in Table 8 and shown on Figure 7. TCL VOCs were detected at concentrations above laboratory detection limits in soil samples collected at six of the seventeen sampling locations. Analytical results obtained for the laboratory analysis of the subsurface soil samples for TCL VOCs are summarized below.

Detected Constituent	Number of Sampling Locations Where Compound was Detected	Range of Detected Concentrations (ppm)	Sample Exhibiting Maximum Concentration	MDEP S-3 & GW-3 Soil Standard (ppm)
Methylene Chloride	1	0.22	SB-11-2 (0.5-2')	700
Trichloroethylene	4	0.24-0.30	SB-16-2 (0-2')	500
1,2,4-Trichlorobenzene	1	0.44	SB-07-5 (4-5')	800
Naphthalene	2	0.33-0.39	SB-05-2 (0-2')	1,000
1,2,3-Trichlorobenzene	1	1.1	SB-07-5 (4-5')	-

Notes:
1. MDEP S-3 & GW-3 Soil Standards were obtained from MCP 310 CMR 40.0000.
2. - indicates that an MDEP S-3 & GW-3 Soil Standard was not listed for that particular constituent.

The results indicate that none of the soil samples collected during the boring activities contained concentrations of TCL VOCs which exceed the MDEP S-3 & GW-3 Soil Standards for TCL VOCs presented in MCP 310 CMR 40.0000.

2.5.3.2 Ground-Water Investigation

This section presents a summary of information regarding the geology/hydrogeology of the site and a description of a the ground-water investigation activities which were conducted as part of the removal investigation at the Aerovox facility.

Site-Specific Geology

The following summary of the site-specific geology has been prepared based on information generated through previous investigations performed by GHR Engineering Corporation (GHR). This information was presented in the following GHR reports:

- *Report of Sampling and Analysis Program at the Aerovox Property, New Bedford, Massachusetts, October 7, 1982;*
- *Report of Evaluation of Remedial Alternatives for the Aerovox Property, New Bedford, Massachusetts, February 11, 1983;*
- *Site Assessment Report of Soils and Groundwater in the Vicinity of a Concrete Oil Containment Bunker at th Aerovox Property, New Bedford, Massachusetts, August 23, 1988;* and
- *Phase I - Limited Site Investigation Addendum of Soils and Groundwater in the Vicinity of a Concrete Oil Containment Bunker at the Aerovox Property, New Bedford, Massachusetts, June 30, 1989.*

GHR prepared and presented a series of cross sections (A-A' through E-E') illustrating the subsurface geology across the northern and eastern portions of the site (GHR, 1983). Copies of these cross sections, as well as the figure showing the locations of these sections, are presented in Attachment 5 for ease of reference. Site-specific stratigraphic information acquired since 1982 does not change the interpretation of subsurface conditions reflected in the GHR cross sections. Geologic data was also generated through the drilling of 17 soil borings by BBL for the soil investigation activities described in Section 2.5.3.1. To supplement GHR's cross sections, BBL has utilized data from the recently performed soil borings activities to prepare an additional cross section (X-X') beginning in the northwestern corner of the site, continuing across the center of the site, and extending through the parking lot along the southern portion of the site. This cross section is presented as Figure 8. The location of this cross section is illustrated on Figure 5.

As depicted on these cross sections, the sequence of overburden materials encountered below the surface at the site include: a layer of fill; a sand and gravel layer; a peat layer; a fine to medium sand; a medium to coarse sand; and a till. A brief description of these overburden materials follows.

- The heterogeneous backfill materials encountered at the surface across the entire site are composed of sand and gravel with various refuse and construction debris.
- The shallow sand and gravel layer encountered below the fill was a light brown to gray fine to coarse sand ar fine to medium gravel characterized as homogeneous, unsorted deposit.

- The layer of peat was consistently encountered between approximately 5 and 10 feet below grade in borings located within the eastern portion of the site, along the Acushnet River. However, this peat layer is laterally discontinuous as it was not observed at boring locations within the western or central portions of the site.

- The deposits of light brown to yellow fine to medium sand as well as the medium to coarse sand were observed primarily below the peat, however, these deposits were also observed to be interbeded within the peat at some locations.

- The clay-rich glacial till was encountered at only a single location (MW-5) in the northwest corner of the site.

Bedrock was encountered at the site during the investigation and removal of the concrete oil containment bunker (see Section 2.4). The bedrock was characterized by GHR (GHR, 1989) as a chlorite gneissic schist, with some high angle fractures parallel to the foliation, and a two to three foot zone of weathering at the bedrock surface. The schist appears as a localized knob or ridge, found as shallow as 1.5 feet below grade near the eastern edge of concrete bunker area, but sloping away to the north and east. Rock was not been observed in any well or boring drilled more than 120 feet from the concrete bunker, except at SB-2 near the western property boundary, at just 5 feet below grade.

Ground-Water Investigation Activities

Based on the objectives of the removal investigation, ground-water investigation activities were conducted which consisted of the following:

- Assessing the condition at each of the 13 existing ground-water monitoring wells at the facility, including volatile headspace measurement and measuring depth to ground water, total well depth, and the extent of sediment deposition in the well;

- Collecting low-flow ground-water samples for unfiltered PCBs and TCL VOCs analyses from each of the existing ground-water monitoring wells; and

- Obtaining one round of ground-water elevation measurements from each of the 13 existing ground-water monitoring wells over a relatively short period of time, and using this information, as well as previously existing site information, to develop a comprehensive understanding of hydrogeologic conditions at the site.

A detailed description of the activities and results of the ground-water investigation is presented below.

Ground-Water Monitoring Well Assessment and Sampling Activities

The ground-water sampling activities were conducted in accordance with the USEPA document entitled *Low Stress (low flow) Purging and Sampling Procedure for the Collection of Ground-Water Samples from Monitoring Wells* Revision 2, dated June 30, 1996. Prior to sampling each ground-water monitoring well, monitoring well assessment activities were conducted which included probing each well to determine the presence and depth (if any) of sediment within the well, measuring headspace concentrations of VOCs using a PID, measuring the depth to water, and determining the total depth of the well. Based on these inspection activities, small amounts of sediment were found at the bottom of eight out of the thirteen existing on-site monitoring wells. Measurable headspace VOC concentrations were not obtained at any of the thirteen existing ground-water monitoring wells. Field notes

summarizing the conditions observed during the monitoring well assessment activities are presented as Attachment 6.

Following these inspection activities, a low flow submersible pump with polyethylene tubing was placed within the well and ground water was purged from the well until indicator field parameters were stabilized within the ranges presented in the above-referenced USEPA document (indicator field parameters included turbidity, dissolved oxygen, specific conductance, temperature, pH, and oxidation/reduction potential). Ground-water samples collected as part of the removal investigation activities were submitted to Galson for laboratory analysis for PCBs (using USEPA SW-846 Method 8082) and TCL VOCs (using USEPA SW-846 Method 8260). In addition, three trip blank samples (one for each day of sampling) and one rinse blank sample were collected for quality assurance/quality control (QA/QC) purposes.

Ground-water monitoring well MW-4A was pumped dry during purging activities conducted on May 27, 1998 at approximately 9:30 a.m. A ground-water sample was collected the following morning at approximately 6:30 a.m. after the well had recharged just enough to collect the ground-water samples. Detailed ground-water well sampling logs summarizing the field parameters measured during ground-water sampling activities are included as Attachment 7. Detailed field notes describing the ground-water investigation field activities are presented in Attachment 8.

Ground-Water Sampling Results

Analytical results obtained for the laboratory analysis of ground-water samples collected during the ground-water investigation activities for PCBs and TCL VOCs are presented below. The discussion includes a comparison of the analytical results obtained for the laboratory analysis of the ground-water samples with MDEP Ground-Water Category GW-3 Standards presented in MCP 310 CMR 40.0000.

PCBs

Analytical results obtained for the laboratory analysis of ground-water samples for PCBs are listed in Table 9 and shown on Figure 9. Total PCBs were detected in four of the thirteen ground-water samples collected during the ground-water investigation at concentrations ranging from 3 ppb in sample MW-8S to 36 ppb in sample MW-4A. As indicated in MCP 310 CMR 40.0000, the MDEP Ground-Water Category GW-3 Standard for PCBs is 0.3 ppb. As indicated in Table 9, this standard is exceeded in all four of the ground-water samples in which PCBs were detected. In addition, analytical detection limits for several of the ground-water samples collected at the facility were elevated due to matrix interference (due to siltation, salinity, hydrocarbon interferences, etc.).

VOCs

Analytical results obtained for the laboratory analysis of ground-water samples for TCL VOCs are listed in Table 10 and shown on Figure 10. TCL VOCs were detected at concentrations above laboratory detection limits in samples collected at 12 of the 13 sampling locations. Analytical results obtained for the laboratory analysis of the ground-water samples for TCL VOCs are summarized below.

Detected Constituent	Number of Sampling Locations Where Compound was Detected	Range of Detected Concentrations (ppb)	Sample Exhibiting Maximum Concentration	MDEP GW-3 Ground-Water Standard (ppb)
Vinyl Chloride	4	76-520	MW-7	40,000
cis-1,2-Dichloroethylene	6	29-2,900	MW-7	50,000
1,1-Dichloroethylene	1	37	MW-4B	50,000
Methylene Chloride	1	12 B	MW-4B	50,000
1,1-Dichloroethane	1	9	MW-4B	50,000
Chloroform	1	9	MW-4B	10,000
1,1,1-Trichloroethane	1	41	MW-4B	50,000
Benzene	2	35-60	MW-3A	7,000
Trichloroethylene	2	3,600-8,900	MW-7	20,000
Tetrachloroethylene	2	17-33	MW-4B	5,000
Chlorobenzene	5	19-1,000	MW-3A	500
Ethylbenzene	2	95-150	MW-3	4,000
1,3-Dichlorobenzene	1	150	MW-2	8,000
1,4-Dichlorobenzene	4	7-220	MW-2	8,000
1,2,4-Trichlorobenzene	1	5	MW-4B	500
Naphthalene	1	18	MW-2A	6,000

Notes:
1. MDEP Ground-Water Category GW-3 Standards were obtained from MCP 310 CMR 40.0000.
2. B indicates that the constituent was detected in both the sample and the associated method blank.

The results indicate that Chlorobenzene was detected in ground-water samples collected from monitoring wells MW-2 (570 ppb) and MW-3A (1,000 ppb) at concentrations which exceeded the MDEP Ground-Water Category GW-3 Standard of 500 ppb as presented in MCP 310 CMR 40.0000.

Ground-Water Elevations and Hydrogeologic Characterization

Ground water was encountered under water table conditions across the site at depths ranging from approximately 3.5 below grade near the river to nearly 12 feet below grade at the western edge of the site. Along the eastern portion of the site ground water was also observed to exist perched above the fines-rich peat layer. Water level

measurements obtained from the 13 existing wells at the site on May 21, 1998 (provided in Table 11) were used to generate the ground-water potentiometric surface contour maps illustrating the hydraulic gradient across the site within the deeper water-bearing unit as well as the shallow/perched water-bearing unit. These maps are presented as Figures 11 and 12, respectively.

Ground-water level data have also been recorded from select monitoring wells at this site on a regular basis by SAIC Engineering, Inc. (SAIC), as part of the Site Post-Closure Monitoring Program associated with the site remediation activities completed in 1984. As discussed in Section 2.4 and the previously mentioned article entitled *On-Site Containment of PCB-Contaminated Soils at Aerovox, Inc., New Bedford, Massachusetts*, those remediation activities included installation of a vertical sheet pile wall to serve as a barrier to ground water and tidal flow into and out of the impacted soils located at the eastern end of the site. The sheet piling cutoff wall is from 9 to 13 feet in depth, the actual depth is dictated by the depth to the peat layer into which the wall is keyed. The wall has been installed along the eastern boundary of the property. In the area directly behind the manufacturing building, the sheet pile wall extends west up to the building foundation; thereby, forming a containment cell with the building foundation serving as the fourth side of this cell. The approximate location of the sheet pile wall is shown on Figure 3.

The Site Post-Closure Program includes obtaining periodic high and low tide water level measurements from a tide gauge and from the eight monitoring wells located at the eastern end of the site (MW-2, MW-2A, MW-3, MW-3A, MW-4, MW-4A, MW-7, and MW-7A). The water level measurements obtained by SAIC during the past three years are provided as Attachment 10. After reviewing this data set, representative water level data obtained during both high-tide and low-tide periods within the shallow and deep wells (provided in Table 12) were used to prepare the ground-water potentiometric contour maps presented as Figures 13 through 16.

The observed hydraulic gradients indicate the direction of ground-water flow would generally be from west to east, in the direction of the river. The deep water-bearing zone appears to respond to high-tide periods with a temporary reversal in the hydraulic gradient in the immediate vicinity of the Acushnet River.

The perched ground-water bearing zone appears to be isolated from hydraulic interaction with the adjacent river to some degree by the presence of the vertical sheet pile wall installed along the river and in the eastern corner of the site to form a containment cell (see Figure 3). A review of water level monitoring data recorded by SAIC over the past several years (provided as Attachment 10) indicate that the ground water within this perched water-bearing unit does not appear to respond to tidal fluctuations in the river, as observed in the deeper monitoring wells within this portion of the site. A review of the water level data at well clusters within the area of the site observed to have a perched water table indicate that downward vertical gradients exist consistently during both high and low tide periods.

2.6 Streamlined Risk Evaluation

2.6.1 Introduction

Consistent with USEPA guidance, the streamlined risk evaluation presented in this section focuses on those risk issues that the EE/CA removal action is intended to address and provides justification for the removal action. This streamlined risk evaluation addresses both soil and ground water, as well as the building at the facility.

2.6.2 Soil and Ground Water

At this facility, the applicable category of soil is S-3 Soils and the applicable category of ground water is GW-3 Ground Water. These categories have been established by the MDEP for use in characterization of risk posed by a site. The categories are used to determine the applicability of the soil and ground-water standards listed and described in the MCP, 310 CMR 40.0000, issued by the MDEP Bureau of Waste Site Cleanup, effective October 31, 1997. The categories are also considered when determining the appropriate removal action alternative to be implemented at the site.

The soil at the site has been categorized as S-3 Soils based on the criteria listed in Section 40.0933 of the MCP. Site, receptor, and exposure information identified in Sections 40.0904 - 40.0929 of the MCP, in conjunction with current and potential future site activities and uses, were also used to categorize the soil. Category S-3 Soils are appropriate because soil at the facility is essentially inaccessible (i.e., covered with asphalt pavement or concrete), children are not present at the facility, and the frequency and intensity of exposure to the soil by adults is low.

The ground water at the site has been categorized as GW-3 Ground Water based on the criteria listed in section 40.0932 of the MCP. Category GW-3 Ground Water, while considered a potential source of discharge to surface water, represents the minimum-risk ground-water category. The ground water at the site has not been additionally categorized as GW-1 or GW-2 because it is not located within either a current or potential drinking water source area and the building will be demolished as part of the removal action. Therefore, as set forth in the MCP, the total PCB cleanup standard is 0.3 ppb for the GW-3 Ground-Water samples collected from the site.

The MCP Risk Characterization Method I was utilized at the site through the use of promulgated standards described in Sections 40.0970 - 40.0979 of the MCP. Method I relies upon the use of the numerical standards given above for chemicals in ground water and soil to accurately characterize the risk posed by the site. The potential risks posed by the soil and ground water at the facility are characterized by comparing detected concentrations to their respective Method I Standard.

As outlined in Section 40.0975 of the MCP, "the MCP Method 1 Soil Standards consider both the potential risk of harm resulting from direct exposure to the oil and/or hazardous material in the soil and the potential impacts on the ground water at the disposal site. The applicability of a specific numerical Standard is thus a function of both the soil and the ground-water category identified." Therefore, the Soil Category S-3 Standards for the combination of soil and ground-water categories are S-3 and GW-3, respectively, are given in Table 4 in Section 40.0975 of the MCP. These soil standards are identified in Tables 4 through 8 which present the soil analytical data associated with the recent investigation activities conducted at the facility. Ground-Water Category GW-3 Standards are identified in Tables 9 and 10 which present the recent ground-water analytical results. Detected concentrations exceeding Standards have been shaded in these tables.

As shown in these tables, PCBs are the only constituents detected in the soil samples at concentrations in excess of their respective Soil Category S-3 & GW-3 Standard (2 ppm), and PCBs and chlorobenzene are the only constituents detected in the ground-water samples at concentrations in excess of Standards. PCBs were detected in excess of the Category GW-3 Standard of 0.3 ppb in 4 of the 13 samples collected, at a maximum concentration of only 36 ppb. The only other constituent detected in the ground-water samples at concentrations in excess of the Standard was chlorobenzene, which was detected in only 2 out of the 13 ground-water samples. The Category GW-3 Standard for chlorobenzene is 500 ppb. The ground-water samples collected from MW-2 and MW-3A contained chlorobenzene at 570 ppb and 1,000 ppb, respectively. These monitoring wells, however, are located in the eastern portion of the property, within the area addressed by the remedial action completed in 1984, and not subject to this

removal action. That remedial action was completed in compliance with a 1982 Consent Order entered into by Aerovox with the USEPA (September 21, 1984 letter from the USEPA).

Thus, PCBs in soils represent the only constituents of interest in environmental media at the facility. Because concentrations of PCBs at the site considerably exceed Standards in a number of soil sampling locations both beneath the building and the parking lot, implementation of a PCB removal action is appropriate to mitigate potential exposure and migration pathways.

2.6.3 Building Materials

The results of the PCB Building Material/Equipment Investigation conducted by BBL on November 24 and 25, 1997 are presented in Section 2 of the *Building Demolition Alternative Report.* These analytical results are summarized below.

- The wood floor on the second and third floors of the eastern section of the building contains PCBs at concentrations greater than 50 ppm.
- Two of the three wood floor full core samples collected from the second floor in the western section of the building contained PCBs at concentrations greater than 50 ppm.
- One of the two concrete floor full core samples collected from the second floor in the western section of the building contained PCBs at concentrations greater than 50 ppm.
- The PCB concentrations in all of the full core dust and dirt scrape samples ranged from 2.48 ppm to as high 56,000 ppm.
- PCBs were detected in each of the 12 dust and dirt scrape samples at concentrations greater than 50 ppm.
- 17 of the 18 wipe samples collected from non-porous building materials and appurtenances contained PCBs at concentrations greater than 10 ug/100cm^2, which is the TSCA PCB Spill Policy cleanup objective for low- and high-contact interior surfaces.
- 10 of the 13 wipe samples collected from the surfaces of building equipment contained PCBs at concentrations greater than 10 ug/100 cm^2. The PCB concentrations in all of the wipe samples ranged from 2.5 ug/100 cm^2 to 520 ug/100 cm^2.

Based on these data these data, PCB concentrations at many different sampling locations within the Aerovox facility exceeded 50 ppm within building materials and 10 ug/100 cm^2 on the surfaces of building materials. Accordingly, demolition of the building is an appropriate removal action to mitigate potential exposure and migration pathways.

Table 3

Aerovox, Inc. Facility
New Bedford, Massachusetts
Engineering Evaluation/Cost Analysis (EE/CA)

PCB Analytical Results
Soil Sampling from Beneath Concrete Floor Slab

Sample ID	Total PCBs (ppm)
IB6(0-2")	**18,000**
IB6(2-6")	**3,200**
IB8(0-2")	**1,800**
IB10(0-2")	11.8
IB20(0-2")	0.94
IB35(0-2")	19.6
IC5(0-2")	**980**
IC52(0-2")	0.218
ID7(0-2")	**14,000**
ID7(2-6")	**4,900**
ID63(0-2")	**180**
IE38(0-2")	0.62
IE59(0-2")	10.5
IF7(0-2")	13.0
IF10(0-2")	12.4
IH6(0-2")	2.3

Notes:

1. All concentrations in parts per million (ppm).
2. Samples analyzed using USEPA SW-846 Method 8082.
3. Samples IB6(2-6") and ID7(2-6") exceeded laboratory holding times.
4. Bold values indicate concentrations greater than 50 ppm.

Table 4

Aerovox, Inc. Facility

New Bedford, Massachusetts

Engineering Evaluation/Cost Analysis (EE/CA)

PCB Analytical Results

Soil Located Beneath the Floor of the Manufacturing Building (ppm)

Sample ID	Sample Collection Date	Sample Collection Depth	Total PCBs (ppm)
IB-6	5/13/98	1-2'	4,100
ID-7	5/13/98	3-4'	2,000

NOTES:

1. Shaded values represent concentrations which exceed the Massachusetts Department of Environmental Protection (MDEP) Soil Category S-3 & GW-3 Standard of 2 ppm for PCBs presented in the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000, effective October 31, 1997.
2. All concentrations are reported in parts per million (ppm).
3. Samples were analyzed using United States Environmental Protection Agency SW-846 Method 8082.

Table 6

Aerovox, Inc. Facility

New Bedford, Massachusetts

Engineering Evaluation/Cost Analysis (EE/CA)

PCB Analytical Results

Soil Located Beneath the Parking Area (ppm)

Sample ID	Sample Collection Date	Sample Collection Depth	Total PCBs (ppm)
SB-01-2	5/20/98	1-2'	0.64
SB-02-1	5/21/98	0-1'	0.05
SB-03-2	5/20/98	1-2'	0.05
SB-04-2	5/20/98	1-2'	16
SB-05-2	5/19/98	1-2'	178
SB-06-1	5/19/98	0-1'	65
SB-07-2	5/19/98	0-1'	120
SB-07-5	5/19/98	4-5'	2900
SB-08-1	5/21/98	0-1'	0.14
SB-10-1	5/21/98	0-1'	4.2
SB-11-1.5	5/21/98	0.5-1.5'	0.94
SB-12-1	5/20/98	0-1'	7.6
SB-13-1	5/20/98	0-1'	100
SB-14-5	5/20/98	4-5'	310
SB-14-5D	5/20/98	4-5'	170
SB-15-2	5/19/98	1-2'	0.12
SB-16-2	5/19/98	1-2'	12.2
SB-17-2	5/19/98	1-2'	0.14
SB-17-5	5/19/98	4-5'	0.6
SB-18-1	5/20/98	0-1'	84

NOTES:

1. Shaded values represent concentrations which exceed the Massachusetts Department of Environmental Protection (MDEP) Soil Category S-3 & GW-3 Standard of 2 ppm for PCBs presented in the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000, effective October 31, 1997.
2. All concentrations are reported in parts per million (ppm).
3. Samples were analyzed using United States Environmental Protection Agency SW-846 Method 8082.
4. "D" in the Sample ID column indicates a duplicate sample.

Table 7

Aerovox, Inc. Facility

New Bedford, Massachusetts

Engineering Evaluation/Cost Analysis (EE/CA)

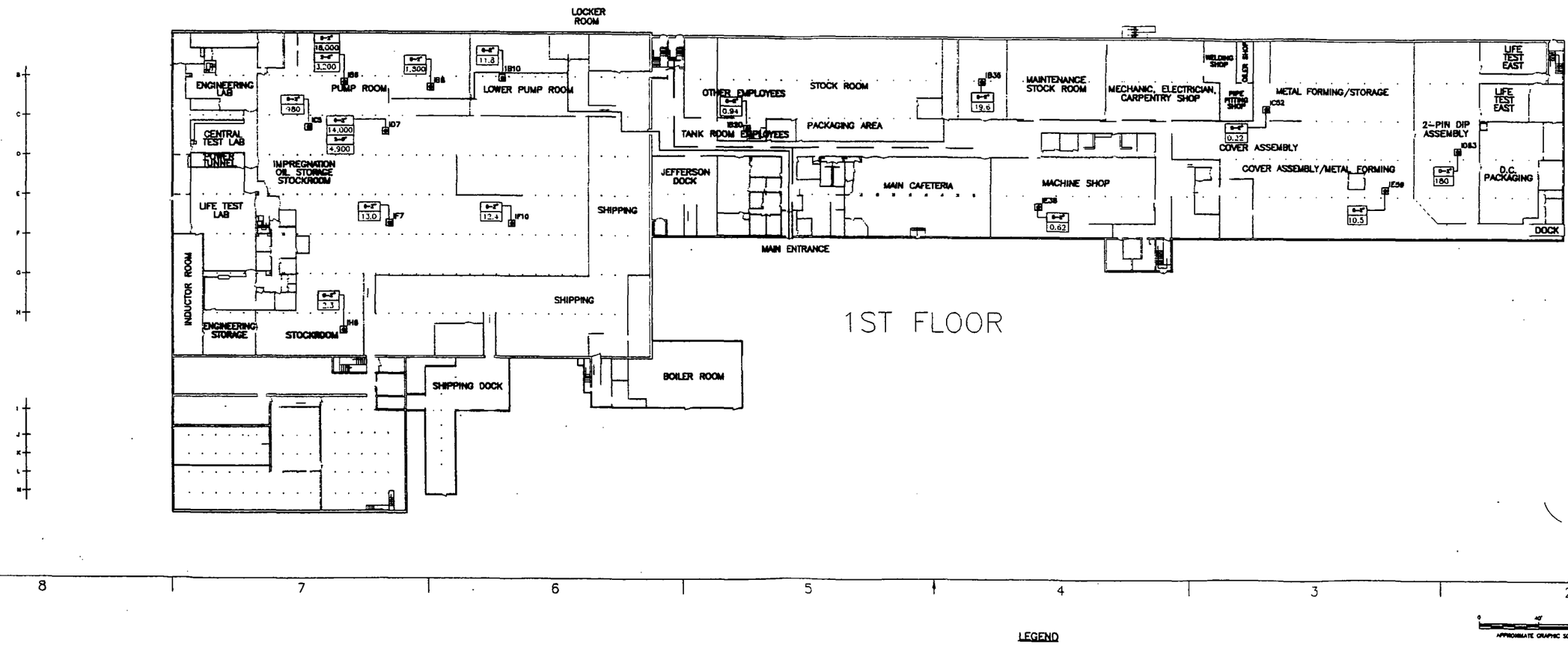
PCB Analytical Results

Asphalt Located in the Parking Area (ppm)

Sample ID	Sample Collection Date	Composited from Discrete Samples from	Total PCBs (ppm)
COMP-1	5/19/98	SB-6, SB-7, SB-15, SB-16	136
COMP-2	5/20/98	SB-4, SB-5, SB-13, SB-14	140
COMP-3	5/21/98	SB-3, SB-10, SB-11, SB-12	33
COMP-4	5/21/98	SB-2, SB-8	1.13

NOTES:

1. All concentrations are reported in parts per million (ppm).
2. Samples were analyzed using United States Environmental Protection Agency SW-846 Method 8082.



LEGEND

ID43 SOIL SAMPLING LOCATION

6-9" SAMPLE DEPTH

10.5 TOTAL PCBs < 50 ppm (mg/kg)

980 TOTAL PCBs > 50 ppm (mg/kg)

0 40' 80'
APPROXIMATE GRAPHIC SCALE

NOTES
1. DRAWING FROM ELECTRONIC FILE FROM AEROVOX, INC.
DRAWING NO. PAVX-AG-0002 DATED NOVEMBER 18, 1997.
2. ALL LOCATONS ARE APPROXIMATE.

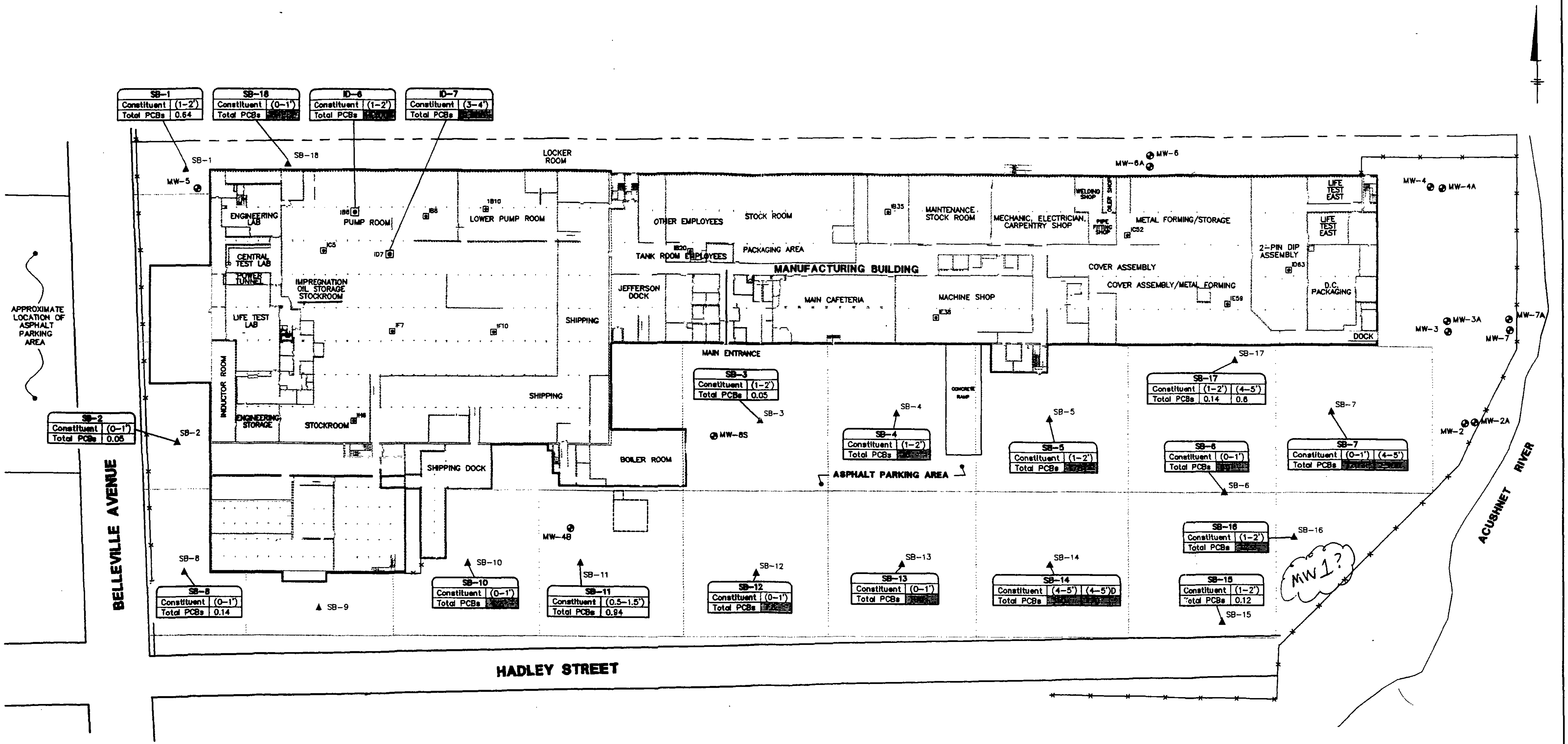
X (XREF)
LAYERS OFF=0,CONCRETEFLOOR,FIG1,REF,SAMPLELOCATION,SCRAPES,SEALEDAREAS,WIPES,WOODLOT
P: AERO.PCP
6/10/98 DWG#-RCB DWG RCB
03855063/03855SM3

Aerovox INC.
740 BELLEVILLE AVE., NEW BEDFORD, MA 02745 USA
ENGINEERING EVALUATION/COST ANALYSIS (EE/CA)

PCB SOIL SAMPLING RESULTS BENEATH CONCRETE SLAB

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 4



NOTES

1. SEE NOTES 1 THROUGH 7 ON FIGURE 5 – SOIL BORING/GROUND-WATER MONITORING WELL LOCATIONS.
2. ALL CONCENTRATIONS ARE GIVEN IN PARTS PER MILLION (ppm).
3. SHADED VALUES INDICATE CONCENTRATIONS WHICH EXCEEDED THE MDEP S-3 AND GW-3 SOIL STANDARD FOR PCBs (2 ppm) PRESENTED IN THE MASSACHUSETTS CONTINGENCY PLAN 310 CMR 40.0000.
4. "D" INDICATES A DUPLICATE SAMPLE.

LEGEND

- MW-1 — EXISTING GROUND-WATER MONITORING WELL LOCATION
- ID63 — PREVIOUS SOIL SAMPLING LOCATION BENEATH FLOOR SLAB (FEBRUARY, 1998)
- SB-6 — SOIL BORING LOCATION OUTSIDE BUILDING
- SOIL BORING LOCATION BENEATH FLOOR SLAB (MAY, 1998)
- EXISTING FENCE
- EXISTING PROPERTY LINE
- 120' X 120' SAMPLE GRID

0 80' 160'
APPROXIMATE GRAPHIC SCALE

Aerovox INC.
NEW BEDFORD, MASSACHUSETTS
ENGINEERING EVALUATION/COST ANALYSIS (EE/CA)

SUBSURFACE SOIL SAMPLING RESULTS DETECTED PCBs (ppm)

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 6

L: ON=*, OFF=(FROZEN), PCBP,VOC*; ON=PCB3*
P: AERO.PCP
6/10/98 DIV64-RCB, PCL
03665003/03665B46.DWG