Department of Environmental Conservation

Division of Environmental Remediation

Record of Decision

Bulova Watch Case Factory Site
Village of Sag Harbor, Suffolk County
Site Number 1-52-139

December 1996

New York State Department of Environmental Conservation
GEORGE E. PATAKI, *Governor* MICHAEL D. ZAGATA, *Commissioner*

DECLARATION STATEMENT - RECORD OF DECISION

Bulova Watch Case Factory Inactive Hazardous Waste Site
Sag Harbor, Suffolk County, New York
Site No. 152139

Statement of Purpose and Basis

The Record of Decision (ROD) presents the selected remedial action for the Bulova Watch Case Factory inactive hazardous waste disposal site, which was chosen in accordance with the New York State Environmental Conservation Law (ECL). The remedial program selected is not inconsistent with the National Oil and Hazardous Substances Pollution Contingency Plan of March 8, 1990 (40CFR300).

This decision is based upon the Administrative Record of the New York State Department of Environmental Conservation (NYSDEC) for the Bulova Watch Case Factory inactive hazardous waste site and upon public input to the Proposed Remedial Action Plan (PRAP) presented by the NYSDEC. A bibliography of the documents included as a part of the Administrative Record is included in Appendix B of the ROD.

Assessment of the Site

Actual or threatened release of hazardous waste constituents from this site, if not addressed by implementing the response action selected in this ROD, presents a current or potential threat to public health and the environment.

Description of Selected Remedy

Based upon the results of the Remedial Investigation (RI) for the Bulova Watch Case Factory and the remediation goals established for the site, the NYSDEC has selected No Further Action. The components of the remedy are as follows:

- Continued operation of the ongoing soil and groundwater remediation system, consisting of two air sparging and soil vapor extraction systems to treat VOCs at the site. One system is located in the Interior Courtyard to remediate the source area, and the other is located in the Northwest Courtyard to prevent contaminants from leaving the site property.

- Monitoring of the performance of the remediation system to ensure that the remediation goals are met.

- Reclassification of the site from a Class 2 to a Class 4 on the New York State Registry of Inactive Hazardous Waste Disposal Sites.

New York State Department of Health Acceptance

The New York State Department of Health concurs with the remedy selected for this site as being protective of human health.

Declaration

The selected remedy is protective of human health and the environment, complies with State and Federal requirements that are legally applicable or relevant and appropriate to the remedial action to the extent practicable, and is cost effective. This remedy utilizes permanent solutions and alternative treatment or resource recovery technologies, to the maximum extent practicable, and satisfies the preference for remedies that reduce toxicity, mobility, or volume as a principal element. This remedy addresses contamination associated with hazardous waste disposal at the site. Residual petroleum contamination remains on the property and must be addressed by the current property owner pursuant to the NYSDEC Spill Response Program.

12/20/96
Date

Michael J. O'Toole, Jr., Director
Division of Environmental Remediation

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SECTION 1: SITE LOCATION AND DESCRIPTION

The site is located in the Village of Sag Harbor in the Town of Southampton, Suffolk County, New York. The Village of Sag Harbor is located on the north shore of the south fork of Long Island. The site is bordered by Division Street to the east, Washington Street on the north, Church Street to the west and Sage Street to the south. Division Street forms the boundary between the Village of Sag Harbor/Town of Southampton and the Town of East Hampton. A site location map and a site plan are presented in Figures 1 and 2, respectively.

The site encompasses approximately 2.3 acres and presently contains one building. The building consists of an abandoned one- to four-story brick and timber structure located on the north end of the site. The building is irregular in shape and contains a number of courtyards referred to as:

The Interior Courtyard, located in the central portion of the building;
The South Courtyard, which is located directly south of the building;
The Northeastern Courtyard, which fronts Division Street and Washington Street;
The Northwestern Courtyard, which fronts Church Street and Washington Street;
The Western Courtyard, which fronts Church Street; and
The SU-7 Courtyard, located between the western wing and southeast corner of the building.

A brick furnace is located approximately 50 feet south of the building. Previous structures which existed on the site include a water tower, which was approximately 20 feet from the south side of the main building, and a rectangular building approximately 100 x 150 feet in size located in the southwest corner of the site.

The site is located next to the downtown portion of Sag Harbor, which consists of residential, commercial, and community structures. The site is located in the historical district of Sag Harbor. The structures surrounding the site consist primarily of private residences, a church community center, and an elementary school in the east and a paved parking area and a row of commercial store fronts in north.

The majority of open space on the property is paved with either bituminous asphalt or concrete. Approximately 25% of the site is unpaved. Site access is restricted by chain link or iron fencing that completely surrounds the property. The southwest corner of the site is approximately 15 feet below street level and rises to street level along the western and north sides of the site. Regional topography generally slopes down to the north, in the direction of Sag Harbor which is a salt water body located approximately 800 feet to the north-northeast of the site.

Other bodies of salt water are also located approximately 1200 feet to the northwest of the site (Sag Harbor Cove) and approximately 2200 feet to the southwest of the site (Upper Sag Harbor Cove). The closest surface fresh water body is Otter Pond located approximately 2300 feet to the south-southwest of the site. Groundwater at the site flows towards the north-northwest and occurs at 12 - 14 feet below ground surface.

SECTION 2: SITE HISTORY

2.1 Operational/Disposal History

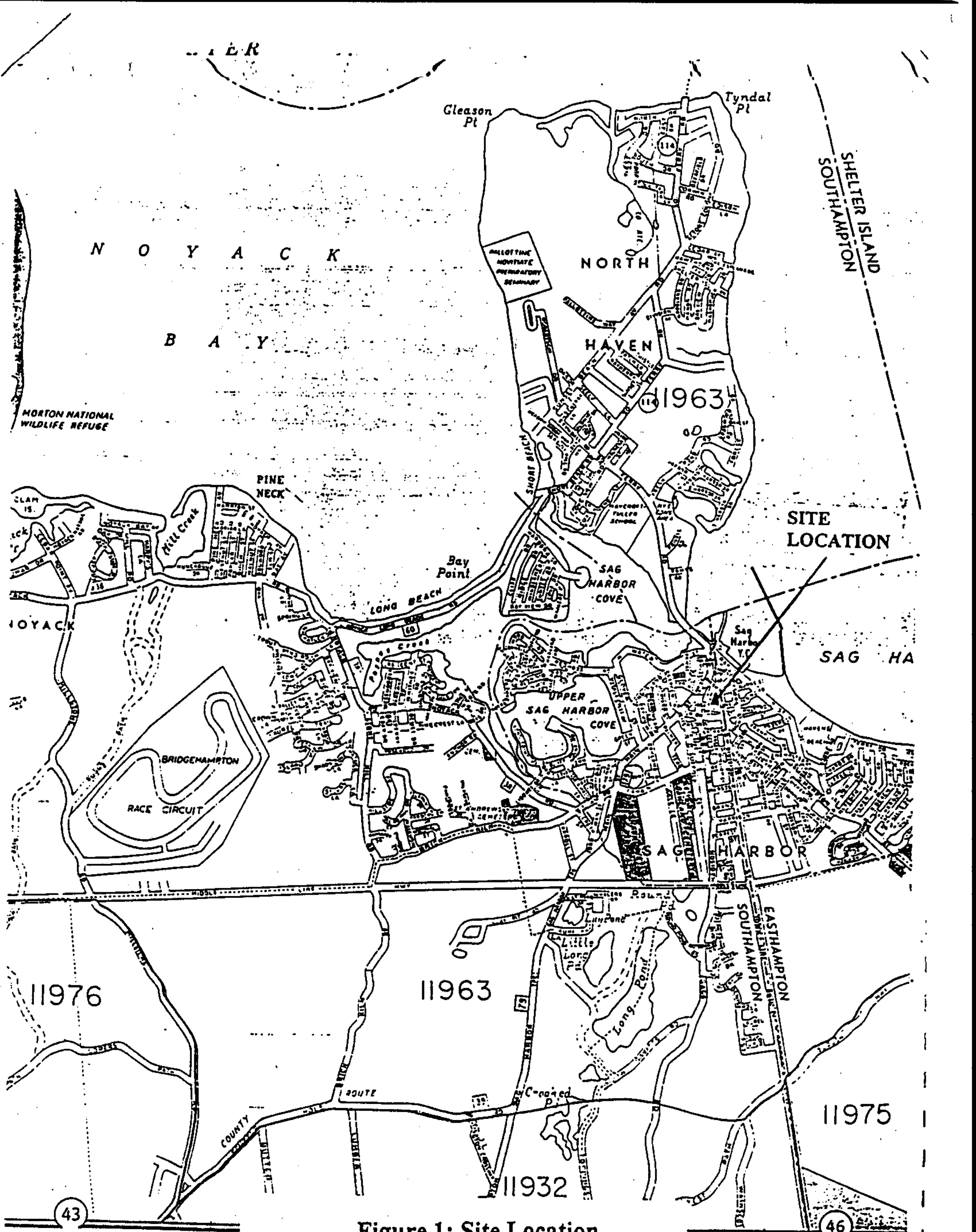
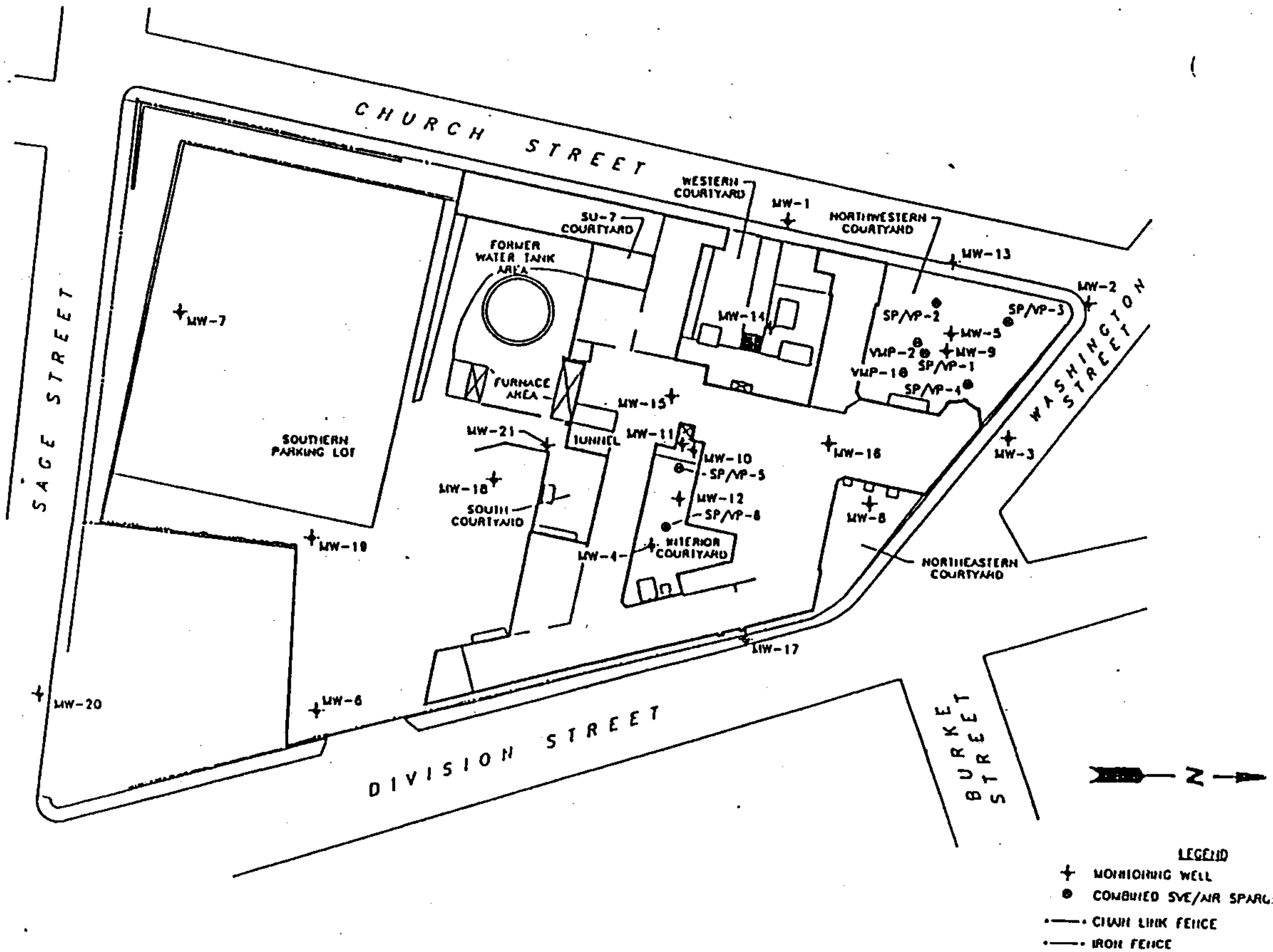


Figure 1: Site Location

Figure 2: Former Watch Case Factory Site



Former Watch Case Factory Site, Sag Harbor, New

Bulova Corporation owned and operated the facility between 1936-1981. During this period, unknown quantities of 1,1,1 trichloroethane and trichloroethene wastes were released into the environment. The primary location of chemical and hazardous waste storage was the Interior Courtyard and a room adjoining that courtyard. Underground storage tanks (USTs) containing fuel oil presently exist in the Interior Courtyard and South Courtyard, and two USTs have been removed from the Western Courtyard.

The site was designated as a Class 2 site by the NYSDEC on January 20, 1993.

2.2 Remedial History

The following is a chronological listing of investigations and remedial measures performed at the site. A more detailed description of these actions is provided in the May 1995 Remedial Investigation/Feasibility Study (RI/FS) Work Plan.

September 1987 - An environmental survey, consisting of 8 soil and 11 soil gas samples, was performed.

May 1989 - An additional soil vapor survey was performed. A total of 15 soil gas samples were collected.

June/July 1989 - Five monitoring wells, currently labeled MW-6 through MW-9, were installed and sampled.

February 1990 - Two underground storage tanks were removed from the Western Courtyard.

February 1991 - An asbestos survey of the building interior was performed.

June/July 1991 - Monitoring wells MW-1 through MW-5 were installed and sampled. Soil samples were also obtained during the installation of the wells.

May 1993 - Air sparge/vapor extraction point SP-VP-1, located in the Interior Courtyard, was installed. Three soil borings and six surface soil samples were also taken.

June 1993 - The former transformer pad was sampled for Polychlorinated Biphenyls (PCBs).

September/October1993 - Dry wells, storm water catch basins, sumps and floor drains were sampled and cleaned out. Soil samples were also taken from the building and Interior Courtyard.

November 1993 - Air sparge/vapor extraction points SP-VP-2 thru SP-VP-6, located in the Interior and Northwest Courtyards, were installed.

April 1994 - A second clean out of select dry wells, catch basins, sumps and floor drains was performed and verification samples were taken.

April 1994 - Soil samples were collected from the base of the coal tunnel, approximately 6 feet inside the entrance. Historically, this tunnel was used to move coal in wheelbarrows from storage bins to the furnace area.

September 1994 - Operation of the Air Sparge and Soil Vapor Extraction System began.

November 1994 - Soil gas points SG-1 through SG-25 were installed and sampled.

November 1994 - Additional surface and subsurface soil samples were collected around the furnace, adjacent to sump SU-5, at the base of the tunnel and near injection well IW-7. Background soil samples were also taken for comparison.

December 1994 - Monitoring wells MW-13 through MW-20 were installed and sampled.

January 1995 - A third clean out of select dry wells, catch basins, sumps and floor drains was performed and verification samples were taken.

July 1996 - Surface soils across one-third of the Interior Courtyard were removed and the entire courtyard was covered with 12 inches of clean soil.

Currently, soil vapor extraction systems and air sparging systems are operating in the Northeast and Interior Courtyards. Periodic sampling of select monitoring wells is also being conducted in compliance with the approved Interim Remedial Measures (IRM) Work Plan.

SECTION 3: CURRENT STATUS

In response to a determination that the presence of hazardous waste at the site presents a significant threat to human health and the environment, the responsible party (Bulova Corporation) has recently completed a Remedial Investigation (RI).

3.1 Summary of the Remedial Investigation

The purpose of the RI was to define the nature and extent of any contamination resulting from previous disposal activities at the site.

Due to the extent of prior investigations, the RI was implemented in one phase, which concluded in October 1995. The Final Remedial Investigation Report, dated August 1996, describes the field activities and findings of the RI in detail.

The RI included the following activities:

Surficial soil samples were collected from 15 different locations on and off the site. The purpose of three (3) off-site soil samples was to determine the background levels of chemicals in area soils. The soil samples collected were analyzed for VOCs, SVOCs, pesticides/PCBs and metals.

To supplement the information already collected on the groundwater underneath the site, groundwater samples were collected from existing wells in the Western and Northwest Courtyard areas. These samples were analyzed for VOCs, SVOCs and metals.

To further understand the groundwater conditions beyond the property line, eight groundwater samples were taken at six locations between the northern boundary of the site and the shore line. These samples were analyzed for VOCs.

Air samples were taken at four locations inside the building and analyzed for VOCs.

To determine which media (soil, groundwater, etc.) contain contamination at levels of concern, the RI analytical data was compared to environmental Standards, Criteria, and Guidance (SCGs). Groundwater, drinking water and surface water SCGs identified for the Bulova Watch Factory Site were based on NYSDEC Ambient Water Quality Standards and Guidance Values and Part V of the New York State Sanitary Code. NYSDEC soil cleanup guidelines for the protection of groundwater, background conditions, and risk-based remediation criteria were used as SCGs for soil. These are listed in NYSDEC's Technical Administrative Guidance Memorandum (TAGM) #4046.

Based upon the results of the Remedial Investigation and comparison to the SCGs and potential public health and environmental exposure routes, some of the soils and groundwater at the site required remediation. These are summarized below. More complete information can be found in the RI Report.

Chemical concentrations in soils and groundwater are reported in parts per billion (ppb) and parts per million (ppm). Air sampling results are reported in parts per billion by volume (ppbv). For comparison purposes, SCGs are given for each medium.

3.1.1 Nature of Contamination

As described in the RI Report, many soil, groundwater and air samples were collected at the site to characterize the nature and extent of contamination.

<u>Soil</u>

A total of twelve soil samples were collected from different areas on site. Three background soil samples were also obtained to determine soil quality off site. All the samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and metals. All but two soil samples were also analyzed for pesticides and PCBs.

The concentrations of VOCs detected in soil were below the recommended cleanup objectives. Trichloroethene, benzene, naphthalene and toluene were the primary VOCs detected in soil.

Several SVOCs, including benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, phenol, and dibenzo(a,h)anthracene were detected in one or more soil samples, above the recommended cleanup objectives. Benzo(a)pyrene was detected in the background samples above the recommended cleanup objectives.

One PCB, Aroclor-1254, was detected in site soils, at concentrations below the recommended cleanup objective of 1 ppm. Several pesticides were detected in both on-site and background soil samples at concentrations exceeding the cleanup guidelines.

Arsenic, mercury, chromium, lead, silver and selenium are the metals which exceeded the recommended cleanup objectives in one or more soil samples.

<u>Groundwater</u>

During the RI, selected on-site monitoring wells were sampled and analyzed for VOCs, SVOCs and metals. Six off-site geoprobe points were installed and eight groundwater samples were obtained from them. Two of the eight geoprobe samples were taken from a depth of 27 feet to see if the contamination had migrated deeper into the aquifer. All groundwater samples obtained using the geoprobe were analyzed for VOCs.

Wells MW-1 and MW-15 presently contain floating fuel oil, and MW-14 contains an oily sheen. The investigation and remediation of this petroleum-related contamination is being undertaken by the current property owner pursuant to the NYSDEC's Spill Response Program, and is not under the scope of this ROD.

Groundwater analytical results from monitoring wells MW-13 and MW-14 contained benzene, toluene, ethyl benzene, and xylene (BTEX), and several chlorinated hydrocarbons at concentrations exceeding ambient standards. SVOCs were also detected in the two monitoring wells at concentrations exceeding standards. Naphthalene was the primary compound detected in MW-14. The only inorganic contaminant which exceeded the laboratory detection limit was barium.

Geoprobe samples taken off site found VOC concentrations ranging from non-detect to 29 ppb. Trichloroethene, benzene and naphthalene were detected at concentrations exceeding ambient standards in three different locations. Each of these contaminants was found in only one off-site sample, indicating that a measurable off-site plume was not identified.

Several on-site monitoring wells are part of the monitoring program instituted as part of the IRM at the site, as described in Section 3.2. Groundwater samples are obtained from these monitoring wells on a periodic basis and analyzed for VOCs. The following chlorinated VOCs are routinely detected at concentrations exceeding ambient standards:

trichloroethene	tetrachloroethene	chloroform
1,1,1-trichloroethane	1,2-dichloroethene	vinyl chloride
1,1,2-trichloroethane	1,1-dichloroethane	

<u>Air</u>

Three of the four indoor air samples did not contain detectable levels of contaminants. One sample, collected in the eastern wing of the building adjacent to SU-5, contained trichloroethene at a concentration of 2.4 ppbv. The Annual Guideline Concentration (AGC) for this contaminant is 0.084 ppbv.

3.1.2 Extent of Contamination

Table 1 summarizes the extent of contamination for the contaminants of concern in soil, groundwater, and air, and compares the data with the remedial action levels (SCGs) for the site. For the purposes of the RI, the site has been organized into 11 geographic areas. The following are the media which were investigated in each of these areas and a summary of the findings of the investigation.

Soil

Interior Courtyard

A total of four soil samples were collected from the Interior Courtyard. VOCs were below the recommended soil cleanup objectives. Several SVOCs, including benzo(a)anthracene (0.24-2.8 ppm), chrysene (0.36-3.1 ppm), benzo(b)fluoranthene (0.36-3.4 ppm), benzo(k)fluoranthene (0.37-2.4 ppm) and benzo(a)pyrene (0.26-2.5 ppm) exceeded soil cleanup guidelines in one or more samples. Metals exceeded background concentrations in all four samples. Chromium and lead were detected at up to 2600 ppm and 900 ppm, as compared to the cleanup objectives of 50 ppm and 260 ppm (site background) respectively.

Furnace Area

VOCs in the sample collected from this area were below the soil cleanup guidelines. Three SVOCs, phenol (0.34 ppm), benzo(a)pyrene (0.15 ppm) and dibenz(a,h)anthracene (0.043 ppm) were above the cleanup guidelines. Cadmium exceeded the background concentrations but was below the soil cleanup guideline of 10 ppm.

Former Water Tank Area

VOCs, SVOCs, pesticides and PCBs were detected below the soil cleanup guideline with the exception of benzo(a)pyrene (0.14 ppm).

SU-7 Courtyard

No VOCs exceeded the soil cleanup guidelines. Five SVOCs: benzo(a)anthracene (1.7 ppm), chrysene (2.8 ppm), benzo(b)fluoranthene (2.6 ppm), benzo(k)fluoranthene (1.8 ppm), and benzo(a)pyrene (1.8 ppm) exceeded the soil cleanup guidelines. Arsenic (19 ppm), silver (9.5 ppm) and selenium (2.7 ppm) exceeded the soil cleanup guidelines.

Southern Parking Lot

VOCs, SVOCs and pesticides/PCBs were all below soil cleanup guidelines. Arsenic (33 ppm) was the only metal that exceeded the cleanup guideline.

South Courtyard

VOCs, pesticides and PCBs were below cleanup guidelines. Three SVOCS: benzo(a)anthracene (0.30 ppm), chrysene (0.45 ppm) and benzo(a)pyrene (0.24 ppm) were detected above cleanup guidelines. Silver (65 ppm) also exceeded the background cleanup guideline.

Western Courtyard

VOCs and SVOCs were not detected at the detection limit. Concentrations of all metals were below background levels.

Groundwater

Groundwater beneath the site is contaminated above ambient groundwater standards in the primary source area (Interior Courtyard) and downgradient of this source. This on-site groundwater contamination is limited to the uppermost portion of the Upper Glacial Aquifer, and contaminants do not appear to have migrated into wells located 50 feet below ground surface.

At the site boundary, the Interim Remedial Measures described below have been effective in reducing formerly high contaminant concentrations to levels which are approaching ambient groundwater standards. Since April 1996, monthly monitoring results have detected individual site contaminants at 15 ppb or less, as compared to their groundwater standard of 5 ppb.

Off-site groundwater impacts from past releases were investigated using the Geoprobe methodology. Site-related contaminants were detected off site at concentrations that exceeded ambient groundwater standards. However, no individual contaminant was found in more than one well, and all contaminants occurred at low concentrations (< 30 ppb). The highest contaminant level found off site was 29 ppb of trichloroethylene in GP-2D, at a depth of 27 feet. This data indicates that an off-site plume was not identified.

3.2 Interim Remedial Measures

Interim Remedial Measures (IRMs) are conducted at sites when a source of contamination or exposure pathway can be effectively addressed before completion of the RI/FS.

In 1994, a remediation system for sub-surface soils and groundwater was installed at the site as an Interim Remedial Measure (IRM). The objective of this system is to remove VOCs from the soil and groundwater by a combination of two techniques, soil vapor extraction and air sparging.

The soil vapor extraction (SVE) system uses a blower attached to several wells to draw air through soils above the water table. This flow of air allows VOCs to evaporate from the soils and into air between soil particles. Contaminants are then drawn into the collection wells and treated prior to discharge.

SVE systems are effective in cleaning soils above the water table, but are not effective for remediating contaminated soils below the water table. Air sparging is a technology that has proven effective in these situations. This technology can remove VOCs from soil below the water table and also offers the additional benefit of capturing some of the VOCs dissolved in the groundwater. Air sparging is the process of injecting air into the saturated soils below the water table. This causes VOCs in the saturated soil to evaporate into the injected air, which in turn is captured by the SVE system. Figure 2 shows the 8 locations at which the system operates at the site.

Figure 3: Bulova Watch Factory
IRM Monitoring Results - MW-9

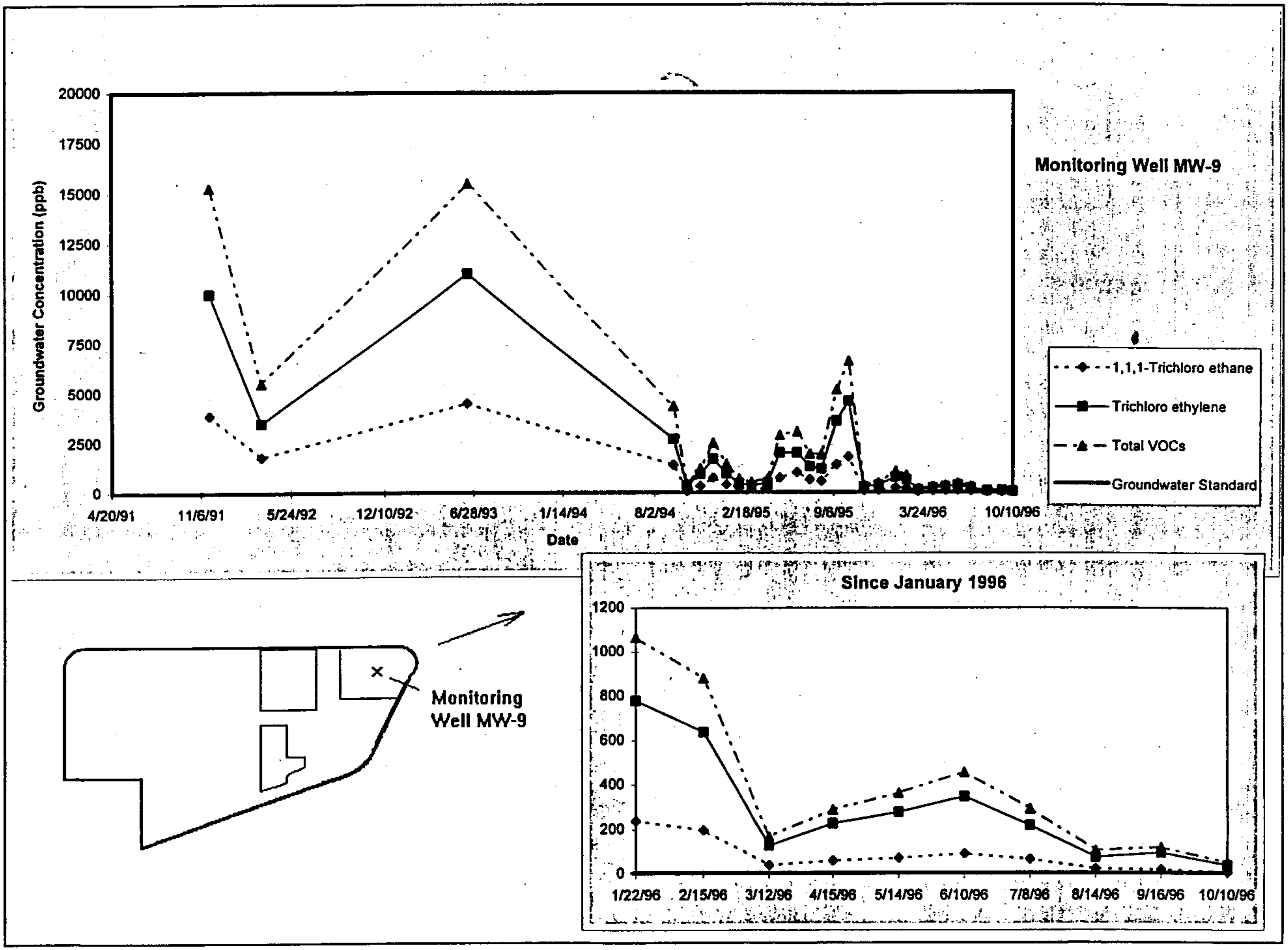
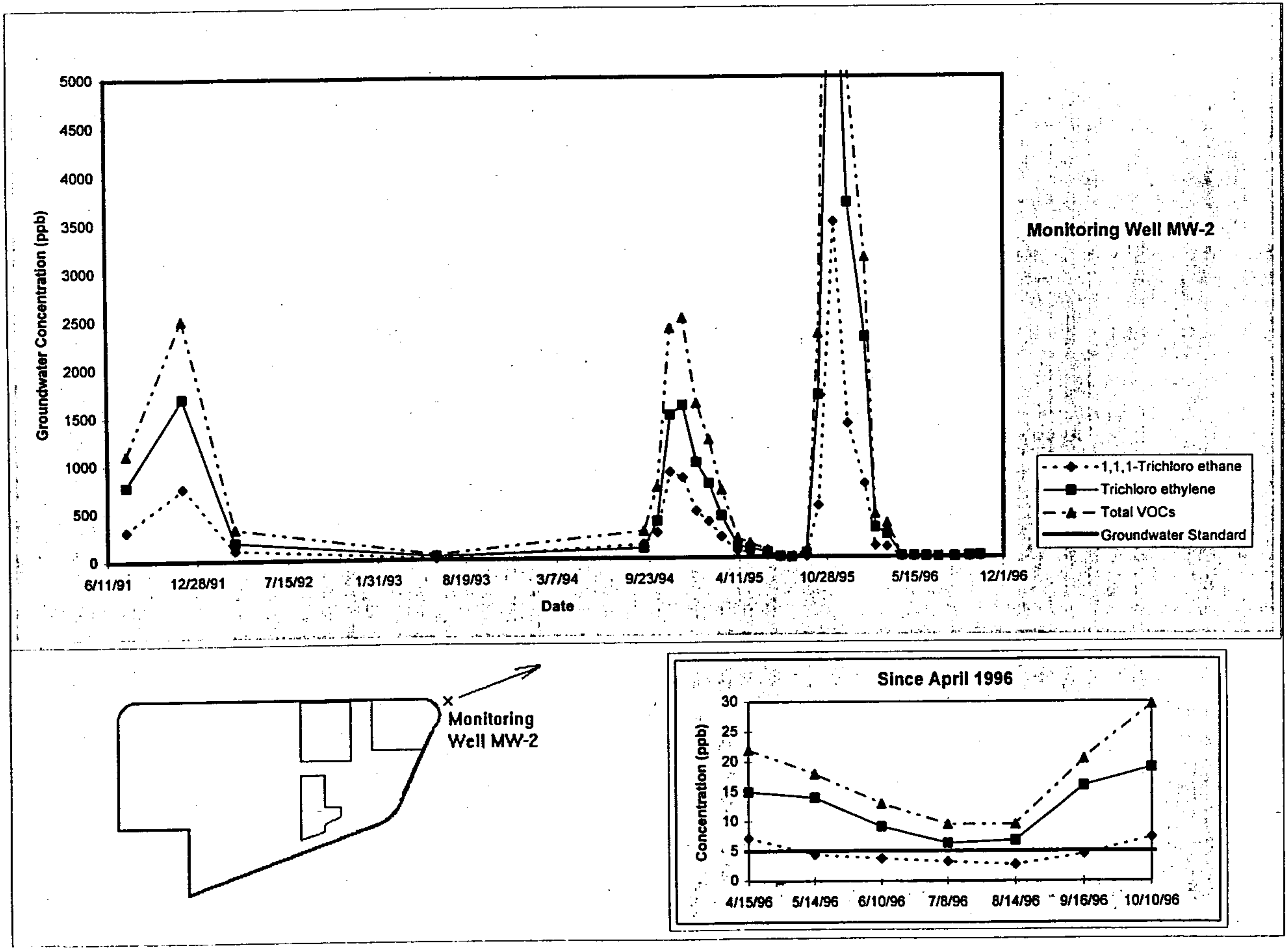


Figure 4: Bulova Watch Factory
IRM Monitoring Results - MW-2



The IRM has proven to be effective in reducing VOC concentrations in site groundwater and soil. From the time of the system start-up through March 1996, the overall concentrations of VOCs in the site groundwater have decreased significantly. The analytical results from periodic groundwater monitoring in the source and downgradient areas are displayed in Figures 3 and 4 respectively.

In July 1996, another Interim Remedial Measure was performed to address soil contamination in the Interior Courtyard area. This action was taken in response to concerns about future residential exposure to contaminants in surficial soils. The top 12 inches of soil, contaminated primarily with lead and chromium, comprising approximately 60 cubic yards, was excavated and removed from portions of the area. Twelve inches of clean soil were placed over the entire Interior Courtyard area. As a result of this action, metals concentrations in surficial soils of the Interior Courtyard are now below soil cleanup guidelines.

3.3 Summary of Human Exposure Pathways

This section describes the types of human exposures that may present added health risks to persons at or around the site. A more detailed discussion of the health risks can be found in Appendix E of the RI Report ("Risk Assessment").

An exposure pathway is the route by which an individual may come into contact with a site contaminant. The five elements of an exposure pathway are 1) the source of contamination; 2) environmental media and transport mechanisms; 3) the point of exposure; 4) the route of exposure; and 5) the receptor population. These elements of an exposure pathway may be based on past, present, or future events.

The former Watch Case Factory building is currently a vacant industrial structure. A fence surrounds the property. Based on current development plans, the building is likely to be renovated for future residential occupancy. The site is supplied by municipal drinking water; groundwater at the site is not used as a drinking water source.

Identified Exposure Pathways and Receptors

Current Use:
Under current land use the site is vacant and access is restricted by fencing. Although contaminants have been detected in the soil, groundwater, and indoor air, there are no identified receptors under current use.

Future Use:
Under future land use the Bulova building will remain in place and will be converted into condominiums. Potential receptors include residents, on-site construction workers and visitors. Potential exposure points are soil, groundwater and air.

Using the future residential exposure scenario, the carcinogenic and non-carcinogenic risks to potential human receptors were estimated for the levels of contaminants of concern found at the site. For child and adult residents, inhalation of vapors in indoor air produced carcinogenic risks of 3.0×10^{-6} and 4.0×10^{-6} (3 and 4 in one million), respectively. This risk is due entirely to the contaminant trichloroethylene, which is present in groundwater beneath the site. The risks due to contact (both skin contact and incidental ingestion) with surface soils are estimated to be 5×10^{-7} and 8×10^{-7} (5 and 8 in ten million) for child and adult receptors, respectively. For on-site construction workers, the risk due to contact with subsurface soil is estimated to be 8.0 x 10^{-9}. The primary contaminant associated with these risks is benzo(a)pyrene.

These estimated risks are evaluated in comparison to the New York State Department of Health health risk goal of one excess cancer in one million (1 x 10^{-6}). Although the risk associated with indoor air exposure exceeds the guideline by a small amount, it should be noted that trichloroethylene was detected in only one of four indoor air samples at a concentration of 2.4 ppbv. Also, future operation of the groundwater IRM system and replacement of the building floors are expected to further reduce the potential for airborne exposure. The risk associated with exposure to surface soils is within acceptable goals.

Non-carcinogenic risks are evaluated by calculating the Hazard Index, which is an estimate of effects such as organ damage or reproductive effects. Hazard Indexes for the exposure scenarios discussed above are well within acceptable limits.

3.4 Summary of Environmental Exposure Pathways

This section summarizes the types of environmental exposures which may be presented by the site. The Environmental Assessment included in Appendix E of the RI presents a more detailed discussion of the potential impacts from the site to fish and wildlife resources.

The site is located in a developed area and provides little habitat value. Thus, the amount of fish and wildlife resources in the vicinity is limited. Freshwater aquatic life will not be impacted by contaminants in groundwater since there are no freshwater bodies downgradient of the site. Potential exposure was evaluated for marine life, which may be impacted by contaminants as groundwater migrates towards Sag Harbor, the nearest downgradient saline water body. Because a remedial action is already in place, the groundwater plume is not expected to further migrate. A fate and transport model demonstrated that chemicals at the site are not anticipated to impact Sag Harbor Cove.

SECTION 4: ENFORCEMENT STATUS

Potentially Responsible Parties (PRPs) are those who may be legally liable for contamination at a site. This may include past or present owners and operators, waste generators, and haulers.

Orders on Consent

Date	Index	Subject
07/11/94	W1-0674-94-01	IRM
09/11/95	W1-0674-94-01	RI/FS/RA

The NYSDEC and the Bulova Corporation entered into a Consent Order on September 11, 1995. The Order obligates the Responsible Party to perform a full remedial program, consisting of a Remedial Investigation (RI), Feasibility Study (FS) and Remedial Action (RA). Upon issuance of the Record of

Decision, the Bulova Corporation will implement the selected remedy in compliance with this Order on Consent.

SECTION 5: SUMMARY OF THE REMEDIATION GOALS AND SELECTED REMEDY

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375-1.10. The overall remedial goal is to meet all Standards, Criteria, and Guidance (SCGs) and to be protective of human health and the environment.

At a minimum, the remedy selected should eliminate or mitigate all significant threats to public health and to the environment presented by the hazardous waste disposed at the site through the proper application of scientific and engineering principles.

The goals selected for this site are:

- Eliminate the potential for direct human or animal contact with the contaminated soils on site.
- Mitigate the impacts of contaminated groundwater to the environment.
- Provide for attainment of SCGs for groundwater quality at the site boundary, to the extent practicable. The SCGs for the groundwater quality are provided in 6NYCRR Part 703.5.

The selected remedy should be protective of human health and the environment, be cost effective, comply with other statutory laws and utilize permanent solutions, alternative technologies or resource recovery technologies to the maximum extent practicable.

At the Bulova Watch Factory Site, four remedial measures have already been employed or are currently in operation. Drywells, catch basins, sumps, and drains have been cleaned out and contaminated soils have been excavated, which addressed the majority of site soil contamination. A Soil Vapor Extraction/ Air Sparging (SVE/AS) system is currently operating as an IRM. This remediation system consists of two SVE/AS systems to treat VOCs at the site. One system is located in the Interior Courtyard, which addresses the source of site groundwater contamination. The second system is located in the Northwest Courtyard, which addresses VOCs in the downgradient portion of the site, and prevents groundwater contaminants from migrating off-site. In July 1996, surficial soils across one-third of the Interior Courtyard were removed and the entire courtyard was covered with 12 inches of clean soil.

The remedial measures which have been implemented or which are currently in operation have been demonstrated to effectively remediate contaminants associated with the site. Based on this effectiveness and the factors described below, the NYSDEC determined that it was not necessary to develop and evaluate additional remedial alternatives in a Feasibility Study.

- The SVE/AS system will continue to operate, under the NYSEDC's review, until groundwater quality standards are achieved or it is determined that it is not practical or feasible to remove additional VOCs from the soil and groundwater.
- Groundwater at the site and downgradient of the site is not used as a drinking water source.

- Contaminants in the groundwater are not expected to migrate off site in significant concentrations due to the SVE/AS remedial system currently operating.

- The offsite groundwater sampling detected infrequent occurrences and low levels of VOCs.

- The computer model used to forecast future groundwater flow showed no potential for migration of site contaminants to private water supplies located to the east, west and south of the site.

Concerns of the community regarding the RI Report and the Proposed Remedial Action Plan have also been evaluated. The Responsiveness Summary included as Appendix A presents the public comments which were received and the Department's response to the concerns which were raised. One written comment was received during the comment period, and this supported the proposed remedy and congratulated the public and private organizations which made the project a success. Most of the verbal comments raised during the public meeting were questioners seeking more detailed justifications for the protectiveness of the proposed remedy. These justifications are provided in Appendix A.

Based on these factors, the NYSDEC has selected no further action as the preferred remedial alternative for contamination associated with hazardous waste disposal at the site. This selection is based upon the demonstrated ability of the ongoing IRM to effectively reduce the concentrations of site contaminants. VOC contamination in soils and groundwater are expected to be reduced below cleanup goals as a result of the soil vapor extraction and air sparging systems currently operating at the site. Residual petroleum contamination associated with leaking underground storage tanks will be addressed by the current site owner pursuant to the NYSDEC Spill Response Program.

The selected remedy does not incur any costs in addition to those associated with the completed and ongoing Interim Remedial Measures. The estimated present worth cost to implement the IRMs is $753,300. The cost to construct the soil vapor extraction system was $200,000, and the cost of the soil excavation IRM was $70,000. The average operation, maintenance and monitoring cost of the soil vapor extraction system is approximately $100,000 per year. The present worth cost estimate is based on construction and three years' past operation of the SVE/AS system, and two years of future operation. This estimated duration is provided solely for the purposes of estimating costs, and does not necessarily represent the DEC's expectation that the remedial goals will be achieved in such a time frame.

The elements of the selected remedy are as follows:

- Continued operation of the ongoing soil and groundwater remediation system, consisting of two air sparging and soil vapor extraction systems to treat VOCs at the site. One system is located in the Interior Courtyard to remediate the source area, and the other is located in the Northwest Courtyard to prevent contaminants from leaving the site property. These systems will be operated until the remediation goals established for the site are achieved, or until it is demonstrated that achieving such goals is not technically praticable.

- Monitoring the performance of the remediation system to ensure that the remediation goals are met.

- Reclassification of the site from a Class 2 to a Class 4 on the New York State Registry of Inactive Hazardous Waste Disposal Sites. A Class 4 inactive hazardous waste disposal site is "a site that has been properly closed but that requires continued operation, maintenance, and/or monitoring".

SECTION 6: HIGHLIGHTS OF COMMUNITY PARTICIPATION

As part of the remedial investigation process, a number of Citizen Participation (CP) activities were undertaken in an effort to inform and educate the public about conditions at the site and the potential remedial alternatives. The following public participation activities were conducted for the site:

- A repository for documents pertaining to the site was established in the John Jermain Memorial Library in Sag Harbor.

- A site mailing list was established, which included nearby property owners, local political officials local media and other interested parties.

- A public meeting was held in April 1994 to present the Interim Remedial Measures Work Plan to the public and to receive comments.

- Fact sheets were mailed out in December 1993, April 1994, October 1995 and September 1996 to keep the public apprised of activities occurring at the site.

- In October 1996 a public meeting was held to present the Proposed Remedial Action Plan (PRAP) to the public and receive comments.

- In November 1996 a Responsiveness Summary was prepared and made available to the public, to address the comments received during the public comment period for the PRAP.

Table 1
Nature and Extent of Contamination

MEDIA	CLASS	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (ppb)	FREQUENCY of SCG EXCEEDANCE	SCG (ppb)
Groundwater	Volatile Organic Compounds (VOCs)	Benzene	ND to 6	6 of 34	0.7
		1,1-Dichloroethane	ND to 860	2 of 34	5
		1,1-Dichloroethene	ND to 1100	6 of 34	5
		1,1,1-Trichloroethane	ND to 21000	11 of 34	5
		1,1,2-Trichloroethane	ND to 70	3 of 34	5
		1,2-Dichloroethene	ND to 7000	6 of 34	5
		cis -1,2-Dichloroethene	ND to 180	4 of 21	5
		Chloroform	ND to 31	2 of 34	7
		Naphthalene	ND to 920	2 of 19	10
		Trichloroethene	ND to 29000	18 of 34	5
		Ethyl benzene	ND to 120	4 of 34	5
		Vinyl Chloride	ND to 120	3 of 34	2
		Meta+ Para-Xylenes	ND to 440	3 of 13	5
	Semivolatile Organic Compounds (SVOCs)	Acenaphthene	ND to 32	1 of 10	20
		Naphthalene	ND to 280	1 of 10	10
	Pesticides & Polychlorinated Biphenyls (PCBs)	4,4'-DDE	ND to 0.57	1 of 11	ND
		Endrin	ND to .05	1 of 11	ND
		4,4'-DDD	ND to .051	1 of 11	ND
	Metals	Cadmium	ND to 13.4	1 of 11	10
		Manganese	ND to 493	1 of 11	300
		Iron	ND to 780	1 of 11	300

MEDIA	CLASS	CONTAMINANT OF CONCERN	CONCENTRATION RANGE (ppm)	FREQUENCY of SCG EXCEEDANCE	SCG (ppm)
Soils	Semivolatile Organic Compounds (SVOCs)	Benzo (a)anthracene	ND to 2.8	5 of 12	0.224
		Chrysene	ND to 3.1	4 of 12	0.40
		Benzo(b) fluoranthene	ND to 3.4	3 of 12	1.1
		Benzo(k) fluoranthene	ND to 2.4	3 of 12	1.1
		Benzo(a)pyrene	ND to 2.5	7 of 12	0.061
		Phenol	ND to 0.34	1 of 12	0.030
		Dibenzo(a,h)anthracene	ND to 0.52	3 of 12	0.014
	Inorganics	Arsenic	ND to 33	2 of 12	7.5 or SB
		Mercury	ND to 2.7	4 of 12	0.10
		Barium	2.3 - 130	0 of 12	300 or SB
		Cadmium	ND to 8	0 of 12	10 or SB
		Chromium	2.4 - 2600	5 of 12	50 or SB
		Lead	41 - 900	5 of 12	SB (260)
		Silver	ND to 74	6 of 12	SB (5.1)
		Selenium	ND to 2.7	6 of 12	2 or SB
Air	VOCs	Trichloroethene	ND to 2.4	1 of 4	0.084

ND - Non-Detectable
SB - Site Background
SCG - Standard, Criteria or Guidance

APPENDIX A:
Responsiveness Summary

Apart from verbal and written comments received during the public meeting, no written comments were received during the public comment period. The single written comment received during the meeting was supportive of the proposed remedy, and offered congratulations to the public and private organizations for conducting a successful project. Therefore, this responsiveness summary will entirely address the verbal comments and questions which were raised during the October 17, 1996 public meeting.

Questions Relating to Development of the Site and Future Habitation of the Building

Q. How will the building be converted into condominiums?

A. The DEC has not received any information concerning the development plans for the site. However, the cleanup levels which were achieved for surface soils are consistent with any future residential activities at the site.

Q. What is the potential for future residential exposure to contaminants adhered to the interior surfaces of the building?

A. The DEC required Bulova to evaluate the potential for exposure to contaminants in indoor air by obtaining indoor air samples at four locations over a 24-hour period. These sample locations were selected based on areas where solvents were known to have been used. Because site contaminants are volatile, any contaminants present on the wall surfaces would have been detected in indoor air samples. Three of these samples contained no detectable levels of contaminants. The fourth contained a concentration of trichloroethylene (2.4 ppb_v) which was only slightly greater than the detection limit of the analysis (2.0 ppb_v). These results indicate that indoor air contamination is not a threat to future residents of the building.

Q. What is the potential for the release of soil gases during future construction at the site?

A. Areas in which subsurface soils were contaminated with volatile organic chemicals are being remediated with the soil vapor extraction (SVE) system. This SVE system is also extracting contaminants that were in groundwater and which are being volatilized by the air sparging (AS) system. Typically, soil contaminants are more easily extracted by SVE systems than those in groundwater, and the DEC believes that most volatile soil contaminants have now been removed. The contaminants currently being collected by the SVE system are those which are volatilized from groundwater by the air sparging system. As a result, construction which disturbs the top 12 to 14 feet of soils above the water table would have a minimal potential for releasing soil gases.

Q. When will operation of the Interim Remedial Measure (IRM) be complete so that construction of residences in the building can begin? Is the site habitable now, even though the soil vapor extraction system is in operation? Can DEC give an expected date for termination of the vapor extraction system?

A. The DEC cannot give a firm estimate as to when the operation of the IRM may be complete. Based on trends in the groundwater monitoring results, operation of the system in the Interior Courtyard, the source area, may be terminated prior to that in the Northwest Courtyard. As explained in more detail below, the DEC will allow Bulova to shut off the Interior Courtyard system for one month to observe the response. This may allow a better estimate of the IRM duration in that area. However, the DEC believes that construction in the building may proceed while the IRM is in operation, provided that such construction does not interfere with that operation. The DEC and State Department of Health (DOH) believe that, with respect to prior hazardous waste contamination, the site is safe for construction and habitation in its present condition.

Q. Will the Suffolk County Department of Health have a problem with issuing a building permit and allowing residential occupation of the building?

A. The DEC cannot speak for the Suffolk County Department of Health, particularly if they may have concerns unrelated to prior hazardous waste contamination. As stated above, the DEC and DOH believe that hazardous waste contamination at the site has been remediated to levels that are safe for future residential occupation.

Q. Can someone live in the building with the vapor extraction pumps running? Is there a noise concern?

A. The vapor extraction pumps, which are located in a room adjacent to the Interior Courtyard, are quite noisy. The DEC presumes that future development of the site would include measures to mitigate this noise.

Q. Can Mr. Malloy go to construction tomorrow?

A. With respect to the site's status as an inactive hazardous waste site, provided that the IRM system is not disturbed, construction could begin immediately.

Q. When will the site be reclassified? How long will the site remain a Class 4 Inactive Hazardous Waste Site?

A. Shortly after the Record of Decision is issued, the DEC will begin the process of reclassifying the site to a Class 4. The DEC expects that this process will be complete by the next annual issuance of the Registry of Inactive Hazardous Waste Sites in April 1997. The DEC cannot give a firm estimate as to how long the site would remain as a Class 4. Even after the air sparge and soil vapor extraction systems are discontinued, the site will require continued monitoring to ensure that residual concentrations of contaminants remain at acceptable levels.

Q. Within 6 months to a year, will it be safe for people to inhabit the site, have vegetable gardens and use a playground?

A. As stated above, the DEC and DOH believe that hazardous waste contamination at the site has been remediated to levels that are safe for future residential occupation. With specific regard to gardens and playgrounds, the cleanup guidelines which were applied to the soil IRMs were established with these activities in mind. The exposure scenarios for ingestion of soils, which produced the site-specific cleanup goals, account for these uses. Because the soil cleanup goals were achieved, the site is considered to be safe for future residential occupation.

<u>Questions Relating to the Air Sparge / Soil Vapor Extraction System and Other IRMs</u>

Q. What measures were taken during the soil removal to prevent dust emissions and associated contaminant exposures to the public?

A. During the soil removal, dust emissions were monitored, and a contingency plan was in place if dust levels reached an unacceptable level. This plan called for control measures and work stoppage if the threshold value of 150 micrograms per cubic meter was exceeded. This did not occur.

Q. Who owns the treatment system?

A. The air sparging and soil vapor extraction system is owned by the Bulova Corporation.

Q. Has the system experienced any breakdowns or accidents?

A. The system has not experienced any accidental release of contaminants to the air, nor any accident involving personal injury. There have been a few breakdowns of system components which have caused temporary shutdowns of the system. On two occasions, a rotary vane in the Interior Courtyard blower system failed, and system operation was briefly terminated. In October 1995, a starter motor to one of the Northwest Courtyard sparge pumps was replaced due to decreasing performance. The same pump later failed, causing a system shutdown, and was replaced in December 1995.

Q. Is there a plan to turn off the vapor extraction system for a month? When? Why would this be done, and what would happen after that?

A. Bulova and their consultant have proposed turning off the Interior Courtyard air sparging and soil vapor extraction system for one month. The Northwest Courtyard system would remain operational. The purpose of this suspended operation is to observe the response in groundwater contaminant concentrations, and to thereby evaluate how much contamination remains sorbed onto soil particles below the water table. Contaminant concentrations in the source area have been relatively constant, at approximately 50 ppb of Total Volatile Organics (TVOCs), since September 1995. This level (50 ppb) is the ambient groundwater standard for TVOCs. After the system operation is suspended, groundwater contaminant concentrations will be measured, and the system will be restarted. If TVOC concentrations remain at 50 ppb after suspended operation, it may be seen as an indication that the source area has been remediated to levels that comply with groundwater standards. If a "spike" in contaminant concentrations is observed, it would be interpreted as evidence that a source of higher contamination exists in the source area that requires further remediation.

Q. With regard to the "spikes" of elevated VOC concentrations that were detected in groundwater, what caused these temporary increases, how long does it take for each spike to drop, and why is the second spike in MW-2 higher than the first? Is the changing ground temperature the cause of these spikes?

A. The temporary increases, or spikes, in VOC concentrations are believed to have been caused by equipment failures and problems in the operation of the air sparge/vapor extraction system in the Northwest Courtyard. These spikes were first observed in monitoring well MW-9 in the Northwest Courtyard, and then appeared the following month in monitoring well MW-2, located at the site boundary. In MW-2, two well-defined spikes occurred in November/December 1994 and November 1995. After both of these occurrences, groundwater concentrations returned to their baseline levels after 4 months. The NYSDEC cannot explain why the spike which occurred in the fall of 1995 was greater than that which occurred in the fall of 1994. Because both groundwater and subsurface soil temperatures are relatively constant throughout the year, it is unlikely that air temperature fluctuations are the cause of these spikes. Evidence for this includes the lack of spikes in the Interior Courtyard during the winter months, and the fact that spikes in MW-9 occurred in the fall, then diminished during the winter months.

Q. Is there air monitoring conducted in connection with operation of the air sparging system? Have the respirator cartridges of the air sparging technicians been checked? What is being released to the air from the air sparging system?

A. Two types of air monitoring are performed monthly. Concentrations of contaminants in air are measured before and after the carbon filter which is used to control emissions from the site. These are measured first using hand-held instruments, and then samples are taken for laboratory analysis, which provides a better level of detection. The laboratory sample results are used to evaluate compliance with the air emissions permit for the site. During inspection and maintenance of the equipment, hand-held instruments are used to measure contaminant concentrations in the work area as part of the health and safety plan for site technicians. These measurements have not indicated the need for technicians to wear respirators, and so no analysis of respirator cartridges has been done. The level of contaminants in the air emissions has been consistently below the detectable limit, so it is difficult to estimate the exact discharge rate. In August 1996, an alternate analytical method was used, which produced a lower detection limit. Based on detections in those samples, the emission rate is estimated to be 1.1 pound per year of total solvents.

Q. How often is the air sparging system monitored?

A. The system is monitored monthly for vapor-phase contaminant concentrations in the influent and effluent from the carbon filter, and for groundwater concentrations in selected monitoring wells. In addition, the system is connected by remote telemetry, which provides an immediate notification to the operator of equipment failure or system shutoff.

Q. Who changes the carbon filters and how often? Where does the spent carbon go?

A. The carbon filters, which control airborne emissions of contaminants, have been replaced twice since the system began operation in September 1994. This was done by Fluor Daniel GTI, on behalf of the Bulova Corporation. The used carbon is shipped back to the supplier, Calgon Corporation, where the solvents are recovered and the carbon is reused.

Questions Relating to Potential Homeowner Drinking Water Wells in the Area

Q. How was the survey of private (homeowner) wells conducted?

A. The survey of homeowner wells was conducted by the Suffolk County Department of Health Services, which compared water billing records to tax map information to determine possible residences not connected to public water.

Q. What if a person finds contamination in a domestic supply well in the future?

A. If contamination in a private well is determined to be related to a specific inactive hazardous waste disposal site, a carbon filter is installed by the DEC as an emergency action. If this contamination persists, arrangements would be made for connection to a public water supply.

Q. Was the water tested at the Elementary School?

A. Water at the Elementary School is provided by public water supply wells located outside of the area potentially impacted by this site. For this reason the schools water was not tested as part of this site investigation. However, the Sag Harbor public water supply is tested at least quarterly by the Suffolk County Water Authority and must meet all NYSDOH drinking water standards.

Questions Relating to Groundwater Contamination

Q. From what depth were groundwater samples taken during the investigation?

A. Groundwater samples were generally taken from the top of the aquifer (water table wells), with the following exceptions. Wells MW-5 and MW-10, located on-site, are screened 50' below the water table. Groundwater samples taken from Geoprobe™ points GW-2D and GW-3D were taken from a depth of 27' below ground surface, or about 15' below the water table.

Q. How big is the groundwater plume under the site? Where does it start and where does it go?

A. The groundwater plume is approximately 500 feet long and 100 feet wide beneath the site. It begins in the interior courtyard area (MW-4) and ends at the site boundary (MW-2).

Q. Where was the highest detection of contaminants found off-site?

A. The highest detection contaminants in groundwater off site was found in GW-2D, where 29 ppb of trichloroethylene was found.

Q. How can it be that there is no evidence of an off-site groundwater plume? How do you know that you have adequately characterized the plume? Why didn't on-site contaminants continue to migrate off-site?

A. At the time of the off-site investigation, October 1995, the NYSDEC found only sporadic detections of contaminants off site. At that particular point in time, no evidence of an off-site plume was found. If significant releases occurred from the site historically, it is possible that a plume once existed and passed under the Village and out into the Harbor. Since 1994, however, the groundwater treatment system has controlled the off-site migration of contaminants.

Q. Did historical off-site groundwater contamination flow out into the Harbor?

A. Based on the rate and direction of groundwater flow, historic releases of contaminants would have discharged into the Harbor.

Q. How fast is the groundwater flowing under the site? Based on this velocity, why isn't there a plume under the Village? Also, what happened to the spikes of contamination that occurred in MW-2?

A. Groundwater flow is estimated to be 1 foot per day in the area. Based on that velocity, it would take a molecule of water less than 2 ½ years to reach the Harbor after passing under the Village. Because contaminants in groundwater generally move more slowly than water, contaminant flow is expected to be somewhat less. As discussed above, it is possible that a contaminant plume passed under the Village in the past, but there is currently no evidence of one. Once the treatment system began operation in 1994, the high regional groundwater flow rate may have flushed contaminants out from beneath the Village. The spikes of contamination which occurred in MW-2 would likely have migrated off-site under the Village. Because these were short-term releases, they would have mixed with clean groundwater and been somewhat diluted.

Q. Were the analytical methods and instrumentation the same throughout the studies and investigations?

A. Yes, laboratory methods of analyzing samples were consistent throughout the studies.

Q. What is the chemistry of site contaminants in the subsurface? What do they degrade to, is there a microbial mechanism, and is there complete mineralization?

A. The primary contaminants at the site, trichloroethylene and trichloroethane, are degraded in the subsurface by reductive dechlorination, in which chlorine atoms are removed from the parent molecule. The activity of soil microbes is a primary mechanism for this process. The resulting products are dichlorethylenes and dichloroethanes, which have been found at much lower levels beneath the site. The next step in the degradation of these substances is further dechlorination to vinyl chloride (chloroethylene) and chloroethane. These contaminants were not detected during the site investigation. Although complete mineralization to hydrochloric acid and carbon dioxide is theoretically possible, the absence of vinyl chloride and chloroethane would preclude it at this site.

Q. Has seasonal variation in the acidity of rainwater and groundwater been taken into account?

A. Seasonal variation in rainfall and groundwater acidity has not explicitly been taken into account. This variation would only affect the leaching of metals from site soils, and should not affect the chemistry of organic contaminants. The cleanup standards for metals in soils are established based on conservative assumptions for leachability, and the laboratory method for analyzing metals involves an aggressive acid extraction process. By these means, the variation in rainfall acidity has been implicitly factored into the cleanup standards.

Miscellaneous Questions

Q. What is DEC's and DOH's toll-free number?

A. DEC's toll-free number is 1-800-342-9296. DOH's toll-free number is 1-800-458-1158, extension 305.

APPENDIX B:
Administrative Record Index

1. Index

2. Record of Decision (December 1996), Proposed Remedial Action Plan (October 1996), and Related Correspondence

3. Consent Orders (July 11, 1994, September 11, 1995)

Reports:

4. Summary Report for Closure of Class V Injection Wells (Groundwater Technology, February 1994)

5. Interim Remedial Measure Work Plan (Groundwater Technology, Draft Final/Approved, February 1994)

6. Interim Remedial Measure Work Plan, Appendix H: Operation and Maintenance Plan (Groundwater Technology, Draft Final/Approved, February 1994)

7. Interim Remedial Measure Work Plan, Appendix I: Quality Assurance Project Plan (Groundwater Technology, Draft Final/Approved, February 1994)

8. Summary Report of Additional Work for Closure of Class V Injection Wells (Groundwater Technology, August 1994)

9. Interim Remedial Measure Work Plan, Appendix J: Health and Safety Plan (Groundwater Technology, Draft Final/Approved, November 1994)

10. Interim Remedial Measure Report (Groundwater Technology, December 1994)

11. Remedial Investigation / Feasibility Study Work Plan (Groundwater Technology, Draft/Approved, May 1995)

12. Remedial Investigation / Feasibility Study Work Plan, Appendices A and B: Summary Tables and Drill Logs (Groundwater Technology, Draft/Approved, August 1995)

13. Remedial Investigation / Feasibility Study Work Plan, Appendix C: Quality Assurance Project Plan (Groundwater Technology, Draft/Approved, May 1995)

14. Remedial Investigation / Feasibility Study Work Plan, Appendix D: Field Sampling and Analysis Plan (Groundwater Technology, Draft/Approved, May 1995)

15. Remedial Investigation / Feasibility Study Work Plan, Appendix F: Citizen Participation Plan (Groundwater Technology, Final, October 1995)

16. Remediation Investigation Report (Groundwater Technology, Final, August 1996)

17. Risk Assessment Report (Groundwater Technology, Final, August 1996)

Correspondence Files

18. Foilable Correspondence

19. Non-Foilable Correspondence