# TE INSPECTION WORKSHEET
(Region I version 6/30/95)

WARNING!!
EPA has determined that the HRS score of any site that is progressing towards listing on the NPL is confidential. Deliberations regarding scoring or listing issues, the site specific status, and HRS scores cannot be released or discussed with non-Agency persons. For additional guidance see the April 30, 1993 OSWER Directive 9320.1-11.

CONFIDENTIAL

| SITE LOCATION | | | |
|---|---|---|---|
| Site Name: Former TRW DOT Division | | | |
| Street Address: 320/330 Nevada Street (also listed as 459 Watertown Street) | | | |
| City: Newton | State: MA | Zip Code: 02160 | Telephone: |
| CERCLIS ID#: MAD001032671 | Coordinates: Latitude: 42° 21' 33" Longitude: 71° 12' 30" | | |

| OWNER/OPERATOR IDENTIFICATION | | | | | |
|---|---|---|---|---|---|
| Owner: Joseph Biotti | | | Operator:* Dragon Systems | | |
| Owner Address: c/o 1 Nevada St. Realty Trust 97 Adams Street | | | Operator Address: 320 Nevada Street | | |
| City: Newton | | | City: Newton | | |
| State: MA | Zip Code: 02195 | Telephone: (617) 527-6242 | State: MA | Zip Code: 02195 | Telephone: (617) 965-5200 |

*Additional operators include Politzer & Haney, Matritech, and Amcare Medical Services,

US EPA REGION 1 CAS
DETERMINED THAT THIS DOCUMENT MAY BE RELEASED
Nancy Smith
DATE: 5-29-98

| SITE EVALUATION | |
|---|---|
| Agency/Organization: Stone & Webster Environmental Technology & Services | TDD#: 9704-10-CSX |
| Investigator: Lisa White | Date: April 30, 1998 |

| EPA CONTACT | | |
|---|---|---|
| EPA SAM: Nancy Smith | | |
| Address: JFK Federal Building | | |
| City: Boston | State: MA | Zip Code: 02203 |
| Telephone: (617) 573- 9697 | | |
| EPA Reviewer: Nancy Smith | Date: 5-29-98 | |

SEMS DocID 595152

## GENERAL INFORMATION

Note: Text in italics is taken directly from the March, 1993 Preliminary Assessment Report prepared by TRC Companies, Inc. (Reference [2]). Other references are noted in brackets [ ], and are listed numerically at the end of this document.

**Site Description**

The Former TRW DOT Division (also known as United-Carr, Inc. or the Ucinite Corporation/DOT Corporation) *is located at 320 Nevada Street, Newton, Massachusetts, Middlesex County, at* 42°21' 33" latitude and 71°12' 30" longitude.[1] *It is part of a larger property designated as 459 Watertown Street.* The site is situated on Lots 9, 10, and 10A of the Town's Assessor's Map 17 NE, Block 8. *The Ucinite/DOT Corporation property is in a mixed residential/industrial neighborhood in the Nonantum section of Newton.* A portion of the Boston South USGS 7.5 minute topographic map showing a 1-mile radius from the site is included as Figure 1.

*The property is 5.1 acres which slope gradually to the north-northeast. At an average elevation of 47.6 feet above mean sea level, the property is located in Zone C (not prone to flooding) as defined on the Federal Emergency Management Agency's Flood Insurance Rate Map.*[19] *Groundwater is found at an average depth of 5 feet across the property. Groundwater flow is difficult to determine, although it is believed to flow north, toward Silver Lake and the Charles River. A perched water table exists at a depth of 5 feet under the parking lot in the area of the former Silver Lake.*

*The site consists of a* five-*story brick mill building, a one-story* warehouse *building* (which later became known as the Plastic Moldings Building as shown on Figure 2), *and a two-story* assembly *building* all *surrounded by a paved, landscaped parking lot.* The entire site is paved, with the exception of a row of trees along Nevada Street.[4]

*Approximately 50 feet north of the mill building is a wetland approximately 5 acres in size. The wetland is what remains of Silver Lake, a small pond that has been mostly filled. Surface water runoff at the property apparently runs behind the mill building (north) and into the remnant of Silver Lake. The wetland appears to be internally drained. Surface water runoff from the property is also channeled into two storm drains immediately to the northeast of the mill building, which ultimately empty into the Charles River, 2,000 feet northwest of the property.*

*Land in the vicinity of 320 Nevada Street is heavily developed.* The site is surrounded by residential properties to the southeast, across Watertown Street, to the southwest, across Nevada Street, and to the northwest, abutting the site. The site is bordered by J. Biotti and Sons Construction and the Paolini Corporation to the northeast.[4] *The nearest residence is 50 feet west of the mill building, across a driveway.*

The site is currently owned by Joseph Biotti of 1 Nevada Street Realty Trust. Currently, the site is occupied by four companies; Dragon Systems, a computer software company, Politzer and Haney, also a computer software company, Matritech, manufacturer of test kits for cancer diagnostics, and Amcare Medical Services, a home service medical care provider.[4] Past and present activities at the former TRW DOT Division are described in the following Operational History section.

CONFIDENTIAL

## Operational History

There are three buildings on the property. The large, five story brick building was built in the mid- 1860s, with two wings added to the original structure in the 1880s and in 1917, respectively. This building, referred to as the "mill building," was used by the Silver Lake Cordage Company to manufacture solid braided cord, sash ropes, clotheslines and trolley and bell pulls. In an area of the mill building, also referred to as the electroplating room, the Silver Lake Cordage Company had a large, coal-powered fly wheel which dragged hemp rope through the then-existing Silver Lake. According to the Massachusetts Historical Commission Report, the Silver Lake Cordage Company ceased operations on the property in approximately 1928.[5]

United-Carr, Inc. (which was acquired by TRW in 1968) began renting space in the mill building in approximately 1938. Space was shared with the Ark-less Switch Company. United-Carr purchased the building in 1947.[5]

Major filling of Silver Lake occurred in 1952 to make room for the one-story concrete block building, referred to as the "plastic moldings building," for parking, and for use by other adjacent property owners. Permits were sought and obtained from the City of Newton for this work. There is no information available concerning the quality of fill material used. The former plastic moldings building was built in the early fifties in two sections. The building originally housed a plastic molding operation and offices. Later it served as an office and warehouse. The first section included trenches for air, water and power services for the plastic molding machines. The second section added floor space and enclosed a deep process water well. Water from the well was used to cool the molding machines and was then recycled.[5]

The two-story building on the property, referred to as the "assembly building " or "telephone building" (which later became known as the assembly/warehouse building, as shown on Figure 2), was acquired by United-Carr in 1960. The building had formerly served as a telephone company garage. United-Carr added the second story in the mid-fifties.[5]

United-Carr, then the Fasteners Division of TRW, conducted manufacturing operations on the property from 1938 until 1983, when the property was donated to the TRW Foundation, an Ohio non-profit corporation. The manufacturing operations all related to specialty fasteners of various types or to the assembly of electromechanical devices. From 1980 until 1983, the only manufacturing operations conducted on the property related to the machining and assembling of fastener attaching machines.[5]

Operations which were conducted at various times by United-Carr included the following: plating of cadmium, copper, silver, nickel and zinc, degreasing, painting, wire stripping, soldering, metal stamping, metal machining, thermoset molding, thermo-plastic molding and the assembly of metal and plastic components including Bakelite, which is a phenolic-based material. All plating and degreasing activity terminated in 1978.[5]

Inside the mill building there was a brick cistern or well. This cistern had not been used for many years and its original purpose is unclear. For many years the cistern went undetected by TRW personnel because it was in a small room with no entrance. The cistern was discovered in 1982.[5]

CONFIDENTIAL

Currently four companies occupy the site. (Note: It is unknown when the three of the four companies took occupation of the site. Matritech began occupying the site in December, 1995). Floors two through five of the former mill building are occupied by Dragon Systems, a computer software company. Dragon Systems employs approximately 200 people.[4]

The former electroplating room, which was located in the first floor of the mill building, is occupied by Politzer and Haney, also a computer software company. Politzer and Haney employ approximately 60 people.[4]

The first floor of the former assembly/warehouse building is also occupied by Dragon Systems. The second floor of the building has been occupied by Matritech, a company that manufactures test kits for cancer diagnostics, since December, 1995. The company utilizes hazardous chemicals in the manufacturing process including 2-Methylbutane, 2-Propanol, acetic acid, acetone, alcohol, ammonium hydroxide, ammonium sulfate, benzene, E.D.T.A., ethanol, glycerol, glycine, hepes, hydrochloric acid, imidazole, lauryl sulfate, methanol, phosphoric acid, potassium chloride, polyvinyl alcohol, sodium hydroxide, sorbitol, sucrose, sulfuric acid, urea, and xylene.[4] Prior to Matritech, a company called Hygea Science leased the second floor of the former assembly/warehouse building. Hygea manufactured medical test kits and utilized a great deal of mercury. Matritech had 22 laboratory sinks and one neutralization tank decontaminated by Zecco, Inc. in April, 1996.[6]

The former plastic moldings building is currently occupied by Amcare Medical Services, Inc., a home service medical care provider. Amcare also houses a retail pharmacy on site. Approximately 60 people are employed by Amcare.[4]

**Regulatory History**

The following describes inspections and activities which have occurred at the property.

In November, 1982 EG&G Environmental Consultants (EG&G) of Waltham, MA performed an environmental site assessment of the facility for the purpose of identifying the presence and extent of on-site contamination. The cistern in the electroplating room of the mill building was discovered by EG&G at this time. *EG&G installed monitoring wells as part of the assessment.* (Note: Details of these monitoring wells were unavailable during preparation for this worksheet). *A 150-foot deep process water bedrock well to supply water to cool machinery is located in their plastics molding building. EG&G collected soil boring and groundwater samples from the monitoring wells and from the process water well.* It is unknown what these samples were analyzed for.

Upon conclusion of EG&G's site assessment, their findings indicated that the process water well, EW-3, contained 2,000 ppb t-1,2-DCE. Water samples at four observation wells produced unknown amounts of cyanide, TCE, t-1,2-dichloroethylene (t-1,2-DCE), cadmium, zinc, chromium, silver, nickel, and beryllium. On-site soil samples (S01, S03, and S04), collected during installation of the observation wells and shown on Figure 3, indicated levels of vinyl chloride and methylene chloride, as well as the contaminants identified in the wells.[3] The depth at which these samples were collected is unknown. *The results of this investigation are summarized in the TRW DOT Preliminary Assessment dated July 10, 1984.* This report was unavailable during preparation of this worksheet.

CONFIDENTIAL

*In November, 1982 under the supervision of EG&G, Pollution Control Unlimited, Inc. of New York pumped 700 gallons of water and an unknown quantity of sludge from the cistern and removed it from the site. Analysis of water samples from the cistern detected t-1,2-DCE at 2,000 parts per billion (ppb), as well as cyanide, TCE,* vinyl chloride, methylene chloride, cadmium, zinc, chromium, copper, silver, nickel, and beryllium at unknown concentrations. (Note: The parameters for which these samples were analyzed are unknown). Evidence indicates that the cistern was used to dispose of plating wastes and possibly other unknown materials.[3] *After EG&G data analyses determined the presence of groundwater contamination following this work, the MA DEQE was notified and the entire 459 Watertown Street property was entered on the CERCLIS as TRW DOT Division on January 1, 1983 (CERCLIS #: MAD001032671).*

*After receiving the November, 1982 EG&G Site Assessment, the MA DEQE began monitoring site remediation and removal* of contaminated material *at the former Ucinite property. From March through May 1983, under the supervision of Camp, Dresser and McKee (CDM) of Boston, MA, CECOS International of New York, a waste disposal company, tested the surfaces of the electroplating room and removed asbestos- and cyanide-contaminated concrete from the room.* The origin of the cyanide is thought to be from the formation of cyanide gas from the acidic plating baths, or from splashes from these same baths.[3] All asbestos pipe insulation, together with contaminated duct work and miscellaneous piping, was removed and placed in a secure container.[5] *CECOS also cleaned and removed an empty 1,500-gallon above ground trichloroethene(TCE) tank located outside the rear of the mill building. The asbestos and the tank were removed to a CECOS secure storage facility in Niagara Falls, New York in June 1983.*

*The MA DEQE completed a Preliminary Assessment of the property on July 10, 1984 and a Site Inspection on August 17, 1984.* Upon the DEQE's inspection of the facility in August, 1984, two electroplating rooms were identified in the first floor of the mill building. Each of these plating rooms had a drainage manhole in the floor containing discolored liquid and sludge. The concrete floor was rutted around these manholes possibly indicating that acidic plating liquids had drained into them.[3]

Questions not addressed in the November, 1982 EG&G report spurred further investigation in June, 1984 by CDM.[3] The field program consisted of three primary elements: geophysical investigation, groundwater sampling, and wipe testing of wall in the former plating room.[8]

*On July 2, 1984, CDM hired Weston Geophysical, Inc.* (Weston) *to conduct a ground-penetrating radar survey. Weston's investigation determined the margin of Silver Lake and identified a water table located at a depth of five feet at the northwest end of the property. The investigation also determined the locations of filled areas and of point sources in the northwest corner of the property. These point sources were consistent with the disposal of incinerations cinders.* (Note: this is discussed in the Waste Characteristics section) *The point sources were excavated on September 11, 1984 under the supervision of the MA DEQE but no evidence of buried waste materials was found.*

The groundwater sampling consisted of collecting samples from four existing monitoring wells (OW-1A, 2A, 3A, and 4A. A fifth well, OW-2C was abandoned); the former cistern (EW-1); and a former process water well (EW-3). The water levels observed in these wells showed that there was a perched water table, most likely as a result of the filling of Silver Lake, in the north and northeastern section of the site. The direction of flow in the aquifer immediately below the perched layer and nearest the ground surface under

CONFIDENTIAL

the remainder of the site was not readily apparent due to the very small magnitude of the flow gradient. This conclusion concurs with that of EG&G during their investigation.[8]

CDM sampled all the wells and the cistern in June 1984. Compounds detected in the monitoring wells include: arsenic, cadmium, chromium, copper, lead, zinc, benzene and TCE. Compounds detected in the cistern included cadmium, chromium, copper, lead, silver, zinc, t-1,2-DCE and TCE.[2] The process water bedrock well was found to contain t-1,2 DCE. Laboratory results are discussed in detail in the Groundwater Pathway section.

During the course of the CDM investigation of the former mill building, CDM personnel collected three wipe samples from the walls and one sample of the scrap of wall material from the former plating room that had been sandblasted by CECOS. The wipe samples were collected using a sodium hydroxide solution over a six inch square area. These samples were analyzed for cyanide and each tested positively. This is merely indicative that cyanide is present in the areas investigated.[8]

*On October 22, 1984, Empro Services, Inc. removed sludge from the drains in the electroplating room, filled the drains with peastone and sealed them. The sludge was taken to SCA Services in Braintree, MA. On October 24, 1984 the cistern was filled with peastone and sealed. During the week of October 22, 1984, the electroplating room was again cleaned, treated, and tested for cyanide. The surfaces tested negative for cyanide contamination.*

*The Commonwealth of Massachusetts determined that all its requirements for site remediation and waste removal had been met. On January 14, 1985, "No Further Action" status was granted for the site under Chapter 21E of the Massachusetts General Laws.*

*Information provided by an anonymous informant was forwarded to the Superfund Site Assessment Program in a September 4, 1991 memorandum from William Hanscom, EPA Inspector, to Nancy Smith, EPA Site Assessment Manager. According to the informant, the building located at 320 Nevada Street was owned and operated by the Ucinite/DOT Corporation during the 1940s-1950s. During this time, the company disposed of drums and liquid hazardous wastes in Silver Lake. The informant alleged that the Raytheon Corporation and the Hartz and Mason Corporation also used Silver Lake for hazardous waste disposal. The informant claims that he/she used to fill cans with "white gooey foam" which were ignited and used as "flame throwers." According to this informant, the 320 Nevada Street property (mill building) was later divided into several parcels and sold to Pat Franci, the Belli Brothers, and the Angelo Paolini Corporation. Drums of waste were said to have been buried by these new owners when Silver Lake was filled.*

*On the basis of the above information, the 320 Nevada Street property was entered onto CERCLIS on January 8, 1992 as a potential hazardous waste disposal site. During file review for the Preliminary Assessment* for 320 Nevada Street conducted by TRC Companies, Inc., *it was discovered that the 320 Nevada Street property is completely within the 459 Watertown Street property.*

*TRC's file review of the 320 Nevada Street property indicated that the 320 Nevada Street/459 Watertown Street property was owned by TRW until 1984. On September 18, 1984, the entire 459 Watertown Street property (including 320 and 330 Nevada Street and the plastics molding building) was sold to Mr. Joseph A. Biotti. None of the individuals mentioned above (Franci, Belli, or Paolini) own or have ever owned any*

CONFIDENTIAL

*part of this property. In addition, the portion of Silver Lake on which the property fronted was filled in 1952. It is not known what wastes may have been discharged to Silver Lake before 1952, however, no filling of the lake occurred at 459 Watertown Street after its resale in 1984.*

There are five CERCLIS sites and 71 RCRA notifiers within one mile of the site. [7] *Review of the businesses in the vicinity of 459 Watertown Street indicates that one RCRA notifier, Paolini Corporation (MAD019529759), is located at 103 Rear Adams Street, Newton. The Silver Lake area is a large open lot bordered by Watertown, Nevada, Linwood, and Adams Street. The Paolini Corporation, on Adams Street, is on the opposite side of Silver Lake from the Ucinite/DOT Corporation property on Nevada Street. It may be that the informant was referring to the Adams Street area when he/she discussed recent waste disposal. In addition, another company the informant mentioned, the Raytheon Corporation, owned property one block northeast of Adams Street, on Bridge Street. The waste disposal practices identified by the informant may have occurred on that side of Silver Lake, not at the 320 Nevada Street/Nevada Street property.*

**Waste Characteristics**

Prior to 1938 the site was a rope manufacturing plant, but records of any waste generation are not available. From 1938 to 1983 TRW's activities consisted of electroplating and other manufacturing processes. Electroplating operations involved zinc, copper, cadmium, and other metals. Plastic molding, performed in the one-story building, required cooling water for 30 machines that was derived from an on-site bedrock well. The plastic molding process did not generate hazardous wastes.[3]

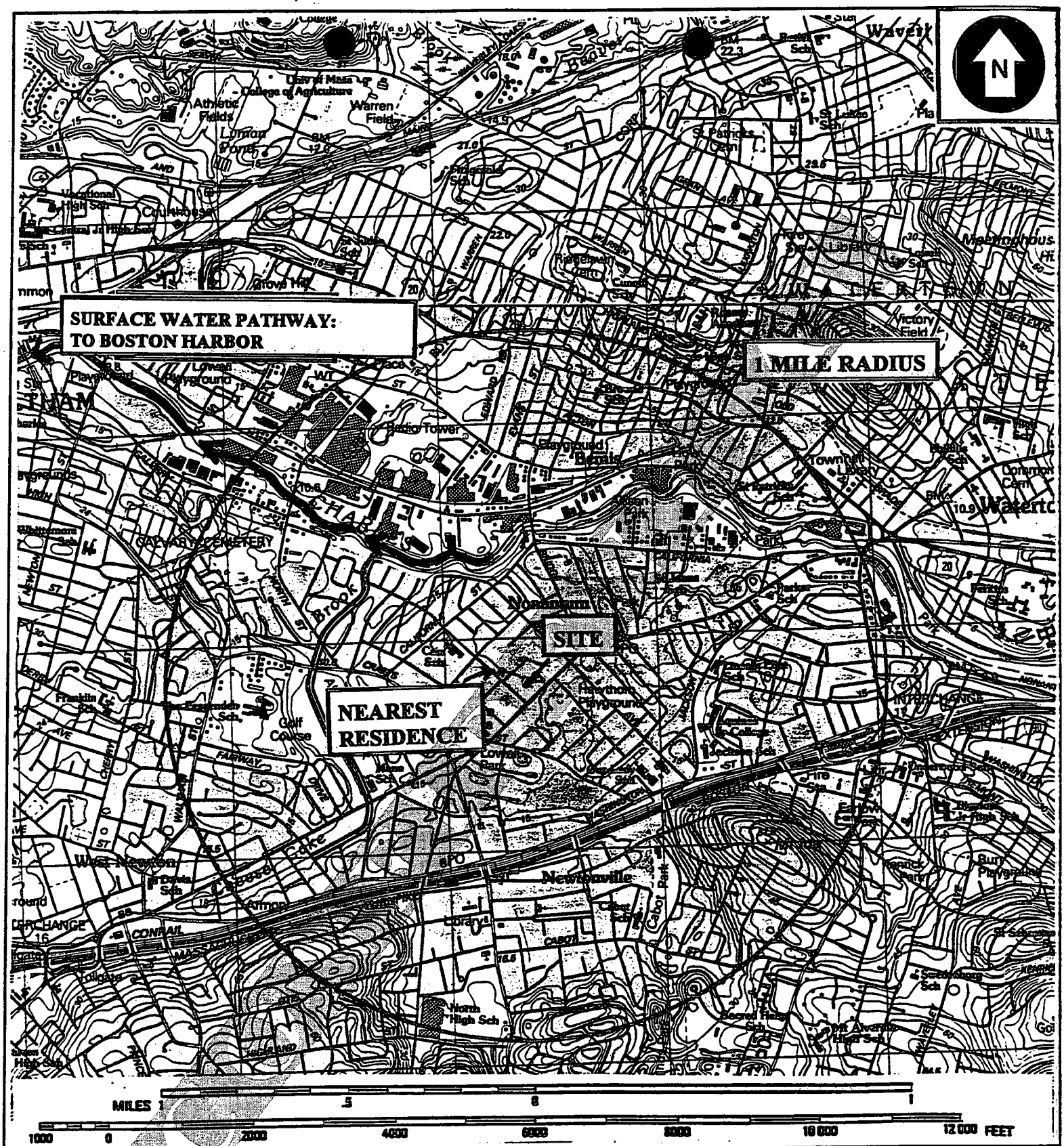
A large stack exists on-site servicing an old incinerator. Mr. John Searle, the plant manager from 1966 to 1972, attests that the incinerator was not used since his arrival at TRW in 1966 and did not know when it was last used. He did, however, suggest that cinders generated from the past use of the incinerator might be part of the fill material that was found on site. [3] (Note: as previously mentioned, these cinders were consistent with point sources detected by Weston's geophysical survey. The point sources were excavated on September 11, 1984.)

Hazardous wastes are currently generated on site by Matritech. Matritech has been designated a very small quantity generator under MADEP guidelines. On July 10, 1997 the most recent waste disposal occurred removing corrosive liquids, sulfuric acid, hydrochloric acid, citric acid, acetone, silver nitrate, sodium hydroxide, mercury, zinc, methanol, and potassium permanganate. Matritech generates 6 to 7 gallons of waste quarterly. Hazardous wastes are stored in nonflammable cabinets until they are removed by Laidlaw Environmental.[4] In addition, Matritech also stores a small number of plastic containers of unused acid and base in the neutralization tank room. The containers are approximately one gallon each.[4]

Dragon Systems and Politzer and Haney do not generate hazardous waste. The only chemicals in their possessions are cleaning fluids and toner for the printers and photocopiers.[4]

Amcare does not generate hazardous waste but rather arranges for biological waste disposal (i.e., sharps) from patients homes. It is possible, although rare, that this biological waste is briefly stored at the Amcare facility prior to disposal. [4]

CONFIDENTIAL

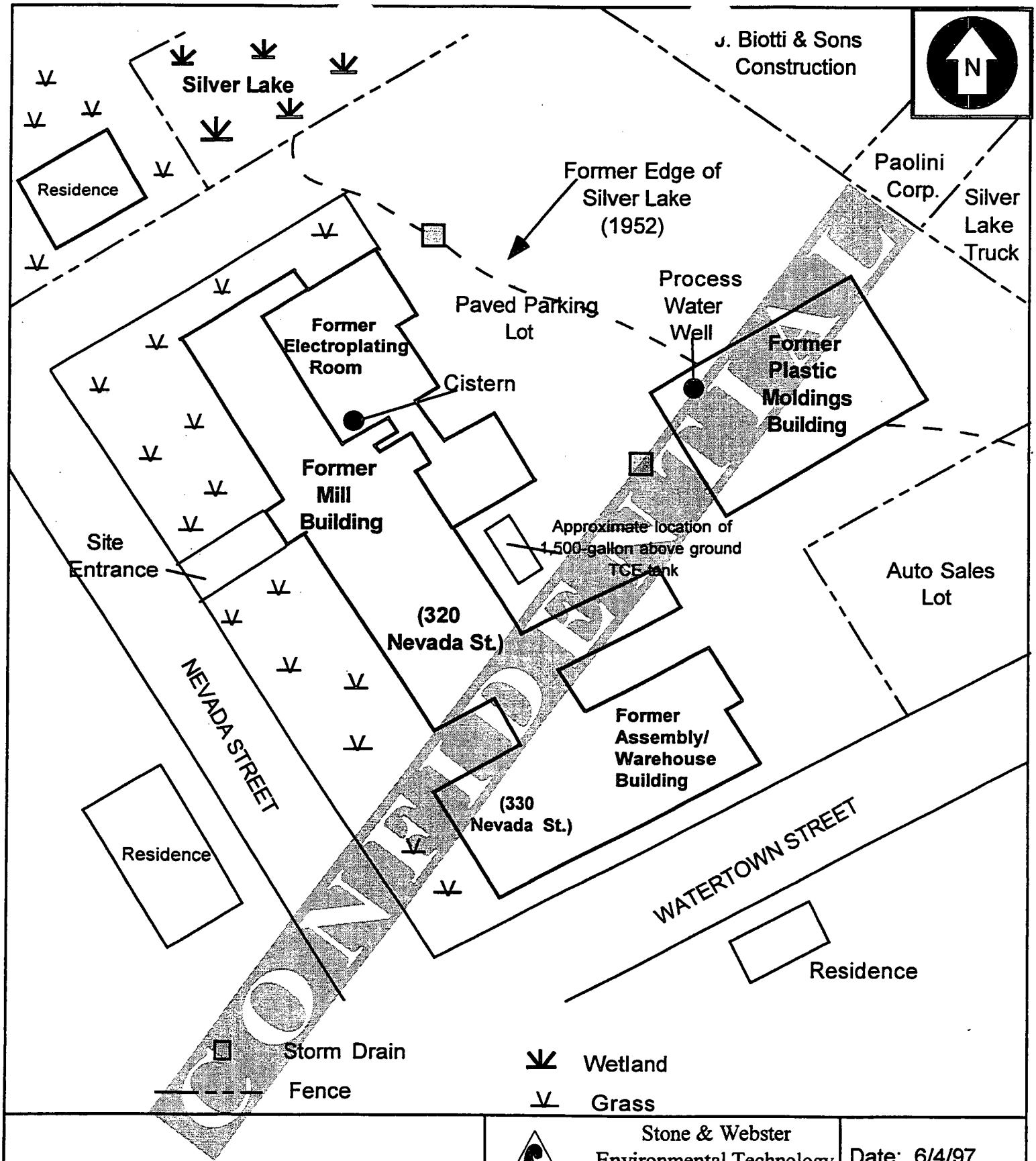



BASE MAP IS A PORTION OF BOSTON SOUTH (1987) AND BOSTON NORTH (1985) MASSACHUSETTS 7.5 MINUTE SERIES USGS TOPOGRAPHIC MAPS.

Stone & Webster
Environmental Technology
and Services
Boston, Massachusetts

Date: 7/10/97
CERCLIS No.:
MAD 001032671

Site Location Map
FORMER TRW DOT DIVISION
Figure 1

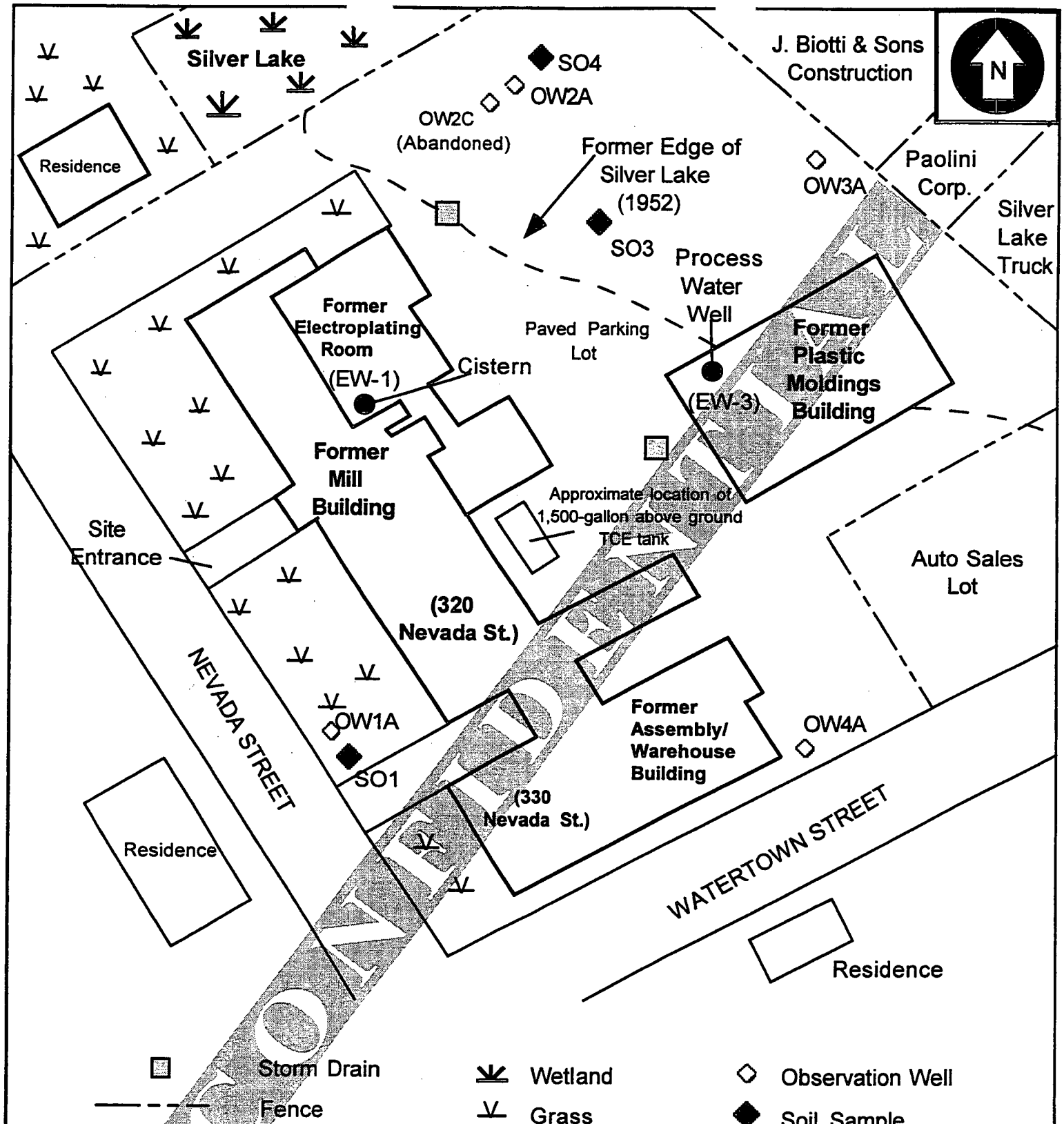



MAP IS ADAPTED FROM TRC COMPANIES' PRELIMINARY ASSESSMENT, MARCH 1993

Stone & Webster Environmental Technology and Services
Boston, Massachusetts

Date: 6/4/97
CERCLIS No.: MAD 001032671

Site Sketch
TRW DOT DIVISION (former)
Figure 2




MAP IS ADAPTED FROM TRC COMPANIES' PRELIMINARY ASSESSMENT, MARCH 1993

Stone & Webster
Environmental Technology
and Services
Boston, Massachusetts

Date: 6/4/97
CERCLIS No.:
MAD 001032671

Site Plan with Sample Locations
TRW DOT DIVISION (former)
Figure 3

## SOURCE EVALUATION

Several possible sources of contamination that were identified during file review and on the August 1997 site reconnaissance include:

- cinders/ash
- drainage manholes in electroplating rooms
- cistern
- bedrock process water well
- discharge from storm drains to Charles River
- 1,500-gallon aboveground TCE tank

**Description of each source:**

**Source 1 - Cinders/Ash in Fill**
**Source Type: Other**

A large stack exists on site servicing an old incinerator. The DEQE reported in 1984 that it was believed that the incinerator had not been used since prior to 1966. The DEQE also reported that the Plant Manager suggested that cinders from the incinerator may be part of the fill in Silver Lake. [3] Ash is known to contain metals, and since metals were found on site, cinders/ash will be considered a potential source of contamination. This source was available to the groundwater and surface water.

**Source 2 - Drainage manholes in electroplating rooms**
**Source Type: Other**

Upon DEQE's inspection of the facility in 1984, two electroplating rooms were identified in the first floor of the mill building. Each of these plating rooms had a drainage manhole in the floor containing discolored liquid and sludge. The DEQE noted that the concrete floor was rutted around these manholes possibly indicating that acidic plating liquids and cyanide had drained into them. On October 22, 1984, Empro Services, Inc. removed sludge from the manholes in the electroplating room, filled them with peastone and sealed them. The sludge was taken to SCA Services in Braintree, MA. Although sampling of the surfaces in the electroplating room after the sludge was removed indicated that cyanide was no longer present, samples were not analyzed for metals.[3] For this reason, the manholes will be considered a potential source of contamination. It is possible for these manholes to have leaked contaminated liquid to the soil surrounding them via cracks in the concrete. The conditions of the manholes are unknown. This source is available to the groundwater and soil exposure pathway.

CONFIDENTIAL

**Source 3 - Cistern**
**Source Type: Other**

Source 3 is a brick cistern/well located in the mill building. Analysis of water samples collected from the cistern by EG&G in November, 1982 detected t-1,2-DCE at 2,000 ppb, as well as cyanide, TCE, vinyl chloride, methylene chloride, cadmium, zinc, chromium, copper, silver, nickel, and beryllium at unknown concentrations. Subsequently, under the supervision of EG&G, Pollution Control Unlimited of New York pumped 700 gallons of water and an unknown quantity of sludge from the cistern and disposed of it off site. In October, 1984 the cistern was filled with peastone and sealed. [2] However, sampling did not occur after the water and sludge were removed to document that all contamination had been removed. Therefore, the cistern will be considered further as a source. This source was available to the groundwater, surface water and air pathway.

**Source 4 - Bedrock Process Water Well**
**Source Type: Other**

Source 4 is a 150-foot bedrock well located in the former plastics moldings building. Water from the well was used to cool the molding machines and then recycled back into the well. In November, 1982, EG&G collected groundwater samples from the process water well. The contaminants detected in groundwater included cadmium, nickel, chromium, zinc, silver, lead, beryllium, copper, cyanide, mercury, and phenolics, all at unknown concentrations.[2] It is unknown whether or not the process water well was sealed. No evidence of the well was noted on the 1997 Stone & Webster site reconnaissance and the building in which the well was located has been completely renovated. However, since potentially contaminated water was recycled back into the well, therefore allowing for availability to the groundwater pathway, it will be considered further as a source.

**Source 4 - Discharge from storm drains to the Charles River**
**Source Type: Other**

Two storm drains in the parking lot to the rear of the mill building discharge to the Charles River. The Charles River is approximately 2,000 feet to the northwest of the site. Because it was not be proven that the TRW DOT was the only facility along this 2,000 foot pathway to discharge to the Charles River, discharge from storm drains to the Charles River will not be considered further as a source.

**Source 5 - 1,500-gallon aboveground TCE tank**
**Source Type: Tanks and non-drum containers**

Source 5 is a 1,500-gallon above ground storage tank used to store TCE. The tank was located outside the rear of the Mill Building. There is no evidence of spills or leakage associated with this tank. The tank was removed in June, 1983 by CECOS International of New York [2] and will not be considered further as a source.

CONFIDENTIAL

| Source # | Source Type | Pathway Availability | | | |
|---|---|---|---|---|---|
| | | GW | SW | SE | A |
| 1 | Other | Y | Y | N | N |
| 2 | Other | Y | N | Y | N |
| 3 | Other | Y | Y | N | Y |
| 4 | Other | Y | Y | N | Y |

Legend: Y = available to pathway
N = not available to pathway
? = availability unknown
I = ineligible waste

CONFIDENTIAL

## SOURCE EVALUATION (Continued)

**Hazardous Waste Quantity (HWQ) Calculations:** SI Tables 1 and 2 (See HRS Tables 2-5, 2-6, and 5-2).

SOURCE 1: Other

Size and area of contamination resulting from cinders/ash is unknown, therefore, this source is assigned a WQ of 10.

SOURCE 2: Other

Amount of contamination caused by the manholes in the electroplating rooms is unknown, therefore, this source is assigned a WQ of 10.

SOURCE 3: Other

Amount of contamination resulting from the cistern is unknown, therefore, this source is assigned a WQ of 10.

SOURCE 4: Other

Quantity of contamination resulting from the former process water well is unknown, therefore, this source is assigned a WQ of 10.

| | | |
|---|---|---|
| Per SI Table 2: | Source 1 WQ= | 10 |
| | Source 2 WQ= | 10 |
| | Source 3 WQ= | 10 |
| | Source 4 WQ= | 10 |
| | Total= | 40, which is between 1 and 100, which would normally score 1. However, since the hazardous waste constituent quantity data are not complete, the HWQ=10. |

**GW HWQ =10**
**SW HWQ =10**
**SE HWQ = 0**
**AIR HWQ = 10**

CONFIDENTIAL

## SI TABLE 1: HAZARDOUS WASTE QUANTITY (HWQ) SCORES FOR SINGLE SOURCE SITES AND FORMULAS FOR MULTIPLE SOURCE SITES

| | | Single Source Sites (assigned HWQ scores) | | | | Multiple Source Sites |
|---|---|---|---|---|---|---|
| **Tier** | **Source Type** | **HWQ = 10** | **HWQ = 100** | **HWQ = 10,000** | **HWQ = 1,000,000** | **Divisors for Assigning Source WQ Values** |
| **A Hazardous Constituent Quantity** | N/A | HWQ = 1 if Hazardous Constituent Quantity data are complete<br>HWQ = 10 if Hazardous Constituent Quantity data are not complete | >100 to 10,000 lbs | >10,000 to 1 million lbs | > 1 million lbs | lbs ÷ 1 |
| **B Hazardous Wastestream Quantity** | N/A | ≤500,000 lbs | >500,000 to 50 million lbs | >50 million to 5 billion lbs | >5 billion lbs | lbs ÷ 5,000 |
| **C Volume** | Landfill | ≤6.75 million $ft^3$<br>≤250,000 $yd^3$ | >6.75 million to 675 million $ft^3$<br>>250,000 to 25 million $yd^3$ | >675 million to 67.5 billion $ft^3$<br>>25 million to 2.5 billion $yd^3$ | >67.5 billion $ft^3$<br>>2.5 billion $yd^3$ | $ft^3$ ÷ 67,500<br>$yd^3$ ÷ 2,500 |
| | Surface impoundment | ≤6,750 $ft^3$<br>≤250 $yd^3$ | >6,750 to 675,000 $ft^3$<br>>250 to 25,000 $yd^3$ | >675,000 to 67.5 million $ft^3$<br>>25,000 to 2.5 million $yd^3$ | >67.5 million $ft^3$<br>>2.5 million $yd^3$ | $ft^3$ ÷ 67.5<br>$yd^3$ ÷ 2.5 |
| | Drums | ≤1,000 drums | >1,000 to 100,000 drums | >100,000 to 10 million drums | >10 million drums | drums ÷ 10 |
| | Tanks and non-drum containers | ≤50,000 gallons | >50,000 to 5 million gallons | >5 million to 500 million gallons | >500 million gals. | gallons ÷ 500 |
| | Contaminated soil | ≤6.75 million $ft^3$<br>≤250,000 $yd^3$ | >6.75 million to 675 million $ft^3$<br>>250,000 to 25 million $yd^3$ | >675 million to 67.5 billion $ft^3$<br>>25 million to 2.5 billion $yd^3$ | >67.5 billion $ft^3$<br>>2.5 billion $yd^3$ | $ft^3$ ÷ 67,500<br>$yd^3$ ÷ 2,500 |
| | Pile | ≤6,750 $ft^3$<br>≤250 $yd^3$ | >6,750 to 675,000 $ft^3$<br>>250 to 25,000 $yd^3$ | >675,000 to 67.5 million $ft^3$<br>>25,000 to 2.5 million $yd^3$ | >67.5 million $ft^3$<br>>2.5 million $yd^3$ | $ft^3$ ÷ 67.5<br>$yd^3$ ÷ 2.5 |
| | Other | ≤6,750 $ft^3$<br>≤250 $yd^3$ | >6,750 to 675,000 $ft^3$<br>>250 to 25,000 $yd^3$ | >675,000 to 67.5 million $ft^3$<br>>25,000 to 2.5 million $yd^3$ | >67.5 million $ft^3$<br>>2.5 million $yd^3$ | $ft^3$ ÷ 67.5<br>$yd^3$ ÷ 2.5 |

CONFIDENTIAL

## SI TABLE 1: HAZARDOUS WASTE QUANTITY (HWQ) SCORES FOR SINGLE SOURCE SITES AND FORMULAS FOR MULTIPLE SOURCE SITES

| | | Single Source Sites (assigned HWQ scores) | | | | Multiple Source Sites |
|---|---|---|---|---|---|---|
| **Tier** | **Source Type** | **HWQ = 10** | **HWQ = 100** | **HWQ = 10,000** | **HWQ = 10,000,000** | **Divisors for Assigning Source WQ Values** |
| **D Area** | Landfill | ≤340,000 $ft^2$<br>≤7.8 acres | >340,000 to 34 million $ft^2$<br>>7.8 to 780 acres | >34 million to 3.4 bil. $ft^2$<br>>780 to 78,000 acres | >3.4 billion $ft^2$<br>>78,000 acres | $ft^2$ ÷ 3,400<br>acres ÷ 0.078 |
| | Surface Impoundment | ≤1,300 $ft^2$<br>≤0.029 acres | >1,300 to 130,000 $ft^2$<br>>0.029 to 2.9 acres | >130,000 to 13 million $ft^2$<br>>2.9 to 290 acres | >13 million $ft^2$<br>>290 acres | $ft^2$ ÷ 13<br>acres ÷ 0.00029 |
| | Contaminated Soil | ≤3.4 million $ft^2$<br>≤78 acres | >3.4 million to 340 million $ft^2$<br>>78 to 7,800 acres | >340 million to 34 bil. $ft^2$<br>>7,800 to 780,000 acres | >34 billion $ft^2$<br>>780,000 acres | $ft^2$ ÷ 34,000<br>acres ÷ 0.78 |
| | Pile | ≤1,300 $ft^2$<br>≤0.029 acres | >1,300 to 130,000 $ft^2$<br>>0.029 to 2.9 acres | >130,000 to 13 million $ft^2$<br>>2.9 to 290 acres | >13 million $ft^2$<br>>290 acres | $ft^2$ ÷ 13<br>acres ÷ 0.00029 |
| | Land treatment | ≤27,000 $ft^2$<br>≤0.62 acres | >27,000 to 2.7 million $ft^2$<br>>0.62 to 62 acres | >2.7 mil. to 270 million $ft^2$<br>>62 to 6,200 acres | >270 million $ft^2$<br>>6,200 acres | $ft^2$ ÷ 270<br>acres ÷ 0.0062 |

1 ton = 2,000 lbs = 1 $yd^3$ = 4 drums = 200 gallons

CONFIDENTIAL

## SI TABLE 2: HWQ SCORES FOR MULTIPLE SOURCE SITES

| Site WQ Total | HWQ Score |
|---|---|
| 0 | 0 |
| 1[a] to 100 | 1[b] |
| >100 to 10,000 | 100 |
| >10,000 to 1,000,000 | 10,000 |
| >1,000,000 | 1,000,000 |

[a]If the HWQ total is between 0 and 1, round it to 1.
[b]If the hazardous constituent quantity data are not complete, assign the score of 10.

## SI TABLE 3: WASTE CHARACTERIZATION WORKSHEET

Enter "NA" for substances which are not available to a pathway.
Enter "NL" for substance values not listed in SCDM.
Provide footnote for substances listed in table but not used for scoring purposes
(e.g. BTEX substances attributable to a gasoline tank).

Sources:
1. Cistern
2. Former Process Water Well
3. Found in Soil Samples
4. Found in Monitoring Wells

| | | | GROUND WATER PATHWAY | | SURFACE WATER PATHWAY | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | OVERLAND/FLOOD MIGRATION | | | | | | | |
| Source | Hazardous Substance | Toxicity | GW Mobility (HRS Table 3-8) | Tox. × Mobility Value (HRS Table 3-9) | Pers. (HRS Tables 4-10 and 4-11) | Tox. × Pers. Value (HRS Table 4-12) | Bioacc. Pot. (HRS Table 4-15) | Tox. × Pers. × Bioacc. Value (HRS Table 4-16) | Ecotox. (HRS Table 4-19) | Ecotox. × Pers (HRS Table 4-20) | Eco. Bioacc. Pot. (HRS Table 4-20) | Ecotox. × Pers. × Eco. Bioacc. Value (HRS 4-21) |
| 3, 4 | Arsenic* | 10,000 | 1.0E-02 | 100 | 1 | 10,000 | 5 | 50,000 | 10 | 10 | 500 | 5,000 |
| 1, 4 | Beryllium* | 10,000 | 1.0E-02 | 100 | 1 | 10,000 | 50 | 500,000 | NL | NL | 50 | NL |
| 1, 3, 4 | Cadmium* | 10,000 | 1.0E-02 | 100 | 1 | 10,000 | 5,000 | 5.0E+07 | 1,000 | 1,000 | 5,000 | 5.0E+06 |
| 1, 3, 4 | Chromium* | 10,000 | 1.0E-02 | 100 | 1 | 10,000 | 5 | 50,000 | 100 | 100 | 5 | 500 |
| 1, 3, 4 | Copper* | NL | 1.0E-02 | NL | 1 | NL | 50,000 | NL | 100 | 100 | 50,000 | 5E+06 |
| 1, 3, 4 | Lead* | 10,000 | 1.0E-02 | 100 | 1 | 10,000 | 50 | 500,000 | 1,000 | 1,000 | 5,000 | 5.0E+06 |
| 3 | Mercury | 10,000 | 1.0E-02 | 100 | 0.4 | 4,000 | 50,000 | 2.0E+08 | 10,000 | 4,000 | 50,000 | 2.0E+08 |
| 1,4 | Nickel* | 10,000 | 1.0E-02 | 100 | 1 | 10,000 | 0.5 | 5,000 | 10 | 10 | 500 | 5,000 |
| 1, 3, 4 | Silver* | 100 | 1 | 100 | 1 | 100 | 50 | 5,000 | 10,000 | 10,000 | 50 | 5.0E+05 |
| 1, 4 | Zinc* | 10 | 1.0E-02 | 0.1 | 1 | 10 | 500 | 5,000 | 10 | 10 | 500 | 5,000 |
| 1, 4 | Cyanide* | 100 | 1 | 100 | 0.4 | 40 | 0.5 | 20 | 1,000 | 400 | 0.5 | 200 |
| 3, 4 | Benzene | 100 | 1 | 100 | 0.4 | 40 | 5,000 | 2.0E+05 | 100 | 40 | 500 | 20,000 |
| 1, 2, 3, 4 | t-1,2-Dichloroethylene* | 100 | 1 | 100 | 0.4 | 40 | 50 | 2,000 | 1 | 0.4 | 50 | 20 |
| 1, 3, 4 | Trichloroethylene* | 10 | 1 | 10 | 0.4 | 4 | 50 | 200 | 100 | 40 | 50 | 2,000 |
| 1, 3 | Vinyl Chloride** | 10,000 | 1 | 10,000 | 0.0007 | 7 | 5 | 35 | NL | NL | 5 | NL |
| 1, 3 | Methylene Chloride** | 10 | 1 | 10 | 0.4 | 4 | 5 | 20 | 1 | 0.4 | 5 | 2 |
| | | | | | | | BCF | | | | | |

SCDM Version: June 1996
References: [2]
Notes: Groundwater Mobility - liquid, non-karst,; Persistence - river; Bioaccumulation and ecotoxicity - fresh water.
SI Table 3 lists all contaminants found on site. The contaminants marked with an asterisk were detected three times background levels and, therefore, were used in scoring the site. Contaminants marked with a double asterisk were not detected three times background, but were detected in a source. Therefore, these contaminants were used in scoring the site.

CONFIDENTIAL DRAFT

## SI TABLE 3: WASTE CHARACTERIZATION WORKSHEET (Continued)

Sources:
1. Cistern
2. Process Water Well
3. Found in Soil Samples
4. Found in Monitoring Wells

| | | | SURFACE WATER PATHWAY GROUND WATER TO SURFACE WATER | | | | AIR PATHWAY | | |
|---|---|---|---|---|---|---|---|---|---|
| Source | Hazardous Substance | Toxicity | Tox. × Mob. × Pers. Value (HRS Table 4-26) | Tox. × Mob. × Pers. × Bioacc. Value (HRS Table 4-28) | Ecotox. × Mob. × Pers. Value (HRS Table 4-29) | Ecotox. × Mob. × Pers. × Bioacc. Value (HRS Table 4-30) | Gaseous/ Particulate (HRS Table 6-13) (indicate G or P) | Mobility (HRS Table 6-11, 6-12) | Tox. × Mob. Value (HRS Table 6-13) |
| 3, 4 | Arsenic* | 10,000 | 100 | 500 | 0.1 | 50 | P | NA | NA |
| 1, 4 | Beryllium* | 10,000 | 100 | 5,000 | NL | NL | P | NA | NA |
| 1, 3, 4 | Cadmium* | 10,000 | 100 | 5.0E+05 | 10 | 5.0E+04 | P | NA | NA |
| 1, 3, 4 | Chromium* | 10,000 | 100 | 500 | 1 | 5 | P | NA | NA |
| 1, 3, 4 | Copper* | NL | NL | NL | 1 | 50,000 | P | NA | NA |
| 1,3 , 4 | Lead* | 10,000 | 100 | 5,000 | 10 | 50,000 | P | NA | NA |
| 3 | Mercury | 10,000 | 40 | 2.0E+06 | 40 | 2.0E+06 | P, G | 0.2 | 2,000 |
| 1, 4 | Nickel* | 10,000 | 100 | 50 | 0.1 | 50 | P | NA | NA |
| 1, 3, 4 | Silver* | 100 | 100 | 5,000 | 10,000 | 5.0E+05 | P | NA | NA |
| 1, 4 | Zinc* | 10 | 0.1 | 50 | 0.1 | 50 | P | NA | NA |
| 1, 4 | Cyanide* | 100 | 40 | 20 | 400 | 200 | P | NA | NA |
| 3, 4 | Benzene | 100 | 40 | 2.0E+05 | 40 | 20,000 | G | 1 | 100 |
| 1, 2, 3, 4 | t-1,2-Dichloroethylene* | 100 | 40 | 2,000 | 0.4 | 20 | G | 1 | 100 |
| 1, 3, 4 | Trichloroethylene* | 10 | 4 | 200 | 40 | 2,000 | G | 1 | 10 |
| 1, 3 | Vinyl Chloride** | 10,000 | 7 | 35 | NL | NL | G | 1 | 10,000 |
| 1, 3 | Methylene Chloride** | 10 | 4 | 20 | 0.4 | 2 | G | 1 | 10 |

SCDM Version: June 1996
References: [2]
Notes: Groundwater Mobility - liquid, non-karst,; Persistence - river; Bioaccumulation and ecotoxicity - fresh water.
SI Table 3 lists all contaminants found on site. The contaminants marked with an asterisk were detected three times background levels and, therefore, were used in scoring the site. Contaminants marked with a double asterisk were not detected three times background but were detected in a source. Therefore, these contaminants were used in scoring.

CONFIDENTIAL

## GROUND WATER PATHWAY

*Land in the vicinity of 320 Nevada Street is heavily developed.* The entire site is paved with the exception of a row of trees along Nevada Street.[4] *Materials beneath the property consist of sand and gravel fill to a depth of 5 feet, underlain by the peat bottom of what was Silver Lake. Bedrock beneath the property consists of the Roxbury Conglomerate. The entire area is within the Boston Basin, a structural depression bounded to the west and southwest by the Bloody Bluff Fault Zone.*

*Groundwater is found at an average depth of 5 feet across the property. Groundwater flow is difficult to determine, although it is believed to flow north, toward Silver Lake and the Charles River. A perched water table exists at a depth of 5 feet under the parking lot in the area of the former Silver Lake.*

Annual precipitation for the vicinity of the site in 43.81 inches.[9]

**Groundwater Usage**

The cities and towns that are within a 4-mile radius of the site are Newton, Waltham, Watertown, Belmont, and Boston. All of these cities obtain their drinking water from Massachusetts Water Resources Authority's supply at the Quabbin Reservoir. There is no population supplied by municipal wells within four miles of the site.[11, 12, 13, 14, 15, 16]

Private wells are listed by Frost Associates as occurring in the 1- to 2-mile radius out to the 3 to 4-mile radius. Frost Associates estimated the population served by private wells by summing the total number of drilled and dug wells within each CENTRACTS block (a Cartesian data management system used by the census bureau) and multiplying this total by the average number of people in each household.[10]

Table A lists the populations which receive drinking water from public and private sources located within each of the target distance rings.

CONFIDENTIAL

**Table A**
**Estimated Drinking Water Populations Served by Groundwater Sources Within Four Miles of TRW DOT**

| Radial Distance From TRW DOT (miles) | Estimated Population Served by Private Wells | Estimated Population Served by Public Wells | Total Estimated Population Served by Groundwater Sources Within the Ring |
|---|---|---|---|
| 0.00 to 0.25 | 0 | 0 | 0 |
| > 0.25 to 0.50 | 0 | 0 | 0 |
| > 0.50 to 1.00 | 0 | 0 | 0 |
| > 1.00 to 2.00 | 3 | 0 | 3 |
| > 2.00 to 3.00 | 50 | 0 | 50 |
| > 3.00 to 4.00 | 86 | 0 | 86 |
| TOTAL | 139 | 0 | 139 |

References: [10, 11]

## Groundwater Sampling

In November, 1982 EG&G performed an environmental site assessment of the facility for the purpose of identifying the presence and extent of on-site contamination. *EG&G installed monitoring wells as part of the assessment.* (Note: Details of these monitoring wells were unavailable during preparation for this worksheet). *A 150-foot deep process water bedrock well to supply water to cool machinery is located in the former plastics molding building. EG&G collected groundwater samples from the monitoring wells and from the process water well.* It is unknown what these samples were analyzed for.

Limited results were available for the November, 1982 sampling effort. T-1,2-DCE was detected at 2,000 ppb in EW-3, the former process water well. Water samples at four observation wells produced unknown amounts of cyanide, TCE, t-1,2-dichloroethylene (t-1,2-DCE), cadmium, zinc, chromium, silver, nickel, and beryllium. Detailed results of this investigation *are summarized in the TRW DOT Preliminary Assessment dated July 10, 1984.* This report was unavailable during preparation of this worksheet.

*In November, 1982 under the supervision of EG&G, Pollution Control Unlimited, Inc. of New York pumped 700 gallons of water and an unknown quantity of sludge from the cistern and removed it from the site. Analysis of water samples from the cistern detected t-1,2-DCE at 2,000 parts per billion (ppb), as well as cyanide, TCE,* vinyl chloride, methylene chloride, cadmium, zinc, chromium, copper, silver, nickel, and beryllium at unknown concentrations. (Note: The parameters for which these samples were analyzed are unknown).

CDM conducted groundwater sampling in June, 1984. The groundwater sampling consisted of collecting samples from four existing monitoring wells (OW-1A, 2A, 3A, and 4A. A fifth well, OW-2C, was abandoned); the former cistern (EW-1); and the former process water well (EW-3).

CONFIDENTIAL

The parameters for which these samples were analyzed were not provided in the reference literature for this report. The water levels observed in these wells showed that there was a perched water table, most likely as a result of the filling of Silver Lake, in the north and northeastern section of the site. The direction of flow in the aquifer immediately below the perched layer and nearest the ground surface under the remainder of the site was not readily apparent due to the very small magnitude of the flow gradient.[8]

The water quality data showed some levels marginally in excess of Massachusetts Class I groundwater standards as follows:

| Well | Constituents |
|---|---|
| OW-1A | Lead (0.67 mg/L), zinc (20 mg/L) |
| OW-2A | Chromium (2.4 mg/L), copper (1.1 mg/L), lead (0.14 mg/L), zinc (8.1 mg/L) |
| OW-2C | Cadmium (0.17 mg/L), chromium (0.5 mg/L), copper (0.5 mg/L) lead (0.22 mg/L), silver (0.038 mg/L), zinc (10 mg/L) |
| OW-3A | Arsenic (0.055 mg/L), lead (0.13 mg/L), zinc (17 mg/L) |
| EW-1 | antimony (<0.05 mg/L), arsenic (<0.025 mg/L), beryllium (<0.1 mg/L), cadmium (9 mg/L), chromium (4.5 mg/L), copper (1.3 mg/L), cyanide (0.36 mg/L), lead (0.45 mg/L), silver (0.08 mg/L), thallium (0.08 mg/L), zinc (7.6 mg/L) |

Zinc was in excess of standards in all of the monitoring wells and in EW-1. The wells are constructed with galvanized steel riser pipe, of which zinc is a constituent.[8]

The contaminants detected in groundwater from the process water well include cadmium, nickel, chromium, zinc, silver, lead, and beryllium, all at unknown concentrations.[2]

Volatile organic scans were performed for each of the groundwater samples and they showed the water to be high quality in the monitoring wells. Volatile organics detected in groundwater include: benzene (0.007 mg/L in OW-2C), TCE (0.020 mg/L in OW-4A and 0.069 mg/L in EW-1), and t-1,2 DCE (0.007 mg/L in EW-1 and 0.545 mg/L in EW-3).[2]

CONFIDENTIAL

These results are generally consistent with those of the November, 1982 EG&G study, which found some low levels of volatile organics at the site with a significant level (2,000 ppb) of t-1,2-DCE in EW-3.

No groundwater sampling has occurred at the site since 1984. Additional sampling at the present time is not possible as the wells have since been paved over.[4]

An observed release of contaminants to the environment has occurred. However, because the communities in the vicinity of the site do not draw groundwater for drinking water purposes, and no private drinking water wells were sampled, actual contamination targets were not documented.

CONFIDENTIAL

## SI TABLE 4: GROUND WATER OBSERVED RELEASE SUBSTANCES (BY AQUIFER)

Note: Mobility equals 1 for all observed release substances.

| Sample ID | Hazardous Substance | Substance Concentration | Bckgrd. ID. | Bckgrd. Conc. | Tox. × Mob. = Tox. | References |
|---|---|---|---|---|---|---|
| EW-1 | Cadmium | 9 mg/L | OW-01A | <0.1 mg/L | 10,000 | [2] |
| EW-1 | Chromium | 4.5 mg/L | OW-01A | <0.1 mg/L | 10,000 | [2] |
| EW-3 | t-1,2-Dichloroethylene | 0.545 mg/L | OW-01A | <0.005 mg/L | 100 | [2] |
| OW-2C | Silver | 0.038 mg/L | OW-01A | <0.001 mg/L | 100 | [2] |
| EW-1 | Cyanide | 0.36 mg/L | OW-01A | <0.01 mg/L | 100 | [2] |
| EW-1 | TCE | 0.069 mg/L | OW-01A | <0.005 mg/L | 10 | [2] |
| EW-1 | Copper | 1.3 mg/L | OW-01A | <0.1 mg/L | NL | [2] |
| OW-3 | Arsenic | 0.055 mg/L | OW-01A | <0.025 mg/L | 10,000 | [2] |
| | | | | Highest Value | 10,000 | |

Notes:

## SI TABLE 5: GROUND WATER ACTUAL CONTAMINATION TARGETS

Notes: Convert all results and SCDM values to ppb or µg/L.
If sum of percents calculated for I or J index is ≥ 100%, consider the well a Level I target; if sum of I or J index is < 100%, consider the well a Level II target.

Well ID: Level I: Level II:
Population Served: References:

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Conc. (MCL or MCLG) | % of Benchmark | RfD (J Index) | % of RfD | Cancer Risk Conc. (I index) | % of Cancer Risk Conc. |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

SCDM Version:
Notes: This table does not apply since no targets were sampled.

CONFIDENTIAL

# GR ND WATER PATHWAY WORKS T

| LIKELIHOOD OF RELEASE | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED RELEASE: If sampling data or direct observation support a release to the aquifer, assign a score of 550. Record observed release substances on SI Table 4. | 550 | | |
| 2. POTENTIAL TO RELEASE: Depth to aquifer: _____ feet. If sampling data do not support a release to the aquifer, and the site is in karst terrain or the depth to aquifer is 70 feet or less, assign a score of 500; otherwise, assign a score of 340. Optionally, evaluate potential to release according to HRS Section 3.1.2. | | | |
| LR = | 550 | | |

| TARGETS | Score | Data Type | Refs |
|---|---|---|---|
| Are any wells part of a blended system? Yes __ No ✓<br>If yes, attach a page to show apportionment calculations. | | | |
| 3. ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates that any target drinking water well for the aquifer has been exposed to a hazardous substance from the site, evaluate the factor score for the number of people served (SI Table 5).<br>Level I: ___ people × 10 = ___<br>Level II: ___ people × 1 = ___ Total = | 0 | | |
| 4. POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water wells for the aquifer or overlying aquifers that are not exposed to a hazardous substance from the site; record the population for each distance category in SI Table 6a or 6b. Sum the population values and multiply by 0.1. | 1 | | |
| 5. NEAREST WELL: Assign a score of 50 for any Level I Actual Contamination Targets for the aquifer or overlying aquifer. Assign a score of 45 if there are Level II targets but no Level I targets. If no Actual Contamination Targets exist, assign the Nearest Well Score from SI Table 6a or 6b. If no drinking water wells exist within 4 miles, assign 0. | 5 | | |
| 6. WELLHEAD PROTECTION AREA (WHPA): If any source lies within or above a WHPA for the aquifer, or if a ground water observed release has occurred within a WHPA, assign a score of 20; assign 5 if neither condition applies but a WHPA is within 4 miles; otherwise assign 0. | 0 | | |
| 7. RESOURCES: Assign a score of 5 if one or more ground water resource applies; assign 0 if none applies.<br>• Irrigation (5 acre minimum) of commercial food crops or commercial forage crops<br>• Watering or commercial livestock<br>• Ingredient in commercial food preparation<br>• Supply for commercial aquaculture<br>• Supply for a major or designated water recreation area, excluding drinking water use | 5 | | |
| Sum of Targets T = | 11 | | |

CONFIDENTIAL

## SI TABLE 6 (FROM HRS TABLE 3-12): VALUES FOR POTENTIAL CONTAMINATION GROUND WATER TARGET POPULATIONS

### SI Table 6a: Other Than Karst Aquifers

| Distance From Site | Pop. | Nearest Well (choose highest) | POPULATION SERVED BY WELLS WITHIN DISTANCE CATEGORY | | | | | | | | | | | | Pop. Value | Ref. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1000 | 1001 to 3000 | 3001 to 10,000 | 10,001 to 30,000 | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | 1,000,000 to 3,000,000 | | |
| 0 to 1/4 mile | 0 | 20 | 4 | 17 | 53 | 164 | 522 | 1,633 | 5,214 | 16,325 | 52,137 | 163,246 | 521,360 | 1,632,455 | 0 | |
| > 1/4 to ½ mile | 0 | 18 | 2 | 11 | 33 | 102 | 324 | 1,013 | 3,233 | 10,122 | 32,325 | 101,213 | 323,243 | 1,012,122 | 0 | |
| > ½ to 1 mile | 0 | 9 | 1 | 5 | 17 | 52 | 167 | 523 | 1,669 | 5,224 | 16,684 | 52,239 | 166,835 | 522,385 | 0 | |
| > 1 to 2 miles | 3 | 5 | 0.7 | 3 | 10 | 30 | 94 | 294 | 939 | 2,939 | 9,385 | 29,384 | 93,845 | 293,842 | 0.7 | |
| > 2 to 3 miles | 50 | 3 | 0.5 | 2 | 7 | 21 | 68 | 212 | 678 | 2,122 | 6,778 | 21,222 | 67,777 | 212,219 | 7 | |
| > 3 to 4 miles | 86 | 2 | 0.3 | 1 | 4 | 13 | 42 | 131 | 417 | 1,306 | 4,171 | 13,060 | 41,709 | 130,596 | 4 | |
| Nearest Well = | | 5 | | | | | | | | | | | | Sum = | 11.7 | |

Notes:

CONFIDENTIAL

## SI TABLE 6 (FROM HRS TABLE 3-12): VALUES FOR POTENTIAL CONTAMINATION GROUND WATER TARGET POPULATIONS (Continued)

### SI Table 6b: Karst Aquifers

| Distance From Site | Pop. | Nearest Well (choose highest) | POPULATION SERVED BY WELLS WITHIN DISTANCE CATEGORY | | | | | | | | | | | | Pop. Value | Ref. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1000 | 1001 to 3000 | 3001 to 10,000 | 10,001 to 30,000 | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | 1,000,000 to 3,000,000 | | |
| 0 to 1/4 mile | | 20 | 4 | 17 | 53 | 164 | 522 | 1,633 | 5,214 | 16,325 | 52,137 | 163,246 | 521,360 | 1,632,455 | | |
| >1/4 to ½ mile | | 20 | 2 | 11 | 33 | 102 | 324 | 1,013 | 3,233 | 10,122 | 32,325 | 101,213 | 323,243 | 1,012,122 | | |
| >½ to 1 mile | | 20 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | 26,068 | 81,623 | 260,680 | 816,227 | | |
| >1 to 2 miles | | 20 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | 26,068 | 81,623 | 260,680 | 816,227 | | |
| >2 to 3 miles | | 20 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | 26,068 | 81,623 | 260,680 | 816,227 | | |
| >3 to 4 miles | | 20 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | 26,068 | 81,623 | 260,680 | 816,227 | | |
| Nearest Well = | | | | | | | | | | | | | | Sum = | | |

Notes:

CONFIDENTIAL

**WASTE CHARACTERISTICS**

| | | | | |
|---|---|---|---|---|
| 8. | If any Actual Contamination Targets exist for the aquifer or overlying aquifers, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if no Actual Contamination Targets exist, assign the hazardous waste quantity score calculated for sources available to migrate to ground water. | 10 | | |
| 9. | Assign the highest ground water toxicity/mobility value from SI Table 3 or 4.<br>Substance(s): Cadmium / Chromium / Vinyl chloride<br>Value: 10,000 / 10,000 / 10,000<br>From Table: SI Table 4 / SI Table 4 / SI Table 4 | 10,000 | | |
| 10. | Multiply the ground water toxicity/mobility and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below: (from HRS Table 2-7) | | | |

| Product | WC Score | * |
|---|---|---|
| 0 | 0 | |
| >0 to <10 | 1 | |
| ≥10 to <100 | 2 | |
| ≥100 to <1,000 | 3 | |
| ≥1,000 to <10,000 | 6 | |
| ≥10,000 to <1E+05 | 10 | |
| ≥1E+05 to <1E+06 | 18 | ✓ |
| ≥1E+06 to <1E+07 | 32 | |
| ≥1E+07 to <1E+08 | 56 | |
| ≥1E+08 or greater | 100 | |

*check (✓) the WC score calculated for the pathway

**WC =** 18

Multiply LR by T and by WC. Divide the product by 82,500 to obtain the ground water pathway score for each aquifer. Select the highest aquifer score. If the pathway score is greater than 100, assign 100.

**GROUND WATER PATHWAY CALCULATION:** $\frac{LR \times T \times WC}{82{,}500}$ = **1.3**

Notes: 550 x 11 x 18 / 82,500 = 1.3

CONFIDENTIAL

CONFIDENTIAL

## SURFACE WATER PATHWAY

*The TRW DOT facility is located on 5.1 acres which gradually slope to the north-northeast. At an average elevation of 47.6 feet above mean sea level, the property is located in Zone C (not prone to flooding) as defined on the Federal Emergency Management Agency's Flood Insurance Rate Map.*[19] *Adjacent to the mill building to the northwest is a small wetland. The wetland is what remains of Silver Lake, a small pond that has mostly been filled. The Charles River flows east-northeast of the property. There are two drains in the parking lot northeast behind the mill building which ultimately empty into the Charles River.*

Surface water could be potentially impacted via two separate migration routes: overland flow of stormwater runoff or catch basin discharge. *Surface water runoff at the property apparently runs behind the mill building (north) and into the remnant wetland of Silver Lake. This wetland,* the Probable Point of Entry (PPE) of the overland flow, *is approximately* 50 *feet north of the mill building and is five acres in size. It appears to be internally drained,* therefore the surface water pathway for this migration route ends with the wetland.

*Surface water runoff from the property is also channeled into two storm drains immediately to the northeast of the mill building, which ultimately empty into the Charles River.* The Charles River, the PPE of the catch basin discharge, is located *2,000 feet northwest of the property site.*

*The Charles River flows 14 miles downstream from the property and forms an estuary in Boston Inner Harbor before dispersing into the Outer Harbor at Castle Island.*[1] This surface water migration route is shown on Figure 4. There are no public water supply intakes or reservoirs downstream of the property along the Charles River.[11, 12, 13, 14, 15, 16]

*The Charles River flows at an average rate of* 300 cubic feet per second *and is tidal beyond the locks of the Charles River Dam.*[17] *Although this section of the Charles River is not stocked with fish, fishing is permitted along these sections. There is one wetland located 2.3 miles downstream of the site. It is a 12.8-acre, palustrine, forested island with approximately 500 feet of frontage. There are no threatened or endangered species living within a 4-mile radius of the site or along the Charles River downstream of the property.*

No surface water or sediment sampling has occurred at the site.

CONFIDENTIAL

**Scoring Assumptions**

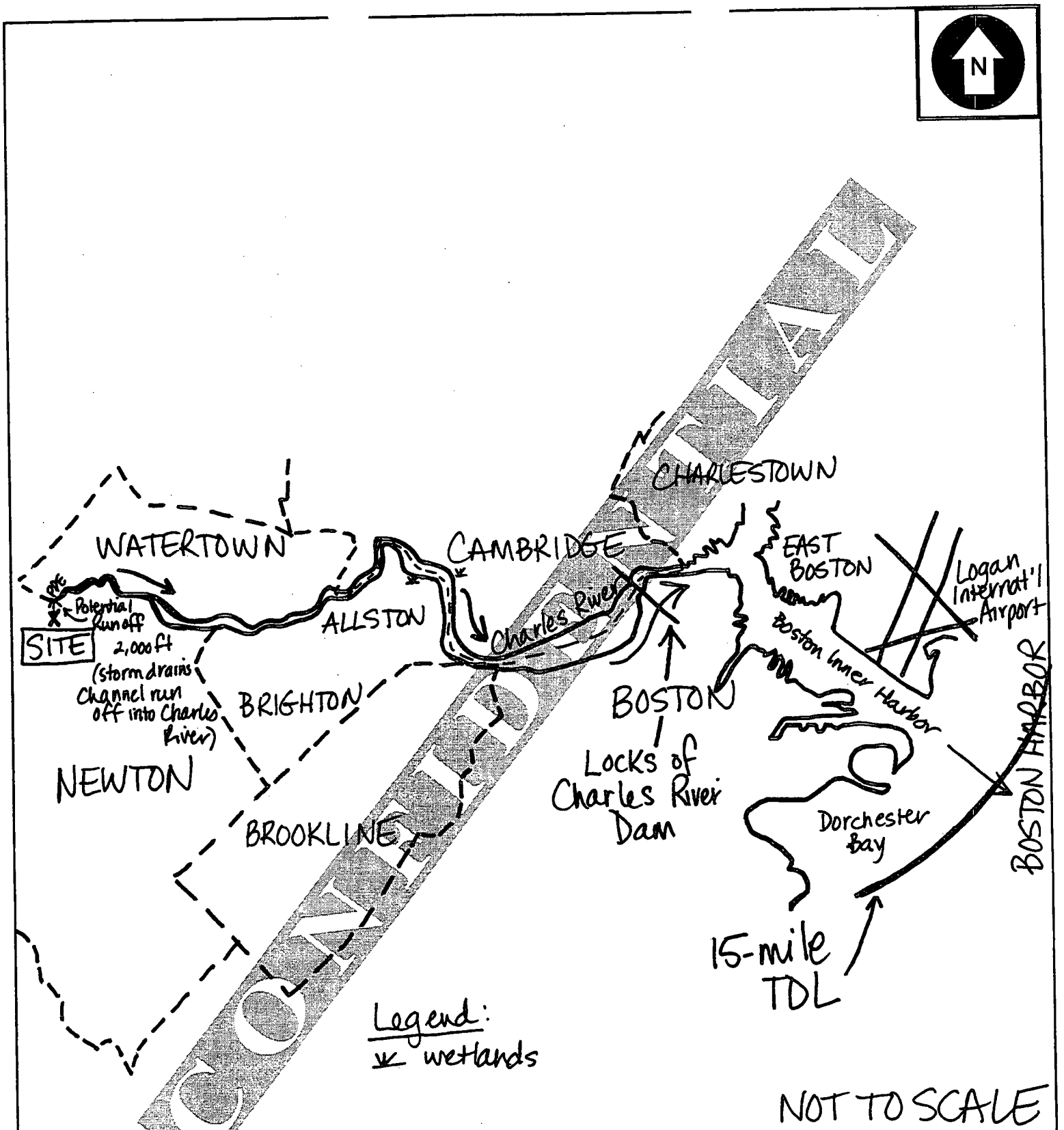
Since the site has more than one migration route (i.e., overland flow and direct discharge) both routes were used separately to calculate the surface water migration pathway score. The route that scored higher, the migration of contaminants to the adjacent wetland via overland flow, was used to calculate the surface water migration pathway. The calculation for the migration of contaminants to the Charles River via direct discharge, which was not used to calculate the surface water migrations pathway, is as follows:

| | |
|---|---|
| Likelihood of release | = 500 |
| Drinking Water Threat | = 5 |
| Human Food Chain Threat | = 0 |
| Environmental Threat | = 0.03 |
| Waste Characteristic Score for Drinking Water | = 18 |
| Waste Characteristic Score for Human Food Chain | = 100 |
| Waste Characteristic Score for Environment | = 56 |

Drinking Water = 500 x 5 x 18 / 82,500 = 0.55
Human Food Chain = 500 x 0 x 100 / 82,500 = 0
Environment = 500 x 0.03 x 56 / 82,500 = 0.01

0.55 + 0 + 0.01 = 0.56

CONFIDENTIAL




BASE MAP IS A PORTION OF BOSTON (1989) MASSACHUSETTS 30 MINUTE SERIES USGS TOPOGRAPHIC MAPS.

Stone & Webster
Environmental Technology and Services
Boston, Massachusetts

Date: 7/18/97
CERCLIS No.: MAD 001032671

Surface Water Migration Route Sketch
FORMER TRW DOT DIVISION
Figure 4

## SI TABLE 7: SURFACE WATER OBSERVED RELEASE SUBSTANCES

List all substances that meet the criteria for an observed release to surface water; however do not eliminate a substance from this table if it has a BCF of less than 500.

| Sample ID | Hazardous Substance | Substance Concentration | Bckgrd. ID. | Bckgrd. Conc. | BCF HRS Table 4-15 | Toxicity × Persistence | Toxicity × Persis. × Bioaccum | Ecotoxicity × Persis. × Ecobioaccum | References |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | Highest Values | | | | |

Notes: Surface water has not been sampled, therefore, this table does not apply.

## SI TABLE 8: SURFACE WATER DRINKING WATER ACTUAL CONTAMINATION TARGETS

Notes: Convert all results and SCDM values to ppb or µg/L.
If sum of percents calculated for I or J index is ≥ 100 percent, consider the intake a Level I target; if sum of I or J index is < 100 percent consider the intake a Level II target.

Intake ID: Sample Type: Level I: Level II: Population Served: References:

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Conc. (MCL or MCLG) | % of Benchmark | RfD (J Index) | % of RfD | Cancer Risk Conc. (I index) | % of Cancer Risk Conc. |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

SCDM Version:
Notes: There are no surface water drinking water supplies, therefore, there are no actual contamination targets.

CONFIDENTIAL

# SURFACE WATER PATHWAY
## LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT WORKSHEET

| LIKELIHOOD OF RELEASE - OVERLAND/FLOOD MIGRATION | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED RELEASE: If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7. | | | |
| 2. POTENTIAL TO RELEASE: Distance to surface water: 50 (feet) If sampling data do not support a release to surface water in the watershed, use the table below to assign a score from the table below based on distance to surface water and flood frequency. | | | |
| Optionally, evaluate surface water potential to release according to HRS Section 4.1.2.1.2 | 500 | | |
| LR = | 500 | | |

| | |
|---|---|
| Distance to surface water <2500 feet | 500 |
| Distance to surface water >2500 feet, and: | |
| Site in annual or 10-yr floodplain | 500 |
| Site in 100-yr floodplain | 400 |
| Site in 500-yr floodplain | 300 |
| Site outside 500-yr floodplain | 100 |

| LIKELIHOOD OF RELEASE - GROUND WATER TO SURFACE WATER MIGRATION | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED RELEASE: If sampling data or direct observation support a release to surface water in the watershed, assign a score of 550. Record observed release substances on SI Table 7. | | | |
| NOTE: Evaluate ground water to surface water migration only for a surface water body that meets all of the following conditions: | | | |
| 1) A portion of the surface water is within 1 mile of site sources having a containment factor greater than 0. | | | |
| 2) No aquifer discontinuity is established between the source and the above portion of the surface water body. | | | |
| 3) The top of the uppermost aquifer is at or above the bottom of the surface water. Elevation of top of uppermost aquifer: _____ Elevation of bottom of surface water body: _____ | | | |
| 2. POTENTIAL TO RELEASE: Depth to aquifer: 5 feet. If sampling data do not support a release to the aquifer, and the site is in karst terrain or the depth to aquifer is 70 feet or less assign a score of 500: otherwise assign a score of 340. Optionally, evaluate potential to release according to HRS Section 3.1.2. | 500 | | |
| LR = | 500 | | |

CONFIDENTIAL

# SURFACE WATER PATHWAY
## LIKELIHOOD OF RELEASE AND DRINKING WATER THREAT WORKSHEET
## (Continued)

| DRINKING WATER THREAT TARGETS | Score | Data Type | Refs |
|---|---|---|---|
| Record the water body type, flow, and number of people served by each drinking water intake within the distance limit in the watershed. If there is no drinking water intake within the target distance limit, assign 0 to factors 3, 4, and 5.<br><br>Intake Name \| Water Body Type \| Flow \| People Served<br>_____<br>_____<br><br>Are any intakes part of a blended system? Yes ___ No ___<br>If yes, attach a page to show appointment calculations.<br><br>3. ACTUAL CONTAMINATION TARGETS: If analytical evidence indicates a drinking water intake has been exposed to a hazardous substance from the site, list the intake name and evaluate the factor score for the drinking water population (SI Table 8).<br><br>Level I: ___ people × 10 = _____<br>Level II: ___ people × 1 = _____ **Total =** | 0 | | |
| 4. POTENTIAL CONTAMINATION TARGETS: Determine the number of people served by drinking water intakes for the watershed that have not been exposed to a hazardous substance from the site. Assign the population values from SI Table 9. Sum the values and multiply by 0.1. | 0 | | |
| 5. NEAREST INTAKE: Assign a score of 50 for any Level I Actual Contamination Drinking Water Targets for the watershed. Assign a score of 45 if there are Level II targets for the watershed, but no Level I targets. If no Actual Contamination Drinking Water Targets exist, assign a score for the intake nearest the PPE from SI Table 9. If no drinking water intakes exist, assign 0. | 0 | | |
| 6. RESOURCES: Assign a score of 5 if one or more surface water resource applies; assign 0 if none applies.<br>• Irrigation (5 acre minimum) of commercial food crops or commercial forage crops<br>• Watering of commercial livestock<br>• Ingredient in commercial food preparation<br>• Major or designated water recreation area, excluding drinking water use. | 5 | | |
| **Sum of Targets T =** | 5 | | |

UNPUBLISHED DRAFT

## SI TABLE 9 (FROM HRS TABLE 4-14): DILUTION-WEIGHTED POPULATION VALUES FOR POTENTIAL CONTAMINATION FOR SURFACE WATER MIGRATION PATHWAY[a]

| Type of Surface Water Body[b] | Pop. | Nearest Intake | NUMBER OF PEOPLE | | | | | | | | Pop. Value |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1,000 | 1,001 to 3,000 | 3,001 to 10,000 | 10,001 to 30,000 | |
| Minimal Stream (<10 cfs) | | 20 | 4 | 17 | 53 | 164 | 522 | 1,633 | 5,214 | 16,325 | |
| Small to moderate stream (10 to 100 cfs) | | 2 | 0.4 | 2 | 5 | 16 | 52 | 163 | 521 | 1,633 | |
| Moderate to large stream (> 100 to 1,000 cfs) | 0 | 0 | 0.04 | 0.2 | 0.5 | 2 | 5 | 16 | 52 | 163 | |
| Large Stream to river (>1,000 to 10,000 cfs) | | 0 | 0.004 | 0.02 | 0.05 | 0.2 | 0.5 | 2 | 5 | 16 | |
| Large River (> 10,000 to 100,000 cfs) | | 0 | 0 | 0.002 | 0.005 | 0.02 | 0.05 | 0.2 | 0.5 | 2 | |
| Very Large River (>100,000 cfs) | | 0 | 0 | 0 | 0.001 | 0.002 | 0.005 | 0.02 | 0.05 | 0.2 | |
| Shallow ocean zone or Great Lake (depth < 20 feet) | | 0 | 0 | 0.002 | 0.005 | 0.02 | 0.05 | 0.2 | 0.5 | 2 | |
| Moderate ocean zone or Great Lake (Depth 20 to 200 feet) | | 0 | 0 | 0 | 0.001 | 0.002 | 0.005 | 0.02 | 0.05 | 0.2 | |
| Deep ocean zone or Great Lake (depth > 200 feet) | | 0 | 0 | 0 | 0 | 0.001 | 0.003 | 0.008 | 0.03 | 0.08 | |
| 3-mile mixing zone in quiet flowing river (≥ 10 cfs) | | 10 | 2 | 9 | 26 | 82 | 261 | 817 | 2,607 | 8,163 | |

CONFIDENTIAL

## SI TABLE 9 (FROM HRS TABLE 4-14): DILUTION-WEIGHTED POPULATION VALUES FOR POTENTIAL CONTAMINATION FOR SURFACE WATER MIGRATION PATHWAY[a] (Continued)

| Type of Surface Water Body | Pop. | NUMBER OF PEOPLE | | | | | Pop. Value |
|---|---|---|---|---|---|---|---|
| | | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | 1,000,001 to 3,000,000 | 3,000,001 to 10,000,000 | |
| Minimal Stream (<10 cfs) | | 52,137 | 163,246 | 521,360 | 1,632,455 | 5,213,590 | |
| Small to moderate stream (10 to 100 cfs) | | 5,214 | 16,325 | 52,136 | 163,245 | 521,359 | |
| Moderate to large stream (> 100 to 1,000 cfs) | 0 | 521 | 1,633 | 5,214 | 16,325 | 52,136 | |
| Large Stream to river (>1,000 to 10,000 cfs) | | 52 | 163 | 521 | 1,632 | 5,214 | |
| Large River (> 10,000 to 100,000 cfs) | | 5 | 16 | 52 | 163 | 521 | |
| Very Large River (>100,000 cfs) | | 0.5 | 2 | 5 | 16 | 52 | |
| Shallow ocean zone or Great Lake (depth < 20 feet) | | 5 | 16 | 52 | 163 | 521 | |
| Moderate ocean zone or Great Lake (Depth 20 to 200 feet) | | 0.5 | 2 | 5 | 16 | 52 | |
| Deep ocean zone or Great Lake (depth > 200 feet) | | 0.3 | 1 | 3 | 8 | 26 | |
| 3-mile mixing zone in quiet flowing river (≥ 10 cfs) | | 26,068 | 81,623 | 260,680 | 816,227 | 2,606,795 | |
| | | | | | | Sum = | |

[a]Round the number of people to nearest integer. Do not round the assigned dilution-weighted population value to nearest integer.

[b]Treat each lake as a separate type of water body and assign it a dilution-weighted population value using the surface water body type with the same dilution weight from HRS Table 4-13 as the lake. If drinking water is withdrawn from coastal tidal water or the ocean, assign a dilution-weighted population value to it using the surface water body type with the same dilution weight from HRS Table 4-13 as the coastal tidal water or the ocean zone.

CONFIDENTIAL

## SI TABLE 10: HUMAN FOOD CHAIN ACTUAL CONTAMINATION TARGETS FOR WATERSHED

Notes: Convert all results and SCDM values to µg/kg or ppb.
If sum of percents calculated for I or J index is ≥ 100%, consider the fishery a Level I target; if sum of I or J index is < 100 percent consider the fishery a Level II target.
List only those substances that meet the observed release criteria in a fishery within the target distance limit and have a BCF of ≥ 500; BCF values are found on SI Table 7.

Fishery ID: Sample Type: Level I: Level II: References:

| Sample ID | Hazardous Substance | Conc. (µg/kg) | Benchmark Conc. (FDAAL) | % of Benchmark | RfD (J index) | % of RfD | Cancer Risk Conc. (I index) | % of Cancer Risk Conc. |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Notes: This table does not apply because surface water and/or sediment samples were not collected.
Reference Sample:

## SI TABLE 11: SENSITIVE ENVIRONMENT ACTUAL CONTAMINATION TARGETS FOR WATERSHED

Notes: Convert all results and SCDM values to µg/L or ppb.
If the highest % of benchmark calculated is ≥ 100%, consider the sensitive env. a Level I target; if the highest % of benchmark calculated is < 100% consider the sensitive env. a Level II target.

Environment ID: Sample Type: Level I: Level II: Environment Value:

| Sample ID | Hazardous Substance | Conc. (µg/L) | Benchmark Conc. (AWQC or AALAC) | % of Benchmark | References |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | Highest Percent | |

SCDM Version:
Notes: This table does not apply because surface water and/or sediment samples were not collected.

CONFIDENTIAL

| HUMAN FOOD CHAIN THREAT TARGETS | Score | Data Type | Refs |
|---|---|---|---|
| Record the water body type and flow for each fishery within the target distance limit. If there is no fishery within the target distance limit, assign a score of 0 at the bottom of this page. | | | |
| Fishery Name: Water Body: Flow<br><br>Fishery Name: Water Body: Flow: | | | |
| **FOOD CHAIN INDIVIDUAL (Select highest value)**<br><br>7. ACTUAL CONTAMINATION FISHERIES:<br><br>Assign 50 points for a Level I fishery only if tissue samples document an observed release of a substance with a BCF ≥ 500 to a fishery within the target distance limit (SI Table 10).<br>List substance(s):_____.<br><br>Assign 45 points for a Level II fishery if surface water/sediment samples document an observed release of a substance with a BCF ≥ 500 to a fishery within the target distance limit (SI Table 10).<br>List substance(s):_____.<br><br>8. POTENTIAL CONTAMINATION FISHERIES:<br><br>Assign 20 points for a potential fishery if there is an observed release of a substance with a BCF ≥ 500 (SI Table 7) to a watershed containing fisheries within the target distance limit, but no Level I or Level II fisheries are scored because there is no fishery documented between the PPE and the most downstream observed release sample point.<br><br>If there is no observed release of a substance with a BCF ≥ 500 to a watershed, assign a value for potential contamination fisheries from the table below using the lowest flow of all fisheries within the target distance limit. | | | |

| Lowest Flow | FCI Value |
|---|---|
| <10 cfs | 20 |
| 10 to 100 cfs | 2 |
| >100 cfs, coastal tidal waters, oceans, or Great Lakes | 0 |
| 3-mile mixing zone in quiet flowing river | 10 |

| | |
|---|---|
| **FCI Value =** | 0 |
| **Targets T =** | 0 |

Notes: There is no fishery associated with the wetland.

CONFIDENTIAL

# SU. .ACE WATER PATHWAY (Conti. .)
## ENVIRONMENTAL THREAT WORKSHEET

When measuring length of wetlands that are located on both sides of a surface water body, sum both frontage lengths. For a sensitive environment that is more than one type, assign a value for each type.

| ENVIRONMENTAL THREAT TARGETS | Score | Data Type | Refs |
|---|---|---|---|
| Record the water body and flow for each surface water sensitive environment within the target distance limit (see SI Table 12). If there is no sensitive environment within the target distance limit, assign a score of 0 at the bottom of the page. | | | |

| Environment Type (SI Table 13) | Water Body Name | Flow |
|---|---|---|
| Wetlands (0.1 to 1 mile) | Silver Lake Wetland | NA cfs |
| CWA | Silver Lake Wetland | NA cfs |
| | | cfs |
| | | cfs |
| | | cfs |

9. ACTUAL CONTAMINATION SENSITIVE ENVIRONMENTS: If sampling data or direct observation indicate any sensitive environment has been exposed to a hazardous substance from the site, record this information on SI Table 11, and assign a factor value for the environment (SI Tables 13 and 14).

Substance(s): _____ _____ _____

From Table: _____ _____ _____

| Environment Type (SI Table 13) | Environment Value (SI Tables 13 & 14) | Multiplier (10 for Level I, 1 for Level II) | Product |
|---|---|---|---|
| | | × = | |
| | | × = | |
| | | × = | |
| | | × = | |
| | | Sum = | |

10. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS:

| Flow | Dilution weight (SI Table 12) | Environment Type and Value (SI Tables 13 & 14) | Pot. Cont. | Product |
|---|---|---|---|---|
| NA cfs | 1 × | 25 (wetlands) × | 0.1 = | 2.5 |
| NA cfs | 1 × | 5 (CWA) × | 0.1 = | 0.5 |
| cfs | × | × | 0.1 = | |
| cfs | × | × | 0.1 = | |
| cfs | × | × | 0.1 = | |
| | | | Sum = | 3 |

Sum of Targets T = 3

Notes: The sensitive environment is an isolated wetland. There is no flow. As a conservative estimate, dilution weight is assumed to be 1.

CONFIDENTIAL

## SI TABLE 12 (HRS TABLE 4-13): SURFACE WATER DILUTION WEIGHTS

| * | TYPE OF SURFACE WATER BODY | | Assigned Dilution Weight |
|---|---|---|---|
| | Descriptor | Flow Characteristics | |
| ✓ | Minimal stream | < 10 cfs | 1 |
| | Small to moderate stream | 10 to 100 cfs | 0.1 |
| | Moderate to large stream | > 100 to 1,000 cfs | 0.01 |
| | Large stream to river | > 1,000 to 10,000 cfs | 0.001 |
| | Large river | > 10,000 to 100,000 cfs | 0.0001 |
| | Very large river | > 100,000 cfs | 0.00001 |
| | Coastal tidal waters | Flow not applicable; depth not applicable | 0.0001 |
| | Shallow ocean zone or Great Lake | Flow not applicable; depth less than 20 feet | 0.0001 |
| | Moderate depth ocean zone or Great Lake | Flow not applicable; depth 20 to 200 feet | 0.00001 |
| | Deep ocean zone or Great Lake | Flow not applicable; depth greater than 200 feet | 0.000005 |
| | 3-mile mixing zone in quiet flowing river | 10 cfs or greater | 0.5 |

* Check all (✓) appropriate dilution weights.

Notes: A dilution weight of 1 is assumed for the isolated wetland.

CONFIDENTIAL

## SI TABLE 13 (HRS TABLE 4-23): SURFACE WATER AND AIR SENSITIVE ENVIRONMENTS VALUES

| * | Sensitive Environment | Assigned Value |
|---|---|---|
| | Critical habitat for Federal designated endangered or threatened species<br>Marine Sanctuary<br>National Park<br>Designated Federal Wilderness Area<br>Ecologically important areas identified under the Coastal Zone Wilderness Act<br>Sensitive Areas identified under the National Estuary Program or Near Coastal Water Program of the Clean Water Act<br>Critical Areas identified under the Clean Lakes Program of the Clean Water Act (subareas in lakes or entire small lakes)<br>National Monument (air pathway only)<br>National Seashore Recreation Area<br>National Lakeshore Recreation Area | 100 |
| | Habitat known to be used by Federal designated or proposed endangered or threatened species<br>National Preserve<br>National or State Wildlife Refuge<br>Unit of Coastal Barrier Resources System<br>Coastal Barrier (undeveloped)<br>Federal land designated for the protection of natural ecosystems<br>Administratively Proposed Federal Wilderness Area<br>Spawning areas critical for the maintenance of fish/shellfish species within a river system, bay, or estuary<br>Migratory pathways and feeding areas critical for the maintenance of anadromous fish species within river reaches or areas in lakes or coastal tidal waters in which the fish spend extended periods of time<br>Terrestrial areas utilized by large or dense aggregations of vertebrate animals (semi-aquatic foragers) for breeding<br>National river reach designated as recreational | 75 |
| | Habitat known to be used by State designated endangered or threatened species<br>Habitat known to be used by a species under review as to its Federal endangered or threatened status<br>Coastal Barrier (partially developed)<br>Federally designated Scenic or Wild River | 50 |
| | State land designated for wildlife or game management<br>State designated Scenic or Wild River<br>State designated Natural Area<br>Particular areas, relatively small in size, important to maintenance of unique biotic communities | 25 |
| ✓ | State designated areas for the protection and maintenance of aquatic life under the Clean Water Act | 5 |
| ✓ | Wetlands See SI Table 14 (Surface Water Pathway) or SI Table 23 (Air Pathway) | 25 |

*Check (✓) all environments impacted or potentially impacted by the site.

## SI TABLE 14 (HRS TABLE 4-24): SURFACE WATER WETLANDS FRONTAGE VALUES

| * | TOTAL LENGTH OF WETLANDS | ASSIGNED VALUE |
|---|---|---|
| | Less than 0.1 mile | 0 |
| ✓ | 0.1 to 1 mile | 25 |
| | Greater than 1 to 2 miles | 50 |
| | Greater than 2 to 3 miles | 75 |
| | Greater than 3 to 4 miles | 100 |
| | Greater than 4 to 8 miles | 150 |
| | Greater than 8 to 12 miles | 250 |
| | Greater than 12 to 16 miles | 350 |
| | Greater than 16 to 20 miles | 450 |
| | Greater than 20 miles | 500 |

* Check (✓) highest value for each applicable flow characteristic.

Notes: The entire wetland is within the TDL, therefore, the perimeter of the wetland serves as the total length. The wetland is 5 acres in size. The perimeter of the wetland is estimated to be approximately 1,848 feet, or 0.35 mile.

CONFIDENTIAL

# SI  \CE WATER PATHWAY (Conclu[illegible]l)
## WASTE CHARA[illegible]ERISTICS, THREAT, AND PATHWAY SCORE SUMMARY

| WASTE CHARACTERISTICS | Score |
|---|---|
| 11. If an Actual Contamination Target (drinking water, human food chain, or environmental threat) exists for the watershed, assign the calculated hazardous waste quantity score, or a score of 100, whichever is greater. If no Actual Contamination Targets exist, assign the hazardous waste quantity score calculated for sources available to migrate to surface water. | 10 |

12. Assign the highest value from SI Table 3 or SI Table 7 for the hazardous substance waste characterization factors below. Multiply each by the surface water hazardous waste quantity score and determine the waste characteristics score for each threat.

| | DWT | HFCT | ET |
|---|---|---|---|
| Substance(s): | Cadmium, Chromium, Vinyl Chloride | Cadmium | Cadmium |
| Value: | 10,000 | 5.0E+07 | 5.0E+06 |
| From Table: | SI Table 3 | SI Table 3 | SI Table 3 |

*Footnote all substances which cannot fit on Table.

13. Multiply the toxicity and hazardous waste quantity scores. Assign the waste characteristics score for each threat from the table below.

| Product | WC Score | DWT | HFCT | ET |
|---|---|---|---|---|
| 0 | 0 | | | |
| >0 to <10 | 1 | | | |
| ≥10 to <100 | 2 | | | |
| ≥100 to <1,000 | 3 | | | |
| ≥1,000 to <10,000 | 6 | | | |
| ≥10,000 to <1E+05 | 10 | | | |
| ≥1E+05 to <1E+06 | 18 | ✓ | | |
| ≥1E+06 to <1E+07 | 32 | | | |
| ≥1E+07 to <1E+08 | 56 | | | ✓ |
| ≥1E+08 to <1E+09 | 100 | | ✓ | |
| ≥1E+09 to <1E+10 | 180 | | | |
| ≥1E+10 to <1E+11 | 320 | | | |
| ≥1E+11 to <1E+12 | 560 | | | |
| ≥1E+12 or greater | 1000 | | | |

*check (✓) the WC score calculated for each threat

| | Substance Value | HWQ | Product | WC Score (from Table) | |
|---|---|---|---|---|---|
| Drinking Water Threat Toxicity/Persistence | 10,000 x | 10 = | 1.0E+05 | 18 | (Maximum of 100) |
| Food Chain Threat Toxicity/Persistence Bioaccumulation | 5.0E+07 x | 10 = | 5.0E+08 | 100 | (Maximum of 1000) |
| Environmental Threat Ecotoxicity/Persistence/ Ecobioaccumulation | 5.0E+06 x | 10 = | 5.0E+07 | 56 | (Maximum of 1000) |

CONFIDENTIAL

## SURFACE WATER PATHWAY THREAT SCORES

| Threat (T) | Likelihood of Release (LR) Score | Targets (T) Score | Pathway Waste Characteristics(WC) Score (determined above) | Threat Score $\frac{LR \times T \times WC}{82,500}$ | |
|---|---|---|---|---|---|
| Drinking Water (DW) | 500 | 5 | 18 | 0.55 | (Maximum of 100) |
| Human Food Chain (HFC) | 500 | 0 | 100 | 0 | (Maximum of 100) |
| Environmental (E) | 500 | 3 | 56 | 1 | (Maximum of 60) |

Multiply LR by T and by WC. Divide the product by 82,500 for each threat (T). Sum the threat scores to obtain the surface water pathway score for each watershed/migration route. Select the highest watershed/migration route score. If the pathway score is greater than 100, assign 100.

**SURFACE WATER PATHWAY CALCULATION:**
(DWT + HFCT + ET) =

**1.55**

(Maximum of 100)

CONFIDENTIAL

## SOIL EXPOSURE PATHWAY

The total number of workers on site is 360.[4] The total population within one mile travel distance of the site is approximately 22,133.[10] A residential population is not associated with the site. However, there are residences located to the west, south and east of the facility. *The nearest residential property is 50 feet west of the site.* There are no schools or day care facilities within 200 feet of the site. [1, 2, 7] *There are no terrestrial sensitive environments on an area of observed contamination.*

**Sampling**

A site investigation of the TRW facility was performed in November 1982 by EG&G for the purpose of identifying the presence and extent of on-site contamination. On-site soil samples collected throughout the site, as shown on Figure 3, showed levels of vinyl chloride and methylene chloride, lead, chromium, copper, cadmium, mercury, arsenic, silver, benzene, trichloroethylene, and t-1,2-dichloroethylene.[3] The depths at which these samples were collected and the exact concentrations of contaminants are unknown, as laboratory analyses from previous soil sampling were not available during review for this HRS Worksheet.

Based on current conditions, there is no contaminated soil available to the soil exposure pathway, as the entire site is paved. Subsequently, the likelihood of exposure = 0, therefore, the pathway score = 0.

CONFIDENTIAL

## SI TABLE 15a: SOIL EXPOSURE OBSERVED CONTAMINATION SUBSTANCES

Source ID:

| Sample ID | Hazardous Substance | Substance Concentration | Bckgrd. ID. | Bckgrd. Conc. | Toxicity | References |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | Highest Toxicity | | |

Notes:

## SI TABLE 15b: SOIL EXPOSURE RESIDENT POPULATION TARGETS

Notes: Convert all results and SCDM values to µg/kg or ppb.
If sum of percent calculated for I or J index is ≥ 100%, consider residents Level I targets; if sum of I or J index is < 100%, consider the residents Level II targets.

Residence ID: Level I: Level II: Population:

| Sample ID | Hazardous Substance | Conc. (µg/kg) | RfD (J index) | % of RfD | Cancer Risk Conc. (I index) | % of Cancer Risk Conc. | References |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | Sum of Percents | | Sum of Percents | | |

SCDM Version:
Notes:

CONFIDENTIAL

# SOIL EXPOSURE PATHWAY WORKSHEET
## RESIDENT POPULATION THREAT

| LIKELIHOOD OF EXPOSURE | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED CONTAMINATION: If evidence indicates presence of observed contamination (depth of 2 feet or less), assign a score of 550; otherwise, assign a 0. Note that a likelihood of exposure score of 0 results in a soil exposure pathway score of 0. | 0 | | |
| LE= | 0 | | |

**TARGETS**

| | | | |
|---|---|---|---|
| 2. RESIDENT POPULATION: Determine the number of people occupying residences or attending school or day care on contaminated property and within 200 feet of areas of observed contamination (HRS section 5.1.3).<br>Level I: _____ people × 10 = _____<br>Level II: _____ people × 1 = _____ Sum= | 0 | | |
| 3. RESIDENT INDIVIDUAL: Assign a score of 50 if any Level I resident population exists. Assign a score of 45 if there are Level II targets but no Level I targets. If no resident population exists (i.e., no Level I or Level II targets), assign 0 (HRS Section 5.1.3). | 0 | | |
| 4. WORKERS: Assign a score from the table below for the total number of workers at the site and nearby facilities and within areas of observed contamination associated with the site. | | | |

| Number of Workers | Score |
|---|---|
| 0 | 0 |
| 1 to 100 | 5 |
| 101 to 1,000 | 10 |
| >1,000 | 15 |

| | | | |
|---|---|---|---|
| | 10 | | |
| 5. TERRESTRIAL SENSITIVE ENVIRONMENTS: Assign a value for each terrestrial sensitive environment (SI Table 16) in an area of observed contamination. | | | |

| Terrestrial Sensitive Environment Type | Value |
|---|---|
| | |
| | |
| | |
| | |
| Sum = | |

| | | | |
|---|---|---|---|
| | 0 | | |
| 6. RESOURCES: Assign a score of 5 if any one or more of the following resources is present on area of observed contamination at the site; assign 0 if none applies.<br>• Commercial agriculture<br>• Commercial silviculture<br>• Commercial livestock production or commercial livestock grazing | | | |
| Sum of Targets T= | 10 | | |

Notes:

CONFIDENTIAL

# SOIL EXPOSURE PATHWAY WORKSHEET
## NEARBY POPULATION THREAT

| LIKELIHOOD OF EXPOSURE | | Score | Data Type | Ref. |
|---|---|---|---|---|
| 7. | Attractiveness/Accessibility (from SI Table 17 or HRS Table 5-6) Value: 10 | | | |
| | Area of Contamination (from SI Table 18 or HRS Table 5-7) Value: 0 | | | |
| | Likelihood of Exposure (from SI Table 19 or HRS Table 5-8) | | | |
| | LE= | 0 | | |

| TARGETS | | Score | Data Type | Ref. |
|---|---|---|---|---|
| 8. | Assign a score of 0 if Level I or Level II resident individual has been evaluated or if no individuals live within 1/4 mile travel distance of an area of observed contamination. Assign a score of 1 if nearby population is within 1/4 mile travel distance and no Level I or Level II resident population has been evaluated. | 1 | | |
| 9. | Determine the population within 1 mile travel distance that is not exposed to a hazardous substance from the site (i.e., properties that are not determined to be Level I or Level II); record the population for each distance category in SI Table 20 (HRS Table 5-10). Sum the population values and multiply by 0.1. | 21 | | |
| | Sum of Targets T= | 22 | | |

Notes: The site is assigned a value of 10 for attractiveness/accessibility, however, because there are no areas of contamination the likelihood of exposure = 0.

CONFIDENTIAL

## SI TABLE 16 (HRS TABLE 5-5): SOIL EXPOSURE PATHWAY TERRESTRIAL SENSITIVE ENVIRONMENT VALUES

| * | TERRESTRIAL SENSITIVE ENVIRONMENT | ASSIGNED VALUE |
|---|---|---|
| | Terrestrial critical habitat for Federal designated endangered or threatened species<br>National Park<br>Designated Federal Wilderness Area<br>National Monument | 100 |
| | Terrestrial habitat known to be used by Federal designated or proposed threatened or endangered species<br>National Preserve (terrestrial)<br>National or State terrestrial Wildlife Refuge<br>Federal land designated for protection of natural ecosystems<br>Administratively proposed Federal Wilderness Area<br>Terrestrial areas utilized by large or dense aggregations of animals (vertebrate species) for breeding | 75 |
| | Terrestrial habitat used by State designated endangered or threatened species<br>Terrestrial habitat used by species under review for Federal designated endangered or threatened status | 50 |
| | State lands designated for wildlife or game management<br>State designated Natural Areas<br>Particular areas, relatively small in size, important to maintenance of unique biotic communities | 25 |

* - Check (✓) all environments impacted or potentially impacted by the site.

Notes:

CONFIDENTIAL

## SI TABLE 17 (HRS TABLE 5-6); ATTRACTIVENESS/ACCESSIBILITY VALUES

| * | AREA OF OBSERVED CONTAMINATION | ASSIGNED VALUE |
|---|---|---|
| | Designated recreational area | 100 |
| | Regularly used for public recreation (for example, vacant lots in urban area) | 75 |
| | Accessible and unique recreational area (for example, vacant lots in urban area) | 75 |
| | Moderately accessible (may have some access improvements-for example, gravel road) with some public recreation use | 50 |
| | Slightly accessible (for example, extremely rural area with no road improvement) with some public recreation use | 25 |
| ✓ | Accessible with no public recreation use | 10 |
| | Surrounded by maintained fence or combination of maintained fence and natural barriers | 5 |
| | Physically inaccessible to public, with no evidence of public recreation use | 0 |

* Check (✓) highest value.

## SI TABLE 18 (HRS TABLE 5-7): AREA OF CONTAMINATION FACTOR VALUES

| * | TOTAL AREA OF THE AREAS OF OBSERVED CONTAMINATION (SQUARE FEET) | ASSIGNED VALUE |
|---|---|---|
| | ≤ to 5,000 | 5 |
| | > 5,000 to 125,000 | 20 |
| | > 125,000 to 250,000 | 40 |
| | > 250,000 to 375,000 | 60 |
| | > 375,000 to 500,000 | 80 |
| | > 500,000 | 100 |

* Check (✓) highest value.

Notes:

CONFIDENTIAL

## SI TABLE 19 (HRS TABLE 5-8): NEARBY POPULATION LIKELIHOOD OF EXPOSURE FACTOR VALUES

| Area of Contamination Factor Value | Attractiveness/Accessibility Factor Value | | | | | | |
|---|---|---|---|---|---|---|---|
| | 100 | 75 | 50 | 25 | 10 | 5 | 0 |
| 100 | 500 | 500 | 375 | 250 | 125 | 50 | 0 |
| 80 | 500 | 375 | 250 | 125 | 50 | 25 | 0 |
| 60 | 375 | 250 | 125 | 50 | 25 | 5 | 0 |
| 40 | 250 | 125 | 50 | 25 | 5 | 5 | 0 |
| 20 | 125 | 50 | 25 | 5 | 5 | 5 | 0 |
| 5 | 50 | 25 | 5 | 5 | 5 | 5 | 0 |

## SI TABLE 20 (HRS TABLE 5-10): DISTANCE-WEIGHTED POPULATION VALUES FOR NEARBY POPULATION THREAT

| Travel Distance Category (miles) | Pop. | NUMBER OF PEOPLE WITHIN THE TRAVEL DISTANCE CATEGORY | | | | | | | | | | | | Pop. Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1,000 | 1,001 to 3,000 | 3,001 to 10,001 | 10,001 to 30,000 | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | |
| Greater than 0 to 1/4 | 1,703 | 0 | 0.1 | 0.4 | 1.0 | 4 | 13 | 41 | 130 | 408 | 1,303 | 4,081 | 13,034 | 41 |
| Greater than 1/4 to ½ | 4,325 | 0 | 0.05 | 0.2 | 0.7 | 2 | 7 | 20 | 65 | 204 | 652 | 2,041 | 6,517 | 65 |
| Greater than ½ to 1 | 16,105 | 0 | 0.02 | 0.1 | 0.3 | 1 | 3 | 10 | 33 | 102 | 326 | 1,020 | 3,258 | 102 |
| | | | | | | | | | | | | | Sum = | 208 |

References:
Notes:

CONFIDENTIAL

# SOIL EXPOSURE PATHWAY WORKSHEET (Included)

**WASTE CHARACTERISTICS** — **Score**

10. Assign the hazardous waste quantity score calculated for soil exposure — 0

11. Assign the highest toxicity value from SI Table 15a.

Substance(s): _____ _____ _____

Value: _____ _____ _____

From Table: _____ _____ _____

12. Multiply the toxicity and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below:

| Product | WC Score | * |
|---|---|---|
| 0 | 0 | |
| >0 to <10 | 1 | |
| ≥10 to <100 | 2 | |
| ≥100 to <1,000 | 3 | |
| ≥1,000 to <10,000 | 6 | |
| ≥10,000 to <1E+05 | 10 | |
| ≥1E+05 to <1E+06 | 18 | |
| ≥1E+06 to <1E+07 | 32 | |
| ≥1E+07 to <1E+08 | 56 | |
| ≥1E+08 or greater | 100 | |

*check (✓) the WC score calculated for the pathway

**WC =** 0

**RESIDENT POPULATION THREAT SCORE:**

(Likelihood of Exposure, Question 1;
Targets = Sum of Questions 2, 3, 4, 5, 6)

$\frac{LE \times T \times WC}{82{,}500} =$ **0**

**NEARBY POPULATION THREAT SCORE:**

(Likelihood of Exposure, Question 7;
Targets = Sum of Questions 8,9)

$\frac{LE \times T \times WC}{82{,}500} =$ **0**

**SOIL EXPOSURE PATHWAY CALCULATION:**
Resident Population Threat + Nearby Population Threat =

**0**

(Maximum of 100)

Notes:

CONFIDENTIAL

## AIR MIGRATION PATHWAY

The nearest individuals to the facility are the employees on site. The residential population within 4 miles of the site is 293,537. [10]

**Table B**
**Estimated Population Within Four Miles of TRW DOT**

| Radial Distance From the Former TRW DOT Division (miles) | Estimated Population |
|---|---|
| 0.00 to 0.25 | 1,703 |
| > 0.25 to 0.50 | 4,325 |
| > 0.50 to 1.00 | 16,105 |
| > 1.00 to 2.00 | 69,993 |
| > 2.00 to 3.00 | 101,530 |
| > 3.00 to 4.00 | 99,881 |
| TOTAL | 293,537 |

References: [10]

There are no sensitive environments onsite.[1] Wetland acreage within 4 miles of the site was estimated to be approximately 125 acres. [1, 2]

There has been no previous air sampling associated with the site, nor is there any reason to suspect a release into the air pathway. The site is scored on potential target population and sensitive environments due to the presence of VOCs in the groundwater.

CONFIDENTIAL

## SI TABLE 21a: AIR PATHWAY OBSERVED RELEASE SUBSTANCES

Note: Mobility equals 1 for all observed release substances.

| Sample ID | Hazardous Substance | Substance Concentration | Bckgrd. ID. | Bckgrd. Conc. | Gaseous or Particulate | Tox. × Mob. = Tox. | References |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | Highest Value | |

Notes: Table does not apply because air samples were not collected.

## SI TABLE 21b: AIR PATHWAY ACTUAL CONTAMINATION TARGETS

Note: Convert all results and SCDM values to $\mu g/m^3$ or ppb.
If sum of percents calculated for I or J index is ≥ 100%, consider the targets as Level I; if the sum of I or J index is < 100% consider the targets as Level II.

Sample ID: Level I: Level II: Distance from Sources (mi): References:

| Hazardous Substance | Conc. ($\mu g/m^3$) | Toxicity/ Mobility | Benchmark Conc. (NAAQS or NESHAPS) | % of Benchmark | RfD (I index) | % of RfD | Cancer Risk Conc. (J index) | % of Cancer Risk Conc. |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Highest Tox./ Mobility | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Sample ID: Level I: Level II: Distance from Sources (mi): References:

| Hazardous Substance | Conc. ($\mu g/m^3$) | Toxicity/ Mobility | Benchmark Conc. (NAAQS or NESHAPS) | % of Benchmark | RfD (I index) | % of RfD | Cancer Risk Conc. (J index) | % of Cancer Risk Conc. |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | Highest Tox./ Mobility | | Highest Percent | | Sum of Percents | | Sum of Percents | |

Notes: Table does not apply because actual contamination targets were not sampled.

CONFIDENTIAL

## AIR PATHWAY WORKSHEET

| LIKELIHOOD OF RELEASE | Score | Data Type | Refs |
|---|---|---|---|
| 1. OBSERVED RELEASE: If sampling data or direct observation support a release to air, assign a score of 550. Record observed release substances on SI Table 21. | | | |
| 2. POTENTIAL TO RELEASE: If sampling data do not support a release to the air, assign a score of 500. Optionally, evaluate air migration gaseous and particulate potential to release (HRS Section 6.1.2). | 500 | | |
| **LR =** | 500 | | |

| TARGETS | Score | Data Type | Refs |
|---|---|---|---|
| 3. ACTUAL CONTAMINATION POPULATION: Determine the number of people within the target distance limit subject to exposure from a release of a hazardous substance to the air.<br><br>Level I: _____ people × 10 = _____<br>Level II: _____ people × 1 = _____ **Total =** | 0 | | |
| 4. POTENTIAL TARGET POPULATION: Determine the number of people within the target distance limit not subject to exposure from a release of a hazardous substance to the air using SI Table 22. Sum the values and multiply by 0.1. | 219 | | |
| 5. NEAREST INDIVIDUAL: Assign a score of 50 if there are any Level I targets. Assign a score of 45 if there are Level II targets but no Level I targets. If no Actual Contamination Population exists, assign the Nearest Individual score from SI Table 22. | 20 | | |
| 6. ACTUAL CONTAMINATION SENSITIVE ENVIRONMENTS: Sum the sensitive environment values (SI Table 13) and wetland acreage values (SI Table 23) for environments subject to exposure from the release of a hazardous substance to the air. | | | |
| 7. POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS: Use SI Table 24 to evaluate sensitive environments not subject to exposure from a release. | 0.66 | | |
| 8. RESOURCES: Assign a score of 5 if one or more air resources applies within ½ mile of a source; assign a 0 if none applies<br>• Commercial agriculture<br>• Commercial silviculture<br>• Major or designated recreation area | 5 | | |
| **Sum of Targets T =** | 245 | | |

| Sensitive Environment Type | Value |
|---|---|
| | |
| | |
| **Wetland Acreage** | **Value** |
| | |
| | |

Notes:

CONFIDENTIAL

# A1 ATHWAY WORKSHEET (Concluded)

| WASTE CHARACTERISTICS | | Score |
|---|---|---|
| 9. | If any Actual Contamination Targets exist for the air pathway, assign the calculated hazardous waste quantity score or a score of 100, whichever is greater; if there are no Actual Contamination Targets for the air pathway, assign the calculated HWQ score for sources available for air migration. | 10 |
| 10. | Assign the highest air toxicity/mobility value from SI Table 21a or SI Table 3. | |

| | | | |
|---|---|---|---|
| Substance(s): | Vinyl Chloride | T-1,2-DCE | Trichloroethylene |
| Value: | 10,000 | 100 | 10 |
| From Table: | SI Table 3 | SI Table 3 | SI Table 3 |

11. Multiply the toxicity and hazardous waste quantity scores. Assign the Waste Characteristics score from the table below:

| Product | WC Score | * |
|---|---|---|
| 0 | 0 | |
| >0 to <10 | 1 | |
| ≥10 to <100 | 2 | |
| ≥100 to <1,000 | 3 | |
| ≥1,000 to <10,000 | 6 | |
| ≥10,000 to <1E+05 | 10 | |
| ≥1E+05 to <1E+06 | 18 | ✓ |
| ≥1E+06 to <1E+07 | 32 | |
| ≥1E+07 to <1E+08 | 56 | |
| ≥1E+08 or greater | 100 | |

*check (✓) the WC score calculated for the pathway

WC = 10

Multiply LR by T and by WC. Divide the product by 82,500 to obtain the air migration pathway score. If the pathway score is greater than 100, assign 100.

**AIR MIGRATION PATHWAY CALCULATION:**

$$\frac{LE \times T \times WC}{82{,}500} = \mathbf{26.7}$$

(Maximum of 100)

Notes: 500 x 245 x 18 / 82,500 = 26.7

CONFIDENTIAL

## SI TABLE 22 (FROM HRS TABLE 6-17): VALUES FOR POTENTIAL CONTAMINATION AIR TARGET POPULATIONS

| Distance From Site | Pop. | Nearest Individual (choose highest) | NUMBER OF PEOPLE WITHIN THE DISTANCE CATEGORY | | | | | | | | | | | | Pop. Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 to 10 | 11 to 30 | 31 to 100 | 101 to 300 | 301 to 1000 | 1001 to 3000 | 3001 to 10,000 | 10,001 to 30,000 | 30,001 to 100,000 | 100,001 to 300,000 | 300,001 to 1,000,000 | 1,000,000 to 3,000,000 | |
| On a source | 360 | 20 | 4 | 17 | 53 | 164 | **522** | 1,633 | 5,214 | 16,325 | 52,137 | 163,246 | 521,360 | 1,632,455 | 522 |
| 0 to 1/4 mile | 1,703 | * | 1 | 4 | 13 | 41 | 131 | **408** | 1,304 | 4,081 | 13,034 | 40,812 | 130,340 | 408,114 | 408 |
| > 1/4 to ½ mile | 4,325 | 2 | 0.2 | 0.9 | 3 | 9 | 28 | 88 | **282** | 882 | 2,815 | 8,815 | 28,153 | 88,153 | 282 |
| > ½ to 1 mile | 16,105 | 1 | 0.06 | 0.3 | 0.9 | 3 | 8 | 26 | 83 | **261** | 834 | 2,612 | 8,342 | 26,119 | 261 |
| > 1 to 2 miles | 69,993 | 0 | 0.02 | 0.09 | 0.3 | 0.8 | 3 | 8 | 27 | 83 | **266** | 833 | 2,659 | 8,326 | 266 |
| > 2 to 3 miles | 101,530 | 0 | 0.009 | 0.04 | 0.1 | 0.4 | 1 | 4 | 12 | 38 | 120 | **375** | 1,199 | 3,755 | 375 |
| > 3 to 4 miles | 99,881 | 0 | 0.005 | 0.02 | 0.07 | 0.2 | 0.7 | 2 | 7 | 28 | **73** | 229 | 730 | 2,285 | 73 |
| **Nearest Individual =** | | 20 | | | | | | | | | | | | **Sum =** | 2,187 |

*Score = 20 if the Nearest Individual is within 1/8 mile of a source; score = 7 if the Nearest Individual is between 1/8 and 1/4 mile of a source.

References: [10]
Notes: The 360 workers onsite are considered the population on a source.

CONFIDENTIAL

## SI TABLE 23 (HRS TABLE 6-18): AIR PATHWAY VALUES FOR WETLAND AREA

| * | WETLAND AREA | ASSIGNED VALUE |
|---|---|---|
| | < 1 acre | 0 |
| | 1 to 50 acres | 25 |
| ✓ | > 50 to 100 acres | 75 |
| | > 100 to 150 acres | 125 |
| | > 150 to 200 acres | 175 |
| | > 200 to 300 acres | 250 |
| | > 300 to 400 acres | 350 |
| | > 400 to 500 acres | 450 |
| | > 500 acres | 500 |

* Check (✓) highest value.

## SI TABLE 24: DISTANCE WEIGHTS AND CALCULATIONS FOR AIR PATHWAY POTENTIAL CONTAMINATION SENSITIVE ENVIRONMENTS

| DISTANCE | DISTANCE WEIGHT | SENSITIVE ENVIRONMENT TYPE AND VALUE (FROM SI TABLES 13 AND 23) | PRODUCT |
|---|---|---|---|
| On a Source | 0.10 | × 0 (wetlands) | 0 |
| | | × | |
| 0 to 1/4 mile | 0.025 | × 25 (wetlands - 5 acres) | 0.625 |
| | | × | |
| | | × | |
| 1/4 to ½ mile | 0.0054 | × 0 | 0 |
| | | × | |
| | | × | |
| ½ to 1 mile | 0.0016 | × 0 | 0 |
| | | × | |
| | | × | |
| 1 to 2 miles | 0.0005 | × 25 (wetlands - 25 acres) | 0.0125 |
| | | × | |
| | | × | |
| 2 to 3 miles | 0.00023 | × 75 (wetlands - 55 acres) | 0.01725 |
| | | × | |
| | | × | |
| 3 to 4 miles | 0.00014 | × 25 (wetlands - 45 acres) | 0.0035 |
| | | × | |
| | | × | |
| > 4 miles | 0 | × | |
| | | **Total Environments Score =** | 0.66 |

Notes:

CONFIDENTIAL

| SITE SCORE CALCULATION | S | $S^2$ |
|---|---|---|
| GROUND WATER PATHWAY SCORE ($S_{GW}$) | 1.3 | 1.69 |
| SURFACE WATER PATHWAY SCORE ($S_{SW}$) | 1.55 | 2.4 |
| SOIL EXPOSURE PATHWAY SCORE($S_{SE}$) | 0 | 0 |
| AIR PATHWAY SCORE ($S_A$) | 26.7 | 712.89 |
| SITE SCORE $\sqrt{\frac{S_{GW}^2 + S_{SW}^2 + S_{SE}^2 + S_A^2}{4}} =$ | | **13.4** |

COMMENTS:

Per EPA's request an alternative scenario was calculated using HWQ = 100.

Groundwater Pathway -- 550 x 11 x 32 / 82,500 = 2.35, $2.35^2 = 5.52$

Surface Water Pathway

DW -- 500 x 5 x 32 / 82,500 = 0.97

HFC -- 500 x 0 x 180 / 82,500 = 0

E -- 500 x 3 x 100 / 82,500 = 1.82

2.79, $2.79^2 = 7.78$

Soil Exposure Pathway -- 0

Air Pathway -- 500 x 245 x 32 / 82,500 = 47.52, $47.52^2 = 2,258.15$

The square root of $\frac{5.52 + 7.78 + 0 + 2,258.15}{4}$ = **23.8**

WARNING!!
EPA has determined that the HRS score of any site that is progressing towards listing on the NPL is confidential. Deliberations regarding scoring or listing issues, the site specific status, and HRS scores cannot be released or discussed with non-Agency persons. For additional guidance see the April 30, 1993 OSWER Directive 9320.1-11.

CONFIDENTIAL

## REFERENCES


[1] United States Geologic Survey. Boston North (1985) and Boston South (1987), Massachusetts 7.5 Minute Series topographic map.

[2] TRC Companies, Inc. Preliminary Assessment - Ucinite Corp./ DOT Corp. March 1993.

[3] Massachusetts Department of Environmental Quality Engineering. Site Investigation - TRW Facility. August 27, 1984.

[4] Stone & Webster Environmental Technology & Services. Former TRW DOT Division Site Reconnaissance Notes. August 11, 1997.

[5] Camp Dresser & McKee, Inc. Fax transmittal to Steve Johnson - Department of Environmental Quality Engineering from Rick Hughto re: TRW Site History. August 3, 1984.

[6] Zecco, Inc. Letter to Joseph Corbo - Matritech re: The Decontamination of Approximately Twenty-two Laboratory Sinks and One Water Neutralization Tank Located at Matritech, 330 Nevada Street, Newton, MA 02160. April 26, 1996.

[7] New England DataMap Technology Corp. Environmental FirstSearch Report for 320/330 Nevada Street, Newton, MA 02160. May 2, 1997.

[8] Camp Dresser & McKee, Inc. Letter to Ms. Laurie Burt, Esq. - Foley Hoag & Eliot and Mr. Robert A. Fishman, Esq. - Nutter McLennen & Fish from Richard J. Hughto re: Laboratory Analysis of Field Studies at the TRW Facility in Newton, MA. August 13, 1984.

[9] National Oceanic and Atmospheric Administration. Local Climatological Data - Annual Summaries for 1991 - Part I Eastern Region. 1991.

[10] Frost Associates. CENTRACTS report for the Former TRW DOT, Newton, MA. May 7, 1997.

[11] Massachusetts Department of Environmental Protection. Massachusetts Public Water Supply Database. June, 1995.

[12] Stone & Webster Environmental Technology & Services. Telephone Conversation between Lisa White and Barbara Stevens - Newton Water Department. June 18, 1997.

[13] Stone & Webster Environmental Technology & Services. Telephone Conversation between Lisa White and Watertown Water Department. June 18, 1997.


CONFIDENTIAL

[14] Stone & Webster Environmental Technology & Services. Telephone Conversation between Lisa White and Waltham Water Department. June 18, 1997.

[15] Stone & Webster Environmental Technology & Services. Telephone Conversation between Lisa White and Belmont Water Department. June 18, 1997.

[16] Stone & Webster Environmental Technology & Services. Telephone Conversation between Lisa White and Frank McLaughlin - Boston Water & Sewer. April 28, 1997.

[17] United States Geologic Survey Web Page. www.usgs.com. 804 National Center, Reston, VA 20192. Last modified July 7, 1997.

[18] Camp Dresser & McKee. Certificate of Laboratory Analysis and Laboratory Analysis to Richard J. Hughto from Alexander W. Schuthesis and Ralph J. Tella. July 27, 1984.

[19] Federal Emergency Management Agency. Flood Insurance Rate Map - City of Newton, MA Middlesex County - Panel 2 of 5. July 17, 1986.

[20] Stone & Webster Environmental Technology & Services. Telephone Conversation between Lisa White and Joseph Biotti. March 3, 1998.

CONFIDENTIAL