

**Site Investigation Report Addendum (2)**  
**Town of Tiverton**  
**Tiverton, Rhode Island**

*Prepared for*

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## 1. INTRODUCTION

This Site Investigation Report (SIR) Addendum (2) has been prepared in accordance with Section 7.0 of the Rhode Island Department of Environmental Management (RIDEM) “Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases,” or “Remediation Regulations” (March 1993, amended August 1996). EA Engineering, Science, and Technology, Inc. (EA) has prepared this addendum on behalf of the Town of Tiverton, Rhode Island to supplement the SIR prepared by EA in March 2003 and the SIR Addendum prepared by EA in October 2003. The purpose of this site investigation is to further investigate the extent of soil contamination discovered during the Site Investigation conducted over the period of October 2002 – October 2003. This phase of an ongoing investigation has two objectives: to determine whether or not contamination exists beneath portions of Lepes Road, Church Street, Borden Street, Sission Avenue, and Judson Street, all Town of Tiverton-owned roadways included in a moratorium prohibiting excavations, and to complete follow-up surface soil sampling at the previously investigated Bay View Recreation Area (Plat 8-6, Block 3, Lot 2), a town-owned property on Hooper Road.

Figure 1 is a site locus for the study area. Figure 2 is a site plan showing all boring locations in the Bay View Recreation Area. Figure 3 is a detailed site plan including all roadway soil boring locations. Appendix A includes the Certificates of Analysis for the Bay View Recreation Area. Appendix B contains the soil boring logs for the roadway borings. Appendix C contains the Certificates of Analysis from the roadway borings. The Soil Management Plan for the area is included as Appendix D.

## 2. DESCRIPTION OF RELEASE, SITE CONDITIONS, AND RECEPTORS

A description of the release, site conditions, and surrounding receptors is provided below.

### 2.1 SITE DESCRIPTION

The study area is an approximately 46-acre parcel located within 0.25 mi of the Sakonnet River/Mount Hope Bay in Tiverton, Rhode Island. Topography is characterized by a steep slope towards the west, flattening out towards the shore. There are no significant surface water bodies located within the study area, although there is a stream draining to Hooper Street from the east. Locations of subsurface investigation included the Bay View Recreation Area and the following Town of Tiverton public roadways: Judson Street, Church Street, Borden Street, Sission Avenue, and Lepes Road.

Surrounding land usage is predominantly residential, with commercial/residential usage to the north at Bay Street and State Avenue and to the east along Main Road. Commercial businesses in this area include a fuel terminal and fuel distribution company. The Fall River Wastewater Treatment Facility is located less than 0.25 mi to the north on Bay Street. Inactive, former Conrail tracks run north-south along the entire length of the study area, approximately 50 ft to the west of Bay Street.

The depth to groundwater was found to be variable over the site. The direction of groundwater flow is assumed to be west by northwest based upon surface topography. No barriers to groundwater flow are known at the site. Soil at the site is characterized as urban fill overlying coastal sand deposits. Merrimac-Urban land complex and Udorthents-Urban land complex cover the site area, but the study area was expected to contain more urban fill, as all boring locations, with the exception of the Bay View Recreation Area, were on paved roadways. Bedrock at the site is characterized as Sachuest Arkose, a sandstone and conglomerate interbedded with phyllite.

### 2.2 SITE HISTORY

Information was gathered regarding the site history during a review of historical aerial photographs from 1939 to 1995 at the Rhode Island Statewide Planning Office. Land use in the area of Bay Street in North Tiverton was primarily agricultural in 1939, and residential development was already in place along Bay Street and its side streets, including those investigated during this site investigation phase. The Bay View Primary School was present at this time in the current Bay View Recreation Area lot. The school was reportedly destroyed by fire in the late 1960s, a fact that is supported by its presence on the 1962 aerial photograph and absence on the 1972 aerial photograph. By 1972, the land use had switched to predominantly residential, with the exception of land along Judson Street that remained open space, developed only with paths at this time. These lots were not developed until the 1992 aerial photograph, when the Bay View Recreation Area was also present, with the current basketball court and baseball diamond visible.

Of the roads included in this phase of the site investigation, only Judson Street was present as a paved road in the 1951 aerial photograph. By 1962, Church Street, Borden Street, Sission Avenue, and the eastern portion of Lepes Road (to approximately 200 ft west of Sission Avenue) were paved and developed roadways. Lepes Road was developed gradually from the 1962 to 1981 aerial photographs, and was completely paved and developed with residential lots by the 1992 aerial photograph.

### **2.3 SURROUNDING RECEPTORS**

The study area is bounded to the north by residential/commercial development, including the Fall River Wastewater Treatment Facility, to the east of residential development and commercial development along Main Road, to the south by an area by residential development, and to the west by the Rhode Island Department of Transportation Rail right-of-way, followed by undeveloped land and the Mount Hope Bay/Sakonnet River. Between Judson Street and Lepes Road is an undeveloped parcel of land. Although area groundwater is zoned as GA/GAA, defined as suitable for use as drinking water without treatment, all residences in the immediate vicinity of the site are served by Town water. There are no Wellhead Protection Areas located within 500 ft of the site.

### **2.4 DESCRIPTION OF RELEASE**

During excavation of soils along Bay Street in August 2002 for the Mount Hope Bay Sewer Interceptor Project, contamination was discovered in the form of petroleum-impacted soils. The odor of petroleum and a sheen on groundwater were observed. Soils from this area were designated as unsuitable for backfill due to structural concerns and were transported to two temporary staging areas on Kaufman and Last Streets. A Notification of Release for these locations was filed with RIDEM on 2 October 2002, and an Emergency and Short-Term Response Action was completed to address these releases from September through November 2002.

A site investigation was conducted by EA between October 2002 and February 2003. The first stage of this investigation, in October 2002, was to install soil borings along the proposed path of the Mount Hope Bay Sewer Interceptor Project along Bay Street and Foote Street. Borings were also installed at 100 and 200 ft from the Bay Street intersection and Judson, Hooper, Canonicus, and Hilton Streets and Chace Avenue. This round of subsurface investigation discovered semivolatile organic compounds (SVOCs), particularly polycyclic aromatic hydrocarbons (PAHs), and cyanide at levels exceeding both the RIDEM Residential and Industrial/Commercial Direct Exposure Criteria (RDEC and I/CDEC). The RIDEM RDEC and I/CDEC were exceeded at Judson-2, Bay-5, and Hilton-1 for several analytes. Figure 3 identifies all the subsurface investigation locations on the roadways.

A follow-up phase of the Site Investigation was conducted in November 2002 to try to locate the eastern extent of the subsurface contamination on Judson and Hilton Streets, as well as to investigate Chace Avenue, for which utilities were not marked for the first phase of the investigation. Three borings were advanced on Chace Avenue at 100-ft intervals from the

Bay Street intersection. The first two soil borings, at 100 ft and 200 ft east of the Bay Street/Chace Avenue intersection, indicated the presence of contamination through screening results, and a soil sample from the third soil boring, 300 ft east of the Bay Street/Chace Avenue intersection, was sent for laboratory analysis. No exceedances of the RIDEM RDEC were detected at Chace-3. Although no visual or olfactory evidence of contamination was observed at Hilton-2 (100 ft east of Hilton-1 from the previous phase), the RDEC was exceeded in soils at this location for benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene, all PAHs. Judson-8, advanced a total of 600 ft east of Judson-2, contained concentrations of benzo(a)pyrene and chrysene exceeding the RIDEM RDEC.

In December 2002, the site investigation was expanded to include the areas east of Hilton-2 and Judson-8 to find the extent of the contaminated material. Judson-9, 100 ft east of Judson-8, did not contain any analytes at concentrations exceeding the RIDEM RDEC. Borings were advanced east on Hilton Street and the soil screening results indicated the presence of the fill material extending to the intersection of Bottom Street. A soil sample collected from Hilton-7 contained benzo(a)pyrene at a concentration just exceeding the RIDEM RDEC, at 0.405 parts per million. However, visual evidence suggested a thinning of this layer as the investigation continued in a easterly direction.

Since the submittal of the SIR in March 2003, anecdotal evidence has been found to link this contamination to historic dumping of manufactured gas plant waste material by the former Fall River Gas Company. Chemical profiles of the contaminated soil and organic material are consistent with this suspected source. Extensive filling reportedly occurred when the Town of Tiverton established the easternmost reaches of Judson Street, in the area of the Bay Street/Judson Street intersection. The Bay View Primary School was located on the current Bay View Recreation Area from prior to 1939 until it was destroyed by fire in the late 1960s. Some material found in soil borings at the recreation area are consistent with debris from this building.

The Site Investigation conducted by EA discovered soil contamination under Town of Tiverton-owned roadways above RIDEM Industrial/Commercial Direct Exposure Criteria (I/C DEC) for total cyanide and PAHs. In some locations, particularly along Judson Street, a layer of highly contaminated wood mulch was observed in the soil borings. Follow-up investigations discovered contaminated soils at Bottom Street, A Connell Street, State Avenue, Chace Avenue, and Canonicus Street. In response to soil analyses conducted by EA, the Town of Tiverton established a moratorium on excavation soil activities extending from State Avenue to Lepes Road, and from Bay Street to Church Street. This phase of the site investigation addresses the southern extent of the area included in the excavation activity moratorium.

### 3. INVESTIGATION GOALS

This investigation was conducted on Town of Tiverton property to assess the impacts to their property as well as potential impact to private property. Based upon the results of the prior SIR Addendum, a moratorium was established prohibiting any soil excavations (except those done on an emergency response basis) in the area south of State Avenue to Lepes Road and east from Bay Street to Church Street. At the conclusion of this site investigation phase, all Town-owned property included in this moratorium will have been investigated.

This investigation also completed surface soil sampling in the Bay View Recreation Area. Arsenic in particular has been discovered within soils on this property, and further investigation has provided adequate sampling coverage to determine whether the site is in compliance with RIDEM standards and, therefore, safe for recreational use.

## 4. SUBSURFACE INVESTIGATION

### 4.1 BAY VIEW RECREATION AREA

#### 4.1.1 29 and 30 April 2003 Soil Sampling

In April 2003, a subsurface investigation of the Bay View Recreation Area was conducted by EA. This investigation consisted of the advancement of 18 soil borings to 12 ft below ground surface using a Geoprobe. Soils were screened using a flame ionization detector, and soils exhibiting visual, olfactory, or screening indications of contamination were submitted for laboratory analysis. Three locations exhibited potential contamination based upon screening results (BVRC-5, 6, and 9) at levels below 2 ft below ground surface and were submitted for laboratory analysis. Seven surface soil samples (BVRC-1, 3, 7, 11, 14, 16, and 18) were also submitted for laboratory analysis based upon spatial coverage. Soil samples were collected in clean 8-oz glass jars and clean 40-mL vials, preserved with methanol, and all samples were kept under 4°C pending submittal to a certified analytical laboratory. The 10 soil samples were analyzed for SVOCs analysis by U.S. Environmental Protection Agency (EPA) Method 8270, Total Cyanide analysis by EPA Method 9010, Priority Pollutant (PP13) Metals by EPA Methods 6010/7471, and volatile organic compounds (VOCs) by EPA Method 8260B/5035. A trip blank was also submitted for laboratory analysis of VOCs to assess any travel-related cross contamination. The results from this first round of sampling at the Bay View Recreation Area are summarized in the table below.

**ANALYTICAL RESULTS FOR 29 AND 30 APRIL 2003 SOIL SAMPLING ACTIVITIES**

Analyte Detected (ppm)	BVRC1 (0-2 ft)	BVRC3 (0-2 ft)	BVRC5 (10-12 ft)	BVRC6 (2-4 ft)	BVRC7 (0-2 ft)	BVRC9 (5-7 ft)	BVRC11 (0-2 ft)	BVRC14 (0-2 ft)	BVRC16 (0-2 ft)	BVRC18 (0-2 ft)	RIDEM RDEC
Cyanide	ND	ND	ND	8.9	ND	ND	9.2	ND	ND	ND	200
Arsenic	2.92	4.64	2.25	4.88	3.41	2.27	6.36	4.96	<b>10.3</b>	3.88	7.0
Beryllium	0.197	0.304	0.261	<b>0.827</b>	<b>0.420</b>	0.307	<b>0.439</b>	0.321	<b>0.460</b>	0.301	0.4
Chromium	6.1	6.96	2.22	4.18	7.57	3.65	9.06	8.45	8.92	9.91	1,790
Copper	10.3	16.9	6.66	27.4	4.73	9.19	17.8	2.02	11.9	11.7	3,100
Lead	ND	84.1	11.6	<b>257</b>	ND	8.53	99	12.8	65.6	12.8	150
Mercury	ND	0.115	ND	0.343	ND	ND	1.01	0.124	0.292	0.037	23
Nickel	11.5	6.56	3.44	8.6	4.89	4.57	7.06	5.33	7.55	11.3	1,000
Zinc	23.2	190	10.2	28.1	18.9	12.4	51.4	21.6	43.7	42	6,000
2-Methylnaphthalene	ND	ND	ND	0.189J	ND	ND	ND	ND	0.069J	ND	123
Acenaphthene	ND	ND	ND	0.046J	ND	ND	ND	ND	0.025J	ND	43
Acenaphthylene	ND	ND	ND	0.179J	ND	ND	0.146J	ND	ND	0.040J	23
Anthracene	ND	ND	ND	0.385J	ND	ND	0.069J	ND	ND	ND	35
Benzo(a)anthracene	ND	0.110J	ND	<b>1.310</b>	ND	ND	0.255J	ND	0.106J	0.097J	0.9
Benzo(a)pyrene	ND	0.142J	ND	<b>1.610</b>	ND	ND	0.279J	ND	0.114J	0.131J	0.4
Benzo(b)fluoranthene	ND	0.129J	ND	<b>1.870</b>	ND	ND	0.273J	ND	0.103J	0.112J	0.9
Benzo(g,h,i)perylene	ND	0.109J	ND	<b>1.000</b>	ND	ND	0.199J	ND	0.070J	0.176J	0.8
Benzo(k)fluoranthene	ND	0.136J	ND	<b>1.200</b>	ND	ND	0.269J	ND	0.119J	ND	0.9
Chrysene	ND	0.136J	ND	<b>1.440</b>	ND	ND	0.305J	ND	0.160J	0.113J	0.4
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	ND	0.056J	ND	ND	0.031J	0.4
Fluoranthene	ND	0.203J	ND	1.390	ND	ND	0.332J	ND	0.243J	0.275J	20
Fluorene	ND	ND	ND	0.097J	ND	ND	ND	ND	ND	ND	28
Indeno(1,2,3-cd)pyrene	ND	0.093J	ND	0.885	ND	ND	0.155J	ND	0.057J	0.088J	0.9
Naphthalene	ND	ND	ND	0.256J	ND	ND	0.044J	ND	0.186J	ND	54
Phenanthrene	ND	0.069J	ND	1.360	ND	ND	0.206J	ND	0.125J	0.101J	40
Pyrene	ND	0.183J	ND	4.900	ND	ND	0.427	ND	0.217J	0.306J	12

NOTE: **Bold** indicates an exceedance of the Rhode Island Department of Environmental Management (RIDEM) Residential Direct Exposure Criteria (RDEC).  
 J = Detected below the Method Detection Limit; estimated value.  
 ND = Not detected.

**4.1.2 26 November 2003 Soil Sampling**

At the request of town residents, a second round of soil sampling was conducted at the Bay View Recreation Area on 26 November 2003. This sampling event was conducted with a hand auger and limited to the surficial 2 ft of soil across the playground. The soil samples were collected from the upper 2 ft of the soil column in close proximity to the previous boring locations. To fulfill both Remediation Regulation requirements and public safety concerns, 6 soil samples were collected from the 0-6 in. interval and 5 were collected from the 0-24 in. interval. Soil samples were collected in clean 8-oz glass jars and clean 40-mL vials preserved with methanol, and all samples were kept under 4°C pending submittal to a certified analytical laboratory. The 11 soil samples were analyzed for SVOC analysis by EPA Method 8270, Total Cyanide analysis by EPA Method 9010, Priority Pollutant (PP13) Metals by EPA Methods 6010/7471, and VOCs by EPA Method 8260B/5035. A trip blank was also submitted for laboratory analysis of VOCs to assess any contamination. The results of all detected analytes are summarized in the table below.

**ANALYTICAL RESULTS FOR 26 NOVEMBER 2003 SOIL SAMPLING ACTIVITIES**

Analyte Detected (ppm)	BVRC2 (0-24 in)	BVRC4 (0-6 in)	BVRC5 (0-6 in)	BVRC6 (0-6 in)	BVRC8 (0-6 in)	BVRC9 (0-6 in)	BVRC10 (0-24 in)	BVRC12 (0-6 in)	BVRC13 (0-24 in)	BVRC15 (0-24 in)	BVRC17 (0-24 in)	RIDEM RDEC
Arsenic	3.53	6.49	2.01	0.740	6.84	4.84	4.51	4.91	5.22	6.76	3.14	7.0
Beryllium	0.293	0.311	0.190	0.128	0.354	0.278	0.276	0.325	0.281	0.230	0.327	0.4
Chromium	8.29	10.5	48.0	48.2	8.14	22.1	7.33	7.00	7.02	6.84	8.42	1,790
Copper	7.20	9.91	34.5	25.1	8.35	14.5	4.81	10.3	6.21	10.4	2.41	3,100
Lead	14.9	37.4	16.3	7.07	28.8	27.7	18.0	54.4	29.2	24.8	11.5	150
Mercury	1.45	0.323	0.036	ND	1.97	0.282	0.161	0.219	0.185	1.64	0.088	23
Nickel	6.07	6.96	23.3	27.2	5.87	12.0	5.17	6.09	5.54	5.39	6.21	1,000
Zinc	32.4	30.1	43.8	30.4	29.8	34.5	21.0	43.2	23.5	40.2	23.3	6,000
Acenaphthylene	ND	0.022 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	23
Benzo(a)anthracene	ND	0.088 J	ND	ND	ND	0.046 J	ND	0.152 J	0.033 J	0.070 J	ND	0.9
Benzo(a)pyrene	ND	0.071 J	ND	ND	ND	0.048 J	ND	0.156 J	ND	0.071 J	ND	0.4
Benzo(b)fluoranthene	ND	0.047 J	ND	ND	ND	0.046 J	ND	0.143 J	ND	0.054 J	ND	0.9
Benzo(g,h,i)perylene	ND	ND	ND	ND	ND	ND	ND	0.100 J	ND	0.045 J	ND	0.8
Benzo(k)fluoranthene	ND	ND	ND	ND	ND	ND	ND	0.176 J	ND	ND	ND	0.9
Chrysene	ND	0.100 J	ND	ND	ND	0.053 J	ND	0.226 J	ND	0.080 J	ND	0.4
Dibenzo(a,h)anthracene	ND	ND	ND	ND	ND	0.090 J	ND	ND	ND	ND	ND	0.4
Fluoranthene	ND	0.121 J	ND	ND	ND	ND	ND	0.380 J	0.059 J	0.131 J	ND	20
Indeno(1,2,3-cd)pyrene	ND	ND	ND	ND	ND	ND	ND	0.089 J	ND	ND	ND	0.9
Phenanthrene	ND	ND	ND	ND	ND	0.041 J	ND	0.228 J	ND	0.061 J	ND	40
Pyrene	ND	0.162 J	ND	ND	ND	0.077 J	ND	0.365 J	0.051 J	0.112 J	ND	12
2-Butanone	0.191 J,B	ND	0.148 J,B	ND	0.222 J,B	0.154 J,B	ND	0.273 J,B	0.165 J	0.211 J,B	0.219 J,B	--
Tetrahydrofuran	ND	ND	ND	ND	ND	ND	ND	0.053 J,B	ND	0.039 J,B	ND	--

NOTE: B = Analyte also present in Trip Blank.  
J = Detected below the Method Detection Limit; estimated value.  
ND = Not detected.  
-- = No standard established for this analyte.

No analytes were detected in the second round of sampling at levels exceeding the RIDEM RDEC. Total cyanide was not detected in any of these samples. Complete Certificates of Analysis for the 26 November 2003 Bay View Recreation Area soil samples are included as Appendix A.

#### 4.2 ROADWAY INVESTIGATION – 21 and 24 NOVEMBER 2003

On 21 and 24 November 2003, an additional roadway investigation was performed on the following streets: Judson Street (between the Bay View Recreation Area and Church Street), Church Street, Borden Street, Sission Avenue, and Lepes Road. Prior to the subsurface investigation, all locations were cleared for utilities by calling DigSafe. Judson Street had previously been investigated with soil borings at the Bay Street (western) end during the prior phase of this site investigation, and this phase extended boring installations from approximately 1,000 ft east of the Bay/Judson Street intersection east to the intersection of Church/Judson Street.

Soil borings were advanced in the center of the roadways to 8 ft below ground surface using a truck-mounted Geoprobe 5400. Locations were established every 100 ft in order to provide a consistent means of coverage throughout the area. Soils were logged and screened in 4-ft long,

2-in. diameter acetate sleeves using visual/olfactory observations and a flame ionization detector. Boring logs are included as Appendix B.

A soil sample was submitted for total arsenic/lead analysis for every 200 ft. A total of 20 soil samples were submitted for As/Pb analysis by EPA Method 6010. The results of the As/Pb analyses are summarized in the table below.

**ROADWAY SOIL BORING ARSENIC/LEAD ANALYTICAL RESULTS  
21 AND 24 NOVEMBER 2003**

Concentration (ppm)	Judson 12	Judson 14	Church 1	Church 3	Church 5	Church 7	Borden 1	Sission 2	Lepes 1	RIDEM RDEC	RIDEM I/CDEC
Arsenic	<b>7.97</b>	2.13	2.34	3.46	1.61	3.05	3.10	1.46	3.96	7.0	7.0
Lead	<b>539</b>	15.7	22.0	21.0	10.7	8.91	ND	7.04	6.55	150	500

Concentration (ppm)	Lepes 3	Lepes 5	Lepes 7	Lepes 9	Lepes 11	Lepes 13	Lepes 15	Lepes 17	Lepes 19	RIDEM RDEC	RIDEM I/CDEC
Arsenic	3.53	3.08	2.28	3.48	2.16	1.71	2.14	2.24	1.71	7.0	7.0
Lead	7.63	9.41	6.34	10.3	7.88	10.1	8.85	9.68	9.91	150	500

Note: ppm = Parts per million.

**Bold** indicates an exceedance of the RIDEM RDEC.

*Italics* indicate an exceedance of the RIDEM I/CDEC.

ND = Not detected.

The only location in which soils below the roadway exceeded the applicable RIDEM criteria was Judson-12, where both arsenic and lead exceeded both the RIDEM RDEC and I/CDEC.

During the inspection of the soils, if any anomalous observations were noted, such as odor, a soil sample was submitted for PAH analysis by EPA Method 8270C. A total of 3 soil samples (Judson-15, Church-8, and Sission-1) were submitted for PAH analysis based on field observations. Odors were noted in each of these 3 soil samples, although screening results did not indicate the presence of contamination. These odors were not considered to indicate the levels of contamination detected in earlier site investigation activities. Soil samples were collected in clean 8-oz glass jars. The concentrations of detected analytes are summarized in the table below.

**ROADWAY SOIL BORING PAH ANALYTICAL RESULTS  
21 AND 24 NOVEMBER 2003**

Analyte Detected (ppm)	Judson-15	Church-8	Sission-1	RIDEM RDEC	RIDEM I/CDEC
Benzo(a)anthracene	0.048	0.345	ND	0.9	7.8
Benzo(b)fluoranthene	0.100	ND	ND	0.9	7.8
Benzo(g,h,i)perylene	0.081	ND	ND	0.8	10,000
Benzo(k)fluoranthene	0.086	ND	ND	0.9	78
Chrysene	0.160	<b>1.040</b>	0.292	0.4	780
Fluoranthene	0.094	ND	ND	20	10,000
Indeno(1,2,3-cd)pyrene	0.066	ND	ND	0.9	7.8
Pyrene	0.134	1.200	0.178	13	10,000

Note: **Bold** indicates an exceedance of the RIDEM RDEC.

ND = Not detected.

ppm = Parts per million.

The only RIDEM exceedance from the roadway PAH samples was a chrysene level above the RDEC at Church-8. This soil is isolated from direct contact by approximately 4-in of asphalt. Complete Certificates of Analysis for the roadway soils are included as Appendix C.

## 5. REMEDIAL ALTERNATIVES

To address the contamination identified on Town of Tiverton-owned land, EA is proposing two remedial alternatives. Based on the results of the previously conducted Site Investigation and this Site Investigation Addendum, two remedial alternatives are presented for further consideration for the Town of Tiverton property in and around Bay Street:

1. Excavation and disposal of impacted soil
2. An Environmental Land Usage Restriction (ELUR). Further discussion is presented to better define the requirements and effectiveness of the proposed remedial alternatives.

The following criteria were incorporated into the evaluation of remedial alternatives for the site:

- Ability to prevent the exposure of residents and site workers to contaminated soil
- Ability to remediate soil to RIDEM RDEC standards
- Cost-effectiveness
- Time efficiency (schedule concerns related to the everyday use of the property as public roadways and the concentration of nearby residences).

### **Remedial Alternative No. 1: Removal Action**

One alternative to address this contamination would be to establish clearly defined extents of contamination and initiate a removal action to excavate all soils contaminated above the applicable RIDEM direct exposure criteria. Soil would be screened and submitted to a certified analytical laboratory for confirmatory analysis to ensure that all contaminated material had been removed. This would eliminate all possibility of risk to residents or workers in the area. Following removal, soil would be transported to a licensed facility for disposal. The timeframe of this alternative would be the several months necessary to remove all of the contaminated material. However, this option would require no further action following the removal.

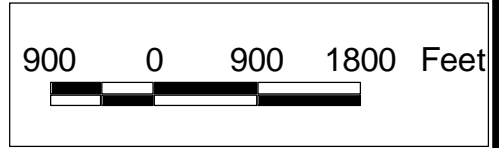
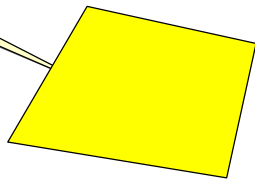
It is important to note that the contamination beneath the Town-owned roadways poses no risk to residents when the integrity of the paving is intact. This impermeable layer prevents risks of direct exposure to soils by site residents while also preventing the migration of this contamination by runoff, infiltration, or wind transport. Therefore, although the soil exceeds RIDEM direct exposure criteria for several analytes, the presence of 0.3–1.0 ft of asphalt over these soils has prevented the possibility of exposure. No residents in the immediate vicinity of or downgradient from this contaminated soil are served by private drinking water wells. All potable water to residents in the area is supplied by the Town of Tiverton. A removal action would, in fact, increase exposure to residents and workers to the material through working conditions and potential wind-borne contaminants.

**Remedial Alternative No. 2: Environmental Land Usage Restriction**

Another alternative to address the contamination found beneath the Town-owned roadways would be to establish an ELUR for the entire area between Judson Street and State Avenue, and between Bay Street and Bottom Street. This would involve establishing guidelines on any future intrusive activities within the range of contaminated material, such as those found in the attached Soil Management Plan (Appendix D). Such guidelines would include a requirement for air monitoring during excavations and the segregation of any contaminated soil from clean material in cases where the material cannot be used as backfill. Guidelines would also require replacement of the asphalt over the roadway that is acting as a cap to prevent exposure to the soil. This ELUR would be recorded in the land evidence records of the Town of Tiverton.

No decisions regarding the ultimate remedy will be made until the Southern Union-sponsored site investigations of privately-owned property has been completed.

SITE LOCATION



TOWN OF TIVERTON SITE INVESTIGATION REPORT  
TIVERTON, RHODE ISLAND

FIGURE 1  
SITE LOCATION MAP

PROJECT MGR TR	DESIGNED BY DC	DRAWN BY DC	CHECKED BY JP	SCALE AS SHOWN	DATE JAN 2004	PROJECT NO. 1407001	FILE NO. I:\TIV.APR
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