

# Five-Year Review Report

Fourth Five-Year Review  
for  
Old Springfield Landfill Superfund Site  
Springfield, Vermont

August 2013

Prepared by:

The United States Environmental Protection Agency  
Region 1, New England  
Boston, Massachusetts



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*Nancy Barnhart for 08/01/13*

James T. Owens, Director  
Office of Site Remediation and Restoration  
U.S. EPA, New England

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- 1 Site Location Maps
- 2 Town of Springfield Maps
- 3 Institutional Controls
- 4 List of Documents Reviewed
- 5 Five-Year Review Inspection Checklist and Interview Records
- 6 Site Photos from the Five-Year Review Inspection

## ACRONYMS

1,1-DCA	1,1-Dichloroethane
1,1-DCE	1,1-Dichloroethene
1,2-DCE	1,2-Dichloroethene
AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirement
AWQC	Ambient Water Quality Criteria
CAA	Clean Air Act
CC	Construction complete
CD	Consent Decree
COC	Contaminant of Concern
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CSFs	cancer slope factors
CWA	Clean Water Act
EPA	Environmental Protection Agency
FS	Feasibility Study
FYR	Five Year Review
GAC	granular activated carbon
gpm	gallons per minute
HAAS	Vermont Hazardous Ambient Air Standard
IC	Institutional control
IRIS	Integrated Risk Information System
LTMP	Long-term Monitoring Plan
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
mg/kg	milligrams per kilogram
NRWQC	National Recommended Water Quality Criteria
Nobis	Nobis Engineering, Inc.
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
O&F	Operational and functional
O&M	Operations and Maintenance
OSHA	Occupational Safety and Health Administration
OSWER	Office of Solid Waste and Emergency Response
OU	Operable Unit

PAHs	Polycyclic aromatic hydrocarbons
PCBs	Polychlorinated biphenyls
PCE	Tetrachloroethene
PCOR	Preliminary Close-Out Report
POTW	Public-owned treatment works
PRP	Potentially Responsible Party
PTF	a pre-treatment facility
RA	Remedial Action
RAC	Remedial Action Contract
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RfDs	Risk Reference Doses
RI/FS	Remedial Investigation/Feasibility study
ROD	Record of Decision
RP	Responsible Party
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
Site	Old Springfield Landfill Superfund Site
SVOC	Semi-volatile organic compounds
TAL	Target analyte list
TBCs	To-Be-Considered Requirements
TCA	1,1,1-Trichloroethane
TCE	Trichloroethene
TLVs	Threshold Limit Values
UU/UE	Unlimited use or unrestricted exposure
µg/L	micrograms per liter
VI	Vapor Intrusion
VOC	Volatile organic compound
VT DEC	Vermont Department of Environmental Conservation
VT DOH	Vermont Department of Health
VT GES	Vermont Groundwater Enforcement Standards

## EXECUTIVE SUMMARY

### Summary

This is the fourth Five-Year Review for the Old Springfield Landfill Superfund Site (the "Site"). The triggering action for this review was the completion of the third Five-Year Review dated September 2008. This Five-Year Review is required because hazardous contamination remains at the Site above levels that allow for unlimited use and unrestricted exposure.

The remedies for the two OUs at the Old Springfield Landfill in Springfield, Vermont include stabilization and capping of contaminated soils on-site; a leachate and groundwater collection system; on-site pre-treatment of contaminated groundwater and leachate; gas collection vents; and institutional controls to prevent use of groundwater and restrict access to the Site. The Site achieved construction completion with the signing of the Preliminary Close-Out Report on September 22, 1994. The assessment in this Five-Year Review confirms that the remedy was constructed in accordance with the requirements of the OU I and OU II Records of Decision (RODs). The remedy is functioning as designed.

As part of this fourth Five-Year Review, EPA identified a new/emerging issue for consideration. The remedy selected in the RODs for the Site did not address potential vapor intrusion risks. EPA's review of current and historic Site data indicate the potential for a vapor intrusion pathway outside of Site boundaries. As a result, this Five-Year Review recommends additional evaluation to determine if there is a potential vapor intrusion pathway that may pose unacceptable risks to human health.

### Five-Year Review Protectiveness Statement:

A protectiveness determination for the remedy cannot be made until further information is obtained regarding a potential vapor intrusion pathway at the Site. An evaluation of this exposure pathway will be conducted to determine if it may pose an unacceptable human health risk at the Site. It is anticipated that these actions will take approximately two years to complete, at which time a protectiveness determination will be made.

## Five-Year Review Summary Form

SITE IDENTIFICATION				
<b>Site Name:</b> Old Springfield Superfund Site				
<b>EPA ID:</b> VTD00086239				
<b>Region:</b> 1	<b>State:</b> VT	<b>City/County:</b> Springfield/Windsor		
SITE STATUS				
<b>NPL Status:</b> Final				
<b>Multiple OUs?</b> Yes	<b>Has the site achieved construction completion?</b> Yes			
REVIEW STATUS				
<b>Lead agency:</b> EPA				
<b>Author name (Federal or State Project Manager):</b> Leslie McVickar				
<b>Author affiliation:</b> Remedial Project Manager				
<b>Review period:</b> 10/01/2008 – 09/30/2013				
<b>Date of site inspection:</b> April 11, 2013				
<b>Type of review:</b> Statutory				
<b>Review number:</b> 4				
<b>Triggering action date:</b> 09/30/2008				
<b>Due date (five years after triggering action date):</b> 09/30/2018				
ISSUES/RECOMMENDATIONS				
<b>There are two OUs at the site with five issues which need to be addressed.</b>				
<b>Issues and Recommendations Identified in the Five-Year Review:</b>				
<b>OU: 1&amp;2</b>	<b>Issue Category: Monitoring</b>			
	<b>Issue:</b> Components of the remedy requiring repair were identified by EPA and were not implemented in a timely manner.			
	<b>Recommendation:</b> Implement repairs as needed to maintain the protectiveness of the remedy, but not longer than one year following identification.			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
No	Yes	PRP	EPA/State	As Needed

### Five-Year Review Summary Form (cont.)

Issues/Recommendations (cont.)				
<b>There are two OUs at the site with five issues which need to be addressed.</b>				
<b>Issues and Recommendations Identified in the Five-Year Review:</b>				
<b>OU: 1&amp;2</b>	<b>Issue Category: Monitoring</b>			
	<b>Issue:</b> Annual long-term monitoring reports were not prepared and submitted in a timely manner.			
	<b>Recommendation:</b> Resume annual submission of O&M reports.			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
No	No	PRP	EPA/State	March 30 of each year
<b>OU: 1&amp;2</b>	<b>Issue Category: Monitoring</b>			
	<b>Issue:</b> Locks on wells used for long-term monitoring of groundwater were found missing or broken.			
	<b>Recommendation:</b> Replace locks on wells.			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
No	No	PRP	EPA/State	06/30/2014
<b>OU: 1&amp;2</b>	<b>Issue Category: Monitoring</b>			
	<b>Issue:</b> Gas vent air samples were collected from the influent of the carbon treatment canisters instead of the effluent as required.			
	<b>Recommendation:</b> Modify sampling ports as needed and collect samples from the effluent.			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
No	No	PRP	EPA/State	06/30/2014
<b>OU: 1&amp;2</b>	<b>Issue Category: Risk Assessment</b>			
	<b>Issue:</b> The vapor intrusion exposure pathway has not been evaluated.			
	<b>Recommendation:</b> Perform a vapor intrusion evaluation to determine the appropriate response measures, if warranted by the data.			
<b>Affect Current Protectiveness</b>	<b>Affect Future Protectiveness</b>	<b>Implementing Party</b>	<b>Oversight Party</b>	<b>Milestone Date</b>
Yes	Yes	PRP	EPA/State	09/30/2015

**Five-Year Review Summary Form (cont.)**

**Sitewide Protectiveness Statement**

Protectiveness Determination:  
Protectiveness Deferred

July 2013

*Protectiveness Statement:*

A protectiveness determination for the remedy cannot be made until further information is obtained regarding a potential vapor intrusion pathway at the Site. An evaluation of this exposure pathway will be conducted to determine if it may pose an unacceptable human health risk at the Site. It is anticipated that this action will take approximately two years to complete, at which time a protectiveness determination will be made.

## 1.0 INTRODUCTION

EPA conducted a Five-Year Review (FYR) of the Old Springfield Landfill Superfund Site (the Site). The purpose of the FYR is to determine whether the remedy selected for the Site remains protective of human health and the environment. This report summarizes the FYR process, including historical investigations and remedial actions undertaken at the Site; evaluates the monitoring data collected since the last FYR; reviews, as appropriate, the Applicable or Relevant and Appropriate Requirements (ARARs) specified in the ROD for any changes; discusses any issues identified during the review; and presents recommendations to address those issues.

The EPA prepared this FYR pursuant to the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) §121 and the National Contingency Plan. CERCLA §121(c) states:

*“If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.”*

The EPA interpreted this requirement further in the National Contingency Plan; 40 CFR §300.430(f)(4)(ii) states:

*“If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.”*

This is the fourth FYR for the Old Springfield Landfill Superfund Site. The first FYR was completed in September 1998 as a post-SARA statutory review in accordance with the 1988 ROD. There are two operable units (OUs) at the Site and construction is completed on both. Therefore, this FYR addresses the status of the Site remedial actions in their entirety and considers components of both OUs. The triggering action for this review is the date of the

previous FYR Report, which was signed on September 26, 2008. This statutory review is required because hazardous substances, pollutants, or contaminants remain on-Site above levels that allow for unlimited use and unrestricted exposure.

This FYR was completed in accordance with EPA's Comprehensive Five Year Review Guidance, Office of Solid Waste and Emergency Response (OSWER) publication no. 9355.7-03B-P.

## 2.0 SITE CHRONOLOGY

**Table 2-1  
Chronology of Site Events  
Old Springfield Landfill Superfund Site  
Springfield, Vermont**

Approximate time period of initiation of waste disposal activities at the site	July 12, 1947
Closure of dump and conversion to mobile home park	November 19, 1968
NPL listing	December 1982
Installation of water line by PRPs	1984
Remedial Investigation (RI) completed	June 1988
Feasibility Study (FS) for OU I completed	June 1988
OU I Record of Decision (ROD) issued by EPA	September 22, 1988
EPA enters into an Administrative Order with the Potentially Responsible Parties (PRPs) to perform OU II Feasibility Study	March 1989
EPA and PRPs enter into Consent Decree (CD) to perform OU I Remedial Action (RA)	September 1989
OU II ROD issued by EPA	September 28, 1990
EPA and PRPs enter into CD to perform OU II RA	May 1991
Remedial Design (RD) for OU I completed	April 1992
RA for OU I initiated	June 1992
RD for OU II completed	May 1993
Construction of OU I completed	September 1993
Interim Remedial Action Report for OU I	September 20, 1994
Construction of OU II completed	June 1994
Preliminary Close-Out Report (PCOR) and Interim Remedial Action Reports of OU II completed	September 22, 1994
Operation and maintenance of OU I and II by PRPs with EPA oversight	1994 to present
Previous FYR Reports issued	September 29, 1998; September 26, 2003, and September 26, 2008

### **3.0 BACKGROUND**

The background section presents a description of the Site, describes the land use history, and summarizes the remedial actions required and taken at the Site.

#### **3.1 Site Location and Physical Description**

The 10 acre Old Springfield Landfill Superfund Site is located approximately one mile southeast of the center of the Town of Springfield, Windsor County, Vermont. Springfield is located in the Connecticut River Valley in the southeastern quadrant of Vermont, south of Hanover, New Hampshire and west of Interstate-91. The 2010 National Census lists the population of Springfield as 9,373. The Villages of Goulds Mill and Hardscrabble Corner are located within a one mile radius of the Site.

The Old Springfield Landfill, previously referred to as the Will Dean Dump, was operated by the Town of Springfield between 1947 and 1968. After the closure of the landfill in 1968, it was sold and developed for use as a mobile home park, known as Springfield Mobile Home Estates. At the time of the mobile home park's development, the Vermont Department of Health (VT DOH) recommended that drilled wells not be used to supply water to the mobile homes because the development was located over areas previously used for chemical disposal. Municipal water lines were extended to serve the mobile homes. Springfield Mobile Homes Estates is no longer occupied and the mobile homes have been removed, and the private well decommissioned. A six-building condominium complex and thirteen single family residences are located in the immediate vicinity of the Site, and are either connected to municipal water or are upgradient and well beyond the Site groundwater plume.

The Site is located on an upland plateau with slopes descending steeply to the north, east, and west. Seavers Brook runs west of the Site and the Black River runs to the east. Seavers Brook flows northward to the Black River, which flows south and empties into the Connecticut River. Will Dean Road is located along the western side of the Site. Will Dean Road intersects Vermont Route 11 just north of the Site. Route 11 runs along the eastern side of the Site. Maps showing the location of the Site (Figure 1) and Site features (Figure 2) can be found in Attachment 1.

### **3.2 Land and Resource Use**

The land use within a one-mile radius of the Site is primarily low-density residential housing, light agriculture, undeveloped forest land, and commercial. The land adjacent to the Site to the west is zoned as residential/agricultural and to the east is zoned as land reserve (SWCRPC, 2003). Springfield High School lies within one mile northwest of the Site. Approximately 200 homes and condominiums are located within a one-mile radius of the Site, housing an estimated population of 650 to 750 people. The Southern Windsor County Regional Planning Commission (SWCRPC) lists intended future use of the Site as forest (SWCRPC, 2003). Town maps showing these use designations are in Attachment 2.

Natural resources in the vicinity of the Site include groundwater, surface water, fish and game, arable land, forest, woodland, and minerals. Based on soil data, land in the immediate vicinity of the Site is listed as "prime agricultural land" by the U.S. Department of Agriculture's Natural Resources Conservation Service. The Site drains to the Black River, which is listed by the State as warm water fish habitat from Lovejoy Dam to the Connecticut River and as cold water fish habitat elsewhere. The Black River is also on the State's 2006 CWA 303(d) list as impaired for human contact and recreation use near Springfield due to combined sewer overflow events.

A bedrock aquifer is a current source of drinking water in the area for those individuals not connected to the municipal water supply system. The State of Vermont classifies this aquifer as Class III (suitable as water source for individual domestic wells, irrigation, agriculture, general industrial and commercial use; this is the standard default classification in VT [VTWSD, 2008]). Users of the bedrock aquifer groundwater in the Site vicinity are located primarily upgradient of the Site. Groundwater monitoring wells are located between the Site and current users of the bedrock aquifer. All other residents in close proximity to the Site receive municipal water from the Town of Springfield.

### **3.3 History of Contamination**

The Site was operated by the Town of Springfield between 1947 and 1968. Hazardous industrial waste from local industries was co-disposed with municipal trash. The industrial waste was disposed both in discrete trenches and mixed with municipal solid waste. Most hazardous material was disposed in bulk liquid and semi-liquid form. Shortly after the opening of the Springfield Mobile Home Estates, a nearby resident's complaint of foul-smelling water prompted

an investigation by VT DOH and VT DEC. Volatile organic compounds (VOCs) were found in a spring located near Seavers Brook and in the residential well near the mobile home park. The spring was abandoned and the affected home near the mobile home park was connected to the public water supply.

### **3.4 Initial Response**

In 1984, in response to VOCs found in a spring located near Seavers Brook and in the residential well near the mobile home park, the potentially responsible parties (PRPs) installed a water line extending to nearby homes. EPA then performed a remedial investigation and feasibility study (RI/FS) to determine the extent and risk of contamination and potential cleanup actions. In 1988, EPA signed the first Record of Decision (ROD) for the Site to initiate a cleanup action for the contaminated groundwater and seeps. In 1990, EPA signed the second and final ROD to address the landfill closure.

### **3.5 Basis for Taking Action**

The Human Health Risk Assessment for the Old Springfield Landfill documented an unacceptable threat to human health based on:

- Future potential ingestion of groundwater contaminated with vinyl chloride, trichloroethene (TCE), tetrachloroethene (PCE), dichloroethene, and methylene chloride.
- Current and future potential exposure to landfill waste and soil containing polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs).

## **4.0 REMEDIAL ACTIONS**

This section provides information on remedy selection and implementation.

### **4.1 Remedy Selection**

The clean up actions for the Site have been implemented in two Operable Units (OUs).

The Remedial Action Objectives (RAOs) for OU I are:

- Prevent direct contact (incidental ingestion and dermal absorption) with contaminated surface soils throughout the Site by residents and by construction workers;
- Prevent the volatilization of contaminants from contaminated soils, wastes, and leachate seeps to ambient air;
- Prevent the contamination of fish in the Black River by preventing leaching of contaminants from site soils to shallow groundwater to the bedrock aquifer with subsequent discharge to Seavers Brook and into the Black River; and
- Prevent the leaching of contaminants from site soils to shallow groundwater with subsequent transportation from the shallow groundwater to the potable bedrock aquifer.

To meet these RAOs, the OU I ROD required the design and construction of:

- 1) two groundwater extraction wells;
- 2) a collection system for three areas of contaminated seepage: two on the Site's east side at the base of Waste Areas 2 and 3, and one on the Site's west side along Seavers Brook Road; and
- 3) a pre-treatment facility (PTF) to remove VOCs prior to discharge of collected water to the Springfield public-owned treatment works (POTW).

The OU I ROD also included the implementation of the Town of Springfield Municipal Ordinance 88-2 as an institutional control (IC) to restrict the future use of groundwater until such time that groundwater reaches the maximum contaminant levels (MCLs). The ROD recommends that the State and Town implement and enforce this ordinance. The ROD recommends this IC apply to an area bounded by Route 11 on the east, Seavers Brook Road on the west, and John Curtin's property boundaries on the south and north.

The OU I ROD did not address closure of the landfill and recommended further studies to determine the final cleanup activities needed for the Site.

To complete remediation of the Site, EPA signed a ROD to implement the second OU (OU II) in September 1990. The RAOs for OU II are:

- Prevent direct contact (dermal contact and ingestion) with contaminated soil;
- Reduce or prevent, to the extent practicable, infiltration of surface and/or groundwater into waste areas and leaching of contaminants from waste areas into the groundwater below and downgradient of the waste;
- Prevent leaching of soil contaminants to the groundwater; and
- Control the harmful buildup or emission of landfill gases containing hazardous substances.

To meet these RAOs, the OU II ROD required the design and construction of:

- 1) a third groundwater extraction well;
- 2) upgradient french drains and surface water diversions; and
- 3) a multi-layer landfill cap with gas vents.

The OU II ROD also required measures to stabilize the side slopes of Waste Areas 2 & 3.

The OU II ROD required deed restrictions to limit the use, such as excavation, of the site within the fenced area. Objectives of these restrictions include preventing interference with, and protecting the integrity of, the multi-layer cap, french drains, wells, and IC components.

Long-term operation, maintenance, and monitoring of the remedial actions (RAs) were requirements of the OU I and OU II RODs.

Three Five-Year Reviews have been completed previously for the Site in 1998, 2003, and 2008. All of the previous Five-Year Reviews determined that the remedies conducted at the Site remain protective of human health and the environment.

## **4.2 Remedy Implementation**

The remedial design process for OU I was completed in April 1992. The final design required the construction of a pre-treatment facility with two air strippers, metal pre-treatment, and granular activated carbon (GAC) treatment of the air emissions. The PRP's contractor, REMCOR, mobilized to the Site on June 1, 1992 to begin construction of the remedial action. Construction activities for the groundwater extraction wells, west side seepage collection system, and pretreatment facility were completed by February 8, 1993. The east side leachate collection system was delayed until placement of the cap. The start-up testing and performance testing of the collection system and additional extraction wells were completed by June 18, 1993. Performance testing for the source control well and eastern seep collection system was completed on August 8, 1993.

The completion of OU I collection systems and pre-treatment facility construction was documented in the Remedial Action (RA) Report for OU I, dated September 1993. EPA approved this Report on September 20, 1993. EPA and the oversight contractors performed a final inspection on September 16, 1993. At the time of this FYR Report, the OU I remedy is performing as expected, capturing groundwater flow, and meeting the RAOs.

The final design of OU II was completed in May 1993. As part of pre-design activities, a pre-load of common borrow soil was placed on Waste Area 4 in the fall on 1992 to reduce long-term settlement of the waste material. The PRP's contractor, REMCOR, mobilized to the Site on May 1993. In June 1993, two french drains were installed using a bio-polymer slurry technique. One drain is upgradient of Waste Area 4 and the other is upgradient of Waste Area 3. Cap construction began in July 1993. The cap includes a 12-inch gas vent layer, a geosynthetic clay liner (GCL), a 40-mil very low density polyethylene (VLDPE) geomembrane, 12-inch sand drainage layer, 36 inches of frost and erosion protection, and 6 inches of top soil. Passive gas vents with attached carbon treatment canisters attached were installed. The cap on the steep slopes consists of a 40-mil textured geomembrane over common borrow soil. The layers above the geomembrane were the same as those detailed above. Construction activities were

completed in November 1993. EPA and the oversight contractor performed a substantial completion inspection in December 1993. In April 1994, a retention pond overflowed due to a construction defect. This defect was corrected by changing the design of the discharge pipe and installing a new overflow channel. In addition, areas of erosion were repaired and re-seeded in June 1994.

EPA and the oversight contractor performed a final inspection of OU II on June 30, 1994. The cap, source control wells, french drains, and surface water diversions were determined to be constructed according to design with some minor erosion and sparse vegetation noted. On August 11, 1994, based upon an EPA follow-up inspection, the landfill was determined to have a well-established grass cover in all areas. The french drains and cap were found to be successful in reducing the saturation of the waste material as measured by piezometers below the waste. A Remedial Action Report for OU II was completed in September 1994. At that time, all physical construction for the Site was complete and this was documented in a Preliminary Close-Out Report (PCOR) for OUs I and II, signed on September 22, 1994. This document designates this site as a construction complete (CC) site.

The remedial action is complete and is considered operational and functional (O&F) as of the PCOR and the OU II RA Report in 1994. Two consent decrees require the PRPs to conduct operation and maintenance (O&M) on the long-term remedial action for a period of 30 years. In actuality, O&M is expected to continue at the Site in perpetuity. The Town of Springfield is performing the O&M.

A Final Remedial Action Report will be prepared once the remedial action has achieved the groundwater cleanup goals established in the OU I and OU II RODs. This report will support the final Superfund Site Closeout Report to document the completion of all cleanup activities.

#### **4.3 Institutional Controls (ICs)**

ICs are non-engineered instruments, such as administrative and/or legal controls, that help minimize the potential for exposure to contamination and protect the integrity of the remedy. Compliance with ICs is required to assure long-term protectiveness for any areas, which do not allow for unlimited use or unrestricted exposure (UU/UE). ICs are required at the Site to ensure the protectiveness of the remedy and are selected in both the OU I and OU II RODs. All non-

UU/UE areas are addressed effectively by institutional controls as determined by IC evaluation activities discussed below. The ICs in use at this site are effective and no further ICs or changes to the current ICs are recommended at this time.

#### **4.3.1 Institutional Controls in Site Documents**

The 1988 OU I ROD includes a requirement for ICs to restrict the use of groundwater where it exceeds MCLs. The ROD recommends that the State and Town implement and enforce Town of Springfield Ordinance 88-2 (Attachment 3). The ROD recommends this IC apply to an area bounded by Route 11 on the east, Seavers Brook Road on the west, and John Curtin's property boundaries to the south and north. The 1990 OU II ROD includes a general requirement for deed restrictions to restrict the use of the Site within the fenced area. It identifies the objectives of restricting excavation, to prevent interference with and protect the integrity of the cap, french drains, wells, stabilized slopes, and other RA components.

The 1993 Administrative Order on Consent (AOC) with Harold Millay includes in Section VI, "Access and Notice" (paragraph #22), the following provision for a deed notice:

*"Respondent shall file in the land records of Windsor County a notice, approved by EPA, to subsequent purchasers of the land, that hazardous substances have migrated into a sand and gravel aquifer which is located approximately 80 ft. beneath the Respondent's property and the EPA makes no representation as to the appropriate use of the property."*

The AOC notes that the Millay property is on both sides of Will Dean Road and is listed in the Town of Springfield Map Index (5/1988), as Block #3, Lot #53 under deed 59-466.

#### **4.3.2 Institutional Control Implementation**

The Town of Springfield has implemented Ordinance 88-2 giving the Town of Springfield the authority to determine "that certain parcels of land within the town contain hazardous wastes, toxic materials, or harmful chemical matter". However, a resolution needed to be passed by the Town in order to apply the restrictions in Ordinance 88-2 to specific parcels of land. Such a resolution, Town of Springfield Resolution 92-4 (Attachment 3), was passed on August 3, 1992. This resolution applies the following 10 restrictions to the Site. The resolution refers to maps on

file that describe the restricted area, which includes the fenced area of remediation for the Site. In brief the restrictions are:

1. no construction of buildings;
2. no breaking of soil surface;
3. no crops;
4. no residential, commercial, or recreational use;
5. no taking, use, or consumption of water - surface or ground;
6. no excavation, filling, depositing soil or liquid material;
7. no changes in topography;
8. no entry;
9. no activities that would alter water table; and
10. restrictions are subject to and will not encumber source control remedy.

The 1993 AOC included a provision requiring Harold Millay, owner of a property on Will Dean Road, to place the AOC as a record on his deed indicating possible contamination in the sand and gravel unit underneath his property. It is uncertain whether the 1993 AOC requirement for the Millay property was ever fulfilled. The 2008 Five Year Review noted that subsequent site investigations and monitoring results show that no groundwater contamination is migrating off-Site and any need for filing such a statement on the property deed is negated.

The 1994 PCOR states that ICs that meet the objectives of protecting the integrity of the remedial action components and preventing exposure to groundwater by prohibiting use of areas within the site fence have been implemented. This refers to the implementation of Ordinance 88-2 through Resolution 92-4. The PCOR also notes that ICs to prohibit groundwater use under private wells within the area of the groundwater plume were not yet implemented due to Town reluctance. As the groundwater contamination is now largely contained directly beneath the landfill and is not migrating off-site at concentrations exceeding MCLs. IC measures to address groundwater use beyond the landfill boundary are no longer necessary.

**Table 4-1  
Institutional Controls Summary  
Old Springfield Landfill Superfund Site  
Springfield, Vermont**

<b>Media, Engineered Controls, and Areas that Do Not Support UU/UE Based on Current Conditions</b>	<b>IC Objective</b>	<b>Title of Institutional Control Instrument Implemented</b>
Old Springfield Landfill Property - Area within fenced area, cap, french drains, wells and other RA components	Protect integrity of remedy	Town Ordinance 88-2 applied to site via Town Resolution 92-4
Groundwater – the area beneath the landfill where the plume that exceeds groundwater cleanup standards (MCLs) is contained	Prohibit groundwater use until cleanup standards are achieved	Town Ordinance 88-2 applied to site via Town Resolution 92-4

#### **4.4 Operation and Maintenance**

The Town of Springfield is conducting long-term monitoring and maintenance activities associated with the O&M Plan and the Long-term Monitoring Plan (LTMP). The primary activities associated with O&M and long-term monitoring include:

- Routine inspection and maintenance of the landfill cover system, extraction wells, french drains, and water treatment system;
- Periodic sampling of the groundwater, treatment plant influent and effluent, ambient air within the treatment facility, and air discharges from carbon canisters; and
- Submission of an annual report to EPA and VT DEC to document the performance of the O&M and present sampling results.

The Town budgets between \$130,000 and \$150,000 each year to cover the cost of the O&M activities described above. EPA's oversight contractor, Nobis Engineering, Inc., performs annual inspections of the Site as part of EPA's oversight of the Town of Springfield. Inspections are typically conducted each spring.

## **5.0 PROGRESS SINCE THE LAST FIVE-YEAR REVIEW**

This is the fourth FYR for the Site. The previous Five-Year Review Report was completed in September 2008. The 2008 review concluded that "because the remedial actions at this Site are protective, the Site is protective of human health and the environment." No major issues were identified. The site inspection conducted during the 2008 FYR identified several maintenance issues requiring attention including; rodent removal on the cap, monitoring and removal of sediment and vegetation in channels, and monitoring for slope instability. The Third Five-Year Review Report recommended the Town reinstate use of a Site inspection checklist, continue repairs to drainage channels as needed to address erosion, and replace pipes in the PTF, when needed, due to buildup of precipitate.

Actions completed since the last FYR include:

- Repair of erosion areas on the landfill cap;
- Repair of landfill down-chutes;
- Backfill of animal burrows on the landfill cap; and
- Periodic maintenance of the groundwater extraction and treatment system.

All these actions have been completed at this time. There is no evidence of continued slope instability at the site, and flow data at the influent to the PTF can be used to evaluate whether or not pipes are becoming clogged with precipitate.

## **6.0 FIVE-YEAR REVIEW PROCESS**

This section discusses the individual components of the FYR process, the actions taken to perform the review, and the data collected during the review.

### **6.1 Administrative Components**

EPA, the lead agency for this FYR, notified VT DEC and the PRPs in February 2013 that it was conducting a FYR, with the report due by September 2013. The FYR Team was led by Leslie McVickar, the Site's TOPO, of EPA's Office of Site Remediation and Restoration. Rudy Brown is the EPA Community Involvement Coordinator for the Site. Michael Smith is the Site manager

for VTDEC. Document review began in March 2013 and other activities were completed as described below.

Components of this review included:

- Community notification and involvement
- Document review
- Data review
- Site inspection
- Local interviews
- Five-Year Review Report development

## **6.2 Community Involvement**

EPA issued a news release on May 9, 2013 announcing the commencement of the Five-Year Review and describing the related review process for the Site. EPA did not receive any correspondence or communication from the public regarding the information that was provided in this notification.

## **6.3 Document Review**

The FYR includes a review of documents containing information relevant to assessing the protectiveness of the Site remedy. Documents, such as Records of Decision (RODs), provide the RAOs for the Site. Others, such as Remedial Action Reports, detail specific actions taken at the site. Previous FYRs are also reviewed to assess the status of the Site over time. Additionally, enforcement documents, institutional controls, and various regulations are reviewed. A complete list of documents reviewed for this FYR can be found in Attachment 4.

## **6.4 Data Review**

Monitoring data presented in the Annual Operation and Maintenance Reports for the Site covering the time period since the last FYR were reviewed. A summary of the reviewed data is presented below.

## 6.4.1 Groundwater Monitoring Data

Groundwater monitoring data collected from monitoring wells, extraction points, and seeps was also reviewed as part of this FYR.

### 6.4.1.1 Monitoring Wells

Monitoring of groundwater levels and concentrations is conducted in accordance with the LTMP, with any modifications to the plan to be negotiated between EPA and VT DEC. Select wells in various subsurface units (e.g., sand and gravel, bedrock, till) are sampled annually. The annual sampling includes analysis for VOCs and a target analyte list (TAL) of metals. Water levels do not vary significantly across the Site, especially when compared to the steep hydraulic gradient between the Site and the Black River to the northeast. Groundwater elevations measured in recent years are all within historical ranges.

Ten monitoring wells are sampled annually and analyzed for VOCs. Since 2008, VOCs have only been detected in groundwater samples collected from four of the ten monitoring wells: MW41G, MW45B, MW45T, and MW52G. Wells MW-41G and MW-52G are set within a sand and gravel unit on Site and to the west of the landfill, and wells MW-45B and MW-45T are set within the bedrock and glacial till units to the east of the landfill off Site near Route 11. The VOCs detected in the four monitoring wells are 1,1-dichloroethene (1,1-DCE), vinyl chloride, 1,1-dichloroethane (1,1-DCA), 1,2-dichloroethene (1,2-DCE), and trichloroethene (TCE). The following is a summary of the comparison of VOC concentrations to MCLs over the past 5 years of groundwater monitoring:

- Concentrations of vinyl chloride, *cis*-1,2-DCE, and TCE have exceeded MCLs, but only in samples collected from MW45T and MW45B.
- Vinyl chloride concentrations detected in samples collected from MW45T exceeded the MCL in 2008 and 2009, but have not exceeded the MCL since 2009.
- *Cis*-1,2-DCE and TCE concentrations have exceeded the MCL in samples collected from MW45T since 1995; however, concentrations have trended downward slightly in recent years. The TCE concentration exceeded the MCL in a sample collected from

MW45B in 2009. However, the concentrations of TCE detected in groundwater samples collected from this well were below the detection limit in both 2011 and 2012.

The limited number of VOC detections above MCLs observed between 2008 and 2012 show a reduction compared to previous sampling rounds, indicating that the remedy at the Site is performing effectively.

**6.4.1.2 Extraction Point Monitoring**

Sampling of extraction wells EW-1, EW-2, and SC-1 is being conducted annually, most recently in August 2012. In 2011 and 2012, no VOCs were detected in samples collected from EW-1, and the VOCs detected in samples collected from EW-2 were similar to historical concentrations with some compounds exceeding their MCL. Concentrations of VOCs detected in samples collected from SC-1, which extracts groundwater from the bedrock aquifer, exceeded their MCLs but were similar to historical concentrations.

**Table 6-1  
VOCs in Extraction Wells – 2011 and 2012  
Old Springfield Landfill Superfund Site  
Springfield, Vermont**

<b>Compound</b>	<b>MCL</b>	<b>EW-2 2011</b>	<b>EW-2 2012</b>	<b>SC-1 2011</b>	<b>SC-1 2012</b>
Vinyl Chloride	2	10	8	ND	ND
1,1 DCE	7	4	4	140	150
1,1 DCA	70	ND	ND	20	20
Cis-1,2 DCE	70	18	21	210	230
TCA	200	25	20	510	500
TCE	5	230	220	5200	5400
PCE	5	13	16	200	230

*VOCs were not detected at EW-1 in 2011 or 2012.*

The french drains (FD-1, FD-2, and FD-3) continue to be sampled annually, most recently in August 2012.

- In 2011 and 2012, no VOCs were detected in samples collected from FD-2.
- In 2011, vinyl chloride and *cis*-1,2-DCE were detected in a sample collected from FD-3 at relatively low concentrations. The vinyl chloride concentration exceeded the MCL of 2 µg/L. However, no VOCs were detected in a sample collected from FD-3 during 2012.
- No samples were collected in 2011 or 2012 from FD-1 because it was dry.

The french drains are designed to intercept off-site groundwater before it enters the landfill. The presence of contaminants identified above may indicate some minimal leakage from the landfill, perhaps driven partially by the pumping of the french drains.

The eastern leachate seep (LSE 3/4) was sampled in 2011. Consistent with historic sampling, few VOCs were detected, and TCE was the only contaminant with concentrations exceeding the MCL. No sample was collected from LSE 3/4 in 2012 because there was no flow.

#### **6.4.1.3 PTF and Western Seep Monitoring**

Annual sampling of the combined PTF influent and effluent and of the Western Seep included analysis for VOCs, alkalinity, total iron, total manganese, TAL metals, pesticides, PCBs, SVOCs, and phenols. The sampling of the latter four of these components is only conducted once per year for the PTF effluent and the Western Seep. TAL metals are also analyzed only once per year, but for all samples from all locations. The most recent sampling for all these components occurred in July and August 2012.

Six VOC compounds have been detected regularly in PTF influent: 1,1-DCE; 1,2-DCE; tetrachloroethene (PCE); 1,1,1-trichloroethane (TCA); TCE; and vinyl chloride. Periodic detections of acetone and 1,1-DCA have also been recorded historically. TCE, 1,1-DCE, and PCE concentrations were above their respective MCL standards in 2011 and 2012 influent samples, as has been the historical trend. These results indicate that the groundwater from the Site continues to require treatment.

The average TCE concentration detected in groundwater influent samples collected from the PTF was 368 µg/L in 2008. Since 2008, samples have been collected annually. Results show concentrations at 430 µg/L, 630 µg/L, 730 µg/L, and 660 µg/L from 2009 through 2012, respectively. The overall long-term average for the influent is 613 µg/L, indicating current

concentrations, while lower than in the past, are consistent with the overall historical average. Calculations show that to-date, the PTF has removed approximately 926 pounds of TCE from the influent, 13 pounds of which was removed in 2012 through July 2nd.

TCE was the only VOC compound detected in the PTF effluent samples collected during 2010, indicating a removal efficiency of the PTF of 99.5%. However, in 2011 and 2012 the TCE PTF effluent concentrations exceeded the MCL of 5 µg/L. and there were detections of low concentrations of *cis*-1,2 DCE and TCA. These sampling results were an indication that the carbon canisters used to treat the effluent were spent. To address this issue, the carbon canisters were replaced.

No significant contamination has been detected in the Western Seep samples for several years. The RA component that includes collection of leachate at this seep and discharge to the municipal POTW will continue to be evaluated, through annual O&M activities, to address the need for potential modifications to the current LTM Plan

#### **6.4.2 Surface Water Monitoring**

Based on previous sampling results, EPA and VT DEC have agreed to eliminate the sampling of surface water in drainage channels.

#### **6.4.3 Extraction System Monitoring**

The flows associated with each of the seven groundwater and leachate collection points, and one point downstream of the PTF equalization tank, are measured continuously using digitized totalizing flow meters, which are monitored and recorded every workday. This information is summarized in the annual O&M reports.

Daily flow records are tabulated, and monthly total, average, maximum, and minimum gallons pumped are calculated and compiled over the life of the project. Statistics including means and standard deviations are calculated for each location to facilitate comparisons between locations and across time intervals.

In 2009, flow statistics showed that the long term mean PTF flow decreased slightly by 0.30 gallons per minute (gpm), or 1.2 percent from the previous year. The average PTF flow in 2009

was 24.00 gpm, or 112 percent of the long-term average. Historically, EW-1 and EW-2 have contributed approximately 75 percent of the flow to the PTF, however, in 2009 they contributed only about 45 percent of the flow. In addition, the historical flow to the POTW has been divided nearly evenly between the PTF and the Western Seep. However in 2009, 64 percent of the flow came from the Western Seep compared to 36 percent from the PTF.

In 2010, the long-term mean PTF flow decreased slightly by 0.33 gpm or 1.4 percent and the average 2010 flow was 18.14 gpm or 76.6 percent of the long-term average. In 2010, EW-1 and EW-2 contributed only 56 percent of the flow through the PTF.

In summary, overall flow rates over the life of the project remain well below the design rate of the facility. The 2010 data brought the average PTF flow rate for the life of the project to 23.67 gpm, which is approximately 28 percent of the 87 gpm design flow rate. The 2010 average flow of 18.14 gpm was only 21 percent of the design flow. At the time of this FYR, flow data for 2011 and 2012 had not been evaluated due to the delayed submission of the combined annual monitoring report for those years. This data will be evaluated in 2013.

The total volume treated at the POTW since the inception of this project is close to 482 million gallons.

#### **6.4.4 Air Monitoring, Emissions, and Compliance**

Air monitoring samples are collected from the passive gas vents at the landfill, from the ambient air in the PTF, and from the air stripper vapor-phase carbon treatment canisters influent and effluent. The PTF indoor air and gas vents are typically sampled annually. The air stripper carbon canisters are typically sampled quarterly, but were sampled once per year in 2011 and 2012.

A comparison of influent and effluent levels of TCE (the primary contaminant of concern) show that the air stripper carbon canisters are performing effectively. Influent TCE concentrations exceeded the effluent concentrations in samples collected in 2011 and 2012, and of those six samples, only three samples had TCE concentrations above the detection limit. The carbon canisters are operating at greater than 99% efficiency in reducing TCE. Any breakthrough of

TCE in the effluent indicates that the carbon treatment canisters need to be changed, which typically occurs approximately once per year.

Air samples are collected from the landfill gas vents and replacement of the vent canisters is conducted when the concentrations reach 100 times the HAAS level (adjusted to address “brief worker exposure” rather than “individual lifetime exposure” levels of concern). The gas vent carbon canisters were replaced in 2009. Air samples were collected from the influent of the carbon canisters in August 2011. Five VOCs were detected that exceeded the 100 times the HAAS, however, because the samples were collected from the influent and not the effluent, the need to replace the carbon could not be evaluated. This will be evaluated in 2013.

#### **6.4.5 System Performance Evaluation**

Overall, the RA components have been performing as expected.

The PTF operated daily in 2010 as designed, typically with only one to two hour shutdowns for routine maintenance, as summarized below.

- Leachate collected at 7 locations is pumped to the PTF equalization tank followed by treatment to reduce iron and remove VOCs by air stripping.
- Vapor effluent is treated with GAC canisters to remove VOCs and is then discharged on-site.
- Liquid effluent flows by gravity to the Town of Springfield POTW, where it is joined by untreated leachate collected at the Western Seep.
- Maintenance typically includes change-outs of the GAC canisters, weekly cleaning of filters and probes, cleaning and replacement of vault meters as needed, and cleaning and inspection of air strippers.
- GAC canister change-out is needed on an approximately yearly basis and is indicated by breakthrough of TCE.

- The ten carbon canisters treating passive air discharge from the landfill cap are normally replaced annually, usually at the same time as GAC change-out at the PTF. However, none of the carbon canisters have been replaced since 2009.

The 2010 and most recent, O&M activities indicate that the landfill appears to be in very good condition.

## **6.5 Site Inspections**

Regular (i.e., roughly twice monthly) inspections of the facility are conducted by the Town of Springfield. There is almost constant presence at the POTW of at least one staff member who is on-Site nearly every workday. Flow data from the extraction points at the PTF is collected each of these workdays. Annual oversight inspections are performed by EPA's contractor. There was a gap in these inspections in 2007 when EPA switched contractors from TRC to Nobis Engineering. Nobis was introduced to the site during the 2008 FYR site inspection and continued conducting semi-annual inspections until 2011. Inspections, since commencement of the RA have occurred annually at the Site.

A Site Inspection for the Five-Year Review was performed on April 11, 2013. The following bullets summarize the observations and findings made during the Site Inspection:

- No redevelopment has occurred at the Site since the 2008 Five-Year Review. A shed/garage not noted in previous Five-Year Reviews was observed along the western side of Will Dean Road near the Site.
- Environmental media sampling has been conducted according to schedule since the 2008 Five-Year Review.
- Access to the Site is controlled by a padlocked gate and a chain-linked fence. The gate was padlocked upon arrival and the chain-linked fence was generally in good condition.
- The ten existing monitoring wells currently being sampled as part of the monitoring program were located during the Site Inspection. The wells appeared to be intact and in good condition.

- No evidence of surficial contamination (i.e., stained soil, stressed vegetation, odors) was observed during the Site Inspection.
- Some animal burrows were seen in the capped area, and some small trees were found growing close to the cap.

The completed inspection checklist is provided as Attachment 5 and inspection photos are provided as Attachment 6.

## **6.6 Interviews**

Interviews were conducted at the Site during the April 11, 2013 inspection with Town of Springfield personnel from the publicly owned treatment works (POTW), the Town Water and Waste Water Department, and the Town's consultant Sanborn, Head and Associates, Inc. Separate interviews were conducted by telephone with the Town Manager and the Planning and Zoning Officer.

The following is a summary of the interviews with the Town and the Town's consultant:

- The Town is unaware of any development under consideration for the Site parcel. No development interest has been shown within the previous 5 years.
- The Town is unaware of any changes in the surrounding properties or land use in the last 5 years, and the Town is unaware of any anticipated changes.
- No community interest in the Site has been noted by the Town officials interviewed. No Site-related inquiries have been made of the Town officials interviewed.
- The Town's overall impression of the remedy is positive, but the Town would like the cleanup to be completed more quickly.
- The Town is not aware of any issues with the Site remedy or with the potential future reuse of the property.

The following is a summary of the telephone interview with Mr. Michael Smith of the Vermont Department of Environmental Conservation (VT DEC):

- Mr. Smith stated that he was unaware of any inquiries regarding this Site within the previous 5 years. He also is unaware of any issues with the remedy and feels it is functioning adequately.

Records of interviews are presented in Attachment 5.

## **7.0 TECHNICAL ASSESSMENT**

This section provides a technical assessment of the remedy implemented at the Site, as outlined in the *Comprehensive Five-Year Review Guidance* (USEPA, 2001). The remedy has been evaluated based on its function in accordance with decision documents, its adherence to valid risk data and scenarios, and any other information that could have affected the remedy's protectiveness.

### **7.1 Question A: Is the Remedy Functioning as Intended by the Decision Documents?**

Yes. The remedy is functioning as intended by the OU I and OU II RODs.

Concentrations of COCs in the extracted groundwater exceed cleanup standards, indicating that treatment is still required at the Site. Based on the evaluation of pre- and post-treatment water samples, the PTF has a 97-99% removal rate for key contaminants. Concentrations of TCE detected in monitoring wells are gradually declining, indicating that the remedy is effectively reducing contaminant mass. Semi-volatile organic compounds (SVOCs) have not been detected since 2001 and polychlorinated biphenyls (PCBs) and pesticides since 1995. Landfill gas vents are operating as intended and carbon canisters are being replaced as needed based on analyses of air samples. Air standards are generally being met, except for short periods of time between change-out of GAC carbon canisters.

Slope stability remains a general concern for the cap due to the steep slope of the landfill surface and slope below the landfill. Indications of slope instability were not observed during the most recent Site Inspection. During past inspections, buildup of downchute sediments and

erosion associated with stormwater drainage channels have been identified. Continued periodic inspections for erosion and buildup of sediments should identify issues for repair in a timely manner to maintain the effectiveness of the remedy. General cap maintenance, including filling in animal burrows, regular mowing, and trimming trees and vegetation located near the landfill cap will also aid in preventing cap degradation. In addition, continued monitoring for iron-fouling of extraction wells and the pipes should be performed to ensure optimal performance of the groundwater extraction and treatment system. The continued monitoring and inspection of the Site by Town officials and their contractor will help ensure that the remedy continues to function as designed.

### **Remedial Action Performance and Monitoring Results**

The Town of Springfield is conducting long-term monitoring and maintenance activities associated with the O&M Plan and the Long-term Monitoring Plan (LTMP). EPA's oversight contractor, Nobis Engineering, Inc., performs annual inspections of the Site as part of EPA's oversight of the Town of Springfield. Inspections are typically conducted each spring. However, issues identified by the O&M activities and the annual inspections have not been addressed in a timely manner during recent years. The laboratory detection limits for certain COCs have been higher than their respective MCL for LTM groundwater samples, making a comparison to Site cleanup levels difficult. At the time of development of this Five-Year Review, annual LTM reports had not been prepared for years 2011 and 2012.

### **Operations and Maintenance Costs**

The O&M activities for this Site include groundwater and air sampling, and maintenance of the capped area. The Town budgets between \$130,000 and \$150,000 each year for O&M costs.

### **Opportunities for Optimization**

While the remedy appears to be meeting the RAOs, the continued elevated concentrations of VOCs, particularly TCE, in the PTF influent suggests that groundwater extraction and treatment may be required longer than the anticipated 30 years estimated for PRP operation and maintenance of the RA. Therefore, the time to reach RAOs should be evaluated and remedy optimization should be considered by the LPC to expedite reduction of the mass of chlorinated solvents beneath the cap, that are a continuing source of VOCs to groundwater. Optimization of

the reduction of contaminant mass below the cap will in turn reduce the time frame required for extraction and treatment of groundwater.

### **Indicators of Remedy Problems**

Based on the Site Inspection and a review of Site documents, there do not appear to be indications of problems with the remedy, as designed.

### **Implementation of Institutional Controls**

The Town of Springfield has implemented Ordinance 88-2 giving the Town of Springfield the authority to determine “that certain parcels of land within the town contain hazardous wastes, toxic materials, or harmful chemical matter” The Town passed Town of Springfield Resolution 92-4 (Attachment 3), on August 3, 1992 to address these restrictions. The Resolution refers to maps describing the restricted area, which includes the fenced area of remediation for the Site.

#### **7.2 Question B: Are the Exposure Assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives (RAOs) Used at the Time of the Remedy Selection Still Valid?**

No. Not all of the assumptions, cleanup standards and RAO’s used at the time of remedy selection are currently valid, as summarized below and elaborated upon in Sections 7.2 and 7.3.

Toxicity values, exposure assumptions, exposure pathways to be considered, and methods of evaluating risk have changed since the time of remedy selection. As a result, the following risk scenarios have not been evaluated: (1) potential dermal contact with household groundwater use; (2) inhalation of VOCs during household groundwater use other than during showering; (3) incidental ingestion of surface water and sediment; and (4) inhalation of VOCs through vapor intrusion (VI) at nearby homes. The RA considered the first three pathways identified above but determined that it was unnecessary to perform a complete evaluation for each. The RA did not consider the fourth pathway identified above. VI was not an exposure pathway typically considered or evaluated during the period of time that the remedy was selected. This is further discussed below.

### *Groundwater Cleanup Levels*

All groundwater clean-up levels selected for the Site at the time of the remedy currently remain valid.

### *Vapor Intrusion*

While Site groundwater cleanup levels remain currently valid, they were not developed to be protective of the VI exposure pathway. VI has recently been identified as a potential pathway for human exposure to Site contaminants at nearby off-Site properties. As recommended in this FYR, this is a change which warrants an evaluation of existing data and current Site conditions to determine the current and future protectiveness of the RA.

### *Soil Clean-up Levels*

The soil clean-up levels selected at the time of the remedy may no longer be valid. However, since the remedy prevents exposure to contaminated soil through O&M of the landfill cap, the remedy remains protective against potential soil exposures.

### *RAO's*

The RAOs used at the time of the remedy selection are still valid. The remedial actions at this Site address the RAOs through the landfill cap, passive gas vents with carbon treatment canisters, a leachate collection and treatment system, and extraction wells. As described in the previous section, each of these components appears to be functioning as intended by the RODs.

### **Changes in Exposure Pathways**

The human health exposure pathways evaluated in the 1988 Endangerment Assessment (Ebasco, 1988) performed during the RI included: (1) ingestion and dermal contact with soil; (2) exposure to groundwater through ingestion of household drinking water and inhalation of vapors during showering; (3) dermal contact with leachate seeps and sediment; (4) exposure to surface

water through ingestion as drinking water; (5) inhalation of ambient air modeled from soil, groundwater, and leachate seeps; and (6) consumption of fish.

As noted in the above summary, there are potential human health exposure pathways at the Site that were not evaluated in the 1988 Endangerment Assessment, but are routinely included in present-day risk assessments. These include the following:

- Potential dermal contact with household groundwater;
- Potential inhalation of volatiles during household groundwater use not related to showering;
- Incidental ingestion associated with leachate seeps and sediment; and
- Potential inhalation of volatiles in residential indoor air through VI.

The expansion of the public water supply, establishment of institutional controls preventing use of groundwater at the Site, and the remedial actions conducted at the Site have eliminated the first three pathways listed above. Therefore, despite not being included in the development of clean-up levels, the remedies conducted at the Site remain protective of human for these exposures.

The fourth pathway, potential inhalation of volatiles in residential indoor air through VI, was not evaluated in the Endangerment Assessment (Ebasco1988). As a result, this pathway is also not addressed by the RAOs. There are no on-Site occupied buildings, so there isn't an on-Site pathway to evaluate. However, there are residential areas within the vicinity of the Site that now warrant additional investigation. The VI screening levels for VOCs in groundwater are lower than MCLs making it difficult to evaluate the VI exposure pathway at these locations using the limited existing monitoring data for shallow groundwater. The VOCs are migrating within a sand and gravel unit which generally extends to the west/northwest in the vicinity of MW-52 along the residential neighborhood of Will Dean Road. This unconsolidated soil unit may provide a preferential pathway for contaminant migration.

At the time of this FYR, there is sufficient evidence from groundwater samples collected from the deep aquifer to indicate that the VI pathway may be a potential concern at residential properties/occupied buildings in close proximity to the Site. Therefore additional evaluation and potential investigation is necessary. TCE has been detected in groundwater above

conservative VI screening levels in both 2009 and 2010 at MW-52G. MW-52G is a monitoring well located outside the Site security fencing and is closest to several homes and a newly constructed garage which is apparently in use as a workshop located along Will Dean Road. This garage is located approximately 50 to 75 feet from MW-52G. Additionally, TCE and vinyl chloride were detected above vapor intrusion screening levels during this FYR period at MW-45T and MW-45B, which are located adjacent to Route 11 on the eastern side of the landfill. However, no homes lie between this side of the landfill and the Black River. French drain sampling, specifically at FD-2, may represent the closest sampling of shallow groundwater to residents at the southwest corner of the Site. Sampling results from 2011 and 2012 at location FD-2 indicate no detections of either TCE or vinyl chloride, but the reported detection limits exceed VI screening levels.

To address the above noted conditions and VI concerns, an evaluation of the current groundwater VOC plume (particularly at the top of the water table nearest neighboring homes with low detection limits), is needed. Groundwater data from shallow overburden wells within the plume should be compared to the EPA's Office of Solid Waste and Emergency Response (OSWER) Vapor Intrusion Screening Level (VISL) Calculator, (EPA, 2012) for protection of indoor air with target risk levels set at  $1 \times 10^{-6}$  and target hazard indices set at 1.0. If the overburden groundwater concentrations are greater than the comparison values near existing homes and occupied buildings, that may be evidence of a potential VI pathway warranting additional evaluation and subsequent investigation, including soil gas sampling and/or indoor air sampling.

The 1988 ROD recommended an institutional control to prevent use of groundwater in the vicinity of the Site where groundwater concentrations may exceed maximum contaminant levels (MCLs). The Town of Springfield has implemented an institutional control to prevent use of groundwater on-site. The Town has not implemented institutional controls to prevent use of groundwater beyond the fenced area of the Site; however, an expansion of the public water supply has reduced nearby use of groundwater as drinking water, mitigating any potential impacts to the protectiveness of the remedy from exposure to off-property groundwater. In addition, current concentrations of contaminants in wells nearest Will Dean Road have dropped below MCLs, eliminating the need for restrictions on use of groundwater at existing homes at this time. This further enhances the protectiveness of the remedy.

The Endangerment Assessment (Ebasco, 1988) performed during the RI also evaluated risks posed to wildlife and aquatic organisms. The assessment concluded that there were no significant risks expected for aquatic life, birds, or mammals with the possible exception of predators of small vertebrates resulting from bioaccumulation of PCBs. The primary contaminants of concern (“COCs”) evaluated in the Endangerment Assessment, which pertain to potential risks to wildlife and aquatic organisms, are VOCs. Low detections of PCBs detected in Site soils and leachate sediments were also evaluated during the RI. It was determined prior to remedy selection that migration of these contaminants to both groundwater and surface water could be significantly reduced through both capping and leachate collection, which are treatment and off-Site disposal components of the selected RA. These COCs were addressed because all contaminated soil and sediment identified at the seeps during the RI were removed and consolidated with the other contaminated soils under the cap. A goal of the RA is to prevent contaminants from further migration to the surface water, which could result in unacceptable risk of exposure to fish, wildlife, and predators that could be at risk of bioaccumulating contaminants through ingestion. However, this pathway is not a concern because current O&M data indicate the remedy selected is performing as intended and is containing any potential migration to surface water.

### **Changes in Toxicity and Other Contaminant Characteristics**

Since the time of the Endangerment Assessment (Ebasco, 1988) performed as part of the RI, EPA has re-examined and updated toxicity factors for the majority of the contaminants evaluated and has developed or approved the use of additional toxicity factors for these contaminants.

Since 1988, EPA has issued guidance (EPA RAGS F, 2009) recommending the use of inhalation unit risk factors and reference concentrations as inhalation toxicity factors for evaluating inhalation exposures, rather than inhalation cancer slope factors and inhalation reference doses used in the Endangerment Assessment. In addition, inhalation toxicity factors have been developed and/or accepted by EPA for several VOCs identified as Site contaminants during the RI, but they have been excluded from the risk evaluation of the inhalation pathways because of a lack of inhalation toxicity factors.

EPA has not developed dermal toxicity factors; however, EPA Dermal Guidance (EPA RAGS E, 2004) provides chemical-specific dermal absorption factors not available at the time of the RI to aid in the estimation of acceptable dermal dose exposures.

Despite these changes in toxicity factors, the remedy, by preventing exposures, remains protective for the pathways evaluated in the Endangerment Assessment because it eliminates associated exposure scenarios.

### **Changes in Risk Assessment Methods**

Since the Endangerment Assessment (Ebasco, 1988) and the 1988 and 1990 RODs, changes have occurred in the formulas used to calculate risks from exposures to soil, water, and air. Additionally, methods for evaluating the VI pathway have been introduced (EPA, 2002). Recommendations for dermal permeability factors and revised guidance on dermal exposure evaluations have changed (EPA RAGS E, 2004). Guidance recommending the use of inhalation unit risk factors and reference concentrations in conjunction with average daily concentration estimates rather than average daily dose estimates for evaluating inhalation exposures has been published (EPA RAGS F, 2009). In addition, methods for calculating risks for specific contaminants or groups of contaminants have also changed; including methods for evaluating early childhood cancer risks from contaminants that act via a mutagenic mode of action (EPA's *Guidelines for Carcinogen Risk Assessment* (EPA, 2005a) and *Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens* (EPA, 2005b)), evaluating PAHs through use of relative potency factors, and evaluating dioxin-like PCBs through toxicity equivalence factors.

Despite these changes in risk assessment methods, the remedy, by preventing all identified exposure scenarios, remains protective for the pathways evaluated in the Endangerment Assessment. However, a final conclusion with respect to protectiveness of the remedy must be deferred until additional information regarding potential VI, an exposure pathway identified post-ROD, is obtained and evaluated.

### **New Contaminants and/or Contaminant Sources**

No new contaminant sources or contaminants have been identified since startup of the remedy.

## **Changes in Standards or To-Be-Considered Requirements (TBCs)**

The 1988 and 1990 RODs set forth Applicable or Relevant and Appropriate federal and state Requirements (ARARs) and To-Be-Considered Requirements (TBCs) for the selected remedy.

There have been no changes to the ARARs or TBC requirements identified in the 1988 and 1990 RODs that affect the cleanup standards for the remedy. The RODs require compliance with federal MCLs, federal maximum contaminant level goals (MCLGs), and Vermont Water Quality Standards as the groundwater clean-up criteria. The MCLs have been updated and expanded since ROD signature to include additional chemicals and reflect current toxicity values. Although the Vermont Groundwater Protection Rule was updated in February 2005, Vermont Water Quality Standards were updated in 2009, and Vermont Air Pollution Control Regulations were updated in September 2011; the changes therein do not affect cleanup action or levels at the Site. The water treatment system operates under a State of Vermont permit that is periodically updated. Although not identified in the original ARARs for both RODs, this Fourth Five-Year Review Report identifies the issuance of the EPA Vapor Intrusion Guidance (EPA, 2002) and the follow-up *Vapor Intrusion Screening Level (VISL) Calculator* (EPA, 2012) as potentially relevant guidance due to current recommendations for evaluation of the vapor intrusion pathway's impact on off-Site properties.

There are no chemical-specific ARARs or TBCs for soil. Soil cleanup levels for polycyclic aromatic hydrocarbons (PAHs) and PCBs were based on potential human health risk. As a general matter, toxicity factors and methods of calculating risks from exposure to soil have changed since the time of the RODs, therefore soil cleanup levels would be different if recalculated using present day methods. Specifically, calculation of risks from PAHs, which act via a mutagenic mode of action, and calculation of risks from PCBs, which now include consideration of dioxin-like actions of certain PCBs, have changed since the time of the RODs. With respect to the Site, however, although the existing soil cleanup levels may have changed, the remedy remains protective because it prevents any human exposure to soil on-Site.

## **Expected Progress Towards Meeting RAOs**

The 1988 ROD (OU I) established the following RAOs:

- Prevent direct contact (incidental ingestion and dermal absorption) with contaminated surface soils throughout the Site by residents and by construction workers;
- Prevent the volatilization of contaminants from contaminated soils, wastes, and leachate seeps;
- Prevent the contamination of fish in the Black River by preventing leaching of contaminants from Site soils to shallow groundwater to the bedrock aquifer with subsequent discharge to Seavers Brook and into the Black River; and
- Prevent the leaching of contaminants from Site soils to shallow groundwater with subsequent transportation from the shallow groundwater to the potable bedrock aquifer.

The 1990 ROD (OU II) established the following RAOs:

- Prevent direct contact (dermal contact and ingestion) with contaminated soil;
- Reduce or prevent, to the extent practicable, infiltration of surface and/or groundwater into waste areas and leaching of contaminants from waste areas into the groundwater below and downgradient of the waste;
- Prevent leaching of soil contaminants to the groundwater; and
- Control the harmful buildup or emission of landfill gases containing hazardous substances.

The remedial actions at this Site address these RAOs through the O&M of the landfill cap to prevent contact with soils, passive gas vents to treat landfill gas, a leachate collection and treatment system to prevent leachate from reaching ground and surface water, and a

groundwater extraction and treatment system to reduce the source and prevent migration of contaminated groundwater.

As discussed above, the VI pathway has not been evaluated and a determination regarding protectiveness at the Site cannot be made at this time. Therefore this Five-Year Review recommends further evaluation of a potential VI pathway to nearby properties.

### **7.3 Question C: Has Any Other Information Come to Light that Could Call into Question the Protectiveness of the Remedy?**

Yes. While a review of Site material and the Site Inspection revealed no new information that calls into question the effectiveness and protectiveness of the remedy selected in the RODs, this review has identified the potential for an off-Site VI pathway. No new human or ecological receptors have been identified at this time.

### **Technical Assessment Summary**

According to the data reviewed, the Site Inspection, and the interviews, the remedy is functioning as intended by the RODs. There have been no changes in the physical conditions of the Site that would affect the protectiveness of the remedy. There have been no changes to the ARARs or TBC requirements identified in the 1988 and 1990 RODs that affect the cleanup standards for the remedy.

While there have been changes to exposure assumptions, risk assessment methods, and toxicity factors used in evaluating human health and ecological risk, these changes do not impact the current protectiveness of the remedy as applied to the exposure pathways identified in the RODs. However, evaluation of the potential risks associated with the VI pathway is necessary in order to fully address the current protectiveness of the remedy.

## **8.0 ISSUES**

This Five-Year Review has identified several issues to be addressed, that are listed in Table 8.1. These issues form the basis for the recommendations set forth in Section 9.

**Table 8-1  
List of Issues  
Old Springfield Landfill Superfund Site  
Springfield, Vermont**

	Issues	Affects Protectiveness (Y/N)	
		Current	Future
1	Components of the remedy requiring repair were identified by EPA and were not implemented in a timely manner.	N	Y*
2	Annual long-term monitoring reports were not prepared and submitted in a timely manner.	N	N
3	Locks on wells used for long-term monitoring of groundwater were found missing or broken.	N	N
4	Gas vent air samples were collected from the influent of the carbon treatment canisters instead of the effluent as required.	N	N
5	Vapor intrusion pathway not evaluated	Y	Y

\* = Protectiveness not affected if adequately addressed

## 9.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

While the remedy appears to be meeting the RAOs, the continued elevated concentrations of VOCs, particularly TCE, in the PTF influent suggests that the operation of the PTF may be required after the anticipated 30 years envisioned for PRP operation and maintenance.

In response to the issues noted above, recommended actions for each of the issues raised in the previous section are listed below in Table. 9.1.

**Table 9-1  
Recommendations and Follow-up Actions  
Old Springfield Landfill Superfund Site  
Springfield, Vermont**

	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Follow-up Actions: Affects Protectiveness (Y/N)	
					Current	Future
1	Implement repairs as needed to maintain the protectiveness of the remedy within one year following identification.	Town of Springfield	EPA/VTDEC	As needed	N	Y
2	Resume annual submission of O&M reports.	Town of Springfield	EPA/VTDEC	March 30 each year	N	N
3	Replace all well locks that are missing or broken.	Town of Springfield	EPA/VTDEC	06/30/14	N	N
4	Label all gas sampling ports, indicating influent and effluent, and collect samples from the effluent.	Town of Springfield	EPA/VTDEC	06/30/14	N	N
5	Perform a vapor intrusion evaluation to determine appropriate response measures, as necessary.	Town of Springfield	EPA/VTDEC	09/30/15	Y	Y

## 10.0 PROTECTIVENESS STATEMENTS

A protectiveness determination for the remedy cannot be made until further information is obtained regarding a potential vapor intrusion pathway at the Site. An evaluation of this exposure pathway will be conducted to determine if it may pose an unacceptable human health risk at the Site. It is anticipated that this action will take approximately two years to complete, at which time a protectiveness determination will be made.

## **11.0 NEXT REVIEW**

The next (fifth) FYR for the Site is required by September 2018, because hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unrestricted use and unlimited exposure.

## 12.0 REFERENCES

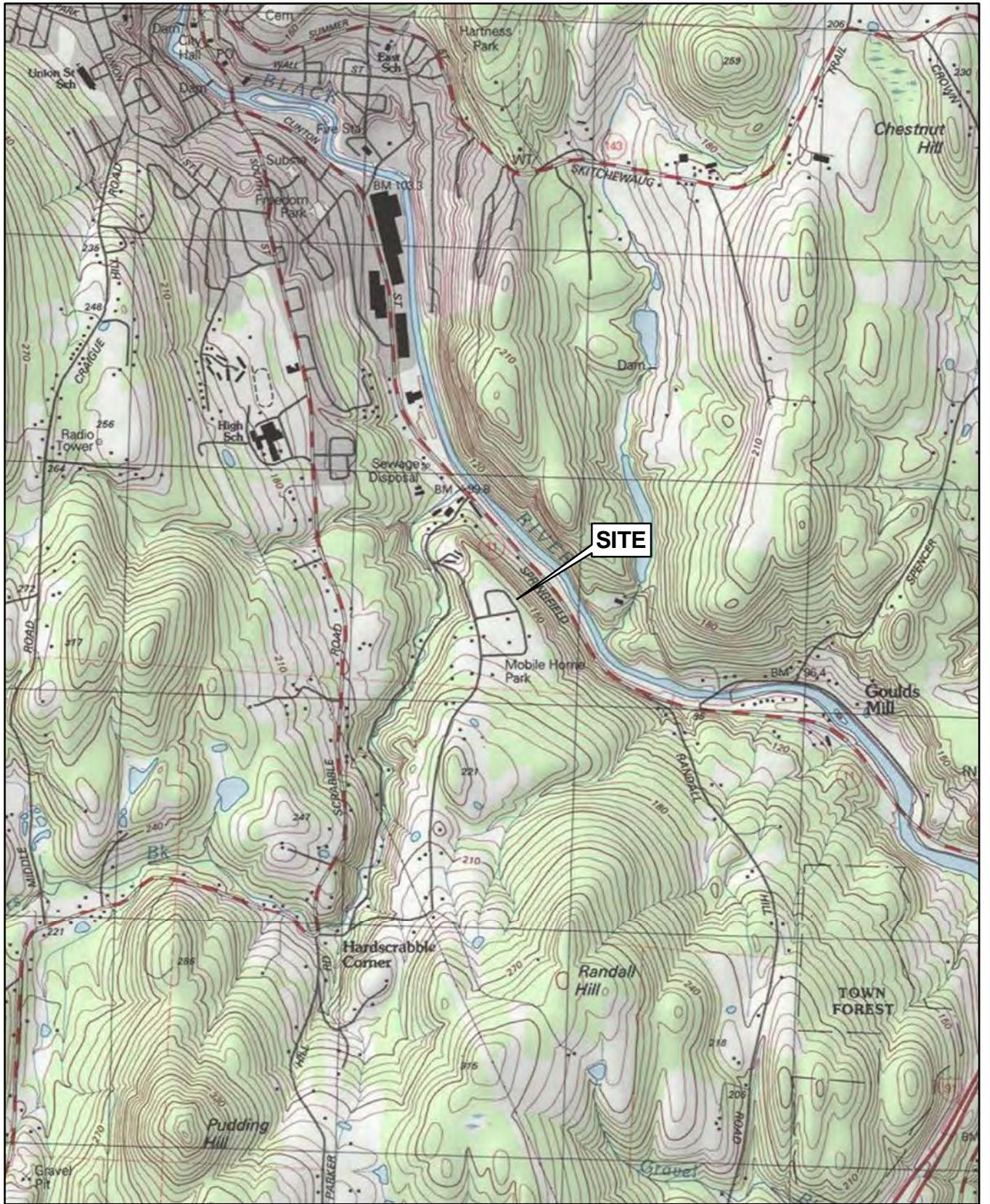
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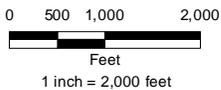
**ATTACHMENT 1**  
**SITE LOCATION MAPS**



Path: C:\Users\haring\OneDrive\Fig\_1\_Springfield\_Landfill\_Locus.mxd Date Printed: 5/20/2013



USGS Topographic Map  
Springfield, VT-NH  
Revised 1998



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**FIGURE 1**  
**LOCUS PLAN**  
Five-Year Review  
Town of Springfield  
Old Springfield Landfill Superfund Site  
Springfield, Vermont

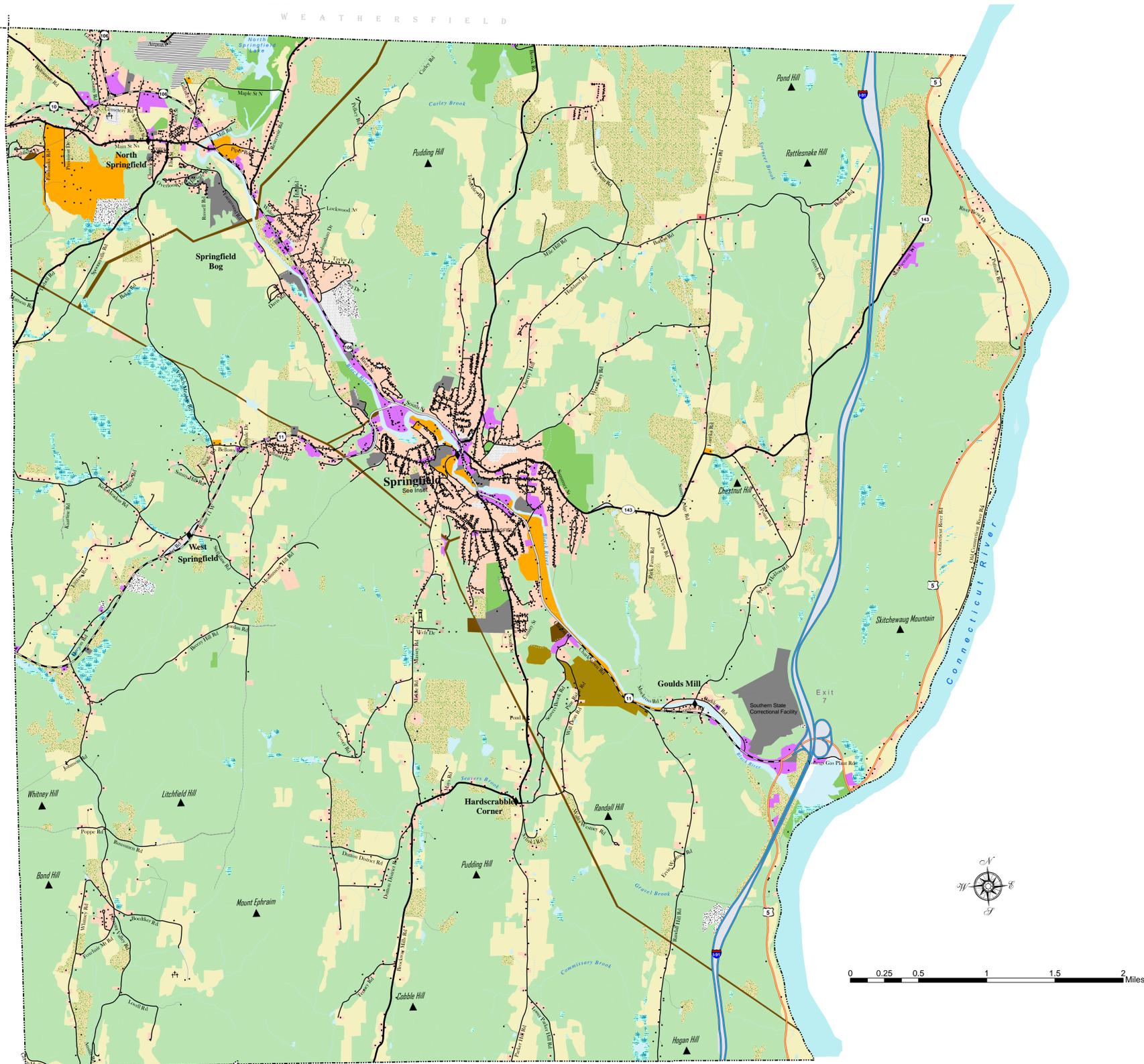
PREPARED BY: JH	CHECKED BY: GM
PROJECT NO. 80014	DATE: MAY 2013



**ATTACHMENT 2**  
**TOWN OF SPRINGFIELD MAPS**

# TOWN OF SPRINGFIELD

## Current Land Use/Land Cover



ROCKINGHAM (WINDHAM COUNTY)

### Legend

----- Town Boundary

■ Building

### Roads:

- Class I TH
- Class II TH
- Class III TH
- Class IV TH
- State Forest Road
- Private Road
- Vermont State Highway
- US Highway
- Interstate
- Legal Trail
- Driveway (Private)

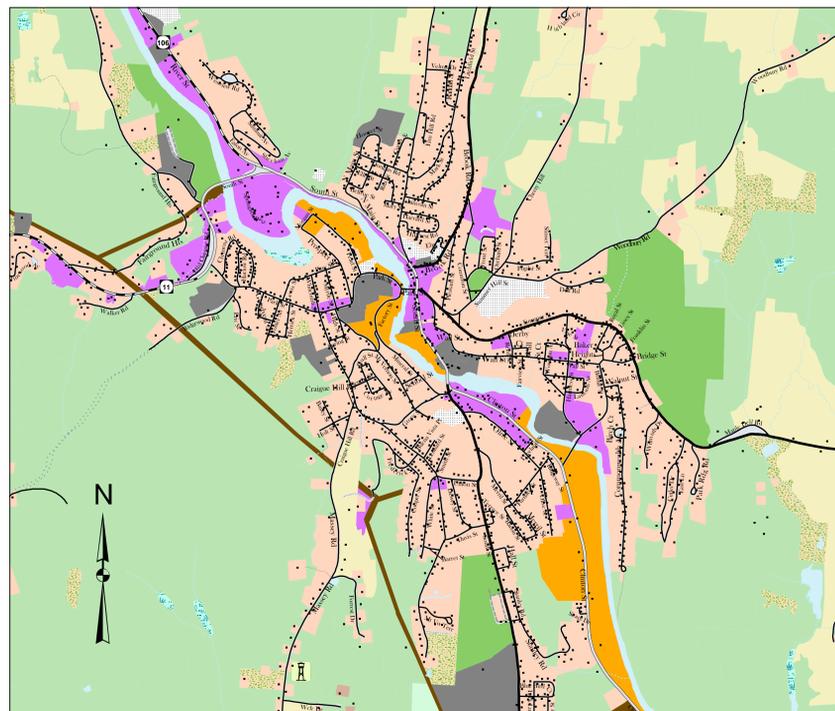
### Current Land Use:

- Agricultural Land
- Air Transportation
- Commercial
- Communication
- Cemetery/Cultural/Public Assembly
- Forest
- Government/Institutional
- Inactive Dump Sites
- Industrial
- Mixed
- Mixed Herbaceous and Shrub/Brush
- Outdoor Recreation/Assembly
- Residential
- Right of Way
- Quarry or Gravel Pit
- Utilities (elec., solid waste etc.)
- Water
- Wetland

Sources of Data:  
 Vermont Center for Geographic Information (VCGI);  
 Southern Windsor County Regional Planning Commission (SWCRPC);  
 Natural Resource Conservation Service (NRCS);  
 Micro Data, Incorporated (MicroData)

TOWN BOUNDARY: Converted from VCGI coverage "TBLASH" (SWCRPC)  
 BUILDING: Locations derived using orthophotography and GPS corrects by the Vermont E911 Program  
 ROADS: VCGI Road Centerlines from 1:5000 orthophotos and GPS correction  
 CURRENT LAND USE: Drafted on 1994 1:5000 orthophotos (MicroData)  
 SURFACE WATERS: From 1:3000 orthophotos and field verification (NRCS)

All Data and Relationships depicted in this map are intended for planning purposes only  
 SWCRPC, NRCS, MicroData and VCGI make no representation of any kind, including but not limited to the warranties of  
 merchantability or fitness for a particular use, nor are any such warranties implied with respect to this data



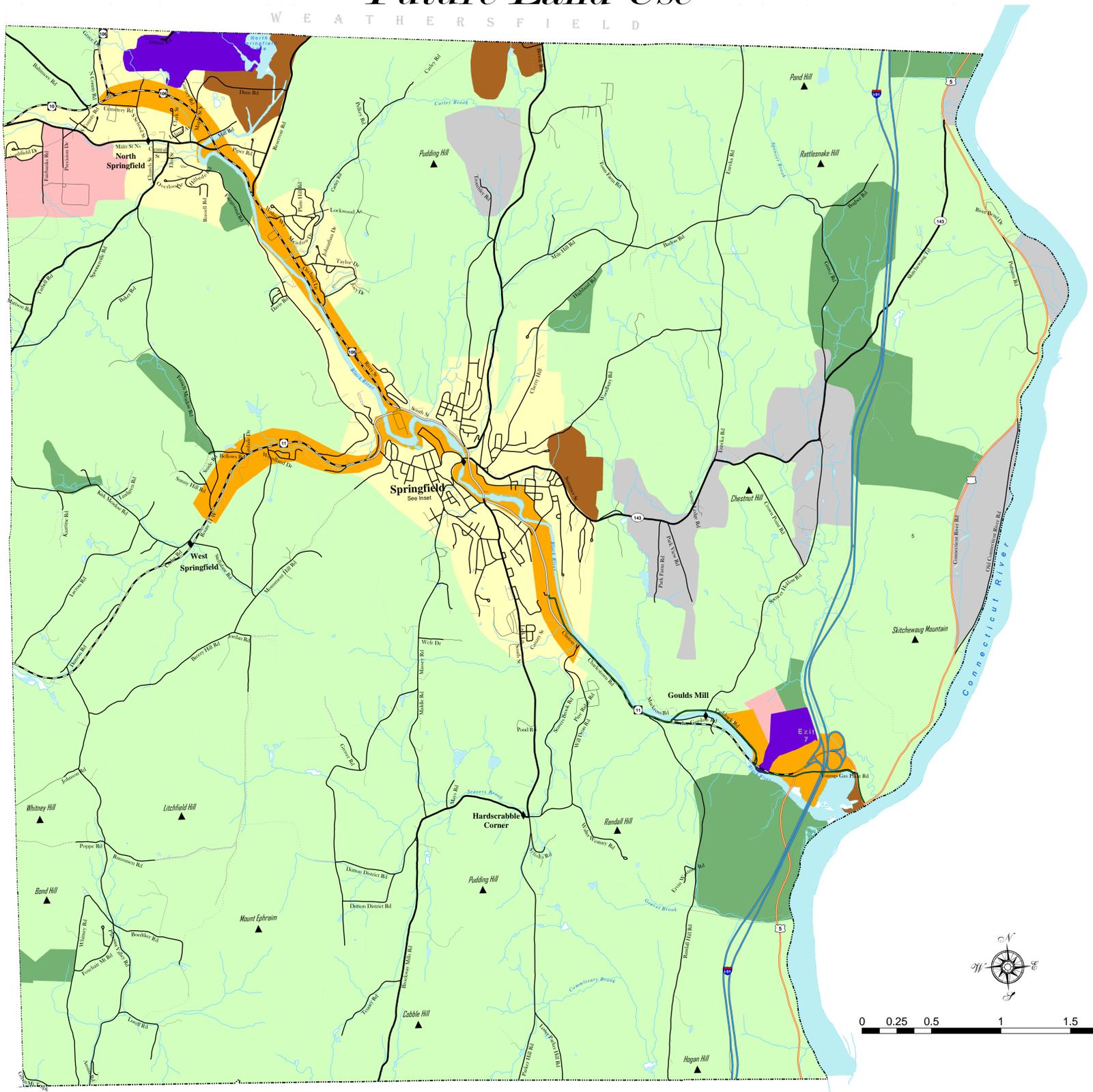
# TOWN OF SPRINGFIELD

## Future Land Use

W E A T H E R S F I E L D

C H E S T E R

N E W H A M P S H I R E



R O C K I N G H A M ( W I N D H A M C O U N T Y )

### Legend

- Town Boundary
- Blue line Rivers and lakes
- Blue line Surface Water
- Roads:**
- Class I TH
- Class II TH
- Class III TH
- Class IV TH
- State Forest Road
- Private Road
- Vermont State Highway
- US Highway
- Interstate
- Legal Trail
- Driveway (Private)
- Springfield Bike Path

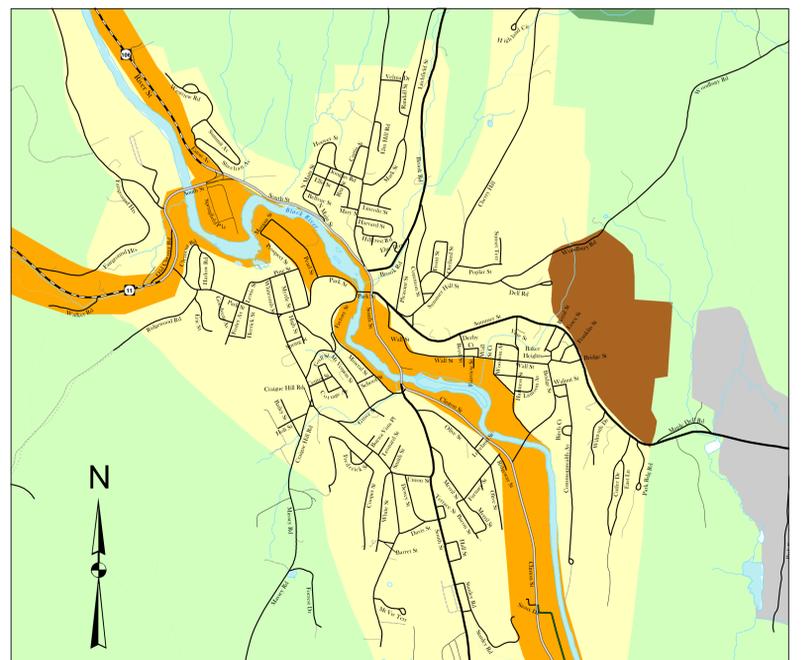
### Land Use Categories

- Grey square AGRICULTURE
- Dark green square CONSERVATION
- Light green square FOREST
- Pink square INDUSTRIAL
- Purple square INSTITUTIONAL
- Orange square MIXED USE
- Brown square RECREATION
- Yellow square RESIDENTIAL

### Sources of Data:

- Vermont Center for Geographic Information (VGCI)
- Southern Windsor County Regional Planning Commission (SWCRPC)
- ROADS: VGCI Road Centerlines from 1:5000 orthophotos and GPS correction
- SURFACE WATERS: VGCI surface water from 1:5000 orthophotos
- FUTURE LAND USE: On file from town (SWCRPC)

All Data and Relationships depicted in this map are intended for planning purposes only. SWCRPC and VGCI make no representation of any kind, including but not limited to the warranties of merchantability or fitness for a particular use, nor are any such warranties implied with respect to this data.



**ATTACHMENT 3**  
**INSTITUTIONAL CONTROLS**



SDMS DocID 262632

262632

TOWN OF SPRINGFIELD  
ORDINANCE 88-2

Be it ordained by the Town of Springfield:

SECTION I. PURPOSE: For protection of the health, safety, and welfare of the inhabitants of the Town of Springfield, it is necessary for the Board of Selectmen to have authority to determine where and when necessary, that certain parcels of land within the Town contain hazardous wastes, toxic materials or harmful chemical matter. Upon such determination, the Board of Selectmen may restrict the uses and activities upon said lands consistent with the provisions hereinafter set forth.

SECTION II. This Ordinance shall apply to any parcel of land determined to contain hazardous waste, harmful and/or toxic substances by the United States Environmental Protection Agency (EPA) and declared to be a Superfund Site or an otherwise hazardous place.

SECTION III. This Ordinance shall also apply to any parcel of land determined to contain hazardous waste, harmful and/or toxic substances by the Board of Selectmen of the Town of Springfield, or any applicable agency of the State of Vermont.

SECTION IV. The restrictions hereinafter set forth may apply to any parcel of land adjacent to land determined to be subject to Sections I-III hereof, or to any parcel of land which carries seepages or any above or below ground watercourse containing hazardous or toxic materials from land defined in Sections I-III.

**SECTION V.**

**RESTRICTIONS:** The Board of Selectmen to protect the health and welfare of the inhabitants of the Town of Springfield may, upon the designation that a parcel of land contains hazardous, harmful or toxic wastes or chemicals, by resolution, restrict the subject land in one or more of the following ways:

A. Prohibit the construction of, or the maintenance of, habitable buildings or other structures upon the subject premises;

B. Prohibit the breaking of the surface of the soil by digging, trenching, drilling, boring or disruption of the soil surface;

C. Prohibit the growing of crops upon the subject premises, the consumption thereof or transportation thereof;

D. Prohibit any residential, commercial or recreational use of said premises;

E. Prohibit the taking, use or consumption of water from or which flows through the subject premises either above or below the soil surface;

F. Prohibit the excavation, filling or depositing of any solid or liquid material on the subject premises, including the sewage, sludge or other waste material;

G. Prohibit the making of any change in the topography of the subject premises;

H. Prohibit the entry upon the subject premises by any person where the degree

of danger is such as to be a threat to life or to health;

I. Prohibit any activity on or near the subject premises which would tend to alter the water table thereon;

J. To place any other restriction on the subject premises which may in the exercise of prudence be necessary for public protection, including posting or fencing of the premises.

SECTION VI. The Board of Selectmen shall designate such parcels of land as are subject to this Ordinance by Resolution, and in said Resolution determine the applicable restrictions necessary to carry out the purposes of this Ordinance.

SECTION VII. Prior to the adoption, modification or removal of a limitation imposed by Resolution pursuant to the terms of this Ordinance, the Board of Selectmen shall cause notice to be given to each affected landowner, and to any other person who may have a record interest in said premises, and shall also give notice to any necessary State or Federal agency.

A. Notice. Notice shall include:

- (1) A statement of the time, place and nature of the hearing;
- (2) A statement of the legal authority and jurisdiction under which the hearing is to held;
- (3) A reference to the particular sections of the statutes and rules involved; and
- (4) A short and plain statement of the matters at issue.

If the Board of Selectmen or other agency is unable to state the matters in detail at the time notice is served, the initial notice may be limited to a statement of the issues involved. As soon as possible thereafter, a more definite and detailed statement shall be furnished.

B. Hearing. All persons who respond to said notice shall have opportunity to present evidence and argument on all issues involved.

C. Informal Disposition. Unless precluded by law, informal disposition may be made by stipulation, agreed settlement, consent order, or default.

D. Record. The record in each case shall include:

- (1) All pleadings, motions, intermediate rulings;
- (2) All evidence received or considered;
- (3) A statement of matters officially noticed;
- (4) Questions and offers of proof, objections and rulings thereon;
- (5) Proposed findings and exceptions; and
- (6) Any decision, opinion or report.

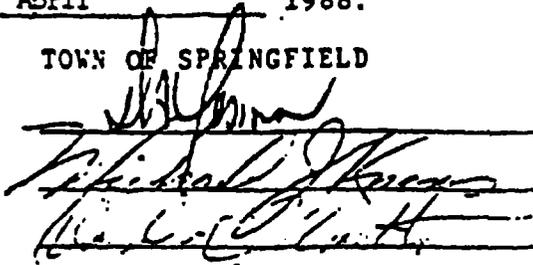
E. Evidence. Findings of fact shall be based exclusively on the evidence and on matters officially noticed.

F. Transcript. Oral proceedings or any part thereof shall be transcribed on request of any party subject to other

applicable provisions of law, and upon payment by the requesting party of the reasonable costs thereof.

Dated at Springfield, County of Windsor and State of Vermont, this 18th day of April, 1988.

TOWN OF SPRINGFIELD



Board of Selectmen

June 10, 1988

I hereby certify that the foregoing is a true copy of Ordinance 088-2 as it appears in the Book of Ordinances for the Town of Springfield, Vermont.

Attest:  CMC  
Town Clerk

TOWN OF SPRINGFIELD, VERMONT

RESOLUTION 92-4

RESOLVED, in accordance with Town of Springfield Ordinance 88-2, V, that the Old Springfield Landfill located on Will Dean Road in Springfield, Vermont is hereby determined as a parcel of land which contains hazardous waste, toxic materials or harmful chemical matters. Said parcel is more particularly described as set forth on a Drawing entitled "Figure 3, Property Boundary Plan, Old Springfield Landfill Remediation" and being the area within a proposed permanent eight (8') foot high chain link fence, a copy of which is on file in the Springfield Town Offices, and a copy of which is appended to this Resolution. Being a portion of the lands of the John Curtin Estate.

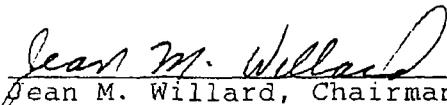
RESOLVED, in accordance with Town of Springfield Ordinance 88-2, that the designated land is subject to the following restrictions:

1. The construction of habitable buildings or other structures upon the premises is prohibited.
2. The breaking of the surface of the soil by digging, trenching, drilling, boring or disruption of the soil surface is prohibited.
3. The growing of crops or the consumption or transportation thereof on the premises is prohibited.
4. Residential, commercial, or recreational use of the premises is prohibited.
5. The taking, use, or consumption of water from or which flows through the premises, either above or below the soil surface is prohibited.
6. The excavation, filling or depositing of any solid or liquid material on the premises, including sewage, sludge or other waste material is prohibited.
7. The making of any change in the topography of the designated parcel is prohibited.
8. The entry upon the subject premises is prohibited.
9. Any activity on the subject premises which would tend to alter the water table thereon is prohibited.

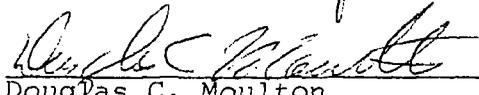
10. The prohibitions set forth above are subject to and shall not in any way encumber or inhibit the source control remedial action to be carried out as outlined in the Partial Conset Decree entered in the matter entitled "United States v. Browning-Ferris Industries of Vermont, Inc., No. 5:91CV383(D. Vt.)"

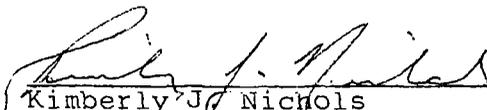
FURTHER, the restrictions set forth herein may be modified or removed at any time upon a showing by an interested party that such restriction is not necessary for the protection of the health and welfare of the inhabitants of the Town, or to carry out the remedial action.

Dated at Springfield, County of Windsor and State of Vermont, this 3rd day of August, 1992.

  
Jean M. Willard, Chairman

  
Robert D. Yoder

  
Douglas C. Moulton

  
Kimberly J. Nichols

  
V. Joyce Lindamood

ATTEST:

  
Bonnie L. Reynolds, CMC/AEE

**ATTACHMENT 4**  
**LIST OF DOCUMENTS REVIEWED**

ATTACHMENT 4  
DOCUMENTS REVIEWED/REFERENCES CITED

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**ATTACHMENT 5**

**FIVE-YEAR REVIEW INSPECTION CHECKLIST AND INTERVIEW RECORDS**

## INTERVIEW RECORD

<b>Site Name:</b> Old Springfield Landfill	<b>EPA ID No.:</b> VTD00086239
<b>Subject:</b> Fourth Five-Year Review	<b>Time:</b> PM <b>Date:</b> 4/18/13
<b>Type:</b> <u>Telephone</u> Visit      Other	Incoming      Outgoing X
<b>Location of Visit:</b> NA	

### Contact Made By:

<b>Name:</b> Deb Chisholm	<b>Title:</b> Project Scientist	<b>Organization:</b> Nobis Engineering, Inc.
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### Individual Contacted:

<b>Name:</b> Bob Forguites	<b>Title:</b> Town Manager	<b>Organization:</b> Town of Springfield
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<b>Telephone No:</b> 802-885-2104	<b>Street Address:</b> 96 Main Street
<b>Fax No:</b>	<b>City, State, Zip:</b> Springfield, VT 05156
<b>E-Mail Address:</b>	

### Summary Of Conversation

Q1: What is your overall impression of the project Site? Good  
Q2: Are you aware of any issues/concerns with the Site? No  
Q3: How do you feel the remedy is functioning at the Site? Good, but no quick enough  
Q4: Have you noticed any changes with or anything that hasn't been reported about the remedy? No  
Q5: Have there been any changes in the surrounding properties or land use in the last 5 years, or are any changes anticipated? No  
Q6: What has been the public interest and involvement with the Site in the last 5 years? None that he knows of. Most people don't know about the site.  
Q7: Does the Town have any particular property and/or re-use interests with the Site? No  
Q8: Are you aware of any changes or proposed changes in the remedy? No  
Mr. Forguites reported that the Town budgets between \$130,000 and \$150,000 per year for site O&M.

## INTERVIEW RECORD

<b>Site Name:</b> Old Springfield Landfill	<b>EPA ID No.:</b> VTD00086239
<b>Subject:</b> Fourth Five-Year Review	<b>Time:</b> 10:00 am <b>Date:</b> 4/11/13
<b>Type:</b> <u>Visit</u>	Incoming      Outgoing <input checked="" type="checkbox"/>
<b>Location of Visit:</b> Landfill Site	

### Contact Made By:

<b>Name:</b> Matt Webber	<b>Title:</b> Project Engineer	<b>Organization:</b> Nobis Engineering, Inc.
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### Individual Contacted:

<b>Name:</b> Various individuals see below	<b>Title:</b> See below	<b>Organization:</b> See below
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<b>Telephone No:</b>	<b>Street Address:</b>
<b>Fax No:</b>	<b>City, State, Zip:</b>
<b>E-Mail Address:</b>	

### Summary Of Conversation

Mr. Rick Chambers - Town of Springfield POTW  
Mr. Jeff Strong - Town of Springfield Public Works Department  
Mr. Tim White - Sanborn, Head & Associates, Inc. consultant to Town

Q1: What is your overall impression of the project Site? Good  
Q2: Are you aware of any issues/concerns with the Site? No  
Q3: How do you feel the remedy is functioning at the Site? Good  
Q4: Have you noticed any changes with or anything that hasn't been reported about the remedy? No  
Q5: Have there been any changes in the surrounding properties or land use in the last 5 years, or are any changes anticipated? No  
Q6: What has been the public interest and involvement with the Site in the last 5 years? None  
Q7: Does the Town have any particular property and/or re-use interests with the Site? No  
Q8: Are you aware of any changes or proposed changes in the remedy? No

## INTERVIEW RECORD

<b>Site Name:</b> Old Springfield Landfill	<b>EPA ID No.:</b> VTD00086239
<b>Subject:</b> Fourth Five-Year Review	<b>Time:</b> 10:00 am <b>Date:</b> 4/11/13
<b>Type:</b> <u>Telephone</u> Visit Other	Incoming Outgoing X
<b>Location of Visit:</b> NA	

### Contact Made By:

<b>Name:</b> Deb Chisholm	<b>Title:</b> Project Scientist	<b>Organization:</b> Nobis Engineering, Inc.
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### Individual Contacted:

<b>Name:</b> Michael Smith	<b>Title:</b> Project Manager	<b>Organization:</b> VTDEC
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<b>Telephone No:</b> 802-249-5826	<b>Street Address:</b> 1 National Life Drive
<b>Fax No:</b>	Montpelier, VT 05620
<b>E-Mail Address:</b>	

### Summary Of Conversation

- Q1: What is your overall impression of the project Site? Fine  
Q2: Are you aware of any issues/concerns with the Site? No  
Q3: How do you feel the remedy is functioning at the Site? Fine  
Q4: Have you noticed any changes with or anything that hasn't been reported about the remedy? No  
Q5: Have there been any changes in the surrounding properties or land use in the last 5 years, or are any changes anticipated? No  
Q6: What has been the public interest and involvement with the Site in the last 5 years? None  
Q7: Does the Town have any particular property and/or re-use interests with the Site? Unknown  
Q8: Are you aware of any changes or proposed changes in the remedy? No

## INTERVIEW RECORD

<b>Site Name:</b> Old Springfield Landfill		<b>EPA ID No.:</b> VTD00086239	
<b>Subject:</b> Fourth Five-Year Review		<b>Time:</b> AM	<b>Date:</b> 4/18/13
<b>Type:</b> <u>Telephone</u> Visit Other		Incoming	Outgoing X
<b>Location of Visit:</b> NA			

### Contact Made By:

<b>Name:</b> Deb Chisholm	<b>Title:</b> Project Scientist	<b>Organization:</b> Nobis Engineering, Inc.
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### Individual Contacted:

<b>Name:</b> William Kearns	<b>Title:</b> Planning and Zoning Officer	<b>Organization:</b> Town of Springfield
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<b>Telephone No:</b> 802-885-2104	<b>Street Address:</b> 96 Main Street
<b>Fax No:</b>	<b>City, State, Zip:</b> Springfield, VT 05156
<b>E-Mail Address:</b>	

### Summary Of Conversation

Q1: What is your overall impression of the project Site? Good  
Q2: Are you aware of any issues/concerns with the Site? No  
Q3: How do you feel the remedy is functioning at the Site? Good  
Q4: Have you noticed any changes with or anything that hasn't been reported about the remedy? No  
Q5: Have there been any changes in the surrounding properties or land use in the last 5 years, or are any changes anticipated? No  
Q6: What has been the public interest and involvement with the Site in the last 5 years? No  
Q7: Does the Town have any particular property and/or re-use interests with the Site? No  
Q8: Does the Town have any particular property and/or re-use interests with the Site? No  
Q10: Are you aware of any changes or proposed changes in the remedy? No





III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)					
1.	<b>O&amp;M Documents</b> O&M manual As-built drawings Maintenance logs Remarks _____	> POTW POTW, PTF	Readily available Readily available Readily available	Up to date Up to date Up to date	N/A N/A N/A
2.	<b>Site-Specific Health and Safety Plan</b> Contingency plan/emergency response plan Remarks _____	Town one at POTW	Readily available Readily available	Up to date Up to date	N/A N/A
3.	<b>O&amp;M and OSHA Training Records</b> Remarks _____	POTW	Readily available	Up to date	N/A
4.	<b>Permits and Service Agreements</b> Air discharge permit Effluent discharge Waste disposal, POTW Other permits Remarks _____	POTW	Readily available Readily available Readily available Readily available	Up to date Up to date Up to date Up to date	N/A N/A N/A N/A
5.	<b>Gas Generation Records</b> Remarks _____	lab reports + yrlly reports POTW	Readily available	Up to date	N/A
6.	<b>Settlement Monument Records</b> Remarks _____		Readily available	Up to date	N/A
7.	<b>Groundwater Monitoring Records</b> Remarks _____	log sheets & monitoring reports POTW	Readily available	Up to date	N/A
8.	<b>Leachate Extraction Records</b> Remarks _____	PTF monthly → POTW	Readily available	Up to date	N/A
9.	<b>Discharge Compliance Records</b> Air Water (effluent) Remarks _____	POTW	Readily available Readily available	Up to date Up to date	N/A N/A
10.	<b>Daily Access/Security Logs</b> Remarks _____	at PTF	Readily available	Up to date	N/A

IV. O&M COSTS			
1.	<b>O&amp;M Organization</b>		
	State in-house	Contractor for State	
	PRP in-house	Contractor for PRP	
	Federal Facility in-house	Contractor for Federal Facility	
	Other	<u>Town of Springfield in house + contractor Sanborn, Head, + Associates</u>	
2.	<b>O&amp;M Cost Records</b>		
	Readily available	Up to date	
	Funding mechanism/agreement in place		
	Original O&M cost estimate	<u>\$200,000/yr</u>	Breakdown attached
	Total annual cost by year for review period if available		
	From <u>7/30/07</u>	To <u>7/30/08</u>	<u>130,000</u> Breakdown attached
	Date	Date	Total cost
	From <u>7/30/08</u>	To <u>7/30/09</u>	<u>130,000</u> Breakdown attached
	Date	Date	Total cost
	From <u>7/30/09</u>	To <u>7/30/10</u>	<u>130,000</u> Breakdown attached
	Date	Date	Total cost
	From <u>7/30/10</u>	To <u>7/30/11</u>	<u>130,000</u> Breakdown attached
	Date	Date	Total cost
	From <u>7/30/11</u>	To <u>7/30/12</u>	<u>130,000</u> Breakdown attached
	Date	Date	Total cost
3.	<b>Unanticipated or Unusually High O&amp;M Costs During Review Period</b>		
	Describe costs and reasons: _____		
	<u>Cap repairs \$ 9-10,000 w/in budget</u>		
	_____		
	_____		
	_____		
<b>V. ACCESS AND INSTITUTIONAL CONTROLS</b>			
			(Applicable) N/A
<b>A. Fencing</b>			
1.	<b>Fencing damaged</b>	Location shown on site map	(Gates secured) N/A
	Remarks <u>some trees on fence but fence still okay</u>		
<b>B. Other Access Restrictions</b>			
1.	<b>Signs and other security measures</b>	Location shown on site map	N/A
	Remarks <u>signs + locked gates</u>		

Off-Site wells not secure - some locked, some not access not restricted.

C. Institutional Controls (ICs)				
1.	<b>Implementation and enforcement</b>			
	Site conditions imply ICs not properly implemented	Yes	No	N/A
	Site conditions imply ICs not being fully enforced	Yes	No	N/A
	Type of monitoring (e.g., self-reporting, drive by) _____			
	Frequency _____			
	Responsible party/agency _____			
	Contact _____			
	Name	Title	Date	Phone no.
	Reporting is up-to-date	Yes	No	N/A
	Reports are verified by the lead agency	Yes	No	N/A
	Specific requirements in deed or decision documents have been met	Yes	No	N/A
	Violations have been reported	Yes	No	N/A
	Other problems or suggestions:	Report attached		
	Nearby residents may still be using gw as down gradient			
	GW on-site is Not being used.			
	_____			
	_____			
2.	<b>Adequacy</b>	ICs are adequate	ICs are inadequate	N/A
	Remarks	_____		
	_____			
D. General				
1.	<b>Vandalism/trespassing</b>	Location shown on site map	No vandalism evident	
	Remarks	_____		
	_____			
2.	<b>Land use changes on site</b>	N/A		
	Remarks	_____		
	_____			
3.	<b>Land use changes off site</b>	N/A		
	Remarks	_____		
	_____			
VI. GENERAL SITE CONDITIONS				
<b>A. Roads</b>	Applicable	N/A		
1.	<b>Roads damaged</b>	Location shown on site map	Roads adequate	N/A
	Remarks	_____		
	_____			

<b>B. Other Site Conditions</b>			
Remarks _____ _____ _____ _____			
<b>VII. LANDFILL COVERS</b>			
		Applicable	N/A
<b>A. Landfill Surface</b>			
1.	<b>Settlement</b> (Low spots) Areal extent _____ Remarks _____	Location shown on site map _____ Depth _____	Settlement not evident
2.	<b>Cracks</b> Lengths _____ Widths _____ Remarks _____	Location shown on site map _____ Depths _____	Cracking not evident
3.	<b>Erosion</b> Areal extent _____ Remarks _____	Location shown on site map _____ Depth <del>unknown</del> _____	Erosion not evident
4.	<b>Holes</b> Areal extent <u>5 x 4 inch diam</u> Remarks <u>- animal burrows - on-site near edge of cap</u>	Location shown on site map _____ Depth <u>unknown</u>	Holes not evident
5.	<b>Vegetative Cover</b> (Trees/Shrubs) (indicate size and locations on a diagram) Remarks <u>Trees/shrubs not on cap itself, off to sides but near drainage structures</u>	<u>Grass</u> <u>Cover properly established</u>	No signs of stress
6.	<b>Alternative Cover</b> (armored rock, concrete, etc.) Remarks _____		N/A
7.	<b>Bulges</b> Areal extent _____ Remarks _____	Location shown on site map _____ Height _____	Bulges not evident

8.	<b>Wet Areas/Water Damage</b>	Wet areas/water damage not evident	
	Wet areas	Location shown on site map	Areal extent _____
	<u>Ponding</u>	<u>Location shown on site map</u>	Areal extent <u>perimeter drainage ditch</u>
	Seeps	Location shown on site map	Areal extent _____
	Soft subgrade	Location shown on site map	Areal extent _____
	Remarks <u>ponding NW corner along perimeter</u>		
9.	<b>Slope Instability</b>	Slides	Location shown on site map <u>No evidence of slope instability</u>
	Areal extent _____		
	Remarks _____		
<b>B. Benches</b>		Applicable	<u>N/A</u>
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)			
1.	<b>Flows Bypass Bench</b>	Location shown on site map	N/A or okay
	Remarks _____		
2.	<b>Bench Breached</b>	Location shown on site map	N/A or okay
	Remarks _____		
3.	<b>Bench Overtopped</b>	Location shown on site map	N/A or okay
	Remarks _____		
<b>C. Letdown Channels</b>		<u>Applicable</u>	N/A <u>3</u>
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)			
1.	<b>Settlement</b>	Location shown on site map	<u>No evidence of settlement</u>
	Areal extent _____	Depth _____	
	Remarks _____		
2.	<b>Material Degradation</b>	Location shown on site map	<u>No evidence of degradation</u>
	Material type _____	Areal extent _____	
	Remarks _____		
3.	<b>Erosion</b>	Location shown on site map	<u>No evidence of erosion</u>
	Areal extent _____	Depth _____	
	Remarks <u>Has been repaired August 2012</u>		

4.	<b>Undercutting</b>	Location shown on site map _____	No evidence of undercutting
	Areal extent _____	Depth _____	
	Remarks _____		
5.	<b>Obstructions</b>	Type _____	No obstructions
	Location shown on site map _____		Areal extent _____
	Size _____		
	Remarks _____		
6.	<b>Excessive Vegetative Growth</b>	Type <u>grass</u>	
	No evidence of excessive growth		
	Vegetation in channels does not obstruct flow		
	Location shown on site map _____	Areal extent <u>limited 100 ft/1000 ft</u>	
	Remarks <u>Some vegetation removed in Fall 2012. Further removal planned; regular maintenance scheduled</u>		
<b>D. Cover Penetrations</b> Applicable      N/A			
1.	<b>Gas Vents</b>	Active _____	Passive _____
	Properly secured/locked _____	Functioning _____	Routinely sampled _____
	Evidence of leakage at penetration _____	Needs Maintenance _____	Good condition _____
	N/A		
	Remarks <u>Not locked in small sheds</u> <u>Sampling port located prior to carbon unit; discussing better options</u>		
2.	<b>Gas Monitoring Probes</b>	Properly secured/locked _____	Functioning _____
	Evidence of leakage at penetration _____	Routinely sampled _____	Good condition _____
	Remarks _____	Needs Maintenance _____	N/A
3.	<b>Monitoring Wells (within surface area of landfill)</b>	Properly secured/locked _____	Functioning _____
	Evidence of leakage at penetration _____	Routinely sampled _____	Good condition _____
	Remarks <u>not locked, some rusted shut, not routinely sampled</u>	Needs Maintenance _____	N/A
4.	<b>Leachate Extraction Wells</b>	Properly secured/locked _____	Functioning _____
	Evidence of leakage at penetration _____	Routinely sampled _____	Good condition _____
	Remarks <u>not locked</u>	Needs Maintenance _____	N/A
5.	<b>Settlement Monuments</b>	Located _____	Routinely surveyed _____
	Remarks _____		
	N/A		

<b>H. Retaining Walls</b>		Applicable	<u>N/A</u>
1.	<b>Deformations</b> Horizontal displacement _____ Rotational displacement _____ Remarks _____	Location shown on site map	Deformation not evident
2.	<b>Degradation</b> Remarks _____	Location shown on site map	Degradation not evident
<b>I. Perimeter Ditches/Off-Site Discharge</b>		Applicable	N/A
1.	<b>Siltation</b> Areal extent _____ Remarks <u>MINIMAL SILTATION IN FABRIFORM PERIMETER DITCH</u>	Location shown on site map	Siltation not evident Depth <u>1" MAX</u>
2.	<b>Vegetative Growth</b> Vegetation does not impede flow Areal extent _____ Remarks <u>Some veg, worst areas cleaned summer 2012</u>	Location shown on site map	N/A Type <u>GRASS</u>
3.	<b>Erosion</b> Areal extent _____ Remarks _____	Location shown on site map	<u>Erosion not evident</u> Depth _____
4.	<b>Discharge Structure</b> Remarks <u>CLEANED WITHIN LAST YEAR</u>	<u>Functioning</u>	N/A
<b>VIII. VERTICAL BARRIER WALLS</b>		Applicable	<u>N/A</u>
1.	<b>Settlement</b> Areal extent _____ Remarks _____	Location shown on site map	Settlement not evident Depth _____
2.	<b>Performance Monitoring</b> Performance not monitored Frequency _____ Head differential _____ Remarks _____	Type of monitoring _____	Evidence of breaching _____

<b>E. Gas Collection and Treatment</b>			<u>Applicable</u>	N/A
1.	<b>Gas Treatment Facilities</b>	Flaring <u>Good condition</u>	Thermal destruction Needs Maintenance	Collection for reuse
	Remarks	<u>passive absorption on carbon in + out March 31, 2013</u> <u>discharge to atmosphere sampling</u>		
2.	<b>Gas Collection Wells, Manifolds and Piping</b>	<u>Good condition</u>	Needs Maintenance	<u>100 x VT HAAS values</u> <u>may need mod of sampling port</u>
	Remarks	<u>vents</u> <u>sampling port before carbon treatment</u> <u>bee hive evidence sample at low barometric pressure</u>		
3.	<b>Gas Monitoring Facilities</b> (e.g., gas monitoring of adjacent homes or buildings)	<u>Good condition</u>	Needs Maintenance	<u>N/A</u>
	Remarks			
<b>F. Cover Drainage Layer</b>			<u>Applicable</u>	N/A
1.	<b>Outlet Pipes Inspected</b>	<u>Functioning</u>		N/A
	Remarks			
2.	<b>Outlet Rock Inspected</b>	Functioning	<u>N/A</u>	
	Remarks			
<b>G. Detention/Sedimentation Ponds</b>			<u>Applicable</u>	N/A
1.	<b>Siltation</b> Areal extent _____ Depth _____	<u>Siltation not evident</u>		<u>N/A</u>
	Remarks	<u>POUND DRY UPON INSPECTION</u>		
2.	<b>Erosion</b> Areal extent _____ Depth _____	<u>Erosion not evident</u>		
	Remarks			
3.	<b>Outlet Works</b>	<u>Functioning</u>	N/A	
	Remarks	<u>MINIMAL FLOW</u>		
4.	<b>Dam</b>	<u>Functioning</u>	N/A	
	Remarks			

<b>IX. GROUNDWATER/SURFACE WATER REMEDIES</b>		Applicable	N/A
<b>A. Groundwater Extraction Wells, Pumps, and Pipelines</b>		Applicable	N/A
1.	<b>Pumps, Wellhead Plumbing, and Electrical</b> Good condition      All required wells properly operating Needs Maintenance      N/A Remarks _____ _____		
2.	<b>Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> Good condition      Needs Maintenance Remarks _____ _____		
3.	<b>Spare Parts and Equipment</b> Readily available      Good condition      Requires upgrade      Needs to be provided Remarks _____ _____		
<b>B. Surface Water Collection Structures, Pumps, and Pipelines</b>		Applicable	N/A
1.	<b>Collection Structures, Pumps, and Electrical</b> Good condition      Needs Maintenance Remarks _____ _____		
2.	<b>Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances</b> Good condition      Needs Maintenance Remarks _____ _____		
3.	<b>Spare Parts and Equipment</b> Readily available      Good condition      Requires upgrade      Needs to be provided Remarks _____ _____		

C. Treatment System		Applicable	N/A
1.	<b>Treatment Train</b> (Check components that apply) Metals removal _____ Oil/water separation _____ Bioremediation _____ ✓ Air stripping _____ ✓ Carbon adsorbers _____ ✓ Filters <u>on order</u> _____ <u>Δ 2/wk</u> <u>last 10 years</u> _____ Additive (e.g., chelation agent, flocculent) _____ Others _____ Good condition _____ <u>Needs Maintenance</u> _____ ✓ Sampling ports properly marked and <u>functional</u> _____ <u>influent a effluent</u> <u>monthly pH</u> <u>metals</u> Sampling/maintenance log displayed and up to date ✓ <u>at treatment plant</u> _____ Equipment properly identified _____ Quantity of groundwater treated annually <u>25-30,000 gal/day</u> _____ Quantity of surface water treated annually <u>0</u> _____ Remarks <u>mechanical seal on pump needs maintenance</u> <u>influent sampling port not labeled.</u>		
2.	<b>Electrical Enclosures and Panels</b> (properly rated and functional) N/A _____ <u>Good condition</u> _____ Needs Maintenance _____ Remarks _____		
3.	<b>Tanks, Vaults, Storage Vessels</b> N/A _____ <u>Good condition</u> _____ Proper secondary containment _____ Needs Maintenance _____ Remarks _____		
4.	<b>Discharge Structure and Appurtenances</b> N/A _____ <u>Good condition</u> _____ Needs Maintenance _____ Remarks _____		
5.	<b>Treatment Building(s)</b> N/A _____ <u>Good condition</u> (esp. roof and doorways) _____ Needs repair _____ Chemicals and equipment properly stored _____ Remarks _____		
6.	<b>Monitoring Wells</b> (pump and treatment remedy) Properly secured/locked <u>Functioning</u> _____ <u>Routinely sampled</u> _____ <u>Good condition</u> _____ All required wells located _____ Needs Maintenance _____ N/A _____ Remarks <u>on-site wells not locked, off-site wells</u> <u>some locks damaged or not present</u>		
<b>D. Monitoring Data</b>			
1.	Monitoring Data	Is routinely submitted on time	Is of acceptable quality
2.	Monitoring data suggests:	Groundwater plume is effectively contained	Contaminant concentrations are declining

<b>D. Monitored Natural Attenuation</b>			
1.	<b>Monitoring Wells</b> (natural attenuation remedy)		
	Properly secured/locked	Functioning	Routinely sampled
	All required wells located	Needs Maintenance	Good condition
	Remarks _____		(N/A)
<b>X. OTHER REMEDIES</b>			
If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.			
<b>XI. OVERALL OBSERVATIONS</b>			
<b>A. Implementation of the Remedy</b>			
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).			
<p style="margin-left: 20px;">Remedy appears to be effective and functioning.</p> <ul style="list-style-type: none"> <li>- Well security needs improvement</li> <li>- Trees near down shoots should be removed</li> <li>- Town monitoring reports <del>was</del> not submitted on time</li> <li>- Nearby residents may still be using gw as dr upgradient</li> </ul>			
<b>B. Adequacy of O&amp;M</b>			
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.			
<p style="margin-left: 20px;">Repairs to cap could be made in a more timely manner.</p>			

<b>C. Early Indicators of Potential Remedy Problems</b>
<p>Describe issues and observations such as unexpected changes in the cost or scope of O&amp;M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.</p> <p><i>None</i></p> <hr/>
<b>D. Opportunities for Optimization</b>
<p>Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.</p> <hr/>

**ATTACHMENT 6**

**SITE PHOTOS FROM THE FIVE-YEAR REVIEW INSPECTION**

**Photo Log**  
**Five-Year Review Inspection April 11, 2013**

Photo 1: View of the landfill cap, looking east



Photo 2: View of the landfill cap, looking southeast



**Photo Log**  
**Five-Year Review Inspection April 11, 2013**

Photo 3: View of the eastern slope, looking east



Photo 4: View of the treatment building, looking south



**Photo Log**  
**Five-Year Review Inspection April 11, 2013**

Photo 5: View of tree leaning on the fence in the southwest corner of the Site, looking west



Photo 6: View of tree branch on fence in southwest corner of Site, looking south



**Photo Log**  
**Five-Year Review Inspection April 11, 2013**

Photo 7: View of ponded water west of the access road leading to the cap, looking west



Photo 8: View of formerly rutted area in perimeter road repaired with gravel, northwest corner of the cap, looking west



**Photo Log**  
**Five-Year Review Inspection April 11, 2013**

Photo 9: View of the southern perimeter drainage swale, looking east



Photo 10: View of a typical animal burrow adjacent to the southern perimeter drainage swale



**Photo Log**  
**Five-Year Review Inspection April 11, 2013**

Photo 11: View of the sedimentation pond, looking south



Photo 12: View of the western downchute, looking north



**Photo Log**  
**Five-Year Review Inspection April 11, 2013**

Photo 13: View of the central downchute, looking south



Photo 14: View of the culvert south of the lower access road, looking north



**Photo Log**  
**Five-Year Review Inspection April 11, 2013**

Photo 15: View of small trees near the central downchute, looking south



Photo 16: View of offsite monitoring wells adjacent to Route 11



**Photo Log**  
**Five-Year Review Inspection April 11, 2013**

Photo 17: View of the manhole and access hatch at the western seep

