SIXTH FIVE-YEAR REVIEW REPORT FOR OLD SPRINGFIELD LANDFILL SUPERFUND SITE WINDSOR COUNTY, VERMONT

Prepared by

U.S. Environmental Protection Agency
Region 1
Boston, Massachusetts

Olson, Bryan
Digitally signed by Olson, Bryan
Date: 2023.07.26 12:13:40 -04'00'

Bryan Olson, Division Director
Superfund and Emergency Management Division

Date

SEMS Doc ID 100026135

Table of Contents

LIST OF ABBREVIATIONS & ACRONYMS....2
I. INTRODUCTION....4
FIVE-YEAR REVIEW SUMMARY FORM....5
II. RESPONSE ACTION SUMMARY....7
Basis for Taking Action....7
Response Actions....7
Status of Implementation....8
Institutional Controls....11
Systems Operations/O&M....14
III. PROGRESS SINCE THE PREVIOUS REVIEW....15
IV. FIVE-YEAR REVIEW PROCESS....16
Community Notification, Community Involvement and Site Interviews....16
Data Review....17
Site Inspection....26
V. TECHNICAL ASSESSMENT....26
QUESTION A: Is the remedy functioning as intended by the decision documents?....26
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?....28
QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?....34
VI. ISSUES/RECOMMENDATIONS....34
VII. PROTECTIVENESS STATEMENT....35
VIII. NEXT REVIEW....36
APPENDIX A – REFERENCE LIST....A-1
APPENDIX B – SITE CHRONOLOGY....B-1
APPENDIX C – INSTITUTIONAL CONTROLS....C-1
APPENDIX D – PRESS NOTICE....D-1
APPENDIX E – INTERVIEWS....E-1
APPENDIX F – DATA REVIEW....F-1
APPENDIX G – SITE INSPECTION CHECKLIST....G-1
APPENDIX H – SITE INSPECTION PHOTOS....H-1
APPENDIX I – ARARS REVIEW....I-1
APPENDIX J – SCREENING-LEVEL RISK REVIEW....J-1

LIST OF ABBREVIATIONS & ACRONYMS

ALM	Adult Lead Methodology
ANR	Agency of Natural Resources
AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirements
ATSDR	Agency for Toxic Substances and Disease Registry
BLL	Blood Lead Level
CASRN	Chemical Abstracts Service Registry Number
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFC	Chlorofluorocarbon
CFR	Code of Federal Regulations
CIC	Community Involvement Coordinator
Cis-1,2-DCE	Cis-1,2-dichloroethene
COC	Contaminant of Concern
DEC	Department of Environmental Conservation
DOH	Department of Health
EAI	Eastern Analytical, Inc.
EPA	United States Environmental Protection Agency
FD	French Drain
FYR	Five-Year Review
GAC	Granular Activated Carbon
GES	Groundwater Enforcement Standard
HAAS	Hazardous Ambient Air Standards
HFPO-DA	Hexafluoropropylene oxide dimer acid
HQ	Hazard Quotient
IC	Institutional Control
lb	Pound
IRIS	Integrated Risk Information System
MCL	Maximum Contaminant Level
mg/kg	Milligrams per Kilogram
mg/kg-day	Milligrams per Kilogram per Day
µg/dL	micrograms per deciliter
µg/L	Micrograms per Liter
$\mu g/m^3$	Micrograms per Cubic Meter
MRL	Minimum Risk Levels
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
ng/L	nanograms per liter
NIOSH	National Institute of Occupational Safety and Health
NPL	National Priorities List
OLEM	Office of Land and Emergency Management
OHHRRAF	OLEM's Human Health Regional Risk Assessment Forum
O&M	Operation and Maintenance
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PAH	Polycyclic Aromatic Hydrocarbons
PAL	Preventative Action Level
PCB	Polychlorinated Biphenyls
PCE	Tetrachloroethene
PEL	Permissible Exposure Limit
PFAS	Per- and Polyfluoroalkyl Substances
PFBA	Perfluorobutanoic Acid
PFBS	Perfluorobutanesulfonic Acid

PFHpA	Perfluoroheptanoic Acid
PFHxA	Perfluorohexanoic Acid
PFHxS	Perfluorohexane Sulfonic Acid
PFNA	Perfluorononanoic Acid
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctane Sulfonic Acid
PMCL	Proposed Maximum Contaminant Level
POTW	Publicly Owned Treatment Works
ppb	Parts per Billion
ppm	Parts per Million
ppt	Parts per Trillion
PQL	Practical Quantitation Limit
PRP	Potentially Responsible Party
PPRTV	Provisional Peer Reviewed Toxicity Value
PTF	Pre-Treatment Facility
Q	Quarter
QAPP	Quality Assurance Project Plan
RAO	Remedial Action Objective
REL	Recommended Exposure Limits
RfC	Reference Concentration
RfD	Reference Dose
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
RSL	Regional Screening Level
SL	Screening Level
TAL	Target Analyte List
TBC	To Be Considered Criteria
TCE	Trichloroethene
THF	Tetrahydrofuran
TWA	Time-Weighted Average
UU/UE	Unlimited Use and Unrestricted Exposure
VAPCR	Vermont Air Pollution Control Regulations
VISL	Vapor Intrusion Screening Level
VOC	Volatile Organic Compound
WWTF	Wastewater Treatment Facility

I. INTRODUCTION

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the sixth FYR for the Old Springfield Landfill Superfund site (Site). The triggering action for this statutory review is the completion date of the previous FYR. The FYR has been prepared because hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site consists of two operable units (OUs). OU1, the management of migration remedy, includes groundwater and leachate collection and treatment. OU2, the source control remedy, includes the groundwater Pre-Treatment Facility (PTF), surface water diversions trenches and the construction of landfill cover. This FYR addresses both OUs.

EPA remedial project manager (RPM) Benjamin Kuhaneck led the FYR. Participants included the Site's previous EPA RPM Kevin Heine, EPA community involvement coordinator (CIC) Aaron Shaheen, EPA attorney Maximilian Boal, EPA human health risk assessor Paulina Do, EPA ecological risk assessor Bart Hoskins, Vermont Department of Environmental Conservation (DEC) representative Graham Bradley and Kirby Webster and Lauren Johnson from FYR support contractor Skeo. The town of Springfield (the Town, a potentially responsible party [PRP]) was notified of the initiation of the FYR. The review began on 1/11/2023.

Appendix A includes a list of documents reviewed for this FYR. Appendix B provides a chronology of site events.

Site Background

The 10-acre Site is about 1 mile southwest of the town of Springfield in Windsor County, Vermont (Figure 1). From 1947 to 1968, the Town operated the Old Springfield Landfill, previously referred to as the Will Dean Dump. Hazardous industrial waste from local industries and municipal trash were disposed of at the landfill. The industrial waste was disposed of in discrete trenches and mixed with municipal solid waste. Most hazardous waste was reportedly in bulk liquid and semi-liquid form.

In 1968, the landfill property was sold and developed for use as a mobile home community, known as Springfield Mobile Home Estates (Figure 1). At the time of the mobile home community's development, the Vermont Department of Health (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. The permit for the mobile home community required the residents to be provided with town water. Municipal water lines were extended to serve the mobile homes. By 1994, Springfield Mobile Homes Estates was no longer occupied and mobile homes were removed. The Site currently consists of the Western Seep (which collects groundwater discharge from an area along Seavers Brook Road) and the capped landfill on Will Dean Road (which includes extraction points from which groundwater is conveyed to the on-site PTF). The portion of the Site occupied by the landfill is undeveloped land. Woodlands border the landfill to the north, east and south (Figure 1). Residences along Will Dean Road border the landfill property to the west. A condominium complex consisting of six buildings and 13 single family residences is north of the Site. Current land use is not anticipated to change in the reasonably foreseeable future.

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 discharges to the Connecticut River. Will Dean Road is located along the western side of the Site. Route 11 runs along the eastern side of the Site (Figure 1).

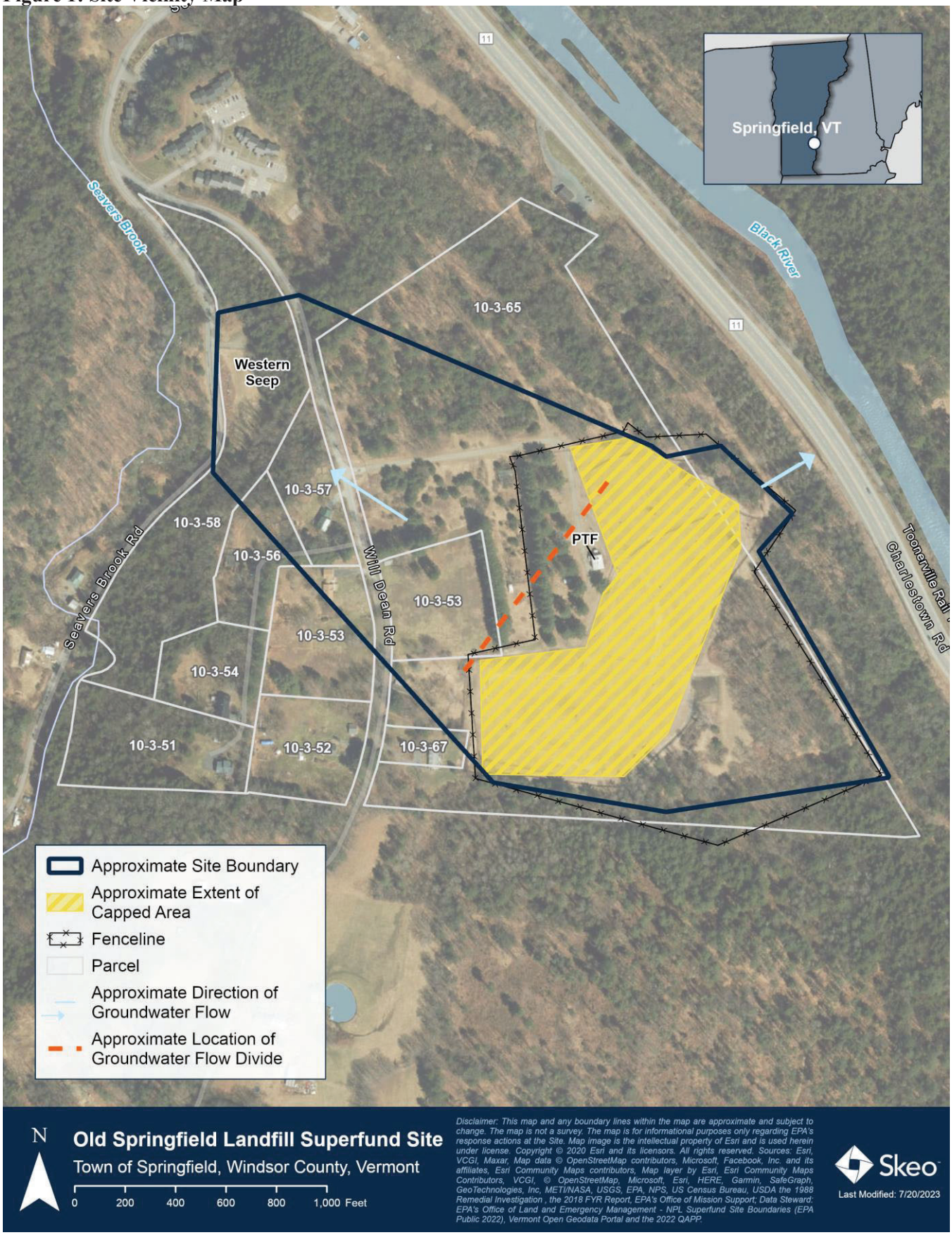
The geology at the Site consists of overburden consisting of silt, glacial till, sands and gravel which is located over bedrock. Groundwater occurs in both the overburden and in the underlying bedrock. Site groundwater is recharged from uplands located south of the landfill. Beneath the waste areas, shallow groundwater in the silt and glacial till flows generally to the east and discharges in seeps and springs on the slopes of the Site. Discharge of the deeper groundwater is anticipated to occur in the sands and gravels along the Black River. Due to the Site's location on a plateau between the Black River and Seavers Brook, a northwest/southwest oriented groundwater divide is present on site. A portion of groundwater at the Site migrates northwest toward Seavers Brook and discharges at the Western Seep. Groundwater in the bedrock flows generally to the east toward the Black River (Figure 1).

Groundwater contamination has historically been located in greatest concentrations beneath the southeastern portion of the landfill. The bedrock aquifer is a current source of drinking water in the area for those individuals not connected to the municipal water supply system. Users of the bedrock aquifer groundwater near the Site are located primarily upgradient of the Site or are beyond the site groundwater plume. 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.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Old Springfield Landfill		
EPA ID: VTD000860239		
Region: 1	**State:** VT	**City/County:** Springfield/Windsor
SITE STATUS		
NPL Status: Final		
Multiple OUs? Yes	**Has the site achieved construction completion?** Yes	
REVIEW STATUS		
Lead agency: EPA		
Author name: Benjamin Kuhaneck		
Author affiliation: EPA		
Review period: 1/11/2023 - 7/31/2023		
Date of site inspection: 4/4/2023		
Type of review: Statutory		
Review number: 6		
Triggering action date: 7/31/2018		
Due date *(five years after triggering action date)*: 7/31/2023		

Figure 1: Site Vicinity Map



II. RESPONSE ACTION SUMMARY

Basis for Taking Action

In 1970, a nearby resident's complaint of foul-smelling water prompted an investigation by the Vermont DOH and Vermont DEC. Volatile organic compounds (VOCs) were found in a spring near Seavers Brook and in a residential well near the mobile home community. The spring was abandoned, and the Town and two PRPs connected one affected home near the mobile home community to the public water supply in 1984 and another in 1985.

EPA added the Site to the National Priorities List (NPL) in 1983. A 1985 remedial investigation (RI) identified contamination in site soils, seeps and groundwater. A 1988 supplemental RI identified four major waste disposal areas (Waste Areas 1 through 4) (Figure 2). Upon further investigation, EPA determined that Waste Area 1 did not represent a threat to human health or the environment and therefore was not included in the remedial activities. Analysis of soil and waste samples collected within the waste disposal areas 2, 3, and 4 revealed high levels of organic chemical contamination. The most concentrated deposits of these contaminants were found in the central part of Waste Area 3.

The Site's 1988 Record of Decision (ROD) documented unacceptable threats to human health based on:

- Direct contact with soils (adult and children) contaminated with polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs).
- Accidental ingestion of soils (children) contaminated with PCBs and PAHs.
- Future ingestion of on-site groundwater contaminated with vinyl chloride, 1,1-dichloroethene and PCBs.
- Exposure (on-site and off-site) to landfill gas contamination and the volatilization of contaminants from leachate seeps contaminated with benzene, chloroform and trichloroethene (TCE).
- Exposure to volatilized contaminants from leachate seeps contaminated with vinyl chloride, 1,1-dichloroethene and 1,1-dichloroethane.
- Current consumption of fish from the Black River contaminated with PCBs.

The ecological risk assessment, performed as part of the 1988 Endangerment Assessment, concluded that adverse effects on wildlife and aquatic life may be expected due to copper, nickel and PCBs in leachate seeps and sediments. Estimated concentrations of these and other chemicals in the Black River and Connecticut River were not expected to pose a risk to wildlife.

Response Actions

EPA selected the remedy for OU1 (management of migration) in a 1988 ROD to clean up contaminated groundwater and seeps. The remedial response objectives for OU1 identified in the 1988 ROD consisted of:

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

The OU1 remedy included leachate collection and groundwater extraction, treatment of the leachate and groundwater, institutional controls, long-term monitoring and additional studies.

EPA selected the remedy for OU2 (source control remedy) in a 1990 ROD to address the landfill closure. The remedy for OU2 identified the following objectives:

- Prevent dermal contact with and ingestion of 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.
- Control the harmful buildup or emission of landfill gases.

The OU2 remedy included capping of Waste Areas 2, 3 and 4; collection of groundwater and surface water in French drains; extraction of groundwater with source control wells; stabilization of the side slopes; collection and venting of landfill gases; operation and maintenance (O&M) of these components; institutional controls and FYRs.

The 1990 ROD established cleanup levels for those contaminants that posed an unacceptable risk to either human health or the environment. Table 1 identifies the cleanup levels for the Site's contaminants of concern (COCs). Groundwater cleanup levels must be met at the completion of the remedial action at the points of compliance described in the 1988 ROD as the boundary of the waste management unit (i.e. landfill).

Table 1: Site Cleanup Levels

COC	Cleanup Level (µg/L)	Basis	Level of Risk	Hazard Index
Groundwater				
Benzene	5	MCL	4×10^{-6}	--
TCE	5	MCL	2×10^{-6}	--
1,1-Dichloroethene	7	MCL	1×10^{-4}	0.02
Vinyl chloride	2	MCL	1×10^{-6}	--
PCE	5	PQL/PMCL	7×10^{-6}	0.01
Xylenes	400	Vermont GES	--	0.006
Soil	**Cleanup Level (mg/kg)**			
PCBs	6	Human Health Risk	5×10^{-6}	--
PAHs	3	Human Health Risk	5×10^{-6}	--

Notes:
µg/L = micrograms per liter
PQL = practical quantitation limit
MCL = maximum contaminant level
GES = groundwater enforcement standard
PCE = tetrachloroethene
PMCL = proposed maximum contaminant level
TCE = trichloroethene
-- = Not applicable
Source: 1990 ROD, PDF p. 34-36.

Status of Implementation

In 1989, EPA entered into an Administrative Order on Consent (AOC) with two PRPs, Emhart Industries, Inc. and Textron Inc. Under the AOC, the PRPs agreed to perform the additional studies called for in the 1988 ROD for OU1 and to prepare a focused feasibility study based on the results of those studies. In 1989 and 1991, EPA entered into a Consent Decree with the PRPs requiring them to perform the OU1 and OU2 remedial actions. In 1993, EPA entered into an AOC with the owner of the property located on both sides of Will Dean Road and contiguous to the landfill; this AOC required a deed restriction to be filed on the property (see the Institutional Controls section of this FYR Report for more information).

The remedial design for OU1 was completed in 1992. The final design required the construction of two groundwater extraction wells, a collection system for three areas of contaminated seepage (two on the east side of the Site and on the west side along Seavers Brook Road) and a PTF with two air strippers, metals pre-treatment

and granular activated carbon (GAC) treatment of the air emissions.[1] The PRPs began construction of the treatment system in June 1992. Construction activities for the groundwater extraction wells, west side seepage collection system and PTF finished in 1993. The PTF includes an air stripping system that transfers VOCs from the groundwater to the air. The (effluent) air is then treated through GAC prior to discharge to the atmosphere. Effluent from the PTF and the untreated groundwater collected at the Western Seep flow to the Town's wastewater treatment facility (WWTF) located about a half mile northwest of the Site. The effluent from the Site is combined with the municipal wastewater stream for treatment (under a state of Vermont discharge permit) prior to discharge to the Black River. The 1993 Remedial Action Report documents the construction completion of the OU1 collection system and PTF, which is still in operation.

The design for OU2 was completed in 1993. As part of the pre-design activities, a pre-load of common borrow soil (surcharge) was placed on Waste Area 4 in 1992 to reduce long-term settlement of the waste material. In 1993, two French drains were installed, one upgradient of Waste Area 4 and the other upgradient of Waste Area 3. Cap construction began in 1993. The cap included a 12-inch gas vent layer, a geosynthetic clay liner, a 40-mil very low-density polyethylene geomembrane, a 12-inch sand drainage layer, 36 inches of frost and erosion protection and 6 inches of topsoil. The cap on the steep slopes consisted of 40-mil textured geomembrane over common borrow. Passive gas vents with carbon treatment canisters were also installed. Construction activities finished in 1993. The 1994 Remedial Action Report documents OU2 construction completion. All physical construction for the Site was complete and documented in a Preliminary Close-Out Report for OU1 and OU2 in 1994.

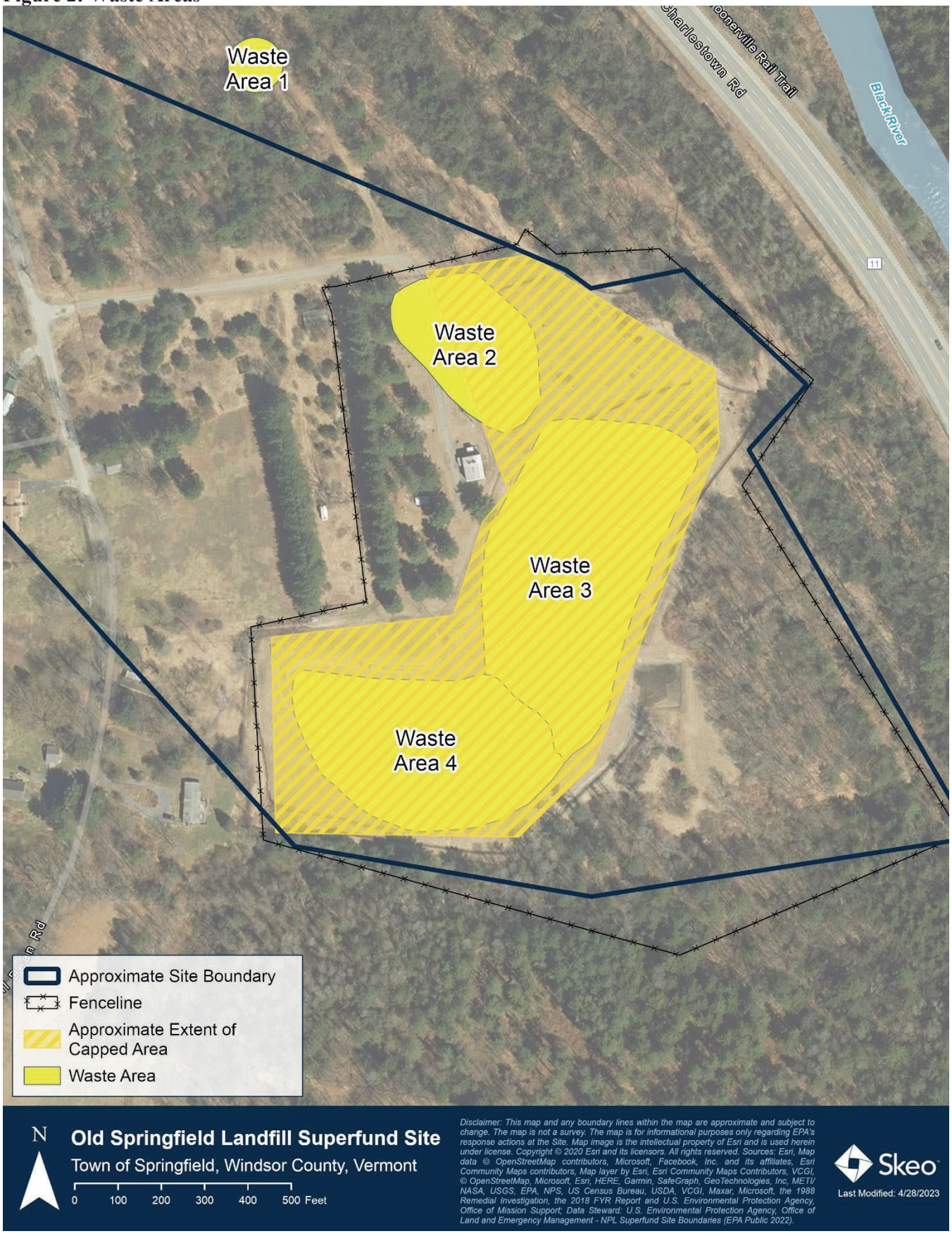
The 1988 and 1990 RODs require long-term operation, maintenance and monitoring. The 1989 and 1991 Consent Decrees require the PRPs to conduct O&M activities for a minimum of 30 years and thereafter until EPA determines that O&M activities are not necessary. O&M activities are expected to continue at the Site in perpetuity. The Town is responsible for current and future operation and maintenance under the settlement reached among the responsible parties. Other responsible parties (primarily former or current industries located in or around Springfield, Vermont) shared in the cost of the construction of the remedy. The Town is the only PRP performing the O&M activities (see the Systems Operations/O&M section for more information).

The 2013 FYR Report identified vapor intrusion as a potential pathway for human exposure to site contaminants at nearby off-site properties. It recommended an assessment of the potential for vapor intrusion. As part of the 2016 FYR Report Addendum, the Town performed a vapor intrusion assessment. The vapor intrusion assessment characterized shallow groundwater for the presence of VOCs in the area between the western margin of the capped landfill and four residences along Will Dean Road. The data collected as part of the evaluation did not indicate an unacceptable human health risk due to vapor intrusion at the Site.

The PTF has been operating for more than 30 years and may be reaching its effective lifespan. As a result, the Town is performing an optimization study to evaluate options to reduce the cost and increase the effectiveness of ongoing operations. Results from the optimization review were not available at the time of the writing of the FYR report.

[1] The OU1 remedy selected in the ROD called for leachate collection and groundwater extraction. The method for collection of leachate is an underground system that collects the groundwater at or upgradient of the points of seep emanations.

Figure 2: Waste Areas



Institutional Controls

The Site's 1988 ROD for OU1 called for institutional controls to restrict the use of groundwater where it may exceed maximum contaminant levels (MCLs). The ROD recommended that the State and Town implement and enforce Ordinance 88-2 (now Ordinance 12-239) as an institutional control to restrict future use of groundwater until it reaches MCLs for the area bounded by Route 11 to the east, Seavers Brook Road to the west and the private property boundaries to the north and south.

In addition to the restrictions provided by the ordinance (described above), the 1990 ROD for OU2 required further institutional controls, including a deed restriction to restrict the use of the landfill property (Lot 65) within the Site, which is located within the fenced area, including restrictions on excavation or any activity that might compromise the integrity of the remedial features.

The Town implemented Ordinance 88-2, giving them the authority to determine "that certain parcels of land within the town contain hazardous wastes, toxic materials, or harmful chemical matter." A Town resolution was needed to apply the restrictions in Ordinance 88-2 to specific parcels of land. Town of Springfield Resolution 92-4 was passed on August 3, 1992. This resolution applies the following restrictions to the area within the fenced portion of the Site property (i.e., Lot 65) (Figure 3):

- The construction of habitable buildings or other structures on the premises is prohibited.
- The breaking of the surface of the soil by digging, trenching, drilling, boring or disruption of the soil surface is prohibited.
- The growing of crops or the consumption or transportation thereof on the premises is prohibited.
- Residential, commercial, or recreational use of the premises is prohibited.
- The taking, use or consumption of water from or which flows through the premises, either above or below the soil surface is prohibited.
- The excavation, filling or depositing of any solid or liquid material on the premises, including sewage, sludge or other waste material is prohibited.
- The making of any change in the topography of the designated parcel is prohibited.
- The entry upon the subject premises is prohibited.
- Any activities on the subject premises which would tend to alter the water table thereon is prohibited.
- 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 Consent Decree entered in the matter entitled "United States v. Browning-Ferris Industries of Vermont, Inc. No. 5:91CV383(D. VT.)."

In the 1988 ROD, EPA identified approximately ten properties that should be subject to groundwater use restrictions via a Town ordinance: the landfill property (Lot 65), eight properties (located west of the landfill) and one Town-owned right-of-way (located east of the landfill). At this time, the Town has only applied the ordinance to the landfill property (Lot 65, Figure 1). Although groundwater contamination is now largely contained directly beneath the landfill (Lot 65) and is not significantly migrating off-site, EPA has identified some exceedances beyond the landfill boundary in the eastern groundwater divide. Therefore, EPA is considering whether the scope of ordinance should be expanded to include any of the additional properties identified in the 1988 ROD or if deed notices are necessary to prevent groundwater use beyond the landfill boundary.

Lot 53 is one of the eight properties located west of the landfill property that was identified in the 1988 ROD as being a property that should have a groundwater use restriction under the Town ordinance, until contamination levels no longer exceed MCLs. In 1993, EPA entered into an AOC with the owner of the Lot 53 property (located on both sides of Will Dean Road and contiguous to the landfill, Figure 1). The AOC required the owner to record a deed notice on the property—the "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 feet beneath the Respondent's property and the EPA makes no representation as to the appropriate use of the property." It is unclear whether all the requirements of the 1993 AOC were fulfilled. Subsequent investigations and monitoring have demonstrated that groundwater

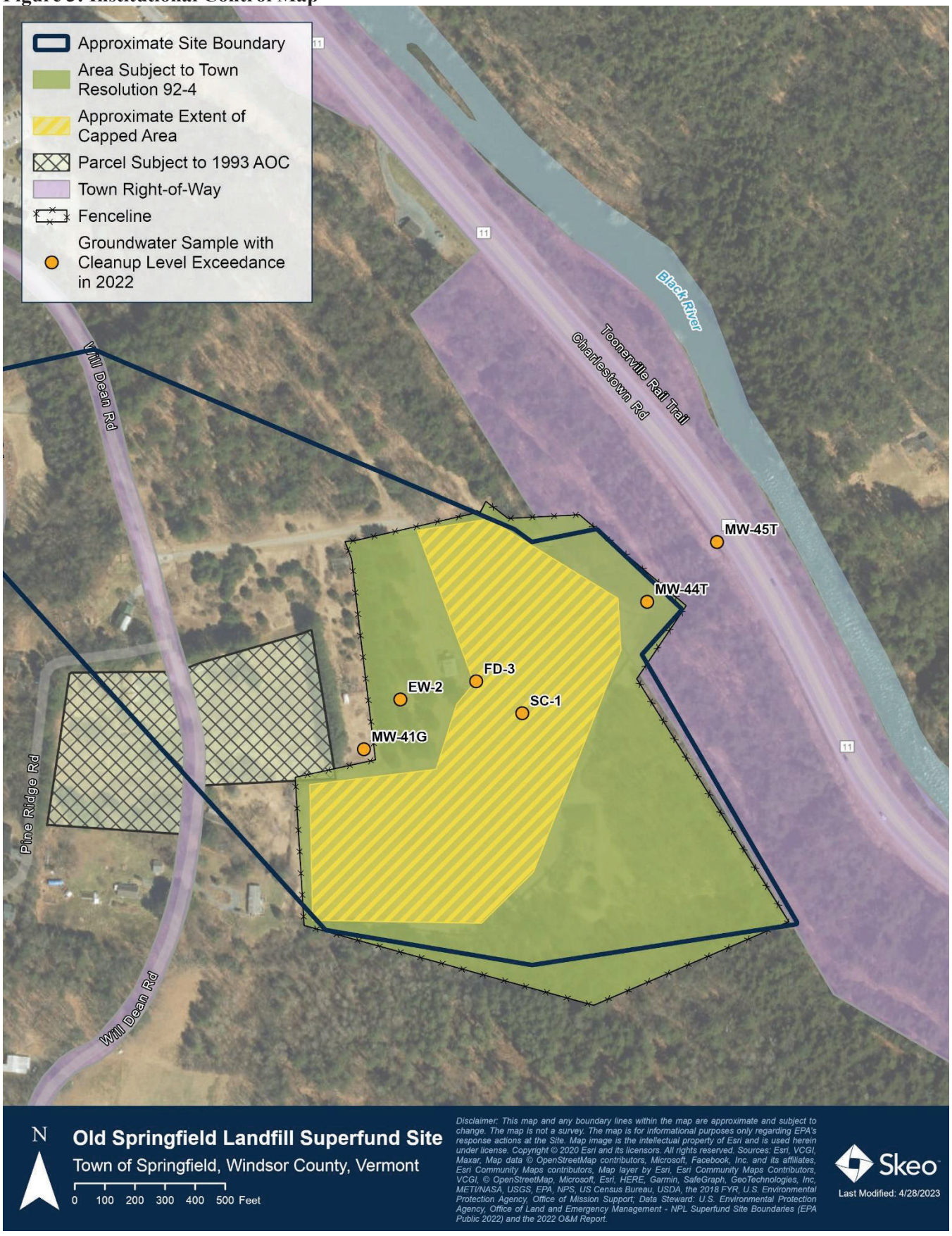
contamination is not migrating off-Site; however, there are some exceedances beyond the limits of the landfill, particularly in the eastern groundwater divide. Lot 53 is located in the western groundwater divide at the Site. Additional ICs may be needed on this property to prevent the use of groundwater, including potentially expanding the scope of the groundwater use ordinance and recording a deed notice.

Table 2 summarizes the institutional controls for the Site. Figure 3 shows the areas subject to institutional controls. Appendix C includes the town of Springfield Ordinance 12-239 and the town of Springfield Resolution 92-4.

Table 2: Summary of Planned and/or Implemented Institutional Controls

Media, Engineered Controls, and Areas That Do Not Support UU/UE Based on Current Conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date
Remedy Components	Yes	Yes	Fenced portion of the landfill property (Lot 65) (see Figure 3)	Prevent the interference with and protect the integrity of the remedial features.	Town Ordinance 88-2 (now Ordinance 12-239) applied to the Site via Town Resolution 92-4. Deed restriction not yet recorded.
Groundwater	Yes	Yes	Fenced portion of the landfill property (Lot 65) (see Figure 3)	Prohibit the use of groundwater until cleanup levels are met.	Town Ordinance 88-2 (now Ordinance 12-239) applied to the Site via Town Resolution 92-4.
	Yes	Yes	Approximately eight properties and a right-of-way located outside of the fenced area and within the groundwater plume	Restrict the use of groundwater where it may exceed MCLs.	Town Ordinance needs modifying. Not yet implemented
	Yes	No, required in the 1993 AOC	010/3/53 (lot 53, which is one of the eight properties described above)	File a deed notice on the property to inform subsequent purchasers of the land, that hazardous substances have migrated into a sand and gravel aquifer beneath the Respondent's property and the EPA makes no representation as to the appropriate use of the property. 1988 ROD recommended that the Town Ordinance for groundwater use restrictions apply to Lot 53 as well.	Neither the deed notice nor the Town Ordinance have been implemented for this Property.

Figure 3: Institutional Control Map



Systems Operations/O&M

The 1988 and 1990 RODs require long-term operation, maintenance and monitoring of the OU1 and OU2 remedial actions. The 1989 and 1991 Consent Decrees require the PRPs to conduct O&M activities for a minimum of 30 years, and thereafter as long as EPA determines that O&M activities are necessary. O&M activities are expected to continue at the Site in perpetuity. The Town of Springfield is conducting long-term monitoring and maintenance activities associated with the O&M Plan, the Long-term Monitoring Plan (LTMP), and the 2021 Quality Assurance Project Plan (QAPP).[2] The primary activities associated with O&M and long-term monitoring include inspection and maintenance of the landfill cover system, stormwater structures, French drains, gas vents and water treatment system; sampling of the groundwater, gas vents, indoor air within the PTF and PTF vapor (see the Data Review section of this FYR Report for more information); and submission of an annual report to EPA and Vermont DEC to document the performance of the O&M activities and to present sampling results.

As part of the 2021 QAPP update, Sanborn Head, the Town's O&M contractor, prepared a technical memorandum proposing changes to the sampling program. EPA approved the following changes to the sampling program in August 2020:

- Reduce sampling frequency of PTF vapor influent and effluent from quarterly to semiannually. Sampling is completed in February (Quarter [Q] 1) and August (Q3) of each year.
- Reduce sampling frequency of the 10 gas vents (GV-1 through GV-10) from annually to biennially.
- Remove MW-48S and MW-34 triplet (MW-34S, MW-34B and MW-24T) from the water level monitoring program.
- Remove MW-44S from the annual groundwater sampling program.

Sanborn Head performs O&M activities on behalf of the town, except for groundwater sampling and analysis. Eastern Analytical, Inc. (EAI), a second Town contractor, performs groundwater sampling and analysis activities for monitoring wells and extraction points. The Site is maintained and operated by the Town's Water and Sewer department. A WWTF staff member visits the Site nearly every workday to perform routine system observation and record flow meter values in accordance with the Town's state of Vermont discharge permit #3-1334. A renewal application for the Permit was submitted by the Town to Vermont DEC in September 2019, prior to the permit's expiration on March 31, 2020. The application is still under review by Vermont DEC, however the Vermont DEC issued a letter to the Town on September 27, 2019, indicating the application for the renewal was sufficient and the existing permit does not expire until the application has been approved.

The flows at each of the seven groundwater and leachate collection points, one point downstream of the PTF equalization tank and the Western Seep are measured continuously using digitized totalizing flow meters, which are monitored and recorded every workday. During 2022, and consistent with recent years, the extraction rates were well below the system design flow values, except for French Drain (FD)-1, FD-2 and FD-3 (FD-2 and FD-3 were consistent with their design flow of <1 gallon per minute, FD-1 was slightly higher). The difference between design and observed flows is inferred to be primarily related to lost efficiency due to system aging. From the time of system startup in 1993 to about 2008, flow to the WWTF was reportedly evenly divided between the PTF and the Western Seep, with the PTF contributing slightly less than half the water in 2008. During the last 13 years (2009-2022), the portion contributed from the PTF has been lower than historical values and has ranged from 14% (2012) to 43% (2014) of the total flow to the WWTF. The data from 2022 indicates flow to the PTF was within the range of values recorded since 2011.

The mass of TCE (pounds) removed from the extraction points has historically been calculated by multiplying the TCE concentration in the PTF influent by the total volume sent to the PTF in one year. In 2022, about 19.7 pounds of TCE were removed. Overall, an estimated 24.9 pounds of VOCs (including TCE) were extracted from

[2] Site monitoring in 2018, 2019 and 2020 was performed under the 2016 QAPP. An update to the 2016 QAPP was prepared by Sanborn Head and approved by EPA and Vermont DEC in 2021.

the groundwater in 2022 (Table 3). The total estimated TCE mass removed from the subsurface at the site (1993 to 2022) in extracted water is approximately 1,109 lbs.

VOC concentrations in the PTF effluent were reduced by approximately half of the PTF influent concentrations through the air stripping process. The reduction in TCE concentration in extracted water as a result of air stripping from 270 micrograms per liter (µg/L) (influent) to 140 µg/L (effluent) in 2022 represents a removal 48% of the TCE from the PTF influent. A total VOC treatment efficiency of approximately 50% was calculated based on an influent concentration of 340.5 µg/L and an effluent concentration of 169.9 µg/L in 2022. The PTF efficiency in 2022 was lower than 2021 and other recent prior sampling years (Table 3). The low treatment efficiency reported in 2022 may be indicative of the need for switching of the air stripper.

Table 3: VOC Removal Estimates, 2016-2021

Year	Estimate Extracted Total VOC Mass (lbs/year)	Total VOC Treatment Efficiency
2016	33.4	90%
2017	18.4	95%
2018	27.9	96%
2019	20.8	97%
2020	17.9	91%
2021	15.7	93%
2022	24.9	50%
Notes: lbs = pounds *Source: 2022 O&M Report, Appendix F.*		

Since the previous FYR, the Site appeared to be in generally good condition, though several minor O&M issues were observed. The annual inspection reports identify observations of new or ongoing issues including animal burrows, vegetation in downchutes and ongoing maintenance needs.

In addition, during a site visit in 2022, a Town representative observed erosion in three locations near the central stormwater downchute. In May 2022, Sanborn Head repaired the erosion. In August 2022, Sanborn Head completed a visual evaluation of all three downchutes. The evaluation indicated that the erosion repair appeared to be in good condition, but that an alternative, longer-term solution would be needed to prevent further erosion. In November 2022, a contractor for the Town completed a pilot test to evaluate the effectiveness of injecting expanding grout beneath the downchutes to fill voids and provide support beneath. The Town plans to continue monitoring the pilot test injections for several months to assess the long-term effectiveness of expanding grout in preventing further erosion. Additional evaluation will be done as part of the 2023 annual inspection to assess whether grouting injection should be considered for the other downchutes or other sections of the central downchute.

III. PROGRESS SINCE THE PREVIOUS REVIEW

Table 4 includes the protectiveness determinations and statements from the 2018 FYR Report. Table 5 includes the recommendation from the 2018 FYR Report and the current status of that recommendation.

Table 4: Protectiveness Determinations/Statements from the 2018 FYR Report

OU #	Protectiveness Determination	Protectiveness Statement
1	Short-term Protective	The OU 1 remedy at Old Springfield Landfill is short-term protective of human health and the environment. The OU 1 ("Management of Migration Remedy") is adequately capturing groundwater at the landfill for discharge to the Pre-Treatment Facility (PTF), with the Western Seep collecting Site groundwater from an area along Seavers Brook Road. Both the PTF and the Western Seep discharge to the Town of Springfield's public-owned treatment works (POTW [also referred to as WWTF]). Data presented in this FYR supports the conclusion that this capture and

		subsequent treatment of Site groundwater, plus existing ICs, are meeting the RAOs for the OU 1 remedy. However, PFAS [per- and polyfluoroalkyl substances] sampling is necessary as the presence of these substances at the Site could impact future protectiveness.
2	Protective	The OU 2 remedy at the Old Springfield Landfill is protective of human health and the environment. The OU 2 ("Source Control Remedy") source control well (SC-1, which discharges to the PTF), 10 passive gas vents, three subsurface "french" drains and surface water diversions, along with the engineered capped landfill on Will Dean Road, are minimizing the entry of off-Site water to the landfill. Data presented in this FYR supports the conclusion that these controls, plus existing ICs [institutional controls], are meeting the RAOs for the OU 2 remedy.
Sitewide	Short-term Protective	Because no current and complete exposure pathways exist, the remedies at OU 1 and OU 2 are protective in the short-term. However, in order for the remedy to be protective in the long-term, PFAS sampling is necessary to determine if they are associated with the Site.

Table 5: Status of Recommendation from the 2018 FYR Report

OU #	Issue	Recommendation	Current Status	Current Implementation Status Description	Completion Date (if applicable)
1	Unknown whether PFAS are associated with the Site	Include PFAS in an upcoming monitoring event to determine if they are associated with the Site	Completed	In 2019, the Town's contractor, EAI, completed an additional groundwater monitoring event for PFAS. One location indicated a detection of a PFAS compound (see the Data Review section of this FYR Report for more information).	6/24/2019

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Community Involvement and Site Interviews

EPA issued an online news release in January 2023 to announce that the FYR was underway. A copy of the news release is included in Appendix D. The results of the review and the completed FYR Report will be made available at EPA's site profile page at http://www.epa.gov/superfund/oldspringfield.

During the FYR process, interviews were conducted to document any perceived problems or successes with the remedy that has been implemented to date. The results of these interviews are summarized below. Appendix E includes the completed interview forms.

Nathan Fraser, representing the Springfield Wastewater Treatment Plant (WWTP), stated that the Town has not had any issues with unusual or unexpected activities at the Site. The operating costs of maintaining the aging facility are growing. Parts and equipment have become obsolete, making it challenging to operate at times. The Town is actively pursuing upgrade options and would be open to any feedback pertaining to potential funding options that may help offset these costs. Heidi Caprood, the Town's contractor, stated that the remedy generally appears to be functioning as designed based on the results of periodic environmental monitoring. Overall trends observed at the Site have indicated that concentrations of TCE detected in monitoring wells have generally decreased, indicating that the remedy continues to reduce contaminant mass. Given the nature of the contaminant source (in particular, the in-place buried waste mass and contamination present in bedrock), the timeframe to achieve remedial standards at all locations is anticipated to be considerable. Extraction rates are generally well below the system design flow values. Despite the reduced flows in the groundwater extraction system, the extent

of contaminated groundwater at the Site has not materially increased over time. Grahame Bradley, with the Vermont Department of Environmental Conservation, stated that the project generally meets expectations. The State understands that the Town of Springfield has concerns about their long-term financial responsibility for maintaining the remedy. The State is amenable to working with EPA to reduce ongoing costs if this is possible without compromising the remedy. The remedy is achieving acceptable performance and the State does not have significant concerns. Technical and financial planning is required to ensure ongoing acceptable performance of the remedy for the foreseeable future.

Data Review

The Town's contractors conduct biennial gas vent sampling, semiannual PTF influent and effluent vapor sampling, annual groundwater sampling, PTF indoor air sampling and water quality sampling for extraction locations in accordance with the 2001 draft Supplemental O&M Manual (with modifications based on subsequent correspondence with EPA and Vermont DEC). This FYR evaluated data collected from 2018 to 2022, focusing on the most recent data collected at the Site in August 2022, with historical context provided as appropriate.

The overall data review findings include:

- The total estimated TCE mass removed from the subsurface at the site (1993 to 2022) in extracted water is approximately 1,109 lbs.
- There are still significant amounts of contamination being extracted, pre-treated, and collected at the Site.
- Groundwater contamination appears to remain generally in the capped landfill area, with the exception of MW-45T (located to the east of the Site in the Town right-of-way) and MW-41G (located right outside the fence on the western side of the landfill).[3]

Groundwater Monitoring

Groundwater monitoring includes sampling and analysis of locations identified in the 2021 QAPP and measuring water levels at other functional/accessible monitoring wells at the Site. Twelve monitoring wells (Appendix F, Table F-1), three extraction wells (EW-1, EW-2 and SC-1), three French drains (FD-1, FD-2 and FD-3), the eastern leachate seep (LSE 3/4) and PTF influent and effluent are included in the annual groundwater sampling events as displayed on Figure 4. Groundwater samples are analyzed for VOCs and target analyte list (TAL) metals.[4] Detected VOC concentrations are compared to the applicable cleanup levels or federal and state standards.

Static groundwater levels were measured by EAI in August 2022. Based on groundwater level measurements from August 2022, groundwater in the vicinity of OU2 on the eastern portion of the Site flows east toward the Black River, and groundwater in the vicinity of OU1 on the western portion of Site flows west to northwest toward Seavers Brook.

Groundwater at Monitoring Wells

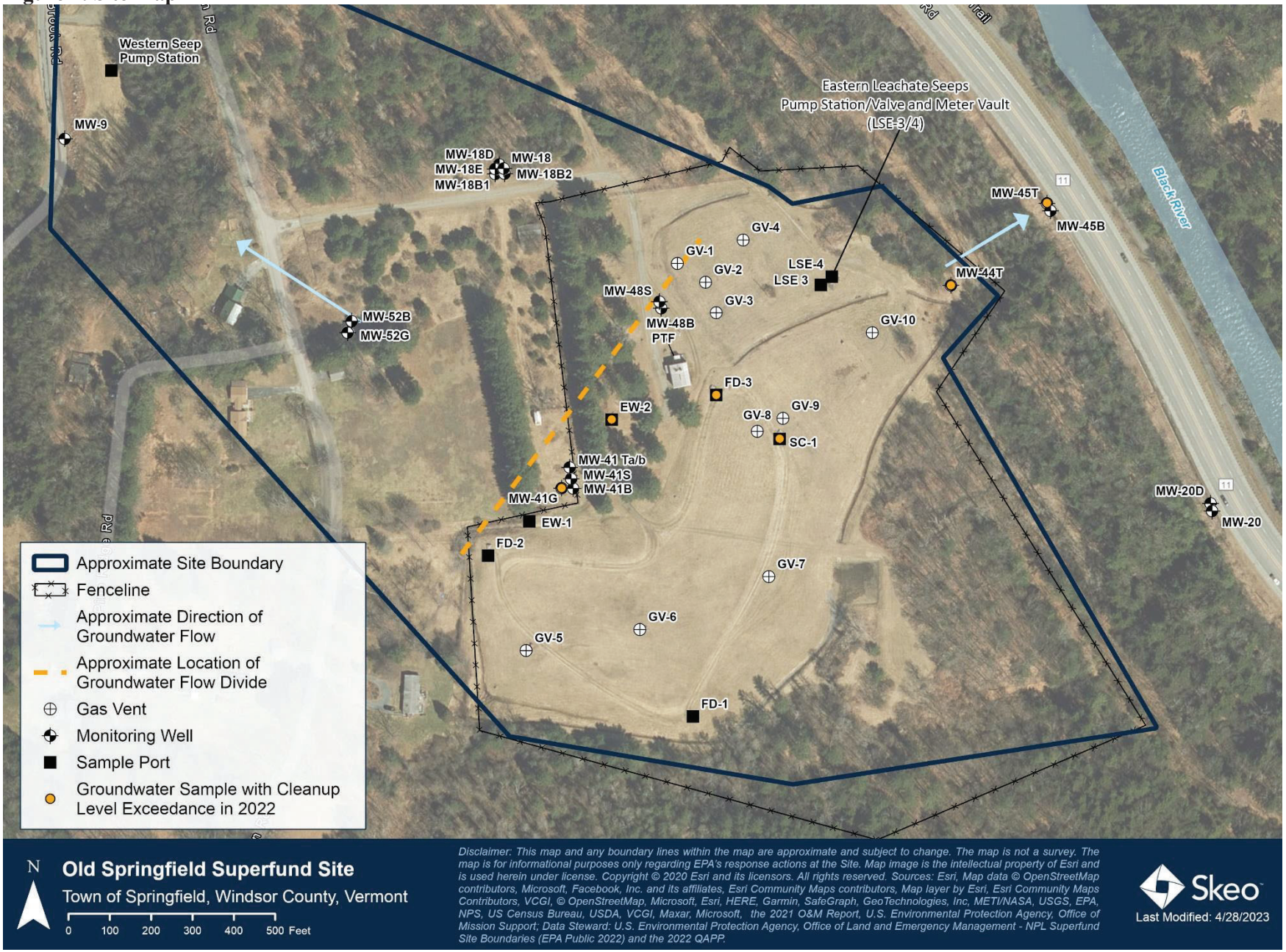
In 2022, VOCs were detected in groundwater samples collected from five of the 12 monitoring wells: MW-41G, MW-44T, MW-45B, MW-45T and MW-52G. The VOCs detected include the following COCs: benzene, 1,1-dichloroethene, tetrachloroethene (PCE), TCE and vinyl chloride. Additional VOCs that have been detected include chlorobenzene, 1,1-dichloroethane, cis-1,2-dichloroethene (cis-1,2-DCE), methylene chloride, 1,1,1-trichlorothethane and 1,4-dioxane.

[3] There have been discussions in the past about placing an additional monitoring well downgradient of MW-45T to further delineate the plume, but there is limited room between MW-45T and the Black River to do so. There are no residences located downgradient of MW-45T and residents in close proximity to the Site receive municipal water from the Town.
[4] TAL metals include aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc.

COCs

MW-41G, MW-44T and MW45-T were the only monitoring wells with concentrations of COCs above cleanup levels in 2022. TCE and vinyl chloride were the only COCs detected above cleanup levels in 2022. Benzene, 1,1-dichloroethene, PCE and xylenes were not detected at concentrations exceeding cleanup levels in monitoring.

Figure 4: Site Map



wells in 2022. MW-41G is located west of the Site right outside the fenced landfill area. MW-44T is located at the eastern base of the landfill in the till. MW-45T is located east of the landfill near Route 11 (Figure 4). All three monitoring wells where exceedances were observed are located within the eastern groundwater divide at the Site (Figure 4). Table 6 shows TCE and vinyl chloride concentrations in MW-41G, MW-44T and MW-45T from 2018 to 2022. Appendix F, Figure F-2 shows VOC concentrations in all monitoring wells from 2018 to 2022 as well as historical data. MW-45T is the most downgradient well to the east of the landfill. It is in the fractured bedrock. MW-45T is directly next to MW-45B (see Figure 4). MW-45B is in the weathered bedrock and has not had any COC exceedances of cleanup goals during this review period except for vinyl chloride in 2019 (3.2 µg/L).

Additional VOCs

Of the detected additional chemicals, cis-1,2-DCE (MW-44T, MW-45T), methylene chloride (MW-44T) and 1,4-dioxane (MW-44T, MW-45B and MW-45T) were the only detections above federal or state standards in 2022. Table 7 shows cis-1,2-DCE, methylene chloride and 1,4-dioxane concentrations in MW-44T, MW-45B and MW-45T from 2018-2022. Appendix F, Figure F-2 shows VOC concentrations in all monitoring wells from 2018 to 2022 as well as historical data.

Table 6: TCE and Vinyl Chloride Concentrations in MW-41G, MW-44T and MW-45T; 2018-2022

Sample Date	COC (µg/L)	
	TCE	Vinyl Chloride
	Cleanup goal = 5 µg/L	Cleanup goal = 2 µg/L
MW-41G		
2018	<0.5	<0.5
2019	<0.5	<0.5
2020	2.1	0.85
2021	2.0	<0.5
2022	**23**	1.3 J+
MW-44T		
2018	**97**	**72**
2019	**38**	**43**
2020	**91**	**57**
2021	**68**	**42**
2022	**67**	**53 J+**
MW-45T		
2018	**21**	**3.9**
2019	**18**	**3.6**
2020	**21**	**3.5**
2021	**17**	**4.1**
2022	**24**	**6.7 J+**

Notes:
< = indicates the parameter was not detected above the indicated laboratory reporting limit
Bold = concentration exceeds applicable cleanup level
µg/L = micrograms per liter
J+ = indicates that the result is estimated with potential high bias
Source: 1990 ROD, PDF p. 34-36, 2022 O&M Report, Table 3A, PDF p. 36-39.

Table 7: Cis-1,2-DCE, Methylene Chloride and 1,4-Dioxane concentrations in MW-44T, MW-45B and MW-45T; 2018-2022

Sample Date	COC (µg/L)		
	Cis-1,2-DCE	Methylene chloride	1,4-Dioxane
	Federal or State Standard = 70[a,d], 35[b] µg/L	Federal or State Standard = 5[a,d], 0.5[b] µg/L	Federal or State Standard = 0.3[abc] µg/L
MW-44T			
2018	*57*	*1.1*	*7.3*
2019	*39*	*0.69*	*6.5*
2020	*49*	*1.1*	*8.5*
2021	*38*	*<0.5*	*7.9*
2022	*36*	*0.82*	*6.3*
MW-45B			
2018	3.4	<0.5	*0.73*
2019	13	<0.5	*1.3*
2020	6.8	<0.5	*1.3*
2021	<1.0	<0.5	*0.78*
2022	1.0	<0.5	*1.1*
MW-45T			
2018	*61*	<0.5	*7.5*
2019	*52*	<0.5	*6.6*
2020	*57*	<0.5	*8.0*
2021	*44*	<0.5	*6.1*
2022	*75*	<0.5	*9.4*

Notes:
a. Vermont DEC Enforcement Standard
b. Vermont DEC Preventative Action Level (PAL)
c. Vermont DOH Drinking Water Health Advisories
d. MCL

µg/L = micrograms per liter
< = indicates the parameter was not detected above the indicated laboratory reporting limit
J+ = indicates that the result is estimated with potential high bias
Yellow shading = detected concentration exceeds the Vermont DEC Enforcement Standard or MCL
Italic = the detected concentration exceeds the Vermont DEC PAL Standard
Bold = the detected concentrations exceeds the Vermont DOH Drinking Water Health Advisories
Source: 2022 O&M Report, Table 3A, PDF p. 36-39.

Groundwater at Extraction Locations

In 2022, VOCs were detected in five of the seven extraction locations (EW-1, EW-2, SC-1, FD-3 and LSE-3/4). The VOCs detected include the following COCs: TCE, 1,1-dichloroethene, PCE, vinyl chloride, benzene and m,p-xylenes. Additional VOCs that have been detected include 1,4-dioxane, chlorobenzene, 1,2-dichlorobenzene, 1,2-dichloroethane, cis-1,2-DCE, 1,1,1-trichlorethane, 1,1-dichloroethane and ethylbenzene.

COCs

COCs were detected above cleanup levels at three extraction locations (EW-2, SC-1 and FD-3) in 2022. The COCs detected in the three extraction wells in 2022 over cleanup levels included TCE (EW-2, SC-1 and FD-3), 1,1-dichloroethene (SC-1, FD-3), vinyl chloride (EW-2, SC-1) and PCE (EW-2, SC-1 and FD-3). Table 8 shows TCE, PCE, 1,1-dichloroethene and vinyl chloride concentrations in EW-2, SC-1 and FD-3 from 2018 to 2022. Appendix F, Figure F-2 shows VOC concentrations in extraction locations from 2018 to 2022 as well as historical data.

Additional VOCs

Of the detected additional chemicals, 1,4-dioxane (EW-1, EW-2, SC-1), cis-1,2-DCE (SC-1) and 1,1,1-trichloroethene (SC-1), were the only detections above federal or state standards during 2022. Table 9 shows 1,4-dioxane, cis-1,2-DCE and 1,1,1-trichloroethene concentrations in EW-1, EW-2 and SC-1 from 2018 to 2022.

Appendix F, Figure F-2 shows VOC concentrations in extraction locations from 2018 to 2022 as well as historical data.

Table 8: TCE, PCE, 1,1-Dichloroethene and Vinyl Chloride Concentrations in EW-2, SC-1 and FD-3, 2018-2022

Sample Date	COC (µg/L)			
	TCE	PCE	1,1-Dichloroethene	Vinyl Chloride
	Cleanup goal = 5 µg/L	Cleanup goal = 5 µg/L	Cleanup goal = 7 µg/L	Cleanup goal = 2 µg/L
EW-2				
2018	**29**	3.4	<0.5	0.68
2019	**16**	2.4	<0.5	<0.5
2020	**32**	4.1	<0.5	<0.5
2021	**100**	**11**	1.7	1.5
2022	**65**	**10**	1.4	**2.5 J+**
SC-1				
2018	**440**	**29**	**13**	<3
2019	**2,300**	**140**	**65**	**11**
2020	**1,800**	**100**	**50**	**8.3**
2021	**1,500**	**110**	**47**	**6.7**
2022	**2,200**	**170**	**86**	**15 J+**
FD-3				
2018	Dry			
2019	<0.5	<0.5	<0.5	<0.5
2020	<0.5	<0.5	<0.5	<0.5
2021	<0.5	<0.5	<0.5	<0.5
2022	**210**	**19**	**9.1**	0.74 J+

Notes:
< = the parameter was not detected above the indicated laboratory reporting limit
Bold = concentration exceeds cleanup goal
µg/L = micrograms per liter
If duplicate samples were taken, the higher of the two was reported.
J+ = indicates the result is estimated with potential high bias
Sources: 1990 ROD, PDF p. 34-36, 2022 O&M Report, Table 3A, PDF p. 36-39.

Table 9: 1,4-Dioxane, Cis-1,2-DCE and 1,1,1-Trichloroethane Concentrations in EW-1, EW-2 and SC-1; 2018-2022

Sample Date	COC (µg/L)		
	1,4-dioxane	Cis-1,2-DCE	1,1,1-trichloroethane
	Federal or State Standard = 0.3[abc] µg/L	Federal or State Standard = 70[ad], 35[b] µg/L	Federal or State Standard = 200[ad], 100[b] µg/L
EW-1			
2018	<0.25	<1	<1
2019	<0.2	<1	<1
2020	0.27	<1	<1
2021	0.22	<1	<1
2022	***0.31***	<1	<1
EW-2			
2018	***0.34***	4.3	1.9
2019	0.26	3.2	1.1
2020	0.27	3.5	2.8
2021	***0.36***	13	8.7
2022	0.25	12	4.4
SC-1			
2018	***4.5***	17	31
2019	***43***	*140*	*180*
2020	***32***	*110*	*150*

2021	***36***	*110*	*130*
2022	***44***	*150*	*180*

Notes:
a. Vermont DEC Enforcement Standard
b. Vermont DEC Preventative Action Level
c. Vermont DOH Drinking Water Health Advisories
d. MCL

µg/L = micrograms per liter
< = indicates the parameter was not detected above the indicated laboratory reporting limit
J+ = indicates that the result is estimated with potential high bias
Yellow shading = detected concentration exceeds the Vermont DEC Enforcement Standard or MCL
Italic = the detected concentration exceeds the Vermont DEC Preventative Action Level Standard
Bold = the detected concentrations exceeds the Vermont DOH Drinking Water Health Advisories
Source: 2022 O&M Report, Table 3A, PDF p. 36-39.

PTF and Western Seep Monitoring

Samples collected annually from the PTF influent and effluent and the Western Seep are analyzed for inorganic analytes and VOCs. Samples collected from the PTF effluent and Western Seep are also analyzed for PCBs, semi-VOCs, total phenols and pesticides. The VOCs detected in 2022 include the following COCs: 1,1-dichloroethene, PCE, TCE and vinyl chloride. Additional VOCs that were detected included: chlorobenzene, 1,1-dichloroethane, cis-1,2-DCE and 1,1,1-trichloroethane. No additional detected VOCs were detected above federal or state standards. Groundwater flows collected from the Western Seep and the PTF effluent are combined and flow by gravity to the Town's WWTF for treatment under a state of Vermont Pre-Treatment Discharge Permit.

COCs

COCs were detected above cleanup levels in the PTF influent and the effluent in 2022. The primary COCs detected in the PTF influent and effluent over cleanup levels included TCE and PCE. Table 10 shows concentrations of TCE and PCE in the PTF influent and effluent from 2018 to 2022. Benzene, 1,1-dichloroethene, vinyl chloride and xylenes were not detected at concentrations exceeding cleanup levels in the PTF influent or PTF effluent in 2022. No COCs have been detected at concentrations exceeding cleanup levels in the Western Seep since 2011 (Appendix F, Figure F-2). The remedial action component that includes collection of leachate at the Western Seep and discharge to the Town's WWTP will continue to be evaluated through annual O&M activities to address the need for potential modifications.

Table 10: PCE and TCE Concentrations in PTF Influent and Effluent; 2018-2022

Sample Date	COC (µg/L)	
	PCE	TCE
	Cleanup goal = 5 µg/L	Cleanup goal = 5 µg/L
PTF Influent		
2018	**15**	**300**
2019	**14**	**220**
2020	**11**	**220**
2021	**9.9**	**150**
2022	**19**	**270**
PTF Effluent		
2018	<0.5	**12**
2019	<0.5	**8.0**
2020	0.64	**21**
2021	<0.5	**11**
2022	**7.2**	**140**

Notes:
µg/L = micrograms per liter
< = the parameter was not detected above the indicated laboratory reporting limit
Bold = concentration exceeds cleanup goal
Sources: 1990 ROD, PDF p. 34-36, 2022 O&M Report, Table 3A, PDF p. 36-39.

PFAS Sampling Event
The 2018 FYR recommended that PFAS be included in an upcoming monitoring event to determine if they were associated with the Site. In 2019, the Town's contractor completed an additional groundwater monitoring event for PFAS in accordance with the 2019 QAPP Addendum #1. Samples were collected from eight monitoring locations where VOCs have been detected in recent sampling events (EW-2, SC-1, LSE-3/4, MW-41G, MW-44T, MW-45B, MW-45T and MW-52G). The samples were analyzed for perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), perfluorohexane sulfonic acid (PFHxS), perfluoroheptanoic acid (PFHpA), perfluorononanoic acid (PFNA) and perfluorobutanesulfonic acid (PFBS).

Of the eight locations sampled, only one location (LSE-3/4) had a detection of a PFAS compound (PFOS). The PFOS concentration at LSE-3/4 was 6.21 nanograms per liter (ng/L), below the Vermont DEC groundwater enforcement standard (20 ng/L), but above the Vermont DEC preventative action level (PAL) for PFOS (2 ng/L) and EPA's regional screening level (RSL) for a hazard quotient (HQ) of 0.1 of 4 ng/L.[5] Due to its proximity to the limit of waste and the presence of the downgradient monitoring points where PFAS analytes were not detected, LSE-3/4 is not considered a "point of compliance" where the PAL would apply.[6] Additionally, residents in close proximity to the Site receive municipal water from the Town.

Air Monitoring, Emission and Compliance
Air monitoring samples are collected biennially from 10 passive gas vents at the landfill, annually from the indoor air within the PTF and semiannually from the air stripper vapor-phase carbon treatment canisters influent and effluent.

PTF Influent and Effluent Vapor Samples
PTF vapor-phase carbon cannister influent and effluent samples are collected "upstream" of the carbon canisters (influent) and prior to the last two carbon canisters (effluent). Samples are compared to Vermont Air Pollution Control Regulations (VAPCR) Hazardous Ambient Air Standards (HAAS) action levels (the potential release of contaminants in pounds of emission per eight hours [lbs/8 hr]). In 2022, the VAPCR HAAS action levels were not exceeded for any analytes detected in the influent or effluent samples. A comparison of influent and effluent levels of TCE (the primary COC) in March 2021 showed that the carbon canisters were not meeting the minimum 98% treatment efficiency. The Town replaced the carbon canisters in April 2021; the August 2021 and Q1 and Q3 2022 sampling events again met the treatment efficiency guideline.

PTF Indoor Air
To evaluate the potential presence of VOCs in the indoor air at the PTF, one air sample is collected annually from within the PTF building. PTF indoor air results are compared to the Vermont DEC indoor air standards, EPA's RSLs for industrial air, and the National Institute of Occupational Safety and Health (NIOSH) time-weighted average (TWA) recommended exposure limits (RELs). If no NIOSH TWA REL has been established for an analyte, concentrations were compared to Occupational Safety and Health Administration (OSHA) permissible exposure limit (PEL) TWAs.

Due to equipment malfunction, the PTF indoor air sample collected in 2022 was not analyzed. Sixteen analytes were detected in the PTF indoor air sample collected in 2021 (Table 11). Of these analytes, only TCE was detected at concentrations (16.4 micrograms per cubic meter [$\mu g/m^3$]) exceeding its Vermont DEC non-resident indoor air standard (0.7 $\mu g/m^3$). The TCE concentration measure in PTF indoor air in 2021 was the lowest

[5] EPA residential child site-specific screening levels are site-specific screening levels developed by EPA Region 1 for PFOA, PFOS and PFBS for the groundwater exposure pathway for a child resident. The screening levels were calculated using the EPA Regional Screening Level calculator. The calculator used the oral reference dose (RfD) of 3×10^{-6} milligrams per kilogram per day (mg/kg-day) for PFOA and 2×10^{-6} mg/kg-day for PFOS, and the oral RfD of 2×10^{-2} mg/kg-day for PFBS, as well as default exposure assumptions for a child resident for groundwater. Screening levels were developed as the concentration associated with an HQ of 0.1.
[6] As identified in Section 12-603 the Groundwater Protection Rule and Strategy.

concentration recorded since 2012. N-Octane has not been detected in indoor air samples dating back to 2012. The detection of n-octane (5.79 µg/m^3) was below the NIOSH TWA REL (350,000 µg/m^3) and there is no Vermont DEC non-resident indoor air standard established for n-octane. The detection of carbon tetrachloride and chlorofluorocarbon (CFC) 113 in PTF indoor air in 2021 is possibly related to lower reporting limits than have historically been achieved in some sampling events. Concentrations of the remaining analytes were generally consistent with concentrations recorded over the past five years of PTF indoor air samples (Appendix F, Table F-3). Vermont DEC indoor air standards, where established, were not exceeded for any analyte except TCE. NIOSH TWA RELs and/or OSHA TWA PELs, where applicable, were not exceeded for any analytes detected in indoor air in 2021.

Table 11: Analytes Detected in PTF Indoor Air, 2021

Acetone	Carbon tetrachloride	n-Octane
Chloromethane	CFC 12	1,1,1-trichloroethane
1,1-Dichloroethene	Cis-1,2-DCE	CFC 113
PCE	Toluene	1,1-Dichloroethane
TCE	CFC 11	
Vinyl chloride	Chloroform	
Notes: *Source: 2021 O&M Report, Exhibit 5, PDF p. 51.*		

Gas Vent Sampling

Gas vent air sampling last took place in 2022. Thirty-one analytes were detected in one or more gas vent samples in 2022 (Table 12). The detected analytes and their distributions are generally similar to previous sitewide results dating back to 2009, with the exception of many analytes that were detected for the first time at a new location (Table 13). In addition to new detects, several analytes were detected at the highest concentrations recorded at these locations since 2009: GV-1 (acetone, ethanol, dichloromethane, tetrahydrofuran [THF], toluene, CFC 11), GV-2 (CFC 12), GV-5 (CFC 12, dichloromethane), GV-6 (chloromethane), GV-8 (chloromethane, THF) and GV-9 (chloromethane). The laboratory results from the gas vent sampling are compared to 100x the VAPCR HAASs. No exceedances of 100x HAAS values were recorded in 2022; therefore, canister change-outs at the gas vents are not warranted based on site-specific criteria.

Table 12: Analytes Detected in Gas Vent Samples, 2022

Acetone	Acetonitrile	Acrolein
2-Butoanone	Chloromethane	CFC 11
CFC 12	CFC 114	Ethanol
Ethyl Acetate	Ethylbenzene	4-Ethyltoluene
n-Heptane	n-Hexane	2-Hexanone
Isopropyl Alcohol	Methyl Isobutyl Ketone	Methylene Chloride
n-Nonane	n-Octane	PCE
Propene	n-Propylbenzene	Styrene
THF	Toluene	1,2,4-Trimethylbenzene
1,3,5-Trimethylbenzene	Vinyl chloride	m,p-Xylene
o-Xylene		
Notes: *Source: 2022 O&M Report, Exhibit 7, PDF p. 24*		

Table 13: Analyte – First Time Detect at Gas Vent Since 2009

Location	Analyte
GV-1	Acetonitrile, ethylbenzene, 4-ethyltoluene, n-heptane, n-hexane, n-nonane, n-propylbenzene, styrene, 1,2,4-trimethylbenzene, 1,3,5-trimetylbenzene, and m,p- and o-xylenes
GV-3	PCE
GV-5	Chloromethane
GV-7	Chloromethane
GV-10	Chloromethane, isopropyl alcohol
Notes: *Source: 2022 O&M Report, PDF p. 24.*	

Site Inspection

The site inspection was conducted on 4/4/2023. In attendance were Benjamin Kuhaneck (EPA RPM), Graham Bradley (Vermont DEC), Nate Fraser, Jeff Strong and Rick Chambers (Town of Springfield Department of Public Works), Heidi Caprood (Sanborn Head) and Kirby Webster and Lauren Johnson (EPA contractor, Skeo). The purpose of the inspection was to assess the protectiveness of the remedy. Appendix G includes the completed site inspection checklist. Appendix H includes photographs from the site inspection.

Site inspection participants met at the PTF to discuss the status of the remedy, recent issues at the Site, and ongoing concerns.

Site inspection participants walked the perimeter of the fenced area. The fence is in generally good condition. Two locked gates protect the entrance to the area. No issues were identified with the fence line. The downchutes all held moving water and or snow and were effective in moving the water off the landfill cap. The sedimentation pond held water and was also working as it was designed. The central downchute was recently repaired and the repair appears to be working. The eastern downchute was also flowing steadily. The landfill cap was adequately vegetated and although it is steep, no sloughing or erosion issues were noted. Likewise, no animal burrows were observed. No trespassing or vandalism was observed.

Site inspection participants observed the PTF. It was operational. Observed extraction points, French drains, monitoring wells and gas vents were in good condition. No issues were identified.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

Question A Summary:

Yes, the review of documents, applicable or relevant and appropriate requirements (ARARs), risk assumptions and the results of the site inspection indicate that the implemented remedies at OU1 and OU2 are currently functioning as intended for the areas identified as the Site in the 1988 ROD (OU1) and 1990 ROD (OU2).

Remedial Action Performance

Concentrations of COCs in the extracted groundwater exceed cleanup levels, indicating that treatment is still required at the Site. Based on the evaluation of the influent and effluent, the PTF has a 50-97% removal rate for key contaminants in the previous five years (Table 3). A total VOC treatment efficiency of approximately 50% was calculated in 2022. The PTF efficiency in 2022 was lower than 2021 and other recent prior sampling years (Table 3). The low treatment efficiency reported in 2022 may indicate the need for switching of the air stripper.

Concentrations of COCs in six sample locations (SC-1, EW-2, FD-3, MW-41G, MW-44T and MW-45T) remain elevated over cleanup levels. SC-1, EW-2, FD-3 and MW-44T are located within the fenced landfill area and subject to institutional controls that restrict the use of groundwater. MW-41G is located west of the Site right outside of the fenced landfill area. MW-45T is located downgradient of the landfill area within a town right-of-

way (Figure 3). There have been discussions in the past about placing an additional monitoring well downgradient of MW-45T to further delineate the plume, but there is limited room between MW-45T and the Black River to do so. There are no residences located downgradient of MW-45T and residents near the Site receive municipal water from the Town. Landfill gas vents are operating as intended and carbon canisters are being replaced, as needed, based on analysis of air samples. The site-specific PTF influent and effluent vapor samples are generally being met, except for short periods of time between change-out of carbon canisters. TCE was the only analyte detected at concentrations exceeding its EPA RSL in PTF indoor air samples. The TCE concentrations measured in PTF indoor air in 2021 was the lowest concentration recorded since 2012. The Site is visited every day to perform routine system observations, maintenance and flow values in accordance with the State discharge permit.

Slope stability remains a general concern for the cap due to the steep slope of the landfill surface and slope below the landfill. Maintenance is performed to prevent the buildup of downchute sediments and erosion associated with stormwater drainage channels. General cap maintenance, including filling animal burrows, regular mowing and trimming trees and vegetation located near the landfill cap will also aid in preventing cap degradation. During a site visit in 2022, a Town representative observed erosion in three locations near the central stormwater downchute. In May 2022, Sanborn Head repaired the erosion. In August 2022, Sanborn Head completed a visual evaluation of all three downchutes. The evaluation indicated that the erosion repair appeared to be in good condition, but an alternative, longer-term solution would be needed to prevent further erosion. In November 2022, the Town's contractor, EFT, completed a pilot test to evaluate the effectiveness of injecting expanding grout beneath the downchutes to fill voids and provide support beneath. Additional evaluation will be done as part of the 2023 Annual Inspection to assess whether grouting injection should be considered for the other downchutes or other sections of the central downchute.

The PTF has been operating for more than 30 years and may be reaching its effective lifespan. Sanborn Head, on behalf of the Town, is currently conducting an optimization study to evaluate options to reduce the cost and burden of ongoing operations.

System Operations/O&M

The Town is conducting long-term monitoring and maintenance activities associated with the O&M Manual and 2021 QAPP. Waste continues to be contained within the capped landfill and the Site is secured to prevent trespassing. The landfill cap and associated drainage structures are routinely maintained and are in good condition. Routine inspections and monitoring are conducted and reported to EPA in a timely manner. Landfill gas vent monitoring is performed biennially. Constructed drainage systems at the Site are adequately maintained and repaired. Sanborn Head performs annual inspections of the Site. Results of the annual inspections are reported to EPA. Annual reports show that the O&M is working in a manner that will continue to maintain the effectiveness of the remedy. The Town reports that the groundwater treatment plant is aging. The town is conducting an optimization review of the operation and maintenance of the groundwater treatment remedy.

Implementation of Institutional Controls and Other Measures

The Town has implemented Ordinance 88-2 (now Ordinance 12-239) giving the Town the authority to determine "that certain parcels of land within the town contain hazardous waste, toxic materials, or harmful chemical matter." The Town passed Resolution 92-4 on August 3, 1992, to apply groundwater use restrictions, excavation restrictions, and prohibit interference with the Superfund remedy; however, the Town only applied the ordinance to the landfill property (Lot 65) and not other properties that EPA identified in the 1988 ROD as needing groundwater use restrictions. The Resolution describes the restricted area, which includes the fenced area of remediation for the Site (Lot 65). The Town of Springfield Ordinance 88-2 (now Ordinance 12-239) through Resolution 92-4 prevents exposure to groundwater and prevents the interference with remedial features by prohibiting use of the areas within the site fence. The Town has not yet applied the ordinance to prohibit groundwater use on seven other properties identified by EPA in the 1988 ROD outside of the fenced area and within the area of the groundwater plume (Figure 1). Residents are served by public water. Although groundwater contamination is largely contained directly beneath the landfill property (Lot 65) within the eastern groundwater divide at the Site, EPA observed some exceedances of MCLs to the east of the landfill property, closer to Route 11. EPA will continue to evaluate whether additional institutional controls, such as expanding the

scope of the Town ordinance, are necessary to apply groundwater use restrictions to the properties located beyond the landfill boundary. MW-45T and MW-41G are the only wells outside of the fenced landfill area with concentrations of COCs above cleanup levels. MW-41G is located west of the Site right outside of the fenced landfill area. MW-45T is located downgradient of the landfill area within a town right-of-way (Figure 3). There have been discussions in the past about placing an additional monitoring well downgradient of MW-45T to further delineate the plume, but there is limited room between MW-45T and the Black River to do so. There are no residences located downgradient of MW-45T and residents in close proximity to the Site receive municipal water from the Town.

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?

Question B Summary:
No. There have been changes in toxicity values and exposure assumptions since the 1988 and 1990 RODs were issued as discussed below. However, the RAOs and cleanup levels for the Site are still valid.

The RAOs are addressed through the landfill cap, passive gas vents with carbon treatment canisters, a leachate collection and treatment system and extraction wells. The changes as described below are not expected to alter the protectiveness of the remedy because residents in close proximity to the Site receive municipal water from the Town.

Changes in Standards and To Be Considered Criteria (TBCs)
New standards (federal or state statutes and/or regulations), as well as new TBC guidance, should be considered during the FYR process as part of the protectiveness determination. Under the NCP, if a new federal or state statute and/or regulation is promulgated or a new TBC guidance is issued after the ROD is signed, and, as part of the FYR process it is determined that the standard needs to be attained or new guidance procedures followed to ensure that the remedy is protective of human health and the environment, then the FYR should recommend that a future decision document be issued that adds the new standard as an ARAR or guidance as a TBC to the remedy.

EPA guidance states:

> "Subsequent to the initiation of the remedial action new standards based on new scientific information or awareness may be developed and these standards may differ from the cleanup standards on which the remedy was based. These new…[standards] should be considered as part of the review conducted at least every five years under CERCLA §121(c) for sites where hazardous substances remain on-site. The review requires EPA to assure that human health and the environment are being protected by the remedial action. Therefore, the remedy should be examined in light of any new standards that would be applicable or relevant and appropriate to the circumstances at the site or pertinent new [standards], in order to ensure that the remedy is still protective. In certain situations, new standards or the information on which they are based may indicate that the site presents a significant threat to health or environment. If such information comes to light at times other than at the five-year reviews, the necessity of acting to modify the remedy should be considered at such times." (See CERCLA Compliance with Other Laws Manual: Interim Final (Part 1) EPA/540/G-89/006 August 1988, pp. 1-56.)

As part of this FYR, ARARs for the Site and TBC guidance set forth in the decision documents were reviewed to identify any newly promulgated or modified standards that may affect the protectiveness of the remedy. Groundwater cleanup levels were established for the Site in the 1990 ROD. The ROD identified MCLs, practical quantitation limits (PQLs)/proposed maximum contaminant levels (PMCLs) and Vermont groundwater enforcement standards (GESs) as groundwater ARARs. Table I-1 in Appendix I compares the groundwater cleanup levels to current standards. The current standards for the groundwater cleanup levels have either not changed or are less stringent than those established in the 1990 ROD (Table I-1).

There were no chemical specific ARARs or TBCs for soil included in the remedy selection for the Site. Soil cleanup levels were established for the Site in the 1990 ROD based on potential human health risk. Table J-1 in Appendix J compares the soil cleanup levels to EPA's current residential soil RSLs. All soil cleanup goals correspond to risk levels or HQs below or within the EPA's acceptable risk ranges and therefore remain valid.

PFAS (Federal)
In May 2022, EPA issued updated noncancer RfD values for several PFAS compounds which result in the following RSLs at HQ target 0.1:

- PFOA: 6 nanograms per liter (ng/L) (equivalent to parts per trillion [ppt])
- PFOS: 4 ng/L
- PFNA: 6 ng/L
- PFHxS: 40 ng/L
- Hexafluoropropylene oxide dimer acid (HFPO-DA) (Gen-X): 6 ng/L

The RfD values for PFOA, PFOS, PFNA and PFHxS are based on Agency for Toxic Substances and Disease Registry (ATSDR) Minimal Risk Levels (MRLs) for ingestion exposure.

The RfD value for HFPO-DA (Gen-X) is based on a chronic oral RfD from EPA Office of Water which is 3E-06.

In May 2021, EPA issued an updated noncancer RfD for PFBS. PFBS has a chronic oral RfD of 3E-04.

In December 2022, EPA released a new oral RfD of 1.0E-03 milligrams per kilogram per day (mg/kg-day) for perfluorobutanoic acid (PFBA) based on a new Integrated Risk Information System (IRIS) value. Previously, no RfD was available for PFBA.

In April 2023, EPA released a new oral RfD of 5.0E-04 mg/kg-day for Perfluorohexanoic acid (PFHxA) based on a new IRIS value. Previously, no RfD was available for PFHxA.

PFAS (State)
On July 6, 2019, the Vermont Agency of Natural Resources adopted an amended *Groundwater Protection Rule and Strategy*.[7] The amendment, among other things, updated the list of groundwater enforcement standards. In particular, the amendment finalized a groundwater enforcement standard of 20 ng/L (ppt) for any combination of PFOA, PFOS, PFNA, PFHpA and PFHxS. (See *Groundwater Protection Rule and Strategy*, Appendix One.[8]) Vermont also promulgated MCLs of 20 ng/L (ppt), individually or combined, for the same five PFAS compounds in drinking water through an amendment of its Water Supply Rules, adopted on March 17, 2020.[9]

At this time EPA has made no determination of whether these state standards will need to be added as ARARs for this Site. They should, however, be used as screening values for PFAS compounds without more conservative RSLs. For purposes of this FYR, EPA has evaluated the PFAS data collected against EPA's RSLs and the state's PFAS standards.

As shown in the data review section of this FYR report, eight groundwater locations (three extraction locations and five monitoring wells) were sampled for PFAS in 2019. Only one location (LSE-3/4, an extraction location) indicated a detection of a PFAS compound (PFOS). The PFOS concentration at this location was 6.21 ng/L, which is below the Vermont DEC GES of 20 ng/L, but above the Vermont DEC PAL for PFOS of 2 ng/L and EPA's RSL for an HQ of 0.1 of 4 ng/L. The remedy remains protective because residents in close proximity to the Site receive municipal water from the Town and institutional controls are in place to restrict the use of

[7] VT ANR, Chapter 12 of the Environmental Protection Rules: Groundwater Protection Rule and Strategy. Adopted July 6.
[8] The groundwater enforcement standard of 20 ppt for any combination of the five PFAS was previously adopted and continued in two emergency rules dated July 11, 2018, and January 8, 2019.
[9] See Vermont's Water Supply Rule, 16-3 VT. Code 500 (2020).

groundwater on the fenced in portion of the site property (of which LSE-3/4 is located). Due to its proximity to the limit of waste and the presence of the downgradient monitoring points where PFAS analytes were not detected, LSE-3/4 is not considered a "point of compliance" where the PAL would apply.

PFAS (Summary)
The 2019 PFAS sampling event included sampling for PFOA, PFOS, PFHxS, PFHpA, PFNA and PFBS in groundwater at eight sample locations. PFOS was detected in one location (LSE-3/4) above the Vermont DEC PAL but below the Vermont DEC GES. Although there is an exceedance of the Vermont DEC PAL for PFOS, the remedy remains protective because residents in close proximity to the site receive municipal water from the Town and institutional controls are in place to restrict the use of groundwater on the fenced in portion of the site property (of which LSE-3/4 is located). Due to its proximity to the limit of waste and the presence of the downgradient monitoring points where PFAS analytes were not detected, LSE-3/4 is not considered a "point of compliance" where the PAL would apply. Therefore, EPA has determined that additional PFAS evaluations are not needed at this time of review.

1,4-Dioxane (Federal)
Using 2013 updated IRIS toxicity information and the standard Superfund risk assessment approach, EPA's carcinogenic risk range of 10^{-6} to 10^{-4} for 1,4-dioxane equates to a concentration range of 0.46 µg/L to 46 µg/L (ppb).

1,4-Dioxane (State)
On July 6, 2019, the Vermont Agency of Natural Resources (ANR) adopted an amended Groundwater Protection Rule and Strategy.[10] The amendment, among other things, updated the list of groundwater enforcement standards. In particular, the amendment finalized a groundwater enforcement standard of 0.3 µg/L (ppb) for 1,4-dioxane.

1,4-Dioxane (Summary)
1,4-Dioxane is not a COC at the Site. Groundwater samples collected annually are analyzed for VOCs, including 1,4-dioxane. The maximum detection of 1,4-dioxane during this review period was 44 µg/L in SC-1 in 2022, which is below EPA's maximum $1x10^{-4}$ screening level of 46 µg/L but above 0.46 µg/L. Given the presence of 1,4-dioxane above 0.46 µg/L it should continue to be sampled for.

Changes in Toxicity and Other Contaminant Characteristics

2023 PFHxA non-cancer toxicity value
In April 2023, EPA released a new oral reference dose (RfD) of 5.0E-04 mg/kg-day for Perfluorohexanoic acid (PFHxA) based on a new IRIS value. Previously, no RfD was available for PFHxA.

Sampling for PFAS in 2019 did not include PFHxA. The remedy remains protective because residents in close proximity to the site receive municipal water from the Town.

2022 cis-1,2-DCE Noncancer Toxicity Value
In October 2022, EPA released a noncancer reference concentration (RfC) of 4.00E-02 milligrams per cubic meter (mg/m^3) for cis-1,2-DCE, based on a provisional peer reviewed toxicity value (PPRTV) screening value. Previously, no RfC was available for cis-1,2-DCE.

Cis-1,2-DCE is not a site COC. Groundwater samples collected annually are analyzed for VOCs, including cis-1,2-DCE. In 2022, cis-1,2-DCE exceeded Federal or State standards at three sample locations (SC-1, MW-44T and MW-45T). The maximum detection of cis-1,2-DCE during this review period was 150 µg/L in SC-1 in 2022. Although these are exceedances of the Federal and State standards for cis-1,2-DCE, the remedy remains protective because residents in close proximity to the site receive municipal water from the Town.

[10] VT ANR, Chapter 12 of the Environmental Protection Rules: Groundwater Protection Rule and Strategy. Adopted July 6, 2019.

2022 PFBA Noncancer Toxicity Value
In December 2022, EPA released a new oral RfD of 1.0E-03 mg/kg-day for PFBA based on a new IRIS value. Previously, no RfD was available for PFBA.

Sampling for PFAS in 2019 did not include PFBA. The remedy remains protective because residents in close proximity to the site receive municipal water from the Town.

2022 PFOA Noncancer Toxicity Value
In May 2022, EPA released an updated oral RfD of 3E-06 mg/kg-day for PFOA, based on the ATSDR MRL. The new value indicates that PFOA is more toxic from noncancer health effects and would result in an increased noncancer risk.

Sampling for PFOA in 2019 did not identify any detections of PFOA in any of the eight sample locations.

2022 PFOS Noncancer Toxicity Value
In May 2022, EPA released an updated oral RfD of 2E-06 mg/kg-day for PFOS, based on the ATSDR MRL. The new value indicates that PFOS is more toxic from noncancer health effects and would result in an increased noncancer risk.

PFOS was detected at one groundwater sample location at a concentration of 6.21 ng/L, which is below the Vermont DEC GES of 20 ng/L, but above the Vermont DEC PAL for PFOS of 2 ng/L and EPA's RSL for an HQ of 0.1 of 4 ng/L. Although there is an exceedance of the Vermont DEC PAL for PFOS, the remedy remains protective because residents in close proximity to the site receive municipal water from the Town and institutional controls are in place to restrict the use of groundwater on the fenced in portion of the site property (of which LSE-3/4 is located).

2022 PFNA Noncancer Toxicity Value
In May 2022, EPA released an oral RfD of 3E-06 mg/kg-day for PFNA, based on the ATSDR MRL. Previously, no RfD was available for PFNA.

Sampling for PFNA in 2019 did not identify any detections of PFNA in any of the eight sample locations.

2022 PFHxS Noncancer Toxicity Value
In May 2022, EPA released an oral RfD of 2.0E-05 mg/kg-day for PFHxS, based on the ATSDR MRL. Previously, no RfD was available for PFHxS.

Sampling for PFHxS in 2019 did not identify any detections of PFHxS in any of the eight sample locations.

2022 HFPO-DA (Gen-X) non-cancer toxicity value
In May 2022, EPA released an oral reference dose (RfD0 of 3.0E-06 mg/kg-day for hexafluoropropylene oxide dimer acid (HFPO-DA), also known as Gen-X, based on an oral RfD available from EPA office of Water. Previously, no RfD was available for HFPO-DA.

Sampling for PFAS in 2019 did not include HFPO-DA. The remedy remains protective because residents in close proximity to the site receive municipal water from the Town.

2021 PFBS Noncancer Toxicity Value
In May 2021, EPA released an oral RfD of 3E-04 mg/kg-day, based on an EPA PPRTV (USEPA, 2021a). The new value indicates that PFBS is more toxic from noncancer health effects and would result in an increased noncancer risk.

Sampling for PFBS in 2019 did not identify any detections of PFBS in any of the eight sample locations.

2020 Trans-1,2-dichloroethylene non-cancer toxicity value
In November 2020, EPA finalized a new reference concentration (RfC) for trans-1,2-dichloroethylene based on a new PPRTV. There previously was no RfC for trans-1,2-dichloroethylene.

Trans-1,2-dichloroethylene is not a COC at the Site, however it is analyzed for. There were no detections of trans-1,2-dichloroethylene in 2022.

Lead in Soil Cleanups
EPA continues to examine the science around lead exposure. Updated scientific information indicates that adverse health effects are associated with blood lead levels (BLLs) at less than 10 micrograms per deciliter (µg/dL). Several studies have observed "clear evidence of cognitive function decrements in young children with mean or group BLLs between 2 and 8 µg/dL."

Based on this updated scientific information, EPA is including an evaluation of potential lead risks with a goal to limit exposure to residential and commercial soil lead levels such that a typical (or hypothetical) child or group of similarly exposed children would have an estimated risk of no more than 5% of the population exceeding a 5 µg/dL BLL. This is based on evidence indicating cognitive impacts at BLLs below 10 µg/dL. A target BLL of 5 µg/dL reflects current scientific literature on lead toxicology and epidemiology that provides evidence that the adverse health effects of lead exposure do not have a threshold.

EPA's 2017 OLEM memorandum "Transmittal of Update to the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters" (OLEM Directive 9285.6-56) provides updates on the default baseline blood lead concentration and default geometric standard deviation input parameters for the Adult Lead Methodology (ALM). These updates are based on the analysis of the National Health and Nutrition Examination Survey 2009-2014 data, with recommended updated values for baseline blood lead concentration being 0.6 µg/dL and geometric standard deviation being 1.8.

Using updated default Integrated Exposure Uptake Biokinetic Model and ALM parameters at a target BLL of 5 µg/dL, site-specific lead soil screening levels (SLs) of 200 parts per million (ppm) and 1,000 ppm are developed for residential and commercial/industrial exposures, respectively.

Given the ongoing review of information, the above SLs are considered in this FYR for informational purposes.

The 1988 ROD identified the maximum detection of lead in surface soil to a depth of 4.5 feet was 139 mg/kg, which is below lead soil screening levels.

Changes in Risk Assessment Methods
Since the 2018 FYR, there have not been changes to human health risk assessment methodology with respect to exposure estimates and risk calculation. In November 2022, EPA updated toxicity values that are incorporated into its Vapor Intrusion Screening Level (VISL) calculator (https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-level-calculator). EPA also updated the RSL tables with the most current version, updated in May 2023 (https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables).

Changes in Exposure Pathways
The human health exposure pathways evaluated in the 1988 Endangerment Assessment performed during the RI included ingestion and dermal contact with soil, exposure to groundwater through ingestion of household drinking water and inhalation of vapors during showering, dermal contact with leachate seeps and sediment, exposure to surface water through ingestion and drinking water, inhalation of ambient air modeled from soil, groundwater and leachate seeps and consumption of fish. There are potential human health pathways at the Site that were not evaluated in the 1988 Endangerment Assessment but are routinely included in present-day risk assessment. These potential human health exposure pathways include the following:

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

The expansion of the public water supply and establishment of institutional controls restricting access to the fenced in part of 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 cleanup levels, the remedies conducted at the Site remain protective of humans from these exposures.

The 1988 ROD required an institutional control to prevent the use of groundwater in the vicinity of the Site where groundwater concentrations may exceed MCLs. The Town has implemented an institutional control to prevent use of groundwater on site. The Town had not implemented institutional controls to prevent the use of groundwater beyond the fenced area of the Site; however, the expansion of the public water supply to the vicinity of the Site 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.

The Endangerment Assessment performed during the RI also evaluated risks posed to wildlife and aquatic organisms. The assessment concluded that there were no significant risks expected from aquatic life, birds, or mammals, with the possible exception of predators of small vertebrates resulting from bioaccumulation of PCBs. The primary 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 that 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 remedial action. These COCs were addressed because all contaminated soil and sediment identified in the seeps during the RI were removed and consolidated with the other contaminated soils under the cap. A goal of the remedial action is to prevent contaminants from migrating to surface water, which could result in unacceptable risk of exposure to fish, wildlife, and predators via the bioaccumulation of contaminants through ingestion. However, this pathway was not monitored during this five-year review period. Surface water samples for COCs could provide more evidence to support previous findings.

Vapor Intrusion

The fourth pathway, potential inhalation of volatiles in residential indoor air through vapor intrusion, was not evaluated in the Endangerment Assessment. As a result, this pathway is also not addressed by the RAOs. The 2013 FYR Report identified vapor intrusion as a potential pathway for human exposure to site contaminants at nearby off-site properties. It recommended an assessment of the potential for vapor intrusion. As part of the 2016 FYR Report Addendum, the Town's contractor Sanborn Head performed a vapor intrusion assessment. The vapor intrusion assessment characterized shallow groundwater for the presence of VOCs in the area between the western margin of the capped landfill and four residences along Will Dean Road. The data collected as part of the evaluation and assessment of potential sitewide vapor intrusion pathways did not indicate an unacceptable human health risk at the Site. MW-52G and MW-52B are the only wells located within 100 feet of an occupied structure (besides the PTF, of which the indoor air is sampled annually and is not occupied for extended periods of time). There have been no detections of VOCs in MW-52B during this FYR period. Low levels of TCE have been detected in MW-52G throughout the review period with a maximum concentration of 1.5 µg/L in 2022. Using EPA's VISL calculator for residential use the modeled vapor intrusion risk for this detection is $1x10^{-6}$ and 0.3 (HQ of 1.0) which is within EPA's acceptable carcinogenic risk range and below the target noncancer HQ of 1.0.

2018 EPA VISL Calculator

In February 2018, EPA launched an online VISL calculator which can be used to obtain risk-based screening level concentrations for groundwater, sub-slab soil gas and indoor air. The VISL calculator uses the same database as the RSLs for toxicity values and physiochemical parameters and is automatically updated during the

semi-annual RSL updates. The User's Guide provides further details on how to use the VISL calculator: https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-level-calculator.

Expected Progress Towards Meeting RAOs

The remedial action at this Site addresses 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 vapor intrusion pathway was evaluated and a determination was made by EPA that the remedies are protective of nearby properties.

QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

The expected impacts of climate change in New England pose increasing risks to contaminated sites. Increases in air and water temperature, precipitation, flooding, and periods of drought may result in altered fate and transport pathways and exposure assumptions, impaired aquatic habitats, dispersal of contaminants, damage to remediation related structures and ultimately, ineffective remedies. At coastal sites, saltwater impacts made more likely by sea-level rise may cause corrosion of remediation equipment and impair restoration efforts. Increased frequency of extreme weather events may cause damage or releases at sites, impairing remedial efforts where remedies have not been adequately designed to protect against these risks.

The risks posed by climate change in New England are not expected to alter the protectiveness of the remedy at the Old Springfield Landfill site because the Site is located outside of the FEMA Zone A 100-year floodplain. Climate change in New England is not expected to alter the protectiveness of the remedy at the Site because the remedy is relying the continued operation of the groundwater extraction and treatment system, a groundwater ordinance, and the availability of a municipal water supply.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues and Recommendations Identified in the FYR:
OU2

Issues and Recommendations Identified in the FYR:

OU(s): 1	**Issue Category: Institutional Controls**
	Issue: Town ordinance only currently prohibits groundwater use on the landfill property. Institutional controls to prohibit groundwater use outside the fenced landfill area and within the area of the groundwater plume have not been implemented. Potentially 9 properties (town right-of-way, Lot 53, and remaining 7 lots west of the landfill property) outside the fenced area are being considered for additional IC's. Although the Town ordinance prohibits interference with the remedy on the landfill property, no deed restriction has been placed on the landfill property.
	Recommendation: Determine whether institutional controls that have not been implemented are still necessary, and implement them, if appropriate.

Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	EPA/State	EPA/State	7/31/2025

Other Findings

In addition, the following are recommendations that were identified during the FYR and may improve performance of the remedy, reduce costs, improve management of O&M, accelerate site close out, conserve energy but do not affect current or future protectiveness:

- The groundwater treatment plant is aging and difficult to repair. Evaluate the results from the optimization study and determine if an adjustment to the remedy is necessary.
- No significant contamination has been detected in the Western Seep samples for several years. Continue to evaluate the remedial action component that includes collection of leachate at this seep and discharge to the Town's WWTP to address the need for potential modifications.
- The TCE concentration measure in PTF indoor air in 2021 was the lowest concentration recorded since 2012 but TCE was detected at concentrations (16.4 µg/m^3) exceeding its Vermont DEC non-resident indoor air standard (0.7 µg/m^3). Evaluate the cause of indoor air continually exceeding standards for TCE within the PTF.
- A goal of the remedial action is to prevent contaminants from migrating to surface water, which could result in unacceptable risk of exposure to fish, wildlife and predators via the bioaccumulation of contaminants through ingestion. Consider surface water sampling of the Black River to ensure that this goal is being met.

VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)	
Operable Unit: OU1	*Protectiveness Determination:* Short-term Protective
Protectiveness Statement: The OU1 remedy currently protects human health and the environment. The OU1 remedy ("Management of Migration Remedy") is adequately capturing groundwater at the landfill for discharge to the PTF, with the Western Seep collecting site groundwater from an area along Seavers Brook Road. Both the PTF and the Western Seep discharge to the Town's WWTF. Data presented in this FYR support the conclusion that this capture and subsequent treatment of site groundwater are meeting the remedial response objectives for the OU1 remedy. However, in order for the remedy to be protective in the long term the following actions need to be taken: determine whether institutional controls that have not been implemented are necessary, and implement them, if appropriate.	

Protectiveness Statement(s)	
Operable Unit: OU2	*Protectiveness Determination:* Protective
Protectiveness Statement: The OU2 remedy is protective of human health and the environment. The OU2 remedy ("Source Control Remedy") source control well (SC-1, which discharges to the PTF), 10 passive gas vents, three subsurface French drains and surface water diversions, along with the engineered capped landfill on Will Dean Road, are minimizing the entry of off-site water to the landfill. Data presented in this FYR Report support the conclusion that these controls, plus existing institutional controls, are meeting design objectives for the OU2 remedy.	

Sitewide Protectiveness Statement
Protectiveness Determination: Short-term Protective
Protectiveness Statement: The remedy currently protects human health and the environment because there are no current complete exposure pathways. However, in order for the remedy to be protective in the long term the following actions need to be taken: determine whether institutional controls that have not been implemented are necessary, and implement them, if appropriate.

VIII. NEXT REVIEW

The next FYR for the Old Springfield Landfill Superfund site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

ATSDR. 2021. Toxicological Profile for Perfluoroalkyls. https://www.atsdr.cdc.gov/toxprofiles/tp200.pdf

EPA, 1985. Remedial Investigation at Old Springfield Landfill Site. U.S. Environmental Protection Agency, Region 1. September 17, 1985.

EPA, 1985. Remedial Investigation at Old Springfield Landfill Site, Volume II. 1985. Remedial Investigation at Old Springfield Landfill Site. September 17, 1985.

Ebasco, 1988. Draft Final Endangerment Assessment Report Old Springfield Landfill, Ebasco Services, Inc., June 1988

Ebasco, 1988. Draft Final Feasibility Study Report Old Springfield Landfill, Ebasco Services, Inc. June 1988.

Ebasco, 1988. Draft Final Supplemental Remedial Investigation Report Volume I Old Springfield Landfill, Ebasco Services, Inc. June 1988.

EPA. 1988. CERCLA Compliance with Other Laws Manual: Interim Final (Part 1). EPA/540/G-89/006. August 1988.

EPA, 1988. Record of Decision. U.S. Environmental Protection Agency, Region I. September 22, 1988.

EPA, 1990. Record of Decision. U.S. Environmental Protection Agency, Region I. September 28, 1990.

EPA, 2003. Second Five-Year Review. U.S. Environmental Protection Agency, Region I. September 2003.

EPA, 2008. Third Five-Year Review. U.S. Environmental Protection Agency, Region I. September 2008.

EPA. 2014. Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors Memorandum. OSWER Directive 9200.1-120.

EPA, 2013. Fourth Five-Year Review. U.S. Environmental Protection Agency, Region I. August 2013.

EPA. 2017. Transmittal of Update to the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters Memorandum, May 17, 2017. OLEM Directive 9285.6-56.

EPA. 2018. Vapor Intrusion Screening Level (VISL) Calculator. Office of Land and Emergency Management, Office of Superfund Remediation and Technology Innovation (OSRTI), May 2018. https://www.epa.gov/vaporintrusion/vapor-intrusion-screening-level-calculator

EPA, 2016c. Addendum to Fourth Five-Year Review Report. U.S. Environmental Protection Agency, Region I. December 2016.

EPA. 2021. Provisional Peer-Reviewed Toxicity Values for Perfluorobutane Sulfonic Acid (PFBS) and Related Compound Potassium Perfluorobutane Sulfonate. Office of Research and Development, Center for Public Health and Environmental Assessment. EPA/690/R-21/001F. 2021.

EPA. 2021. Recommendations on the Use of Chronic or Subchronic Noncancer Values for Superfund Human Health Risk Assessments Memorandum, May 26, 2021. Office of Land and Emergency Management, Washington, DC. 2021.

EPA. 2021. Human Health Toxicity Values for Hexafluoropropylene Oxide (HFPO) Dimer Acid and Its Ammonium Salt (CASRN 13252-13-6 and CASRN 62037-80-3) Also Known as "Gen-X Chemicals." Office of Water, Health and Ecological Criteria Division, Washington, DC, October 2021.

EPA. Integrated Risk Information System (IRIS). Available at https://www.epa.gov/iris

EPA. Provisional Peer-Reviewed Toxicity Values. Available at https://www.epa.gov/pprtv

EPA. Regional Screening Level Tables. Available at https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables

M. Grippo, J. Hayse, I. Hlohowskyj, and K. Picel. 2021. Derivation of PFAS Ecological Screening Values, Environmental Science Division, Argonne National Laboratory, September 2021.

Sanborn, Head & Associates, Inc., 2016b. *Vapor Intrusion Assessment Work Plan, Old Springfield Landfill*, June 16, 2016.

Sanborn, Head & Associates, Inc., 2016c. 2016 Vapor Intrusion (VI) Assessment Report, Old Springfield Landfill, November 29, 2016.

Sanborn, Head & Associates, Inc., 2018. 2018 Annual Site Inspection Report, Old Springfield Landfill, October 10, 2018.

Sanborn, Head & Associates, Inc., 2019. 2018 Operations and Maintenance Report, Old Springfield Landfill, March 29, 2019.

Sanborn, Head & Associates, Inc., 2019. 2019 Annual Site Inspection Report, Old Springfield Landfill, November 11, 2019.

Sanborn, Head & Associates, Inc., 2020. 2019 Operations and Maintenance Report, Old Springfield Landfill, March 30, 2020.

Sanborn, Head & Associates, Inc. 2020. Proposed Changes to Routine Sampling at Old Springfield Landfill, August 3, 2020.

Sanborn, Head & Associates, Inc. 2020. 2020 Annual Site Inspection Report, Old Springfield Landfill, October 12, 2020.

Sanborn, Head & Associates, Inc. 2020. Quality Assurance Project Plan Revision No. 1 Old Springfield Landfill, December 11, 2020.

Sanborn, Head & Associates, Inc., 2021. 2020 Operations and Maintenance Report, Old Springfield Landfill, March 30, 2021.

Sanborn, Head & Associates, Inc. 2021. 2021 Annual Site Inspection Report, Old Springfield Landfill, August 27, 2021.

Sanborn, Head & Associates, Inc., 2022. 2021 Operations and Maintenance Report, Old Springfield Landfill, March 30, 2022.

Sanborn, Head & Associates, Inc. 2022 Old Springfield Landfill – Summary of May 2022 Central Stormwater Downchute Soil Erosion Repairs, June 17, 2022.

Sanborn, Head & Associates, Inc. 2022. 2022 Annual Site Inspection Report, Old Springfield Landfill, October, 2022.

Town of Springfield, VT, 1988. Ordinance 88-2. April 1988.

Town of Springfield, VT, 1992. Resolution 92-4. August 1992.

APPENDIX B – SITE CHRONOLOGY

Table B-1: Site Chronology

Event	Date
Approximate time period of waste disposal activities at the Site	1947 to 1968
The Old Spring Landfill was closed and developed for use as a mobile home community	November 1968
EPA entered into the investigation of the Site	1975
EPA listed the Site on the NPL	September 1983
A nearby resident complained of foul-smelling water	1984
The PRPs installed the water line to the affected home near the mobile home community	
EPA completed the initial RI	1985
EPA completed the supplemental RI	June 1988
EPA completed the feasibility study for OU1	
EPA completed the Endangerment Assessment Report	
EPA issued the OU1 ROD	September 1988
EPA entered into an AOC with the PRPs to perform the OU2 focused feasibility study	March 1989
EPA and the PRPs entered into a Consent Decree to perform the OU1 remedial action	September 1989
EPA issued the OU2 ROD	September 1990
EPA and the PRPs entered into a Consent Decree to perform the OU2 remedial action	May 1991
The PRPs completed the remedial design for OU1	April 1992
The PRPs initiated the remedial action for OU1	June 1992
The Town passed Resolution 92-4	August 1992
EPA entered into an AOC with the owner of the property located on both sides of Will Dean Road and contiguous to the landfill	1993
The PRPs completed the remedial design for OU2	May 1993
The PRPs completed construction of OU1	September 1993
The PRPs completed construction of OU2	June 1994
EPA issued the Interim Remedial Action Report for OU1	September 1994
EPA completed the Preliminary Close-Out Report and Interim Remedial Action Reports for OU2	September 1994
EPA issued the first FYR Report	September 1998
EPA issued the second FYR Report	September 2003
EPA issued the third FYR Report	September 2008
Site achieved Sitewide Ready for Anticipated Reuse	November 2008
EPA issued the fourth FYR Report	August 2013
The Town issued the vapor intrusion assessment work plan	June 2016
The Town issued the vapor intrusion assessment report	November 2016
EPA issued the Addendum to the fourth FYR Report	December 2016
EPA issued the fifth FYR Report	July 2018

APPENDIX C – INSTITUTIONAL CONTROLS

Sec. 12-239. - Purpose.

For protection of the health, safety, and welfare of the inhabitants of the town, it is necessary for the Selectboard 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 Selectboard may restrict the uses and activities upon the lands consistent with the provisions in this article.

(Code 1990, § 7-126; Ord. No. O-1988-2, § I, 4-18-1988)

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
Jean M. Willard, Chairman

Robert D. Yoder
Robert D. Yoder

Douglas C. Moulton
Douglas C. Moulton

Kimberly J. Nichols
Kimberly J. Nichols

V. Joyce Lindamood
V. Joyce Lindamood

ATTEST: Bonnie L. Reynolds
Bonnie L. Reynolds, CMC/AAE

EPA to Review Cleanups at One Vermont Superfund Site this Year

January 18, 2023

Contact Information
Mikayla Rumph (rumph.mikayla@epa.gov)
(617) 918-1016

BOSTON (Jan. 18, 2023) – The U.S. Environmental Protection Agency (EPA) will conduct a comprehensive review of completed cleanup work at a National Priority List (NPL) Superfund site in Vermont this year.

The site will undergo a legally required Five-Year Review to ensure that previous remediation efforts at the site continue to protect public health and the environment.

"Throughout the process of designing and constructing a cleanup at a hazardous waste site, EPA's primary goal is to make sure the remedy will be protective of public health and the environment, especially for communities that have been overburdened by pollution," **said EPA New England Regional Administrator David W. Cash.** "It is important for EPA to regularly check on this site to ensure the remedy is working properly and Vermont communities continue to be protected."

The Superfund Site where EPA will conduct the Five-Year Review in 2023 is listed below with a web link that provides detailed information on site status as well as past assessment and cleanup activity. Once the Five-Year Review is complete, its findings will be posted to the website in a final report.

Five-Year Review of Superfund site in Vermont to be completed in 2023:

Old Springfield Landfill, Springfield

More information:
The Superfund program, a federal program established by Congress in 1980, investigates and cleans up the most complex, uncontrolled, or abandoned hazardous waste sites in the country and EPA endeavors to facilitate activities to return them to productive use. In total, there are 123 Superfund sites across New England.

Superfund and other cleanup sites in New England <https://epa.gov/superfund/search-superfund-sites-where-you-live>

EPA's Superfund program <https://epa.gov/superfund>

Contact Us <https://epa.gov/newsreleases/forms/contact-us> to ask a question, provide feedback, or report a problem.

LAST UPDATED ON JANUARY 18, 2023

SEMS Doc ID 671773

No FEAR Act Data
<https://epa.gov/ocr/whistleblower-protections-epa-and-how-they-relate-non-disclosure-agreements-signed-epa>

Plain Writing
<https://epa.gov/web-policies-and-procedures/plain-writing>

Privacy <https://epa.gov/privacy>

Privacy and Security Notice
<https://epa.gov/privacy/privacy-and-security-notice>

Subscribe
<https://epa.gov/newsroom/email-subscriptions-epa-news-releases>

USA.gov <https://www.usa.gov/>

White House
<https://www.whitehouse.gov/>

Follow.

APPENDIX E – INTERVIEWS

OLD SPRINGFIELD SUPERFUND SITE FIVE-YEAR REVIEW INTERVIEW FORM	
Site Name: Old Springfield	
EPA ID: VTD000860239	
Interviewer name:	**Interviewer affiliation:**
Subject name: Nathan Fraser	**Subject affiliation: C/O Springfield WWTP**
Subject contact information: wwtp@vermontel.net	
Interview date: 5/22/2023	**Interview time: 8:30**
Interview location: Springfield Vermont WWTP	
Interview format (circle one): In Person Phone Mail Email Other:	
Interview category: Local Government	

1. Are you aware of the historic environmental issues at the Site and the cleanup activities that have taken place to date? **Yes, the OSL site was a locally owned landfill that not only took in household waste, but also hazardous industrial waste as well. We are actively capturing TCE and VOC's while pumping the contaminated ground water to keep the pollution contained within the dump site, and pre-treating before discharging to the WWTP.**

2. Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might EPA convey site-related information in the future? **Yes**

3. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism, or trespassing? **The town has not seen any issues with any of these activities.**

4. Are you aware of any changes to state laws or local regulations that might affect the protectiveness of the Site's remedy? **I am not aware of any changes at the State level.**

5. Are you aware of any changes in projected land use(s) at the Site? **None that we are aware of.**

6. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future? **To the best of my knowledge yes. We haven't had many questions or complaints regarding the OSL.**

7. Do you have any comments, suggestions or recommendations regarding the project? **Only that the operational costs of maintaining the aging facility are growing. Parts and equipment have become obsolete, making it challenging to operate at times. The town is actively pursuing upgrade options and would be open to any feedback pertaining to potential funding options that may help offset these costs.**
   •
8. Do you consent to have your name included along with your responses to this questionnaire in the FYR report? **Yes**

OLD SPRINGFIELD SUPERFUND SITE FIVE-YEAR REVIEW INTERVIEW FORM	
Site Name: Old Springfield	
EPA ID: VTD000860239	
Interviewer name:	**Interviewer affiliation:**
Subject name: Heidi Caprood	**Subject affiliation: PRP Contractor**
Subject contact information: hcaprood@sanbornhead.com **; 603-415-6149**	
Interview date: May 15, 2023	**Interview time:**
Interview location: Bedford, NH	
Interview format (circle one): In Person Phone Mail (Email) Other:	
Interview category: O&M Contractor	

1. What is your overall impression of the project, including cleanup, maintenance, and reuse activities (as appropriate)?

The remedy generally appears to be functioning as designed based on the results of periodic environmental monitoring.

2. What is your opinion of the current performance of the remedy in place at the Site?

Based on the periodic monitoring results, the remedies appear to be performing as expected based on the age of the site and design of remedial technologies.

3. What monitoring data do you regularly collect? What are the key trends in the data you're familiar with regarding contaminant levels and or system performance that are being documented over time at the Site?

As discussed in the Annual Reports, most recently issued in March 2023, groundwater sampling is performed annually, PTF air effluent is sampled semi-annually (two times per year), and gas vent sampling is performed biennially (every other year – odd years). The Town's contractor EAI is responsible for collecting groundwater sampling and Sanborn Head reports the data. Sanborn Head is responsible for collecting and reporting the PTF air effluent and gas vent data. Overall trends observed at the site have indicated that concentrations of TCE detected in monitoring wells have generally decreased, indicating that the remedy continues to reduce contaminant mass. We note that given the nature of the contaminant source (in particular, the in-place buried waste mass and contamination present in bedrock) the timeframe to achieve remedial standards at all locations is anticipated to be considerable. Landfill gas vents are operating as intended and carbon canisters are being replaced as needed based on analyses of air samples. The Site-specific air standards are generally being met and GAC carbon canisters are changed-out periodically based on the results of sampling.

In addition, 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. Trends observed indicate that extraction rates are well below the system design flow values, with the exception of the french drains which are consistent with their design flows of <1 gallon per minute. Flow rates have generally been consistent throughout the past five year period and tend to steadily decrease throughout the year until a pump changeout is required. Despite the reduced flows in the groundwater extraction system, the extent of contaminated groundwater at the site has not materially increased over time.

4. What is the approximate frequency of on-site O&M at this time? Please describe staff responsibilities and activities associated with it.

The Town of Springfield performs routine O&M activities. I understand this includes daily monitoring/recording of flow rates and visual inspection of the site. Other maintenance activities are performed periodically as needed:

- **Extraction well pump replacement**
- **Carbon drum changeout on PTF and gas vents**
- **Air stripper cleaning and maintenance**
- **Cap mowing in the summer**
- **Pest control (typically groundhogs)**
- **Erosion repair of the downchutes**
- **Routine inspection and maintenance of the landfill cover system (routinely completed in August of each year)**
- **Submission of an annual report to EPA and VT DEC to document the performance of the O&M and sampling results.**

5. Have there been any significant changes in site O&M requirements, maintenance schedules or sampling routines within the last five years? If so, do they affect the protectiveness or effectiveness of the remedy? Please describe changes and any impacts.

The 2021 QAPP update included several modifications to the monitoring program based on a review of the environmental data. These modifications were relatively minor and dealt with sampling frequency of PTF air effluent and gas vents, which are typically well understood based on the long history of operation of the site. These modifications did not affect the protectiveness or effectiveness of the remedy and were approved by USEPA.

6. Have there been unexpected O&M difficulties or costs at the Site within the last five years? If so, please provide details.

I understand that the costs for typical O&M activities are budgeted by the Town. In September 2022, a pilot grout injection test was performed on the central downchute to evaluate potential measures to mitigate erosion recently observed near these features. The results of that test will continue to be evaluated throughout 2023. If performance of the grout injection appears to be favorable, recommendations may be developed for the Town to consider injection of grout in additional sections of the downchutes to reduce the potential for erosion beneath and adjacent to these features.

Additionally, it is our understanding that additional maintenance has been required each year as the infrastructure ages. Additionally, costs associated with maintaining the equipment have also increased as parts are harder to find and need to be more frequently replaced. Based on information provided by the Town, the need for frequent pump replacements in the extraction wells (approximately 1-2 replacements per year per well) has been an increasing cost with each pump costing approximately $1,000.

7. Are you aware of any opportunities to optimize O&M activities or sampling efforts? Please describe potential changes that could produce desired cost savings or improved efficiencies at the Site.

An evaluation of remedial alternatives is currently being evaluated by the Town. If any opportunities to optimize O&M activities are identified as part of that work, Sanborn Head will request the Town share that information with USEPA.

8. Do you have any comments, suggestions or recommendations regarding and O&M activities at the Site?

As discussed above, the 2021 QAPP update included several modifications to the monitoring program based on a review of the environmental data. In future QAPP updates, the scope and frequency of the monitoring program will be evaluated for potential update/revision. I have no further recommended changes at this time.

9. Do you consent to have your name included along with your responses to this questionnaire in the FYR report?

Yes.

OLD SPRINGFIELD SUPERFUND SITE FIVE-YEAR REVIEW INTERVIEW FORM	
Site Name: Old Springfield	
EPA ID: VTD000860239	
Interviewer name:	**Interviewer affiliation:**
Subject name: Grahame Bradley	**Subject affiliation:** VTDEC
Subject contact information: Grahame.Bradley@vermont.gov **; 802-622-4129**	
Interview date: 6/20/2023	**Interview time:** 11:00 am
Interview location: Montpelier, VT	
Interview format (circle one): In Person Phone Mail **Email** Other:	
Interview category: State Agency	

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

The project generally meets expectations. We understand that the Town of Springfield has concerns about their long-term financial responsibility for maintaining the remedy.

2. What is your assessment of the current performance of the remedy in place at the Site?

The remedy is achieving acceptable performance and we do not have significant concerns. Nevertheless, we note small exceedances of the Vermont Groundwater Enforcement Standards in sentinel well MW-45T and MW-45B on the site-side of VT Rt 11. We recognize that there is limited ability to install additional wells east of Rt. 11 on the west side of the Black River. There are no drinking water wells, and there is a negligible likelihood a drinking water well would be installed between MW-45T and the river. We understand that the exceedances in groundwater do not constitute an ecological risk to the river.

We understand that due to the age of the water treatment plant and associated extraction wells some decrease in efficiency and increase in maintenance costs are being experienced, as is to be expected. Technical and financial planning is required to ensure ongoing acceptable performance of the remedy for the foreseeable future.

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years?

No.

4. Has your office conducted any site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities.

General discussion with the Town of Springfield regarding ongoing monitoring and maintenance costs. The State of Vermont is amenable to working with EPA to reduce ongoing costs if this is possible, without compromising the remedy.

5. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy?

I am not aware of planned changes to state law that might affect the protectiveness of the Site's remedy.

I note that PFAS analysis conducted in 2020 had a reporting limit over 4 ng/L, and therefore above the EPA proposed MCLs. Should federal and state standards change, it may ne necessary to retest with a lower reporting limit.

6. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?

The status of institutional controls, including required easements and restrictions, should be assessed to ensure necessary land records are in place.

7. Are you aware of any changes in projected land use(s) at the Site?

No.

8. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?

No.

-

9. Do you consent to have your name included along with your responses to this questionnaire in the FYR report?

Yes

APPENDIX F – DATA REVIEW

Figure F-1: Monitoring Wells Included in Annual Sampling

Exhibit 1
Monitoring Wells Included in Annual Sampling

Monitoring Well	Lithologic Formation
MW-9	Till/Weathered bedrock
MW-18B1	Weathered bedrock
MW-18B2	Competent bedrock
MW-20	Weathered bedrock
MW-20D	Weathered bedrock
MW-41B	Bedrock
MW-41G	Sand and gravel
MW-44T	Till
MW-45B	Weathered bedrock
MW-45T	Fractured bedrock
MW-52G	Sand and gravel
MW-52B	Weathered bedrock

Source: 2022 O&M Report, Exhibit 1, PDF p. 7

Figure F-2: Historic Groundwater Monitoring Data; 2011-2022

TABLE 3A
Water Quality Summary - Volatile Organic Compound Concentrations
Old Springfield Landfill
Springfield, Vermont
CERCLA Site No. VTD000860239
VTDEC SMS Site #770023

Analyte		Concentrations in µg/L – VOCs – AVOCs					CVOCs												Other VOCs		
		Benzene	Ethylbenzene	Xylene (m,p-)	Xylenes (Total)	Total AVOCs	Chlorobenzene (Monochlorobenzene)	Dichlorobenzene (1,2-)	Dichloroethane (1,1-)	Dichloroethane (1,2-)	Dichloroethene (1,1-)	Dichloroethene (cis-1,2-)	Methylene Chloride (Dichloromethane)	Tetrachloroethene (PCE)	Trichloroethane (1,1,1-)	Trichloroethene (TCE)	Vinyl Chloride	Total CVOCs	Dioxane (1,4-)	Total Other VOCs	Total VOCs
VTDEC ES		5	700	–	10,000		100	600	70	5	7	70	5	5	200	5	2		0.3	–	–
VTDEC PAL		0.5	350	–	5,000		50	300	35	0.5	0.7	35	0.5	0.5	100	0.5	0.5		0.3	–	–
VT HA		–	–	–	–	–	–	–	70	–	–	–	–	–	–	–	–	–	0.3	–	–
MCL		5	700	–	10,000	–	100	600	–	5	7	70	5	5	200	5	2	–	–	–	–
EW-1	08/09/11	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
EW-1	08/08/12	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
EW-1	08/22/13	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	5	<2	5	NA	ND	5
EW-1	08/12/14	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
EW-1	08/06/15	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
EW-1	08/02/16	<0.5	<1	<1	ND	ND	<2	<1	<2	<0.5	<0.5	<2	<0.5	<0.5	<2	<0.5	<0.5	ND	<0.25	ND	ND
EW-1	08/10/17	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	0.33	0.33	0.33
EW-1	08/10/17 Dup.	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	0.27	0.27	0.27
EW-1	08/14/18	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.25	ND	ND
EW-1	08/14/18 Dup.	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.25	ND	ND
EW-1	08/22/19	<0.5 J	<1 J	<1 J	ND	ND	<1 J	<1 J	<1 J	<0.5 J	<0.5 J	<1 J	<0.5 J	<0.5 J	<1 J	<0.5 J	<0.5 J	ND	<0.2	ND	ND
EW-1	08/22/19 Dup.	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
EW-1	08/20/20	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	0.27	0.27	0.27
EW-1	08/20/20 Dup.	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	0.26	0.26	0.26
EW-1	08/04/21	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	0.22	0.22	0.22
EW-1	08/04/21 Dup.	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	1.2	<0.5	1.2	0.22	0.22	1.42
EW-1	08/02/22	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5 J	<1	<0.5 J	<0.5	<1	<0.5	<0.5 J	ND	0.31	0.31	0.31
EW-1	08/02/22 Dup.	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	0.69	<0.5	0.69	<0.2	ND	0.69
EW-2	08/09/11	<1	<1	<1	ND	ND	2	1	<2	<2	4	18	<5	13	25	230	10	270	NA	ND	270
EW-2	08/08/12	<1	<1	<1	ND	ND	3	1	<2	<2	4	21	<5	16	20	220	8	293	NA	ND	293
EW-2	08/22/13	<2	<2	<2	ND	ND	3	<2	<2	<2	4	30	<10	20	21	260	16	354	NA	ND	354
EW-2	08/12/14	<1	<1	<1	ND	ND	3	1	<2	<2	6	25	<5	21	35	290	4	385	NA	ND	385
EW-2	08/06/15	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	7	<2	7	NA	ND	7
EW-2	10/21/15	<1	<1	<1	ND	ND	3	1	<2	<2	3	15	<5	13	13	140	3	191	NA	ND	191
EW-2	08/02/16	<0.5	<1	<1	ND	ND	<2	<1	<2	<0.5	0.8	8	<0.5	6.4	5	59	1.5	80.7	0.42	0.42	81.12
EW-2	10/14/16	<0.5	<1	<1	ND	ND	<2	<1	<2	<0.5	0.8	7	<0.5	5	4	51	1.4	69.2	0.35	0.35	69.55
EW-2	08/10/17	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	5	<0.5	3.5	2	27	2.2	39.7	<0.25	ND	39.7
EW-2	08/14/18	<0.5	<1	<1	ND	ND	1.2	<1	<1	<0.5	<0.5	4.3	<0.5	3.4	1.9	29	0.68	40.48	0.34	0.34	40.82
EW-2	08/22/19	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	3.2	<0.5	2.4	1.1	16	<0.5	22.7	0.26	0.26	22.96
EW-2	08/20/20	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	3.5	<0.5	4.1	2.8	32	<0.5	42.4	0.27	0.27	42.67
EW-2	08/04/21	<0.5	<1	<1	ND	ND	4.2	1.2	<1	<0.5	1.7	13	<0.5	11	8.7	100	1.5	141.3	0.36	0.36	141.66
EW-2	08/02/22	<0.5	<1	<1	ND	ND	4.1	1.2	1.1	<0.5	1.4	12	<0.5	10	4.4	65	2.5 J+	101.7	0.25	0.25	101.95
SC-1	08/09/11	<20	<20	<20	ND	ND	<20	<20	20	<20	140	210	<100	200	510	5,200	<40	6,280	NA	ND	6,280
SC-1	08/08/12	<20	<20	<20	ND	ND	<20	<20	20	<20	150	230	<100	230	500	5,400	<40	6,530	NA	ND	6,530
SC-1	08/22/13	<50	<50	<50	ND	ND	<50	<50	<50	<50	110	180	<300	180	350	4,400	<100	5,220	NA	ND	5,220
SC-1	08/12/14	<20	<20	<20	ND	ND	<20	<20	30	<20	190	260	<100	280	490	5,900	<40	7,150	69	69	7,219
SC-1	08/06/15	<20	<20	<20	ND	ND	<20	<20	<20	<20	<20	<20	<100	<20	<20	260	<40	260	5.8	5.8	266
SC-1	10/21/15	<20	<20	<20	ND	ND	<20	<20	20	<20	160	280	<100	280	420	5,100	<40	6,260	66	66	6,326
SC-1	08/02/16	<3	<5	<5	ND	ND	<5	<5	6	<3	27	54	<3	43	86	930	4	1,150	7.9	7.9	1,158
SC-1	08/02/16 Dup.	<3	<5	<5	ND	ND	<5	<5	<5	<3	13	25	<3	33	43	530	<3	644	8.1	8.1	652.1
SC-1	10/14/16	<3	<5	<5	ND	ND	<5	<5	<5	<3	10	17	<3	19	29	360	<3	435	5.9	5.9	440.9
SC-1	08/10/17	<0.5	<1	<1	ND	ND	1	<1	3	<0.5	13	16	<0.5	24	29	320	0.7	407	5.1	5.1	411.8
SC-1	08/14/18	<3	<5	<5	ND	ND	<5	<5	<5	<3	13	17	<3	29	31	440	<3	530	4.5	4.5	534.5
SC-1	08/22/19	<5	<10	<10	ND	ND	10	<10	13	<5	65	140	<5	140	180	2,300	11	2,859	43	43	2,902
SC-1	08/20/20	<5	<10	<10	ND	ND	<10	<10	10	<5	50	110	<5	100	150	1,800	8.3	2,228.3	32	32	2,260.3
SC-1	08/04/21	<0.5	<1	<1	ND	ND	7.7	2.5	9.7	<0.5	47	110	<0.5	110	130	1,500	6.7	1,923.6	36	36	1,959.6
SC-1	08/02/22	1.2	<1	<1	ND	1.2	11	3.6	13	0.62	86	150	<0.5	170	180	2,200	15 J+	2,829.2	44	44	2,874.4
FD-1	08/22/13	2	<1	<1	ND	2	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	2
FD-1	08/12/14	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
FD-1	08/06/15	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
FD-1	08/02/16	<0.5	<1	<1	ND	ND	<2	<1	<2	<0.5	<0.5	<2	<0.5	<0.5	<2	<0.5	<0.5	ND	NA	ND	ND
FD-1	08/10/17	0.6	<1	<1	ND	0.6	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	NA	ND	0.6
FD-1	08/14/18	0.63	<1	<1	ND	0.63	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	NA	ND	0.63
FD-1	08/22/19	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	NA	ND	ND
FD-1	08/20/20	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	NA	ND	ND
FD-1	08/04/21	<0.5	1.6	2.2	2.2	3.8	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	NA	ND	3.8
FD-1	08/02/22	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	NA	ND	ND
FD-2	08/09/11	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
FD-2	08/08/12	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
FD-2	08/22/13	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
FD-2	08/12/14	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
FD-2	08/06/15	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
FD-2	08/02/16	<0.5	<1	<1	ND	ND	<2	<1	<2	<0.5	<0.5	<2	<0.5	<0.5	<2	<0.5	<0.5	ND	NA	ND	ND
FD-2	08/10/17	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	NA	ND	ND
FD-2	08/14/18	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	NA	ND	ND
FD-2	08/22/19	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	NA	ND	ND
FD-2	08/20/20	Not Sampled																			
FD-2	08/04/21	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	NA	ND	ND
FD-2	08/02/22	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	NA	ND	ND
FD-3	08/09/11	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	5	<5	<2	<2	<2	3	8	NA	ND	8
FD-3	08/08/12	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
FD-3	08/22/13	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
FD-3	08/12/14	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
FD-3	08/06/15	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
FD-3	08/05/16	Dry																			
FD-3	08/10/17	Dry																			
FD-3	08/14/18	Dry																			
FD-3	08/22/19	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	NA	ND	ND
FD-3	08/20/20	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	NA	ND	ND
FD-3	08/04/21	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	NA	ND	ND
FD-3	08/02/22	<0.5	<1	<1	ND	ND	<1	<1	1.5	<0.5	9.1	11	<0.5	19	16	210	0.74 J+	267.34	NA	ND	267.34
FD-3	08/26/22	<0.5	<1	<1	ND	ND	4.4	<1	1.2	<0.5	1.9	3.9	<0.5	3.6	3.9	48	0.65	68.29	NA	ND	68.29
LSE 3/4	08/09/11	<1	2	5	5	7	<2	<1	<2	<2	1	3	<5	4	5	59	<2	72	NA	ND	79
LSE 3/4	08/08/12	Dry																			

TABLE 3A
Water Quality Summary - Volatile Organic Compound Concentrations
Old Springfield Landfill
Springfield, Vermont
CERCLA Site No. VTD000860239
VTDEC SMS Site #770023

Analyte		Concentrations in µg/L																			
		VOCs																			
		AVOCs					CVOCs												Other VOCs		
		Benzene	Ethylbenzene	Xylene (m,p-)	Xylenes (Total)	Total AVOCs	Chlorobenzene (Monochlorobenzene)	Dichlorobenzene (1,2-)	Dichloroethane (1,1-)	Dichloroethene (1,2-)	Dichloroethene (1,1-)	Dichloroethene (cis-1,2-)	Methylene Chloride (Dichloromethane)	Tetrachloroethene (PCE)	Trichloroethane (1,1,1-)	Trichloroethene (TCE)	Vinyl Chloride	Total CVOCs	Dioxane (1,4-)	Total Other VOCs	Total VOCs
VTDEC ES		5	700	–	10,000		100	600	70	5	7	70	5	5	200	5	2		0.3	–	–
VTDEC PAL		0.5	350	–	5,000		50	300	35	0.5	0.7	35	0.5	0.5	100	0.5	0.5		0.3	–	–
VT HA		–	–	–	–	–	–	–	70	–	–	–	–	–	–	–	–	–	0.3	–	–
MCL		5	700	–	10,000	–	100	600	–	5	7	70	5	5	200	5	2	–	–	–	–
LSE 3/4	08/22/13	<1	<1	<1	ND	ND	3	1	<2	<2	<1	<2	<5	<2	<2	2	<2	6	NA	ND	6
LSE 3/4	08/12/14	<1	<1	<1	ND	ND	3	<1	2	<2	<1	<2	<5	<2	<2	2	<2	7	NA	ND	7
LSE 3/4	08/06/15	<1	<1	<1	ND	ND	5	1	<2	<2	<1	<2	<5	<2	<2	<2	<2	6	NA	ND	6
LSE 3/4	08/02/16	<3	<5	<5	ND	ND	<5	<5	6	<3	28	67	<3	7.2	110	1,200	<3	1,483	17	17	1,500
LSE 3/4	10/14/16	<3	<5	<5	ND	ND	<5	<5	<5	<3	20	46	<3	41	70	830	<3	1,007	13	13	1,020
LSE 3/4	08/10/17	<0.5	<1	<1	ND	ND	1	<1	3	<0.5	<0.5	3	<0.5	1.5	<1	5.0	<0.5	13.5	<0.25	ND	14
LSE 3/4	08/14/18	<0.5	<1	<1	ND	ND	3.4	<1	2	<0.5	2.8	6.3	<0.5	6.3	7.8	110	0.66	139.26	1.1	1.1	140
LSE 3/4	08/22/19	<0.5	<1	<1	ND	ND	4.4	<1	1.7	<0.5	<0.5	1.4	<0.5	<0.5	<1	1.4	<0.5	8.9	<0.2	ND	8.9
LSE 3/4	08/19/20	<0.5	<1	<1	ND	ND	5.6	<1	1.2	<0.5	<0.5	1.3	<0.5	0.78	<1	1.6	0.64	11.12	<0.2	ND	11.12
LSE 3/4	08/04/21	<0.5	<1	<1	ND	ND	1.2	<1	1.1	<0.5	<0.5	1.8	<0.5	<0.5	<1	2.5	<0.5	6.6	<0.2	ND	6.6
LSE 3/4	08/02/22	<0.5	<1	<1	ND	ND	4.9	<1	1.5	<0.5	<0.5	1.9	<0.5	0.91	<1	1.8	0.97 J+	11.98	<0.2	ND	11.98
MW-09	09/09/13	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-09	08/13/14	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-09	08/06/15	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-09	08/03/16	<0.5	<1	<1	ND	ND	<2	<1	<2	<0.5	<0.5	<2	<0.5	<0.5	<2	<0.5	<0.5	ND	<0.25	ND	ND
MW-09	08/09/17	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.25	ND	ND
MW-09	08/14/18	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.25	ND	ND
MW-09	08/21/19	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-09	08/19/20	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-09	08/04/21	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-09	08/04/21	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-09	08/02/22	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-188 1	08/09/11	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-188 1	08/07/12	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-188 1	08/28/13	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-188 1	08/12/14	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-188 1	08/04/15	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-188 1	08/04/16	<0.5	<1	<1	ND	ND	<2	<1	<2	<0.5	<0.5	<2	<0.5	<0.5	<2	<0.5	<0.5	ND	<0.25	ND	ND
MW-188 1	08/08/17	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.25	ND	ND
MW-188 1	08/15/18	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.25	ND	ND
MW-188 1	08/20/19	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-188 1	08/18/20	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-188 1	08/03/21	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-188 1	08/02/22	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-188 2	08/09/11	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-188 2	08/07/12	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-188 2	08/28/13	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-188 2	08/12/14	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-188 2	08/04/15	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-188 2	08/04/16	<0.5	<1	<1	ND	ND	<2	<1	<2	<0.5	<0.5	<2	<0.5	<0.5	<2	<0.5	<0.5	ND	<0.25	ND	ND
MW-188 2	08/08/17	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.25	ND	ND
MW-188 2	08/15/18	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.25	ND	ND
MW-188 2	08/20/19	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-188 2	08/18/20	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-188 2	08/03/21	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-188 2	08/02/22	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-20	08/10/11	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-20	08/08/12	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-20	09/09/13	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-20	08/14/14	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-20	08/07/15	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-20	08/05/16	<0.5	<1	<1	ND	ND	<2	<1	<2	<0.5	<0.5	<2	<0.5	<0.5	<2	<0.5	<0.5	ND	<0.25	ND	ND
MW-20	08/09/17	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.25	ND	ND
MW-20	08/16/18	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.25	ND	ND
MW-20	08/21/19	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-20	08/19/20	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-20	08/03/21	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-20	08/03/22	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-20D	08/10/11	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-20D	08/08/12	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-20D	09/09/13	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-20D	08/14/14	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-20D	08/07/15	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-20D	08/05/16	<0.5	<1	<1	ND	ND	<2	<1	<2	<0.5	<0.5	<2	<0.5	<0.5	<2	<0.5	<0.5	ND	<0.25	ND	ND
MW-20D	08/09/17	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.25	ND	ND
MW-20D	08/16/18	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.25	ND	ND
MW-20D	08/21/19	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-20D	08/19/20	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-20D	08/03/21	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-20D	08/03/22	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-41B	08/09/11	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-41B	08/07/12	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-41B	08/28/13	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-41B	08/12/14	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-41B	08/04/15	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-41B	08/04/16	<0.5	<1	<1	ND	ND	<2	<1	<2	<0.5	<0.5	<2	<0.5	<0.5	<2	<0.5	<0.5	ND	<0.25	ND	ND
MW-41B	08/09/17	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.25	ND	ND
MW-41B	08/15/18	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.25	ND	ND
MW-41B	08/20/19	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-41B	08/18/20	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-41B	08/04/21	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-41B	08/02/22	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-41G	08/09/11	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-41G	08/07/12	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	3	<2	3	NA	ND	3

TABLE 3A
Water Quality Summary - Volatile Organic Compound Concentrations
Old Springfield Landfill
Springfield, Vermont
CERCLA Site No. VTD000860239
VTDEC SMS Site #770023

Analyte		Concentrations in µg/L																			
		VOCs																			
		AVOCs					CVOCs												Other VOCs		
		Benzene	Ethylbenzene	Xylene (m,p-)	Xylenes (Total)	Total AVOCs	Chlorobenzene (Monochlorobenzene)	Dichlorobenzene (1,2-)	Dichloroethane (1,1-)	Dichloroethane (1,2-)	Dichloroethene (1,1-)	Dichloroethene (cis-1,2-)	Methylene Chloride (Dichloromethane)	Tetrachloroethene (PCE)	Trichloroethane (1,1,1-)	Trichloroethene (TCE)	Vinyl Chloride	Total CVOCs	Dioxane (1,4-)	Total Other VOCs	Total VOCs
VTDEC ES		5	700	–	10,000		100	600	70	5	7	70	5	5	200	5	2		0.3	–	–
VTDEC PAL		0.5	350	–	5,000		50	300	35	0.5	0.7	35	0.5	0.5	100	0.5	0.5		0.3	–	–
VT HA		–	–	–	–	–	–	–	70	–	–	–	–	–	–	–	–	–	0.3	–	–
MCL		5	700	–	10,000	–	100	600	–	5	7	70	5	5	200	5	2	–	–	–	–
MW-41G	08/28/13	<1	<1	<1	ND	ND	<2	<1	<2	<2	2	11	<5	4	6	82	7	112	NA	ND	112
MW-41G	08/12/14	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	5	<2	5	NA	ND	5
MW-41G	08/04/15	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-41G	08/04/16	<0.5	<1	<1	ND	ND	<2	<1	<2	<0.5	<0.5	<2	<0.5	<0.5	<2	1.8	<0.5	1.8	0.58	0.58	2.38
MW-41G	08/09/17	<0.5	<1	<1	ND	ND	1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	1.4	<0.5	2.4	0.34	0.34	2.74
MW-41G	08/15/18	<0.5	<1	<1	ND	ND	1.3	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	1.3	0.41	0.41	1.71
MW-41G	08/20/19	<0.5	<1	<1	ND	ND	1.1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	1.1	0.37	0.37	1.47
MW-41G	08/18/20	<0.5	<1	<1	ND	ND	<2	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	2.1	0.85	2.95	0.29	0.29	3.24
MW-41G	08/03/21	<0.5	<1	<1	ND	ND	1.4	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	2.0	<0.5	3.4	0.26	0.26	3.66
MW-41G	08/02/22	<0.5	<1	<1	ND	ND	2.2	<1	1.3	<0.5	0.58	2.3	<0.5	1.7	1.3	23	1.3 J+	33.7	0.23	0.23	33.91
MW-44T	08/14/14	<1	<1	<1	ND	ND	<2	<1	17	<2	6	69	<5	3	<2	110	83	288	NA	ND	288
MW-44T	08/06/15	<1	<1	<1	ND	ND	<2	<1	15	<2	4	60	<5	2	<2	84	51	216	NA	ND	216
MW-44T	08/03/16	0.7	<1	<1	ND	0.7	<2	<1	16	<0.5	3.3	63	1.2	1.4	<2	93	54	231.9	13	13	245.6
MW-44T	08/09/17	0.7	<1	<1	ND	0.7	<1	<1	14	<0.5	4.2	52	1.2	1.4	<1	93	60	225.8	9.7	9.7	236.2
MW-44T	08/15/18	0.62	<1	<1	ND	0.62	<1	<1	15	<0.5	4.0	57	1.1	2.2	<1	97	72	248.3	7.3	7.3	256.22
MW-44T	08/21/19	0.51	<1	<1	ND	0.51	<1	<1	11	<0.5	2.6	39	0.69	<0.5	<1	38	43	134.29	6.5	6.5	141.30
MW-44T	08/19/20	0.81	<1	<1	ND	0.81	<1	<1	14	<0.5	4.0	49	1.1	1.4	<1	91	57	217.5	8.5	8.5	226.81
MW-44T	08/04/21	<1	<1	<1	ND	ND	<1	<1	11	<0.5	3.2	38	<0.5	1.2	<1	68	42	163.4	7.9	7.9	171.3
MW-44T	08/02/22	0.59	<1	<1	ND	0.59	<1	<1	11	<0.5	3.2	36	0.82	1.6	<1	67	53 J+	172.62	6.3	6.3	179.51
MW-45B	08/10/11	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	6	<5	<2	<2	2	<2	8	NA	ND	8
MW-45B	08/08/12	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	5	<5	<2	<2	<2	<2	5	NA	ND	5
MW-45B	09/09/13	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	4	<5	<2	<2	<2	<2	4	NA	ND	4
MW-45B	08/14/14	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	3	<5	<2	<2	<2	<2	3	NA	ND	3
MW-45B	08/04/15	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	5	<5	<2	<2	<2	<2	5	NA	ND	5
MW-45B	08/03/16	<0.5	<1	<1	ND	ND	<2	<1	<2	<0.5	<0.5	3	<0.5	<0.5	<2	1.2	0.6	4.8	1.2	1.2	6
MW-45B	08/08/17	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	8	<0.5	<0.5	<1	3.0	2.7	13.7	0.88	0.88	14.58
MW-45B	08/16/18	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	3.4	<0.5	<0.5	<1	1.4	1.2	6.0	0.73	0.73	6.73
MW-45B	08/21/19	<0.5	<1	<1	ND	ND	<1	<1	1.1	<0.5	<0.5	13	<0.5	<0.5	<1	4.3	3.2	21.6	1.3	1.3	22.9
MW-45B	08/19/20	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	6.8	<0.5	<0.5	<1	1.8	1.6	10.2	1.3	1.3	11.5
MW-45B	08/05/21	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	0.52	<0.5	0.52	0.78	0.78	1.30
MW-45B	08/02/22	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	1	<0.5	<0.5	<1	0.83	<0.5	1.83	1.1	1.1	2.93
MW-45T	08/10/11	<1	<1	<1	ND	ND	<2	<1	6	<2	<1	86	<5	<2	<2	26	<2	118	NA	ND	118
MW-45T	08/08/12	<1	<1	<1	ND	ND	<2	<1	6	<2	<1	73	<5	<2	<2	21	<2	100	NA	ND	100
MW-45T	09/09/13	<1	<1	<1	ND	ND	<2	<1	6	<2	<1	66	<5	<2	<2	22	4	98	NA	ND	98
MW-45T	09/09/13 Dup.	<1	<1	<1	ND	ND	<2	<1	5	<2	<1	65	<5	<2	<2	22	5	97	NA	ND	97
MW-45T	08/13/14	<1	<1	<1	ND	ND	<2	<1	5	<2	<1	61	<5	<2	<2	24	5	95	NA	ND	95
MW-45T	08/04/15	<1	<1	<1	ND	ND	<2	<1	6	<2	<1	63	<5	<2	<2	21	3	93	NA	ND	93
MW-45T	08/03/16	<0.5	<1	<1	ND	ND	<2	<1	7	<0.5	0.6	64	<0.5	0.9	<2	21	1.9	95.4	9.5	9.5	104.9
MW-45T	08/08/17	<0.5	<1	<1	ND	ND	<1	<1	6	<0.5	0.9	52	<0.5	0.8	<1	20	3.3	83.0	7.6	7.6	90.6
MW-45T	08/16/18	<0.5	<1	<1	ND	ND	<1	<1	6.5	<0.5	0.76	61	<0.5	0.72	<1	21	3.3	93.88	7.5	7.5	101.38
MW-45T	08/21/19	<0.5	<1	<1	ND	ND	<1	<1	6	<0.5	0.71	52	<0.5	0.86	<1	18	3.6	81.17	6.6	6.6	87.77
MW-45T	08/19/20	<0.5	<1	<1	ND	ND	<1	<1	7	<0.5	0.81	57	<0.5	0.81	<1	21	3.5	90.12	8.0	8	98.12
MW-45T	08/05/21	<0.5	<1	<1	ND	ND	<1	<1	4.7	<0.5	0.69	44	<0.5	0.73	<1	17	4.1	71.22	6.1	6.1	77.32
MW-45T	08/02/22	<0.5	<1	<1	ND	ND	<1	<1	8.3	<0.5	1.2	75	<0.5	1.2	<1	24	6.7 J+	117.0	9.4	9.4	126.4
MW-52B	08/09/11	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-52B	08/07/12	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-52B	08/28/13	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-52B	08/12/14	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-52B	08/05/15	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-52B	08/05/16	<0.5	<1	<1	ND	ND	<2	<1	<2	<0.5	<0.5	<2	<0.5	<0.5	<2	<0.5	<0.5	ND	<0.25	ND	ND
MW-52B	08/09/17	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.25	ND	ND
MW-52B	08/15/18	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.25	ND	ND
MW-52B	08/20/19	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-52B	08/18/20	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-52B	08/04/21	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-52B	08/03/22	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	<0.2	ND	ND
MW-52G	08/09/11	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-52G	08/07/12	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
MW-52G	08/29/13	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	18	<2	18	NA	ND	18
MW-52G	08/12/14	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	8	<2	8	NA	ND	8
MW-52G	08/12/14 Dup.	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	8	<2	8	NA	ND	8
MW-52G	08/05/15	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	2	<2	2	NA	ND	2
MW-52G	08/05/15 Dup.	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	2	<2	2	NA	ND	2
MW-52G	08/04/16	<0.5	<1	<1	ND	ND	<2	<1	<2	<0.5	<0.5	<2	<0.5	<0.5	<2	1.2	<0.5	1.2	0.34	0.34	1.54
MW-52G	08/04/16 Dup.	<0.5	<1	<1	ND	ND	<2	<1	<2	<0.5	<0.5	<2	<0.5	<0.5	<2	1.3	<0.5	1.3	0.30	0.30	1.6
MW-52G	08/09/17	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	1.1	<0.5	1.1	<0.25	ND	1.1
MW-52G	08/09/17 Dup.	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	1.1	<0.5	1.1	0.26	0.26	1.36
MW-52G	08/15/18	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	1.3	<0.5	1.3	<0.25	ND	1.3
MW-52G	08/15/18 Dup.	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	1.2	<0.5	1.2	0.27	0.27	1.47
MW-52G	08/20/19	<0.5	<1.1	<1.1	ND	ND	<1.1	<1.1	<1.1	<0.5	<0.5	<1.1	<0.5	<0.5	<1.1	0.77	<0.5	0.77	0.22	0.22	0.99
MW-52G	08/20/19 Dup.	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	0.83	<0.5	0.83	0.29	0.29	1.12
MW-52G	08/18/20	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	0.87	<0.5	0.87	0.24	0.24	1.11
MW-52G	08/18/20 Dup.	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	0.86	<0.5	0.86	0.27	0.27	1.13
MW-52G	08/04/21	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	0.98	<0.5	0.98	0.22	0.22	1.20
MW-52G	08/03/22	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	1.5	<0.5	1.5	<0.2	ND	1.5
MW-52G	08/03/22 Dup.	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	1.3	<0.5	1.3	<0.2	ND	1.3
PTF Influent	08/09/11	<5	<5	<5	ND	ND	<5	<5	<5	<5	14	34	<30	25	59	730	<10	862	NA	ND	862
PTF Influent	10/29/11	<5	<5	<5	ND	ND	<5	<5	<5	<5	11	31	<30	23	45	590	<10	690	NA	ND	690
PTF Influent	07/02/12	<5	<5	<5	ND	ND	<5	<5	<5	<5	11	35	<30	23	45	660	<10	774	NA	ND	774
PTF Influent	08/22/13	<1	<1	<1	ND	ND	<2	<1	<2	<2	4	15	<5	10	15	200	3	247	NA	ND	247
PTF Influent	08/12/14	<1	<1	<1	ND	ND	<2	<1	<2	<2	5	14	<5	11	18	230	<2	278	NA	ND	278
PTF Influent	08/06/15	<1	<1	<1	ND	ND	<2	<1	<2	<2	5	15	<5	13	20	250	<2	303	NA	ND	303
PTF Influent	11/24/15	<2	<2	<2	ND	ND	<2	<2	2	<2	10	27	<10	21	35	460	<4	555	NA	ND	555
PTF Influent	08/02/16	<9	<5	<9	ND	ND	<5	<9	<9	<3	9	34	<9	31	44	560	<9	678	NA	ND	678

TABLE 3A
Water Quality Summary - Volatile Organic Compound Concentrations
Old Springfield Landfill
Springfield, Vermont
CERCLA Site No. VTD000860239
VTDEC SMS Site #770023

Analyte		Concentrations in µg/L																			
		VOCs																			
		AVOCs					CVOCs												Other VOCs		
		Benzene	Ethylbenzene	Xylene (m,p-)	Xylenes (Total)	Total AVOCs	Chlorobenzene (Monochlorobenzene)	Dichlorobenzene (1,2-)	Dichloroethane (1,1-)	Dichloroethane (1,2-)	Dichloroethene (1,1-)	Dichloroethene (cis-1,2-)	Methylene Chloride (Dichloromethane)	Tetrachloroethene (PCE)	Trichloroethane (1,1,1-)	Trichloroethene (TCE)	Vinyl Chloride	Total CVOCs	Dioxane (1,4-)	Total Other VOCs	Total VOCs
VTDEC ES		5	700	–	10,000		100	600	70	5	7	70	5	5	200	5	2		0.3	–	–
VTDEC PAL		0.5	350	–	5,000		50	300	35	0.5	0.7	35	0.5	0.5	100	0.5	0.5		0.3	–	–
VT HA		–	–	–	–	–	–	–	70	–	–	–	–	–	–	–	–	–	0.3	–	–
MCL		5	700	–	10,000	–	100	600	–	5	7	70	5	5	200	5	2	–	–	–	–
PTF Influent	08/10/17	<0.5	<1	<1	ND	ND	1	<1	2	<0.5	*4.9*	14	<0.5	*11*	16	*190*	*1.1*	240.0	NA	ND	240.0
PTF Influent	08/14/18	<1	<2	<2	ND	ND	<2	<2	<2	<1	*6.7*	17	<1	*15*	21	*300*	<1	359.7	NA	ND	359.7
PTF Influent	08/22/19	<3	<5	<5	ND	ND	<5	<5	<5	<3	*6.1*	16	<3	*14*	17	*220*	<3	273.1	NA	ND	273.1
PTF Influent	08/20/20	<3	<5	<5	ND	ND	<5	<5	<5	<3	4.7	15	<3	*11*	16	*220*	<3	266.7	NA	ND	266.7
PTF Influent	08/04/21	<0.5	<1	<1	ND	ND	1.4	<1	1.1	<0.5	*4.0*	11	<0.5	*9.9*	11	*150*	<0.5	188.4	NA	ND	188.4
PTF Influent	08/02/22	<0.5	<1	<1	ND	ND	2.6	<1	*2.4*	<0.5	*8.3*	18	<0.5	*19*	19	*270*	*1.2 J+*	340.5	NA	ND	340.5
PTF Effluent	08/09/11	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	3	<5	<2	4	*56*	<2	63	NA	ND	63
PTF Effluent	10/29/11	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	2	<5	<2	<2	*31*	<2	33	NA	ND	33
PTF Effluent	07/02/12	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	4	<5	<2	3	*55*	<2	62	NA	ND	62
PTF Effluent	08/22/13	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	6	<5	*2*	3	*64*	<2	75	NA	ND	75
PTF Effluent	08/22/13 Dup.	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	6	<5	*2*	3	*59*	<2	70	NA	ND	70
PTF Effluent	08/12/14	<1	<1	<1	ND	ND	<2	<1	<2	<2	*1*	7	<5	*3*	5	*95*	<2	111	NA	ND	111
PTF Effluent	08/12/14 Dup.	<1	<1	<1	ND	ND	<2	<1	<2	<2	*1*	8	<5	*3*	5	*100*	<2	117	NA	ND	117
PTF Effluent	08/06/15	<1	<1	<1	ND	ND	<2	<1	<2	<2	*3*	13	<5	*9*	13	*190*	<2	228	NA	ND	228
PTF Effluent	08/06/15 Dup.	<1	<1	<1	ND	ND	<2	<1	<2	<2	*3*	13	<5	*9*	13	*180*	<2	218	NA	ND	218
PTF Effluent	11/24/15	<1	<1	<1	ND	ND	<2	<1	<2	<2	*1*	11	<5	*4*	6	*130*	<2	152	NA	ND	152
PTF Effluent	08/02/16	<0.5	<1	<1	ND	ND	<2	<1	<2	<0.5	<0.5	7	<0.5	*1.8*	2	*56*	<0.5	66.8	NA	ND	66.8
PTF Effluent	08/10/17	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	1	<0.5	<0.5	<1	*11*	<0.5	12	NA	ND	12
PTF Effluent	08/14/18	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	1.7	<0.5	<0.5	<1	*12*	<0.5	13.7	NA	ND	13.7
PTF Effluent	08/22/19	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	1.2	<0.5	<0.5	<1	*8.0*	<0.5	9.2	NA	ND	9.2
PTF Effluent	08/20/20	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	3.1	<0.5	*0.64*	<1	*21*	<0.5	24.7	NA	ND	24.74
PTF Effluent	08/04/21	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	1.4	<0.5	<0.5	<1	*11*	<0.5	12.4	NA	ND	12.4
PTF Effluent	08/02/22	<0.5	<1	<1	ND	ND	1.4	<1	1.2	<0.5	*1.4*	12	<0.5	*7.2*	6.7	*140*	<0.5	169.9	NA	ND	169.9
Western Seep	08/09/11	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
Western Seep	08/08/12	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
Western Seep	08/22/13	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
Western Seep	08/12/14	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
Western Seep	08/06/15	<1	<1	<1	ND	ND	<2	<1	<2	<2	<1	<2	<5	<2	<2	<2	<2	ND	NA	ND	ND
Western Seep	08/02/16	<0.5	<1	<1	ND	ND	<2	<1	<2	<0.5	<0.5	<2	<0.5	<0.5	<2	*0.6*	<0.5	0.6	NA	ND	0.6
Western Seep	08/09/17	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	NA	ND	ND
Western Seep	08/14/18	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	NA	ND	ND
Western Seep	08/21/19	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	NA	ND	ND
Western Seep	08/19/20	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	NA	ND	ND
Western Seep	08/04/21	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	NA	ND	ND
Western Seep	08/02/22	<0.5	<1	<1	ND	ND	<1	<1	<1	<0.5	<0.5	<1	<0.5	<0.5	<1	<0.5	<0.5	ND	NA	ND	ND

Notes:

1. Samples through 2016 were collected and analyzed by Eastern Analytical, Inc. (EAI) of Concord, New Hampshire for volatile organic compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method 8260B. Sampled collected in 2017 through present collected and analyzed by EAI for VOCs by USEPA Method 8260C. Dioxane (1,4-) was analyzed by Method 8260B SIM.

2. Only analytes detected in one or more sampling events since 2011 are indicated on this table. Refer to Appendix D for analytical laboratory reports. Refer to Appendix E for historical summaries.

3. Concentrations are presented in micrograms per liter (µg/L) which are equivalent to parts per billion (ppb).

4. "<" indicates the parameter was not detected above the indicated laboratory reporting limit.
"J" indicates for EW-2 and MW-52G the August 2019 results are estimated due to the matrix spike (MS)/matrix spike duplicate (MSD) being analyzed beyond hold time.
"J" indicates the result is estimated.
"J+" indicates the result is estimated with potential high bias.

"Total" concentrations (e.g., total xylenes) were calculated by Sanborn Head and are the sum of detected concentrations of relevant analytes.
"ND" indicates not detected.
"NA" indicates not analyzed.
"AVOCs" are aromatic VOCs.
"CVOCs" are chlorinated VOCs.

5. VTDEC "ES" and "PAL" Standards are Primary Groundwater Standards from the State of Vermont Agency of Natural Resources Department of Environmental Conservation "Chapter 12 of the Environmental Protection Rules Groundwater Protection Rule and Strategy" (Adopted July 6, 2019). "ES" is Enforcement Standard; "PAL" is Preventive Action Level.
"VT HA" indicates State of Vermont Department of Health (Health Department) Health Advisories, as presented in the Drinking Water Guidance document, published July 24, 2014, updated February 27, 2015 and May 3, 2019.
"MCL" indicates United States Environmental Protection Agency (USEPA) Maximum Contaminant Level, as presented in the National Primary Drinking Water Regulations, dated May 2009.
"–" indicates no standard is established for this parameter.

6. Yellow shading indicates the detected concentration exceeds the VTDEC ES Standard or USEPA MCL.
Italic indicates the detected concentration exceeds the VTDEC PAL Standard.
Bold indicates the detected concentration exceeds the VTDEC HA Standard.

Source: 2022 O&M Report, Table 3A, PDF p. 36-39

Figure F-3: Summary of Indoor Air Concentrations, 2010-2021

TABLE 5
Summary of PTF Indoor Air Concentrations
Old Springfield Landfill
Springfield, Vermont
CERCLA Site No. VTD000860239
VTDEC SMS Site #770023

Analyte	Concentrations in µg/m³															
	VTDEC Indoor Air Standards	USEPA RSLs	NIOSH TWA REL	PTF Ambient	PTF Ambient	PTF Ambient	PTF Ambient	PTF Indoor	PTF Ambient	PTF Ambient	PTF Ambient	PTF Ambient	PTF Ambient	PTF Ambient	PTF Ambient
	Non-resident	Industrial Air		08/04/10	08/30/11	09/28/12	08/21/13	11/04/14	08/04/15	08/04/16	08/09/17	11/12/18	08/20/19	08/18/20	08/03/21
Acetone	NS	140,000	590,000	7.4	<6.2	14	18	<6.2	10	15	<5	<6.1	14	7.06	4.18
Acetonitrile	NS	260	34,000		<1.2	<1.2	<1.4	<1.2	<1.3	<0.79	<0.5	<0.78	0.98	<0.159	<0.159
Acrolein	NS	0.088	250		<2.5	<2.4	<2.8	<2.5	<2.6	2.2	<1	<0.3	1.3	0.174	<0.115
Benzene	1.05	1.6	Ca 319		<1.2	<1.2	<1.4	<1.2	<1.3	1.4	<0.5	<0.78	<0.77	<0.319	<0.319
Bromodichloromethane	NS	0.33	--	ND	2.4	<1.2	<1.4	<1.2	<1.3	<0.79	<0.5	<0.8	<0.78	<0.134	<0.134
Butanone (2-) (Methyl Ethyl Ketone)	NS	22,000	590,000		<6.2	<6.1	<7.2	<6.2	<6.5	<7.9	<5	<1.5	4.4	<1.47	<1.47
Butyl Acetate (n-)	NS	NS	710,000		<1.2	<1.2	<1.4	<1.2	<1.3	1.9	<0.5	<0.81	<0.8	<2.38	<2.38
Carbon Disulfide	NS	3,100	3,000	14	<6.2	<6.1	<7.2	<6.2	6.8	<7.9	<5	<1.7	<1.6	<0.623	<0.623
Carbon Tetrachloride	1.36	2.0	Ca 12,600 (60 min)		<1.2	<1.2	<1.4	<1.2	<1.3	<0.79	<0.5	0.89	<0.77	0.447	0.440
Chlorobenzene	NS	220	OSHA TWA 350,000		<1.2	<1.2	<1.4	<1.2	<1.3	<0.79	1.7	0.89	<0.78	<0.461	<0.461
Chloroethane	35,040	44,000	OSHA TWA 2,600,000		<1.2	<1.2	<1.4	<1.2	<1.3	<0.79	0.53	<0.77	<0.75	<0.264	<0.264
Chloroform	0.36	0.53	Ca ST 9,780 (60 min)		<1.2	<1.2	<1.4	<1.2	<1.3	<0.79	<0.5	<0.81	<0.8	0.098	0.103
Chloromethane (Methyl Chloride)	NS	390	Ca OSHA TWA 207,000 (5 min max peak in any 3 hrs)		<1.2	<1.2	<1.4	<1.2	<1.3	<0.79	<0.5	<0.75	<0.74	0.89	0.787
Dichlorobenzene (1,2-)	NS	880	C 300,000		<1.2	<1.2	<1.4	<1.2	<1.3	<0.79	0.56	<0.81	<0.8	<0.12	<0.12
Dichlorodifluoromethane (CFC 12)	NS	440	4,950,000	2.1	2.3	3.2	2.4	2.7	2.1	2.7	0.78	2.5	2.0	2.45	2.06
Dichloroethane (1,1-)	5.11	7.7	400,000	2.5	<1.2	<1.2	<1.4	<1.2	1.7	<0.79	2.9	1.7	<0.77	0.247	0.130
Dichloroethene (1,1-) (Vinylidene Chloride)	700.8	880	Ca OSHA none	23	6.7	<1.2	<1.4	4	13	3.2	11	16	0.91	1	0.622
Dichloroethene (cis-1,2-)	NS	NS	--	14	7.9	<1.2	2.2	4.2	16	4.0	21	15	1.6	2.34	0.908
Ethanol (Ethyl Alcohol)	NS	NS	1,900,000		<6.2	<6.1	<7.2	<6.2	<6.5	23	<5	<7.7	19	<9.42	<9.42
Ethyl Acetate	NS	310	1,400,000	ND	<1.2	<1.2	<1.4	<1.2	2.3	310	<1	<1.7	48	<1.8	<1.8
Ethylbenzene	3.27	4.9	435,000		<1.2	<1.2	<1.4	<1.2	<1.3	1.3	<0.5	<0.78	<0.77	<0.087	<0.087
Hexane (n-)	NS	3,100	180,000		<1.2	<1.2	<1.4	<1.2	<1.3	1.6	<0.5	<0.81	<0.8	<0.705	<0.705
Isopropyl Alcohol (2-Propanol)	NS	880	980,000		<1.2	<6.1	<7.2	<6.2	<6.5	<7.9	<5	<3.2	6.8	15	<1.23
Limonene (d-)	NS	NS	--		<1.2	<1.2	<1.4	<1.2	<1.3	1.8	<0.5	<0.77	1.3		
Methylene Chloride (Dichloromethane)	817.6	1,200	Ca OSHA PEL TWA 86,750	ND	<1.2	1.3	<1.4	<1.2	<1.3	0.92	<0.5	<0.81	1.6	<1.74	<1.74
Octane (n-)	NS	NS	350,000		<1.2	<1.2	<1.4	<1.2	<1.3	<0.79	<0.5	<0.81	<0.8	<0.934	5.79
Pinene (alpha-)	NS	NS	--	ND	2.0	<1.2	<1.4	<1.2	<1.3	1.8	<0.5	<0.78	0.94		
Propene	NS	13,000	--		<1.2	<1.2	<1.4	<1.2	<1.3	4.8	<0.5	<0.78	2.3	<0.861	<0.861
Styrene	NS	4,400	215,000		<1.2	<1.2	<1.4	<1.2	<1.3	3.3	<0.5	<0.8	<0.78	<0.085	<0.085
Tetrachloroethene (PCE)	5.11	47	Ca OSHA PEL TWA 678,000	28	9.7	<1.2	2.1	6.5	22	5.9	29	33	2.3	2.06	0.983
Toluene	NS	22,000	375,000		<1.2	<1.2	<1.4	<1.2	<1.3	33	<0.5	<0.8	3.0	0.234	0.188
Trichloroethane (1,1,1-)	NS	22,000	C 1,900,000 (15 min)	65	22	<1.2	2.8	11	35	8.6	32	43	2.3	2.54	1.59
Trichloroethene (TCE)	0.7	3.0	Ca OSHA PEL TWA 537,000	430	210	2.7	34	110	320	84	360	390 D	29	30.5	16.4
Trichlorofluoromethane (CFC 11)	NS	NS	C 5,600,000	1.7	2.0	1.5	1.6	1.8	1.4	1.7	0.97	1.7	1.6	1.7	1.46
Trichlorotrifluoroethane (1,1,2-) (CFC 113)	NS	22,000	7,600,000		<1.2	<1.2	<1.4	<1.2	<1.3	<0.79	<0.5	<0.8	<0.78	0.537	0.406
Vinyl Chloride	1.86	2.8	Ca OSHA PEL TWA 2,560 (15 min)	4.3	<1.2	<1.2	<1.4	<1.2	1.4	<0.79	2.2	1.3	<0.78	0.097	0.067
Xylene (m,p-)	NS	440	435,000		<1.2	<1.2	<1.4	<1.2	<1.3	2.9	<1	<1.7	<1.8	<0.174	<0.174
Xylene (o-)	NS	440	435,000		<1.2	<1.2	<1.4	<1.2	<1.3	1.1	<0.5	<0.8	<0.78	<0.087	<0.087
Xylene (Total)	NS	440	--		ND	ND	ND	ND	ND	4.0	ND	ND	ND	ND	ND

Notes:

1. Samples in 2009 were collected by Stantec, samples in 2010 through 2012 were collected by F. David Deane of Ascutney, Vermont; samples in and after 2013 were collected by Sanborn Head. Samples were analyzed by ALS Environmental (ALS) of Simi Valley, California for volatile organic compounds (VOCs) by United States Environmental Protection Agency (USEPA) Method TO-15. In August 2016 and after, the PTF Ambient sample was collected as an 8-hour time-weighted average sample; prior to 2016, PTF Ambient samples were collected as grab samples. Samples collected after 2019 were collected by Sanborn Head and analyzed by Alpha Analytical (Alpha) of Mansfield, Massachusetts. Compounds listed as Freons in the laboratory reports are synonymous with CFC compounds listed here.

2. Concentrations are presented in micrograms per cubic meter (µg/m³), as reported by the laboratory.

3. Only those analytes detected in one or more samples are shown. Refer to the analytical laboratory reports for the full list of analytes.

4. "<" indicates the analyte was not detected at or above the indicated laboratory method reporting limit.
Blank cells indicate the sample was not analyzed for the indicated analyte.

5. "VTDEC Indoor Air Standards" are Non-resident Vermont Air Standards from Appendix A of the "Investigation and Remediation of Contaminated Properties Rule", State of Vermont Agency of Natural Resources, Department of Environmental Conservation, Waste Management and Prevention Division (Adopted July 6, 2019).
"USEPA RSLs" are the USEPA Regional Screening Levels for Industrial Air (RSLs; May 2021, THQ=1.0).
"NIOSH TWA REL" indicates National Institute for Occupational Safety and Health Time-Weighted Average (TWA) Recommended Exposure Limit (REL) (http://www.cdc.gov/niosh/npg/default.html).
"OSHA PEL TWA" indicates Occupational Safety & Health Administration Permissible Exposure Limit Time-Weighted Average (http://www.cdc.gov/niosh/npg/default.html).
"C" indicates NIOSH indicates this value is a ceiling REL.
"Ca" indicates NIOSH considers this analyte a potential occupational carcinogen.
"--" indicates no standard is established for this analyte.
"D" indicates the reporting result is from a dilution.
"ND" indicates not detected.

6. Detected concentrations are indicated in **bold** font.

Source: 2022 O&M Report, Table 5, PDF p. 50

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site Name: Old Springfield Landfill	**Date of Inspection:** 04/04/2023
Location and Region: Springfield, Vermont, Region 1	**EPA ID: VTD000860239**
Agency, Office or Company Leading the Five-Year Review: US EPA	**Weather/Temperature:** 40 degrees Fahrenheit and raining

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☒ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other: _____
- ☐ Monitored natural attenuation
- ☒ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (check all that apply)

1. **O&M Site Manager** _____ (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone: _____
   Problems, suggestions ☐ Report attached: _____

2. **O&M Staff** _____ (Name) _____ (Title) _____ (Date)
   Interviewed ☐ at site ☐ at office ☐ by phone Phone: _____
   Problems/suggestions ☐ Report attached: _____

3. **Local Regulatory Authorities and Response Agencies** (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply.

   Agency _____
   Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone No.)
   Problems/suggestions ☐ Report attached: _____

   Agency _____
   Contact _____Name _____ (Title) _____ (Date) _____ (Phone No.)
   Problems/suggestions ☐ Report attached:_____

   Agency _____
   Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone No.)
   Problems/suggestions ☐ Report attached:_____

   Agency _____
   Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone No.)
   Problems/suggestions ☐ Report attached: _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone No.
Problems/suggestions ☐ Report attached: _____

4. **Other Interviews** (optional) ☐ Report attached: _____

III. ON-SITE DOCUMENTS AND RECORDS VERIFIED (check all that apply)

1. **O&M Documents**

☒ O&M manual	☒ Readily available	☒ Up to date	☐ N/A
☒ As-built drawings	☒ Readily available	☒ Up to date	☐ N/A
☒ Maintenance logs	☒ Readily available	☒ Up to date	☐ N/A

Remarks: _____

2. **Site-Specific Health and Safety Plan** ☒ Readily available ☒ Up to date ☐ N/A

☐ Contingency plan/emergency response plan ☒ Readily available ☒ Up to date ☐ N/A

Remarks: _____

3. **O&M and OSHA Training Records** ☒ Readily available ☒ Up to date ☐ N/A

Remarks: _____

4. **Permits and Service Agreements**

☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
☒ Effluent discharge	☒ Readily available	☒ Up to date	☐ N/A
☒ Waste disposal, POTW	☒ Readily available	☒ Up to date	☐ N/A
☐ Other permits: _____	☐ Readily available	☐ Up to date	☒ N/A

Remarks: Indoor air sampling is performed annually and reported to EPA. The Town maintains a state of Vermont wastewater discharge permit.

5. **Gas Generation Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

6. **Settlement Monument Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

7. **Groundwater Monitoring Records** ☒ Readily available ☐ Up to date ☐ N/A

Remarks: _____

8. **Leachate Extraction Records** ☒ Readily available ☐ Up to date ☐ N/A

Remarks: _____

9. **Discharge Compliance Records**

☒ Air	☒ Readily available	☒ Up to date	☐ N/A
☒ Water (effluent)	☒ Readily available	☒ Up to date	☐ N/A

Remarks: _____

10. **Daily Access/Security Logs** ☒ Readily available ☒ Up to date ☐ N/A

Remarks: _____

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☐ Contractor for state

☒ PRP in-house ☒ Contractor for PRP

☐ Federal facility in-house ☐ Contractor for Federal facility

☐ _____

2. **O&M Cost Records**

☐ Readily available ☐ Up to date

☐ Funding mechanism/agreement in place ☒ Unavailable

Original O&M cost estimate: _____ ☐ Breakdown attached

Total annual cost by year for review period if available

From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs during Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing Damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A

Remarks: Fencing appears in good condition. No evidence of trespassing observed.

B. Other Access Restrictions

1. **Signs and Other Security Measures** ☐ Location shown on site map ☐ N/A

Remarks: Site gates are locked and signed.

C. Institutional Controls (ICs)

1. **Implementation and Enforcement**

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: Daily

Responsible party/agency: Town of Springfield

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

2. **Adequacy** ☐ ICs are adequate ☒ ICs are inadequate ☐ N/A

Remarks: _____

D. General

1. **Vandalism/Trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks: _____

2. **Land Use Changes On Site** ☒ N/A

Remarks: _____

3. **Land Use Changes Off Site** ☒ N/A

Remarks: _____

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads Damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A

Remarks: _____

B. Other Site Conditions

Remarks: _____

VII. LANDFILL COVERS ☒ Applicable ☐ N/A

A. Landfill Surface

1. **Settlement** (low spots) ☐ Location shown on site map ☒ Settlement not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Cracks** ☐ Location shown on site map ☒ Cracking not evident

Lengths: _____ Widths: _____ Depths: _____

Remarks: _____

3.	**Erosion**	☐ Location shown on site map	☒ Erosion not evident
	Area extent: _____		Depth: _____
	Remarks: _____		
4.	**Holes**	☐ Location shown on site map	☒ Holes not evident
	Area extent: _____		Depth: _____
	Remarks: _____		
5.	**Vegetative Cover**	☒ Grass	☒ Cover properly established
	☐ No signs of stress	☐ Trees/shrubs (indicate size and locations on a diagram)	
	Remarks: _____		
6.	**Alternative Cover** (e.g., armored rock, concrete)		☒ N/A
	Remarks: _____		
7.	**Bulges**	☐ Location shown on site map	☒ Bulges not evident
	Area extent: _____		Height: _____
	Remarks: _____		
8.	**Wet Areas/Water Damage**	☒ Wet areas/water damage not evident	
	☐ Wet areas	☐ Location shown on site map	Area extent: _____
	☐ Ponding	☐ Location shown on site map	Area extent: _____
	☐ Seeps	☐ Location shown on site map	Area extent: _____
	☐ Soft subgrade	☐ Location shown on site map	Area extent: _____
	Remarks: _____		
9.	**Slope Instability**	☐ Slides	☐ Location shown on site map
	☒ No evidence of slope instability		
	Area extent: _____		
	Remarks: _____		
B. Benches		☐ Applicable	☒ N/A
	(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.	**Flows Bypass Bench**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
2.	**Bench Breached**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
3.	**Bench Overtopped**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
C. Letdown Channels		☒ Applicable	☐ N/A
	(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. **Settlement** (Low spots) ☐ Location shown on site map ☒ No evidence of settlement
   Area extent: _____ Depth: _____
   Remarks: _____

2. **Material Degradation** ☐ Location shown on site map ☒ No evidence of degradation
   Material type:_____ Area extent: _____
   Remarks: _____

3. **Erosion** ☐ Location shown on site map ☒ No evidence of erosion
   Area extent: _____ Depth: _____
   Remarks: _____

4. **Undercutting** ☐ Location shown on site map ☒ No evidence of undercutting
   Area extent: _____ Depth: _____
   Remarks: _____

5. **Obstructions** Type: _____ ☒ No obstructions
   ☐ Location shown on site map Area extent: _____
   Size: _____
   Remarks: _____

6. **Excessive Vegetative Growth** Type: _____
   ☒ No evidence of excessive growth
   ☐ Vegetation in channels does not obstruct flow
   ☐ Location shown on site map Area extent: _____
   Remarks: _____

D. Cover Penetrations ☒ Applicable ☐ N/A

1. **Gas Vents** ☐ Active ☒ Passive
   ☐ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
   ☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A
   Remarks: _____

2. **Gas Monitoring Probes**
   ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
   ☐ Evidence of leakage at penetration ☐ Needs maintenance ☒ N/A
   Remarks: _____

3. **Monitoring Wells** (within surface area of landfill)
   ☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
   ☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A
   Remarks: _____

4. **Extraction Wells Leachate**

☐ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A

Remarks: _____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A

Remarks: _____

E. Gas Collection and Treatment ☒ Applicable ☐ N/A

1. **Gas Treatment Facilities**

☐ Flaring ☐ Thermal destruction ☐ Collection for reuse

☒ Good condition ☐ Needs maintenance

Remarks: Gas treatment is performed at the PTF air stripper and 10 gas vents. Treatment is by passive adsorption on granular activated carbon with discharge to the atmosphere.

2. **Gas Collection Wells, Manifolds and Piping**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Gas Monitoring Facilities** (e.g., gas monitoring of adjacent homes or buildings)

☐ Good condition ☐ Needs maintenance ☒ N/A

Remarks: _____

F. Cover Drainage Layer ☒ Applicable ☐ N/A

1. **Outlet Pipes Inspected** ☒ Functioning ☐ N/A

Remarks: _____

2. **Outlet Rock Inspected** ☐ Functioning ☒ N/A

Remarks: _____

G. Detention/Sedimentation Ponds ☒ Applicable ☐ N/A

1. **Siltation** Area extent: _____ Depth: _____ ☐ N/A

☒ Siltation not evident

Remarks: _____

2. **Erosion** Area extent: _____ Depth: _____

☒ Erosion not evident

Remarks: _____

3. **Outlet Works** ☒ Functioning ☐ N/A

Remarks: _____

4. **Dam** ☒ Functioning ☐ N/A

Remarks: _____

H. Retaining Walls ☐ Applicable ☒ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident

Horizontal displacement: _____ Vertical displacement: _____

Rotational displacement: _____

Remarks: _____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident

Remarks: _____

I. Perimeter Ditches/Off-Site Discharge ☒ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☒ Siltation not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A

☒ Vegetation does not impede flow

Area extent: _____ Type: _____

Remarks: _____

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident

Area extent: _____ Depth: _____

Remarks: _____

4. **Discharge Structure** ☒ Functioning ☐ N/A

Remarks: _____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Performance Monitoring** Type of monitoring: _____

☐ Performance not monitored

Frequency: _____ ☐ Evidence of breaching

Head differential: _____

Remarks: _____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A

A. Groundwater Extraction Wells, Pumps and Pipelines ☒ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing and Electrical**

☒ Good condition ☒ All required wells properly operating ☐ Needs maintenance ☐ N/A

Remarks: _____

2. **Extraction System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☒ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☒ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

B. Surface Water Collection Structures, Pumps and Pipelines ☐ Applicable ☒ N/A

1. **Collection Structures, Pumps and Electrical**

☐ Good condition ☐ Needs maintenance

Remarks: _____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

C. Treatment System ☒ Applicable ☐ N/A

1. **Treatment Train** (check components that apply)

☐ Metals removal ☐ Oil/water separation ☐ Bioremediation

☒ Air stripping ☒ Carbon adsorbers

☒ Filters: _____

☐ Additive (e.g., chelation agent, flocculent): _____

☐ Others: _____

☒ Good condition ☐ Needs maintenance

☒ Sampling ports properly marked and functional

☒ Sampling/maintenance log displayed and up to date

☒ Equipment properly identified

☒ Quantity of groundwater treated annually: 2018: 25.7 million gallons, 2019: 26.9 million gallons, 2020: 24.9 million gallons, 2021: 27.5 million gallons, 2022: 25.7 million gallons

☐ Quantity of surface water treated annually: _____

Remarks: _____

2. **Electrical Enclosures and Panels** (properly rated and functional)

☐ N/A ☒ Good condition ☐ Needs maintenance

Remarks: _____

3. **Tanks, Vaults, Storage Vessels**

☐ N/A ☒ Good condition ☐ Proper secondary containment ☐ Needs maintenance

Remarks: _____

4. **Discharge Structure and Appurtenances**

☐ N/A ☒ Good condition ☐ Needs maintenance

Remarks: _____

5. **Treatment Building(s)**

☐ N/A ☒ Good condition (esp. roof and doorways) ☐ Needs repair

☐ Chemicals and equipment properly stored

Remarks: _____

6. **Monitoring Wells** (pump and treatment remedy)

☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition

☐ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: _____

D. Monitoring Data

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

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ All required wells located ☐ Needs maintenance ☒ N/A

Remarks: _____

X. OTHER REMEDIES

If there are remedies applied at the site and 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.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

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 designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions).

The remedy was designed to contain the groundwater plume and cap the landfill waste. This has been achieved. However, groundwater remains contaminated after 30 years of O&M and the Town is looking for opportunities to modify or optimize the remedy to reduce costs, but maintain human health and ecological protectiveness.

B. Adequacy of O&M

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.

The current O&M operations are adequate. However, given the age of the groundwater treatment system, it is unclear how long the system will be able to continue operating. The Town is currently evaluating alternative options and remedy optimization.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

None

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

The PRP contractor is currently evaluating opportunities to optimize the remedy or consider a remedy modifcation given the age of the pump and treat system and the concentrations of remaining groundwater contamination.

APPENDIX H – SITE INSPECTION PHOTOS

First entrance to landfill property

Second entrance to landfill property

Western portion of the landfill (view from the PTF)

Eastern portion of the landfill

Fenceline on the west side where a tree recently had to be removed

Western downchute

Sedimentation Pond

Downchute after the sedimentation pond

Central downchute where recent erosion work was completed

Eastern downchute

PTF

Inside the PTF entrance

PTF

MW-45T and MW-45B

APPENDIX I – ARARS REVIEW

CERCLA Section 121(d)(1) requires that Superfund remedial actions attain "a degree of cleanup of hazardous substances, pollutants, and contaminants released into the environment and control of further release at a minimum which assures protection of human health and the environment." The remedial action must achieve a level of cleanup that at least attains those requirements that are legally applicable or relevant and appropriate. In performing the FYR for compliance with ARARs, only those ARARs that address the protectiveness of the remedy are reviewed.

Groundwater

Groundwater cleanup levels were established for the Site in the 1990 ROD. The 1990 ROD identified MCLs, PQLs/PMCLs, and Vermont GESs as groundwater ARARs. Table I-1 compares groundwater cleanup goals to current standards. The current standards for the groundwater cleanup levels have either not changed or are less stringent than those established in the 1990 ROD.

Table I-1: Groundwater Cleanup Levels ARARs Comparison

COC	1990 ROD Cleanup Level (µg/L)	Basis for Cleanup Level	Current Standard (µg/L)[a]	Change
Benzene	5	MCL	5	None
TCE	5	MCL	5	None
1,1-Dichloroethene	7	MCL	7	None
Vinyl chloride	2	MCL	2	None
PCE	5	PQL/PMCL[b]	5	None
Xylenes	400	Vermont GES	10,000	Less stringent

Notes:

a. Accessed 4/7/2023 at https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations and https://dec.vermont.gov/sites/dec/files/dwgwp/DW/2019.07.06%20-%20GWPRS.pdf.

b. The 1990 ROD indicated that the PQL and PMCL were the basis for the cleanup level for PCE. PCE now has an MCL, so this evaluation compared the cleanup level to the current MCL.

APPENDIX J – SCREENING-LEVEL RISK REVIEW

Soil

Soil cleanup levels were established for the Site in the 1990 ROD. Table J-1 compares the soil cleanup levels to the EPA's current residential soil RSLs. RSLs incorporate current toxicity values and standard default exposure factors. The Site is currently not in use and is fenced with a locked gate, thus access is restricted. Additionally, implemented institutional controls restrict access to the fenced landfill area. Therefore, comparing soil cleanup levels to residential RSLs is a conservative estimate. All cleanup goals correspond to risk levels or HQs below or within the EPA's acceptable risk ranges and therefore remain valid.

Table J-1: Screening-Level Risk Review for Soil Cleanup Levels

COC	1990 ROD Cleanup Level (mg/kg)	Residential RSL (mg/kg)[a]		Cancer Risk[b]	Noncancer HQ[c]
		1 x 10^{-6} Risk	HQ = 1.0		
PCBs[d]	6	0.23	N/A	3 x 10^{-5}	N/A
PAHs[e]	3	0.11	18	3 x 10^{-5}	0.2

Notes:

a. Accessed at 4/7/2023 at https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables.
b. The cancer risks were calculated using the following equation, based on the fact that RSLs are derived based on 1 x 10^{-6} risk: cancer risk = (cleanup level ÷ cancer-based RSL) × 10^{-6}.
c. The noncancer HQ was calculated using the following equation: HQ = cleanup level ÷ noncancer-based RSL.
d. PCBs (high risk) used for PCBs.
e. Benzo(a)pyrene used for PAHs.

mg/kg = milligrams per kilogram
N/A = not applicable