US ARMY CORPS OF ENGINEERS, NORTH ATLANTIC DIVISION **STAFF ACTION SUMMARY** For use of this form, see AR 25-50; the proponent agency is CENAD-DE.	1. CONTROL NUMBER 1105	2. SUSPENSE DATE *(YYYYMMDD)* 20160920

SECTION I - ACTION OFFICER

1. RANK / TITLE NAME *(First, Last)*	2. OFFICE	3. TELEPHONE NUMBER	4. DATE *(YYYYMMDD)*
Luz Spann-LaBato	CENAD-PD-IIE	347-370-4605	20160831

5. ACTION
☐ a. INFORMATION ☒ b. APPROVAL ☒ c. SIGNATURE ☐ d. OTHER (*specify*)

SECTION II - GENERAL INFORMATION

1. SUBJECT
Decision Document for Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS), Project No. D01VT036301, Lyndonville Air Force Base Property for East Haven, VT

2. BACKGROUND / DISCUSSION / RECOMMENDATION
Starting 29Jul16, MSC Commanders are the approval authority for decision documents that have a selected remedy with total CTC estimate for the RA-C and RA-O phases for remedial actions, or the RmA-C or IRA phase for removal actions < $5 million. Selected Remedy consists of excavation, off-site disposal & backfill for unlimited use/unrestricted exposure. Total present worth Cost of the remedy is $151,960.

SECTION III - COORDINATION

#	a. RANK / TITLE NAME *(First, Last)*	b. OFFICE	c. CONCURRENCE: CONCUR	c. CONCURRENCE: NONCONCUR	d. COMMENT	e. DATE *(YYYYMMDD)*	f. SIGNATURE *(line locks upon CAC signing)*
1.	Ravi Ajodah	CENAD-PD-I	☑	☐	☐ SEE	20160829	
2.	Patsy Falcigno	CECC-NAD	☑	☐	☐ SEE	20160909	
3.			☐	☐	☐ SEE		
4.			☐	☐	☐ SEE		
5.			☐	☐	☐ SEE		
6.			☐	☐	☐ SEE		
7.			☐	☐	☐ SEE		
8.			☐	☐	☐ SEE		

☒ 9a. PROGRAMS DIRECTOR ☒ CONCUR ☐ NONCONCUR ☐ COMMENT		☐ 10a. REGIONAL BUSINESS DIRECTOR ☐ CONCUR ☐ NONCONCUR ☐ COMMENT	
b. RANK / TITLE NAME *(First, Last)* Mr. Tom Harnedy	c. DATE *(YYYYMMDD)* 20160830	b. RANK / TITLE NAME *(First, Last)*	c. DATE *(YYYYMMDD)*
d. PROGRAM DIRECTOR'S SIGNATURE		d. REGIONAL BUSINESS DIRECTOR'S SIGNATURE	

SECTION IV - ROUTING

☒ 1a. EXECUTIVE OFFICE ☒ REVIEWED		
b. RANK / TITLE NAME *(First, Last)* Shamirra Shelton-Thornton	c. DATE *(YYYYMMDD)* 9/15/16	d. SIGNATURE
☐ 2a. DEPUTY COMMANDER ☐ CONCUR ☐ NONCONCUR ☐ COMMENT		
b. RANK / TITLE NAME *(First, Last)* COL Leon F. Parrott	c. DATE *(YYYYMMDD)*	d. DEPUTY COMMANDER'S SIGNATURE
☒ 3a. COMMANDER ☒ APPROVE ☐ DISAPPROVE ☐ COMMENT		
b. RANK / TITLE NAME *(First, Last)* BG William H. Graham	c. DATE *(YYYYMMDD)* 15 Sep	d. COMMANDER'S SIGNATURE

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, NORTH ATLANTIC DIVISION
FORT HAMILTON MILITARY COMMUNITY
302 GENERAL LEE AVENUE
BROOKLYN NY 11252-6700

CENAD-PD-I

SEP 15 2016

MEMORANDUM FOR Commander, U.S. Army Corps of Engineers, New England District, (CENAE-PP-M/Ms. Sullivan), 696 Virginia Road, Concord, MA 01742-2751

SUBJECT: Decision Document for Defense Environmental Restoration Program for Formerly Used Defense Sites (DERP-FUDS), Project No. D01VT036301, Lyndonville Air Force Base Property for East Haven, VT

1. Reference NAE, CENAE-PP-M memorandum dated 25 August 2016, subject as above.

2. I approve the Decision Document for the Lyndonville AFS FUDS Project No. D01VT036301 and concur with its conclusions.

3. The point of contact is Ms. Luz Spann-LaBato, Senior Environmental Program Manager, (347) 370-4605, Luz.O.Spann-LaBato@usace.army.mil.

Encl

WILLIAM H. GRAHAM
Brigadier General, USA
Commanding

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 VIRGINIA ROAD
CONCORD MA 01742-2751

CENAE-PP-M

25 August 2016

MEMORANDUM FOR Commander, U.S. Army Corps of Engineers, North Atlantic Division, (CENAD-PD-IIS-P/Ravi Ajodah), Fort Hamilton Military Community, 302 General Lee Ave, Brooklyn, NY 11252

SUBJECT: Request for Approval of Defense Environmental Restoration Program - Formerly Used Defense Sites (DERP-FUDS) Decision Document for Project No. D01VT036301, Lyndonville Air Force Station (AFS), East Haven, VT

1. The purpose of this memorandum is to gain your approval of the Decision Document for the Lyndonville AFS FUDS, D01VT036301. The Former Lyndonville Air Force Station is located on Radar Road in East Haven, Essex County, Vermont. The Former Lyndonville Air Force Station was used by the United States Air Force (USAF) from 1956 to 1963 as an aircraft control and warning radar. After the Air Force Station was closed in 1963, a private party acquired the land from the General Services Administration. In 2001, the land was sold to East Mountain Development Corporation. In 2005, the five parcels comprising the Site (a total of 50.2 acres) were conveyed to the current owner, Northeast Kingdom Wind Power, LLC.

2. Based on the Final Remedial Investigation Report and Final Feasibility Study Report, the only actionable risk based on the human health risk assessment (HHRA) is at the Debris Area in Area of Concern (AOC) 1. The Debris Area, including AOC 1, was created by disposal of solid wastes generated at the Air Force Station. Waste containing PCBs was disposed of in AOC 1 and covered with clean soil. The PCBs appear to have remained adsorbed to soil particles, and have not migrated to groundwater or surface water at detectable levels. The Selected Remedy (Alternative 4) consists of excavation, off-site disposal, and backfill and is expected to achieve a condition of unlimited use and unrestricted exposure (UU/UE) for the Site.

3. In accordance with FUDS policy, the Environmental and Munitions Center of Expertise (EMCX) has reviewed, and concurs with, the Decision Document. The Army Public Health Command has reviewed the Risk Assessment. NAE Office of Counsel and VT DEC have reviewed, and concur, with the Decision Document.

4. The Division Commander for any Division assigned FUDS mission execution responsibility is the approval authority for decision documents that have a selected remedy less than $5 million. I recommend that North Atlantic Division approve and sign the Decision Document.

5. Please contact me directly if I can be of further assistance. Detailed information desired by your staff can be obtained by contacting Ms. Heather Sullivan, who may be reached at (978) 318-8543.

CHRISTOPHER J. BARRON
COL, EN
Commanding

Encl - Decision Document

FINAL

DECISION DOCUMENT

LYNDONVILLE FORMER AIR FORCE STATION
EAST HAVEN, VERMONT

FUDS PROJECT NUMBER: D01VT0363 01
CONTRACT NUMBER: W912WJ-15-C-0025

DEBRIS AREA: VT SMS #91-1152

CANTONMENT AREA: VT SMS #2009-3914

OPERATIONS AREA: VT SMS #2009-3915

RECEIVER BUILDING: VT SMS #2009-3916

PARCEL ADJACENT TO CANTONMENT AREA: VT SMS #2009-3917

Stone Project ID 15-0180

September 2016

Prepared for:

US Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742-2751

US Army Corps of Engineers®

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LIST OF ACRONYMS

AECOM	AECOM, Inc.
amsl	above mean sea level
AOC	Area of Concern
ARAR	applicable or relevant and appropriate requirement
AST	Aboveground Storage Tank
ATV	All-terrain vehicle
B(a)P-TE	Benzo(a)Pyrene Toxic Equivalency Factor
bgs	below ground surface
CENAE	U.S. Army Corps of Engineers, New England District
CERCLA	Comprehensive Environmental Response, Compensation and Liability
CFR	Code of Federal Regulations
CSF	Cancer Slope Factor
CSM	Conceptual Site Model
cyd	cubic yard
DERP	Defense Environmental Restoration Program
DOD	Department of Defense
ELCR	Excess Lifetime Cancer Risk
EPC	Exposure Point Concentration
ER	Engineering Regulation
FS	Feasibility Study
ft	foot, feet
FUDS	Formerly Used Defense Site
HHRA	human health risk assessment
HI	Hazard Index
HQ	Hazard Quotient
INPR	Inventory Project Report
IRIS	Integrated Risk Information System
JCO	The Johnson Company
LUC	Land Use Control
MCL	Maximum Contaminant Level
mg/Kg	milligrams per kilogram (parts per million)
NCP	National Contingency Plan
O&M	operation and maintenance

PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
RAO	Remedial Action Objective
RB-RSC	Risk-Based Residential Soil Concentration
RfD	Reference Dose
RfC	Reference Concentration
RG	Remedial Goal
RI	Remedial Investigation
RSL	Regional Screening Level
RSLERA	Refined Screening Level Ecological Risk Assessment
S&W	Stone & Webster
SLERA	Screening Level Ecological Risk Assessment
sqft	square feet
SMAC	Site Management Activity Completed
SMS	Sites Management Section (Vermont)
Stone	Stone Environmental, Inc.
SVOC	semivolatile organic compound
TMV	toxicity. mobility and volume
UCL	Upper Confidence Limit
µg/L	micrograms per liter (parts per billion)
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USC	United States Code
USEPA	United States Environmental Protection Agency
UU/UE	Unlimited Use and Unrestricted Exposure
VOC	volatile organic compound
VSWI	Vermont's Significant Wetlands Inventory
VTANR	Vermont Agency of Natural Resources
VTDEC	Vermont Department of Environmental Conservation
VTDOH	Vermont Department of Health

1. THE DECLARATION

1.1. Site Name and Location

The Lyndonville Former Air Force Station (the Site) is located in East Haven, Essex County, Vermont. The Site is a Formerly Used Defense Site (FUDS) (D01VT0363 01).

1.2. Statement of Basis and Purpose

This Decision Document presents the final remedy selected for the Site, which was developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended, 42 U.S.C. §§ 9601 et seq. and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) as amended, 40 C.F.R. Part 300. This final decision for the Site is based on the Administrative Record file which was developed in accordance with Section 113(k) of CERCLA and is available for public review at the Cobleigh Public Library, 14 Depot Street, Lyndonville, VT 05851 and the U.S. Army Corps of Engineers (USACE) New England District (NAE) Office, 696 Virginia Road, Concord, MA 01742-2751.

The Division Commander for USACE, NAE has been delegated the authority to approve this Decision Document. The lead state regulatory agency for this site is the Vermont Department of Environmental Conservation (VTDEC), Waste Management and Prevention Division, Sites Management Section (SMS). The State of Vermont concurs with the selected remedy described herein. Appendix A contains a copy of VTDEC's Letter of Concurrence.

1.3. Assessment of the Site

The primary contaminants of concern at the Site are polychlorinated biphenyls (PCBs). Polychlorinated biphenyl-containing materials were used by the United States Air Force (USAF) during their historical operations at the Air Force Station (Figure 1), and were disposed of in the western portion of an onsite landfill known as the Debris Area, designated as Area of Concern (AOC) 1 (Figure 2, Figure 3). Total PCBs have been detected in three soil samples collected from AOC 1. The concentration of total PCBs exceeded the Remedial Goal (RG) of 1.7 milligrams per kilogram (mg/Kg) established for the Site at only one location (Test Pit 6) where the total PCB concentration was 48 mg/Kg. There are no unacceptable human health or ecological risks under current use scenarios; however, the response action selected in this Decision Document is necessary to protect against potential human health risks for reasonable future use scenarios.

1.4. Description of the Selected Remedy

The final remedy selected by the USACE for the Site (the Selected Remedy) is removal and off-site disposal of soil with total PCBs in accordance with the Remedial Action Objective (RAO). Key elements of the Selected Remedy include:

- Pre-design investigation to refine the estimated volume of soil requiring excavation.
- Removal of soil containing total PCBs concentrations that result in risks in excess of USEPA's target ELCR level (1×10^{-4}) and/or which exceed a target non-cancer HI greater than 1.0..
- Confirmation sampling to verify that the RG has been met.

- Characterization of excavated soil for waste disposal purposes.
- Disposal of excavated soils at an off-site permitted facility.
- Site restoration

The Selected Remedy does not require land use controls (LUCs) or post-remedial monitoring. Five-year reviews are not required, since the Selected Remedy attains a condition of Unlimited Use and Unrestricted Exposure (UU/UE). The total estimated cost of implementing the Selected Remedy is approximately $151,960.

1.5. Statutory Determinations

Under CERCLA §121 and the NCP, the lead agency must select remedies that: are protective of human health and the environment; comply with applicable or relevant and appropriate requirements (ARARs) – unless a statutory waiver is justified; are cost-effective; utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and satisfy the statutory preference for treatment as a principal element of the remedy. This section discusses how the Selected Remedy meets these statutory requirements.

1.5.1. Protectiveness of Human Health and the Environment

The Selected Remedy would remove all soils in the Debris Area that contained total PCBs at concentrations exceeding the RG, thereby protecting human receptors and achieving the Remedial Action Objective (RAO). Therefore, overall protection of human health and the environment would be achieved by the Selected Remedy.

1.5.2. Compliance with ARARs

There are no ARARs identified for implementation of the Selected Remedy. USEPA's Toxic Substances Control Act does not apply to soils in Debris Area AOC 1, where PCB disposal occurred prior to April 18, 1978 and PCB concentrations are currently less than 50 mg/kg.

1.5.3. Cost-Effectiveness

In the lead agency's judgment, the Selected Remedy is cost-effective and represents a reasonable value for the money to be spent.

1.5.4. Utilization of Permanent Solutions and Alternative or Resource Recovery Technologies

The Selected Remedy would remove soil contaminated above the RG, thus eliminating residual risk. LUCs would not be necessary to prevent exposure because the contaminated soil would be removed. Five-year reviews would not be necessary because the Selected Remedy would permanently remove contaminated soil, thus allowing for unlimited use and unrestricted exposure. USACE has determined that the Selected Remedy represents the maximum extent to which permanent solutions and alternative or resource recovery technologies can be utilized in a practicable manner at the Site.

1.5.5. Statutory Preference for Treatment as a Principal Element of the Remedy

The excavation, offsite disposal and backfill alternative is not a treatment method, so it would not reduce the toxicity, mobility and volume (TMV) of contaminants through treatment. The

Selected Remedy does, however, result in the permanent removal of the contaminated soil driving a finding of unacceptable risk, and therefore provides a remedy that allows unrestricted use of the Site with no ongoing requirements for monitoring, or operations and maintenance. In addition, the offsite disposal facility will likely be a lined landfill, thereby reducing mobility through containment.

1.6. Data Certification Checklist

The following information is included in the Decision Summary section of this Decision Document (Section 2.0). Additional information can be found in the Administrative Record file for this Site.

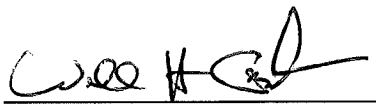
- Chemicals of concern and their respective concentrations (Subsection 2.4.5).
- Baseline risk represented by the chemicals of concern (Subsection 2.6).
- Cleanup levels established for chemicals of concern and the basis for these levels (Subsection 2.7).
- How source materials constituting principal threats are addressed (Subsection 2.10).
- Current and reasonably anticipated future land use assumptions and current and potential future beneficial uses of groundwater (Subsections 2.5).
- Potential land and groundwater use that will be available at the Site as a result of the Selected Remedy (Subsection 2.5).
- Estimated capital, annual operation and maintenance (O&M), and total present worth costs, discount rate, and the number of years over which the remedy cost estimates are projected (Subsection 2.11.3).
- Key factor(s) that led to selecting the remedy (i.e., a description of how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria (Subsection 2.9).

1.7. Authorizing Signatures

The Selected Remedy for the Site (Excavation, Offsite Disposal, and Backfill) is protective of human health and the environment, is readily implementable, and is cost effective. The Selected Remedy does not satisfy the statutory preference for remedies that utilize treatment as a principal element to reduce the toxicity, mobility, or volume of hazardous substances; however, implementation of the remedy does provide a permanent solution resulting in unlimited use and unrestricted exposure.

SEP 15 2016

Date



WILLIAM H. GRAHAM
Brigadier General, USA
Commanding

2. THE DECISION SUMMARY

2.1. Site Name, Location, and Description

The Lyndonville Former Air Force Station (the Site) is located on Radar Road in East Haven, Essex County, Vermont. East Haven Town property records indicate that the former Air Force Station on East Mountain included federal government ownership of 50.2 acres in the area of interest, mostly in the Town of East Haven, Vermont (Figure 1).

The Site includes five surveyed land parcels (Figure 2), which were subdivided from the parent parcel and serve to separate each Study Area from the parent parcel.

- Debris Area: Parcel A100-1;
- Cantonment Area: Parcel A100-2;
- Operations Area: Parcel A100-3;
- Receiver Building: Parcel A106; and
- Parcel Adjacent to Cantonment Area: Parcel A108.

The Site is a Formerly Used Defense Site (Property No. D01VT0363, Project No. 01). The Department of Defense (DOD) has the responsibility for cleaning up former DOD facilities under the FUDS Program; USACE is the lead agency responsible for the Lyndonville Former Air Force Station. The VTDEC is the lead regulatory agency. VTDEC has participated in the Remedial Investigation, Feasibility Study, and remedy selection process. Although VTDEC has no regulatory authority under the federal program, USACE seeks the involvement and consensus of the state, but does not require it.

2.2. Site History and Enforcement Activities

2.2.1. Site History

The Site was acquired as several parcels by the federal government by purchase and condemnation between the years of 1956 and 1965. Between 1956 and August 1963, the Site was used by the Air Force as an aircraft control and warning radar. Initially, the Site was known as the North Concord Air Force Station, and was re-named the Lyndonville Air Force Station around March 1962. After the Air Force Station was closed in 1963, a private party acquired the land from the General Services Administration. In 2001, the land was sold to East Mountain Development Corporation. In 2005, the five parcels comprising the Site (a total of 50.2 acres) were conveyed to the current owner, Northeast Kingdom Wind Power, LLC. As of the date this Decision Document, the Former Air Force Station was completely surrounded by land owned by Plum Creek Timber Company (formerly Essex Timber Company, and prior to that, the St. Regis Paper Company) which owns approximately 86,000 acres of land surrounding the Site.

2.2.2. Prior Investigations and Studies

The Site (D01VT0363 01) was identified as a site eligible for the Defense Environmental Restoration Program (DERP) in a Findings and Determination of Eligibility dated 22 September 1989 (USACE, 1989). DERP work at the Site (Project 01) was authorized on 09 February 1994 in an Inventory Project Report (INPR) (USACE, 1994). A Preliminary Assessment, which is usually performed under CERCLA, was not completed for this Site; however, the inventory

performed by the USACE served the same purpose – to determine if environmental conditions at the Site have been impacted by release(s) of hazardous substances. A Site Investigation was completed for the Site in 1997 (S&W, 1997). The DERP project eligibility was based on the finding of groundwater contamination that likely resulted from USAF activities at the Site.

Table 1 summarizes the history of investigations at the Site.

2.2.3. Regulatory Background

The DOD has the responsibility to address contamination issues at former DOD facilities under DERP for FUDS and, therefore, is responsible for site investigation and remediation activities at the Site. The goal of the USACE is to achieve regulatory closure for the Site. FUDS program policy (USACE, 2004) requires USACE to:

- Comply with the DERP Statute (10 USC 2701 et seq.) and CERCLA, Executive Orders 12580 and 13016, the NCP, DERP guidance, and Army policies for the FUDS program;
- Coordinate with, and obtain input from, the appropriate state regulatory agency, which for this Site is the VTDEC;
- Conduct a remedial investigation with a baseline risk assessment to evaluate the need for remediation; and
- In a response action, attain standards and meet requirements that are consistent with CERCLA and NCP processes and criteria.

Substantive requirements provided by the state may be considered ARARs. The VTDEC has participated by providing regulatory oversight of the FUDS investigation. It is the policy of the USACE to uphold federal laws assuring that activities conducted at the Site are protective of human health and the environment, and meet other substantive requirements that are determined to be ARARs.

The Remedial Investigation (RI) and Feasibility Study (FS) were conducted between 2008 and 2014 under the DERP for FUDS, and completed in accordance with CERCLA and the NCP, including United States Environmental Protection Agency (USEPA) Remedial Investigation (RI) / Feasibility Study (FS) Guidance (USEPA, 1988) and pursuant to USACE Engineer Regulation (ER) 200-3-1 (USACE, 2004).

2.3. Community Participation

The *Final RI Report* (JCO, 2013) for the Site was completed in November 2013. The *Final FS Report* (Stone, 2014) was completed in November 2014. The *Final Proposed Plan* (Stone, 2015), was completed on June 11, 2015. The RI, FS, and Proposed Plan can be found in the Administrative Record file at the Cobleigh Public Library in Lyndonville, VT.

A public comment period was held from June 22 to July 24, 2015. In addition, a public meeting was held on July 15, 2015 to present the Proposed Plan to the public. During the public meeting, USACE and VTDEC answered questions about the preferred remedy for the Site. This meeting was also used to solicit comments and input regarding the Proposed Plan. Responses to the comments received during the public comment period and at the public meeting are included in the Responsiveness Summary provided in Section 3.0 of this Decision Document.

2.4. Site Characteristics

2.4.1. Conceptual Site Model

A Conceptual Site Model (CSM), based upon all available data, was developed during preparation of the *Final RI Report* which describes the contaminant source, hydrogeology, and the contamination nature, extent, fate and transport. Based on the *Final RI Report* (JCO, 2013) and *Final FS Report* (Stone, 2014), the only actionable risk based on the human health risk assessment (HHRA) is at the Debris Area in Area of Concern (AOC) 1.

The Debris Area was subdivided into two study areas, consisting of AOC 1 (west of Radar Road) and AOC 2 (east of Radar Road). The Debris Area, including AOC 1, was created by disposal of solid wastes generated at the Air Force Station into low-lying areas near an unnamed stream, on top of the existing overburden soils. Environmental sampling of soil, groundwater, pore water, surface water, and sediment was conducted, including sampling of background locations, with analysis for a wide range of potential contaminants, including volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), PCBs, and metals. The analytical results of the sampling indicated that VOCs were present at the Site at concentrations which do not result in unacceptable risk, and PAHs and metals were present at the Site at concentrations consistent with background concentrations. PCBs were detected in three soil samples collected from AOC 1. A total PCBs concentration of 48 mg/Kg was detected in Test Pit 6, at a depth of 2 feet below ground surface (ft bgs), resulting in an average concentration of total PCBs in this area that was greater than the RG of 1.7 mg/Kg established for the Site (Stone, 2014). Therefore, based on the available soil analytical results, it appears that PCB-containing materials which were used by the USAF during their historical operations at the Air Force Station, were disposed of at the Site, in AOC 1 (Figures 2 and 3).

Potential impacts to groundwater were evaluated through the collection and analysis of groundwater samples from test pits and pore water surrounding the Site. PCBs were not detected in groundwater samples collected at the Site. Potential impacts to surface water were evaluated through the collection and analysis of sediment samples, which were selected because PCBs have low solubility in water, and tend to sorb to soil particles and sediment. No PCBs were detected in the sediment samples. The lack of detections of PCBs in groundwater and surface water samples resulted in a conclusion that there are no impacts to these media (Stone, 2014).

In summary, waste containing PCBs was disposed of in AOC 1 and covered with clean soil. The PCBs appear to have remained adsorbed to soil particles, and have not migrated to groundwater or surface water at detectable levels.

2.4.2. Site Overview and Physical Setting

The Site is located on a remote, forested mountaintop in East Haven, VT (Figure 1) and is located on the southwest limb of East Mountain at an elevation of approximately 2,100 ft above mean sea level (ft amsl). The town of East Haven is located approximately 20 miles from interstate Route 91 and the city of Saint Johnsbury.

The available data suggest that the extent of the PCB contamination at Debris Area AOC 1 is approximately 625 square feet (sqft) (Figure 3). The Site is only accessible to the public by walking or by recreational vehicles (i.e., all-terrain vehicles (ATVs) or snowmobiles), due to the presence of two locked gates on the single privately owned, 11-mile-long access road (Radar

Road). There are no known residences within 1,000 ft of the Site and there are currently no industrial or residential activities occurring at or near the Site. However, there is evidence of uncontrolled access and trespassers at the site. The nearest water supply well is more than 2 miles from the Site (JCO, 2013).

2.4.3. Surface Water and Wetlands

The Debris Area appears to have been at least partly located in a wetland, although the extent of former wetlands has not been determined. An unnamed stream flows southwestward along the northern and western boundaries of the Debris Area (Figure 3). The relationship between groundwater and surface water in the vicinity of the Site has not been investigated, as there is no evidence of PCB impacts to either medium.

2.4.4. Geology and Hydrogeology

2.4.4.1. Overburden Geology

Overburden soil was characterized at the Site (JCO, 2013). At Debris Area AOC 1 the overburden geology comprises 5 to more than 10 feet of dense, basal glacial till, overlain by thin, rare peat deposits; these deposits are thinner (up to 5 ft) in AOC 2 (JCO, 2013). Glacial till is unsorted sediment deposited directly by and beneath the glacier. It includes clay, silt, sand, gravel and boulders. The till lies directly over fractured bedrock (Stone, 2014).

Soil descriptions in the Cantonment Area range from clay to non-plastic silt, with sand and gravel, which are consistent with the composition of glacial till. Soils in the Operations Area are limited to less than 1 ft of organic soil beneath the spruce krumholtz in unpaved areas; soils in the vicinity of buildings are mostly regarded or imported sandy silt, silty sand, sand, and gravel (JCO, 2013).

2.4.4.2. Bedrock Geology

Bedrock beneath the Site is mapped as part of the Gile Mountain Formation. The characteristic lithology of the Gile Mountain Formation is bands of light gray, quartzose phyllite alternating with bands of dark gray, pelitic or slatey phyllite. The bands are generally a few millimeters to centimeters in thickness, but occasionally are as wide as 3 to 4 ft. Quartz veins, often intricately folded and sheared, are common at thicknesses from a few millimeters to several ft. The bedding, schistocity and false cleavage are all near vertical (mostly greater than 80 degrees dip) and generally strike north-south. The bedrock is in the staurolite/garnet metamorphic zone (which also commonly contains chlorite porphyroblasts) (Woodland, 1965).

2.4.4.3. Hydrogeology

Groundwater beneath the Site is classified by the State of Vermont as “Class III” which is considered “Suitable as a source of water for individual domestic water supply irrigation, agricultural use and general industrial and commercial use”. (Groundwater was incorrectly classified as Class II in the Remedial Investigation and Feasibility Study Reports.) However, other than the three former bedrock water supply wells in the Cantonment Area installed by the Air Force (Well-C on Parcel A108, and Wells -A and -B on Parcel A100-2), there are no known water supplies within 2 miles of the Site.

Groundwater was encountered in five of the test pits in the Debris Area, at depths ranging between 4 ft bgs and 7.5 ft bgs. Data from these, and 28 additional, dry test pits in the Debris Area, indicate that the observed groundwater is ephemeral and is perched on the dense, dry glacial till observed in many test pits (JCO, 2013). Available downgradient pore water data indicate that the PCB contamination has not migrated to groundwater beneath the Debris Area.

The bedrock aquifer at the Debris Area has not been evaluated. The bedrock is separated from buried debris and PCB-contaminated soil by the presence of the low permeability, dense, dry silt till based upon the test pit logs (JCO, 2013).

The depth to groundwater in the Cantonment Area is between zero and 8 ft bgs based upon visual observations of natural seeps and springs and water levels reported in the soil boring logs and in available wells (JCO, 2013). The data suggest that there is a relatively thin (less than 15 ft thick) zone of overburden saturation in the unconsolidated deposits beneath portions of the Cantonment Area.

No groundwater was observed above the bedrock surface in the Operations Area, which is not unexpected due to its location on top of a mountain with no recharge area, and the shallow depth to rock (JCO, 2013).

2.4.5. Nature and Extent of Contamination

The following sections summarize information from the Final RI Report (JCO, 2013), primarily focused on the area requiring a response action, Debris Area AOC 1.

2.4.5.1. Soil

Environmental sampling of soil was conducted in 2008 and 2009 at the Site, including sampling of background locations, with analysis for a wide range of potential contaminants, including VOCs, PAHs, PCBs, and metals (JCO, 2013).

The analytical results of the sampling indicated that VOCs were present in soil at the Debris Area AOC 1 at concentrations which do not result in unacceptable risk, and PAHs and metals were present in soil at the Site at concentrations consistent with background concentrations (Stone, 2014).

PCBs were detected in six of the 27 soil samples from Debris Area AOC 1 that were analyzed for PCBs. The mean total PCBs concentration in soil samples collected from Test Pit 6 exceeded the RG established (1.7 mg/Kg) (Stone, 2014).

2.4.5.2. Groundwater

Environmental sampling of groundwater and pore water was conducted in July 2008, including sampling of background locations, with analysis for a wide range of potential contaminants, including VOCs, PAHs, PCBs, and metals (JCO, 2013). The analytical results of the sampling indicated that VOCs were not present in groundwater beneath the Site, and PAHs and metals were present at the Site at concentrations consistent with background concentrations. Available test pit groundwater and downgradient pore water data indicate that the soil PCB contamination has not migrated to groundwater beneath the Site (Stone, 2014).

2.4.5.3. Surface Water

Environmental sampling of surface water and sediment was conducted in July 2008, including sampling of upstream background locations, with analysis for a wide range of potential contaminants, including VOCs, PAHs, PCBs, and metals (JCO, 2013). The analytical results of the sampling indicated that VOCs and PCBs were not present, and PAHs and metals were present at the Site at concentrations consistent with site-specific background concentrations. Available sediment data from the unnamed stream indicate that the soil PCB contamination has not migrated to surface water downgradient of the Site (Stone, 2014).

2.5. Current and Potential Future Site and Resource Uses

The current land use for the FUDS Property is undeveloped forest land (Figure 2). The land use in the vicinity of the Site has remained unchanged over the past four decades, predominantly undeveloped woodland.

The Town of East Haven does not have zoning regulations and does not provide municipal water or sewer services. There are no known residences within 1,000 ft of the Site and there are currently no industrial or residential activities occurring at or near the Site. The nearest water supply well is more than 2 miles from the Site (JCO, 2013).

The Site does not contain significant historic resources. Potential future uses include residential use, silviculture and wind power development. The basis for reasonably anticipated future land use at the Site is a continuation of current land use, corporate ownership, and the expectation that residential development pressure is expected to continue in the future.

Potential future uses mentioned by the property owners include logging on Plum Creek Timber Company properties, installation and maintenance of wind turbines in the Operations Area, and use of the Cantonment Area as a lay-down area for wind turbine construction. However, it is possible that that the properties may be used for residential purposes in the future (JCO, 2013), therefore residential use is considered to be a reasonably anticipated future use for the site. It is noted that future redevelopment of the mountaintop parcels on East Mountain (2100 to 2300 ft above mean sea level) may require compliance with other regulatory requirements such as compliance with the objectives of Vermont Act 250, and the owner's voluntary land use control would require notification to the Vermont DEC both for any future disturbance to the former Debris area, and for the permitting of any future onsite drinking water supply well.

2.6. Summary of Potential Site Risks

A Human Health Risk Assessment (HHRA) and Screening Level Ecological Risk Assessment (SLERA) were conducted for the Site in accordance with USEPA and VTDEC guidance. The risk assessments estimate what risks the Site poses if no action were taken. It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. This section of the Decision Document summarizes the results of the HHRA and SLERA.

2.6.1. Human Health Risk Assessment

The HHRA evaluated potential adverse human health effects of chronic exposures to compounds detected in samples of environmental media collected from the Site. The HHRA identified whether Site-related compounds present at the Operations Area, the Cantonment Area, or the

Debris Area at the Site pose a risk/hazard above target levels to human health. In order to meet the objective of identifying possible remedial alternatives that provide unlimited use and unrestricted exposure (UU/UE) for the Site in the future, the potential future land use with the most stringent criteria, residential use, was evaluated.

2.6.1.1. Chemicals and Media of Concern

Concentrations of potential contaminants in each media (soil, groundwater, surface water, and sediment) were compared against risk-based screening levels and, where appropriate, background concentrations. These comparisons are summarized as follows.

The maximum detected concentrations of PAHs and metals in soil were found to be consistent with site-specific background concentrations, and therefore, were not considered to be the result of a release of hazardous substances at the Site. The concentrations of VOCs detected in soil at the Site were lower than residential soil Risk-Based-Residential Soil Concentrations (RB-RSCs) developed by Vermont Department of Health (VTDOH) in 2006 or one-tenth of the 2010 USEPA Region 3 Regional Screening Levels (RSLs) for residential soil for compounds where VTDOH values are not available; therefore VOCs were not selected as contaminants of concern. The concentrations of total PCBs detected in soil in four of 27 soil samples that were analyzed for PCBs at the Debris Area AOC 1 were greater than residential soil USEPA RSL for Aroclor-1260, which was selected as a surrogate in the absence of an RSL for total PCBs (0.22 mg/Kg (or 220 micrograms per kilogram [µg/Kg]); no VTDOH RB-RSC is established); therefore PCBs were selected as a contaminant of concern, and soil was selected as a medium of concern.

Polychlorinated biphenyls were not detected in groundwater and pore water samples collected from the Site, which were used to evaluate groundwater. The concentrations of VOCs detected in water at the Site were lower than VTDOH Drinking Water Guidance Values (consisting of Vermont Action Levels or Vermont Health Advisories) or USEPA Maximum Contaminant Levels (MCLs); therefore VOCs were not selected as contaminants of concern. The maximum detected concentrations of PAHs and metals in groundwater samples were found to be consistent with background concentrations, and therefore, were not considered to be the result of a release of hazardous substances at the Site. Therefore, groundwater was not selected as a medium of concern.

Neither VOCs nor PCBs were detected in sediment samples collected from the Site, which were used to evaluate surface water. The maximum detected concentrations of PAHs and metals in sediment samples were found to be consistent with background concentrations, and therefore, were not considered to be the result of a release of hazardous substances at the Site. Therefore, surface water was not selected as a medium of concern.

The data used to evaluate the chemicals and media of concern were validated, and found to be usable for their intended purpose. The reporting limit for PCBs analytical results was well below the RG and screening values.

2.6.1.2. Exposure Assessment

Based on the CSM described in Section 2.4.1, PCBs in soil at the Site have remained sorbed to soil and have not migrated to groundwater or surface water. The exposure assessment considered the potential future residential and on-site, industrial, outdoor worker exposure

pathways through soil exposure. Exposure pathways included exposure to contaminants in soil by ingestion and dermal contact.

The exposure point concentration (EPC) for each compound of potential concern was defined as the upper confidence limit (UCL) on the arithmetic mean concentration, or the maximum concentration, whichever was lower (USEPA, 2002). Based on limitations regarding minimum numbers of sample and frequency of detection, UCLs were calculated where at least 10 samples and at least 5 detects were available. Where too few samples or detects were available, as was the case in the surficial soil data set for AOC 1, the maximum detected concentration was used (AECOM, 2012). Therefore, although exposure point concentrations used in a HHRA are typically an estimate of the average concentrations (i.e., to represent average exposures across the Site and over time), the HHRA for AOC 1 conservatively used the maximum detected total PCBs concentration.

2.6.1.3. Toxicity Assessment

The toxicity assessment considered the toxicity of total PCBs, the probable exposure dose, and the health effects that could result from exposure to PCBs. The HHRA evaluated both carcinogenic and non-carcinogenic effects for exposure. Carcinogenic health effects were assumed to be cumulative over a lifetime of exposure, without a lower limit or threshold of effect. Non-carcinogenic health effects were assumed to be effective over the duration of exposure, with a lower limit or threshold below which the adverse effect is not expressed.

Carcinogenic health effects were assessed by evaluating the excess cancer risk over a person's lifetime that results from exposure to Site-related PCBs in environmental media. Carcinogenic risk is a function of the dose and the cancer slope factor dose-response relationships for a particular compound (e.g., PCBs). Integrated Risk Information System (IRIS) dose-response values for the carcinogenic oral and inhalation routes were used in accordance with a hierarchy of sources recommended by USEPA to quantify potential cancer risks from exposure to PCBs. The potential total excess lifetime cancer risk (ELCR) for each receptor was calculated assuming that cancer risks from each of the exposure pathways are additive (cumulative).

The USEPA has developed Reference Doses (RfDs) and Reference Concentrations (RfCs) for chronic and subchronic exposures to non-carcinogens. The RfD is intended to provide a reasonable estimate of the threshold at which human health effects are expected to occur over time, up to a lifetime of exposure. Dose-response values were selected from USEPA sources in accordance with a hierarchy of sources recommended by USEPA. A Hazard Quotient (HQ) is estimated for each contaminant of concern, then a Hazard Index (HI) is calculated and used to evaluate non-carcinogenic risks associated with potential exposure to contaminants of concern at the Site.

Total PCB concentrations were calculated by summing the separate Aroclor concentrations, limited to the individual Aroclors detected at least once within the Debris Area (specifically, Aroclor-1242, -1254, and -1260). Non-detects within the data set for Aroclor-1242, -1254, and -1260 were evaluated using the full reporting limit. Based on a review of the cancer slope factor (CSF) selection criteria, the CSF value of 2 per mg/Kg per day, the CSF for high risk and persistence, was used in the HHRA for evaluation of the soil exposure routes. An oral reference dose (RfD) is not available for total PCBs; non-cancer chronic risks from potential exposures to PCBs were calculated using the RfD for Aroclor-1254 of 2×10^{-5} mg/Kg per day (AECOM, 2012).

2.6.1.4. Risk Characterization

Risk characterization is the process by which the dose-response information is combined with quantitative estimates of human exposure. The result is a quantitative estimate of the likelihood that humans will experience any adverse health effects given the exposure assumptions made.

The HQ for total PCBs was 10.5, which is greater than 1, which is considered by USEPA and VTDOH to present an unacceptable risk for non-carcinogenic effects.

Carcinogenic risks are probabilities that usually are expressed in scientific notation (e.g., 1×10^{-6}). An ELCR of 1×10^{-6} indicates that an individual experiencing the reasonable maximum exposure estimate over a lifetime has a one in 1×10^{6} (one million) chance of developing cancer as a result of Site-related contaminant exposure. This is referred to as an "excess" lifetime cancer risk because it would be in addition to risks of cancer from other non-Site related causes such as smoking or exposure to too much sun. For Site-related exposures, the USEPA's target cancer risk range is 1×10^{-4} to 1×10^{-6} (one in ten thousand to one in one million). The calculated ELCRs were also compared to 1×10^{-6}, which has been set by VTDOH as the upper bound for an acceptable cancer risk level.

For the potential future onsite resident, the calculated ELCR was 9.13×10^{-5}; within USEPA's target cancer risk range of 1×10^{-4} to 1×10^{-6} and above VTDOH's upper bound cancer risk of 1×10^{-6}.

Uncertainty is inherent in all risk estimates due to the combined uncertainties introduced by field sampling, laboratory measurements, toxicity studies, derivation of toxicity values for humans, and assumptions made in the exposure assessment. However, the HHRA used conservative assumptions to over-predict exposures at the Site, therefore predicting risks that are likely higher than the actual risks at the Site.

2.6.2. Screening Level Ecological Risk Assessment

The *Screening Level Ecological Risk Assessment* could not conclude that a condition of "no unacceptable risk" exists at the three study areas (JCO, 2013, Appendix 15). However, the *Refined Screening Level Ecological Risk Assessment* (JCO, 2013, Appendix 16) concluded that:

- Ecological risks are negligible;
- Further evaluation was not required; and
- There was no need for remediation on the basis of ecological risk.

2.6.3. Basis for Action

The basis for the response action is to ensure that the Site will not present unacceptable human health risks for any future site use, the most conservative of which would be residential use. The results of the risk assessments performed for the Site indicate that a response action is necessary to ensure that public health is protected in the future from potential risks posed by dermal exposure or ingestion of PCBs that are present in the soil at the Site above the concentration associated with an HQ of 1, in the event of residential use in the future.

2.7. Remedial Action Objectives

Remedial Action Objectives consist of media-specific or operable unit-specific goals aimed at mitigating, restoring, and/or preventing existing and future potential threats to human health and the environment and complying with ARARs. RAOs for the Site were established in the FS,

based upon the results of the HHRA, SLERA, and RSLERA, and the ARARs for the Site. Results of the RI, HHRA, SLERA, and RSLERA, indicate there are no adverse impacts from PCB contamination to groundwater, surface water bodies, sediments, or wetland areas, or to human or ecological receptors in these areas. Accordingly, no RAOs were established for these media or receptors.

The RI indicates that PCB contamination is present in soil at the Site at AOC 1. The concentrations of total PCBs in Site soil result in unacceptable risk, based on non-carcinogenic effects (AECOM, 2012). Accordingly, the following RAO was determined to be appropriate for the protection of human health related to potential future use of PCB-contaminated soil:

> *Prevent or reduce potential future residential human exposure to soil with total PCBs concentrations that result in risks in excess of USEPA's target ELCR level (1×10^{-4}) and/or which exceed a target non-cancer HI greater than 1.0.*

2.7.1. Remedial Goals

Remedial goals (RGs) establish acceptable exposure levels that are protective of human health and the environment. For the Site, one RG was developed for total PCBs for AOC 1 in the Debris Area, to meet a residential soil HQ goal of 1, and be protective of potential future residents. The RG was calculated in Subsection 3.5 of the *FS Report* (Stone, 2014). The RG was determined by calculating the ratio of the total PCB EPC of 18.3 mg/Kg versus its total PCB HI of 10.5, and applying the same ratio to back-calculate the RG that will achieve the total PCB HI goal of 1. The calculation indicated that the total PCB HI goal of 1 is met with an RG of 1.7 mg/Kg. Although total PCBs were detected in three soil samples collected from Debris Area AOC 1 (all at concentrations greater than the USEPA RSL of 0.22 mg/Kg (or 220 µg/Kg)), only one sample collected from Test Pit 6 contained detectable concentrations of total PCBs. This sample was collected from a depth of 2 ft bgs and contained 48 mg/Kg total PCBs.

2.7.2. Remediation Target Areas

In order to develop remedial alternatives, it was necessary to identify the soils that will be addressed by the FS alternatives. The soil impacts requiring remediation are based on a single soil sample collected from Test Pit 6 (sample TP6-2-I, 2 ft bgs, 48 mg/Kg). Although there is some uncertainty in the extent of total PCBs concentrations greater than the RG (due to low data density), the available data suggest that the area of total PCBs concentrations greater than the RG is approximately 625 sqft. This assumption was carried through the FS for cost estimating purposes. Total PCBs were detected at concentrations greater than the RG at 2 ft bgs; however, the total depth of total PCBs concentrations greater than the RG is unknown. For the purposes of the FS, the total PCBs concentrations greater than the RG are assumed to extend to 3 ft bgs. The total volume of soil with total PCBs concentrations greater than the RG is estimated to be 69 cubic yards (cyd) in situ. The uncertainty in the lateral and vertical extent of the total PCBs concentrations greater than the RG will be addressed through pre-design characterization included as part of the remedial alternative.

2.8. Description of Alternatives

Remedial alternatives are developed by assembling combinations of applicable technologies and other unit processes into a sequence of actions which address the specific media to which they would be applied and the RAOs that are developed for a Site. Accordingly, remedial technology

types and process options were identified and screened during the FS as the first step in the development of alternatives for the Site. The technologies that were retained were combined to form four remedial alternatives to address the Debris Area soil. Using the retained technologies and process options, the following remedial alternatives were developed:

- Alternative 1: No Action;
- Alternative 2: Land Use Controls (LUCs);
- Alternative 3: Soil Cover Cap with LUCs; and
- Alternative 4: Removal, Off-Site Disposal, Backfill.

2.8.1. Description of Remedy Components Evaluated

2.8.1.1. Alternative 1 No Action

The No Action alternative is required under CERCLA as a baseline with which to compare other remedial alternatives. In a No Action alternative there are no institutional, administrative, monitoring, or remedial actions implemented at a site.

2.8.1.2. Alternative 2 Land Use Controls

Land use controls, in the form of deed restrictions, a Notice to Land Records, and local ordinances, were proposed for this alternative. The LUCs would be implemented by two methods:

1. USACE will provide annual notifications to the property owner(s) to ensure that they are aware of the existence of the contamination present on the Site, and any recommended restrictions, as a result of the contamination; and
2. VTDEC may record a Declaration of Environmental Covenant or a Notice to Land Record as a means of disclosing the conditions to future potential purchasers, lenders, or owners.

2.8.1.3. Alternative 3 Soil Cover Cap with LUCs

This alternative would involve placing a soil cover cap over the area where total PCBs concentrations exceed the RG and implementing LUCs. The primary objective of the soil cover cap is to eliminate human contact with the contaminated soils.

The cover would include a geomembrane, placed on the grubbed soil. The geomembrane would be covered by 18 inches of fill and 6 inches of topsoil. The topsoil would be seeded with grass or other durable vegetation. The soil cover cap would include a stormwater management system to prevent runoff into the adjacent wetland. Construction of the remedy would result in no net loss of wetlands, and the function of nearby Vermont's Significant Wetlands Inventory (VSWI) wetlands will be preserved. Signage and barriers, including a fence and gate, would be installed to prohibit activities that would disturb or interfere with the integrity or function of the cap (such as construction on, excavation of, or drilling through the soil cover). The soil cover cap would be surveyed upon completion. Windblown emissions of contaminated dust would be controlled using a water spray or plastic sheeting. Silt fences, trenches, or other structures would be constructed to prevent surface runoff and erosion of contaminated soil.

2.8.1.4. Alternative 4 Removal, Offsite Disposal, and Backfill

This alternative involves removal of soil with total PCBs concentrations greater than the RG. The excavation limits would be refined during the pre-design investigation. Excavation confirmation sampling would be conducted. Then the area would be backfilled with fill and topsoil, and finally seeded with grass or other durable vegetation. Construction of the remedy will result in no net loss of wetlands, and the function of nearby VSWI wetlands will be preserved.

2.8.2. Common Elements and Distinguishing Features of Each Alternative

Alternatives 1, 2, and 3 would not remove or treat the contaminated soil. Under Alternatives 1, 2, and 3 the cleanup levels would be reached over time as concentrations decrease through natural attenuation. The cleanup levels would be reached with Alternative 4 after the PCB-contaminated soil was removed. Alternative 1 would not prevent exposure to the PCB-contaminated soil. Alternative 2 would prevent unnecessary exposure to contaminated exposure, provided the LUCs are properly and consistently enforced. Alternative 3 would prevent exposure through installation of the soil cover cap and LUCs. Alternative 4 would prevent exposure through removal of the PCB-contaminated soil from the site and LUCs would not be necessary. Because no monitoring would be conducted to determine when cleanup goals are reached through natural attenuation, Alternatives 2 and 3 would require five-year site reviews in perpetuity. Five-year reviews would not be required with Alternative 4, since a condition of UU/UE would be attained.

2.8.3. Expected Outcomes of Each Alternative

As there would be no action taken with Alternative 1, there would be no reduction of risk of human exposure to PCB-contaminated soil. The land could not be used for residential purposes until concentrations decrease through natural attenuation processes but no monitoring would be conducted to confirm the decrease of concentrations.

Alternative 2 would prevent exposure to PCB-contaminated soil through implementation of LUCs. The land could not be used for residential purposes until concentrations decrease through natural attenuation processes but no monitoring would be conducted to confirm the decrease of concentrations.

Alternative 3 would prevent exposure to PCB-contaminated soil through installation of the soil cover cap. The land could not be used for residential purposes until concentrations decrease through natural attenuation processes but no monitoring would be conducted to confirm the decrease of concentrations.

Alternative 4 would eliminate exposure to PCB-contaminated soil through removal and offsite disposal. There would be no restrictions on the land use after the remedy is complete.

2.9. Comparative Analysis of Alternatives

The NCP requires that the detailed analysis of remedial alternatives be conducted using nine criteria (40 CFR §430). The nine criteria, which encompass statutory requirements and technical, cost and institutional considerations, are divided into three categories:

1. Threshold criteria (which must be satisfied for an alternative to be eligible for selection at the site remedy);

2. Balancing criteria (the primary criteria upon which the comparative analysis of alternatives is based); and
3. Modifying criteria (used to determine acceptability to the state or support agency and the public).

The nine evaluation criteria are listed below.

Threshold Criteria:

- Overall protection of human health and the environment
- Compliance with ARARs

Balancing Criteria:

- Long-term effectiveness and permanence
- Reduction of toxicity, mobility, or volume through treatment
- Short-term effectiveness
- Implementability
- Cost

Modifying Criteria:

- State acceptance
- Community acceptance

A detailed comparison of the four alternatives based on an evaluation of these nine criteria is provided below (and summarized in Table 2).

2.9.1.1. Overall Protection of Human Health and the Environment

Overall protection of human health and the environment addresses whether each alternative provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled, through treatment, engineering controls, and/or institutional controls.

Alternative 1 is the only alternative that would not satisfy the "overall protection of human health and the environment" criterion, due to lack of action. Alternatives 2, 3 and 4 would satisfy this criterion. Alternative 2 would prevent or reduce direct contact with the contaminated soil through LUCs. Alternative 3 would protect human health and the environment by preventing direct contact or incidental ingestion of contaminated soil. Alternative 4 would protect human health and the environment through the removal of the contaminated soil.

2.9.2. Compliance with ARARs

Section 121(d) of CERCLA and Section 300.430(f)(1)(ii)(B) of the NCP require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate Federal and State requirements, standards, criteria, and limitations (collectively referred to as ARARs) unless such ARARs are waived under CERCLA Section 121(d)(4). "Applicable" requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. "Relevant and appropriate"

requirements are those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under Federal environmental or State environmental or facility siting laws that, while not "applicable" to a CERCLA site, they address problems or situations sufficiently similar to those encountered at the CERCLA site that their use may be considered relevant and appropriate.

No ARARs were identified for any of the alternatives. Therefore, compliance with ARARs for the alternatives is the same (not applicable).

2.9.3. Long-Term Effectiveness and Permanence

Long-term effectiveness and permanence refers to the ability of a remedy to continue to be protective of human health and the environment over time. This criterion includes the consideration of residual risk that may remain following remediation and the adequacy and reliability of long term controls.

Alternative 1 would not provide a permanent solution or long-term effectiveness. Alternative 2 would provide long-term protection for only as long as the LUCs remained in place and effective in managing residual risk. Alternative 3 would provide long-term protection for as long as the soil cover cap is maintained and the LUCs remained in place and effective in managing residual risk. Alternative 4 provides long-term effectiveness through removal of the contaminated soil. Alternative 4 provides a more permanent solution than Alternative 3, because Alternative 4 would remove the contaminated soil from the site, thus eliminating residual risk and the need for LUCs.

2.9.4. Reduction of Toxicity, Mobility or Volume Through Treatment

Reduction of toxicity, mobility, or volume (TMV) through treatment refers to the anticipated performance of the treatment technologies that may be included as part of a remedy. The reduction of TMV through treatment is the same for all alternatives. Alternatives 1, 2, 3, and 4 would not reduce the TMV of the contaminants through treatment because they do not include treatment as part of the alternatives. Alternative 4 is, however, the only alternative that results in the permanent removal of the contaminated soil driving a finding of unacceptable risk, and therefore provides the most complete remedy (e.g., one that allows unrestricted use of the Site with no ongoing requirements for monitoring, or operations and maintenance).

2.9.5. Short-Term Effectiveness

Short-term effectiveness relates to adverse impacts to workers, the community and the environment that may result from implementation of the remedy. The short-term effectiveness for the alternatives is the similar for Alternatives 1 through 3, and slightly lower for Alternative 4. For Alternative 1, the time to reach RAOs is unknown and would likely to be longer than 30 years. The waste would remain in place and the RG will not be achieved. There would be no short-term impacts to the community, workers, or the environment because no remedial activities would occur at the site. For Alternative 2, the RAOs would be achieved in approximately one year; however, waste would remain in place and the RG would not be achieved, and there would be no short-term impacts to the community, workers, or the environment. The RAOs for Alternatives 3 and 4 would be achieved in approximately one year and both alternatives would have minimal impacts on the community, workers, and the environment; however, waste would remain in place and the RG would not be achieved for Alternative 3. Alternatives 3 and 4 would

likely have impacts on workers during remedial action from the generation of fugitive dust. However, this impact could be minimized by using appropriate engineering controls and personal protective equipment. The impact to the environment for the Alternatives 3 and 4 would be limited to the lengthening of the access road and the area of the soil cover cap or excavation. Alternative 4 would have slightly higher risks to the community, workers, and the environment due to the invasive activities that would disturb the contaminated soils, and the transportation of the contaminated soils over public roadways.

2.9.6. Implementability

Implementability addresses the technical and administrative feasibility of implementing a remedy. Factors considered include availability of services and materials, administrative feasibility, and coordination with other governmental entities.

All the alternatives can easily be implemented using commonly employed methods, equipment, materials, and personnel. Alternative 1 is the easiest to implement because no action is taken. Alternatives 2 and 3 would require coordination between USACE, the property owners, the Town, and VTDEC on implementation of LUCs. Alternatives 3 and 4 would require the most experienced personnel to implement because of the skill required in precision surveying (Alternative 3 only), sampling, soil cover cap construction, excavation and backfilling.

2.9.7. Cost

The cost estimates developed in the FS for implementing the remedial alternatives consist of two components:

- Capital costs; and
- On-going operation and maintenance (O&M) and administrative costs.

Capital costs comprise one-time, direct and indirect costs associated with construction of the remedy. O&M and administrative costs refer to recurring expenditures associated with activities such as operation and maintenance of treatment systems, long-term environmental monitoring, and five-year reviews. Per CERCLA guidance, FS-level cost estimates are intended to be accurate within a range of -30 to +50 percent of the actual costs. For comparative purposes, the costs for each alternative were estimated in the FS for a 30-year time period, regardless of the actual time frames required to achieve the RAO (which may exceed 30 years).

The capital costs for Alternatives 3 and 4 include costs associated with initial implementation of the LUCs and installation of the soil cover cap or the excavation and backfilling of the Site, respectively. Additional capital costs for Alternative 4 include the costs for off-site disposal of the PCB-contaminated soil which would be removed from the Site.

Recurring costs for Alternatives 2 and 3 include long-term remedy monitoring through five-year site reviews. Additional recurring costs for Alternative 3 include expenditures associated with the operation and maintenance of the soil cover cap.

The estimated present worth costs (at a 2 percent discount rate (OMB, 2011) for 30 years) for Alternatives 2, 3 and 4 are approximately $82,143, $327,579, and $151,960, respectively. A summary of the primary components of these cost estimates is provided in Table 2.

2.9.8. State Acceptance

The State has expressed support of Alternative 4.

2.9.9. Community Acceptance

Based on the records collected during the public comment period for the Proposed Plan, the public has accepted the selected remedial alternative.

A Responsiveness Summary that provides USACE responses to comments received from the public during the public comment period is provided in Section 3.

2.10. Principal Threat Wastes

The "principal threat" concept is applied to the characterization of "source materials" at a site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to groundwater, surface water or air, or acts as a source for direct exposure. Contaminated groundwater generally is not considered to be a source material; however, non-aqueous phase liquids (NAPLs) in the subsurface may be viewed as source material. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur.

Based on the available analytical results, the PCB-contaminated soil at the Site has not impacted groundwater or surface water in the vicinity of the Site. Therefore, there is no evidence indicating the presence of principal threat wastes at the Site.

2.11. Selected Remedy

2.11.1. Summary of the Rationale for the Selected Remedy

The Selected Remedy for this Site is Alternative 4: Removal, Offsite Disposal, and Backfill. The rationale that favors Alternative 4 is summarized below:

- Alternative 1: No Action, is insufficient to protect human health in the event that land use changes occur at the Site. Also, Alternative 1 does not include LUCs that will ensure protection of public health in the future.
- Alternative 2: LUCs, does not allow unlimited use of the Site. LUCs and five-year reviews to verify their effectiveness, would need to be exercised in perpetuity to ensure protection of public health in the future.
- Alternative 3: Soil Cover Cap and LUCs, does not allow unlimited use of the Site. LUCs and five-year reviews to verify their effectiveness would need to be exercised in perpetuity to ensure protection of public health in the future.

Alternative 4 offers the best balance of Site use options (unlimited) and cost (see Subsection 2.9.7).

2.11.2. Description of the Selected Remedy – Removal, Offsite Disposal, and Backfill

This alternative involves removal of soil with total PCBs concentrations greater than the RG. The excavation limits would be refined during the pre-design investigation. For purposes of estimating costs, it is assumed soil would be removed by excavation to an estimated depth of 3

ft. Excavation confirmation sampling would be conducted. Then, the area would be backfilled with clean fill and topsoil, and finally seeded with grass or other durable vegetation similar to that which is native to the area. Construction of the remedy will result in no net loss of wetlands, and the function of adjacent wetlands will be preserved. The contaminated soil volume is approximately 69 cyd. Assuming a 20 percent increase in volume for fluffing (assuming a combination of sand, gravel and loam) and an additional 30 percent increase for conversion to tons (Department of Army, 2000) the total mass of waste material to be excavated would be approximately 108 tons. Conventional earthmoving equipment such as excavators, loaders, and dump trucks would be used for excavation of the soil.

A summary of the elements included in this alternative follow:

- *Pre-design investigation:* A pre-design investigation would be conducted to determine the extent of the total PCBs concentrations in soil above the RG.
- *Remedial Design:* The information obtained from the pre-design activities would be used to develop a remedial design, including engineering plans for the area to be excavated and the specifications for accomplishing the excavation.
- *Excavation:* The soil would be excavated and then transported to a permitted disposal facility.
- *Confirmation Sampling:* Confirmation sampling for PCBs would be conducted. Excavation would continue until the soil RG for total PCBs has been met.
- *Waste Characterization and Disposal:* Characterization of the soil prior to excavation to determine the appropriate disposal method.
- *Well Decommissioning:* In accordance with the FUDS Program Policy (USACE, 2004), monitoring and former water supply wells will be plugged and backfilled in accordance with State and local regulations. In some instances the property owner may choose to keep the wells for future use as a water supply. If this is the case, the property owner shall be required to sign a statement releasing the government from any liability.
- *Restoration:* Clean soil fill would be obtained and used to replace the excavated soil to match the surrounding grade.

2.11.3. Summary of Estimated Remedy Costs

The mechanisms employed in developing the cost estimate for implementing the Selected Remedy are described in Subsection 2.9.7. In accordance with CERCLA guidance, cost estimates are intended to be accurate within a range of -30 to +50 percent of the actual costs. The cost for the Selected Remedy was estimated for a time period less than 5 years, as the Selected Remedy can be implemented in only a few years and has no recurring O&M or administrative costs.

The capital cost for the Selected Remedy includes costs associated with the pre-design investigation, the excavation and backfilling of the Site, and off-site disposal of the PCB-contaminated soil which would be removed from the Site. The estimated present worth cost for the Selected Remedy is approximately $151,960, approximately twice that of Alternative 2, and half that of Alternative 3. A summary of the primary components of this cost estimate is provided in Table 3.

2.11.4. Expected Outcomes of Selected Remedy

The expected outcome of the Selected Remedy is unlimited and unrestricted use in perpetuity, without ongoing O&M and administrative activities. This outcome is the desired outcome for any Site.

2.12. Documentation of No Significant Changes

The *Proposed Plan* identified Removal, Offsite Disposal, and Backfill (Alternative 4) as the Preferred Alternative for the Site (Stone, 2014). The public comment period for the Proposed Plan was June 22 to July 24, 2015. It was determined that no significant changes to the Selected Remedy, as originally described in the Proposed Plan, were necessary or appropriate.

3. RESPONSIVENESS SUMMARY

3.1. Introduction

The public notice of the Proposed Plan and public meeting was published in a local newspaper (*The Caledonian Record*) on four dates (June 22, June 26, July 1, and July 9, 2015). The public comment period began on June 22, 2015 and ended on July 24, 2015. The public meeting was held at the East Haven Municipal Building Community Room on July 15, 2015. The USACE received several verbal comments during the public meeting. This Responsiveness Summary presents the verbal and written comments received during the public comment period and the USACE responses to those comments.

3.2. Technical and Legal Issues

There were no technical or legal issues identified during the public comment period.

3.3. Comment Responses

No written comments regarding the *Proposed Plan* were received. Therefore, no further discussion of written comments is discussed in this Responsiveness Summary.

Section 3.3.1 presents a compilation of verbal comment offered at the public meeting on July 15, 2015. Note that the specific syntax and format of the verbal comment may be slightly paraphrased. Additionally, the response provided during the public meeting may be expanded and/or clarified from what was stated at the meeting. A transcript of the public meeting will be available in the Administrative Record, and upon request from USACE.

3.3.1. Verbal Comments

Comment on July 15, 2015 from Walter Norman, representing the community.

After you do the remediation, is there any liability on the part of the Army or the government as to the site being safe? Who is liable if someone gets sick?

> To answer that question, USACE would have to track that sickness or the problem that has occurred back to the contamination that was as a result of the government's activity at the Site. We can check with our Office of Counsel to get a determination of liability assessment.
>
> USACE Office of Counsel input: If additional contamination related to prior DOD activity is discovered, USACE would investigate to determine if additional remediation is necessary. The FUDS Program can only address remediation of contamination. Any claims against the United States related to the Site would need to be addressed by the United States Department of Justice.

Comment on July 15, 2015 from Walter Norman, representing the community.

For Alternative 4 there was one criterion that didn't meet the reduction of toxicity, mobility, or volume through treatment. Why wouldn't this alternative meet that criterion?

> None of the alternatives meet that criterion because none of them actually involve treatment of the soil. That is a criterion that, often, none of the alternatives evaluated meet, because, as in the case of Lyndonville, actually treating the waste is not a reasonable alternative. We are essentially moving the waste from one place to another, so it's not actually being treated. An

example of an alternative that would meet that criterion is if you had contamination in groundwater, and you were putting in a treatment system to pump groundwater out, treat it, and then pump it back into the aquifer. That treatment would result in being able to at least marginally meeting this criterion, because you are actually reducing the contamination and its toxicity through treatment.

Comment on July 15, 2015 from Tracy Zshau, representing the community.

This area of petroleum impact to groundwater [presented by Hugo Martinez Cazon, from VT DEC], why would that not be part of USACE's remediation effort?

The impacted groundwater is in the in the unconsolidated aquifer, which cannot be developed as a water source, so there is no pathway or impact to human health. There are some former drinking water wells that were part of the former Air Force Station. Those wells do not currently meet the existing law for a drinking water wells in the State of Vermont. They have been out of commission long enough that, in the future, if somebody wanted to develop them, then they would need to reapply to either drill a new drinking water well to bedrock well or show us [VT DEC] that they can rehabilitate those wells. Also, there are no pumps at the bottom of those shafts, so there's no way anybody can drink that water.

Comment on July 15, 2015 from Walter Norman, representing the community.

In which area of the Site is the contaminated groundwater located? [directed to Hugo Martinez Cazon, from VT DEC]

The area with groundwater contamination present is the Cantonment Area parcel of the Site. The source of the petroleum contamination in this area is likely form a small diesel tank that was there and is now removed. The contamination levels are barely over the State of Vermont groundwater enforcement standard, so it's not considered a concern.

Comment on July 15, 2015 from Tracy Zshau, representing the community.

The deed restriction and land use controls don't exist now in the current deeds? [directed to Hugo Martinez Cazon, from VT DEC]

The land use controls do not currently exist, but they will be implemented before the project is completed. VT DEC prefers to wait until the USACE part of the project is finished to do this, so that it can be done in its entirety at the completion of that effort.

Comment on July 15, 2015 from Tracy Zshau, representing the community.

For the land use controls in the Debris Area, are they intended to provide notification before digging or disturbing that area? [directed to Hugo Martinez Cazon, from VT DEC]

That's correct. The Notice to Land Record would identify restrictions in this area.

Comment on July 15, 2015 from Tracy Zshau, representing the community.

From a liability standpoint, I think that [the previous answer regarding land use controls] sort of answers that question, that forever this parcel will have restrictions on it that note that there was contamination, there could still be, and there are restrictions on what you can use it for. [directed to Hugo Martinez Cazon, from VT DEC]

That is correct. As with any project, there's always going to be a level of uncertainty, and so that's why we're saying if there's future development, you have to communicate with the State, and in the areas where it was proven that it's unrestricted use, we will respond to you to identify that's it's OK to dig if you get any necessary local permits. On the other hand, if

you want to dig in the Debris Area, then that's a notice to indicate that there was an action taken in that area, and contamination was removed to the best of our knowledge. So, the State will recommend that you dig with caution, and keep the State involved. If you find something, stop, and then we will reassess the situation. More information about the area should be attained after USACE does the removal action.

Comment on July 15, 2015 from Tracy Zshau, representing the community.

What if a future owner wants to clean this up and bring it back to bare ground? Is that acceptable? [directed to Hugo Martinez Cazon, from VT DEC]

Yes, that is acceptable. The State requests that you communicate with us to make sure that the debris is handled (removed and transported) properly.

Comment on July 15, 2015 from Walter Norman, representing the community.

Are there historical records regarding the base, such as the history of the base, who worked there and the mission, and why it was closed? Is there any publicly available information like that?

Documents in the information repository include the determination of a property to be in the DERP for FUDS, but the information in those documents doesn't typically contain too much information about the history, mission, or why the base was closed. Historic information such as that may be available at a National Archives location.

Comment on July 15, 2015 from Keith Simoneau, representing the community.

In regard to the scope of this project with USACE, the cleanup is going to pertain to PCBs only; the lead paint and the asbestos up there has nothing to do with this project?

That is correct. Asbestos-containing materials and lead-based paint removal are not included in the DERP for FUDS Program [reference: Formerly Used Defense Sites Program Policy, EM200-1-3].

Comment on July 15, 2015 from Keith Simoneau, representing the community.

Are you going to try to use local Contractors for this work?

When USACE procures a contractor to execute field work, we must follow the Federal Acquisition Regulations. We won't complete the physical work using in-house resources. Once the pre-design investigation is completed, we will conduct market research to identify if we have any small business resources available to complete this type of work. To accomplish this, we will release a public notice indicating our intent to procure services to complete this work, to see if there are qualified contractors that are able to accomplish the required activities. The market research is intended to tell us if we have a qualified pool of contractors that qualify as a small business, which may include local companies. The selection of the contractor can also depend on the scale or the cost of the activity and how we go about executing the work.

So, if there are local contractors that we can identify that are qualified and capable of doing the work, then we would certainly look into going that route, within the guidelines set forth by the Federal Acquisition Regulations. However, even if we use a contractor who is not local, they often have relationships with local contractors, who may ultimately be subcontracted to complete this work.

Comment on July 15, 2015 from Tracy Zshau, representing the community.

Where would this material be transported to? Where is the closest qualified disposal site?

It may be transported to the disposal facility in southern New Hampshire, depending on the level of contamination. Different landfills can accept different material, and if we have a relatively low overall concentration of PCBs in the soil that we remove, it may be able to go to a more local landfill as waste or daily cover. Issues such as these will be addressed in the project Work Plans.

4. REFERENCES

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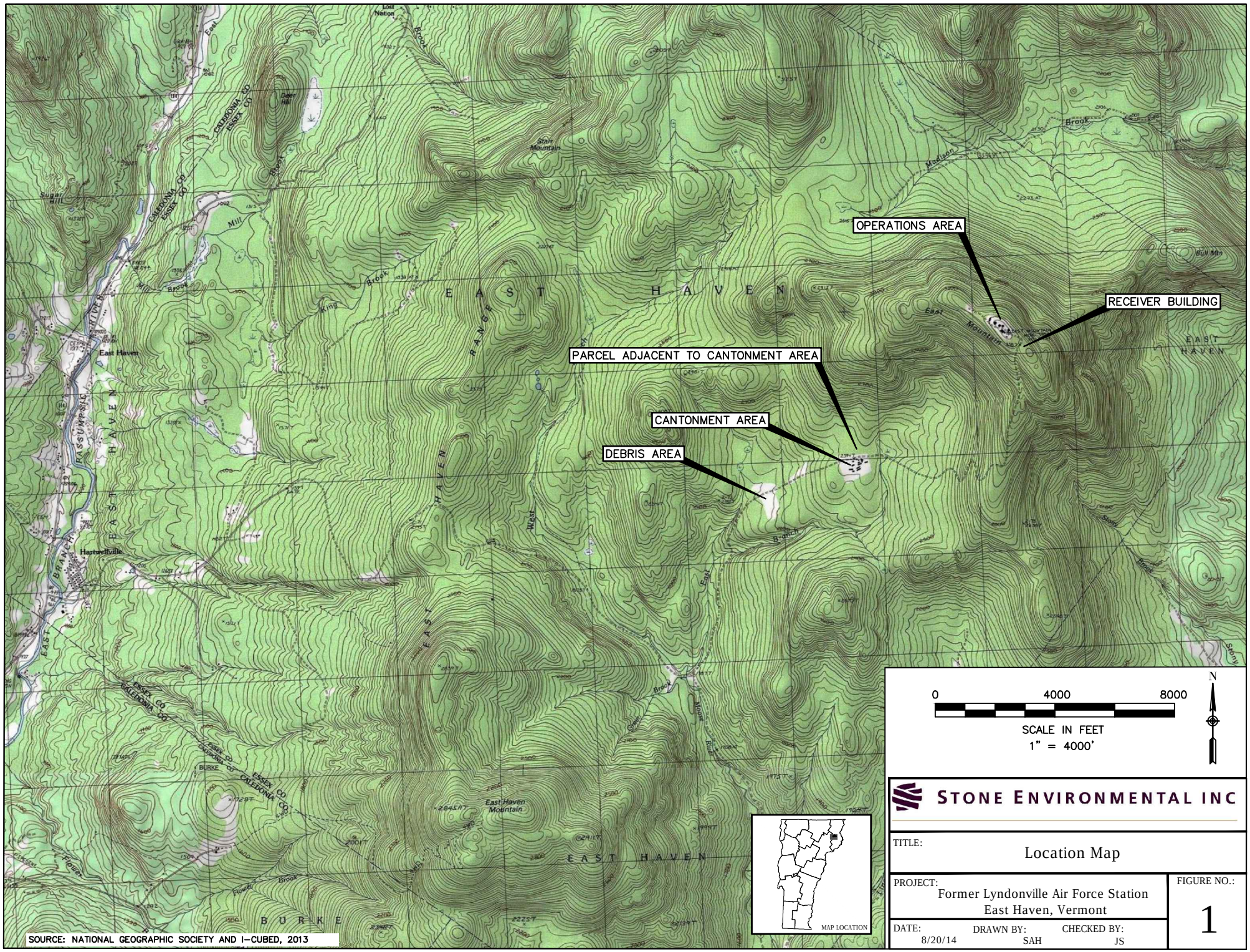
FIGURES



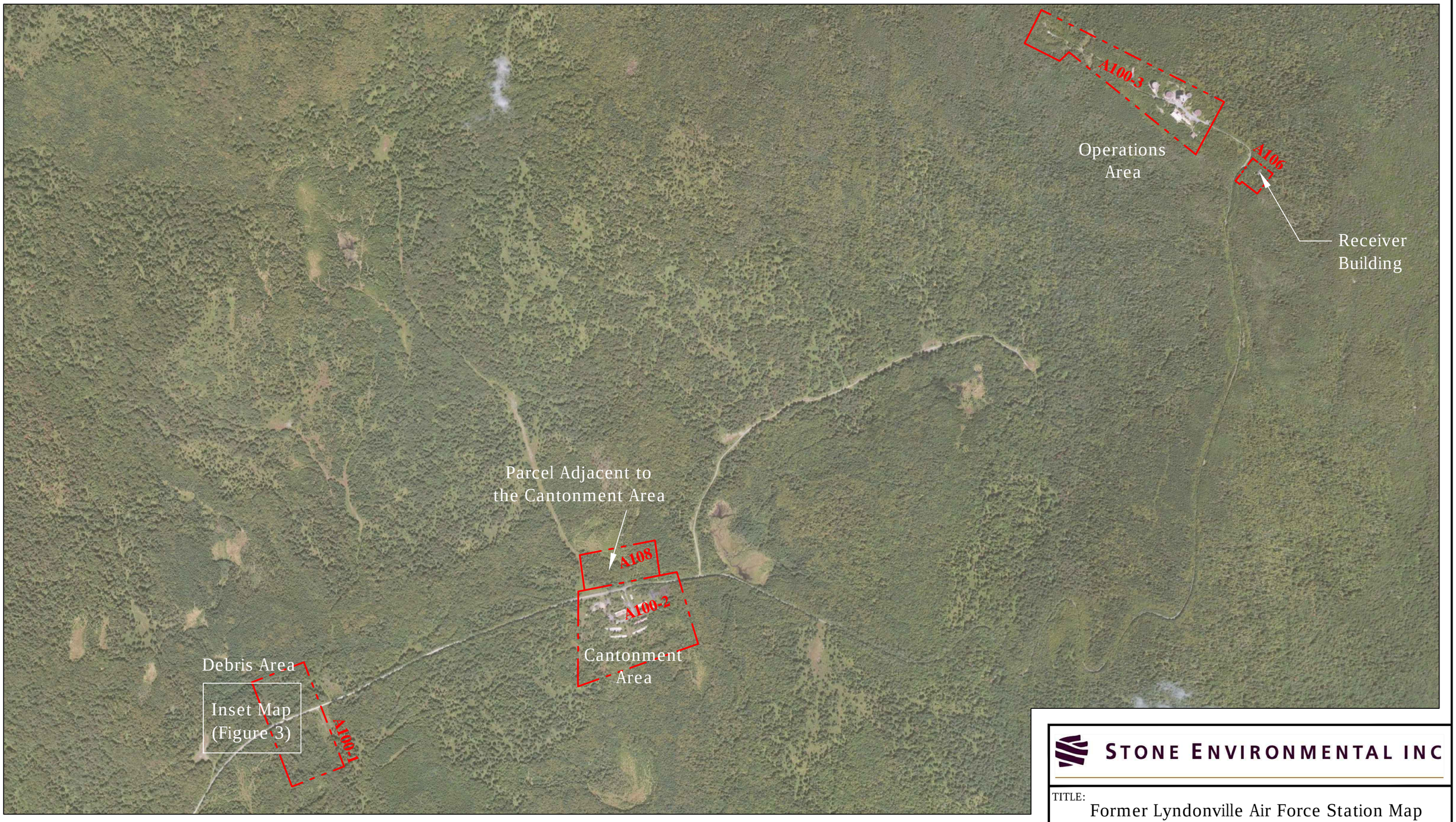
STONE ENVIRONMENTAL INC

TITLE: Location Map

PROJECT: Former Lyndonville Air Force Station
East Haven, Vermont

FIGURE NO.: 1

DATE: 8/20/14 DRAWN BY: SAH CHECKED BY: JS



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SCALE: 1" = 800'
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LEGEND

A100-1 PARCEL ID

PARCEL BOUNDARY

NOTES:
BING IMAGERY 2001-2011.
DRAWING 933-10-01, GENERAL PLAN, FORMER LYNDONVILLE AIR FORCE STATION BY DEPT. OF THE ARMY, NED DATED JAN. 1991.

STONE ENVIRONMENTAL INC

TITLE:
Former Lyndonville Air Force Station Map

PROJECT:
Former Lyndonville Air Force Station
East Haven, Vermont

FIGURE NO.:
2

DATE: 10/2/14
DRAWN BY: SAH
CHECKED BY: JS

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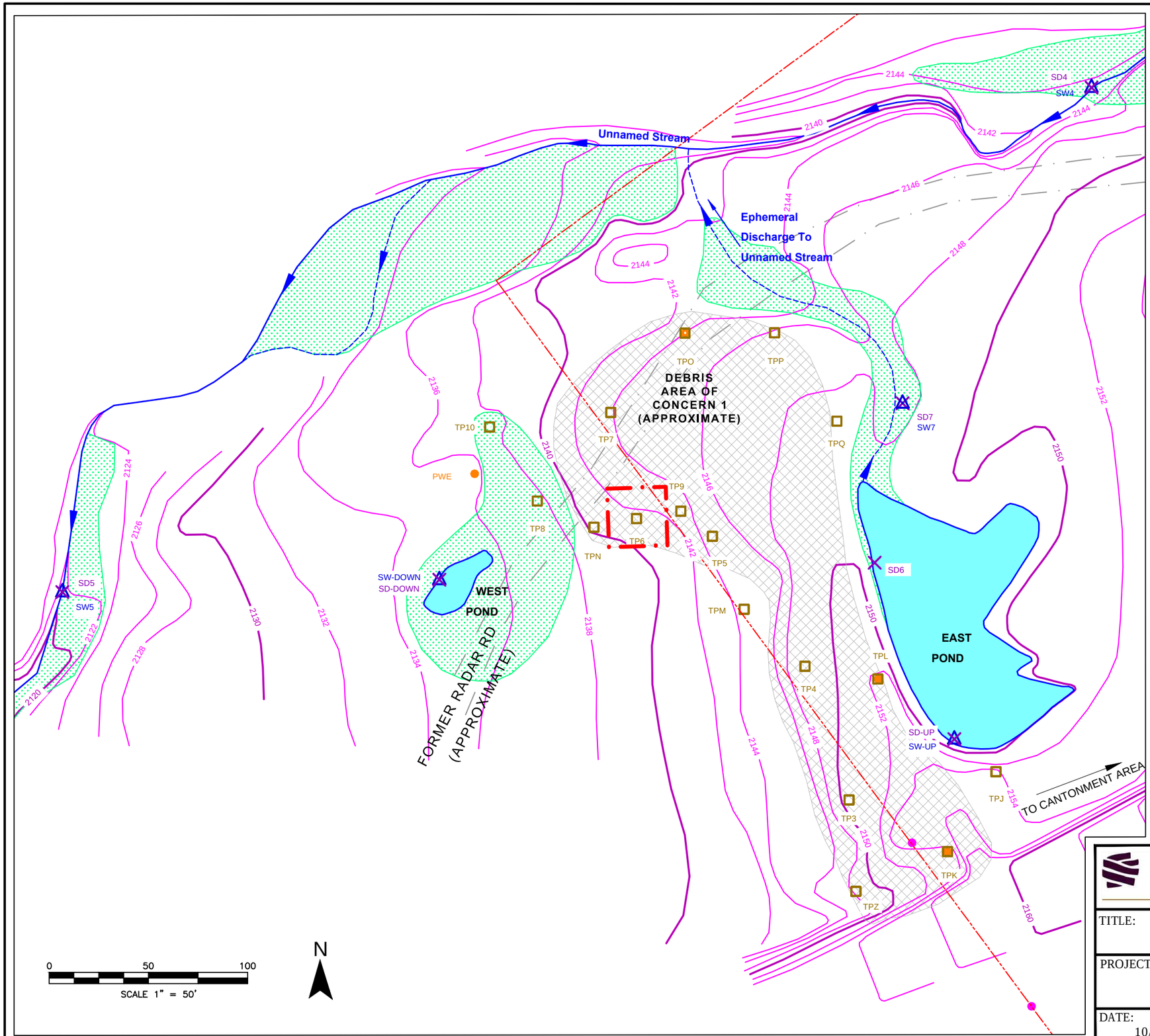

LEGEND

- STREAM
- POND
- UNFORESTED OR ISOLATED TREES
- APPROXIMATE AREA CONTAINING DEBRIS/TRASH
- 2144 — TOPOGRAPHIC CONTOUR (2 FT. INTERVAL 1988 NAVD)
- TEST PIT LOCATION
- GROUNDWATER OR POREWATER SAMPLE LOCATION
- SURFACE WATER SAMPLE LOCATION
- SEDIMENT SAMPLE LOCATION
- BACKGROUND SAMPLE LOCATION
- PROPERTY MONUMENT
- PARCEL A100–1 BOUNDARY
- FORMER RADAR ROAD
- REMEDIATION TARGET AREA (APPROXIMATE EXTENT OF PCB CONCENTRATIONS GREATER THAN 1.7 MG/KG)

DEBRIS AREA OF CONCERN 1&2 COC/COPEC LIST		
ABBREVIATION	NAME	MEDIA
PCB	POLYCHLORINATED BIPHENYL	SED/SOIL

MEDIA ABBREVIATIONS	
GW	GROUNDWATER
PW	PORE WATER
SED	SEDIMENT
SOIL	SOIL
SW	SURFACE WATER

SOURCES:

1. FINAL REMEDIAL INVESTIGATION REPORT, LYNDONVILLE FORMER AIR FORCE STATION, EAST HAVEN, VERMONT - BY THE JOHNSON COMPANY, FEBRUARY 14, 2013
2. LITTLE RIVER SURVEY DATED NOVEMBER 2009
3. THE JOHNSON COMPANY FIELD OBSERVATIONS - 2008 AND 2009
4. STONE AND WEBSTER FINAL PROPOSED REMOVAL ACTION PLAN, MARCH 2001
5. PINKHAM ENGINEERING ASSOCIATES 12/17/1998
6. PLAN OF LAND FOR ST. REGIS PAPER COMPANY, OCTOBER 1981
7. AECOM 2011 RISK ASSESSMENT

STONE ENVIRONMENTAL INC

TITLE: Debris Area - Area of Concern 1 Map

PROJECT: Former Lyndonville Air Force Station
East Haven, Vermont

FIGURE NO.: 3

DATE: 10/2/14 DRAWN BY: SAH CHECKED BY: JS

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TABLES

Table 1: Summary of Previous Site Investigations

Date (s)	Investigation Description	Reference(s)
	Debris Area	
1995	A "waste disposal area" is identified in the *Final Inventory Letter Report*, based upon information obtained from the site owner at that time.	S&W, 1995
1998	Collection and analysis (metals, mercury, PCBs, pesticides, SVOCs, and VOCs) of two surficial soil samples collected from two locations within Debris Area of Concern 2 at a depth of 0 to 1 foot below ground surface (ft bgs).	S&W, 2001
July 2008	Collection of 3 surface water samples, 2 sediment samples, 4 surficial soil samples (0 to 1 ft bgs), and 8 subsurface soil samples (>1 ft bgs). The samples were analyzed for metals, mercury, PCBs, VOCs, and SVOCs.	JCO, 2008
2008, 2009	RI Report concluded soils and groundwater are media of concern at the Debris Area based on investigations performed in 2008 and 2009. Sediment and surface water are also media of potential concern at the Debris Area.	JCO, 2013
October 2014	FS Report concluded (based on RI Report) the lack of detections of VOCs and PCBs, and the lack of detections of PAHs and metals at concentrations above the range of background concentrations in groundwater or surface water indicated that there are no impacts to these media.	Stone, 2014
	Cantonment Area	
November, 1990	Collection and analysis (TPH, PCBs, and VOCs) of 2 surficial soil samples (0 to 1 ft bgs).	JCO, 2013
September & October 1991	Removal of eight USTs, including 323 yards of contaminated soil and 4,200 gallons of gasoline, oil, and water. Collection and analysis for TPH, PCBs, and VOCs of one water sample in connection with removal of UST-5. Collection and analysis for TPH, PCBs, and VOCs, and metals of eight soil samples collected at unknown depths in connection with removal of UST-1, one transformer and associated contaminated soils.	Clean Harbors,1991a; Clean Harbors, 1991b
1995	Collection and analysis (TPH, VOCs (in groundwater only), and SVOCs) of 2 groundwater samples and 3 deep soil samples (>1 ft bgs).	S&W, 1996
1996	Collection and analysis (metals, VOCs, SVOCs, and pesticides (in soil only)) of 3 groundwater samples, 2 surface water samples (from MW-B dry well), 5 shallow soil samples (0 to 1 ft bgs), and 19 deep soil samples (>1 ft bgs).	S&W, 1997
1998	Collection and analysis (metals, and SVOCs) of 4 sediment samples of unreported depth, 11 surficial soil samples (0 to 1 ft bgs), and 2 surface water samples.	S&W, 2001
October 2001	Removal of contaminated soils identified in the 1995, 1996, and 1998 investigations and collection and analysis (metals, PCBs, VOCs, and SVOCs) of 16 deep (VOC only) soil confirmatory samples (>1 ft bgs) and 2 composite waste disposal characterization samples. Excavations were backfilled with clean material	Coastal, 2001a; Coastal 2001b
July 2008	Collection of 6 groundwater samples and 1 sediment sample from the MW-B dry well. The samples were analyzed for metals, PCBs, VOCs, and SVOCS in soil and VOCs in groundwater.	JCO, 2008
2008, 2009	RI Report concluded soils and groundwater are media of concern at the Cantonment Area based on investigations performed in 2008 and 2009. No surface water or sediment was observed in the Cantonment Area, so neither is a media of concern.	JCO, 2013
October 2014	FS Report concluded (based on RI Report) the lack of detections of VOCs and PCBs, and the lack of detections of PAHs and metals at concentrations above the range of background concentrations in groundwater or surface water indicated that there are no impacts to these media.	Stone, 2014

Date (s)	Investigation Description	Reference(s)
	Operations Area	
September, 1991	Collection and analysis (lead, PCBs, TPH, and VOCs) of 4 soil samples of unknown depth. Removal of 3 USTs, 1 AST, and associated contaminated soils	Clean Harbors, 1991
1995	Collection and analysis (TPH and SVOCs) of 3 surficial soil samples (0 to 1 ft bgs)	S&W, 1996
1996	Collection and analysis (metals, pesticides (three >1 ft bgs samples only), TPH, VOCs, and SVOCs) of 4 surficial soil samples (0 to 1 ft bgs) and 9 deep soil samples (>1 ft bgs)	S&W, 1997
1998	Collection and analysis (metals, and SVOCs) of 5 surficial soil samples (0 to 1 ft bgs)	S&W, 2001
October, 2001	Removal of contaminated soils identified in previous investigations, and confirmation sampling.	Coastal, 2001a; Coastal 2001b
2007	Search for Operations and Cantonment Areas Water Supply Wells	JCO, 2008
January 2013	RI Report concluded that neither soils, groundwater, surface water, nor sediment are media of concern at the Operations Area based on previous investigations.	JCO, 2013
	Receiver Building	
2008	Examination of location, including an out-of-service AST.	JCO, 2013
January 2013	RI Report concluded that neither soils, groundwater, surface water, nor sediment are media of concern at the Receiver Building.	JCO, 2013
	Parcel A108	
2008	Examination of location, particularly former bedrock water supply Well C.	JCO, 2013
January 2013	RI Report concluded that neither soils, groundwater, surface water, nor sediment are media of concern at Parcel A108.	JCO, 2013

PCBs – polychlorinated biphenyls. VOCs – volatile organic compounds. SVOCs – semivolatile organic compounds

TPH – Total Petroleum Hydrocarbons AST – Above ground storage tank UST – Below ground storage tank

Table 1 References

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Table 2: Evaluation of Alternatives for the Site

Objective	Alternative 1 – No Action	Alternative 2 – Land Use Controls	Alternative 3 – Soil Cover Cap	Alternative 4 – Excavation, Offsite Disposal, Backfill
Protection of human health and the environment	This alternative would not satisfy this criterion, because the contaminants continue to persist in the environment.	Implementation of this alternative would reduce the potential human health risks from direct contact and incidental ingestion of contaminants in soil exceeding the RG.	The soil cover cap would eliminate the potential human health risks from direct contact, incidental ingestion, or inhalation of contaminants in soil exceeding the RG.	Implementation of this alternative would result in removal of the contaminants to a disposal facility. It would eliminate the potential human health risks from direct contact, incidental ingestion, or inhalation of soils exceeding the RG.
Compliance with ARARs	No pertinent ARARs were identified.	No pertinent ARARs were identified.	No pertinent ARARs were identified.	No pertinent ARARs were identified.
Long-term effectiveness and permanence	There would be residual risk and no controls to prevent exposure.	This alternative would provide long-term protection from residual risks only as long as the LUCs remained in place.	This alternative would provide long-term protection from residual risks only as long as the soil cover cap is maintained and LUCs remained in place.	There would be no unacceptable residual risk and controls would not be necessary. This alternative would provide a permanent solution and would not require any additional actions in the future.
Reduction of toxicity, mobility, or volume (TMV) through treatment	This alternative would not reduce the TMV of contaminants in soil through treatment.	This alternative would not reduce the TMV of contaminants in soil through treatment.	This alternative would not reduce the TMV of contaminants in soil through treatment.	This alternative would not reduce the TMV of contaminants in soil through treatment.
Short-term effectiveness	The RAO would not be achieved. Waste would remain in place and the RG would not be achieved. Because no action would occur, there would be no impact to the local community beyond the potential impacts to human health identified in the RI.	The RAO would be achieved in approximately one year; however, waste would remain in place and the RG would not be achieved. There would be no impacts to the community, workers, or the environment.	The RAO would be achieved in approximately one year; however, waste would remain in place and the RG would not be achieved. No significant risks are posed to the local community or to workers. Workers would be protected from risks from exposure to contaminants in the soil through the use of appropriate personal protective equipment and implementation of proper safety practices. Impacts to the environment would be limited to the area of the cap.	The RAO would be achieved in approximately one year and the RG would be achieved. Disturbance of contaminated soil during excavation and transportation of soil on public roads to disposal facility would result in minimal exposure hazards to the local community or to workers. Engineering controls, use of appropriate PPE, and implementation of proper safety practices would control risks. Impacts to the environment would be limited to the area of the excavation.
Implementability	There would not be any implementability concern	This alternative is implementable. No technical difficulties or uncertainties are anticipated in deed restrictions or local ordinances.	This alternative is implementable. No technical difficulties or uncertainties are anticipated in constructing the soil cover cap or restoring the area.	This alternative is implementable. No technical difficulties are anticipated in sampling, excavating, transporting,

Objective	Alternative 1 – No Action	Alternative 2 – Land Use Controls	Alternative 3 – Soil Cover Cap	Alternative 4 – Excavation, Offsite Disposal, Backfill
				backfilling, or restoring the area to its pre-existing surface condition.
Cost	Total Cost: $0 Capital Cost: $0 Periodic Costs: $0	Total Cost: $82,143 Capital Cost: $5,000 Periodic Costs: $77,143	Total Cost: $327,579 Capital Cost: $143,347 Periodic Costs: $184,232	Total Cost: $151,960 Capital Cost: $151,960 Periodic Costs: $0

Table 3: Cost Estimate for the Selected Remedy for the Site

Item	Rate	Unit	Quantity	Total	Present Worth Cost
Capital Costs					
Pre-Design Investigation					
Data and Sample Collection and Analysis	$37,295	LS	1	$37,295	$37,295
Report	$10,000	LS	1	$10,000	$10,000
Pre-Design Investigation Costs Total					$47,295
Construction Costs					
Mobilization	$6,720	LS	1	$6,720	$6,720
Site Services (portable toilets, trucks)	$2,800	week	1	$2,800	$2,800
Radar Road Maintenance	$2,240	LS	1	$2,240	$2,240
Access Road Development	$8,960	LS	1	$8,960	$8,960
Erosion and Sediment Control	$11	LF	100	$1,120	$1,120
Site Preparation	$7,000	LS	1	$7,000	$7,000
Air Monitoring	$336	3 days	1	$336	$336
Excavation	$4,637	LS	1	$4,637	$4,637
Confirmation Sampling	$2,302	LS	1	$2,302	$2,302
Transportation and Disposal of Soil	$92	ton	108	$9,919	$9,919
Backfill	$56	cyd	57	$3,192	$3,192
Topsoil	$84	cyd	12	$1,008	$1,008
Seeding	$3,500	LS	1	$3,500	$3,500
Demobilization	$3,360	LS	1	$3,360	$3,360
Remedial Action Report	$10,000	LS	1	$10,000	$10,000
Construction Costs Total					$67,094

Table 3: Cost Estimate for the Selected Remedy for the Site

Construction Management/Engineering Fees					
Engineering	8%	%	$67,094	$5,367	$5,367
Contingency	30%	%	$67,094	$20,128	$20,128
Oversight/Construction Management	10%	%	$67,094	$6,709	$6,709
Project Management	8%	%	$67,094	$5,367	$5,367
Construction Management/Engineering Fees Total					$37,571
Total Capital Costs					$151,960
Total Cost for Selected Remedy					**$151,960**

LS – Lump Sum;
LF – Linear Foot
cyd – cubic yard
% - percent
Costs based on a percentage of Construction/Capital Costs or *A Guidance to Developing and Documenting Cost Estimates During Feasibility Study,* EPA 540-R-00-002.

APPENDICES

APPENDIX A: VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION LETTER OF CONCURRENCE

VERMONT

State of Vermont
Department of Environmental Conservation
Waste Management & Prevention Division
1 National Life Drive – Davis 1
Montpelier, VT 05620-3704
(802) 522-5564
Hugo.Martinez.Cazon@vermont.gov

AGENCY OF NATURAL RESOURCES

September 9, 2016

Ms. Marie Wojtas
U.S. Army Corps of Engineers
696 Virginia Road
Concord, MA 01742-2721

RE: **Decision Document, former Lyndonville Former Air Force Station**, East Haven Vermont
Sites: **SMS#91-1152, SMS#2009-3914, SMS#2009-3915, SMS#2009-3916,** and **SMS#2009-3917**
FUDS#: D01VT0363-01
Stone Contract #: W912WJ-11-D-0001

Dear Ms. Wojtas,

The Vermont Department of Environmental Conservation(VTDEC) has reviewed and concurs with the May 2016 Decision Document for Former Air Force Station Facility, East Haven, VT. The selected remedy in the Decision Document includes, among other things, PCB-contaminated soil removal and offsite disposal, confirmation of meeting PCB-remediation goals, decommissioning of out of service onsite former drinking water supply wells. The VTDEC will subsequently request that the owner enter land use controls at the former solid waste disposal area and to decommission the out of service bedrock water supply wells.

The State's concurrence of the selected decision, as described above, should not be construed as the State's concurrence with any conclusion of law or finding of fact, which may be set forth in the ROD or supporting documents for the site listed above. The State reserves any and all rights to challenge any such finding of fact or conclusion of law in any other context.

This concurrence is based on the State's understanding that the Army Corp of Engineers will continue to solicit VTDEC's review and concurrence with implementing the remedy described above.

VTDEC looks forward to continuing to work with you, your consultant, and the stakeholders, to allow these properties productive future uses.

Sincerely,

Hugo Martínez Cazón, PE
Sites Management Section

Cc: Bette Nowack, PE — Stone Environmental, Inc.
Matt Rubin — Northeast Kingdom Wind Power, LLC