FIRST CERCLA FIVE-YEAR REVIEW FOR SITE SS001
AND
SECOND CERCLA FIVE-YEAR REVIEW FOR SITE SS003
AT THE NORTH RIVER RADIO RELAY STATION
UNALAKLEET, ALASKA

Final
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Prepared by

United States Air Force
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List of Abbreviations and Acronyms

611 CES	611th Civil Engineering Squadron
AAC	Alaska Administrative Code
ADEC	Alaska Department of Environmental Conservation
AFCEC	Air Force Civil Engineer Center
bgs	below ground surface
BSNC	Bering Straits Native Corporation
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	chemical or contaminant of concern
cy	cubic yard(s)
DRO	Diesel-range organics
EPA	United States Environmental Protection Agency
FYR	Five-Year Review
LUC	land use control
mg/kg	milligrams per kilogram
NAUL	notice of activity and use limitation
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
POL	petroleum, oils, and lubricants
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
RRO	residual-range organics
RRS	Radio Relay Station
Stantec	Stantec Consulting Services, Inc.
TCB	trichlorobenzene
TCE	trichloroethylene
TCRA	time-critical removal action
TSCA	Toxic Substances Control Act
UNC	Unalakleet Native Corporation
USAF	United States Air Force
UU/UE	unlimited use and unrestricted exposure
VOC	volatile organic compound

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I. INTRODUCTION

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

The United States Air Force (USAF) conducted a statutory FYR of environmental remedies at two sites, SS001 and SS003, at the North River Radio Relay Station (RRS) in Unalakleet, Alaska (**Figure 1**). The USAF is preparing this FYR in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121 and with the National Contingency Plan (40 Code of Federal Regulations Section 300.430(f)(4)(ii)).

The North River RRS is comprised of three source areas managed under CERCLA (Site OT001 [remedy complete and implemented as planned], Site SS001, and Site SS003) and two source areas managed under State of Alaska regulations (Site SO001 and Site SS004) (USAF, 2019a) (**Figure 2**). A FYR is not required for Sites SO001 and SS004. This is the first FYR for Site SS0001 and the second FYR for Site SS003.

The triggering action for this FYR is the August 25, 2016 signature date on the prior FYR report (USAF, 2016). This FYR Report has been prepared because hazardous substances or contaminants regulated under CERCLA remain at these sites above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The status of Sites SS001 and SS003 are listed in the Alaska Department of Environmental Conservation (ADEC) Contaminated Sites Database as "Active" (ADEC, 2020a).

This FYR was led by Stantec Consulting Services, Inc. (Stantec) on behalf of the Air Force Civil Engineer Center (AFCEC) under Contract Number FA8903-16-D-0032, Task Order FA8903-20-F-1077. Participants included AFCEC, Stantec, and ADEC staff with expertise in site investigation and remediation. The review began in August 2020. The list of references is provided in **Appendix A**.

Site Background

The North River RRS consists of an estimated 26 acres located approximately 12 miles east of the Village of Unalakleet, Alaska, on top of a bluff on the north side of the Unalakleet River (Figure 1). The Village of Unalakleet is located on the Norton Sound at the mouth of the Unalakleet River, 148 miles southeast of Nome and 395 miles northwest of Anchorage. Gravel roads connect Unalakleet with the North River RRS.

The North River RRS area is currently used for subsistence harvesting and some recreational use (all-terrain vehicles, etc.). The land encompassing the North River RRS is owned and managed by the USAF, with the exception of Site SS003. In accordance with the Alaska Native Claims Settlement Act, village corporations have the right to surface estate (land) and regional corporations assume claim to subsurface estate (mineral and other resources). At Site SS003,

Unalakleet Native Corporation (UNC) owns the surface estate, while the Bering Straits Native Corporation (BSNC) owns the subsurface estate.

The North River RRS was constructed in 1957 and was one of the original 31 White Alice Communications System facilities used for defense and civilian communications. The facility was operated by the Radio Corporation of America/Alascom. Four parabolic dish antennas were originally situated on the hilltop (now known as Site OT001). Support facilities surrounded the hilltop antennas and consisted of: a composite building, barracks, petroleum storage and distribution facilities, an equipment maintenance building, a water tower, and a temporary garage. The North River RRS was abandoned in 1978 and all structures, including the distinct parabolic antennas, were demolished by the USAF by 1995 (USACE, 2018).

Two landfills are located at the North River RRS. A permitted demolition debris landfill with an asbestos cell was constructed in 1995 (ADEC Permit Number 9432-BA001). The second landfill is a permitted and closed construction/demolition waste landfill (ADEC Permit Number 8432-BA005).

Groundwater is not currently used as a drinking water supply in the North River RRS area and has only been encountered adjacent to Sites SO001 and SS001. The drinking water well that formerly supplied the North River RRS has been removed and decommissioned (USAF, 2019a). Surface water is not present in the vicinity of Sites SS001 or SS003. Surface water resources for the Village of Unalakleet originate outside the Unalakleet River Basin. Cabins within the Unalakleet River Basin, between Unalakleet and the North River RRS, may rely on other sources of potable water (USAF, 2019a).

Site SS001, also referred to as Area C, is located directly west-southwest of Site SO001 (former vehicle maintenance facility) and consists of an all-terrain vehicle trail and temporary drum storage area. The drum storage area was included with SS001 based on proximity, though it is believed to have been used in conjunction with operation of the former vehicle maintenance facility which was designated as Site SO001. Potential contaminant sources include historic spills, leaks, and discharges associated with polychlorinated biphenyl (PCB) contaminated transformer oil and drum storage.

Site SS003, also referred to as Area A, is located on the west side of the access road approximately 0.75 miles southwest of Site OT001 and consists of an area where drums were located. The potential contaminant source is drums and leaks or spills to surface soil that may have percolated downward to the subsurface soil.

FYR and Periodic Review Summary Form

SITE IDENTIFICATION		
Site Name: Sites SS001 and SS003, North River RRS		
EPA ID: AK3570028685		
Region: 10	**State:** AK	**City/County:** Unalakleet/Nome Census Area
SITE STATUS		
NPL Status: Non-NPL		
Multiple OUs? No	**Has the site achieved construction completion?** Yes	
REVIEW STATUS		
Lead agency: Other Federal Agency ***[If "Other Federal Agency", enter Agency name]*:** USAF		
Author name (Federal or State Project Manager): Stantec, on behalf of AFCEC		
Author affiliation: Contractor		
Review period: 6/30/2015 - 9/30/2020		
Date of site inspection: 09/25/2020		
Type of review: Statutory review for Sites SS001 and SS003		
Review number: First review for Site SS001 and second review for Site SS003		
Triggering action date: 8/25/2016		
Due date *(five years after triggering action date)*: 8/25/2021		

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II. RESPONSE ACTION SUMMARY

Basis for Taking Action

A response action was determined to be warranted under CERCLA at Sites SS001 and SS003 because the cumulative risk posed by hazardous substance contaminants of concern (COCs) (PCBs and 1,2,4-trichlorobenzene [TCB] at Site SS001 and PCBs at Site SS003) detected at each site, are greater than acceptable risk levels (USAF, 2019a). Additionally, residual range organics (RRO) detected in soil at Site SS003 exceeded the 18 Alaska Administrative Code (AAC) 75 Method Two soil cleanup level (Table B2) (ADEC, 2020b). **Table 1** lists the COCs identified in the North River RRS ROD Amendment (USAF, 2019a) for sites included in this FYR.

Table 1 North River RRS COCs

Site	Medium	COC
SS001	Soil	Polychlorinated biphenyls
		1,2,4-Trichlorobenzene
SS003	Soil	Polychlorinated biphenyls
		Residual Range Organics

Key:
COC – contaminant of concern
RRS – Radio Relay Station

Risk Summary

The potential risk to a future resident at the North River RRS, for the under 40-inch precipitation scenario, was assessed by inputting the maximum detected concentrations of residual COCs into the ADEC cumulative risk calculator. Neither a formal baseline quantitative human health nor ecological risk assessment were conducted for the North River RRS. RRO in soil at Site SS003 exceeded the ADEC maximum allowable concentration but was not included in in the cumulative risk calculations as it is not regulated by CERCLA. Groundwater is only present at Site SS001; however, groundwater sample results were less than one-tenth of the ADEC cleanup levels and, as such, a risk evaluation of groundwater concentrations was not necessary (USAF, 2019a).

Site SS001 Human Health Risks

The total carcinogenic risk was determined to be 4.31×10^{-4} driven by PCBs, which exceeds both the ADEC risk threshold of 1×10^{-5} and the EPA risk range of 1×10^{-4} to 1×10^{-6}. The carcinogenic risk associated with 1,2,4-TCB was determined to be 3.02×10^{-7}, which is less than the ADEC risk threshold of 1×10^{-5} and the EPA risk range of 1×10^{-4} to 1×10^{-6} (USAF, 2019a).

The total hazard index was determined to be 0.21, less than the ADEC and EPA threshold of 1.0 (USAF, 2019a).

Site SS003 Human Health Risks

The total carcinogenic risk was determined to be 1.16×10^{-3} driven by PCBs, which exceeds both the ADEC risk threshold of 1×10^{-5} and the EPA risk range of 1×10^{-4} to 1×10^{-6} (USAF, 2019a).

Site SS003 did not have non-carcinogenic hazardous substances regulated by CERCLA; therefore, a hazard index was not calculated (USAF, 2019a).

Baseline Ecological Risks

Contaminants remaining on site are below the depth that would expose animals that are burrowing or grubbing for food and are below the root depth of terrestrial plant; therefore, no uptake will occur (USAF, 2019a).

Response Actions

There have not been any enforcement actions at Sites SS001 or SS003. Investigation of the contamination found at the North River RRS was initiated in 1985 and response actions completed at Sites SS001 and SS003 prior to the ROD Amendment (USAF, 2019a) are described below.

Site SS001 – Drum Storage Yard and PCB Trail

Previous investigations of actions at SS001 and neighboring Site SO001 (discussed due to proximity and use of the Site SS001 surface for Site SO001 remedial actions) include:

- In 2002, while on site to investigate drums located at the North River RRS landfill, an area of exceptionally high PCB contamination (designated the Hot Spot) was found on the road to a cabin. This area was identified as Area C (USAF, 2004c).
- In 2003, excavation activities were conducted as part of a time-critical removal action (TCRA). The area within the site exhibiting the highest PCB concentrations was excavated. However, additional PCB contamination remained, most likely due to vehicle traffic (USAF, 2004c).
- In 2004, tissue samples were collected from key animal species (i.e., ptarmigan, grouse, and hare) used for subsistence by the Native Village of Unalakleet and analyzed for total PCBs to determine if subsistence hunting near the Site SS001 Hot Spot was an exposure pathway of concern. No PCBs were detected in any of the sample tissues (USAF, 2004a).
- In 2004, excavation activities continued with another TCRA in an effort to remove additional PCB-contaminated soil from the area exhibiting the highest PCB concentrations and throughout the site. The highest PCB concentration was along the road, at 18.6 milligrams per kilogram (mg/kg). Diesel range organics (DRO) concentrations were present at levels up to 6,780 mg/kg (USAF, 2008).
- In 2005, excavation activities at SS001 during another TCRA focused on the area with the highest PCB concentration. Confirmation samples were collected from the bottom of the excavation, at depths ranging from 3 to 6 feet bgs. Although the deepest point of the excavation was approximately 6 feet bgs, the greatest concentration of PCBs (840 mg/kg) was sampled from an area of the excavation that reached a depth of 3 to 3.5 feet bgs. The excavation was left open with a fence surrounding the excavated area (USAF, 2008).
- In 2007, during a site characterization and remedial investigation effort at SS001, borings were advanced to a maximum of 15 feet bgs in an effort to collect groundwater grab samples; however, refusal was encountered in all borings prior to encountering groundwater (USAF, 2008). Soil samples were analyzed for fuel compounds and PCBs.

Fuel compounds were detected below the ADEC Method Two ingestion cleanup levels. PCBs were detected at a maximum concentration of 1.6 mg/kg (USAF, 2008).

- In 2012, PCB-contaminated soil excavation at SS001 was initiated at the existing 2005 excavation (main excavation) and from a 2007 site investigation sample location (Grid Cell N13). Excavation activities removed approximately 300 tons of PCB-contaminated soil from Site SS001, but PCB contamination was still prevalent, and soil sample results indicate nearly half were at Toxic Substances Control Act (TSCA) hazardous waste levels (USACE, 2013).
- In 2013, excavation of PCB-contaminated soil at SS001 was continued from the existing 2005 excavation (main excavation) and from a 2007 site investigation sample location (Grid Cell N13). During activities at the main excavation, an odor was noted that led to further sampling and a review of site history, resulting in the discovery of 1,2,4-TCB at concentrations above the ADEC site cleanup level. Soil excavation was completed at the 2007 site investigation Grid Cell N13 excavation. All confirmation results were less than 1 mg/kg PCBs, and the excavation area was backfilled and graded to match site contours. Excavation activities removed 1,252 cubic yards (cy) of PCB-contaminated soil from SS001, but PCB contamination and 1,2,4-TCB was still present at the main excavation (USACE, 2014).
- In 2013, additional work at SS001 included the collection of PCB samples from soil along the all-terrain vehicle trail and nearby cabin to confirm the effectiveness of previous remedial actions. The wipe sample results from the cabin were non-detect for PCBs. The soil samples from the trail were all less than the cleanup level. In addition, a drum was discovered near the cabin at the end of the trail. Field screening and analytical samples were collected from the area of the drum and analyzed for fuel constituents. The drum was emptied, removed, decontaminated, and disposed of in the local landfill. The drum contents were containerized and disposed of offsite.
- In 2014, vegetation samples were collected from the roots, leaves, and fruits of various plants at SS001 and analyzed for PCBs. No cleanup level for vegetation exists, and none of the vegetation sample results exceeded the ADEC direct contact soil cleanup level of 1 mg/kg (USACE, 2015). Two samples were collected from berries, both of which were non-detect for PCBs.
- In 2015, activities at SS001 consisted of lining and backfilling the existing excavation, drilling, and site restoration. Five soil borings were advanced. Soil samples were collected from each boring and analyzed for PCBs and 1,2,4-TCB, and monitoring wells and/or test wells were installed to determine if site contamination had migrated to groundwater. Groundwater samples were analyzed for PCBs and 1,2,4-TCB. All soil and groundwater results were less than ADEC cleanup levels. Four wells remain at SS001 (USACE, 2016).
- In 2016, a stockpile cell for petroleum, oils, and lubricants (POL)-contaminated soil excavated from neighboring Site SO001 was constructed at SS001. Five pre-construction soil samples were collected from the footprint of the long-term stockpile and analyzed for the COCs identified in the Decision Document (USAF, 2010b) for Site SO001. All preconstruction sample results were less than ADEC cleanup levels for site COCs. In addition, groundwater samples were collected from four monitoring wells at this site

following completion of the 2016 excavation activities; analytical results did not exceed the ADEC groundwater cleanup levels. Two consecutive annual groundwater sampling events at Site SS001 have indicated that contaminants are not present in site groundwater above the ADEC groundwater cleanup levels; therefore, groundwater monitoring should be discontinued at Site SS001 (USACE, 2017).

- In 2017, a test pit investigation at Site SO001 was conducted to investigate the extent of the remaining POL contamination. Analytical results from test pit activities indicate that POL contamination remains at Site SO001. The long-term stockpile located at SS001 was also inspected during the field effort and rips to the reinforced liner were repaired (USAF, 2019a).
- In 2018, the stockpile cell at SS001 was decommissioned and the contaminated soil was transported to the landfarm constructed at Site OT001. Excavation at Site SO001 continued until the landfarm at Site OT001 was full. Contaminated soil remained at Site SO001 and a landfarm was constructed at SS001 to hold the remaining POL-contaminated soil. Additional pre-construction soil samples were collected within the footprint of the landfarm area and analyzed for COCs identified for Site SO001. Nutrient samples were collected from the SS001 landfarm and tilling commenced in July 2018 (USACE, 2019a).
- In 2019, as part of the 2019 Technical Project Report (USACE, 2020) LTM groundwater sampling and analyses showed that there were five VOCs detected in groundwater at monitoring well C-M07: Bromodichloromethane, cis-1,2-Dichloroethene, Tetrachloroethene (PCE), 1,1,2-Trichloroethane, and Trichloroethylene (TCE) above ADEC Table C Cleanup Levels. Additionally, monitoring well C-MW09 had a detection of PCE above the cleanup level.
- In 2020, the 2020 IC/LUC Report showed that three VOCs (cis-1,2-Dichloroethene, 1,1,2-Trichloroethane, and TCE) were detected above the ADEC Table C Cleanup Levels in well C-MW15 (USACE, 2021). Figure 3 presents the results for the most recent groundwater monitoring event from 2020.

Site SS003 – Drums and Stained Soil

Previous investigations and actions at SS003 include:

- In 2002, while on site to remove drums located at the westernmost toe of slope of the North River RRS landfill, additional drums were found, along with areas of POL soil contamination, at SS003 (USAF, 2004c).
- In 2003, USAF 611th Civil Engineering Squadron (611 CES) personnel found nine 55-gallon drums at SS003, three of which contained product resembling used motor oil. Soil in the vicinity appeared to be contaminated with POL. The nine drums were removed along with obviously contaminated soil. Confirmation soil samples collected after drum removal indicated concentrations of DRO up to 38,400 mg/kg, RRO up to 209,000 mg/kg, and PCBs up to 3.77 mg/kg remained on site. Additional samples collected for PCB analysis from a 'landfill site,' the location of which could not be verified as figures were unavailable, contained PCBs up to 122 mg/kg (USAF, 2004b).
- In 2004, brush was cut, and a chain-link fence and signage were put up at SS003. No removal activities occurred (USAF, 2004c).

- In 2007, during a site characterization and remedial investigation effort at SS003, borings were advanced in an effort to collect groundwater grab samples; however, refusal was encountered in all borings prior to encountering groundwater (USAF, 2008). Soil samples were analyzed for fuel compounds and PCBs. DRO, RRO, and PCBs were detected in soil samples above ADEC cleanup levels, with maximum concentrations of 21,000, 130,000, and 200 mg/kg, respectively (USAF, 2008).
- In 2011, in preparation for the removal and offsite disposal stipulated in the 2010 ROD (USAF, 2010a), soil boring locations from 2007 activities at SS003 were relocated and a 15-foot by 15-foot excavation and sampling grid was established over the anticipated excavation. Thirty-four surface soil samples (0 to 12 inches bgs) were collected from the site to further characterize the PCB contamination and to refine the boundary. These samples were analyzed for PCBs in the mobile laboratory (USACE, 2013).
- In 2012, excavation of comingled PCB- and POL-contaminated soil was initiated at SS003. Soil at this site contained many large rocks, which made containerization of the material difficult and inefficient. Sampling of oversize materials (rocks) was conducted to determine if oversize material could be segregated and left on site. One sample from the 5-inch diameter grouping had a PCBs detection of 2.81 mg/kg; therefore, it was determined that oversize material of an 8-inch diameter or larger could be left on site and material of less than an 8-inch diameter would be disposed of with the contaminated soil. Approximately 1,260 tons of comingled PCB- and POL-contaminated soil was excavated, containerized, and disposed of offsite from Site SS003. PCB contamination was still present in 13 grid cell excavation floors (USACE, 2013).
- In 2013, excavation of contaminated soil continued. Approximately 578 cy of PCB- and POL-contaminated soil were removed from SS003, which included approximately 84 cy of soil contaminated only with POL. Although PCB contamination remained at the floor of the excavation at SS003, it was recommended that no further excavation of PCB- or POL-contaminated soil take place within this excavation due to the depth of the excavation and the presence of bedrock (USACE, 2014).
- In 2014, vegetation was sampled at SS003 and analyzed for PCBs. No cleanup level for vegetation exists; however, none of the vegetation sample results exceeded the ADEC direct contact soil cleanup level of 1 mg/kg (USACE, 2015).
- In 2015, activities at SS003 consisted of lining and backfilling the excavation, drilling, and site restoration. At the request of the community of Unalakleet, two soil borings were advanced downgradient of the excavation at SS003 to assess the potential migration of contaminants from the excavation where contamination remains. The soil borings were advanced until refusal was met at 8 to 8.5 feet bgs. Soil samples were collected and analyzed for DRO, RRO, and PCBs. None of the samples contained concentrations of contaminants that exceeded the ADEC soil cleanup levels (USACE, 2016).

Remedial Action Objectives

Remedial Action Objectives (RAOs) provide a general description of what the cleanup will accomplish. The ROD Amendment (USAF, 2019a) established the RAOs listed below.

Site SS001:

- Prevent human exposure to soil containing PCBs in excess of the ADEC Method Two human health cleanup level (1 mg/kg).
- Prevent exposure to soil containing 1,2,4-TCB in excess of the ADEC Method Two migration-to-groundwater cleanup level (0.082 mg/kg).
- Minimize or eliminate direct ecological exposure to PCBs and 1,2,4-TCB above the established ADEC Method Two cleanup levels.
- Reduce the potential for COCs to migrate from Site SS001 soil.

Site SS003:

- Prevent human exposure to soil containing PCBs in excess of the ADEC Method Two human health cleanup level (1 mg/kg).
- Prevent human exposure to soil containing RRO in excess of the ADEC Method Two cleanup level for ingestion (10,000 mg/kg).
- Minimize or eliminate direct ecological exposure to PCBs and RRO above the established ADEC Method Two cleanup levels.
- Reduce the potential for COCs to migrate from Site SS003 soil.

Remedy Components

The ROD Amendment selected remedy for Sites SS001 and SS003 includes removal and offsite disposal of contaminated soil, capping, and land use controls (LUCs) (USAF, 2019a). The 2010 ROD (USAF, 2010a) selected offsite disposal of contaminated soil. The ROD Amendment selected a remedy that included capping and LUCs with offsite disposal of contaminated soil due to the presence of contaminants within fractured bedrock that could not be readily removed.

Soil Remedy Components

The selected remedy components for soil include (USAF, 2019a):

- All PCB-, VOC-, and POL-contaminated soil above the ADEC cleanup levels at Sites SS001 and SS003 will be excavated and removed, to the extent practicable, for disposal in the contiguous United States.
- PCB concentrations above 10 mg/kg and below 50 mg/kg will be disposed of as nonhazardous waste; PCB concentrations 50 mg/kg and above will be disposed of as hazardous waste in a RCRA Subtitle C facility.
- Soil that reaches or exceeds 50 mg/kg PCBs will be handled, transported, and disposed of in accordance with TSCA and will be segregated from other waste soil. TSCA-regulated soil within fractured bedrock that precludes further excavation will remain onsite.
- Confirmation soil samples will be collected from the excavations to show that remaining PCB, 1,2,4-TCB, and RRO concentrations are below their respective RAOs, where possible.

- PCB- and POL-contaminated soil remaining on site in the fractured bedrock will be covered with a permeable geofabric liner prior to capping. The cap will be designed and constructed to withstand environmental conditions and will prevent exposure of humans and the environment to residual contaminants.
- Cap extents will be surveyed and mapped. LUCs will be applied to the site and cap inspections and maintenance, as needed, will be performed to ensure the long-term integrity of the caps; inspection results and photographs will be communicated in a letter report to ADEC and promptly (within 1 year) addressed by the USAF. Preferential drainage pathways, evidence of erosion, and any instances where the geofabric liner is apparent or has been compromised will be documented and addressed.
- LUCs, such as signage and dig restrictions, will be implemented to notify the public of potential risks and limit human exposure to PCBs and POL. The LUC boundary for Site SS001 includes the capped area of Site SS001 and excludes the former PCB trail and cabin. The former PCB trail and cabin have achieved UU/UE and are closed out under the ROD amendment (USAF, 2019a).

ROD Amendment cleanup levels for soil COCs are presented in **Table 2**.

Table 2 Site COCs and ROD Amendment Soil Cleanup Levels

Site	COC	ROD Amendment Soil Cleanup Level (mg/kg)
SS001	Polychlorinated biphenyls	1
	1,2,4-Trichlorobenzene	0.082
SS003	Polychlorinated biphenyls	1
	Residual Range Organics	10,000

Key:
COC – contaminant of concern
mg/kg – milligrams per kilogram
ROD – Record of Decision

Status of Implementation

The offsite disposal of contaminated soil and capping portions of the selected remedy at Sites SS001 and SS003 were performed from 2011 through 2015. The status of remedy implementation for each activity is discussed below.

Site SS001

In 2012, PCB-contaminated soil excavation at SS001 was initiated at the existing 2005 TCRA excavation (main excavation) and from a 2007 site investigation sample location (Grid Cell N13). Excavation activities removed approximately 300 tons of PCB-contaminated soil from Site SS001 (USACE, 2013).

In 2013, excavation of PCB-contaminated soil at SS001 continued at the existing 2005 TCRA excavation and from a 2007 site investigation sample location (Grid Cell N13). 1,2,4-TCB at

concentrations above the ADEC site cleanup level was identified. Soil excavation was completed at the 2007 site investigation (Grid Cell N13) excavation, all confirmation results were less than 1 mg/kg PCBs, and the excavation area was backfilled and graded to match site contours. Excavation activities removed 1,252 cy of PCB-contaminated soil from SS001, but remaining PCB contamination was detected at 119 mg/kg and remaining 1,2,4-TCB contamination was detected at 9.4 mg/kg (USACE, 2014).

In 2013, additional work at SS001 included the collection of PCB samples from soil along the all-terrain vehicle trail and nearby cabin to confirm the effectiveness of previous remedial actions. The wipe sample results from the cabin were non-detect for PCBs. The soil samples from the trail were all less than the cleanup level. In addition, a drum was discovered near the cabin at the end of the trail. Field screening and analytical samples were collected from the area of the drum and analyzed for fuel constituents. The drum was emptied, removed, decontaminated, and disposed of in the local landfill. The drum contents were containerized and disposed of offsite (USAF, 2019a).

In 2014, vegetation samples were collected from the roots, leaves, and fruits of various plants at SS001 and analyzed for PCBs. No cleanup level for vegetation exists, and none of the vegetation sample results exceeded the ADEC direct contact soil cleanup level of 1 mg/kg (USACE, 2015). Two samples were collected from berries, both of which were non-detect for PCBs.

In 2015, activities at SS001 consisted of lining and backfilling the existing main excavation, drilling, and site restoration. Further excavation was determined to not be feasible due to groundwater and fractured bedrock, and the maximum PCB and 1,2,4-TCB concentrations remaining were 119.5 mg/kg and 9.4 mg/kg, respectively. The excavation was backfilled from bottom to top with:

1) Riprap to above groundwater level.
2) Pit run gravel.
3) Geotextile fabric, which was not placed at the base of the excavation due to groundwater.
4) Clean on-site berm material, pit run gravel, and 3-inch minus rock compacted to existing grades and then mounded to address future settlement.
5) Topsoil from Pit 3 owned by Native Village of Unalakleet.

The perimeter fencing was removed. Seeding of the backfilled area at SS001 could not be accomplished before snowfall drilling activities. Soil samples, analyzed for PCBs and 1,2,4-TCB, were collected from five soil borings around the perimeter of the excavation. Monitoring wells and/or test wells were installed at each perimeter boring location, with groundwater samples analyzed for PCBs and 1,2,4-TCB, to determine if site contamination had migrated to groundwater. All soil and groundwater results were less than ADEC cleanup levels. Four wells were left in place (USACE, 2016).

In 2016, SS001 was selected as a suitable long-term stockpile location for excavated soil from neighboring Site SO001 based on the size of the site, even topography, and proximity. Five pre-construction soil samples, analyzed for Site SO001 COCs, were less than ADEC cleanup levels. The stockpiled soil from Site SO001 was contained within a 20-mil lower liner and two layers of

6-mil poly reinforced top liner. Four groundwater samples, analyzed for PCBs and 1,2,4-TCB, were collected from wells installed in 2015 and results were less than ADEC cleanup levels; therefore, groundwater monitoring was recommended to be discontinued at SS001 (USACE, 2017).

In 2017, the long-term stockpile located at SS001 was inspected and rips to the reinforced liner were repaired (USAF, 2019a).

In 2018, the long-term stockpile at SS001 was decommissioned by transporting the contaminated soil to Site OT001 for treatment and the liners were bagged for disposal. Post-stockpile surface samples of SS001 were not collected as the area was expanded for placement an additional landfarm to treat 1,392 cy of excavated soil from Site SO001. Four pre-construction soil samples collected from the expanded footprint of the landfarm, analyzed for Site SO001 COCs, were less than Decision Document criteria (USAF, 2010b). Tilling was conducted from July to October 2018 (USACE, 2019).

Site SS003

In 2011, in preparation for the removal and offsite disposal remedy stipulated in the 2010 ROD (USAF, 2010a), 34 surface soil samples (0 to 12 inches bgs) were collected from SS003 to further characterize the PCB contamination and to refine the boundary. These samples were analyzed for PCBs in the mobile laboratory (USACE, 2013).

In 2012, excavation of comingled PCB- and POL-contaminated soil was initiated at SS003. Soil at this site contained many large rocks, which made containerization of the material difficult and inefficient. Sampling of oversize materials (rocks) was conducted to determine if oversize material could be segregated and left on site. One sample from the 5-inch diameter grouping had a PCBs detection of 2.81 mg/kg; therefore, it was determined that oversize material of an 8-inch diameter or larger could be left on site and material of less than an 8-inch diameter would be disposed of with the contaminated soil. Approximately 1,260 tons of comingled PCB- and POL-contaminated soil was excavated, containerized, and disposed of offsite from SS003. PCB contamination was still present in 13 grid cell excavation floors (USACE, 2013).

In 2013, excavation of contaminated soil continued. Approximately 578 cy of PCB- and POL-contaminated soil were removed from SS003, which included approximately 84 cy of soil contaminated only with POL. PCB-impacted soil remained at the floor of the Site SS003 excavation, with results ranging from 1.1 to 320.30 mg/kg at depths ranging from 8 to 19 feet bgs. In addition, POL contamination remained in the western portion of the Site SS003 excavation, with RRO detected at 41,000 mg/kg. The report recommended no additional excavation due to the depth of the excavation and the presence of bedrock (USACE, 2014).

In 2014, vegetation was sampled at SS003 and analyzed for PCBs. No cleanup level for vegetation exists; however, none of the vegetation sample results exceeded the ADEC direct contact soil cleanup level of 1 mg/kg (USACE, 2015).

In 2015, activities at SS003 consisted of lining and backfilling the existing excavation, drilling, and site restoration. Further excavation was determined to not be feasible due to the depth of the

excavation and the presence of fractured bedrock, and the maximum PCB and RRO concentrations remaining were 320.3 and 41,000 mg/kg, respectively. The excavation was backfilled from bottom to top with:

1) Compacted pit run gravel/3-inch minus rock to approximately 8-feet bgs.
2) Geotextile fabric, which was not placed at the base of the excavation due to groundwater.
3) Clean on-site berm material compacted to existing grades.
4) Topsoil from Pit 3 owned by Native Village of Unalakleet, which was then seeded, fertilized, and straw applied for erosion control.

The perimeter fencing was also removed. At the request of the community of Unalakleet, two soil borings were advanced downgradient of the excavation at Site SS003 to assess the potential migration of contaminants from the excavation where contamination remains. The soil borings were advanced until refusal was met at 8 to 8.5 feet bgs. Soil samples were collected and analyzed for DRO, RRO, and PCBs. None of the samples contained concentrations of contaminants that exceeded the ADEC soil cleanup levels (USACE, 2016).

LUC Summary

The remedies for SS001 and SS003 include LUCs. Sites SS001 and SS003 are identified in the LUC Management Plan for the Pacific Air Forces Regional Support Center Installation (LUC Management Plan) (USAF, 2019c). However, the contents on Table 2-1, *Description of LUC Types Currently In Effect at PRSC ERP Sites*, and Figure 29, *Installation Map – North River RRS*, within the LUC Management Plan do not reflect the LUCs and associated LUC footprints outlined in the ROD Amendment (USAF, 2019a) for SS001 and SS003.

The BSNC and UNC concurred with LUCs and deed restrictions on SS003, which outline that no water wells may be drilled for the purpose of drinking water and no removal of soil from the site unless approved by ADEC (USAF, 2019b).

The ROD Amendment (USAF, 2019a) outlined the following in relation to long-term LUC management at SS001 and SS003:

- Current site use is recreational and expected to remain recreational. The USAF will restrict any future site use that has the potential to affect the protectiveness of the selected remedy, including residential development and disposition and use of any soil excavated from the site, in the LUC Management Plan.
- LUC boundaries will be surveyed and mapped for inclusion into the LUC Management Plan and used during LUC and cap inspections.
- LUCs are anticipated to be permanent at SS001 (Area C) and SS003 (Area A), as PCB concentrations are unlikely to degrade naturally.
- The USAF will file a notice with the USAF real property office and in State of Alaska Department of Natural Resources land records that describes the nature and location of the pollutants or contaminants and the types and locations of LUCs.

- The USAF will include signage around SS001 (Area C) and SS003 (Area A) to prevent unauthorized access. The signage will be implemented and maintained by the 611 CES.
- The USAF will utilize the base dig permit system, which will prevent activities that could breach the caps. The base dig permit system is implemented by the 611 CES.
- The USAF will utilize the base construction review process, which will prevent ground-disturbing construction activities or ensure safe soil management procedures in areas with residual contamination. The base construction review process is implemented by the 611 CES.
- All ROD use limitations and exposure restriction will be entered in the base master plan and the Geographical Information System (GIS) by the 611 CES within 30 days after ROD signature.
- The USAF will file a notice of activity and use limitation (SS001 [Area C]) and an environmental covenant (SS003 [Area A]) that describe the nature and location of residual contamination, and the types and locations of LUCs.
- The USAF is responsible for implementing, maintaining, monitoring, reporting, and enforcing LUCs.
- The USAF will inform, monitor, enforce, and bind, where appropriate, authorized lessees, tenants, contractors, and local community members regarding the LUCs affecting Sites SS001 (Area C) and SS003 (Area A).
- Although the USAF may later transfer these procedural responsibilities to another party by contract, property transfer agreement, or through other means, the USAF will retain ultimate responsibility for remedy implementation and protectiveness.
- The USAF will notify ADEC as soon as practicable, but no longer than 10 days after discovery, of any activity that is inconsistent with the LUC objectives or use restrictions, or any other action that may interfere with the effectiveness of the LUCs. The USAF will take prompt measures to correct the violation or deficiency and prevent its recurrence. In this notification, the USAF will identify any corrective measures it has taken or any corrective measures it plans to take and the estimated time frame for completing them. For corrective measures taken after the notification, the USAF will notify ADEC when the measures are complete.
- The USAF must provide notice to ADEC at least 6 months prior to any transfer or sale of property containing LUCs so that ADEC can be involved in discussions to ensure that appropriate provisions are included in the transfer or conveyance documents to maintain effective LUCs. If it is not possible for the facility to notify ADEC at least 6 months prior to any transfer or sale, then the facility will notify the state as soon as possible, but no later than 60 days prior, to the transfer or sale of any property subject to LUCs. The USAF agrees to provide ADEC with such notice, within the same time frames, for federal-to-federal transfer of property accountability. The USAF will provide either access to or a copy of the executed notice and covenant or transfer assembly to ADEC.
- The USAF will not modify or terminate LUCs, modify land uses that might impact the effectiveness of the LUCs, take any anticipated action that might disrupt the effectiveness of the LUCs, or take any action that might alter or negate the need for LUCs without 45

days prior to the change seeking and obtaining approval from ADEC of any required ROD modification.

- The USAF will monitor and inspect all site areas subject to LUCs as PCB-contaminated soil will remain on site indefinitely. LUC and cap inspections will be conducted and reported annually for the first 5 years, then every 5 years thereafter.
- The USAF will report no less often than once every 5 years to ADEC on the frequency, scope, and nature of LUC monitoring activities, the results of such monitoring, any changes to the LUCs, and any corrective measures resulting from monitoring during the time period.
- If the road at the North River RRS, or access to the area, is ever not needed, alternatives to remove the remaining contamination may be reevaluated.

III. PROGRESS SINCE THE LAST REVIEW

This is the first FYR for Site SS001 and the second FYR for SS003. The prior FYR for Site SS003, completed in 2016 (USAF, 2016), identified the remedy as currently protective and included the following protectiveness statement:

> *Implementation of the remedy at Site SO001 is ongoing, while the remedy at Site SS003 has been implemented to the extent practicable. Site SS003 is considered "Cleanup Complete with Institutional Controls" by ADEC. There are no immediate threats from the sites, and the remedies are currently protective of human health and the environment. The remedy for Site SO001 is also protective in the future. The remedy for Site SS003 is not protective in the future, but this issue will be addressed by a ROD amendment.*
>
> *The Air Force certifies that the remedies for Sites SO001 and SS003 at the North River RRS are currently protective of human health and the environment and comply with Federal and State requirements that are legally applicable or relevant and appropriate. The Air Force also certifies that the remedy for Site SO001 is protective in the future. A ROD amendment is required to address residual PCB concentrations in soil exceeding the risk-based cleanup levels and ensure the long-term protectiveness of the Site SS003 remedy.*

No issues were identified during the first FYR that affected the current protectiveness of the Site SS003 remedy, but issues that affect future remedy protectiveness were identified. The status of issues Site SS003 from the first FYR are presented in **Table 3**.

Table 3 Status of Recommendations for SS003 from the 2016 FYR

Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
ROD Amendment for Site SS003	Prepare a ROD Amendment to formalize the "Cleanup Complete" status and to ensure the Site SS003 remedy remains protective in the future.	Completed	A ROD Amendment (USAF, 2019a) was signed on 13 January 2020 with ADEC which formalized a remedial action for Site SS003 consisting of offsite disposal of soil, capping, and land use controls. The addition of capping and land use controls ensures that the Site SS003 remedy remains protective in the future.	1/13/2020

Key:
FYR – Five-Year Review
ROD – Record of Decision

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IV. FYR AND PERIODIC REVIEW PROCESS

Community Notification, Involvement, and Site Interviews

A public notice was made available by newspaper posting in the *Fairbanks Daily News-Miner* on 3 October 2020 stating that there was a FYR for Sites SS001 and SS003 at the North River RRS and inviting the public to submit any comments to the USAF (**Appendix B**). No comments were received. The FYR report will be made available in the North River RRS Administrative Record, a copy of which is available online at https://ar.afcec-cloud.af.mil/

During the FYR, interviews were conducted via email questionnaire to document any perceived problems or successes with the remedy that has been implemented to date. Questionnaire responses were provided by the ADEC Project Manager (Mr. Dennis Shepard) on 14 December 2020 and by the AFCEC Remedial Project Manager (Mr. Robert Johnston) on 15 December 2020. Attempts were made to interview the BSNC and the UNC by phone and email on 14 May 2021 and again on 9 July 2021. Responses were not received from the BSNC or UNC.

The ADEC Project Manager indicated that LUCs are functioning as expected and that the sites are generally well managed. It was noted at a January 2020 meeting for the Formally Used Defense Site Aircraft Control and Warning Station, a landowner with property in the general vicinity of SS001 and SS003 discussed their belief that additional contamination is present at the North River sites which is impacting the landowner's property.

The AFCEC Remedial Project Manager indicated that there have been no known LUC breaches and that yearly monitoring is occurring.

The ADEC and AFCEC complete interview responses are provided in **Appendix C**.

Data Review

Available data collected at Sites SS001 and SS003 during the period of this FYR (2015-2020) were reviewed. Data reviewed included: capping and soil and groundwater sampling activities in 2015 at SS001 and SS003, 2016 soil and groundwater sampling activities at SS001, and 2018 soil sampling activities at SS001 (USACE, 2016; 2017; 2019). Data reviewed are discussed in the *Status of Implementation* section of this FYR.

In 2015, at Site SS001, 10 soil samples (15NR-C-SB-7-01, 15NR-C-SB-7-02, 15NR-C-SB-8-01, 15NR-C-SB-8-03, 15NR-C-SB-9-01, 15NR-C-SB-9-02, 15NR-C-SB-10-01, 15NR-C-SB-10-02, 15NR-C-SB-15-01, and 15NR-C-SB-15-02) and one duplicate sample (15NR-C-SB-8-02) were collected from Borings C-SB7, C-SB8, C-SB9, C-SB10, and C-SB15. These samples were analyzed for PCBs and 1,2,4-TCB and all results, with the exception of a 0.013 mg/kg detection of PCB-1260 in sample 15NR-C-SB-9-01, were non-detect. The single PCB detection is below the 18 AAC 75 Method Two soil cleanup level for the Under 40-Inch Zone (Table B1) (ADEC, 2020b). It should be noted that while all 1,2,4-TCB results were non-detect, the detection limit for Samples 15NR-C-SB-7-01, 15NR-C-SB-8-01, 15NR-C-SB-8-02, and 15NR-C-SB-10-01 exceeded the current 0.082 mg/kg 1,2,4-TCB cleanup level, 18 AAC 75 Method Two soil cleanup level for the Under 40-Inch Zone (Table B1) (ADEC, 2020b), with the highest detection limit being 0.12 mg/kg. Five groundwater samples and one duplicate sample from SS001, analyzed for

PCBs and 1,2,4-TCB, were collected from Test/Monitoring Wells C-TW7, C-TW10, C-MW7, C-MW9, and C-MW15. All groundwater samples were non-detect and below 18 AAC 75 Groundwater Cleanup Levels (Table C) (ADEC, 2020b).

In 2015, at Site SS003, four soil samples (15NR-A-SB-1-01, 15NR-A-SB-1-02, 15NR-A-SB-2-01, and 15NR-A-SB-2-02) and one duplicate sample (15NR-A-SB-2-03) were collected from Borings A-SB1 and A-SB2. These samples were analyzed for DRO, RRO, and PCBs and all results were below 18 AAC 75 Method Two soil cleanup level for the Under 40-Inch Zone (Tables B1 and B2) (ADEC, 2020b).

In 2016, at Site SS001, five soil samples (16NR-LTS-S-01, 16NR-LTS-S-02, 16NR-LTS-S-04, 16NR-LTS-S-05, and 16NR-LTS-S-06) and one duplicate sample (16NR-LTS-S-03) were collected from the surface prior to placement of a long-term stockpile for Site SO001 soils. These samples were analyzed for Site SO001 constituents including: gasoline range organics, DRO, benzene, ethylbenzene, methylene chloride, naphthalene, tetrachloroethene, 1-methylnapthalene, 2-methylnapthalene, 4-chloroaniline, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene. All soil sample results were below Decision Document criteria (USAF, 2010b) and below 18 AAC 75 Method Two soil cleanup levels for the Under 40-Inch Zone (Tables B1 and B2) (ADEC, 2020b). Four groundwater samples and one duplicate sample from SS001, analyzed for PCBs and 1,2,4-TCB, were collected from Monitoring Wells C-MW7, C-MW9, C-MW15, and C-TW10. All groundwater samples were below 18 AAC 75 Groundwater Cleanup Levels (Table C) (ADEC, 2020b).

In 2018, at Site SS001, four soil samples and one duplicate sample from Locations V-LF-29, V-LF-30, V-LF-31, V-LF-32 were collected from the surface prior to placement of a landfarm for Site SO001 soils. These samples were analyzed for Site SO001 constituents, and all results were reported as below Decision Document criteria (USACE, 2019). The 2018 Site Activities Report (USACE, 2019) on the USAF administrative record did not contain the data quality assessment and, as such, that data was not available for detailed review.

In 2019 long-term groundwater monitoring was conducted at Site SS001 (C-MW07, C-MW09, C-MW15, and C-TW10) samples were analyzed for PCBs and VOCs. Five VOCs were detected above their respective ADEC Table C groundwater cleanup levels for; Bromodichloromethane, cis-1,2-Dichloroethene, Tetrachloroethene [PCE], 1,1,2-Trichloroethane, and Trichloroethylene (TCE) in well C-MW07. Well C-MW09 also exceeded the ADEC groundwater cleanup level for PCE. (USACE, 2020). The remainder of the VOC compounds were reported as either non-detect or below their respective ADEC Table C Cleanup Level. PCBs were not detected above the ADEC Cleanup Level.

In 2020, a long-term groundwater monitoring sample was collected at Site SS001 monitoring well C-MW15, with wells C-MW07 and C-MW09 not sampled due to insufficient volume (USACE, 2021). Three VOCs – cis-1,2-Dichloroethene, 1,1,2-Trichloroethane, and TCE were detected above their respective ADEC Table C Groundwater Cleanup Levels in well C-MW15.

Site Inspection

Site inspections at Sites SS001 and SS003 were conducted on 25 September 2020 by John Marshall of Stantec as part of this FYR. The following summarizes the findings of the site inspections. The complete site inspection checklist and photologs are provided in **Appendix D**.

Site SS001

The surface of SS001 is currently being used for landfarm treatment of soil from Site SO001. The landfarm area had orange plastic construction fencing on the northwestern, southwestern, and northeastern perimeters. The fence was ripped and stretched in multiple locations. The only signage present was attached to the construction fence outlining "Keep Out" and "Danger Construction Area Keep Out". The landfarming activities encompass the capped area of Site SS001. There was no observed evidence that soil disturbance work, other than tilling of the soil being landfarmed, has occurred that would disturb the SS001 cover. Vegetation growth is occurring along the perimeter of the soil being landfarmed. An exterior inspection of monitoring wells at SS001 did not indicate any damage and the well lids were locked.

Site SS003

Site SS003 is an open area with vegetation throughout. There was no signage present indicating the presence of SS003. There were patches of limited vegetation where the surface was primarily aggregate, however, grasses and brushes were growing on the aggregate. There were vehicular tire marks on the cover and limited rutting of the immediate surface soil. There was no observed evidence that soil disturbance has occurred that would disturb the Site SS003 cover and no erosion was observed.

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V. TECHNICAL ASSESSMENT

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

The review of documents, site data, and the results of the site inspections indicate that the soil remedy at Sites SS001 and SS003 is functioning as intended by the North River RRS ROD Amendment (USAF, 2019a), however the LUCs have not been fully implemented.

The remedy includes off-site disposal of contaminated soil (completed in 2013), capping (completed in 2015), and establishment of LUCs once the ROD Amendment was signed. The caps over both sites do not appear to have been disturbed, based on the 25 September 2020 site visit, indicating that residual contamination remains contained and undisturbed. The use of Site SS001 as a landfarm area prevents Site SS001 from being disturbed. Vegetation is growing across the Site SS003 cap and there are no indications of erosion.

The currently available LUC Management Plan (USAF, 2019c) does not reflect the LUCs and associated LUC footprints outlined in the ROD Amendment (USAF, 2019a) for Sites SS001 and SS003. Signage notifying the public of potential risks was not present during the 25 September 2020 site visit and the notice of activity and use limitation (NAUL) for site SS001 and an environmental covenant for site SS003 have not been filed.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

The exposure assumptions, cleanup levels, and RAOs used at the time of the remedy selection for Sites SS001 and SS003 are still valid. There have been no changes in the physical conditions of either site that would adversely affect the protectiveness of the remedy.

Changes in Standards

There have been no changes to the applicable or relevant and appropriate requirements for SS001 and SS003 at the North River RRS, and there are no new standards affecting the protectiveness of the remedies (**Table 4**). The ROD Amendment cleanup levels for COC's are consistent with the more stringent of current under 40-inch zone ADEC cleanup levels (ADEC, 2020b) for PCBs and RRO, as well as migration-to-groundwater ADEC cleanup levels (ADEC, 2020b) for 1,2,4- TCB.

Table 4 ROD Amendment Cleanup Levels and Current ADEC Cleanup Levels

Site	COC	Media (Units)	ROD Amendment Cleanup Level	Current ADEC Cleanup Level[1]
SS001	Polychlorinated biphenyls	Soil (mg/kg)	1	1
	1,2,4-Trichlorobenzene		0.082	0.082[2]
SS003	Polychlorinated biphenyls	Soil (mg/kg)	1	1
	Residual Range Organics		10,000	10,000[3]

Key:
1 – 18 Alaska Administrative Code 75.341, Tables B1 and B2.
2 – migration to groundwater
3 – ingestion
ADEC – Alaska Department of Environmental Conservation
COC – contaminant of concern
mg/kg – milligrams per kilogram
ROD – Record of Decision

Changes in Toxicity and Other Contaminant Characteristics

There have been no changes in toxicity or other contaminant characteristics that have resulted in changes to current ADEC cleanup levels (ADEC, 2020b) since the ROD Amendment (USAF, 2019a). There were no changes to current ADEC cleanup levels (ADEC, 2020b) for the ROD Amendment COCs (PCBs, RRO, and 1,2,4-TCB) (USAF, 2019a).

Five VOCs (Bromodichloromethane, cis-1,2-Dichloroethene, PCE, 1,1,2-Trichloroethane, and TCE) not identified as COCs in the ROD or ROD amendment, were detected in groundwater at Site SS001 (USACE, 2021 & USACE, 2021) above their respective ADEC Table C Groundwater Cleanup standard.

Changes in Risk Assessment Methods

A quantitative toxicity assessment and risk characterization were not completed as part of the ROD Amendment (USAF, 2019a). Maximum detected concentrations of residual COCs were input into the ADEC cumulative risk calculator to support risk determination for potential future residents, under 40-inch precipitation scenario, the results of which are still valid for the COCs (PCBs, RRO, and 1,2,4-TCB) identified in the ROD Amendment (USAF, 2019a).

Changes in Exposure Pathways

The exposure pathways and use of the area, as outlined in the ROD Amendment remain unchanged (USAF, 2019a), and there have been no identified impacts to surface waters at the North River RRS. Additionally, completion of LUC implementation will provide notification and control of exposure to chemicals that may pose unacceptable level of risk.

Expected Progress Towards Meeting RAOs

The remedy outlined for Sites SS001 and SS003 in the ROD Amendment (USAF, 2019a) is progressing as planned and the identified RAOs will be achieved with the completion of LUC implementation, cap inspections and FYRs.

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

The soil remedies at Sites SS001 and SS003 to prevent direct exposure to contaminated soil remain unchanged.

Five VOCs (Bromodichloromethane, cis-1,2-Dichloroethene, PCE, 1,1,2-Trichloroethane, and TCE) have been detected in groundwater above the ADEC Table C Cleanup levels in 2019 and 2020 at Site SS001. An evaluation of the risk associated with these VOCs has not been performed and further investigation is required.

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VI. ISSUES/RECOMMENDATIONS

This section identifies issues affecting the protectiveness of the remedies at North River RRS Sites SS001 and SS003.

Site(s): SS001	Issue Category: Monitoring			
	Issue: VOCs in groundwater not included in the ROD have been detected above ADEC Table C Cleanup Levels and the extent of contamination has not been delineated. Monitoring well C-MW15 was found to be frost heaved and the well casing disjointed below the ground surface.			
	Recommendation: Replace monitoring well C-MW15. Investigate the level and extent of VOCs in groundwater by conducting additional groundwater monitoring from the three intact existing wells (C-MW07, C-MW09, and C-TW10) and from a replacement well for C-MW15, and analyze the samples for VOCs by low-level EPA SW 846 Method 8260 to determine if a change to the ROD is required.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
Yes	Yes	USAF	ADEC	12/31/2022

Site(s): SS001	Issue Category: Changed Site Conditions			
	Issue: VOCs in groundwater, not included in the ROD have been detected above ADEC Table C Cleanup Levels and the associated risk has not been determined.			
	Recommendation: As four of the five VOCs detected are CERCLA hazardous substances, an assessment of the risk associated with these VOCs should be conducted and follow the EPA risk assessment guidance and procedures.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
Yes	Yes	USAF	ADEC	12/31/2023

Site(s): SS001 and SS003	Issue Category: Institutional Controls			
	Issue: The USAF LUC Management Plan has not been updated with the LUC management and LUC boundary outlined in the ROD Amendment, and the NAUL for site SS001 and an environmental covenant for site SS003 have not been filed			
	Recommendation: Update the USAF LUC Management Plan, as appropriate, to reflect the LUC management requirements outlined in the ROD Amendment and the file the NAUL for site SS001 and an environmental covenant for site SS003.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	USAF	ADEC	12/31/2023

Site(s): SS001 and SS003	Issue Category: Institutional Controls			
	Issue: Signage to inform the public of potential risks and limit human exposure is not present.			
	Recommendation: Install signage around the perimeter of the capped area of Sites SS001 and SS003 as outlined by the ROD Amendment.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	USAF	ADEC	12/31/2023

The following recommendation that does not affect the protectiveness of the site remedy at Site SS001 was identified during this FYR:

- The SS001 surface has not been restored yet. Surface restoration cannot occur until landfarming activities of Site SO001 soils over the surface of SS001 have been completed. Upon completion of landfarming activities, the surface soil of SS001 should be confirmed as not containing Site SO001 COCs in excess of ADEC cleanup levels and surface restoration completed to prevent erosion of SS001 cap materials.

VII. PROTECTIVENESS STATEMENT

Protectiveness Statements		
Site: **North River RRS Sites SS003**	*Protectiveness Determination:* **Short-term Protective**	*Planned Addendum Completion Date:* Not Applicable

Protectiveness Statement: The protectiveness determination of the remedy at the North River RRS Sites SS003 is Short-Term Protective of human health and the environment. The remedy currently protects human health and the environment because excavation and off-site disposal of contaminated soils to the extent feasible and capping at SS003 has been completed. The cap at SS003 isolate residual contaminated soil from human and ecological receptor exposure.

In order for the remedy to be protective in the long-term, the USAF LUC Management Plan requires updating to reflect LUC management as outlined in the ROD Amendment and signs need to be installed at SS003 that inform the public of potential risks and limit human exposure. An environmental covenant for site SS003 will require to be filed, and BSNC and UNC concur with LUCs and deed restrictions for the site.

Protectiveness Statements		
Site: **North River RRS Sites SS001**	*Protectiveness Determination:* **Protectiveness Deferred**	*Planned Addendum Completion Date:* 12/31/2023

Protectiveness Statement: A protectiveness determination on the remedy at the North River RRS Site SS001 cannot be made at this time until further information is obtained. Further information will be obtained by taking the following actions: evaluation of human health and ecological risk associated with the presence of five VOCs (Bromodichloromethane, cis-1,2-Dichloroethene, Tetrachloroethene [PCE], 1,1,2-Trichloroethane, and Trichloroethylene [TCE]) in groundwater; additional site characterization through replacement of the monitoring well C-MW15, monitoring groundwater from all site wells, and conducting an assessment of the risk associated with the VOCs. The evaluation will incorporate groundwater data from 2019, 2020, 2021, as well as new data after the monitoring well has been replaced and an additional sampling event has been conducted. As four of the five VOCs are listed CERCLA hazardous substances, the EPA risk assessment guidance and procedures should be used. It is expected that these actions will take approximately 2 years to complete, at which time a protectiveness determination will be made.

Additionally, the USAF LUC Management Plan requires updating to reflect LUC management as outlined in the 2020 ROD Amendment; signs need to be installed at SS001 that inform the public of potential risks and limit human exposure; and a NAUL filed for site SS001.

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VIII. NEXT REVIEW

The next FYR for Sites SS001 and SS003 at North River RRS will be completed 5 years from the USAF signature date on this FYR and Periodic Review report.

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FIGURES

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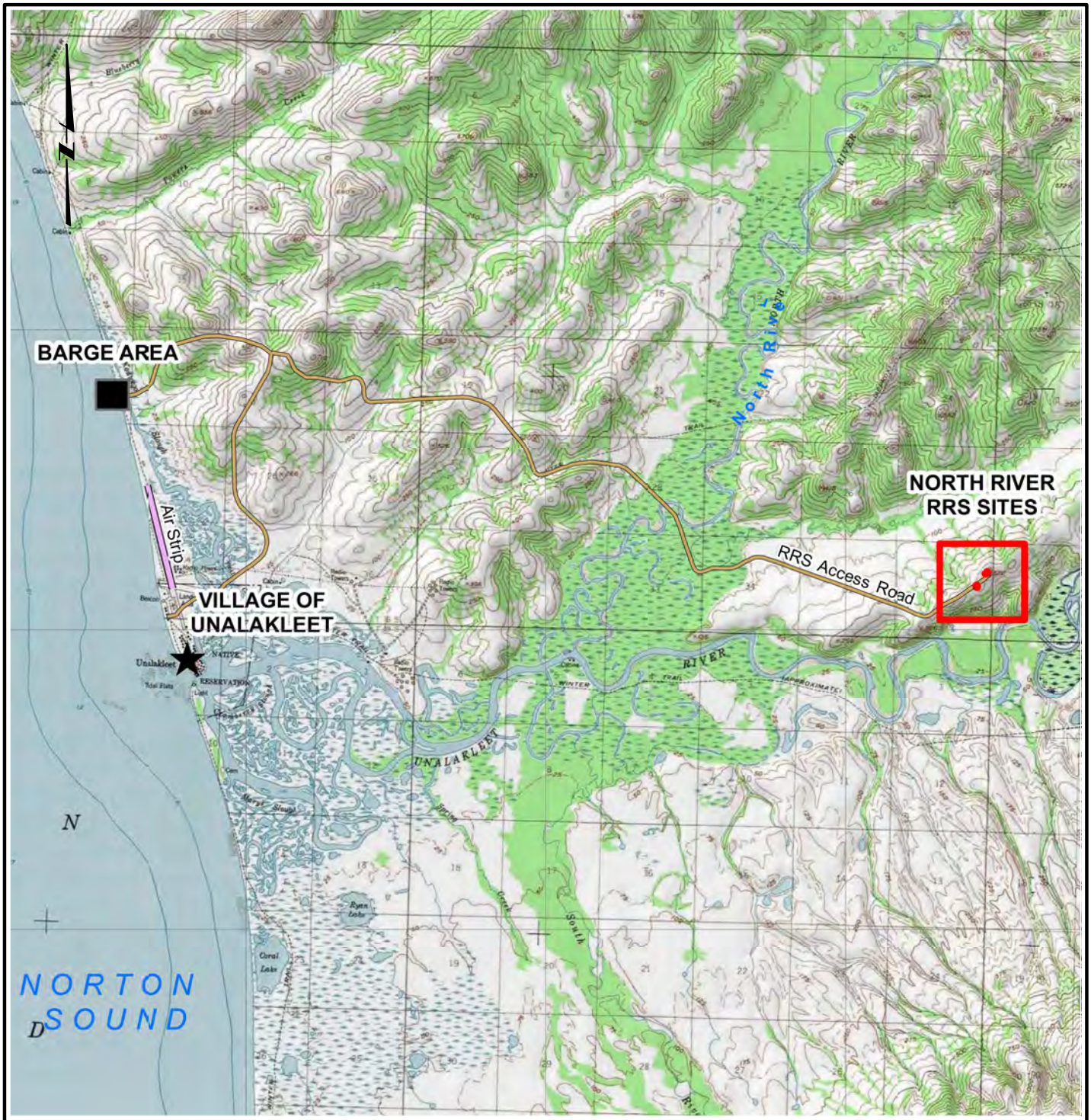

Legend:

- Project Areas
- Air Strip
- RRS Access Road

Source:
North River Radio Relay Station,
Project Location and Vicinity Map,
Unalakleet,Alaska, Figure A-1, 09 Apr 2019

SCALE IN FEET
0 4000

UNITED STATES AIR FORCE
JOINT BASE ELMENDORF-RICHARDSON, ALASKA
FIRST CERCLA FIVE-YEAR REVIEW FOR SITE SS001 AND
SECOND CERCLA FIVE-YEAR REVIEW FOR SITE SS003
AT THE NORTH RIVER RADIO RELAY STATION
UNALAKLEET, ALASKA

PROJECT LOCATION
AND VICINITY MAP

FIGURE
1

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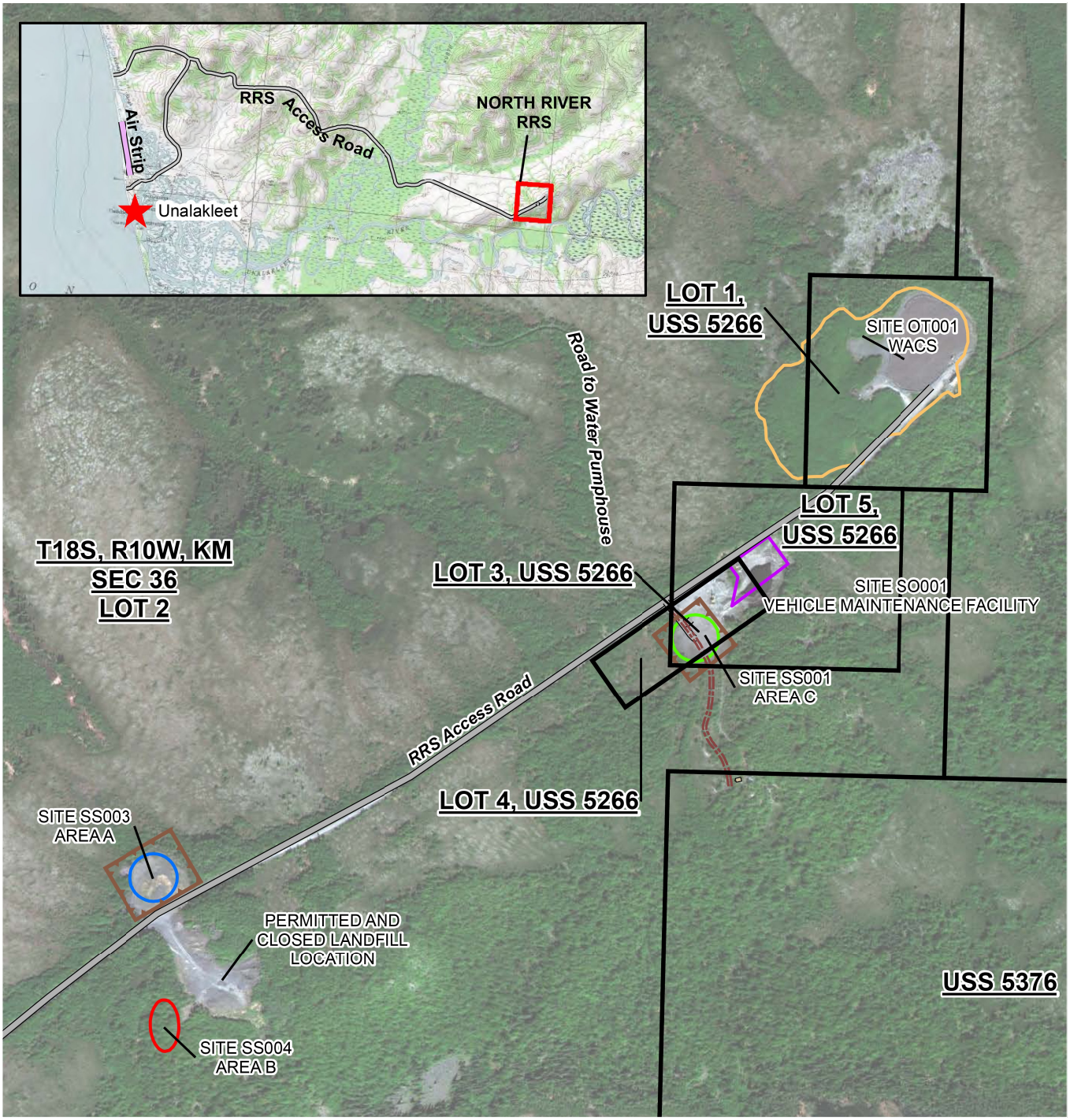

Legend:

- ATV Trail
- RRS Access Road
- Proposed LUC Boundaries
- Site OT001 (White Alice Communications)
- Site SO001 (Vehicle Maintenance Facility)
- Site SS001 (Area C)
- Site SS003 (Area A)
- Site SS004 (Area B)
- Cabin
- Bureau of Land Management (BLM) - Public Land Survey System Intersected (Map Service)

Note:
Plat T18S, R10W, KM, Sec 36, Lot 2 subsurface estate is owned by BSNC and surface estate is owned by UNC. Lot 1, 3, 4, and 5, USS 5266 is owned by USAF.

Source:
North River Radio Relay Station, Sitey Map, Unalakleet,Alaska, Figure A-2, 09 Apr 2019

SCALE IN FEET
0 250

UNITED STATES AIR FORCE
JOINT BASE ELMENDORF-RICHARDSON, ALASKA
FIRST CERCLA FIVE-YEAR REVIEW FOR SITE SS001 AND
SECOND CERCLA FIVE-YEAR REVIEW FOR SITE SS003
AT THE NORTH RIVER RADIO RELAY STATION
UNALAKLEET, ALASKA

SITE MAP

FIGURE
2

185707057.
100.158

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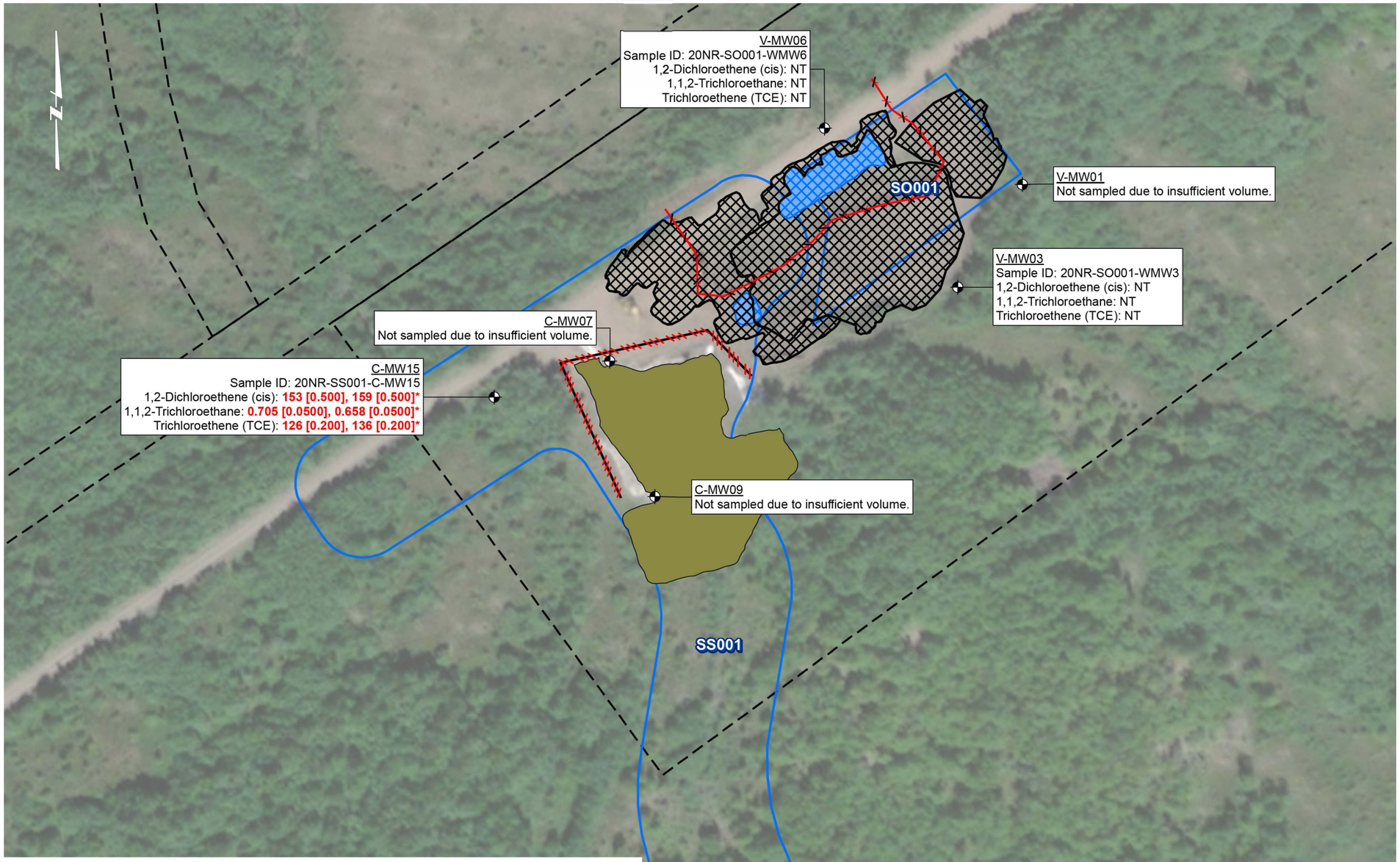

Legend:

- Land Use Control Restriction
- Fenching
- Silt Fencing
- Groundwater area
- Previous Excavation Area
- Area C Landfarm Area
- Installation Boundary
- Monitoring Well/Groundwater Sample Location

Notes:
1. Results are reported with the limit of detection (LOD) in brackets [ ].
2. Results shown in **bold red** exceed the screening levels.
3. An asterisk denotes a duplicate sample.

** Alaska Department of Environmental Conservation (ADEC) Groundwater Cleanup Levels, Alaska Administrative Code Title 18, Chapter 75.345, Table C for Human Health.

NT = Not tested
RRS = Radio Relay Station
µg/L = Microgram(s) per liter

Analyte	Units	ADEC Human Health Cleanup levels **	2019			2020	
			C-MW07	C-MW07 (duplicate)	C-MW09	C-MW15	C-MW15 (duplicate)
Volatile Organic Compounds							
Bromodichloromethane	µg/L	1.3		1.9 J			
cis-1,2-Dichloroethene	µg/L	36	250 JI	240 JI		153	159
Tetrachloroethene (PCE)	µg/L	41	85 DJ	150 DJ	400 DJ		
1,1,2-Trichloroethane	µg/L	0.41	1.1 J	0.89 J		0.705	0.658
Trichloroethene (TCE)	µg/L	2.8	280 DJ	290 DJ		126	136

Key:
D - Analyte Identified at a primary, secondary, or tertiary dilution.
J - Result is detected below the reporting limit and/or is an estimated concnetration based on data assessment.
JI - Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte specific quality control criteria.

Source:
2020 Remedial Action Operations, Institutional Control/Land Use Control Report, North River RRS, Alaska, Sites SO001, SS001, and SS003. Figure 2.

SCALE IN FEET
0 50

UNITED STATES AIR FORCE
JOINT BASE ELMENDORF-RICHARDSON, ALASKA
FIRST CERCLA FIVE-YEAR REVIEW FOR SITE SS001 AND SECOND CERCLA FIVE-YEAR REVIEW FOR SITE SS003
AT THE NORTH RIVER RADIO RELAY STATION
UNALAKLEET, ALASKA

2019 and 2020 GROUNDWATER SAMPLE RESULTS

FIGURE 3

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APPENDIX A
REFERENCE LIST

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REFERENCE LIST

Alaska Department of Environmental Conservation (ADEC), 2020a. ADEC Division of Spill Prevention and Response, Contaminated Sites Program Database, reviewed on September 4, 2020. Available online at: http://dec.alaska.gov/Applications/SPAR/PublicMVC/CSP/Search.

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USAF. 2019a. Final Record of Decision Amendment, North River Radio Relay Station, Unalakleet, Alaska. Signed January 2020.

USAF. 2019b. Signed letter from UNC and BCNC concurring to land use controls and deed restrictions on Site SS003. Signed by BSNC on 23 March 2019 and by UNC on 20 September 2019.

USAF. 2019c. Land Use Control Management Plan Pacific Air Forces Regional Support Center Remote Installations. Environmental Restoration Program. August.

APPENDIX B
COMMUNITY INVOLVEMENT MATERIALS

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Affidavit of Publication

UNITED STATES OF AMERICA
STATE OF ALASKA } SS.
FOURTH DISTRICT

Before me, the undersigned, a notary public, this day personally appeared, Richard Harris who, being first duly sworn, according to law, says that he is the Publisher of the Fairbanks Daily News-Miner, a newspaper (i) published in newspaper format, (ii) distributed daily more than 50 weeks per year, (iii) with a total circulation of more than 500, (iv) holding, a second class mailing permit from the United States Postal Service, (v) not published primarily to distribute advertising, (vi) not intended for a particular professional or occupational group. The advertisement which is attached is a true copy of the advertisement published in said paper on the following day(s):

10/03/2020

and that the rate charged thereon is not excess of the rate charged private individuals, with the usual discounts.

Publisher
Subscribed to and sworn to me this 05th day of October, 2020

Alan Hoover, Notary Public in and for the State Alaska.
My commission expires: April 23, 2022
AP241707-607665-9072661126
STANTEC / USAF
725 E. FIREWEED LN #200
ANCHORAGE, AK 99503

ALAN H. HOOVER
Notary Public
State of Alaska
My Commission Expires Apr 23, 2022

607665

Public Notice
Pacific Air Forces
Regional Support Center
Environmental
Restoration Program
Five-Year Review
North River RRS

Public Notice – The Pacific Air Forces (PACAF) Environmental Restoration Program Office announces the beginning of the Five-Year Review process for North River RRS, Alaska. This process will document whether the remedies implemented at SS001 (Area C, Drum Storage Yard and PCB Trail) and SS003 (Area A, Drums and Stained Soil) remain protective of human health and the environment. The remedy for Site SS001 at the North River RRS includes offsite disposal of contaminated soil, capping, and LUCs. The remedy for Site SS003 includes the excavation of polychlorinated biphenyl (PCB)-impacted soil. For Sites SS001 and SS003, the remedy has been implemented to the extent practicable and is considered "Cleanup Complete with Institutional Controls" by the Alaska Department of Environmental Conservation.

The Department of Defense recognizes the importance of public participation in the PACAF Environmental Restoration Program and encourages your involvement. If you have any issues or concerns about North River RRS cleanup program, or if you have direct knowledge regarding the remedies, the Air Force would like to talk to you. Verbal and written comments to be included in the Five-Year Review may be provided to Mr. Robert Johnston, AFCEC Project Manager, by mail at 10471 20th Street, Suite 339, Joint Base Elmendorf-Richardson, AK 995062201, or by email at robert.johnston17@us.af.mil or by calling 18002224137. The Air Force requests that comments for the Five-Year Review be provided to the Air Force by November 9, 2020. Another public notice will be issued informing the community that the review is complete.

APPENDIX C
INTERVIEW RECORDS

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INTERVIEW DOCUMENTATION FORM

The following is a list of individuals interviewed for this five-year review. See the attached contact record(s) for a detailed summary of the interviews.

Name	Title/Position	Organization	Date
Dennis Shepard	Project Manager	ADEC	14 December 2020
Robert Johnston	Project Manager	AFCEC	15 December 2020

INTERVIEW RECORD

Site Name: North River Radio Relay Station		**EPA ID No.:** AK3570028685
Subject: Five-Year Review for Sites SS001 and SS003		**Time:** 11:41am **Date:**12/14/20
Type: ☐ Telephone ☐ Visit ☒ Other (email) **Location of Visit:**		☒ Incoming ☐ Outgoing

Contact Made By:

Name: Eric Rowney	**Title:** Senior Associate Engineer	**Organization:** Stantec

Individual Contacted:

Name: Dennis Shepard	**Title:** Restoration Manager	**Organization:** ADEC
Telephone No: 907-451-2180 **Fax No:** **E-Mail Address:** dennis.shepard@alaska.gov	**Street Address:** **City, State, Zip:**	

Summary Of Conversation

1. **Sites SS001 and SS003 include LUCs as part of the remedy. Are the LUCs functioning as expected?**
   Yes, from the information I have access to, LUCs are functioning as expected. I am also aware that the landowners have provided concurrence for the land use controls and deed restrictions in an Environmental covenant.

2. **Do you know of any problems or difficulties that have been encountered which have impacted remedy implementation or progress at these sites?**
   Yes. Residual contamination present in the fractured bedrock.
   If so, will any of these problems require changes to the ROD?
   YES it did. A ROD Amendment was signed in Jan 2020 which addressed issues impacting the remedy.

3. **Are you aware of any community concerns regarding these sites?**
   Yes.
   If so, please give details.
   I was present in Unalakleet during a January 2020 proposed plan public meeting for the FUDS Aircraft Control and Warning Station. A landowner with property in the general vicinity of the SS001 and SS003 sites attended. The property owner discussed her belief that additional contamination is present near the North River Air Force sites and impacting her property.

4. **Are you aware of any events, incidents, or activities at these sites such as vandalism, trespassing, or emergency responses from local authorities?**
   No.
   If so, please give details.

5. **Do you feel well informed about the site activities and progress?**
   Yes

6. **Do you have any general comments, suggestions, or recommendations regarding the management of these sites, remedy implementation, or ongoing work at the sites?**
   I comment on the work plans and reporting as they come in. The site is generally well managed.

7. **Do we have your permission to use your name in the Five-Year Review report and document the results of your interview in the report?**
   Please use DEC project manager.

INTERVIEW RECORD

Site Name: North River Radio Relay Station		**EPA ID No.:** AK3570028685
Subject: Five-Year Review for Sites SS001 and SS003	**Time:** 1:55 pm	**Date:** 12/15/20
Type: ☐ Telephone ☐ Visit ☒ Other (email) **Location of Visit:**	☒ Incoming ☐ Outgoing	

Contact Made By:

Name: Eric Rowney	**Title:** Senior Associate Engineer	**Organization:** Stantec

Individual Contacted:

Name: Robert Johnston	**Title:** Restoration Project Manager	**Organization:** AFCEC/CZOP
Telephone No: 907-552-7193 **Fax No:** **E-Mail Address:** robert.johnston.17@us.af.mil	**Street Address:** **City, State, Zip:**	

Summary Of Conversation

1. **Sites SS001 and SS003 include LUCs as part of the remedy. Have any breaches of the LUCs occurred or complaints been filed?**
   No
   If so, how were they addressed?

2. **How are LUCs being enforced? What is the enforcement plan in the event of an IC breach?**
   Currently they are being monitored on a yearly basis. Report the breach to ADEC and then investigate the problem and if needed award a contract to correct the problem.

3. **Do you have any general comments, suggestions, or recommendations regarding remedy implementation or ongoing work at the sites?**
   A new ROD amendment was signed between ADEC and the Air Force and a letter of deed restriction was signed by Air Force and both Native corporations

4. **Do we have your permission to use your name in the Five-Year Review report and document the results of your interview in the report?**
   Yes

APPENDIX D
SITE INSPECTION CHECKLISTS AND PHOTOLOGS, SEPTEMBER 2020

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Five-Year Review Site Inspection Checklist

I. SITE INFORMATION	
Site name: SS001 and SS003	**Date of inspection:** September 25, 2020
Location and Region: North River RRS, Unalakleet, AK / Region 10	**EPA ID:** AK3570028685
Agency, office, or company leading the five-year review: Stantec	**Weather/temperature:** Sunny, ~45F, winds calm

Remedy Includes: (Check all that apply)

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

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. **O&M site manager** __N/A_____ _____ _____
   Name Title Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions; ☐ Report attached _____
   _____

2. **O&M staff** _____N/A_____ _____ _____
   Name Title Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. _____
   Problems, suggestions; ☐ Report attached _____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency _____N/A _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached __None_____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____
_____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached _____
_____

4. **Other interviews** (optional) ☐ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED ☐ Applicable ☒ N/A

1. **O&M Documents**
   - ☐ O&M manual — ☐ Readily available — ☐ Up to date — ☐ N/A
   - ☐ As-built drawings — ☐ Readily available — ☐ Up to date — ☐ N/A
   - ☐ Maintenance logs — ☐ Readily available — ☐ Up to date — ☐ N/A

   Remarks_____

2. **Site-Specific Health and Safety Plan** ☐ Readily available ☐ Up to date ☐ N/A
   - ☐ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☐ N/A

   Remarks_____

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

   Remarks_____

4. **Permits and Service Agreements**
   - ☐ Air discharge permit — ☐ Readily available — ☐ Up to date — ☐ N/A
   - ☐ Effluent discharge — ☐ Readily available — ☐ Up to date — ☐ N/A
   - ☐ Waste disposal, POTW — ☐ Readily available — ☐ Up to date — ☐ N/A
   - ☐ Other permits_____ — ☐ Readily available — ☐ Up to date — ☐ N/A

   Remarks_____

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

   Remarks_____

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

   Remarks_____

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

   Remarks: _____

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

   Remarks_____

9. **Discharge Compliance Records**
   - ☐ Air — ☐ Readily available — ☐ Up to date — ☐ N/A
   - ☐ Water (effluent) — ☐ Readily available — ☐ Up to date — ☐ N/A

   Remarks_____

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

    Remarks_____

IV. O&M COSTS ☐ Applicable ☒ N/A

1. **O&M Organization** ☐ Applicable ☐ N/A
   - ☐ State in-house
   - ☐ Contractor for State
   - ☐ PRP in-house
   - ☐ Contractor for PRP
   - ☐ Federal Facility in-house
   - ☐ Contractor for Federal Facility
   - ☐ Other_____

2. **O&M Cost Records** ☐ Applicable ☐ N/A
   - ☐ Readily available
   - ☐ Up to date
   - ☐ Funding mechanism/agreement in place

   Original O&M cost estimate_____ ☐ Breakdown attached

   Total annual cost by year for review period if available

   From_____ To_____ _____ ☐ Breakdown attached
   Date Date Total cost

   From_____ To_____ _____ ☐ Breakdown attached
   Date Date Total cost

   From_____ To_____ _____ ☐ Breakdown attached
   Date Date Total cost

   From_____ To_____ _____ ☐ Breakdown attached
   Date Date Total cost

   From_____ To_____ _____ ☐ Breakdown attached
   Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period** ☐ Applicable ☐ N/A
   Describe costs and reasons: _____
   _____

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

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured ☐ N/A
   Remarks: Incomplete fencing (chain link and orange snow fence) used to restrict access.

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
   Remarks: Multiple “Keep Out” signs and “Danger” signs posted on fencing. Signs are legible.

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☒ Yes ☐ No ☐ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by): Annual LUC/ICs inspections.

Frequency _Annual, for first 5 years, first review to be in 2020._____

Responsible party/agency __USAF_____

Contact _____ _____ _____ _____

Name Title Date Phone no.

Reporting is up-to-date ☐ Yes ☐ No ☒ N/A

Reports are verified by the lead agency ☐ Yes ☐ No ☒ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ☒ N/A

Violations have been reported ☐ Yes ☐ No ☒ N/A

Other problems or suggestions: ☐ Report attached

_Annual LUC inspection not available for review. Signage posted at Site SS001 does not outline that the site access/use is limited by a LUC or whom to contact. Signage is not present at Site SS003 outlining outline that the site access/use is limited by a LUC or whom to contact._____

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

Remarks: The IC's outline in the ROD amendment are adequate. Adequate signage is not yet present at SS001 or SS003._____

_____

_____

D. General

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

Remarks: General area is used by local residents, but there is no sign of vandalism to the site.

2. **Land use changes on site** ☐ N/A

Remarks: Site SS001 continues to be used for landfarming activities to treat POL contaminated soil.

_____

3. **Land use changes off site** ☐ N/A

Remarks: No observable changes in land use.

_____

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

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

Remarks: Access road from the village of Unalakleet is drivable by four-wheel drive vehicles. River bank erosion near the access road could impede site access in the future.

B. Other Site Conditions

Remarks:

VII. LANDFILL COVERS ☒ Applicable ☐ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☒ Settlement not evident
   Areal extent_____ Depth_____
   Remarks_____

2. **Cracks** ☐ Location shown on site map ☒ Cracking not evident
   Lengths_____ Widths_____ Depths_____
   Remarks_____

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident
   Areal extent_____ Depth_____
   Remarks_____

4. **Holes** ☐ Location shown on site map ☒ Holes not evident
   Areal extent_____ Depth_____
   Remarks_____

5. **Vegetative Cover** ☒ Grass ☐ Cover properly established ☐ No signs of stress
   □ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks: The surface of Site SS001 is still being utilized for landfarming of POL contaminated soil. The cover of Site SS003 is predominately infilled with vegetation.

6. **Alternative Cover (armored rock, concrete, etc.)** ☒ N/A
   Remarks_____

7. **Bulges** ☐ Location shown on site map ☒ Bulges not evident
   Areal extent_____ Height_____
   Remarks:

8. **Wet Areas/Water Damage** ☒ Wet areas/water damage not evident
   ☐ Wet areas ☐ Location shown on site map Areal extent_____
   ☐ Ponding ☐ Location shown on site map Areal extent_____
   ☐ Seeps ☐ Location shown on site map Areal extent_____
   ☐ Soft subgrade ☐ Location shown on site map Areal extent_____
   Remarks:

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ☒ No evidence of slope instability
   Areal extent_____
   Remarks:

B. Benches ☐ Applicable ☒ N/A

(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** ☐ Location shown on site map ☐ N/A or okay
   Remarks_____
   _____

2. **Bench Breached** ☐ Location shown on site map ☐ N/A or okay
   Remarks_____
   _____

3. **Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay
   Remarks_____
   _____

C. Letdown Channels ☐ Applicable ☒ N/A

(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** ☐ Location shown on site map ☐ No evidence of settlement
   Areal extent_____ Depth_____
   Remarks_____
   _____

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation
   Material type_____ Areal extent_____
   Remarks_____
   _____

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion
   Areal extent_____ Depth_____
   Remarks: _____
   _____

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting
   Areal extent_____ Depth_____
   Remarks_____
   _____

5. **Obstructions** Type_____ ☐ No obstructions
   ☐ Location shown on site map Areal extent_____
   Size_____
   Remarks_____

6. **Excessive Vegetative Growth** Type_____
   ☐ No evidence of excessive growth
   ☐ Vegetation in channels does not obstruct flow
   ☐ Location shown on site map Areal extent_____
   Remarks_____
   _____

D. Cover Penetrations ☐ Applicable ☒ N/A

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

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

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

4. **Leachate Extraction Wells**
   ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
   ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
   Remarks_____
   _____

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

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

1. **Gas Treatment Facilities**
   ☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
   ☐ Good condition ☐ Needs Maintenance
   Remarks_____
   _____

2. **Gas Collection Wells, Manifolds and Piping**
   □ Good condition□ Needs Maintenance
   Remarks_____
   _____

3. **Gas Monitoring Facilities** (*e.g.,* gas monitoring of adjacent homes or buildings)
   ☐ Good condition ☐ Needs Maintenance ☐ N/A
   Remarks_____
   _____

F. Cover Drainage Layer ☐ Applicable ☒ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
   Remarks_____
   _____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
   Remarks_____
   _____

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

1. **Siltation** Areal extent_____ Depth_____ ☐ N/A
   ☐ Siltation not evident
   Remarks_____
   _____

2. **Erosion** Areal extent_____ Depth_____
   ☐ Erosion not evident
   Remarks_____
   _____

3. **Outlet Works** ☐ Functioning ☐ N/A
   Remarks_____
   _____

4. **Dam** ☐ Functioning ☐ N/A
   Remarks_____
   _____

H. Retaining Walls ☐ Applicable ☒ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
   Horizontal displacement_____ Vertical displacement_____
   Rotational displacement_____
   Remarks_____
   _____

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

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

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident
   Areal extent_____ Depth_____
   Remarks_There are no perimeter ditches around sites SS001 or SS003. Drainage off of Site SS001 and SS003 is managed by surface flow off site into the surrounding landscape._Site SS001 has some limited temporary ditching associated with landfarming activities which may collect some stormwater runoff._____

2. **Vegetative Growth** ☐ Location shown on site map ☒ N/A
☐ Vegetation does not impede flow
Areal extent_____ Type_____
Remarks_____
_____

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident
Areal extent_____ Depth_____
Remarks_____
_____

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

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
Areal extent_____ Depth_____
Remarks_____
_____

2. **Performance Monitoring** Type of monitoring_____
☐ Performance not monitored
Frequency_____ ☐ Evidence of breaching
Head differential_____
Remarks_____
_____

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

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

1. **Pumps, Wellhead Plumbing, and Electrical**
☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A
Remarks_____
_____
_____

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☐ Good condition ☐ Needs Maintenance
Remarks_____
_____

3. **Spare Parts and Equipment**
☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks_____
_____

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

1. **Collection Structures, Pumps, and Electrical**
☐ Good condition ☐ Needs Maintenance
Remarks_____
_____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☐ Good condition ☐ Needs Maintenance
Remarks_____
_____

3. **Spare Parts and Equipment**
☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks_____
_____

C. Treatment System ☐ Applicable ☒ N/A

1. **Treatment Train** (Check components that apply)
☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
☐ Air stripping ☐ Carbon adsorbers
☐ Filters_____
☐ Additive (*e.g.*, chelation agent, flocculent)_____
☐ Others_____
☐ Good condition ☐ Needs Maintenance
☐ Sampling ports properly marked and functional
☐ Sampling/maintenance log displayed and up to date
☐ Equipment properly identified
☐ Quantity of groundwater treated annually_____
☐ Quantity of surface water treated annually_____
Remarks_____
_____

2. **Electrical Enclosures and Panels** (properly rated and functional)
☐ N/A ☐ Good condition ☐ Needs Maintenance
Remarks_____
_____

3. **Tanks, Vaults, Storage Vessels**
☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs Maintenance
Remarks_____
_____

4. **Discharge Structure and Appurtenances**
☐ N/A ☐ Good condition ☐ Needs Maintenance
Remarks_____
_____

5. **Treatment Building(s)**
☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair
☐ Chemicals and equipment properly stored
Remarks_____
_____

6. **Monitoring Wells** (pump and treatment remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks_____
_____

D. Monitoring Data

1. Monitoring Data
☐ Is routinely submitted on time ☐ Is of acceptable quality

2. Monitoring data suggests:
☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☒ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☒ Good condition
☒ All required wells located ☐ Needs Maintenance ☐ N/A
All required wells were located. None of the wells are properly labelled on their exteriors.

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

There are no other remedies at the sites.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

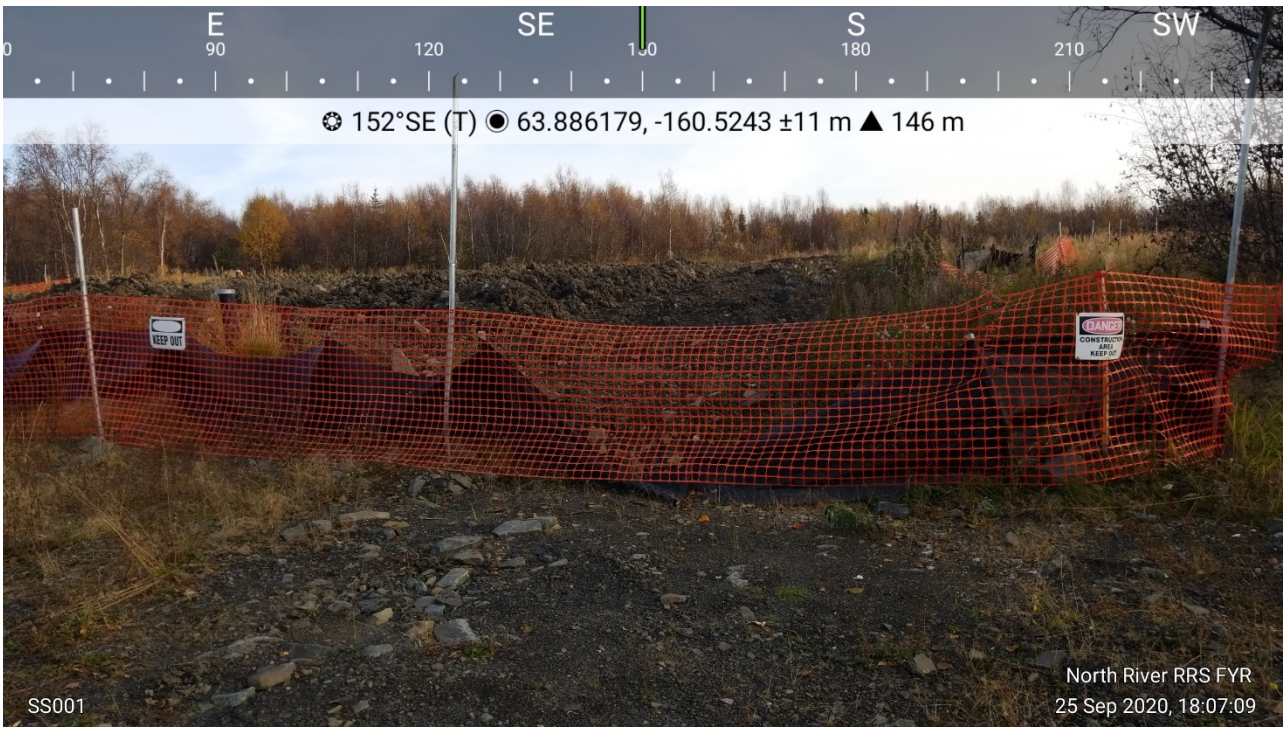
Notes: LUC signage is not present notifying people of the limitations associated with Sites SS001 and SS003.

B. Adequacy of O&M

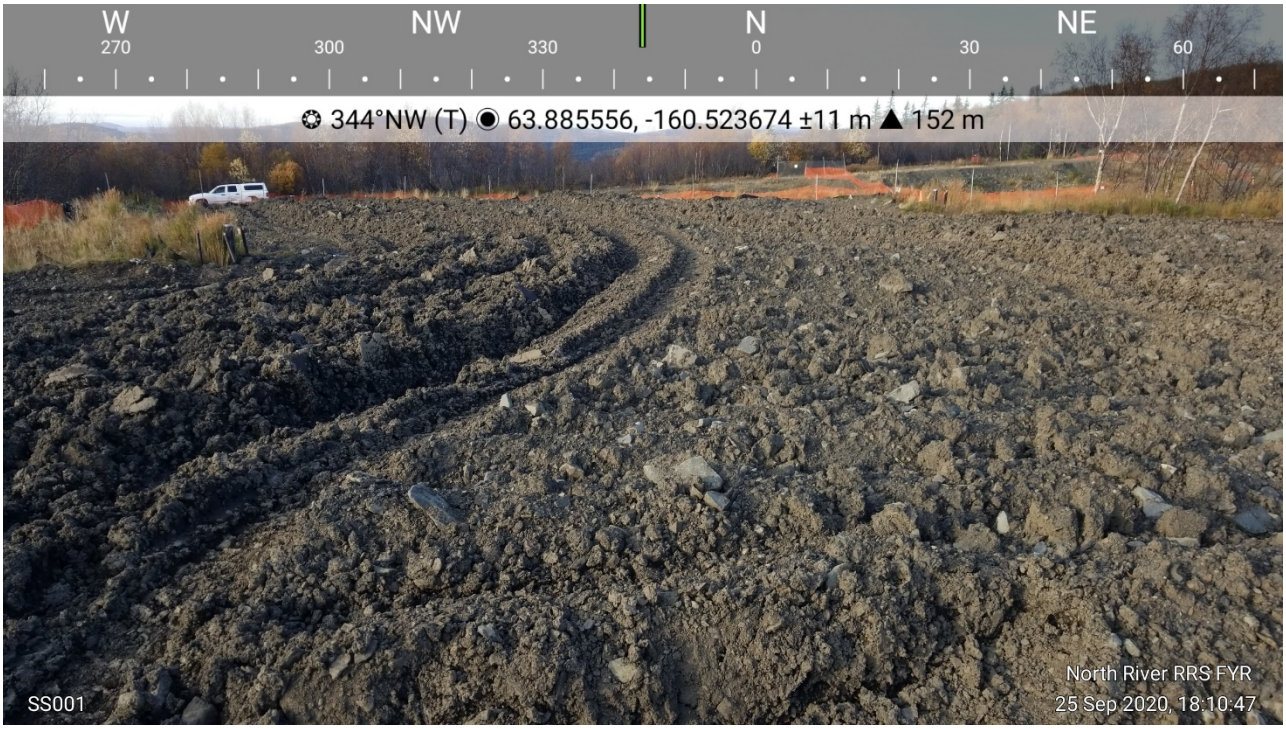
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.
_There are no O&M issues for the Site SS001 and Site SS003 remedies. _____
_____
_____
_____
_____
_____
_____
_____

C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future. _LUC signage is necessary at Sites SS001 and SS003 to limit future remedy problems._____

D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. _Optimization opportunities were not identified._____

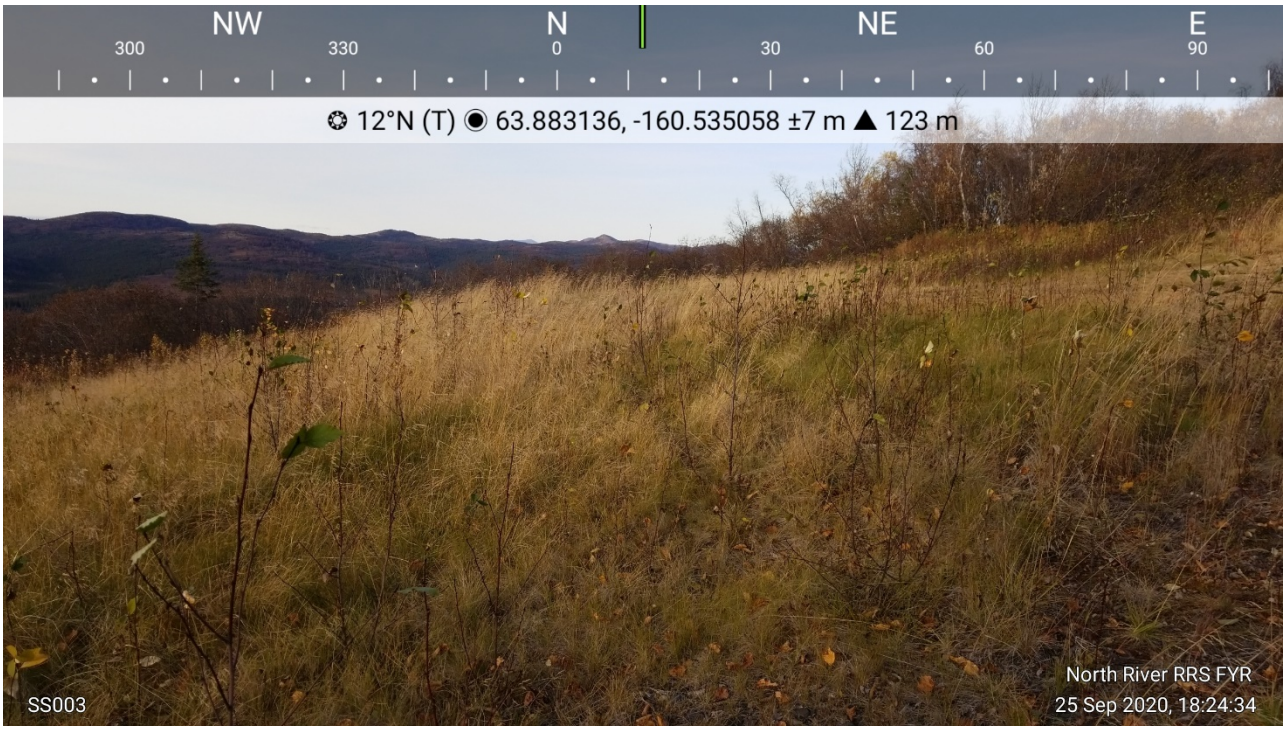


Site SS001 – Construction fencing with general warning signage in front of the Site SO001 soils being landfarmed on the surface of Site SS001.

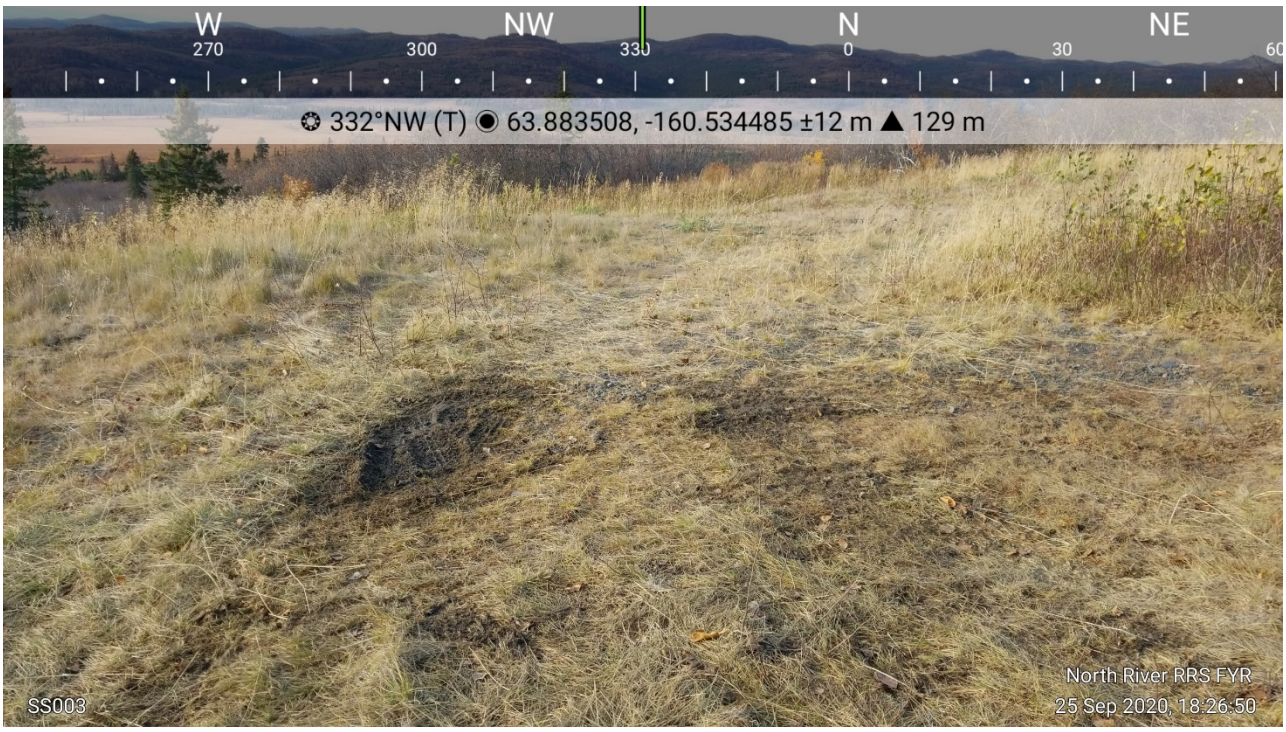


Site SS001 – Soils from Site SO001 being landfarmed on the surface of Site ST001.

Site SS001 – Incomplete fencing around the site.



Site SS003 – Vegetation growing over the capped area.



Site SS003 – Tire marks on the vegetative cover.

Site SS003 – Vegetation is limited in some areas, but appears to be infilling.

APPENDIX E
RESPONSE TO COMMENTS

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THE STATE of ALASKA
GOVERNOR MIKE DUNLEAVY

Department of Environmental Conservation

DIVISION OF SPILL PREVENTION AND RESPONSE
Contaminated Sites Program

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File: 630.38.001

November 02, 2021

Electronic Delivery Only
Mr. Robert Johnston
611 CES/CEVR
10471 20th Street, Suite 327
Elmendorf AFB, AK, 99506-2200

RE: DEC Backcheck for the *Draft Red-line 2021 CERCLA Five-Year Review for Site SS001 and Second CERCLA Five-Year Review for Site SS003 at the North River Radio Relay Station Unalakleet, Alaska, dated November 2021*

Dear Mr. Johnston:

The Alaska Department of Environmental Conservation (DEC) has completed a backcheck review of the above referenced document, received November 2, 2021. This Five-Year Review (FYR) evaluates the implementation and performance of the remedies for the sites in order to determine if the remedies are, and will continue to be, protective of human health and the environment. This FYR covers a period between 6/30/2015 and 9/30/2020.

DEC provided comments for the draft document on October 7, 2021. Based on the backcheck review of the draft red-line version, all DEC comments have been sufficiently addressed. Please provide a Final clean version for formal approval.

If you have any questions, please do not hesitate to contact the DEC project manager at (907) 451-2156, or by email at axl.levan@alaska.gov.

Sincerely,

Dennis Shepard
Environmental Program Specialist

cc via email: Melinda Brunner, DEC
Axl LeVan, DEC

Enclosure: DEC Comment Matrix

Alaska Department of Environmental Conservation
Contaminated Sites Program

DEC review comments for the
Draft 2021 First CERCLA Five-Year Review for Site SS001 and Second CERCLA Five-Year Review for Site SS003 at the North River Radio Relay Station Unalakleet, Alaska, dated August 2021

October 7, 2021

Comment No.	Page	Section	Comment / Recommendation	Response
1.	General		As discussed in the letter from the first backcheck of the "Draft 2021 Remedial Action-Operations and Long-Term Management Work Plan, North River Radio Relay Station, SO001, SS001, and SS003, dated May 2021" there are remaining contaminants of potential concern (COPC) above 18 AAC 75.345 Table C Cleanup levels in the groundwater at Site SS001. These exceedances are documented in the Final 2019 and Draft 2020 IC/LUC reports for North River Radio Relay Station, SO001, SS001, and SS003. Delineation is required to ensure the remedy is protective given the newly identified COPCs. DEC requested the USAF provide a schedule by August 1, 2021 to achieve these requirements. Based on the 2019 Technical Project Report, the five VOCs detected above ADEC Table C Cleanup Level's are: Bromodichloromethane, cis-1,2-Dichloroethene, Tetrachloroethene (PCE), 1,1,2-Trichloroethane, and Trichloroethylene (TCE), in C-MW07. Three of these were detected in 2020 in C-MW15. Add a plan for delineation for SS001 to this five-year review within the recommendation section. This recommendation should	Agreed. Recommendation added for SS001 to further evaluate VOCs and to determine if changes to the ROD are required.. Additionally, Text was added to Section II Response Action Summary detailing the sampling results from 2019 and 2020. Figure 3 was added showing the most recent sampling results from 2020. **DEC Accepts 11/02/2021**

Comment No.	Page	Section	Comment / Recommendation	Response
			outline that a supplemental RI will be performed to delineate the extent of the above COPCs. Based on this supplemental RI results, action regarding the COPCs may be required.	
2.	1	1.0	"The status of Sites SS001 and SS003 are listed in the Alaska Department of Environmental Conservation (ADEC) Contaminated Sites Database as "Open" (ADEC, 2020a)." The sites are listed as Active on the contaminated sites list. Replace Open with Active. Additionally, remove a zero from SS0001.	Agreed. Status will be changed to Active. Note that the ADEC CS Database state that the site is "Open". **DEC Accepts 11/02/2021** Please note that the DEC Internal database indicates "Active" for both these sites, However, the Public facing CSP Contaminated Sites Search does indicate "OPEN".
3.	5	Response Action Summary	Text states: "Additionally, residual range organics (RRO) detected in soil at Site SS003 exceeded the 18 Alaska Administrative Code (AAC) 75 Method Two soil cleanup level (Table B2) (ADEC, 2020b) and a response action was determined to be warranted under State of Alaska regulations." DEC notes that POL contamination that is comingled with CERCLA contaminants should be assessed and addressed under CERCLA.	Agreed. Sentence revised. "and a response action was determined to be warranted under State of Alaska regulations" has been removed for clarity. **DEC Accepts 11/02/2021**
4.	5	2	"Groundwater is only present at Site SS001; however, groundwater sample results were less than one-tenth of the ADEC cleanup levels and, as such, a risk evaluation of groundwater concentration was not necessary (USAF, 2019a)." In 2019 and 2020 sampling results indicated that a few COPCs (five VOC) have been detected above the ADEC 18 AAC 75.345	Agreed- Note the original date for inclusion of monitoring data was sampling data from 2018, but has now been revised to incorporate both the 2019 and 2020 sampling

Comment No.	Page	Section	Comment / Recommendation	Response
			Table C cleanup levels (CULs), and therefore above a carcinogenic risk level of $1x10^{-5.}$ The USAF must consider these contaminants in assessing the protectiveness of its remedy. Please revise the text to indicate the risk from the COPCs will be calculated once the nature and extent of contamination is understood. A change to the decision document (i.e. memo for the record, explanation of significant differences, record of decision amendment) may be necessary, pending the results of the characterization and risk assessment.	data. Section II has been updated and Figure 3 also added to detail the most recent sampling results. **DEC Accepts 11/02/2021**
5.	8	Response Actions	Add the COPC information for SS001 at the end of the bullet points. Since it directly related to the third to last bullet point.	Agreed-. information for SS001 has been added to the bullet list detailing the exceedances of ADEC Table C Cleanup Levels. **DEC Accepts 11/02/2021**
6.	19	FYR and Periodic Review Process	DEC suggests that a radio message may be appropriate in the future to see if it increases local participation during the Five-Year Review process.	Noted.
7.	20	Data Review	Text states: "All groundwater samples were below 18 AAC 75 Groundwater Cleanup Levels (Table C) (ADEC, 2020b)." DEC notes that this was true in 2015/2016 groundwater monitoring events, but as noted above COPCs have been detected about Table C Cleanup Levels at site SS001 in 2019 and 2020.	Agreed. See comment 4. **DEC Accepts 11/02/2021**
8.	23	Question A	DEC disagrees that the remedy is functioning as intended by the decision document. The remedy is not complete, as the land use controls (LUCs) have not been fully implemented. The LUC boundaries have not been incorporated into the base master plan, Geographical Information System (GIS), and LUC Management	Agree. Although the LUCs had not yet been implemented, the presence of the soil cap over the two sites is short term protective. First sentence revised as follows:

Comment No.	Page	Section	Comment / Recommendation	Response
			Plan as required by the record of decision (ROD) amendment; in the absence of this, it is unclear how the USAF is meeting the ROD requirement to use the base dig permitting process and construction review process to control exposure at the site. The notice of activity and use limitations (NAUL) and covenant have not been applied to the properties, as required by the ROD amendment. Signs denoting risk required by the ROD were not present during the site inspection. Additionally, given the unknown extent of the VOC contamination, it is unclear if the remedy as adopted would adequately address the risk. Revise the text.	*"The review of documents, site data, and the results of the site inspections indicate that the soil remedy at Sites SS001 and SS003 is functioning as intended by the North River RRS ROD Amendment (USAF, 2019a), however the LUCs have not been fully implemented."* Note that the ADEC Interview dated 12-14-2020 stated that remedy was functioning as intended. **DEC Accepts 11/02/2021**
9.	24	Question C	DEC considers the COPCs at SS001 detected above promulgated risk-based cleanup levels additional information that has come into light. Until delineated, and assessed for risk, the COPCs in groundwater do call into question the effectiveness of the remedy. Revise the text.	Noted. Protectiveness generally cannot be revised in the FYR for COPCs that are not addressed in the ROD. A rod Amendment is recommended to address any additional COPCs identified that are not addressed in the current ROD. **DEC Accepts 11/02/2021**
10.	25	Issue Category: Institutional Controls	DEC believes the LUC boundaries not being in the LUC Management Plan, the NAUL and covenant not being recorded for the properties, and the lack of signage all affect current protectiveness. Revise the text.	Noted. The LUC Management Plan is currently being updated with an anticipated mid 2022 publication date, which will incorporate the new site boundary

Comment No.	Page	Section	Comment / Recommendation	Response
				for SS001 as shown in Figure 2 Site Map of this FYR. The USAF is managing the site per this figure regardless of the publication date of the LUC Management Plan update. **DEC Accepts 11/02/2021**
11.	27	Protective-ness Statements	DEC disagrees that the remedy is short-term protective. Per EPA's OSWER 9200.2-111, a remedy should be considered "protectiveness deferred" if there is a contaminant is present and the current risk has not been evaluated. Given the concentrations of five VOCs in groundwater at SS001 above DEC's promulgated cleanup levels, and the lack of risk evaluation for these five VOCs, the protectiveness of the current remedy should be deferred pending delineation and risk assessment.	**Agree:** The protectiveness statement has been revised to "protectiveness deferred" based on the presence of the five VOCs in groundwater at SS001. **DEC Accepts 11/02/2021**
12.	Figure 2		Since the COPC were discovered by the Monitoring Wells they should be included in the figure for reference.	**Agree:** Figure 3 had been added to incorporate the 2019 and 2020 groundwater monitoring data. **DEC Accepts 11/02/2021**
End of comments.				