FINAL

ACTION MEMORANDUM

FOR

FIRING RANGES 3 AND 4 REMOVAL ACTION

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
PLUM BROOK STATION
SANDUSKY, OHIO

Prepared for:

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July 17, 2020

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NATIONAL AERONAUTICS SPACE ADMINISTRATION
JOHN H. GLENN RESEARCH CENTER

MEMORANDUM

DATE: July 17, 2020

SUBJECT: Approval and Funding for a Non-Time-Critical Removal Action at Firing Ranges 3 and 4, NASA Plum Brook Station, Sandusky, Erie County, Ohio

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ACRONYMS AND ABBREVIATIONS

AM	Action Memorandum
ARAR	Applicable or Relevant and Appropriate Requirement
bgs	Below Ground Surface
BGSU	Bowling Green State University
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIP	Community Involvement Plan
COC	Chemical of Concern
COMETS	Construction, Maintenance, Environmental and Testing Services
DOI	Department of the Interior
EE/CA	Engineering Evaluation/Cost Analysis
EnviroScience	EnviroScience, Inc.
ESV	Ecological Screening Value
FE	Federal Endangered
FT	Federal Threatened
GRC	Glenn Research Center
ID	Identifier
LDR	Land Disposal Restriction
MCL	Maximum Contaminant Level
mg/kg	Milligrams per Kilogram
NACA	National Advisory Committee for Aeronautics
NASA	National Aeronautics and Space Administration
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NFA	No Further Action
NPL	National Priorities List
NTCRA	Non-Time-Critical Removal Action
OAC	Ohio Administrative Code
Ohio EPA	Ohio Environmental Protection Agency
PA	Preliminary Assessment
PAH	Polycyclic Aromatic Hydrocarbon
PBOW	Plum Brook Ordnance Works
PBS	Plum Brook Station
PCB	Polychlorinated Biphenyl
RA	Removal Action
RAO	Removal Action Objective
RAWP	Removal Action Work Plan
RCI	Reactivity, Corrosivity, and Ignitability
RCLA	Rail Car Loading Area
RCRA	Resource Conservation and Recovery Act
RSE	Removal Site Evaluation
RSL	Regional Screening Level
SAIC	Science Applications International Corporation
SEMS	Superfund Enterprise Management System
SI	Site Inspection
SVOC	Semivolatile Organic Compound
TCLP	Toxicity Characteristic Leaching Procedure
TNT	2,4,6-Trinitrotoluene
URS	URS Corporation

ACRONYMS AND ABBREVIATIONS (Continued)

USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
VSI	Visual Site Inspection
VOC	Volatile Organic Compound

OVERVIEW

A PURPOSE

The National Aeronautics and Space Administration (NASA), in accordance with its delegated authority under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 104 and Executive Order (EO) 12580, has agreed to proceed with a non-time-critical removal action (NTCRA) for antimony-, arsenic-, lead-, and polycyclic aromatic hydrocarbon (PAH)-contaminated soil (and the former wooden blast wall) within Firing Ranges 3 and 4 located at the Plum Brook Station (PBS) in Sandusky, Ohio.

This Action Memorandum (AM) was prepared by Leidos under the Construction, Maintenance, Environmental and Testing Services (COMETS) Contract Number 80GRC018C0022, Subcontract Number FA8-1-S1, Task Order Number E117. This AM is the primary decision document in establishing the Administrative Record for selecting the NTCRA responses per Section 113(k) of CERCLA and provides the following in accordance with the *Superfund Removal Guidance for Preparing Action Memoranda* (USEPA 2009):

- Determines the need for a CERCLA removal action (RA),
- Authorizes the RA,
- Identifies the action and cleanup levels (if applicable), and
- Explains the rationale for the removal response.

B NON-TIME-CRITICAL REMOVAL ACTION

The NTCRA can provide substantial risk reduction at a site by addressing specific problems without requiring time-consuming investigation and decision-making (USEPA 1992). The NTCRA generally attempts to control the source of contamination and can be used to remediate a site completely (DOE 1998). The purpose of the NTCRA at Firing Ranges 3 and 4 is to remove the sources of contamination, allowing for potential future unrestricted use.

This NTCRA process follows the Administrative Record requirements presented in Exhibit 2 of the *Superfund Removal Guidance for Preparing Action Memoranda* (USEPA 2009) and shown in **Figure 1**. NASA is the lead agency responsible for implementing the NTCRA and developed the *Firing Ranges 3 and 4 Removal Site Evaluation Report* (Leidos 2019) that contains all of the requirements of, and is equivalent to, an Engineering Evaluation/Cost Analysis (EE/CA) in accordance with *Guidance for Conducting Non-Time-Critical Removal Actions Under CERCLA* (USEPA 1993).

C PUBLIC NOTIFICATION AND COMMENT PERIOD

Section 113(k)(2) of CERCLA provides for involving communities affected by response decisions at Superfund sites. To ensure public involvement of this NTCRA, NASA issued a notice of availability for the Firing Ranges 3 and 4 Removal Site Evaluation (RSE) Report on January 17, 2020, seeking public input of the final remedy selection. The notice of availability was published in the local newspaper, the *Sandusky Register*, on the same date mentioned above. The RSE Report and other project-related documents were made available to the public in the Information Repository maintained at the Bowling Green State University (BGSU) Firelands Library located at 1 University Drive, Huron, Ohio. No written comments were received during the public comment period.

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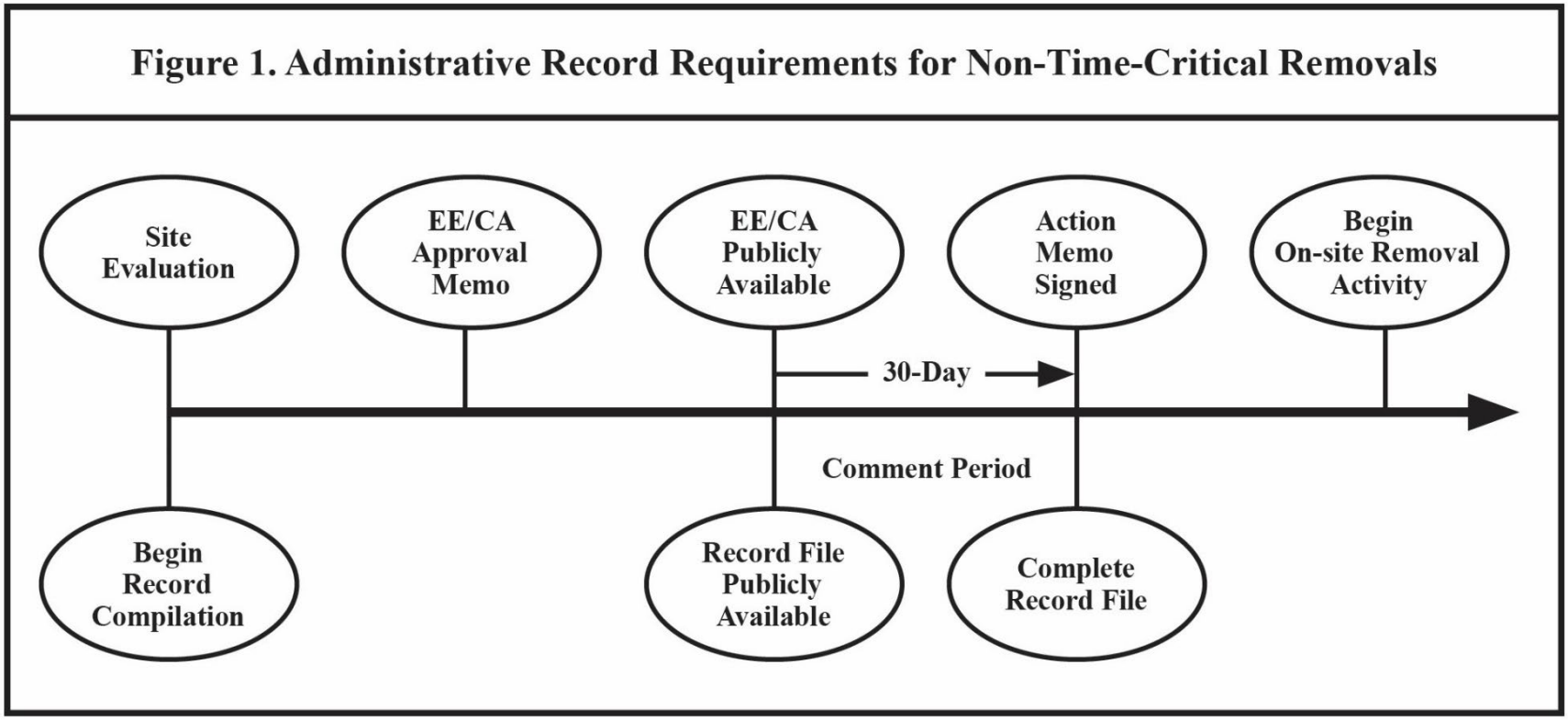

Figure 1. Administrative Record Requirements for Non-Time-Critical Removals

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NASA is developing a Community Involvement Plan (CIP) for seven sites at PBS under the CERCLA process, including Firing Ranges 3 and 4, to ensure the public has convenient access to information regarding project progress. The NASA PBS community relations program interacts with the public through news releases and public meetings with local officials, interest groups, and the general public.

D ACTION MEMORANDUM ORGANIZATION

This document meets the AM purpose and follows the basic AM outline, as presented in the *Superfund Removal Guidance for Preparing Action Memoranda* (USEPA 2009).

E NASA CERCLA AUTHORITY

Section 104 of CERCLA provides broad response action authority to the President. The President has delegated this authority to the heads of Executive departments and agencies by EO 12580 (President of the United States of America, January 29, 1987), *Superfund Implementation*, as amended. In general, EO 12580 delegated to NASA response authority "…with respect to remedial actions for releases or threatened releases which are not on the National Priorities List ("the NPL") and removal actions other than emergencies, where either the release is on or the sole source of the release is from any facility or vessel under the jurisdiction, custody or control of ..." NASA.

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PART I: PURPOSE

The purpose of this AM is to request and document approval of the selected RA of antimony-, arsenic-, lead-, and PAH-contaminated soil (and the former wooden blast wall) within Firing Ranges 3 and 4 located at the NASA PBS in Sandusky, Ohio.

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PART II: SITE CONDITIONS AND BACKGROUND

PBS is located in southern Erie County, Ohio, approximately 3 miles south of Sandusky, Ohio, and approximately 50 miles west of the NASA John H. Glenn Research Center (GRC) at Lewis Field in Cleveland, Ohio (**Figure 2**). The PBS facility encompasses approximately 6,740 acres (Leidos 2018). Most of PBS is in Perkins and Oxford Townships, with some lands in Huron and Milan Townships.

Firing Ranges 3 and 4 are located north of and adjacent to a railroad spur near the south-central portion of PBS **(Figure 3)**. NASA is implementing an NTCRA process to address human health and ecological risk identified in the soil present in the Firing Range 3 Shooting Areas and Firing Ranges 3 and 4 Target Areas at PBS. The selected action will remove the antimony-, arsenic-, lead-, and PAH-contaminated soil (and the former wooden blast wall) to protect human and ecological receptors.

The U.S. Environmental Protection Agency (USEPA) site identifier (ID) for PBS is OH3800015379. Firing Ranges 3 and 4 do not have a specific site ID assigned. The following subsections present the site conditions and background of the proposed removal area.

A SITE DESCRIPTION

Firing Ranges 3 and 4 are located north and adjacent to a railroad spur near the south-central portion of PBS (**Figure 3**). This railroad spur was utilized for 2,4,6-trinitrotoluene (TNT) loading onto railcars during the active operation of the Plum Brook Ordnance Works (PBOW) from 1941 to 1945. The railroad spur at this location joined to the Baltimore and Ohio Railroad west of the facility fence line. During operation, a blast wall was used to protect workers while the railcars were being loaded and unloaded with potentially explosive or highly reactive materials (e.g., munitions). The blast wall was constructed of a wood exterior and was typically 20 feet high, 12 feet wide at the base, and approximately 5 feet wide at the top. The interiors of the walls were filled with soil to provide additional mass to deflect and absorb the force of a blast (URS 1996). The U.S. Army Corps of Engineers (USACE) Huntington District concluded that no further investigation is required for activities associated with this former PBOW Rail Car Loading Area (RCLA).

Firing Ranges at PBS have been utilized at various times since the mid-1960s and are no longer active at the facility. The bullet impact areas for Firing Ranges 3 and 4 utilize the same blast protection wall utilized for railcar loading. Both ranges are currently overgrown with small trees and brush, and the blast wall has deteriorated.

Firing Range 3 used the southern face of the former blast wall as a backstop. The western side of this 150-foot-long blast wall was extensively used for qualifying. After Firing Range 3 was abandoned, the other side of the blast wall was used as a backstop for Firing Range 4. Due to the concern that bullets from Firing Range 4 could penetrate the decaying wall, a 20- by 20-foot pile of dirt was placed in front of the southern face of the blast wall as a safety precaution, thus burying the back and target areas of Firing Range 3 (URS 1996).

Firing Range 4 was established in 1982 and shared the opposite side of the blast wall used by Firing Range 3 (URS 1996). This was the most extensively used firing range at PBS. The entire 150-foot length of the wall has been used as a backstop or target area. The western side has shooting areas at 50, 75, and 100 feet, and the rest of the wall has shooting areas at 50 and 75 feet. Much of the blast wall has failed due to the large number of bullets fired into it. The soil contained within the blast wall has spilled out and collected on the ground surface. A pile of soil was placed against the southern side of the blast wall in Firing Range 3 to support the blast wall (Leidos 2016a).

Figure 2. NASA PBS Location in Ohio

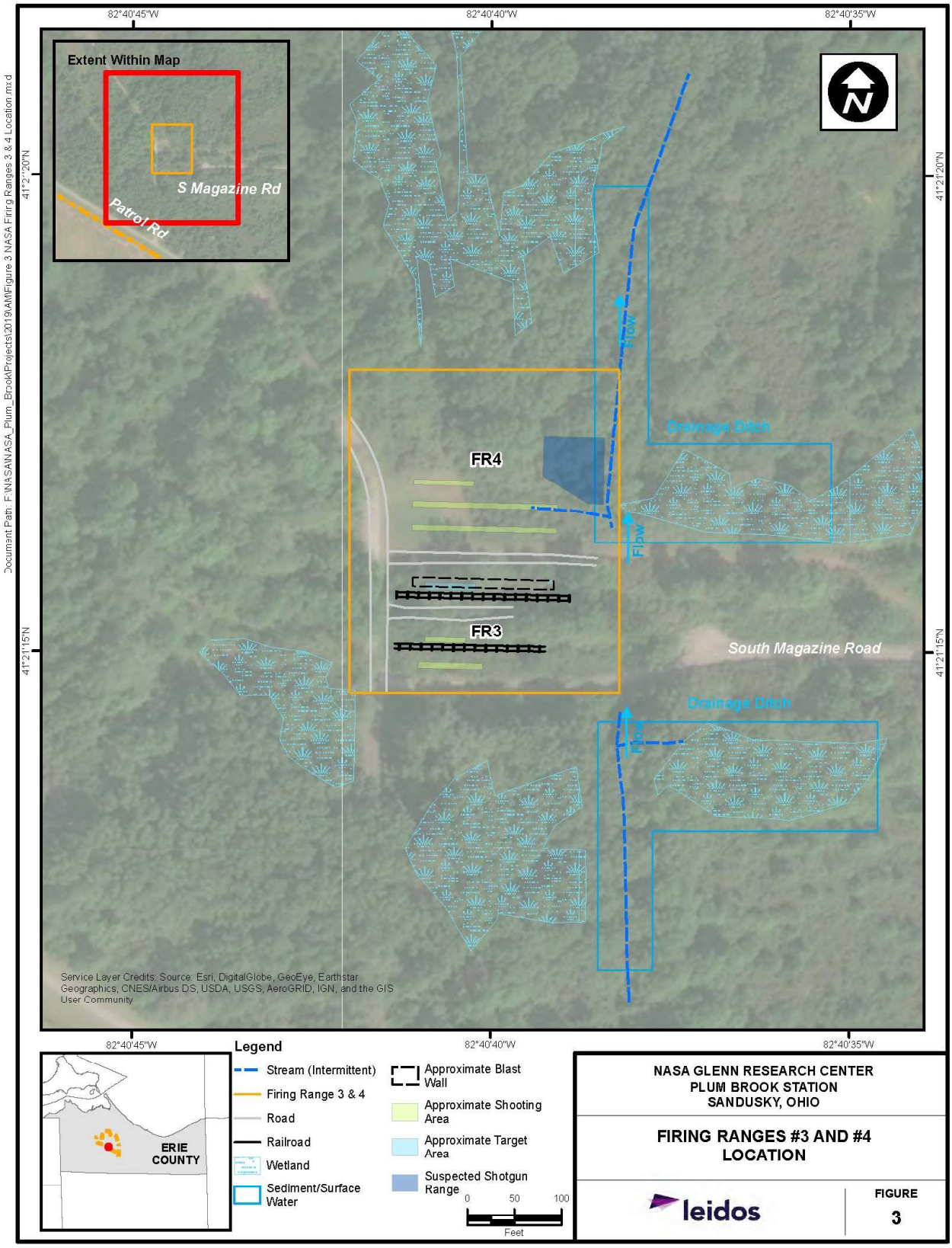

Figure 3. Firing Ranges 3 and 4 Location

Based on field observations during the 2006 investigation, an additional suspected shotgun range was identified and believed to be associated with Firing Range 4. It is unclear what type of range was utilized (e.g., trap or skeet). The range is believed to be located immediately to the northeast of the firing range (Leidos 2016a). An unnamed tributary to Plum Brook flows along the eastern boundary of the suspected shotgun range.

A.1 Removal Site Evaluation

Multiple environmental investigations have been conducted at NASA PBS and the former PBOW for numerous sites across the facility. These investigations provided limited information on Firing Ranges 3 and 4 and no environmental sample analytical results. These reports included:

- The *Plum Brook Station Preliminary Assessment* was conducted by Science Applications International Corporation (SAIC) in 1991 in accordance with USEPA regulations and guidance promulgated under CERCLA/Superfund Amendments and Reauthorization Act authority to determine if any release of hazardous substances from the facility had occurred that posed a potential threat to human health and the environment. The Preliminary Assessment (PA) included recommendations for further investigations for 13 Operable Units (SAIC 1991) but did not include a recommendation for the firing ranges.
- In 1996, URS Corporation (URS) prepared the *Work Plan for Site Investigation of Plum Brook Station Firing Ranges* (URS 1996). The work plan provided information on the physical setting and history of the firing ranges.
- The *Preliminary Assessment/Visual Site Inspection (PA/VSI) Report for NASA Plum Brook Station* (TechLaw 1998) presents cursory information on Firing Ranges 3 and 4. A history of the operations at PBS and regulatory actions is included in the PA/VSI (TechLaw 1998). The PA/VSI included recommendations for further investigation for 20 solid waste management units.

The first report to present detailed information on Firing Ranges 3 and 4 is the Site Inspection (SI) conducted by SAIC in 2006 and by Leidos in 2015. The SI was conducted under two separate field investigations, as described in the approved *Site Investigation of NASA GRC Plum Brook Station Firing Ranges Sampling and Analysis Plan* (SAIC 2006) and the approved *Multi-Site Characterization Sampling and Analysis Plan* (SAIC 2011). The 2015 investigation was completed to address data gaps identified from the initial investigation completed in 2006.

The 2006 SI identified data gaps and recommended further evaluation of an unnamed tributary to Plum Brook that lies approximately northeast of the shotgun practice area. Due to the potential for migration of contaminants (e.g., shotgun pellets) via overland flow/runoff and/or direct fire into the tributary, sampling of surface water and sediment downgradient from Firing Range 4 was recommended. Leidos completed this sampling in 2015, and the results are presented in the *NASA Plum Brook Station Firing Range Site Investigation Report, Revision 1* (Leidos 2016a).

The 2015 SI concluded that due to the need to determine the nature and extent of contamination in soils, sediment, and surface water at Firing Ranges 3 and 4, further evaluation (i.e., a Remedial Investigation or RSE) was recommended.

The RSE was conducted in January 2017 and updated in December 2019. A total of three surface water, five sediment, five soil, and two groundwater samples, including three duplicates (one each for surface water, sediment, and soil), were collected. Sampling locations were selected based on SI analytical results in order to further evaluate potential risk to ecological receptors and human health and further define the extent of contamination. Surface water and sediment samples collected during the RSE were analyzed for

metals and PAHs. Soil samples collected during the RSE were analyzed for lead and/or PAHs. A limited number of groundwater samples were collected from temporary monitoring wells during the RSE and are not reflective of groundwater conditions at PBS. The surface water, sediment, and soil SI and RSE sample analytical results and streamlined risk assessment conclusions provided evidence to conclude that the nature and extent of contamination at Firing Ranges 3 and 4 have been sufficiently defined for these media (Leidos 2019).

Streamlined risk assessments were conducted in accordance with USEPA's guidance for conducting NTCRAs (USEPA 1993). Surface water SI and RSE sampling results were compared to background and the USEPA Regional Screening Levels (RSLs) for tap water (USEPA 2019a), USEPA maximum contaminant levels (MCLs) (USEPA 2019b), and Ohio Water Quality Standards for drinking and non-drinking water exposures (Ohio EPA 2009). Sediment SI and RSE sampling results were compared to Ohio sediment reference values (Ohio EPA 2008), USEPA residential soil RSLs (USEPA 2016), and USEPA ecological screening values (ESVs) (USEPA 2003 and 2010). Soil SI and RSE sampling results were compared to background values (IT 1998), USEPA residential RSLs (USEPA 2016, 2017, and 2019b), and USEPA ESVs (USEPA 2003 and 2010). Due to the questionable nature of the groundwater data collected during the RSE, groundwater sampling results were not evaluated in the streamlined risk assessments. The limited quantity and poor quality of groundwater encountered in the unconsolidated lithology at Firing Ranges 3 and 4 appears consistent with previous groundwater findings at other sites at NASA PBS. The recommended RA activities, discussed below, include confirmation groundwater sampling to determine whether soil contamination from historical operations at Firing Ranges 3 and 4 has impacted groundwater (Leidos 2019).

The human health risk evaluation concluded no chemicals of concern (COCs) requiring remediation are present in sediment and surface water at Firing Ranges 3 and 4. However, COCs requiring remediation in soil are present in the Firing Range 3 Shooting Areas (lead) and Firing Ranges 3 and 4 Target Areas (antimony, arsenic, lead, and PAHs) (Leidos 2019). The sampling locations exceeding lead screening levels for human health are presented in **Figure 4,** and the sampling locations exceeding PAH screening levels for human health are presented in **Figure 5**.

The ecological evaluation concluded no COCs requiring remediation are present in sediment and surface water at Firing Ranges 3 and 4. In addition, the evaluation concluded no remediation of soil is recommended for protection of ecological receptors at Firing Ranges 3 and 4. However, removal of soil with human health screening level exceedances for lead at the Firing Range 3 Shooting Area and lead and benzo(a)pyrene at the Firing Ranges 3 and 4 Target Area would secondarily protect ecological receptors (Leidos 2019).

A.2 Physical Location

Firing Ranges 3 and 4 are located in the south-central portion of PBS. PBS is located in southern Erie County, Ohio, approximately 3 miles south of Sandusky, Ohio, and approximately 50 miles west of the NASA GRC at Lewis Field in Cleveland, Ohio (**Figure 2**). The PBS facility encompasses approximately 6,740 acres (Leidos 2018) and is depicted in two adjacent U.S. Geological Survey (USGS) 7.5-minute series topographic maps: Sandusky Quadrangle (northern portion of the facility) and Kimball Quadrangle (southern portion of the facility). Most of PBS is in Perkins and Oxford Townships, with some lands in Huron and Milan Townships. The site boundaries are Bogart Road to the north, Mason Road to the south, U.S. Highway 250 to the east, and County Road 43 to the west. The northernmost point is at latitude 41°23'39"N, and the southernmost point is at 41°20'04"N. The westernmost point is at longitude 82°43'12"W, and the easternmost point is at 82°38'39"W (MK 1994).

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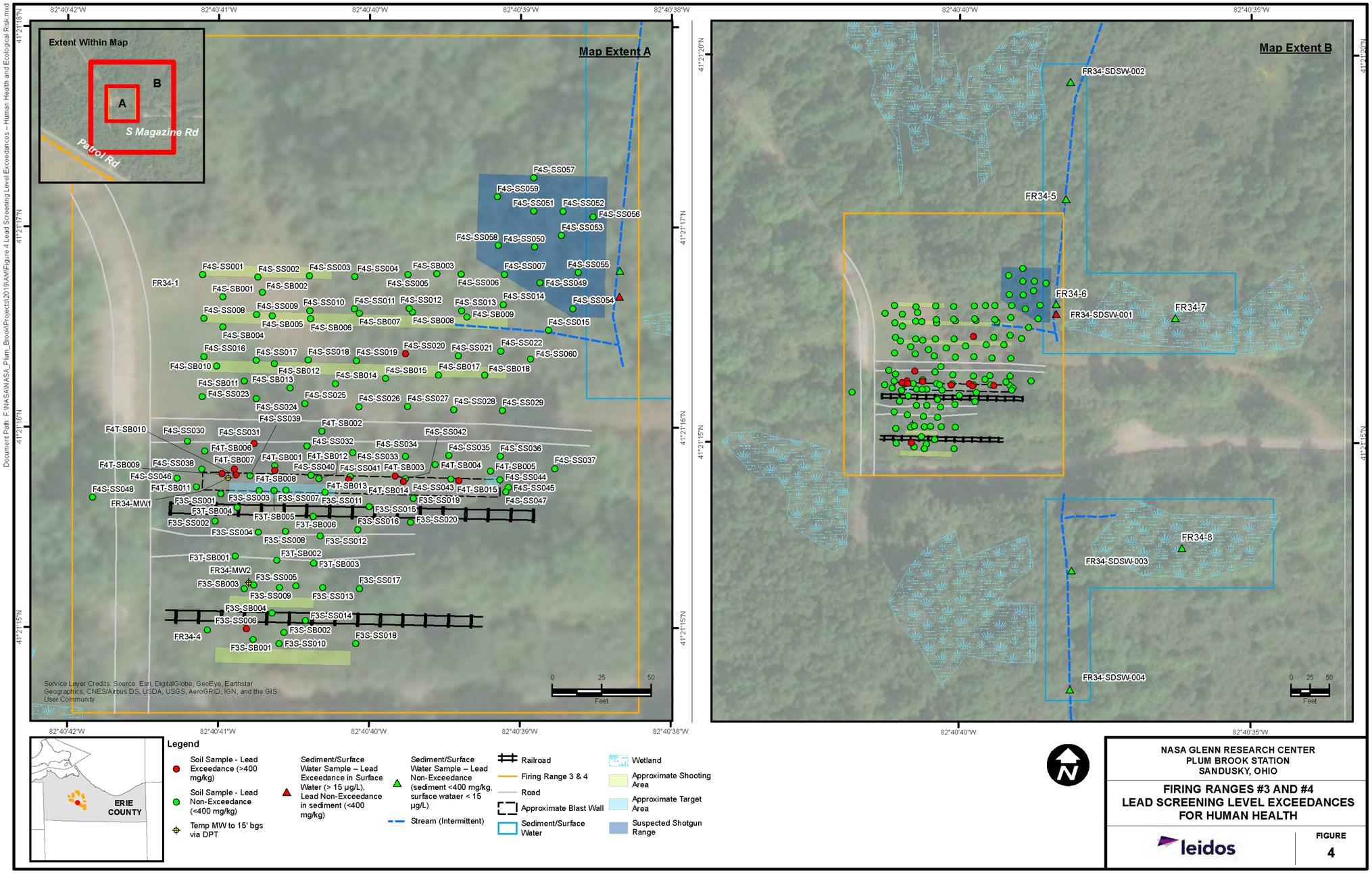

Figure 4. Firing Ranges 3 and 4 Lead Screening Level Exceedances for Human Health

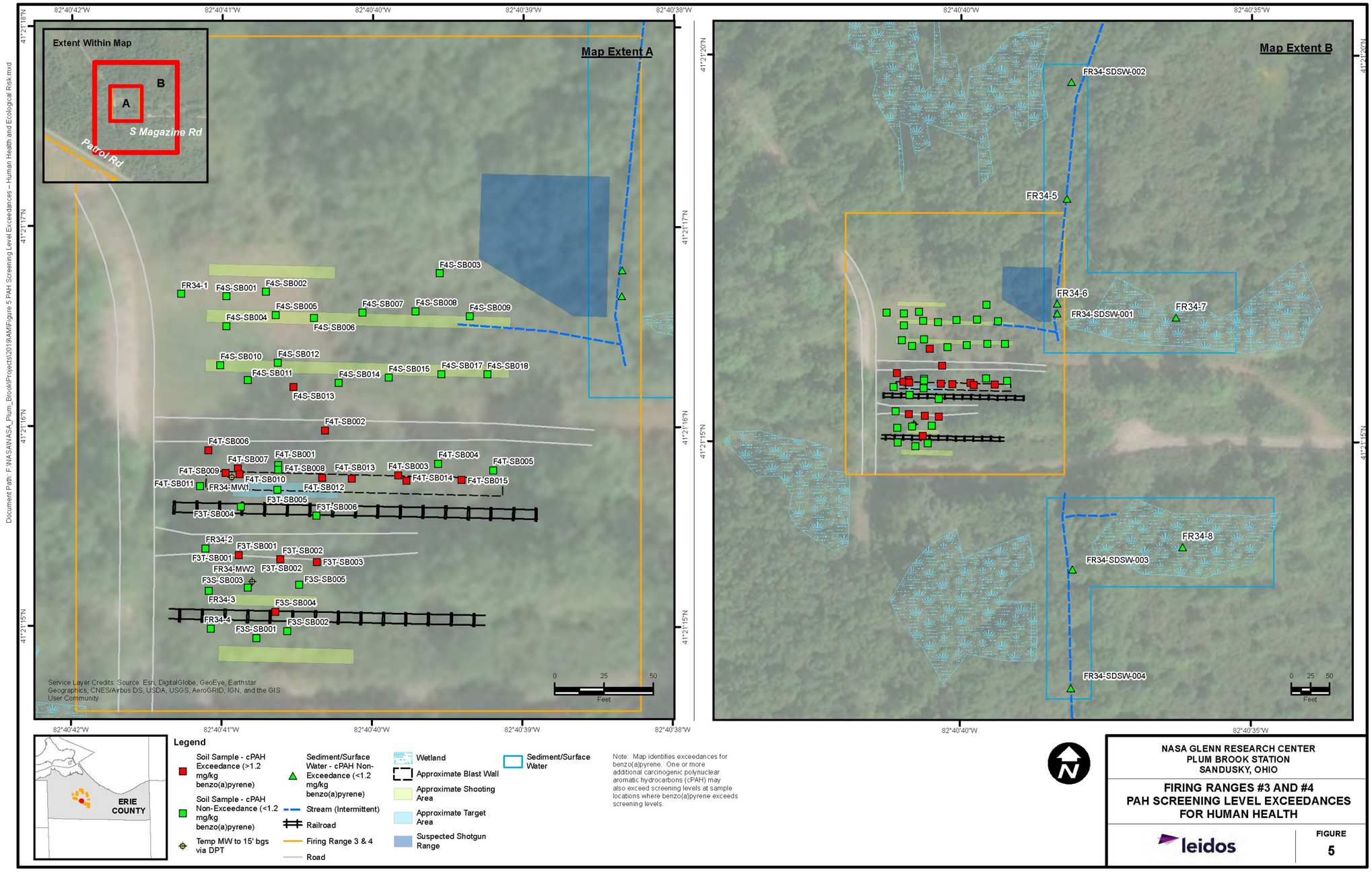

Figure 5. Firing Ranges 3 and 4 PAH Screening Level Exceedances for Human Health

PBS is situated in an area known for its agricultural productivity and is bordered by farmland, some of which is leased to local farmers by NASA. The area surrounding PBS is largely rural and agricultural, with some recent development. Some food processing facilities are located in the area, including dairy and meat processing operations. Tourism and recreation are important economic influences in the Sandusky area. The Erie County Perkins School District currently uses certain former NASA facilities, located near the former PBS main gate on Columbus Avenue and outside the fenced area, for transportation and storage purposes. Intensive commercial development, consisting of highway-oriented uses (e.g., motels, restaurants, and service stations) and shopping malls, predominate immediately to the north and east along U.S. Highway 250 and its intersections with Bogart Road and State Highway 2 in Sandusky. A U.S. Army Reserve Center is situated adjacent to the southeastern corner, just off Mason Road (Leidos 2018).

An 8-foot security fence surrounds approximately 5,845 acres of PBS (Leidos 2018). Most of the land at PBS consists of forestland and old fields with several streams that run across the property. An estimated 75 percent of NASA's property at PBS is considered unused. The remaining land is used for offices, test facilities, roads, and infrastructure. Public access is restricted at PBS, and access to the site is gained through the security guard house located on East Scheid Road, which was newly constructed in 2016. The guard house is staffed by armed guards 24 hours per day (Leidos 2016b). The former main gate located on Columbus Avenue is only open for exiting traffic at peak afternoon hours.

The population in Erie County in the 2016 Census estimate was 75,107 with 37,679 total housing units (Leidos 2018). The largest city is Sandusky with a population of approximately 25,000 (Leidos 2018). The population distribution within a 2-mile radius of the PBS boundary is listed in **Table 1**.

Table 1. Estimated Population Distributions in PBS Vicinity

Distance (miles)	Population
0 to 0.25	600
0.25 to 0.50	450
0.50 to 1.0	2,150
1.0 to 2.0	5,500

Source: U.S. Census Bureau 2016.
PBS = Plum Brook Station.

A site-wide species survey was conducted at PBS in the fall of 2016 (EnviroScience 2017). The Final Protected Species Management Strategy for NASA Glenn Research Center at Lewis Field and Plum Brook Station, Volumes I–III (EnviroScience 2017) is an update to the original 2002 report (ODNR 2002). Three federally listed fauna species have been recorded to occur at PBS, but only one was noted in the 2016 surveys. In addition, 5 state endangered, 3 state threatened, and 21 state species of interest or concern have been noted since 1994 (EnviroScience 2017). Four state endangered, 6 state threatened, and 10 state potentially threatened flora species were recorded in the 2016 survey. One state threatened and one state potentially threatened species were noted in the 2016 survey (EnviroScience 2017). However, no rare or endangered species were observed near Firing Ranges 3 and 4.

EnviroScience, Inc. (EnviroScience) performed a delineation of wetlands and other waters in November 2019 for the NASA PBS Firing Ranges 3 and 4 project. The study area consists of open field, scrub-shrub, forest, and wetland vegetative communities. Four wetlands were identified within the study area, accounting for approximately 0.641 acres of wetland onsite. The onsite wetlands consist of palustrine forest vegetative communities. One channelized intermittent stream was identified within the study area, accounting for approximately 628 linear feet and 0.100 acre of additional waterway. The locations of the wetlands and intermittent stream are shown in **Figure 3**. All four wetlands and the intermittent stream

identified are located outside the boundaries of the contaminated soil and anticipated staging areas. No open water aquatic resources were identified within the project area. The surrounding land use consists of forest, scrub-shrub, old field, and open field vegetative communities, as well as agricultural land use (EnviroScience 2020).

NASA contacted the Ohio Historic Preservation Office to determine if any of the landmarks and/or structures onsite would be considered historically significant. Letters documenting NASA's request for consultation and responses from the Ohio Historic Preservation Office are included in Attachment 1. No historical landmarks and/or structures with historical significance were identified at Firing Ranges 3 and 4. In addition, the Nottawaseppi Huron Band of Potawatomi, the Forest County Potawatomi Community of Wisconsin, and the Miami Tribe of Oklahoma Native American Tribes were consulted pursuant to Section 106 of the National Historic Preservation Act. The Nottawaseppi Huron Band of the Potawatomi and Miami Tribe of Oklahoma Native American Tribes responded that no Native American tribal interests are at the site. The Forest County Potawatomi Community of Wisconsin did not provide interests within the 30-day period. Letters documenting NASA request for tribal consultation are included in Attachment 1.

A.3 Site Characteristics

PBS is operated as a satellite facility (or component installation) of the NASA GRC. Use of PBS by the Federal Government began in 1941 when the U.S. Army established PBOW for the manufacture of munitions and related materials, including TNT, dinitrotoluene, and pentolite (MK 1994). Munitions production was conducted from 1941 to 1945, after which buildings and production lines were decontaminated and decommissioned. In 1956, the National Advisory Committee for Aeronautics (NACA) (later NASA) obtained 500 acres in the northern portion of the site for construction of a nuclear test reactor (MK 1994). Between 1958 and 1960, NASA demolished hundreds of buildings, renovated approximately 41 buildings, and utilized 99 magazines (Gray & Pape 2008). In 1963, NASA acquired an additional 6,000 acres of PBOW and took control over what is now referred to as PBS (MK 1994). From 1967 through 1971, NASA purchased approximately 2,000 acres outside of the fence line from local farmers as "buffer." On April 18, 1978, NASA declared approximately 2,152 acres of the former PBOW as excess. This excess included approximately 1,500 acres outside the fence and was sold as farmland (Leidos 2018). NASA currently operates PBS as a space research facility in support of the NASA GRC. Most of the aerospace testing facilities built in the 1960s at PBS have been demolished or are currently on standby or inactive status. Additional tenants at PBS include the U.S. Department of Agriculture, the U.S. Department of the Interior (DOI), the Federal Bureau of Investigation, and the Ohio Air National Guard.

Firing Ranges 3 and 4 were utilized for TNT loading onto railcars during the active operation of PBOW from 1941 to 1945. Firing Ranges at PBS have been utilized at various times since the mid-1960s. After Firing Range 3 was abandoned, the other side of the blast wall was used as a backstop for Firing Range 4. Firing Range 4 was established in 1982. Both ranges currently are not in use and overgrown with small trees and brush, and the blast wall has deteriorated.

A limited SI at the former RCLA was conducted by the USACE Louisville District under the Defense Environmental Restoration Program for Formerly Used Defense Sites in 1999. The purpose of the limited SI was to evaluate the potential contamination of the RCLA resulting from past loading and unloading of finished and unfinished intermediate TNT products. RCLA 1017, adjacent to the former Dunnage Storage Building 1017, was located at the same location as Firing Ranges 3 and 4. Railroad tracks split into three spurs at the site with an explosion containment wall (backstop for Firing Ranges 3 and 4) located between the two northern tracks. Based on the results of the SI, it was determined that the operation and decommissioning of the RCLA 1017 site did not significantly impact the environment in a negative manner, and a No Further Action (NFA) decision document was recommended (USACE 2000). The Ohio Environmental Protection Agency (Ohio EPA) agreed that NFA was required for the TNT RCLA (Ohio

EPA 2003). Restoration activities at PBS are managed by the NASA GRC Environmental Management Office. This will be the first RA at Firing Ranges 3 and 4.

A.4 Release or Threatened Release into the Environment of a Hazardous Substance, Pollutant, or Contaminant

Available historical documents do not indicate any incidents or occurrences of intentional dumping or discharging hazardous substances at Firing Ranges 3 and 4. However, antimony-, arsenic-, lead-, and PAH-contaminated soils were identified in and around the blast wall at Firing Ranges 3 and 4 that pose a threat to human health exposure to contamination exceeding the USEPA RSLs.

Estimated quantities of contaminated soil and blast wall wood debris are presented in **Tables 2** and **3**. Waste characterization samples have not been collected to determine if the media is characteristically hazardous. The RSE Report (Leidos 2019) presents cost estimates for two disposal options: Option 1 (amendment additional and non-hazardous waste disposal) was estimated to cost $520,686, and Option 2 (hazardous waste disposal) was estimated to cost $556,598. However, the approach to conducting the NTCRA includes waste characterization sampling. Samples will be subjected to full Toxicity Characteristic Leaching Procedure (TCLP) characterization to determine the most cost-efficient disposal option.

Table 2. Estimated Soil Volumes Requiring Removal at Firing Ranges 3 and 4

Media	Height (ft)	Width (ft)	Length (ft)	Volume (ft^3)	Volume (yd^3)	Tons
Blast Wall – Soil Inside Barricade (Firing Range 3 – Western Side)	10	10	75	7,500	278	375
Blast Wall – Soil Inside Barricade (Firing Range 4 – Eastern Side)	5	10	75	3,750	139	187
			Subtotal	**11,250**	**417**	**562**
	Depth bgs (ft)	**Width (ft)**	**Length (ft)**	**Volume (ft^3)**	**Volume (yd^3)**	**Tons**
Soil Excavated Below Barricade	1	10	150	1,500	56	75
Soil Hot Spot Excavation (F4T-SB009, -SB010, -SB007)	4	10	15	600	22	30
Soil Hot Spot Excavation (F4T-SB002)	1	10	10	100	4	5
Soil Hot Spot Excavation (F4T-SB001, -SB008)	2	10	10	200	7	10
Soil Hot Spot Excavation (F4T-SB013)	1	5	5	25	1	1
Soil Hot Spot Excavation (F4T-SB015)	3	5	5	75	3	4
Soil Hot Spot Excavation (F4T-SB006)	1	10	10	100	4	5
Soil Hot Spot Excavation (F4S-SS031)	1	10	10	100	4	5
Soil Hot Spot Excavation (F3S-SS006)	1	10	10	100	4	5
			Subtotal	**2,800**	**104**	**140**
			Total	**14,050**	**521**	**702**

bgs = Below Ground Surface.
ft = Feet.
ft^3 = Cubic Feet.
yd^3 = Cubic Yard.

Table 3. Estimated Wood Debris Volume Requiring Removal at Firing Ranges 3 and 4

Media	Height (ft)	Width (ft)	Length (ft)	Volume (ft^3)	Volume (yd^3)	Tons
Blast Wall – Outer Wooden Barricade	20	0.75	320	4,800	178	89
			Total	**4,800**	**178**	**89**

ft = Feet.
ft^3 = Cubic Feet.
yd^3 = Cubic Yard.

A low likelihood of past and present contaminant migration exists, as sampling results presented in the RSE Report indicate that the contaminated soils are limited to the blast wall area and localized "hot spots" (Leidos 2019). Potential future release or migration of contaminants will be eliminated by the NTCRA by achieving the removal action objective (RAO) and confirmed with confirmation sampling.

A.5 NPL Status

Firing Ranges 3 and 4 are not on USEPA's National Priorities List (NPL). The NPL is a list of hazardous waste sites that are prioritized for cleanup. PBS is not included in USEPA's Superfund Enterprise Management System (SEMS) database. SEMS contains information on hazardous waste sites, potential hazardous waste sites, and remedial activities across the nation.

B OTHER ACTIONS TO DATE

B.1 Previous Actions

No government or private actions have been undertaken specific to the antimony, arsenic, lead, and PAH contamination within Firing Ranges 3 and 4 in the past that have not been previously discussed in this AM.

B.2 Current Actions

No government or private actions are currently being performed specific to the antimony, arsenic, lead, and PAH contamination within Firing Ranges 3 and 4 that have not been previously discussed in this AM.

C STATE AND LOCAL AUTHORITIES' ROLE

C.1 State and Local Actions to Date

State and/or local governments did not request USEPA's assistance to address the contaminated media. Likewise, Ohio EPA determined that the Consent Order with NASA self-terminated in 2000 and did not request involvement in the ongoing CERCLA activities. NASA continues to notify the Ohio EPA of remedial activities at PBS by submitting all primary CERCLA documents.

NASA is developing a CIP for seven sites at PBS under the CERCLA process to ensure the public has convenient access to information regarding project progress. The NASA PBS community relations program interacts with the public through news releases and public meetings with local officials, interest groups, and the general public.

PART III: THREATS TO PUBLIC HEALTH, PUBLIC WELFARE, OR THE ENVIRONMENT

In accordance with Section 300.410 (b) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), the RSE included an evaluation to determine whether an RA was necessary. NASA elected to use its CERCLA Section 104 authority for the site to determine if a release of hazardous substances has occurred or if the potential exists for a release or threat of release of CERCLA hazardous substances (Leidos 2019).

Actual or potential exposure to nearby populations, animals, or the food chain from hazardous substances, pollutants, or contaminants: As summarized in the human health and ecological risk evaluations in the RSE Report (Leidos 2019), a viable potential exists for exposure to antimony-, arsenic-, and lead-contaminated soil contained inside the blast wall for Firing Ranges 3 and 4. While the SI and RSE sampling results indicate the presence of other metals in the soil in the immediate vicinity of the blast wall, the primary driver for RA is the contaminated soil inside the blast wall and spilled at the toe of the blast wall.

Actual or potential contamination of drinking water supplies or sensitive ecosystems: No human health or ecological risk concerns exist with the previously detected contamination in the intermittent drainage ditch located east of Firing Ranges 3 and 4. As discussed in Section 2.4.6 of the RSE Report (Leidos 2019), surface water in Erie County is prohibited from use as private drinking water. The majority of residents of Erie County receive water from public utilities whose primary sources are surface water. Groundwater at PBS is not utilized for drinking water purposes; therefore, no human health concerns exist with any potential lead contamination in groundwater. The limited quantity and poor quality of groundwater encountered in the unconsolidated units at the site are consistent with previous groundwater findings at other sites at NASA PBS (USACE 2012).

Hazardous substances or pollutants or contaminants in drums, barrels, tanks, or other bulk storage containers that may pose a threat of release: No evidence of any drums, barrels, tanks, or other bulk storage containers at Firing Ranges 3 and 4 exists. However, the wooden barricade blast wall is filled with soil that has been contaminated during historical operations at Firing Ranges 3 and 4 (Leidos 2019).

High levels of hazardous substances, pollutants, or contaminants in soils largely at or near the surface that may migrate: Although contaminated soil is mostly contained in the blast wall, portions of the wall have collapsed, causing contaminated soil to spill from the toe of the blast wall. Soil samples in the target area (i.e., immediate vicinity of the blast wall) have historically exhibited high lead concentrations that exceed the USEPA residential RSLs and ESVs, thus posing a risk to human receptors (Leidos 2019).

Weather conditions that may promote migration of hazardous substances: No unusual weather conditions exist that may promote migration of hazardous substances. However, a potential does exist for migration of contaminants via overland flow/runoff toward the intermittent drainage features located east of the site (Leidos 2019).

Threat of fire or explosion: No known threat of fire or explosion exists.

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PART IV: ENDANGERMENT DETERMINATION

Actual or threatened releases of contaminants (antimony, arsenic, lead, and PAHs) from Firing Ranges 3 and 4, if not addressed by implementing the response action selected in this AM, may present an imminent and substantial endangerment to public health, public welfare, or the environment.

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PART V: PROPOSED ACTIONS AND COST ESTIMATES

A PROPOSED ACTIONS

The RSE Report (Leidos 2019), which is equivalent to an EE/CA, was prepared in accordance with USEPA and Ohio EPA guidance to develop and evaluate RA alternatives. The RSE Report developed the following RAO to protect the environment:

- The RAO is to minimize the risk and hazard associated with soil contamination (primarily lead and a few PAHs) in and around the blast wall at Firing Ranges 3 and 4 to protect human and ecological receptors.

The RSE Report (Leidos 2019) was provided for public review and comment from January 17 to February 17, 2020. The Nottawaseppi Huron Band of Potawatomi, the Forest County Potawatomi Community of Wisconsin, and the Miami Tribe of Oklahoma also were consulted pursuant to Section 106 of the National Historic Preservation Act.

A.1 Proposed Action Description

The RSE Report identified RA alternatives and evaluated the alternatives based on effectiveness, implementability, and cost (Leidos 2019). The no action alternative was eliminated during the individual analysis due to the lack of effectiveness. The selected RA alternative is to remove the blast wall structure and soil in and around the blast wall with Disposal Option 1 (disposal offsite as non-hazardous waste with amendment for stabilization) such that residential RSLs are attained for lead and PAHs in soil. In order to attain the In order to achieve the RAO, the average COC soil concentration within each exposure unit must be below the remediation goals, as listed in **Table 4**. This RA will allow potential future unrestricted reuse at Firing Ranges 3 and 4. The following sections describe the components of the selected RA.

Table 4. Remediation Goals for Soils at Firing Ranges 3 and 4

COC	Remediation Goal (mg/kg)
Antimony	31[c]
Arsenic	36.5[b]
Lead	400[a]
Benz(a)anthracene	11[c]
Benzo(a)pyrene	1.1[c]
Benzo(b)fluoranthene	11[c]
Dibenz(a,h)anthracene	1.1[c]
Indeno(1,2,3-cd)pyrene	11[c]

[a] The arithmetic average lead concentration for each area <400 mg/kg is used as the remediation goal. The lead remediation goal correlates to the XRF remediation goal of 411.6 mg/kg.
[b] The non-cancer RSL for arsenic (35 mg/kg) (USEPA 2019) is less than the background criteria (36.5 mg/kg) (IT 1998); therefore, the background concentration for arsenic is used as the remediation goal. The average EPC concentration will be calculated for each area.
[c] The remediation goal for antimony and cPAHs are set at the residential soil RSLs (USEPA 2019). The EPC concentration will be calculated for each area.
COC = Chemical of Concern.
cPAH = Carcinogenic Polycyclic Aromatic Hydrocarbon.
EPC = Exposure Point Concentration.
mg/kg = Milligrams per Kilogram.
RSL = Regional Screening Level.
XRF = X-Ray Fluorescence.

Pre-Removal Activities—Prior to mobilizing for Phase 1 construction activities, detailed planning efforts will be undertaken to include updates to existing site-specific plans (e.g., health and safety plan, quality assurance project plans); procurement of necessary subcontracts (e.g., waste disposal facilities, analytical laboratory services, major construction equipment rental); and completion of a pre-removal readiness review, dig permits, and utility clearances. A Removal Action Work Plan (RAWP) will be developed prior to initiating RAs. This plan will outline the construction requirements, site preparation activities (e.g., staging and equipment storage areas, truck routes, storm water controls), extent of soil excavation, sequence of excavation activities, decontamination, and transportation and disposal of the waste. Erosion controls and health and safety controls will be developed as part of the RAWP to ensure protection of site workers and the environment.

RA Activities – Phase 1—Prior to initiating removal of the blast wall, waste characterization sampling will be conducted for the wooden barricade of the blast wall and the soil contained within the blast wall. A five-part composite sample will be collected from the soil inside the barricade for laboratory analysis (TCLP semivolatile organic compounds [SVOCs]; TCLP volatile organic compounds [VOCs] [plus F-Scan listed VOCs]; TCLP metals; TCLP pesticides; TCLP herbicides; VOCs [plus F-scan listed VOCs]; SVOCs; metals; polychlorinated biphenyls [PCBs]; total cyanide; total sulfide; paint filter test; and reactivity, corrosivity, and ignitability [RCI] analysis) to make a hazardous waste determination. A similar five-part composite sample will be analyzed from the wooden barricade to determine whether the wood debris will be hazardous or non-hazardous. It is anticipated that the wood debris will be able to be disposed of offsite as non-hazardous construction debris. If the soil inside the blast wall is determined to be hazardous due to TCLP metals results, soil stabilization with a suitable amendment (e.g., calcium or potassium phosphate amendment) will occur. Thus, prior to actual removal of the blast wall, a clear determination will be made as to the disposal of the blast wall contents.

Site preparation will involve vegetation clearing around the blast wall to facilitate efficient removal and set-up of erosion controls (e.g., filter logs, silt fences), as necessary, to protect surface drainage features. To protect the critical habitat for two bat species – the Indiana bat (Federal Endangered [FE]) and northern long-eared bat (Federal Threatened [FT]), tree clearing will take place outside of the restricted time frame of April 1st through September 30th; therefore, clearing may be expedited.

RA Activities – Phase 2—The removal of the blast wall will begin with removal of the wooden barricade along the entire length of the blast wall. The appropriate equipment (e.g., excavator with hydraulic extension, skid steer) will be mobilized to the site for the removal activities. It is anticipated that all wood debris waste generated from the removal activities will be disposed of as non-hazardous waste at the Erie County Landfill, which is located approximately 5 miles from NASA PBS. The wooden planks/logs will be removed and cut into manageable size (less than 4 feet in length, as per requirements of the Erie County Landfill) such that it can be easily loaded into dump trucks for offsite disposal at the Erie County Landfill.

Following removal of the wooden barricade, the soil contained within the blast wall will be excavated, staged, and ultimately loaded into dump trucks for offsite disposal. It is estimated that a total of approximately 702 tons of soil will be generated from the removal activities. The soil quantity estimate includes both the soil within the blast wall, soil excavation from 0 to 1 foot below ground surface (bgs) under the footprint of the blast wall, and soil excavation of isolated "hot spot locations" to address specific antimony, arsenic, lead, and PAH exceedances in the target area for Firing Ranges 3 and 4 (see **Figure 6)**.

Waste Management—Soil Disposal Option 1 – If the waste characterization sampling determines the waste to be hazardous due to TCLP results, the soil will be excavated from the blast wall and "hot spot locations," and temporarily stored in containers (as per Ohio Administrative Code [OAC] 3745-52-34 requirements) at an onsite staging location. An appropriate amendment (e.g., calcium or potassium phosphate amendment)

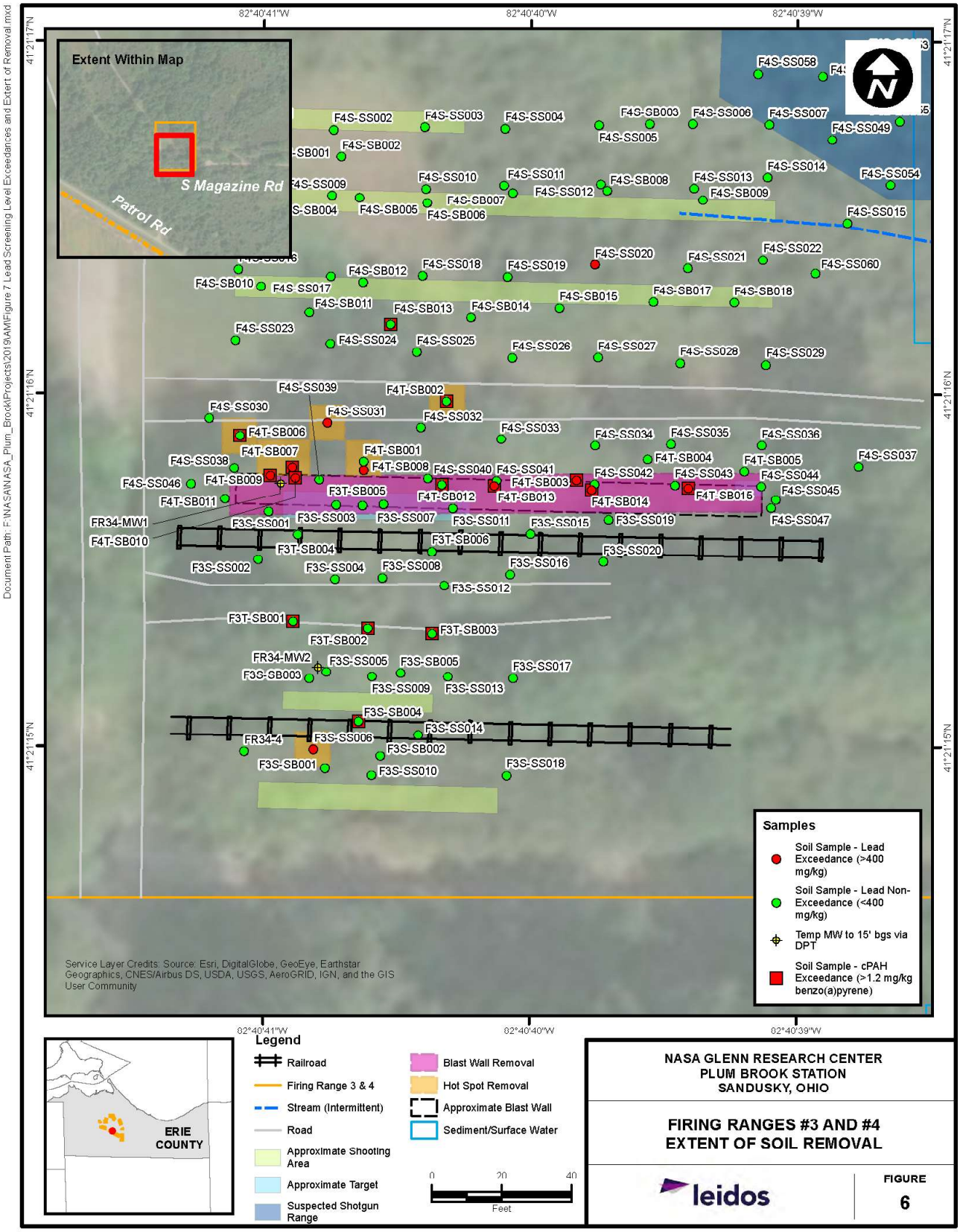

Figure 6. Firing Ranges 3 and 4 Extent of Soil Removal

will be thoroughly mixed with the soil in the containers to render it non-hazardous for disposal. Following confirmation TCLP sampling to ensure that the soil waste is non-hazardous, the soil will be ultimately loaded into dump trucks for offsite disposal. The details regarding the type and quantity of amendment will be specified in the RAWP. Under this disposal option, it is anticipated that the excavated soil from within the blast wall and underneath the footprint of the blast wall will be disposed of offsite at the Erie County Landfill as non-hazardous waste (either with or without amendment addition for soil stabilization).

Confirmation Sampling—Following excavation activities at the blast wall and the isolated "hot spot locations," confirmation soil and groundwater sampling will be conducted at Firing Ranges 3 and 4. Discrete confirmation soil samples will be collected for analysis of lead and PAHs at each excavation location. The confirmation soil sampling will determine whether the RA was fully successful in attaining residential RSLs. Depending on the initial confirmation results, the potential need for extending the excavation footprint will be evaluated.

Confirmation groundwater sampling will be conducted to ensure that historical operations at Firing Ranges 3 and 4 have not impacted groundwater at the site. The temporary monitoring wells installed during the RSE field activities in January 2017 did not yield sufficient water for representative sampling and, consequently, did not provide accurate or representative sampling results. Thus, following removal of the blast wall, a semi-permanent 2-inch-thick, up to 15-foot-deep, monitoring well will be properly installed at location F4T-SB010 (within the blast wall footprint), which exhibited the highest historical lead concentration (44,000 mg/kg) in soil. Based on historical boring logs and the anticipated average bedrock depth of 4 to 5 feet bgs at Firing Ranges 3 and 4, it is estimated that a well depth of 15 feet bgs will be adequate. Upon installation and proper well development, up to two groundwater samples will be collected from the monitoring well for analysis of lead and PAHs. The confirmation groundwater sampling will determine whether groundwater has been impacted above residential RSLs from historical leaching of soil contamination to groundwater.

Site Restoration Activities and Reporting—Following completion of RAs at the blast wall, site restoration will be completed to include seeding the backfilled area with NASA-approved seed mixture, removal of erosion controls, and post-removal inspection. An RA Completion Report will be prepared to document in detail the removal activities at Firing Ranges 3 and 4.

A.2 Contribution to Remedial Performance

The RA will meet the RAO and will achieve quick, protective results at Firing Ranges 3 and 4. The time period to complete this RA is anticipated to be 3 to 3.5 weeks [15 to 17 days]), and NFA will be required once the RA is complete.

A.3 Engineering Evaluation/Cost Analysis

The RSE Report presented the parameters, assumptions, and estimated cost to implement the RA for two disposal options (Leidos 2019). The estimated cost for RA and reporting under Soil Disposal Option 1 (amendment and non-hazardous waste disposal) was $520,686, and the estimated cost for RA and reporting under Soil Disposal Option 2 (hazardous waste disposal) was $556,598. No written comments were received during the public comment period for the RSE Report; therefore, a Responsiveness Summary was unwarranted.

A.4 Applicable or Relevant and Appropriate Requirements

USEPA classifies applicable or relevant and appropriate requirements (ARARs) as chemical-, action-, and location-specific to provide guidance for identifying and complying with ARARs (USEPA 1988). The RSE Report identified the following ARARs for the removal action at Firing Ranges 3 and 4 (Leidos 2019).

Chemical-specific ARARs—Chemical-specific ARARs include the USEPA residential RSLs and ESVs discussed in the human health and ecological risk evaluations.

Action-specific ARARs—Under the recommended RA of the blast wall at Firing Ranges 3 and 4, the following action-specific ARARs are considered:

- Because the RA at the blast wall would include generating and managing contaminated media, Resource Conservation and Recovery Act (RCRA) requirements would be considered potential ARARs for this activity. The RCRA requirements mandate that a generator must determine whether a material is (or contains in the case of environmental media) hazardous waste under OAC 3745-52-11. If a material is determined to be or contain a listed hazardous waste, or exhibits a hazardous waste characteristic, additional management requirements under RCRA must be followed as an ARAR under CERCLA. If the excavated soil is determined to be characteristically hazardous and requires stabilization to render it non-hazardous for disposal, the requirements under OAC 3745-52-34 would be applicable. OAC 3745-52-34 specifies that generators are allowed to treat and accumulate waste onsite up to 90 days without requiring a hazardous waste permit from Ohio EPA. Treatment as defined in OAC 3745-50-10(A) includes any method, technique, or process designed to change the physical, chemical, or biological composition of the waste to render the waste non-hazardous or less hazardous.
- In 1998, USEPA created a new unit for the temporary management of remediation wastes known as the staging pile. The staging pile is an accumulation of solid, non-flowing remediation wastes that may be used for storage of those wastes for 2 years. The requirements for staging piles include the performance criteria of 40 *Code of Federal Regulations* (*CFR*) 264.554(d) and OAC 3745-57-74. These standards require that the staging pile must be designed to prevent or minimize releases of hazardous waste or hazardous constituents into the environment. Storage in a staging pile includes mixing, sizing, blending, or other similar physical operations as long as they are intended to prepare the wastes for subsequent management or treatment.
- Shipments of contaminated soils will comply with Federal, state, and local rules, laws, and regulations. In addition to the identified ARARs for the selected action, NASA will comply with requirements applicable to offsite actions, including RCRA hazardous waste transportation requirements under OAC 3745-52-20 through OAC 3745-52-33, offsite treatment prior to land disposal as required by RCRA's land disposal restrictions (LDRs) under OAC 3745-270, and alternative LDR treatment standards for contaminated soil under OAC 3745-270-49.
- Implementing excavation activities also would trigger potential ARARs associated with land disturbance and emission controls. OAC 3745-15-07 requires that nuisance air pollution emissions be controlled. This includes controlling potential fugitive dust from the blast wall removal and soil excavation activities. In addition, any construction (i.e., soil disturbance activities that would encompass more than 1 acre) would trigger the storm water requirements of 40 CFR Part 450. These requirements mandate that erosion and sedimentation control measures be designed and implemented to control erosion and sediment runoff. Although the proposed RA is not anticipated to disturb more than 1 acre, erosion controls and best management practices will be utilized during the RA.

- In the event solid waste material is found to be contaminated but not a RCRA hazardous waste, management and disposal of this material would be subject to the requirements associated with managing and disposing of the solid waste within the State of Ohio. The OAC 3745-27-05 requirements would be potential ARARs for disposing of non-hazardous contaminated waste material generated during excavation and subsequent disposal at an offsite location.

Location-specific ARARs—Location-specific requirements include those established for potential removal activities conducted within wetlands, within a floodplain area, or with respect to threatened and/or endangered species. While some wetlands are located in the vicinity of Firing Ranges 3 and 4, none of the previously identified wetlands are within the site boundary of the two firing ranges. Furthermore, based on the surface water and sediment sampling at the intermittent drainage east of the site, the human health and ecological risk assessments concluded that no COCs requiring remediation were identified in the surface water and sediment (Leidos 2019). Thus, no location-specific ARARs for wetlands are applicable for the RA at Firing Ranges 3 and 4.

The 50 CFR Part 17, Endangered Species Act, requires action, including consultation with DOI, to conserve ecosystems, habitats, and endangered and threatened species. In addition, Ohio Revised Code 1531.25 and 1501:31-23 provides protections for endangered and threatened species in Ohio. To protect the critical habitat for two bat species (Indiana bat [FE] and northern long-eared bat [FT]), tree clearing must take place outside of the restricted time frame of April 1st through September 30th.

Part III.2.C. of Ohio EPA National Pollutant Discharge Elimination System Permit Number 2IO0000*LD requires effluent shall, at all times, be free of substances in amounts that will alter the natural color or odor of the receiving water to such a degree as to create a nuisance. If discolored water (i.e., red) is observed in any excavation, the NASA GRC Technical Monitor will be immediately notified.

A.5 Project Schedule

The RSE Report was submitted in December 2019 (Leidos 2019), and the public notification and comment period was conducted from January 17 to February 17, 2020. Upon development, review, and approval of the RAWP, NASA will begin implementing the NTCRA at Firing Ranges 3 and 4. The RA is anticipated to be completed over a duration of approximately 3 to 3.5 weeks (15 to 17 days) followed by a post-removal inspection. An RA Completion Report will be prepared to document the RAs.

B ESTIMATED COSTS

A cost analysis is provided in the RSE Report (Leidos 2019). This analysis includes an estimate of the capital cost in dollars and indicates the period of time to complete the proposed action.

The estimated cost to complete the recommended RA at Firing Ranges 3 and 4 is $520,686. These costs include implementing the removal, offsite disposal, site restoration, and reporting. The time period to complete this RA is relatively short and does not include an operations and maintenance period to assess impacts from excavating antimony-, arsenic-, lead-, and PAH-contaminated soils, as allowing potential future unrestricted reuse at Firing Ranges 3 and 4 will be achieved.

PART VI: EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

If no action or a delayed action occurs, lead- and PAH-contaminated soil would remain in place. Therefore, this scenario would not provide for overall protection of the environment. Removal goals would not be achieved, as this scenario provides for no long-term effectiveness and permanence. No mitigation of potential risks to human and ecological receptors from lead and PAHs in soil would exist under this scenario.

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PART VII: OUTSTANDING POLICY ISSUES

No outstanding policy issues are applicable to Firing Ranges 3 and 4 located at NASA PBS.

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PART VIII: ENFORCEMENT

NASA is the lead agency that will oversee this NTCRA. The RSE Report (Leidos 2019) has been prepared following current USEPA guidance documents and was shared with Ohio EPA.

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PART IX: RECOMMENDATION

This AM documents the selected RA for Firing Ranges 3 and 4 at PBS in Sandusky, Ohio, developed in accordance with CERCLA as amended, and is consistent with the NCP. This decision is based on the Administrative Record for the site.

Conditions at Firing Ranges 3 and 4 meet the NCP Section 300.415(b)(2)(i-viii) criteria for an NTCRA. The total project cost of approximately $520,686 is approved by the undersigned.

AUTHORIZING SIGNATURE:

JOEL KEARNS Digitally signed by JOEL KEARNS Date: 2020.07.23 21:12:22 -04'00' 7/23/20

Joel K. Kearns, Director
Facilities, Test, and Manufacturing Directorate
NASA Glenn Research Center

Date

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ATTACHMENT 1.

OHIO HISTORIC PRESERVATION OFFICE AND NATIVE AMERICAN CONSULTATION DOCUMENTATION

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National Aeronautics and
Space Administration

John H. Glenn Research Center
Lewis Field
Cleveland, OH 44135-3191

March 2, 2020

Reply to Attn of: FXP

Ohio Historic Preservation Office
Attn: Ms. Joy Williams
Project Reviews Manager
800 East 17th Avenue
Columbus, OH 43211

Subject: Remediation of Firing Ranges 3 and 4 at NASA Glenn Research Center's (GRC) Plum Brook Station (PBS)

In accordance with Section 106 of the National Historic Preservation Act of 1966 as amended, NASA GRC is consulting with your office regarding the proposed remediation of Firing Ranges 3 and 4 at NASA GRC's PBS in Erie County, Ohio.

The NASA GRC is also consulting with your office under Stipulation III, Archaeology, B within the enclosed Programmatic Agreement between NASA and the Ohio Historic Preservation Office (OHPO) regarding Facilities, Infrastructure, and Sites at NASA GRC's PBS. The Stipulation states NASA GRC must consult the OHPO prior to land-disturbing activities where no previous survey has occurred. No previous survey has occurred in the area where the remediation work is located.

I am requesting your concurrence with NASA GRC's determination of No Adverse Effect based on the enclosed background information. If you have any questions, please contact me at (216) 433-8960 or thomas.m.yohe@nasa.gov.

Thomas Yohe

Thomas M. Yohe
Cultural Resource Manager

3 Enclosures:
Background Information
Site Photographs
Programmatic Agreement

April 19, 2020

In reply, please refer to:
2020-ERI-47904

Thomas M. Yohe, Cultural Resources Manager
NASA Glenn Research Center
Facilities Division
21000 Brookpark Road, Mail Stop 21-1
Cleveland, Ohio 44135

RE: Remediation of Firing Ranges 3 and 4 at NASA Glenn Research Center's Plum Brook Station, Erie County, Ohio

Dear Mr. Yohe:

This letter is in response to correspondence received on March 19, 2020. Our comments are made pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, the associated regulations at 36 CFR Part 800, and guided by the terms established in the *Programmatic Agreement Between the National Aeronautics and Space Administration and the Ohio State Historic Preservation Office Regarding Facilities, Infrastructure, and Sites at the National Aeronautics and Space Administration's Plum Brook Station, Erie County, Ohio*.

The John H. Glenn Research Center (GRC), a U.S. National Aeronautics and Space Administration (NASA) facility, is proposing the remediation of Firing Ranges 3 and 4 at GRC's Plum Brook Station (PBS) in Erie County, Ohio.

Firing Ranges 3 and 4 are located north of, and adjacent to, a railroad track offshoot and an old existing blast wall located near the south-central portion of PBS. Firing Ranges 3 and 4 are recommended as not eligible for inclusion in the National Register of Historic Places. Our office agrees with the recommendation regarding eligibility.

We concur with your finding that the undertaking as proposed will have no adverse effect on historic properties. No further coordination with this office is necessary, unless the undertaking changes or archaeological remains are unexpectedly discovered. In such a situation, our office should be contacted as per Stipulation IV of the above-referenced Programmatic Agreement.

If you have any questions, please contact me at jwilliams@ohiohistory.org or (614) 298-2000. Thank you for your cooperation.

Sincerely,

Joy Williams

Joy Williams, Project Reviews Manager
Resource Protection and Review

"Please be advised that this is a Section 106 decision. This review decision may not extend to other SHPO programs."

RPR Serial No: 1083535

National Aeronautics and
Space Administration

John H. Glenn Research Center
Lewis Field
Cleveland, OH 44135-3191

March 12, 2020

Reply to Attn of: FXP

Mr. Fred Jacko
Tribal Historic Preservation Officer
Nottawaseppi Huron Band of Potawatomi
1485 Mno-Bmadzewen Way
Fulton, MI 49052

Dear Mr. Jacko:

Pursuant to Section 106 of the National Historic Preservation Act and its implementing regulations, 36 Code of Federal Regulations (CFR) Section 800, NASA Glenn Research Center is consulting with you on an environmental remediation project at our Plum Brook Station (PBS) facility.

The undertaking's objective is to minimize risks and hazards associated with soil contamination in and around the blast wall at Firing Ranges 3 and 4 to protect human and ecological receptors. Firing Ranges at PBS were utilized at various times since the mid-1960s, but are no longer active at the facility. The impact areas for Firing Ranges 3 and 4 share the same blast protection wall. Both ranges are overgrown with small trees and brush and the blast wall has deteriorated.

The clean-up effort for the firing ranges consists of two phases. First, a wooden barricade built along the full length of the blast wall will be removed, as will the wooden planks/logs. Next, soil contained within the blast wall will be sifted, staged, and disposed of off-site. Soil will be excavated 1 foot deep under the footprint of the blast wall; areas with high polycyclic aromatic hydrocarbon concentrations will have soil removed to a depth of 2-4 feet. Prior to disposal of the soil, it will be sifted to remove debris and recover bullets or bullet fragments for recycling as scrap metal. Excavated areas will be backfilled and reseeded.

Past surveys indicate a moderate potential for archaeological resources in the remediation area. If you have any questions, please contact me at (216) 433-8960 or thomas.m.yohe@nasa.gov.

Sincerely,

Thomas M. Yohe
Cultural Resource Manager

3 Enclosures
Map of Plum Brook Station
Archaeological Sensitivity Map
Firing Range 3 and 4 Site Photographs

National Aeronautics and
Space Administration

John H. Glenn Research Center
Lewis Field
Cleveland, OH 44135-3191

May 5, 2020

Reply to Attn of: FXP

Mr. Ned Daniels
Chairman
Forest County Potawatomi Community of Wisconsin
P.O. Box 340
Crandon, WI 54520

Dear Mr. Daniels:

Pursuant to Section 106 of the National Historic Preservation Act and its authority, Title 36 Code of Federal Regulations Part 800, Protection of Historic Properties, NASA Glenn Research Center is consulting with you on an environmental remediation project at our Plum Brook Station (PBS) facility.

The undertaking's objective is to minimize risks and hazards associated with soil contamination in and around the blast wall at Firing Ranges 3 and 4 to protect human and ecological receptors. Firing ranges at PBS were utilized at various times since the mid-1960s, but are no longer active at the facility. The impact areas for Firing Ranges 3 and 4 share the same blast protection wall; both ranges are overgrown with small trees and brush and the blast wall has deteriorated.

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Past archaeological surveys indicate a moderate potential for archaeological resources in the area. If you have any questions, please contact me at (216) 433-8960 or thomas.m.yohe@nasa.gov.

Sincerely,

THOMAS YOHE

Digitally signed by THOMAS YOHE
Date: 2020.05.05 11:21:07 -04'00'

Thomas M. Yohe
Cultural Resources Manager

3 Enclosures
Map of Plum Brook Station
Archaeological Sensitivity Map
Firing Range 3 and 4 Site Photographs

bcc:
FX/S. M. Ahmed
FXP/T. M. Yohe
FX/Official File
FXP/Official File

National Aeronautics and
Space Administration

John H. Glenn Research Center
Lewis Field
Cleveland, OH 44135-3191

March 12, 2020

Reply to Attn of: FXP

Ms. Diane Hunter
Tribal Historic Preservation Officer
Miami Tribe of Oklahoma
P.O. Box 1326
Miami, OK 74355

Dear Ms. Hunter:

Pursuant to Section 106 of the National Historic Preservation Act and its implementing regulations, 36 Code of Federal Regulations (CFR) Section 800, NASA Glenn Research Center is consulting with you on an environmental remediation project at our Plum Brook Station (PBS) facility.

The undertaking's objective is to minimize risks and hazards associated with soil contamination in and around the blast wall at Firing Ranges 3 and 4 to protect human and ecological receptors. Firing Ranges at PBS were utilized at various times since the mid-1960s, but are no longer active at the facility. The impact areas for Firing Ranges 3 and 4 share the same blast protection wall. Both ranges are overgrown with small trees and brush and the blast wall has deteriorated.

The clean-up effort for the firing ranges consists of two phases. First, a wooden barricade built along the full length of the blast wall will be removed, as will the wooden planks/logs. Next, soil contained within the blast wall will be sifted, staged, and disposed of off-site. Soil will be excavated 1 foot deep under the footprint of the blast wall; areas with high polycyclic aromatic hydrocarbon concentrations will have soil removed to a depth of 2-4 feet. Prior to disposal of the soil, it will be sifted to remove debris and recover bullets or bullet fragments for recycling as scrap metal. Excavated areas will be backfilled and reseeded.

Past surveys indicate a moderate potential for archaeological resources in the remediation area. If you have any questions, please contact me at (216) 433-8960 or thomas.m.yohe@nasa.gov.

Sincerely,

Thomas Yohe

Thomas M. Yohe
Cultural Resource Manager

3 Enclosures
Map of Plum Brook Station
Archaeological Sensitivity Map
Firing Range 3 and 4 Site Photographs