FINAL

Environmental Assessment

for the modification of existing wetlands adjacent to the runway to reduce Bird/Wildlife Aircraft Strike Hazard (BASH) risk at Ellsworth Air Force Base, South Dakota

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Final

Environmental Assessment for the Modification of Existing Wetlands Adjacent to the Runway to Reduce Bird Aircraft Strike Hazard (BASH) Risk at Ellsworth Air Force Base, South Dakota

December 2022

Lead Agency:	U.S. Department of the Air Force
Cooperating Agency:	N/A
Title of Proposed Action:	Environmental Assessment for the modification of existing wetlands adjacent to the runway to reduce Bird Aircraft Strike Hazard (BASH) risk at Ellsworth Air Force Base
Location:	Pennington and Meade County, South Dakota

Abstract

This Environmental Assessment has been prepared to evaluate the potential environmental impacts of modifying existing wetlands adjacent to the runway to reduce wildlife habitat and corresponding BASH risk at Ellsworth Air Force Base (EAFB). By modifying the wetlands, the United States Department of the Air Force (DAF) will reduce BASH risk and improve the safety of flying conditions for pilots stationed at EAFB. The goal of the DAF BASH Program is to preserve war fighting capabilities by reducing wildlife hazards to aircraft operations. The Proposed Action includes modifying approximately 9.3 acres of wetlands within EAFB. The Proposed Action may include a variety of engineered solutions to retain the stormwater management function of the wetlands while removing wildlife attractants. Specific construction methods that may be utilized as part of the Proposed Action include, but are not limited to, culvert extensions, maintaining open drainage features with a hardened bottom, and sharpening drainage features and/or pond edges. The Proposed Action is needed to permanently resolve the BASH risk associated with the subject wetlands, ensuring EAFB can continue to fulfill flight missions without further flight safety risks associated with these wildlife attractants.

This Environmental Assessment was prepared by the DAF in accordance with the National Environmental Policy Act, the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, and the Air Force Environmental Impact Analysis Process promulgated at 32 Code of Federal Regulations Part 989.

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ACRONYMS AND ABBREVIATIONS

28 BW	28th Bomb Wing	DAFI	Department of the Air Force Instruction
ac	Acres	DAFMAN	Department of the Air Force Manual
A.D.	Anno Domini	DANR	Department of Agriculture and Natural Resources
AFB	Air Force Base	DENR	Department of Environment and Natural Resources
AFSAS	Air Force Safety Automated System	DoD	Department of Defense
AFI	Air Force Instruction	EA	Environmental Assessment
AFMAN	Air Force Manual	EAFB	Ellsworth Air Force Base
AICUZ	Air Installation Compatible Use Zone	EIAP	Environmental Impact Analysis Process
AIRFA	American Indian Religious Freedom Act of 1978	EIS	Environmental Impact Statement
AOA	Aeronautical Operations Area	EO	Executive Order
AQCR	Air Quality Control Region	EPA	United States Environmental Protection Agency
BASH	Bird/Wildlife Aircraft Strike Hazard	EPCRA	Emergency Planning and Community Right-to-Know Act
BGEPA	The Bald and Golden Eagle Protection Act of 1940	ERP	Environmental Restoration Program
B.P.	Before Present	ESA	Endangered Species Act of 1973
BMP	Best Management Practices	FEMA	Federal Emergency Management Agency
CAA	Clean Air Act of 1970	FFRMS	Federal Flood Risk Management Standard
CEQ	Council on Environmental Quality	FONSI	Finding of No Significant Impact
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980	FPPA	Farmland Protection Policy Act of 1981
CFR	Code of Federal Regulations	GFP	Game, Fish, and Parks
CH_4	Methane	GHG	Greenhouse Gasses
CO	Carbon monoxide	GWP	Global warming potential
CO_2	Carbon dioxide	HAZMAT	Hazardous materials
CO_2e	Carbon dioxide equivalent	ICRMP	Integrated Cultural Resources Management Plan
CRM	Cultural Resource Manager	IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
CWA	Clean Water Act of 1972	INRMP	Integrated Natural Resources Management Plan
CY	Calendar Year	IPaC	Information for Planning and Consultation
DAF	United States Department of the Air Force	JD	Jurisdictional Determination

MBTA	Migratory Bird Treaty Act of 1918
MT	Metric tons
LTM	Long-Term Monitoring
MOB	Main Operating Base
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act of 1990
NEI	National Emissions Inventory
NEPA	National Environmental Policy Act of 1969
NHPA	National Historical Preservation Act of 1966
NO_2	Nitrogen dioxide
NOx	Nitrogen oxides
NOA	Notice of Availability
NRHP	National Register of Historic Places
OSHA	Occupational Safety and Health Administration
OU	Operable Units
O_3	Ground-level ozone
PM	Particulate matter
POC	Point of Contact
PSD	Prevention of Significant Deterioration
RCRA	Resource Conservations and Recovery Act
SEF	Flight Safety Office
SD	South Dakota
SHPO	State Historic Preservation Office
SO_2	Sulfur dioxide
SWPPP	Storm water Pollution Prevention Plan
TPY	Tons per year
UFC	Unified Facilities Criteria
USACE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
VOC	volatile organic compound
WS	Wildlife Services
WEZ	Wildlife Exclusion Zone

1.0 PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

The United States Department of the Air Force (DAF) proposes to modify existing wetlands adjacent to the primary instrument runway to reduce wildlife habitat and corresponding Bird/Wildlife Aircraft Strike Hazard (BASH) risk at Ellsworth Air Force Base (EAFB). By modifying the wetlands, the DAF will reduce BASH risk and improve the safety of flying conditions for pilots stationed at EAFB.

This Environmental Assessment (EA) was prepared to evaluate the potential environmental impacts of this Proposed Action in compliance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S. Code [USC] 4331 et seq.), the regulations of the President's Council on Environmental Quality (CEQ) that implement NEPA procedures (40 Code of Federal Regulations [CFR] 1500-1508), as amended in May 2022, and the DAF Environmental Impact Analysis Process promulgated at 32 CFR 989.

1.2 BACKGROUND

The goal of the DAF BASH Program is to preserve war fighting capabilities by reducing wildlife hazards to aircraft operations. The DAF BASH Program is subject to guidance contained within Air Force Instruction (AFI) 91-202 "The US Air Force Mishap Prevention Program," DAF Instruction (DAFI) 91-204 "Safety Investigations and Hazard Reporting" (Bird Strike Reporting), Air Force Manual (AFMAN) 32-7003 "Environmental Conservation," DAF Manual (DAFMAN) 91-223 "Aviation Safety Investigations and Reports," and AFI 91-212 "BASH Management Program."

EAFB is located within a major migration route (Central Flyway) for several bird species and waterfowl. Open water in and around the airfield and the installation attract migrating waterfowl and other bird and wildlife species. Birds flying from surrounding areas to the open water adjacent to the runway can place the birds in direct conflict with flight operations, increasing the risk of bird strikes.

The Integrated Natural Resources Management Plan (INRMP) for EAFB (Air Force, 2020a) summarizes recent wildlife strike incidents at EAFB. In the five-year period, Calendar Year (CY)16-CY20, 74 bird-aircraft strikes occurred at EAFB, 70 with small species and four (4) with large species. Five (5) of these strikes resulted in aircraft damage, three (3) in CY16, one (1) in CY17, and one (1) in CY18, causing $956,828 in damage. Large species strikes included the Canada goose, ferruginous hawk, and great horned owl. Small species strikes included 21 identified species: horned larks, sparrows, killdeer, and two (2) bat species, big brown and little brown bats. Most strikes occurred near the airfield in April, May, September, and October.

EAFB maintains a BASH Program as outlined in the 28th Bomb Wing (28 BW) EAFB BASH Plan (Air Force 2020b), managed by the Bomb Wing Flight Safety Office (28 BW/SEF). The BASH Plan informs all personnel of local hazards, identifies local conditions on the airfield attractive to birds and wildlife, summarizes measures required to reduce these hazards, and includes procedures for active control (dispersal and depredation). The BASH Plan establishes a Wildlife Exclusion Zone (WEZ) with three levels (Zones 1-3), which include both on- and off-base areas where low-altitude flying operations are likely to occur. Zones 1 and 2 have a strict "zero tolerance" policy for wildlife. Zone 1 is defined as the Aeronautical Operations Area (AOA) and includes all runways, taxiways, aprons, and hangers. Zone 2 is defined by the airfield perimeter fence and includes final approach zones. Zone 3 is defined by the Installation perimeter fence. Habitat modifications to reduce the attractiveness to wildlife will take priority in Zones 1 and 2 per the EAFB BASH Plan.

The EAFB BASH Plan is developed and implemented utilizing guidance found in AFI 91-212, which establishes BASH program requirements, personnel responsibilities, and management information. Per AFI 91-212, "habitat modification … is the most effective and best long-term strategy to decrease wildlife attraction to an airfield. Removing or decreasing the attractiveness of water bodies; eliminating nesting, perching, and roosting structures; and reducing food attractants/prey species on and surrounding the airfield are all crucial steps in decreasing the threat wildlife pose to flight safety." This instruction further specifies that, at minimum, vegetative cover should be maintained at a height between seven (7) to 14 inches and converted to vegetation deemed unattractive to wildlife within and for 500 feet beyond the Aircraft Movement Area[1] boundary where able. The EAFB BASH Plan also recommended maintaining vegetation inside the security fence at seven (7) to 14 inches, allowing unimpeded access to the Aircraft Movement Area.

The 28 BW/SEF is supported by the United States Department of Agriculture (USDA) Wildlife Services (WS) in employing various strategies to reduce BASH risk at EAFB. In 2018, the USDA WS Wildlife Biologist recommended that the North and South Sloughs be modified to reduce wildlife attraction. In addition, the BASH Plan recommends ponds be modified to eliminate standing water, remove emergent vegetation, and steepen side slopes. Until these wetlands can be modified, intensive vegetation/fuel reduction activities are recommended such as biannual burning and/or mastication (grinding/shredding vegetation).

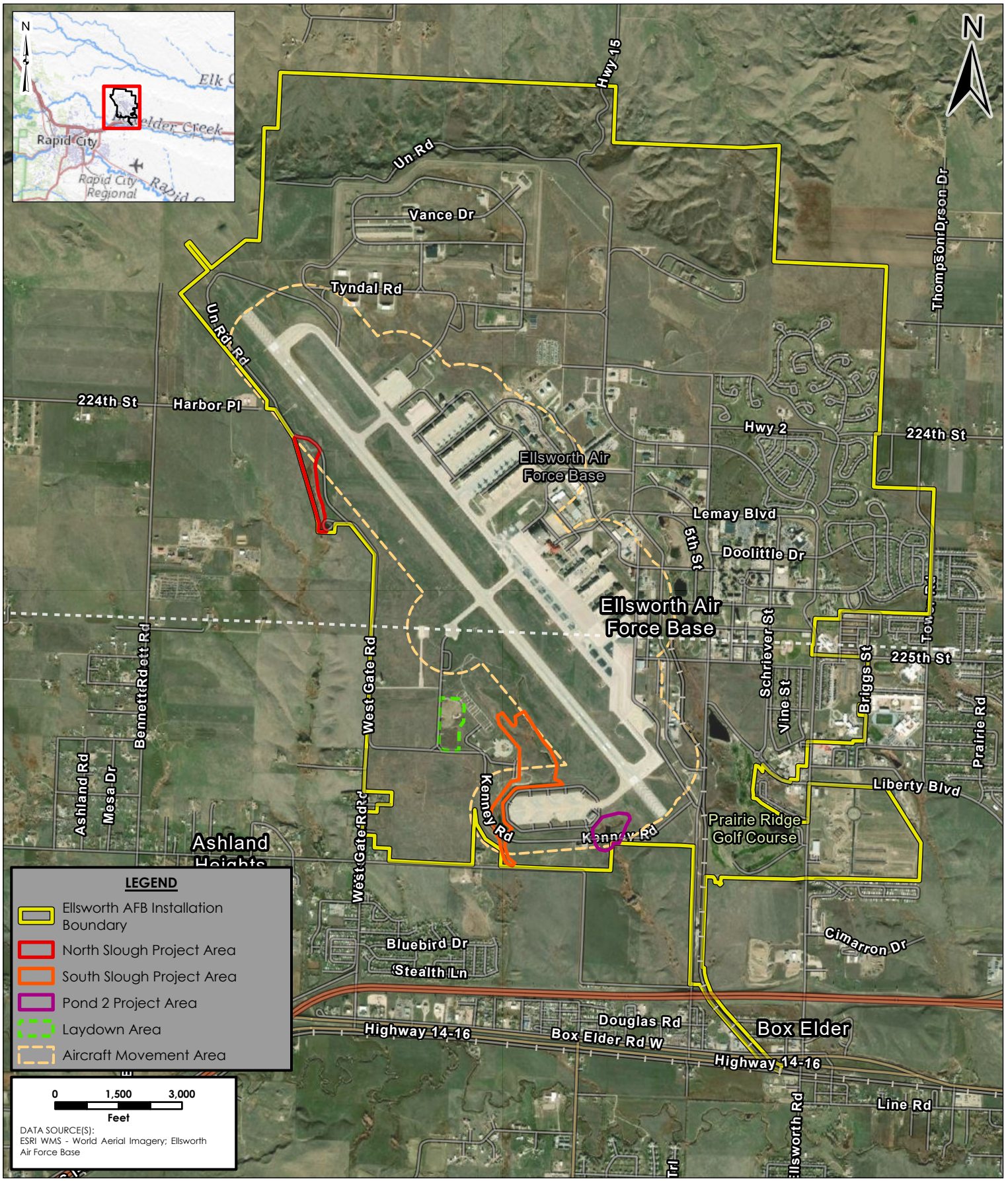
1.3 PROJECT LOCATION AND MISSION

EAFB consists of approximately 5,415 acres in Meade and Pennington counties in southwestern South Dakota (SD) (**Figure 1**). The Air Force's mission is to fly, fight and win – airpower anytime, anywhere. EAFB is home to the 28 BW, including the 28th Operations Group, the 28th Maintenance Group, the 28th Mission Support Group, and the 28th Medical Group. The mission of the 28 BW is to put bombs on target. There are also multiple tenant units at EAFB, including the 89th Attack Squadron and the 82nd Civil Support Team of the SD National Guard. Military infrastructure includes the runway, airfield, hangars, administration buildings, and housing. All flight missions at EAFB rely on safe flight conditions on and around the runway.

In addition to military infrastructure, land use at EAFB includes a memorial park; elementary, middle, and high school; Prairie Ridge Golf Course; EAFB FamCamp; and a museum. Ellsworth's recreational activities include hiking, outdoor tours, biking, hunting, fishing, indoor swimming, shooting (trap and skeet), outdoor archery range, and lakeside swimming and boating (i.e., kayaking, canoes, paddle boats).

The Proposed Action would occur within Meade and Pennington Counties and entirely within the EAFB installation boundary (**Figure 2**). The Proposed Action would occur within the Boxelder Creek watershed, which flows to the Cheyenne River. The wetlands proposed for modification are within three (3) Project Areas adjacent to and south of the runway named the North Slough (14.04 acres), South Slough (40.31 acres), and Pond 2 (12.03 acres). Project Areas include both uplands and wetlands. Wetlands within these project areas are identified as Wetland A (1.33 acres), Wetland B (0.13 acre), Wetland C (0.23 acre), Wetland D1 (South Slough) (3.82 acres), Wetland D2 (Pond 1) (1.49 acres), and Wetland E (2.26 acres) (**Figure 2**).

[1] The Aircraft Movement Area is defined in AFI 91-212 as "that area of the airfield encompassed by the primary surface and the clear zones, as well as all apron areas and taxiways, regardless of their location."



SES Civil and Environmental LLC

Project Location

EA for Wetland Modification
BASH Risk Reduction
Ellsworth AFB, SD
Meade and Pennington Counties, South Dakota

Project No.:	1A001.4080.0009.0019
Drawn By:	JRN
Reviewed By:	GA
Approved By:	JT
Date:	Jun 2022
FIGURE NUMBER	1

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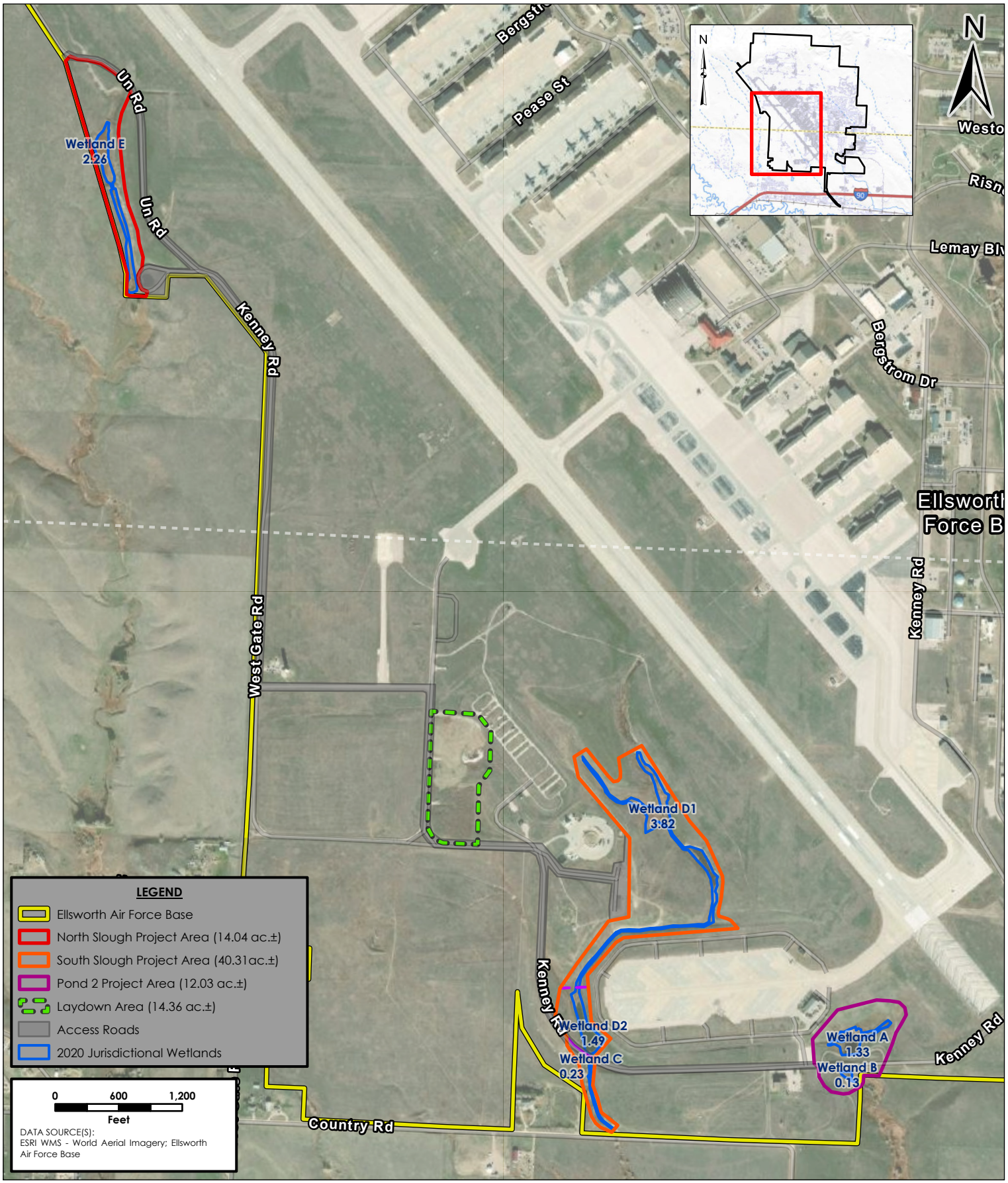

SES Civil and Environmental LLC

Wetlands / Project Areas

EA for Wetland Modification
BASH Risk Reduction
Ellsworth AFB, SD
Meade and Pennington Counties, South Dakota

Project No.:	1A001.4080.0009.0019
Drawn By:	JRN
Reviewed By:	GA
Approved By:	JT
Date:	Jun 2022
FIGURE NUMBER	2

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1.4 PURPOSE OF AND NEED FOR THE PROPOSED ACTION

Purpose. The purpose of this project is to reduce BASH risk associated with wetland areas adjacent to the runway at EAFB.

Need. This project is needed because of wildlife's demonstrated recurrent use of wetland areas adjacent to the runway. The successes of EAFB's flight missions hinge on the operational readiness of the airfield, which is negatively impacted by wildlife habitat adjacent to the runway. The Proposed Action is needed to permanently resolve BASH risk associated with the subject wetlands, ensuring EAFB can continue to fulfill flight missions without further interruption associated with these wildlife attractants.

1.5 NEPA AND OTHER COMPLIANCE REQUIREMENTS

NEPA is a federal statute requiring the identification and analysis of potential environmental impacts associated with proposed federal actions before those actions are taken. NEPA helps decision makers make well-informed choices based on understanding the potential environmental consequences. NEPA established the CEQ, which is charged with developing and implementing regulations and ensuring federal agency compliance with NEPA. The process for implementing NEPA is outlined in 40 CFR §§ 1500–1508, "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, as amended in May 2022.

CEQ regulations specify that an EA must be prepared to provide evidence and analysis to determine whether to prepare a Finding of No Significant Impact (FONSI) or an Environmental Impact Statement (EIS). The EA aids in an agency's compliance with NEPA when an EIS is unnecessary and facilitates the preparation of an EIS when one is required.

Air Force Policy Directive 32-70, "Environmental Considerations in Air Force Programs and Activities," states that the DAF will comply with applicable federal, state, and local environmental regulations and standards for environmental stewardship, including those identified in 32 CFR § 989.

In compliance with NEPA, the DAF has determined that preparing an EA is the appropriate level of the Environmental Impact Analysis Process (EIAP; 23 CFR Part 989) for the Proposed Action described in **Section 2.1**. The EA will determine whether the Proposed Action will result in significant impacts. If the proposed impacts do not rise to the level of significance triggering the need for an EIS and can be addressed using mitigation, a mitigated FONSI will be prepared. If significant impacts are predicted, the DAF will decide whether to prepare an EIS or abandon the Proposed Action. The EA will also be used to guide the DAF in implementing the Proposed Action consistent with DAF standards for environmental stewardship should the Proposed Action be approved for implementation.

In addition to NEPA, the DAF is required to manage impacts to other resources as outlined in AFMAN 32-7003, "Environmental Conservation." AFMAN 32-7003 incorporates other relevant compliance requirements including:

- Clean Water Act (CWA) of 1972, as amended (33 CFR §1251 et seq.), which establishes regulations regarding the discharge of pollutants into waters of the United States
- Executive Order (EO) 11990 "Protection of Wetlands" (May 1977), which directs federal agencies to minimize impacts to wetlands wherever possible
- EO 11988 "Floodplain Management" (May 1997), which directs federal agencies to avoid floodplain impacts where practical
- The Endangered Species Act (ESA) of 1973 (16 USC 35 § 1531 et seq.) requires the protection of federally listed species and their habitats

- Section 106 of the National Historic Preservation Act (NHPA) of 1966 (54 USC § 300101 et seq.) requires federal agencies to consider the effects of their undertakings on historic properties per 36 CFR § 800

1.6 INTERGOVERNMENTAL AND STAKEHOLDER COORDINATION

The Intergovernmental Coordination Act and EO 12372, *as amended* to EO 12416, "Intergovernmental Review of Federal Programs," requires federal agencies to provide opportunities for consultation by elected officials of state and local governments that would be directly affected by a federal proposal.

The DAF conducted early stakeholder engagement with relevant agencies, federally recognized tribes, and other stakeholders about the Proposed Action and alternatives (see **Appendix A** for stakeholder coordination). The early engagement process allowed these stakeholders to comment on the Proposed Action and its impacts. The DAF received and addressed comments from the following stakeholders:

- The United States Army Corps of Engineers (USACE), SD Regulatory Office, provided comments on 26 August 2022 regarding wetland modification. USACE stated that a Department of the Army Permit pursuant to Section 404 of the CWA would most likely be required. See **Section 3.2.3** for permitting language.
- The SD Office of the State Historic Preservation Officer (SHPO) provided Comments on 19 September 2022 regarding ground-disturbing activities. SHPO concurs with the EAFB determination of "No Historic Properties Affected" for the proposed action, provided all activates occur in the previously disturbed areas as delineated. See **Section 3.4.3** for concurrence language.
- The SD Department of Agriculture and Natural Resources (DANR) provided comments on 21 September 2022. SD DANR concurred the proposed action would have little to no effect on solid and hazardous waste, drinking water, or groundwater. Recommendation includes reviewing the spills and tanks database regularly as the project progresses and address any potential contamination caused or encountered during construction activities. Additionally, it is stated the proposed action will have minor impacts to air quality in SD, and SD DANR recommends that EAFB obtain a permit from the Air Quality or Minerals and Mining Program to address source and fugitive emissions. The SD DANR Surface Water Quality Program determined that a General Permit for Stormwater and Section 404 Permit from USACE would likely be required. See **Section 3.2.3** and **3.5.3** for compliance language.
- The United States Fish and Wildlife Service (USFWS) provided comments on 27 September 2022 regarding wetland impacts. USFWS stated that wetland impacts should be avoided to the maximum extent possible. Should unavoidable wetland impacts occur, mitigation should preferably take the form of wetland restoration. USFWS requests the submittal of a mitigation plan prior to ground-disturbing activities. See **Section 3.5.3** for potential wetland mitigation language.

In addition to early stakeholder engagement, a Notice of Availability (NOA) of the Draft EA was published in the *Rapid City Journal*, *Black Hills Pioneer*, and *Native Sun News*. Copies of the Draft EA were also sent to the Rapid City Public Library. Public comments are incorporated and addressed in this Final EA.

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This section describes the Proposed Action, alternatives considered, and the No Action Alternative. The NEPA process evaluates potential environmental consequences associated with a Proposed Action and considers alternative courses of action. Only reasonable alternatives that satisfied the purpose of and need for the Proposed Action, as defined in **Section 1.5**. EIAP regulations were considered. Beyond the Proposed Action, no alternatives were identified that would meet the purpose and need described in **Section 1.5**. The No Action Alternative was also considered the baseline for which potential impacts were compared. While the No Action Alternative would not satisfy the purpose or need for the Proposed Action, it was analyzed per CEQ and DAF NEPA regulations.

2.1 PROPOSED ACTION

The DAF proposes permanently removing all wildlife habitat/wetlands from the North Slough, South Slough, and Pond 2 Project Areas. The Proposed Action may include a variety of engineered solutions to retain the stormwater management function of the wetlands while removing wildlife attractants. The final design will meet Unified Facilities Criteria (UFC) requirements for airfield grade, including DoD UFC 3-260-01, "Airfield and Heliport Planning and Design" (5 May 2020). The final design will also be selected in coordination with the USACE through the Section 404 CWA permitting process. Specific construction methods that may be utilized as part of the Proposed Action are described in **Table 2-1**.

Table 2-1 Construction Methods Under Consideration for the Proposed Action

Project Area	Wetland Areas	Construction Methods Under Consideration
Pond 2	Wetland A	• Extend the culvert within the channel that leads to Wetland A • Maintain open drainage in the channel through the construction of a turf and/or hardened bottom, and non-impounding check dams • Extend the culvert within the channel that leads to Wetland A inside the Approach/Departure Surfaces, and maintain open drainage within the channel outside of the Approach/Departure surfaces • Sharpen and/or armor the edges of the pond
	Wetland B	• Maintain open drainage in the channel through the construction of a turf and/or hardened bottom and non-impounding check dams
South Slough	Wetland C	• Maintain open drainage in the channel through the construction of a turf and/or, hardened bottom, and non-impounding check dams
	Wetland D1 (South Slough)	• Maintain open drainage in the channel through the construction of a turf and/or hardened bottom, and non-impounding check dams • Place a culvert in the existing channel upstream of Wetland D1 to create a diversion west of the existing channel in a North-South alignment to connect the existing channel adjacent to the northwestern side of the Alert Apron. This would include abandoning and contouring/filling the existing channel for drainage and vegetation management.
	Wetland D2 (Pond 1)	• Sharpen and/or armor the edges of Wetland D2 • Enlarge Wetland D2 (note: this is anticipated to be a requirement to provide

Project Area	Wetland Areas	Construction Methods Under Consideration
		additional surge capacity resulting from alterations of Wetland D1 upstream)
North Slough	Wetland E	• Add a culvert in the channel connecting this wetland to the adjacent stormwater pond • Maintain open drainage in the channel through the construction of a turf and/or, hardened bottom, and non-impounding check dams • Add a culvert across the transitional surface boundary

It is assumed that all wetlands within the Proposed Action Project Areas will be permanently impacted using a combination of design alternatives listed in **Table 2-1**. While various design options could be viable alternatives, the environmental consequences (permanently impacting wetlands) would be identical. The Proposed Action would result in permanent impacts up to a maximum of 9.26 acres of wetlands. Wetland permitting and mitigation will be required and coordinated with USACE prior to the start of construction. The area selected for mitigation will be far from the airfield to ensure it does not contribute to future BASH risk. Further, the Proposed Action will ensure that the final engineered design does not negatively impact the on-site and downstream stormwater quality or quantity.

2.2 SELECTION STANDARDS

Considering alternatives helps avoid unnecessary impacts and allows for an analysis of reasonable ways to achieve the stated purpose. An alternative must be reasonable to warrant detailed evaluation. To be considered reasonable, an alternative must be suitable for decision-making, capable of implementation, and sufficiently satisfactory with respect to meeting the purpose of and need for the action. CEQ NEPA regulations define reasonable alternatives as economically and technically feasible and that show evidence of common sense. Specific requirements must be present or reasonably attainable to meet the Proposed Action's purpose and need.

In the DAF, selection standards are used to establish the parameters that must be met for alternatives to be considered reasonable and sufficient to support a Proposed Action. For this EA, all alternatives considered must significantly reduce wildlife habitat/attractant adjacent to the EAFB primary instrument runway. Each proposed alternative was evaluated to determine if it met the DAF selection standards by applying the following selection standards:

- Must reduce the occurrence of wildlife within WEZ 1 and 2;
- Must comply with UFC requirements for airfield grade, including DoD UFC 3-260-01, "Airfield and Heliport Planning and Design" (5 May 2020);
- Must meet the AFI 91-212 (June 2021) requirement to minimize aircraft wildlife strikes and EAFB BASH Plan goals; and
- Must improve airfield safety for military personnel.

These selection standards provide guidance and/or instruction on mitigating wildlife hazards within an operational airfield and were utilized for screening potential alternatives. The WEZ 1 and 2 at EAFB are defined as the AOA and include all runways and taxiways as well as aprons and hangers; the airfield perimeter fence including final approach zones, respectively. DoD UFC 3-260-01, "Airfield and Heliport Planning and Design" (5 May 2020), outlines the utilization of AFI 91-212 during the planning

and design stages of installation development. AFI 91-212 provides the general recommendation that vegetation should be maintained out to 1,500 feet, where able, along either side of the entire length of the runway and generally within 500 feet of areas around taxiways, parking areas, and other active airport spaces. This AFI also instructs the BASH Program Manager to establish WEZ, which should encompass the "Aircraft Movement Area, clear zones, and any additional habitat attractant (such as water treatment facilities, golf courses, landfills, and athletic fields) in proximity to the airfield and low-level flight corridors (such as final approach/departure)."

2.3 SCREENING OF ALTERNATIVES

The following alternatives to the Proposed Action that reduce wildlife habitat/attractant adjacent to the EAFB primary instrument runway were considered by the DAF:

- Alternative 1 – Complete modifications to wetlands in North Slough (Wetland E), South Slough (Wetlands D1 and D2 only), and Pond 2 (Wetlands A only)
- Alternative 2 – Complete modifications to North Slough (Wetland E), South Slough (Wetland D1 only), and Pond 2 (Wetland A only)
- Alternative 3 – Install and maintain deterrent exclusionary devices (e.g., wire grids or bird balls) as well as additional on-site wildlife staff presence within all areas of the North Slough, South Slough, and Pond 2 during significant increases in local wildlife activity

To be carried forward for analysis, the alternatives must meet all four selection standards listed in **Table 2-2.** The table also provides a screening of project alternatives based on selection standards, with green indicating that the selection standard is met, yellow indicating that the selection standard is partially met, and red indicating that the selection standard is not met.

Table 2-2 Alternatives Considered and Selection Standards

Alternatives Considered	**Selection Standards**			
	Reduce occurrence of Wildlife within WEZ 1 and 2	Comply with UFC airfield grade requirements	Meet AFI 91-212 and EAFB BASH Plan goals	Improve the airfield safety for military personnel
Proposed Action	Wildlife habitat/attractant reduced	UFC criteria met	Addresses goals in BASH Plan and AFI 91-212	Reduces wildlife strike hazards and the need for personnel to be on the airfield for active wildlife management
Alternative 1 – North and South Slough (Wetlands D1 and D2 only), and Pond 2 (Wetland A only)	Wildlife habitat/attractant reduced	UFC criteria met	Partially addresses goals in BASH Plan and fully addresses recommendations in AFI 91-212	Partially reduces wildlife strike hazards and the need for personnel to be on the airfield for active wildlife management
Alternative 2 – North Slough (Wetland E), South Slough (Wetland D1 only), and Pond 2 (Wetland A only)	Wildlife habitat/attractant reduced	UFC criteria met	Partially addresses goals in BASH Plan and AFI 91-212	Partially reduces wildlife strike hazards and the need for personnel to be on the airfield for active wildlife management
Alternative 3 – Install and maintain deterrent devices and increase personnel	Wildlife habitat/attractant reduced	UFC criteria met	Addresses goals in BASH Plan and AFI 91-212	Reduces wildlife strike hazards and need for personnel to be on the airfield for active wildlife management; however, it increases the need for personnel on the airfield for inspection and maintenance of deterrent devices
No Action	Wildlife habitat/attractant left as-is	N/A	Does not address goals BASH Plan and AFI 91-212	It does not improve the airfield safety for military personnel

Legend: WEZ-Wildlife Exclusion Zone; UFC- Unified Facilities Criteria; AFI-Air Force Instruction; BASH-Bird/wildlife Aircraft Strike Hazard; EAFB-Ellsworth Air Force Base

Comparing project alternatives to selection standards shows that only the Proposed Action meets all selection standards.

Alternative 1 would significantly mitigate wildlife habitat within about 1,500 feet of the runway and associated movement areas (i.e., Alert Facility ramp) in excess of 2,000 feet of the runway. This alternative significantly reduces wildlife habitat in the airfield environment, greatly improves safety for military aircrew operating from the airfield and reduces the need for active hazard wildlife management. Alternative 1 predominantly addresses goals outlined in AFI 91-212; however, this alternative does not address the goals outlined in the BASH Plan and would leave wildlife attractants within the perimeter fence (WEZ 2). This alternative would still require personnel to be on the airfield to address wildlife hazards.

Alternative 2 would significantly mitigate wildlife habitat within about 1,500 feet of the runway; however, this alternative would still allow wildlife attractants within 500 feet of an Aircraft Movement Area (i.e., Alert Facility ramp) and WEZ 2. Therefore, this alternative partially addresses goals within the BASH Plan and AFI 91-212. While wildlife habitat attractants would be reduced, this alternative would still require active hazard wildlife mitigation on the airfield.

Alternative 3 minimally addresses goals within the BASH Plan and AFI 91-212 and excludes/conceals wildlife habitat in the airfield environment; however, increased wildlife staff would be required to ensure exclusionary techniques are effective. Implementing this alternative would also have associated annual costs and require personnel to be on the airfield to address wildlife hazards.

EAFB actively implements deterrent methods per their current BASH Plan and AFI 91-212. However, wildlife strikes still occur regularly, with EAFB experiencing an average of 11 strikes annually as reported by EAFB to the Air Force Safety Automated System (AFSAS) from 2017-2021. Based on the above matrix, no alternatives to the Proposed Action adequately address the selection criteria. Therefore, only the Proposed Action and No Action Alternative were carried forward for analysis under NEPA.

2.4 NO ACTION ALTERNATIVE

DAF NEPA regulations require consideration of the No Action Alternative. The No Action Alternative is a baseline against which the proposed action's impacts and other potential action alternatives can be evaluated. Under the No Action Alternative, the North Slough, South Slough, and Pond 2 Project Areas would remain in their current state. Per the EAFB BASH Plan, the 28 BW/SEF and USDA WS would continue vegetation maintenance and active wildlife control measures to reduce BASH risk.

2.5 IDENTIFICATION OF THE PREFERRED ALTERNATIVE

DAF has identified the Proposed Action as the preferred alternative.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes each resource area's current/baseline conditions (Affected Environment) while outlining the potential consequences of implementing the Proposed Action and the No Action Alternative (Environmental Consequences). NEPA requires that the analysis address environmental resources that have the potential to be affected. Environmental resources that do not have the potential to be affected need not be analyzed. As a result, seven (7) resource areas were eliminated from further consideration. **Table 3-1** provides the rationale for eliminating resources from further consideration.

Table 3-1. Resource Areas Eliminated from Detailed Analysis

Resource Area	Reason Eliminated from Detailed Analysis
Airspace	The Proposed Action does not include components impacting airspace or the use of airspace. Therefore, airspace was not carried forward for detailed analysis.
Land Use and AICUZ	The Proposed Action would not alter current land use designations or affect the land use compatibility of EAFB and the surrounding community. Furthermore, the Proposed Action would not impact the Air Installation Compatible Use Zone (AICUZ) Program, which applies to land outside the installation boundary. Therefore, Land Use and AICUZ were not carried forward for detailed analysis.
Noise	Potential noise associated with the Proposed Action would be limited to short-term impacts associated with temporary construction activities. Such activities would be negligible compared to the current noise generated by EAFB activities such as mowing and takeoff/landing of military aircraft. Also, the Proposed Action would not conflict with applicable federal, state, or noise control regulations and would not result in continuous and long-term elevated noise levels. Therefore, noise was not carried forward for detailed analysis.
Safety and Occupational Health	The Proposed Action would involve the removal and/or modification of wetland areas documented as BASH risks. Long-term safety benefits to the installation would occur by eliminating wildlife attractants on the airfield and reducing EAFB BASH risks. Construction activities would include temporary safety and occupational health risks typical to a civil construction project. Contractors must comply with Occupational Safety and Health Administration (OSHA) safety standards and project-specific work safety plans. The Proposed Action would not conflict with applicable safety regulations or result in continuous and long-term adverse safety and occupational health risks. Therefore, safety and occupational health was not carried forward for detailed analysis.
Geology, Soils, and Farmland	The Proposed Action would involve reshaping and/or hardening the bottoms of wetland areas adjacent to the runway while preserving the wetlands' general shape, location, topography, hydrologic function, and associated geology soils. The Proposed Action is within Nunn series soils. These soils are considered prime farmland if irrigated and farmland of statewide importance if they have a 6-9% slope. However, the Proposed Action would be conducted in delineated wetlands and their adjacent upland fringe entirely within the runway transition zone of an active military installation. Because farming is not a compatible land use of the Proposed Action Project Area, there would be no impacts on farmland. The Proposed Action would not adversely affect geology, soils, or farmland. Therefore, geology, soils, or farmland were not carried forward for detailed analysis.
Visual Resources	The Proposed Action is entirely within a mowed, maintained runway transition zone within an active military installation. The Proposed Action would reduce vegetation and may add/modify

	stormwater structures within the Project Areas. The only area visible outside the EAFB fence is near Wetland C. Regardless of the construction method utilized, the overall viewshed and purpose of the wetland areas and airfield would not be altered. Therefore, visual resources were not carried forward for detailed analysis.
Socioeconomic Resources and Environmental Justice	There is no potential for adverse environmental justice impacts to occur as described in Proposed EO12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low Income" and EO 13045, "Protection of Children from Environmental Health Risks and Safety Risks." The Proposed Action takes place entirely within EAFB property, and would not impact the surrounding communities. Therefore, socioeconomics and environmental justice were not carried forward for detailed analysis.

Legend: EAFB-Ellsworth Air Force Base; AICUZ-Air Installation Compatible Use Zone; BASH-Bird/wildlife Aircraft Strike Hazard; OSHA-Occupational Safety and Health Administration; EO-Executive Order

The following resources have the potential to be impacted by the Proposed Action and were carried forward for detailed analysis:

- Infrastructure
- Water Resources
- Biological Resources
- Cultural Resources
- Hazardous Materials, Contaminated Sites, and Toxic Substances
- Air Quality

Criteria used to determine potential environmental impacts of the proposed actions are described at the beginning of each resource area subsection. The significance of an action is measured in terms of context and intensity. The types and levels of effects are the following:

- Short-term or long-term impacts - Short-term impacts occur during the time required for construction or demolition activities. Long-term impacts are expected to persist after construction or demolition activities are completed.
- Negligible, minor, moderate, or significant impacts - These terms characterize the magnitude or intensity of impacts. Negligible impacts are perceptible but at a lower level of detection. Minor impacts are slight but detectable. Moderate impacts are apparent. Significant impacts would result in a partial or total resource loss at an appropriately considered scale. Significant impacts warrant more attention and effort in developing mitigation to fulfill the requirements outlined in the CEQ regulations.
- Adverse, neutral, or beneficial impacts - Adverse impacts have unfavorable or undesirable outcomes on the environment. Neutral impacts are neither adverse nor beneficial. Beneficial impacts have positive outcomes.

3.1 INFRASTRUCTURE

Infrastructure is defined as human-made resources that aid in the functionality of a facility and/or community. Infrastructure can include buildings, transportation facilities (i.e., roadways), and utilities (i.e., potable water, sewer, stormwater, electrical, solid waste, etc.).

Potential impacts of the Proposed Action on infrastructure are considered significant if the action would:

- Increase traffic on the installation and local roads so they are unable to accommodate the additional vehicles
- Cause a road not to comply with federal, state, or local laws and regulations;
- Places temporary or permanent demands on a utility system beyond the capacity of that system;
- Creates a temporary or permanent disruption to a utility system; or
- Constitutes a substantial risk to human health or the environment.

3.1.1 Regulatory Setting

To implement the Proposed Action, the DAF must comply with the following:

- DoD UFC 3-260-01, "Airfield and Heliport Planning and Design" (5 May 2020), states that airfield drainage should be designed to manage stormwater so that airfield safety is not compromised.
- SD Department of Environment and Natural Resources (DENR) General Surface Water Discharge Permit Authorizing Discharge Under The SD Surface Water Discharge System, Permit Number SDG860093, which specifies requirements for EAFB associated with discharges into unnamed tributaries of Box Elder Creek.

3.1.2 Affected Environment

The Project Area is adjacent to EAFB's Runway 13/31, several taxiways, taxilanes, site access roads, fencing, and an Alert Facility ramp. The only infrastructure within the Project Area affected by the Proposed Action is the existing stormwater utility that functions as drainage for the runway and associated airport facilities. However, existing wetlands associated with the stormwater utility are documented BASH risks and are not compliant with guidance in DoD UFC 3-260-01.

3.1.3 Environmental Consequences

The Proposed Action would not result in any significant short-term or long-term impacts to infrastructure. The Proposed Action would not involve the removal or relocation of any infrastructure. Short-term minor impacts associated with construction activities on roadways and buried utilities (such as potable water, sewer, and electricity) would be minimized through coordination with the EAFB Water Quality Program and the SD One Call 811 utility locator program. Any impacts to roadways or buried utilities would be temporary, and any disruption, if required, would be quickly restored.

The wetlands associated with the Proposed Action are components of EAFB's stormwater utility. While the Proposed Action would result in a moderate impact to the stormwater infrastructure, it would be designed to ensure the functionality of the stormwater system is not adversely impacted and would be considered neutral or beneficial. A hydraulic study would be completed to ensure the final design meets or exceeds the current stormwater capacity. A Stormwater Pollution Prevention Plan (SWPPP) would be prepared and followed to minimize impacts to the stormwater system during construction, such as downstream sedimentation.

3.1.4 No Action Alternative

No changes to infrastructure would result under the No Action Alternative. The stormwater infrastructure and associated wetland areas would remain as-is and continue to be a BASH risk.

3.2 WATER RESOURCES

Water resources within the Project Areas include groundwater, surface water, wetlands, and floodplains. Because vegetation is utilized in determining the occurrence of on-site wetlands, a brief discussion of plant species is provided in this section. A detailed discussion of plants and other biotic resources that may occur in these areas and their protection measures are discussed further in **Section 3.3**.

Potential impacts of the Proposed Action on water resources are considered significant if the action would:

- Violate federal or state surface water protection laws;
- Constitute a substantial risk to aquatic animals and/or humans or contamination posing secondary health risks during the project life;
- Eliminate or sharply curtail existing aquatic life or human uses dependent on in-stream flows or water withdrawals during the project life;
- Place structures within a 100-year flood hazard area that violate federal, state, or local floodplain regulations; or
- Expose people or structures to a substantial risk of loss, injury, or death involving flooding, including flooding because of the failure of a levee or dam.

3.2.1 Regulatory Setting

To implement the Proposed Action, the DAF must comply with the following:

- CWA of 1972, as amended (33 CFR §1251 et seq.), which establishes regulations regarding the discharge of pollutants into waters of the United States.
- EO 11990 "Protection of Wetlands" (May 1977), which instructs federal agencies to minimize impacts to wetlands wherever possible.
- EO 11988 "Floodplain Management" (May 1997), which directs federal agencies to avoid floodplain impacts where practical.

3.2.2 Affected Environment

3.2.2.1 Groundwater

Groundwater is water that flows from the surface and fills the gaps in the subsurface material (i.e., gravel, sand, and soil) (Carter et al., 2003). Groundwater in western SD is utilized for industrial, agricultural, and municipal purposes. Three aquifers underlie EAFB; the Inyan Kara, Minnelusa, and Madison. Box Elder and Rapid City, SD's surrounding communities utilize these groundwater sources for municipal water. EAFB drinking water is obtained from Rapid City (AFCEC, 2021). No groundwater supply wells occur within the Project Areas. Several groundwater monitor wells are located in the Project Areas.

3.2.2.2 Surface Waters and Wetlands

Surface water is the staging or ponding of water aboveground and can include features such as ponds, streams, and lakes (EPA, 2022). The EPA and USACE define wetlands as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions," (40 CFR 232.2).

Xcel Engineering, Inc. delineated all wetlands within the Project Areas in July-August 2020 per the *1987 Corps of Engineers Wetland Delineation Manual and Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0)*. Results of the wetland delineation were documented in the Final Wetland Surveys to Support B-21 Environmental Impact Statement EAFB, SD (**Appendix B**). Surface water and wetland types were classified utilizing the *Wetlands and Deepwater Habitats Classification System* (the "Cowardin System," Cowardin et al., 1979). Each wetland area was labeled with a specific Cowardin Code indicating the habitat's vegetative and hydrologic structure. The jurisdictional wetland types in the Project Areas are summarized in **Table 3-2** and described in the text that follows.

Table 3-2. Summary of Wetland IDs with Associated Cowardin Codes

Project Area	Wetland Areas	Cowardin	Acres (ac)
Pond 2	Wetland A	L1UBx/PEM	1.33
	Wetland B	PEM	0.13
South Slough	Wetland C	R2UBx	0.23
	Wetland D1 (South Slough)	R2UBx/PEM	3.82
	Wetland D2 (Pond 1)	L1UBx/PEM	1.49
North Slough	Wetland E	PEM	2.26
Total:			**9.26**

Notes: Table content from *Appendix B:* XCEL Engineering, Inc. *Final Wetland Surveys to Support B-21 Environmental Impact Statement Ellsworth Air Force Base, South Dakota*. November 2020. Prepared for Department of the Air Force, Global Strike Command, Ellsworth Air Force Base, South Dakota

Legend: LU1Bx- Lacustrine-Limnetic-Unconsolidated Bottom-Excavated; PEM-Palustrine-Emergent; R2UBx- Riverine-Lower Perennial-Unconsolidated Bottom-Excavated

Pond 2 Project Area

Wetland A (1.33 ac) – Corwadin Classification: Lacustrine-Limnetic-Unconsolidated Bottom-Excavated (L1UBx) and Palustrine-Emergent (PEM)

Wetland A is in the Pond 2 Project Area southeast of the Alert Apron and north of Kenney Road. Wetland A consists of a stormwater retention pond (L1UBx) and connected herbaceous wetland (PEM), which includes the banks/littoral area of the pond and adjacent wetland habitat. The retention pond contains small amounts of emergent vegetation, dominated by common cattail (*Typha latifolia*), and no submerged or floating vegetation. The vegetated wetland surrounding the retention pond is dominated by groundcover species, including Torrey's rush (*Juncus torreyi*), blue vervain (*Verbena hastata*), curly dock (*Rumex crispus*), field sowthistle (*Sonchus arvensis*), bog willowherb (*Epilobium leptophyllum*), and common cattail. Shrub and canopy species in this wetland are dominated by peach-leaf willow (*Salix amygdaloides*) and sandbar willow (*Salix interior*).

Wetland B (0.13 ac) – Cowardin Classification: Palustrine-Emergent (PEM)

Wetland B is within the Pond 2 Project Area, immediately south of Wetland A and Kenney Road and receives drainage from Wetland A via a culvert that runs underneath Kenney Road. This vegetated wetland is dominated by groundcover species, including narrow-leaf cattail (*Typha*

angustifolia), curly dock, and blue vervain. Shrub and canopy species in this wetland are dominated by eastern cottonwood (*Populus deltoides*) trees and saplings.

South Slough Project Area

Wetland C (0.23 ac) – Cowardin Code: Riverine-Lower Perennial-Unconsolidated Bottom-Excavated (R2UBx)

Wetland C is in the South Slough Project Area, immediately south of Kenney Road and receives drainage from Wetland D2 via a culvert that runs underneath Kenney Road. Wetland C is a channelized stream that ranges from approximately six (6) feet to 12 feet wide and steep banks that range from approximately 15 feet to 30 feet high in linear distance from toe-of-slope to top-of-bank. The channel and banks of the stream are covered mainly by riprap that is either loose or secured within gabion baskets to minimize erosion potential. The channelized banks are dominated by groundcover species, including common cattail and three-square (*Schoenoplectus pungens*), with scattered shrub and canopy species dominated by cottonwood, peach-leaf willow, and sandbar willow trees and saplings. The inundated channel contains no floating or emergent vegetation.

Wetland D1 (South Slough) (3.82 ac) – Cowardin Code: Riverine-Lower Perennial-Unconsolidated Bottom-Excavated (R2UBx) and Palustrine-Emergent (PEM)

Wetland D1 is within the South Slough Project Area, north and west of the Alert Apron and immediately north of Wetland D2. Wetland D1 consists of a channelized stream (R2UBx) that ranges from six (6) to 90 feet wide with moderately sloped to very steep banks. Additionally, riprap and associated vegetated wetland fringes (PEM) cover certain portions of the stream. Wetland D1 contains a culvert at its northernmost end, closest to the runway. It is utilized for airfield drainage. The channelized banks are dominated by groundcover species, including common cattail, Torrey's rush, and softstem bulrush (*Schoenoplectus tabernaemontani*), with scattered shrub and canopy species, including peach-leaf willow and sandbar willow trees and saplings. The inundated channel of the stream contains no submerged or floating vegetation.

Wetland D2 (Pond 1) (1.49) – Cowardin Code: Lacustrine-Limnetic-Unconsolidated Bottom-Excavated (L1UBx) and Palustrine-Emergent (PEM)

Wetland D2 is within the South Slough Project Area, immediately north and east of Kenney Road and receives drainage from Wetland D1 and drains into Wetland C via a culvert. Wetland D2 consists of a retention pond (L1UBx) and associated herbaceous wetlands (PEM). The retention pond contains no emergent, submerged, or floating vegetation. The vegetated wetland surrounding the retention pond is dominated by groundcover species, including cattail, narrow-leaf cattail, Torrey's rush, softstem bulrush, curly dock, blue vervain, field sow-thistle, common evening-primrose (*Oenothera biennis*), and common water hemlock (*Cicuta maculata*). The scattered shrub and canopy species in this wetland are dominated by peach-leaf willow and sandbar willow trees and saplings.

North Slough Project Area

Wetland E (2.26 ac) – Cowardin Code: Palustrine-Emergent (PEM)

Wetland E is within the North Slough Project Area, near the northwestern boundary of EAFB, west of Un Road. This wetland receives drainage via culverts located at its northernmost end and an adjacent retention pond at its southern end. Wetland E is a linear, herbaceous wetland dominated by groundcover species, including sandbar willow, common cattail, common spike-

rush (*Eleocharis palustris*), curly dock, and common mint (*Mentha arvensis*). The scattered shrub and canopy species in this wetland are dominated by peachleaf willow and sandbar willow trees and saplings.

The USACE issued a Jurisdictional Determination (JD) for the wetlands described above on 3 November 2020 (NWO-2020-01749-PIE) (USACE, 2020). The JD is valid until 4 November 2025 and clarifies that all wetlands delineated within the Project Areas fall under federal jurisdiction.

All surface waters and wetlands within the Project Areas serve as stormwater drainage for the airfield and associated infrastructure. All water from these wetlands, ponds, and channels flows south into unnamed tributaries, eventually draining into Box Elder Creek, approximately one mile south of the EAFB property boundary (**Figure 3**). Box Elder Creek flows southeast into the Cheyenne River, which meets the Missouri River at Lake Oahe (Air Force, 2020a).

3.2.2.3 Floodplains

Floodplains are defined by the Federal Emergency Management Agency (FEMA) as "any land area susceptible to being inundated by floodwaters from any source." The area subject to a 1 percent chance of flooding in any given year is the 100-year floodplain. Therefore, evaluating development in the 100-year floodplain is necessary to ensure that the project is consistent with EO 11988, "Floodplain Management". The Federal Flood Risk Management Standard (FFRMS), EO 13690, requires that federal projects avoid development in the 100-year floodplain whenever practical. **Figure 4** shows flood zones within the Project Areas based on the FEMA Flood Insurance Rate Map (FIRM) map Panel Numbers 46103C0388H, 46103C0389H, and 46093C1850F. Wetlands A and B are located within FEMA Flood Zones AE and AE (Regulatory Floodway), Wetlands C, D1, and D2 are located within FEMA Flood Zone AE, and FEMA maps Wetland E as a 100-year floodplain.

3.2.3 Environmental Consequences

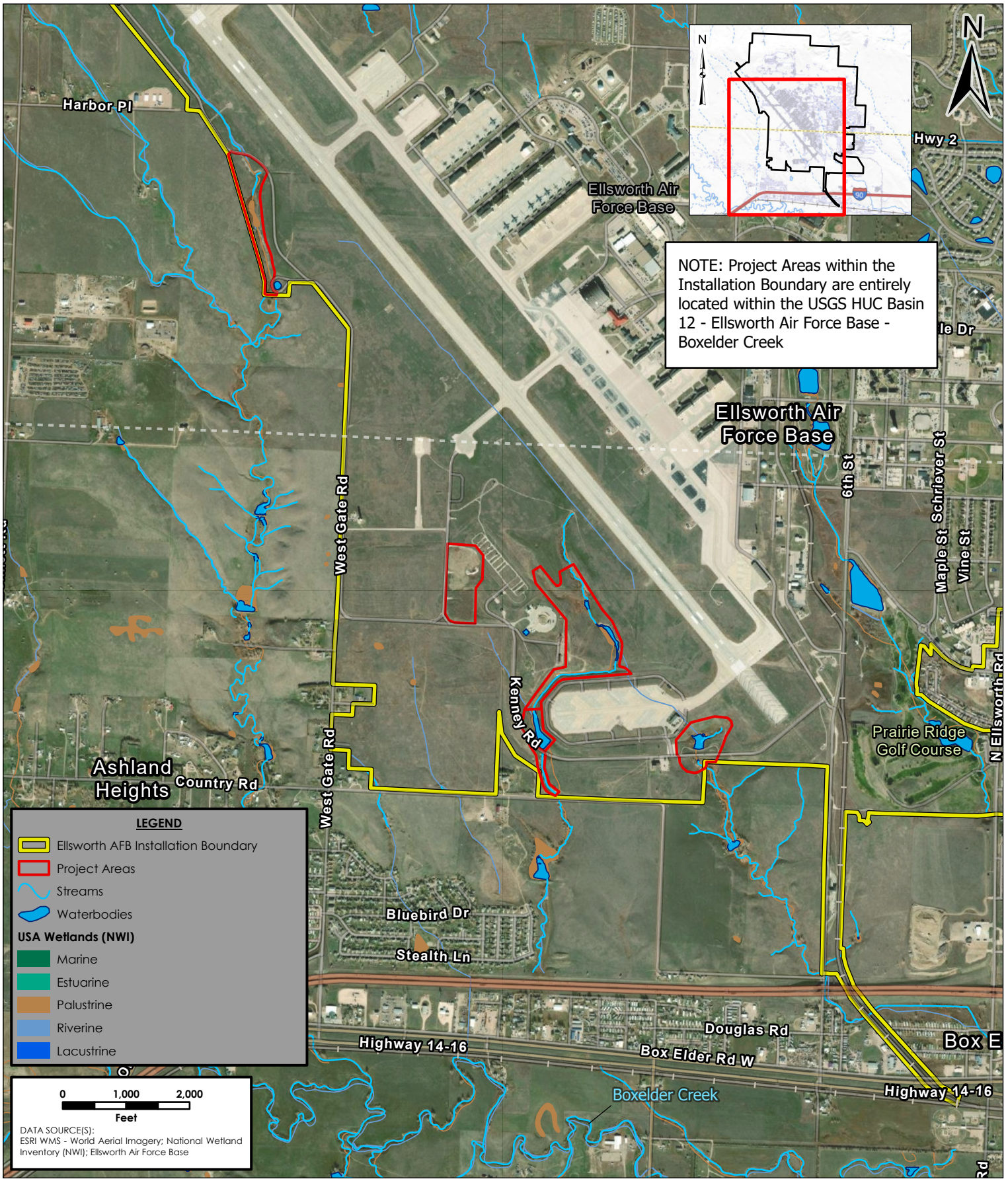
3.2.3.1 Groundwater

The Proposed Action would not impact groundwater. The Proposed Action is outside the regional aquifers' recharge area and would not inhibit groundwater recharge. Because EAFB obtains its water from a reservoir, water required for construction (if any) would not draw down groundwater.

3.2.3.2 Surface waters and Wetlands

A Section 404 individual permit and applicable SD Surface Water Quality Program permits would be required because the Proposed Action would permanently remove all biological and physical features that attract wildlife from the North Slough, South Slough, and Pond 2 Project Areas utilizing various engineered solutions (**Table 2-1**). Additionally, because the Proposed Action would involve over one (1) acre of soil disturbance, authorization under South Dakota's General Permit Authorizing Stormwater Discharges Associated with Construction Activities is expected to be required. Contractors would develop and implement an SWPPP before any ground-disturbing activities start. Additional Best Management Practices (BMPs) may include, but are not limited to, erecting sediment barriers and revegetating exposed soil immediately after grading.

While the Proposed Action would have moderate to significant adverse long-term impacts to wetlands within the Project Areas, these impacts would be offset by providing off-site mitigation. As a result, there will be no net loss to wetlands. The DAF would coordinate with USACE and the SD DANR to develop a mitigation plan to ensure no net loss of wetlands and to address federal and state regulatory program requirements. Mitigation may consist of wetland creation and/or preservation, purchase of mitigation bank credits from an approved mitigation bank, or a combination of those options. The area



SES Civil and Environmental LLC

Water Resources

EA for Wetland Modification
BASH Risk Reduction
Ellsworth AFB, SD
Meade and Pennington Counties, South Dakota

Project No.:	1A001.4080.0009.0019
Drawn By:	JRN
Reviewed By:	GA
Approved By:	JT
Date:	Jun 2022
FIGURE NUMBER	3

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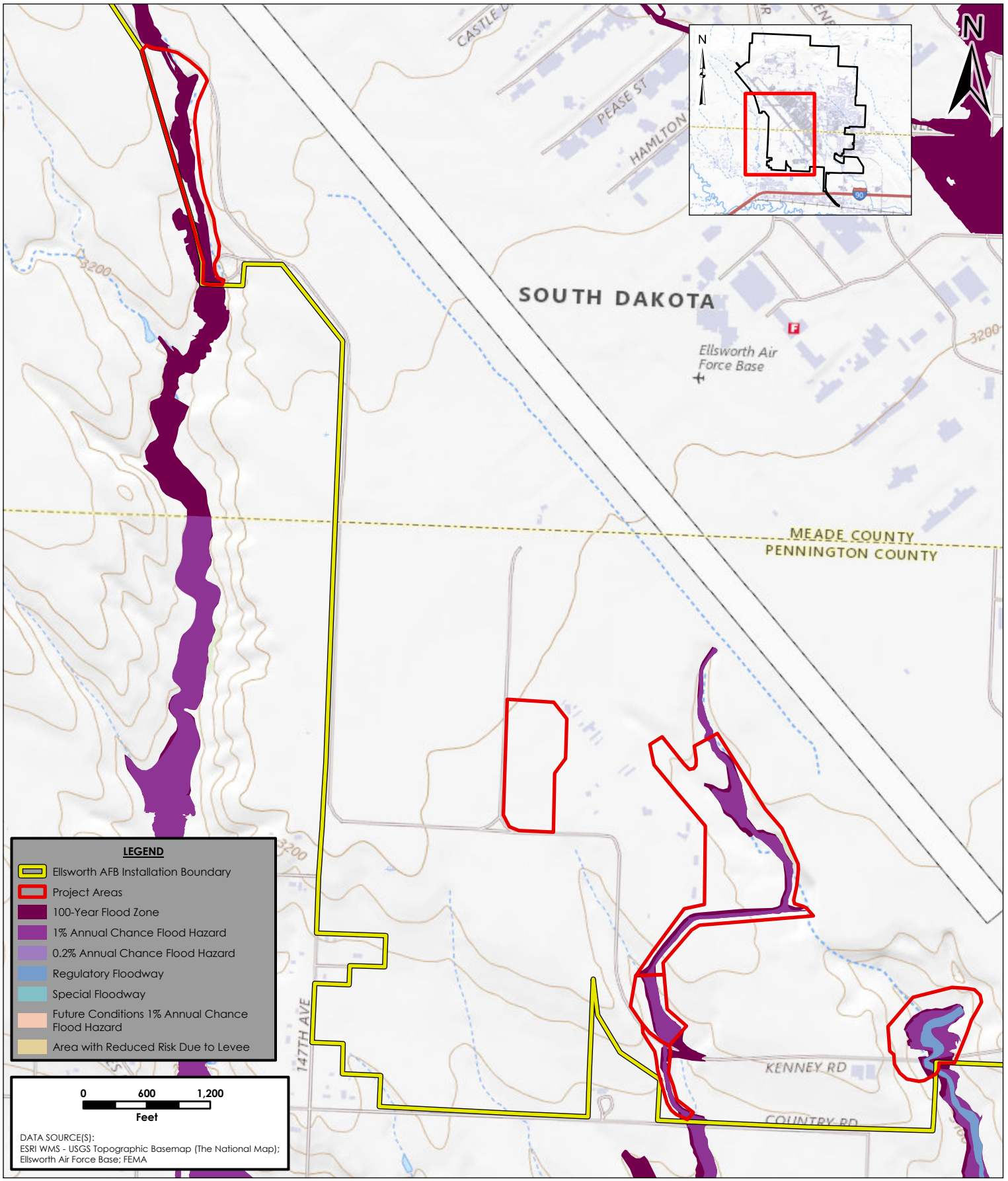

SES Civil and Environmental LLC

FEMA Floodplain

EA for Wetland Modification
BASH Risk Reduction
Ellsworth AFB, SD
Meade and Pennington Counties, South Dakota

Project No.:	1A001.4080.0009.0019
Drawn By:	JRN
Reviewed By:	GA
Approved By:	JT
Date:	Jun 2022

FIGURE NUMBER **4**

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selected for mitigation would be far enough from the airfield to ensure it does not contribute to future BASH risk, which is generally five or more miles from the installation fence (**Figure 5**). The appropriate mitigation type and amount would be finalized during the project's permitting and final design phase.

The final design would retain the stormwater management functions of the wetlands while removing wildlife attractants to reduce the associated BASH risks. Construction methods may include culvert extensions, maintaining open drainage in the channel through the construction of a turf and/or hardened bottom, developing non-impounding check dams, and sharpening and/or armoring the edges of ponds.

3.2.3.3 Floodplains

While the Proposed Action would have moderate to significant adverse long-term impacts to floodplains within the Project Areas, these impacts would be offset through design, coordination with USACE and/or FEMA, and mitigation, if required. As a result, there will be no net loss to floodplains and the overall impacts of the project can be considered negligible to minor. The permitting and final design of the Proposed Action would include a detailed analysis of the flood capacity of these systems. If floodplain mitigation is required, it is expected to involve floodplain creation and/or preservation within the same drainage basin as the impact. While the wildlife attractant characteristics of the floodplain would be eliminated, the stormwater management functions of the floodplain and associated wetlands would be retained to ensure no net loss of flood capacity.

3.2.4 No Action Alternative

No changes to water resources would result under the No Action Alternative. Wetland areas would remain as-is and continue to be a BASH risk.

3.3 BIOLOGICAL RESOURCES

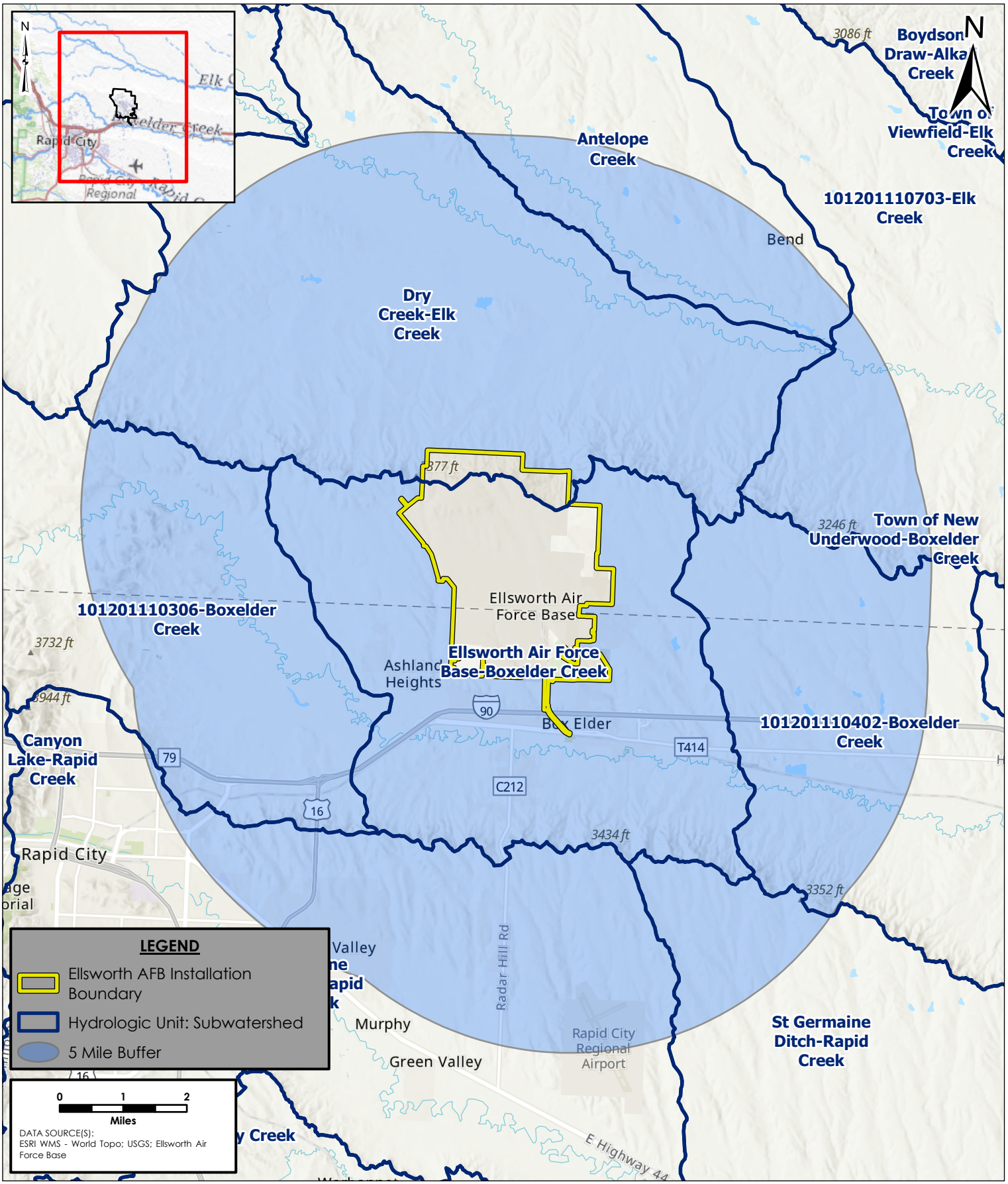
Biological resources are the native or naturalized biotic environment within the Project Areas, including flora, fauna, threatened and endangered species, and protected habitat. Potential impacts of the Proposed Action on biological resources are considered significant if the action would:

- Cause detectable impacts on native communities, and species would be expected to be outside the natural range of variability for long periods or in perpetuity;
- Cause significant, short-term declines in species populations or instability in population numbers or structure, genetic variability, and other demographic factors for species;
- Cause a loss of habitat that could affect the viability of at least some native species; or
- Jeopardize the continued existence of a federally listed species within and/or outside EAFB boundaries.

3.3.1 Regulatory Setting

To implement the Proposed Action, the DAF must comply with the following:

- ESA, which prohibits the import, export, or taking of fish and wildlife, and plants listed as threatened or endangered species. In addition, Title 14 CFR, Part 402 interprets and implements sections 7(a)-(d) [16 U.S.C. 1536(a)-(d)] of the ESA
- Migratory Bird Treaty Act (MBTA) of 1918 which prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the USFWS.
- The Bald and Golden Eagle Protection Act (BGEPA) of 1940 which adds further protections for eagle populations



SES Civil and Environmental LLC	**Watershed Resources** **EA for Wetland Modification** **BASH Risk Reduction** **Ellsworth AFB, SD** **Meade and Pennington Counties, South Dakota**	Project No.: 1A001.4080.0009.0019 Drawn By: JRN Reviewed By: GA Approved By: JT Date: Jun 2022 FIGURE NUMBER 5

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- SD Game, Fish, and Parks (GFP) regulations regarding protected species

3.3.2 Affected Environment

3.3.2.1 Vegetation

EAFB is located in the High Plains region, characterized by grass-shrub and riparian-wetland-aquatic ecological systems (SDGFP, 2014). This area's historical vegetative communities were dominated by mixed-grass prairie before airbase development. Vegetative communities were characterized by western wheatgrass/needlegrass plant communities interspersed with a Needlegrass/Grama/Little Bluestem plant community (SDGFP, 2014). Dominant grasses include western wheatgrass (*Pascopyrum smithii*), needleandthread (*Stipa comata*), green needlegrass (*Stipa viridula*), as well as little bluestem (*Schizachyrium scoparium*), sideoats grama (*Bouteloua curtipendula*), blue grama (*B. gracilis*), and buffalograss (*Buchloe dactyloides*). Historical vegetative communities within EAFB have been heavily modified because of installation development and the prevalence of farming in the surrounding communities. (Air Force, 2020a)

Most of the installation is developed or mowed and maintained lawn. The Project Areas contain a mix of mowed and maintained grasses and riparian wetland habitat. Mowed and maintained areas consist primarily of Kentucky bluegrass (*Poa pratensis*) interspersed with common "weedy species" including field bindweed (*Convolvulus arvensis*), common dandelion (*Taraxacum officinale*), and hairy crabgrass (*Digitaria sanguinalis*) (Air Force 2020a). A summary of wetland vegetation species documented in the Project Study Areas is described in detail in **Appendix B** and summarized in **Section 3.2.2**.

The EAFB BASH Plan directs installation personnel to control airfield vegetation. Maintenance recommendations include maintaining airfield grass at 7-14 inches, mowing vegetation before it seeds, controlling broad-leafed weeds, planting bare areas, maintaining airfield uniformity, and eliminating dead vegetation. These recommendations ensure EAFB remains compliant with applicable regulations, including AFI 91-202, DAFI 91-204, AFMAN 32-7003, DAFMAN 91-223, and AFI 91-212.

3.3.2.2 Wildlife

EAFB is located within the Semiarid Pierre Shale Plains level III ecoregion (Weston and Malo, 1978). Native wildlife in this area is characterized by a variety of grazing herbivores, including the white-tailed deer (*Odocoileus virginianus*), bighorn sheep (*Ovis canadensis*), elk (*Cervus elaphus*), and bison (*Bison bison*) (SDGFP, 2014). In addition, smaller mammals including the black-tailed prairie dog (*Cynomys ludovicianus*) and beaver (*Castor canadensis*) were once prevalent across prairie habitat in western SD (SDGFP, 2014). Over time, intense agricultural activities have limited these species' ranges (SDGFP, 2014). Currently, the predominant land uses in southwestern SD are dryland farming and livestock grazing (Air Force 2020a).

Wildlife species documented within EAFB include a total of 109 vertebrate species, including 16 mammals, 69 birds, seven reptiles, six amphibians, and 11 fishes. Avian species represent the majority of fauna observed within EAFB, and by extension, the Project Areas. EAFB lies in the Central Flyway, a major bird migration route that spans Texas to North Dakota in the United States. Open water in and around the airfield and the installation attract these migrating birds and other wildlife species. (Air Force 2020a)

3.3.2.3 Federal and State Listed Species

Federal and state listed plant and animal species that may occur in Meade and Pennington Counties are provided in **Table 3-3** below. A list of federally protected species that may occur within Meade and Pennington counties was obtained from the USFWS Information for Planning and Consultation (IPaC) (**Appendix C**). A list of state protected species that may occur in Meade and Pennington Counties was

obtained from the SD GFP (**Appendix D**). No federally listed threatened or endangered species are known to reside on EAFB (Air Force, 2020a).

Table 3-3. Federal-, State-, and Candidate Listed Species – Meade and Pennington County

Common Name	Scientific Name	County Occurrence	Federal Status	State Status	Documented on EAFB
PLANTS					
Leedy's Roseroot	*Rhodiola integrifolia* ssp. *leedyi*	Pennington	FT	FT	No
INSECTS					
Monarch Butterfly	*Danaus plexippus*	Meade/Pennington	C	None	Yes
FISH					
Longnose Sucker	*Catostomus catostomus*	Meade/Pennington	None	ST	No
Banded Killifish	*Fundulus diaphanus*	Meade	None	SE	No
Sturgeon Chub	*Macrhybopsis gelida*	Meade/Pennington	None	ST	No
BIRDS					
American Dipper	*Cinclus mexicanus*	Meade/Pennington	None	ST	No
Interior Least Tern	*Sternula antillarum athalassos*	Meade/Pennington	None	SE	No
Osprey	*Pandion haliaetus*	Pennington	None	ST	Yes
Peregrine Falcon	*Falco peregrinus*	Pennington	None	SE	No
Red Knot	*Calidris canutus rufa*	Meade/Pennington	FT	FT	No
Whooping Crane	*Grus americana*	Meade/Pennington	FE/CH	SE	No
MAMMALS					
Black-footed Ferret	*Mustela nigripes*	Meade/Pennington	FE	FE	No
Northern Long-eared Bat	*Myotis septentrionalis*	Meade/Pennington	FT	ST	No
Northern River Otter	*Lontra canadensis*	Meade/Pennington	None	ST	No
Swift Fox	*Vulpes velox*	Meade/Pennington	None	ST/SGCN	Yes

Notes: Table content from SD Game, Fish, and Parks (SD GFP). 2014. *South Dakota Wildlife Action Plan*.; U.S. Air Force. *Integrated Natural Resources Management Plan, Ellsworth Air Force Base.* 2 August 2016. Under Review 2020.; USFWS IPaC 2022.

Legend: C-Candidate species for federal listing; CH-Critical Habitat; FE-Federally Endangered; FT-Federally Threatened; SGCN-Species of Greatest Conservation Need; SE-State Endangered: species in danger of extinction throughout all or a significant portion of its range; ST-State threatened

PLANTS

The Leedy's roseroot is a federally threatened species documented in Pennington County. This cliffside wildflower has populations found only in Minnesota, New York, and SD (USFWSa, 2022). The SD

population occurs on the cliffsides of the Black Hills National Forest (USFWS, 2022a). No suitable habitat for this species occurs within the Project Areas.

INSECTS

The monarch butterfly is a candidate for federal listing in Meade and Pennington counties. Breeding females require milkweeds (genus *Asclepias*) to lay their eggs on, and the larvae must feed on these milkweeds. This species has been documented on EAFB (Air Force 2020a).

FISH

The longnose sucker is stated listed as threatened in Meade and Pennington counties. This fish is characterized by a long, cylindrical sucker with a long, pointed snout (SDGFP, 2014). This species prefers cool, clear, spring-fed streams and lakes (SDGFP, 2014). The longnose sucker is found in the Belle Fourche and Cheyenne River systems and their larger tributaries stemming from the Black Hills (SDGFP, 2014). Tributaries such as Box Elder Creek may represent suitable habitat for this species. However, none are currently documented in this system (Galinat et al., 2019). No suitable habitat for this species occurs within the Project Areas.

The banded killifish is state listed as endangered in Meade County. This small, olive-colored fish prefers quiet, shallow lakes, ponds, and streams with abundant aquatic vegetation and sandy, gravel substrates (SDGFP 2014). All confirmed and probable populations of this species occur west of the James River in western SD. However, major tributaries to the James River like the Cheyenne River, may represent suitable habitat (SDGFP, 2014). No suitable habitat for this species occurs within the Project Areas.

The sturgeon chub is listed as threatened in Meade and Pennington Counties. This slender minnow is characterized by a brownish-blue back with a light belly (SDGFP, 2014). This species prefers areas with moderate to strong currents on large rivers with rocks, gravel, or coarse sand substrates (SDGFP, 2014). Documented occurrences of this species are in the Cheyenne and White River systems; however, potential habitat may occur in associated tributaries (SDGFP, 2014). No suitable habitat for this species occurs within the Project Areas.

MAMMALS

The black-footed ferret is a federally and state listed endangered species in Meade and Pennington counties. This mink-sized, buff-colored weasel was historically associated with prairie dog colonies (SDGFP, 2014). It is estimated that 100-150 acres of prairie dog colony are required to support one ferret, with the closest established habitat located in the Badlands and Cheyenne River Reservation (SDGFP, 2014). No suitable habitat for this species occurs within the Project Areas.

The northern long-eared bat is a federally and state listed threatened species in Meade and Pennington counties. This bat is characterized by its longer ears compared to other species in its genus (USFWS, 2022b). This species prefers forested habitats and will overwinter in caves or mines (USFWS, 2022b). Populations occur across the central and eastern U.S. However, the biggest threat to this species is white-nose syndrome, a fungal disease that affects bats (USFWS, 2022b). EAFB has documented wildlife strikes of the little brown (*Myotis lucifugus*) and big brown (*Eptesicus fuscus*) bats. No suitable habitat for this species occurs within the Project Areas.

The northern river otter is state listed as threatened in Meade and Pennington counties. This otter prefers slow-moving rivers and streams with deep pools, abundant riparian vegetation, and plentiful fish and is often associated with beaver activity (SDGFP, 2014). This species is mainly distributed west of the James River but has populations in the Cheyenne River (SDGFP, 2014). No suitable habitat for this species occurs within the Project Areas.

The swift fox is state listed as threatened/ Species of Greatest Conservation Need in Meade and Pennington counties. This species prefers heavily grazed shortgrass or mixed-grass prairies with open, gently-rolling topography for high visibility of the surrounding area (SDGFP, 2014). This fox is usually associated with prairie dogs or ground squirrel colonies (SDGFP, 2014). A swift fox was captured in the airfield area in 2016; however, habitat within the Project Areas does not represent suitable habitat for this species.

BIRDS

In addition to federal and state status, avian species listed in **Table 3-3** and below are afforded additional protections through the MBTA. This act prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by USFWS.

The American dipper is state listed as threatened in Meade and Pennington Counties. This small, stocky, dark grey bird prefers clean, cold, fast-flowing mountain streams with abundant aquatic insects (SDGFP, 2014). Range distribution is mainly restricted to the Black Hills area (SDGFP, 2014). No suitable habitat for this species occurs within the Project Areas.

The interior least tern is state listed as endangered in Meade and Pennington counties. This species represents the smallest tern species in North America and prefers open areas for feeding and nesting (SDGFP, 2014). This species can be found along the Cheyenne River in the summer months (SDGFP, 2014). No suitable habitat for this species occurs within the Project Areas.

The osprey is state listed as threatened in Pennington County. This large raptor is similar in size to eagles and is characterized by a white head but mottled underside (SDGFP, 2014). This species can be found throughout SD but prefers to be near rivers, lakes, ponds for foraging, and nests/roosts in large open-top trees (SDGFP, 2014). Marginally suitable foraging habitat for this species occurs within the Project Areas.

The peregrine falcon is state listed as endangered in Pennington County. This medium-sized raptor is characterized by a pale brown back and creamy white and heavily spotted underside (SDGFP, 2014). This species prefers open grasslands with suitable nesting cliffs and rock outcroppings near a concentrated prey base, such as waterfowl or colonial ground squirrels (SDGFP, 2014). Marginally suitable foraging habitat for this species occurs within the Project Areas.

The red knot is federally listed as threatened in Meade and Pennington counties. This medium-sized shorebird is characterized by a red underbelly with a black and white mottled back (USFWS, 2022c). This species makes one of the longest migrations in the animal kingdom, wintering in South America and summering as far north as Canada (USFWS, 2022c). The primary diet of this species includes hard-shelled mollusks. No suitable foraging habitat for this species occurs within the Project Areas.

The whooping crane is a federally and state listed endangered species in Meade and Pennington counties. USFWS-designated critical habitat for this species occurs along its migration route from southern Texas to North Dakota. The whooping crane is characterized by its white plumage and red facial skin (SDGFP, 2014). Preferred habitat includes shallow, seasonally, and semi-permanently flooded palustrine wetlands for roosting and various cropland and emergent wetlands for foraging (USFWS, 2007). Marginally suitable foraging habitat for this species occurs within the Project Areas.

A Migratory Bird Depredation Permit allows the lethal "take" of migratory bird species if they are in direct conflict with human safety. Migratory bird species that are not federal or state listed but have been documented as occurring within EAFB include the ferruginous hawk (*Buteo regalis*), Franklin's gull (*Larus pipixcan*), lark bunting (*Calamospiza melanocorys*), marbled godwit (*Limosa fedoa*), red-headed

woodpecker (*Melanerpes erythrocephalus*), and willet (*Tringa semipalmata*). All avian species are frequently harassed if present within EAFB per the BASH plan.

3.3.3 Environmental Consequences

3.3.3.1 Vegetation

The Proposed Action would result in moderate long-term impacts to vegetation through modified vegetation management practices and/or conversion to hardscape features within the Project Areas. Considering the large amount of similar vegetation types in the area, both regionally and locally, the loss of this vegetation is not expected to impact plant communities or habitats adversely.

3.3.3.2 Wildlife

The Proposed Action would have negligible to minor long-term impacts to wildlife that currently utilize the Project Areas. A reduction in low-quality habitat is not considered significant and would not result in population-level effects on wildlife species on the base. Modifying wetlands and making habitat unattractive to wildlife would have a negligible impact to wildlife that would utilize similar habitat nearby. Vegetation within the Project Areas would be mowed prior to and throughout the migratory bird nesting season to discourage nest building. Further, the Proposed Action would have long-term minor benefits to wildlife by decreasing the chance of mortality associated with BASH incidents.

3.3.3.3 Federal and State Listed Species

Implementation of the Proposed Action is not anticipated to impact federal and/or state listed species. Of the federal and state listed species, only the osprey and swift fox have been observed at EAFB. Construction activities would only occur during daylight hours and follow BMPs to ensure no loss of listed wildlife. Contractors would be required to educate crewmembers on identifying listed species and allow species to pass if observed on-site.

3.3.4 No Action Alternative

No changes to biological resources would result under the No Action Alternative. Vegetated areas would remain as-is and continue to provide foraging and shelter for wildlife. Wildlife would continue to utilize these areas and the BASH team would continue to use current deterrent methods when observed within the Project Areas.

3.4 CULTURAL RESOURCES

Cultural resources are prehistoric and historic archaeological sites, districts, buildings, structures, objects, and locations of historic events of importance. The NHPA requires federal agencies to consider the effects of their undertakings (i.e., a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency) on cultural resources, especially historic properties that are or may be eligible for listing on the National Register of Historic Places (NRHP).

Potential impacts of the Proposed Action on cultural resources are considered significant if the action would:

- Alter the character or use of a historic property;
- Diminish the integrity of the historic property's location, design, setting, materials, workmanship, feeling, or association; or
- Otherwise cause an unresolvable "adverse impact" under Section 106 of the NHPA.

3.4.1 Regulatory Setting

To implement the Proposed Action, the DAF must comply with the following:

- Archaeological and Historic Preservation Act of 1974, as amended, requires federal agencies to provide for "the preservation of historical and archeological data (including relics and specimens) which might otherwise be irreparably lost or destroyed as the result of"...any alteration of the terrain caused as a result of any Federal construction project of the federally licensed activity or program.
- The American Indian Religious Freedom Act (AIRFA) of 1978, as amended, protects the rights of Native Americans to exercise their traditional religions by ensuring access to sites, use and possession of sacred objects, and the freedom to worship through ceremonials and traditional rites.
- The Native American Graves Protection and Repatriation Act (NAGPRA) of 1990, as amended, provides for the ownership or control of Native American cultural items (human remains and objects) excavated or discovered on Federal or tribal lands.
- EO 13007 "Indian Sacred Sites," as amended, directs federal land managing agencies to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of such sacred sites.

In addition, the DAF must also comply with Section 106 of the NHPA and ensure the Proposed Action would not impact historic properties that are or may be eligible for listing on the NHRP. To determine if a Section 106 review is required, the EAFB Cultural Resources Manager (CRM) would review the proposed action, determine if historic properties are present, and assess any potential impacts. If no historic properties are affected, the CRM would document this, and the project can proceed. If there may be an effect on a historic property, but it has been deemed Not Adverse, the project can proceed once SHPO consultation is completed. If an effect would adversely impact a historic property, consultation with SHPO would be required and mitigation and/or minimization requirements would be expected.

3.4.2 Affected Environment

The Installation Cultural Resources Management Plan (ICRMP) describes six prehistoric periods associated with the EAFB area. They include the Paleo-Indian Period (11,500 to 7,500 before present [B.P.]), the Early Plains Archaic Period (7,500 to 5,000 B.P.), the Middle Plains Archaic Period (5,000 to 2,500 B.P.), the Late Plains Archaic Period/Plains Woodland Period (3,000 to 1,500 B.P.), the Late Prehistoric Period/Plains Village Period (2,000 to 300 B.P.) and the Protohistoric Period (1700 Anno Domini [A.D.] to 1861 A.D.).

Evidence exists of occupation for all prehistoric periods in the areas surrounding EAFB. However, occupation near EAFB was not documented until the Late Prehistoric Period/Plains Woodland Period. In the Protohistoric Period, numerous tribes occupied land in the vicinity of EAFB. Few sites have been identified and the accounts of these tribes are poorly understood.

American and European settlement in the vicinity of EAFB began in the mid-1880s in response to the development in nearby Rapid City. However, the land around what is now EAFB remained rural and agriculturally based. The attack on Pearl Harbor triggered the creation and development of EAFB in 1941.

A comprehensive archeological survey was conducted on EAFB in 1994. The survey did not reveal any significant archeological sites on Ellsworth AFB. Only three sites were identified: 39MD416, a modified

natural spring, 39MD417, an isolated lithic flake, and 39MD2043/ 39PN2043, segments of the original base railroad from World War II. None of the three sites were deemed eligible to be listed in the NHRP.

The cultural resources of primary concern at EAFB are existing structures that may qualify as historic buildings and structures. Numerous buildings on the property are determined to be eligible for listing on the NHRP, but none of them are in the Project Areas (**Figure 6**). Most of the NHRP-eligible buildings are located on the other (north) side of the runway. Three buildings, Building 6904 – Ordnance Storage, Building 6905 – Ammunition Assembly and Maintenance Shop, and Building 6908 – Munitions Training (Small Arms), are located near the South Slough Project Area. These three buildings were constructed in 1942 and determined eligible for listing on the NRHP.

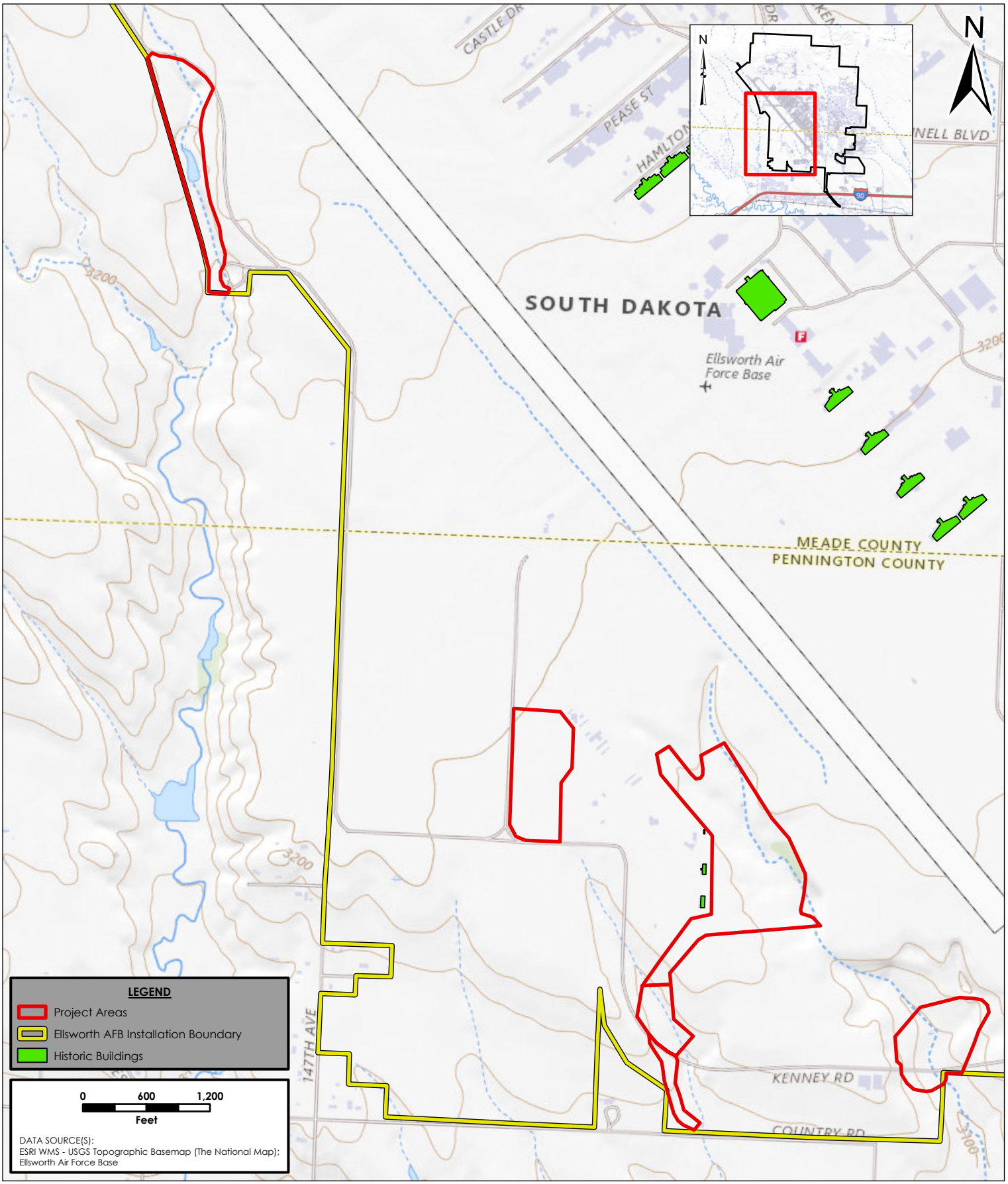
3.4.3 Environmental Consequences

The Proposed Action would not have a significant impact on cultural resources. The Proposed Action will not disturb Buildings 6904, 6905, and 6908. Should potential cultural resources be discovered when implementing the Proposed Action, the following procedure, as specified in the ICRMP, would ensure cultural resources are properly assessed and managed:

- The DAF or Contractor personnel that make a potential cultural discovery should:
    - Immediately notify the CRM of the nature and location of the discovery, cease potentially damaging activities, and
    - Take efforts to ensure the protection of resources until the arrival of the CRM or designee.
- The CRM should:
    - ensure that all cultural items are left in place and that no further disturbance is permitted to occur;
    - sufficiently identify the location of the discovery to provide efficient relocation, yet take efforts to minimize the types of signs that could attract personnel and place the discovery in danger;
    - Notify Security Forces of the discovery;
    - Direct installation personnel and contractors to resume mission-associated activities in a reasonable and timely manner.
- The Security Forces should:
    - Notify the Wing Commander regarding the location, nature, and circumstances of the discovery;
    - Provide security/protection for the site to prevent unauthorized disturbance, looting, or vandalism.

3.4.4 No Action Alternative

No impacts to cultural resources would result under the No Action Alternative. The Project Areas would remain as-is, and any cultural resource that may be present would not be impacted.



SES Civil and Environmental LLC

Cultural Resources

EA for Wetland Modification
BASH Risk Reduction
Ellsworth AFB, SD
Meade and Pennington Counties, South Dakota

Project No.:	1A001.4080.0009.0019
Drawn By:	JRN
Reviewed By:	GA
Approved By:	JT
Date:	Jun 2022

FIGURE NUMBER **6**

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3.5 HAZARDOUS MATERIALS, CONTAMINATED SITES, AND TOXIC SUBSTANCES

Hazardous materials, contaminated sites, and toxic substances are categorized as harmful contaminants, landfills, industrial waste, or other toxic or hazardous substances.

Potential impacts of the Proposed Action on hazardous materials, contaminated sites, and toxic substances are considered significant if the action would:

- Result in noncompliance with applicable federal and state regulations;
- Increase the amounts generated or procured beyond current EAFB waste management procedures and capacities; or
- Disturb or create contaminated sites that negatively affect human health or the environment.

3.5.1 Regulatory Setting

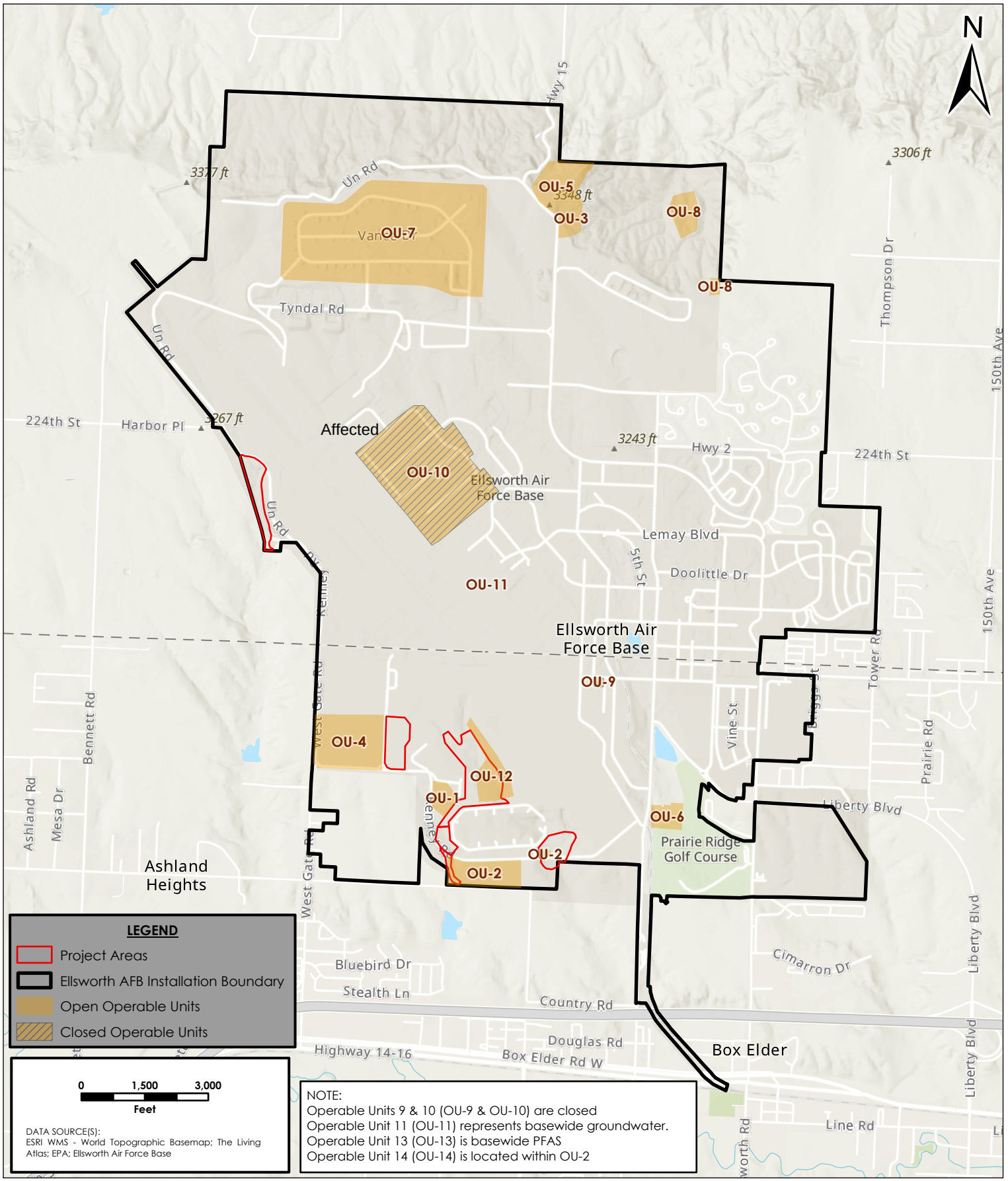
To implement the Proposed Action, the DAF must comply with the following:

- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, which establishes requirements for closed or abandoned hazardous waste sites or the release of hazardous substances
- Resource Conservations and Recovery Act (RCRA) which is utilized to manage hazardous waste from active operations proactively
- Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986 which aids in community planning and protection from industrial use and potential spill of toxic substances
- AFI 32-7086 "Hazardous Material Management", which establishes procedures and standards that govern identification, authorization, and tracking of hazardous materials (HAZMAT)

3.5.2 Affected Environment

The EAFB Environmental Restoration Program (ERP), per CERCLA and RCRA, has identified 34 open ERP sites and no open Munitions Response Sites within the installation boundary. Primary sites in the ERP include storage tanks, landfills, fire-training areas, spills, and low-level radioactive sites. Major contaminants identified in soil and water at EAFB include fuels, waste solvents, dissolved phase fuels and solvents, and low-level radiation waste. Installation activities require storing and using hazardous materials, including flammable and combustible liquids, acids, corrosives, compressed gases, aerosols, batteries, hydraulic fluids, solvents, paints, pesticides, herbicides, lubricants, fire retardants, and alcohols (Air Force, 2020a).

Contaminated sites within EAFB are divided into 14 Operable Units (OU) based on specific remedial actions required (AFCEC, 2021) (**Figure 7**). The South Slough Project Area encompasses the majority of OU-12 and parts of OU-1 and OU-2. The Pond 2 Project Area encompasses parts of OU-2. OU-9 and OU-10 are now closed. OU-14 is the newest addition, representing a low-level radiation contamination found within concrete monoliths, and OU-14 exists within the boundaries of OU-2. All Project Areas are within OU-11 and OU-13, which represent basewide groundwater and basewide PFAS, respectively. PFAS was first identified in 2011, in the soils and groundwater of OU-1 (AFCEC, 2021). During monitoring from 2016-2020, 25 off-Base drinking water wells were found to contain PFAS above the Lifetime Health Advisory. Thus, a basewide Remediation Investigation has been underway since 2020 to determine the extent of PFAS impacts to soil, groundwater, surface water and sediments (AFCEC, 2021).



SES Civil and Environmental LLC

Hazardous Materials Resources

EA for Wetland Modification
BASH Risk Reduction
Ellsworth AFB, SD
Meade and Pennington Counties, South Dakota

Project No.:	1A001.4080.0009.0019
Drawn By:	JRN
Reviewed By:	GA
Approved By:	JT
Date:	Dec 2022

FIGURE NUMBER **7**

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All OUs present within the Project Areas are monitored through soil and surface water sampling and are part of a Long-Term Monitoring (LTM) Work Plan (April 2021) (AECOM, 2021). The purpose of the LTM program is to track the extent of known dissolved contaminant concentrations in known groundwater plumes, monitor the effectiveness of remediation efforts, and verify the effectiveness and integrity of soil covers in place over closed landfills (AECOM, 2021). All ERP sites and OUs at EAFB pose no risk to human health and the environment (HGL, 2020).

3.5.3 Environmental Consequences

The Proposed Action would have minor beneficial impacts to impacted soils or waters in documented OUs. EAFB would continue to test surface water and soils in the Project Areas, and complete remedial actions as part of the LTM program. Implementation of the Proposed Action would not affect the current goals and remedial actions currently taking place within EAFB. Any contaminated soil removed as part of the Proposed Action would be properly disposed of per DAF and local regulations.

EAFB recycles material based on the local market, including scrap metal, various batteries, and cardboard, eliminating solid waste going to the local landfill. Solid waste from modification to the existing stormwater utility that EAFB could not recycle would be transported to the Rapid City Landfill. EAFB does not hold a permit to dispose of solid waste on-site.

Ground disturbing activities would not conflict with applicable safety regulations or installation-specific recommendations outlined in the LTM work Plan and/or five-year review. The SWPPP will include provisions to prevent and respond to accidental releases of fuel, hydraulic fluid, organic material, and solid waste during construction. All ground-disturbing activities would utilize applicable BMPs including, but not limited to, washing heavy equipment in designated upland areas, using secondary containment for fueling and maintenance activities in designated upland areas, and removing all trash from the site before leaving the site. Solid waste would be produced from woody vegetation and wetland soils. EAFB currently does not have a permit to dispose of solid waste on-site. Therefore, any waste produced would be properly disposed of per DAF and local regulations.

3.5.4 No Action Alternative

No changes to hazardous materials, contaminated sites, and toxic substances would result under the No Action Alternative.

3.6 AIR QUALITY

Air quality is the degree to which the ambient air is pollution-free and is assessed by measuring several pollution indicators, such as the seven criteria pollutants addressed in the National Ambient Air Quality Standards (NAAQS). Actions that result in greenhouse gas (GHG) emissions are further evaluated for potential contributions to climate change.

Potential impacts of the Proposed Action on air quality are considered significant if the action would:

- Increase ambient air pollution above any NAAQS;
- Contribute to an existing violation of any NAAQS;
- Interfere with or delay timely attainment of NAAQS;
- Expose people to hazardous air pollutants in large quantities; or
- Result in a substantial increase in the base's potential to emit GHG.

3.6.1 Regulatory Setting

To implement the Proposed Action, the DAF must comply with the following:

- EPA and the SD DENR state specific air quality regulations
- The Clean Air Act (CAA), as amended, gives EPA the responsibility for establishing the primary and secondary NAAQS (40 CFR Part 50) that set acceptable concentration levels for seven criteria pollutants
- EO 13990, "Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis," which directs federal agencies to work to confront the climate crisis

3.6.2 Affected Environment

The NAAQS represent the maximum allowable ambient concentrations for ground-level ozone (O3), carbon monoxide (CO), nitrogen dioxide (NO2), sulfur dioxide (SO2), respirable particulate matter (PM) (including particulate matter equal to or less than 10 microns in aerodynamic diameter [PM10] and particulate matter equal to or less than 2.5 microns in aerodynamic diameter [PM2.5]), and lead (Pb). Ground-level O3 is created through the reactions of volatile organic compounds (VOCs) and nitrogen oxides (NOx) in the presence of sunlight. Short-term standards (i.e., for periods generally less than 24 hours) have been established for pollutants contributing to acute health effects. In contrast, long-term standards (i.e., quarterly or annual averages) have been established for pollutants contributing to chronic health effects. The EPA has given each state the authority to adopt standards stricter than those established under the federal program; however, SD has not set stricter standards; thus only the federal standards apply to proposed projects. **Table 3-4** summarizes the EPA NAAQS for federally listed criteria pollutants that SD has adopted.

Table 3-4. Current National and State Ambient Air Quality Standards (NAAQS)

Pollutant		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)		primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		primary and secondary	Rolling 3-month average	0.15 µg/m^3	Not to be exceeded
Nitrogen Dioxide (NO2)		primary	1 hour	100 ppb	98th percentile of 1-hour maximum daily concentrations averaged over three years
		primary and secondary	1 year	53 ppb	Annual Mean
Ozone (O3)		primary and secondary	8 hours	0.070 ppm	Annual fourth-highest daily maximum 8-hour concentration averaged over three years
Particle Pollution (PM)	PM2.5	primary	1 year	12.0 µg/m^3	annual mean averaged over three years
		secondary	1 year	15.0 µg/m^3	annual mean averaged over three years
		primary and secondary	24 hours	35 µg/m^3	98th percentile averaged over three years
	PM10	primary and secondary	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over three years
Sulfur Dioxide (SO2)		primary	1 hour	75 ppb	99th percentile of 1-hour maximum daily concentrations averaged over three years
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

Note: Table content from EPA 2020 National Ambient Air Quality Standards (40 CFR part 50) and Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide

Legend: PPM=Parts Per Million; µg/m^3= microgram / cubic meter; CO-Carbon Monoxide; Pb-Lead; NO2-Nitrogen Dioxide; O3-Ozone; PM-Particulate Matter; SO2-Sulfer Dioxide

3.6.2.1 Attainment versus Nonattainment

EPA classifies the air quality in an Air Quality Control Region (AQCR) or in subareas of an AQCR (e.g., counties) according to whether the concentrations of criteria pollutants in ambient air exceed the NAAQS. Areas within each AQCR are, therefore, designated as either "attainment," "nonattainment," "maintenance," or "unclassified" areas for each of the seven criteria pollutants.

These are defined as follows:

- Attainment area — The air quality within the area is better than the NAAQS
- Nonattainment area — Criteria pollutant levels exceed NAAQS
- Maintenance area — The area was previously designated as a nonattainment area but is now in attainment
- Unclassified area — There is not enough information to appropriately classify the area, so it is considered an attainment area

The EIAP further outlines the definition of attainment into:

- Clearly Attainment (definitively in attainment, less than 85% of any NAAQS)
- Questionably Attainment (within 15% of any NAAQS)

EAFB is located in an area designated as an attainment zone.

3.6.2.2 General Conformity Rule

The federal General Conformity rule (40 CFR Part 93 Subpart B) under the CAA of 1970, as amended, applies to federal actions in nonattainment or maintenance areas. The General Conformity rule requires that a subject federal action meet the requirements of a State Implementation Plan (SIP) or Federal Implementation Plan. Because EAFB is within an attainment area, a general conformity assessment is not required for Proposed Action. Although a conformity analysis is not mandatory for attainment areas, impacts on air quality would be considered significant if the Proposed Action would have emissions that exceed the *de minimis* threshold levels established under the General Conformity rule or would lead to a violation of any federal, state, or local air regulation. Therefore, an air quality analysis was completed for the Proposed Action.

The analysis considered the temporary emissions generated by short-term activities associated with the Proposed Action including site grading and the installation of culverts. The action is deemed insignificant if the total annual net change of direct and indirect emissions from an action is below the de minimis levels.

3.6.2.3 Greenhouse Gas Emissions and Climate Change

GHGs are gaseous compounds that trap heat in the atmosphere. The most common GHGs emitted from human activities are carbon dioxide (CO_2), methane (CH_4), and NOx. GHG emissions result from burning natural gas, diesel, and propane fuels. To provide a single metric that embodies all GHGs, The CEQ recommends that emissions are reported in metric tons (MT) of carbon dioxide equivalent (CO_2e). Each GHG's emissions mass is multiplied by the appropriate global warming potential (GWP) for that GHG to calculate CO_2e. Current GWP are presented in **Table 3-5** below.

Table 3-5. Current Global Warming Potential Factors

Greenhouse Gas	GWP	Common Sources
Carbon Dioxide (CO_2)	1	Mobile and stationary combustion
Methane (CH_4)	25	Coal mining, fuel combustion, landfills, wastewater treatment
Nitrogen Oxide (N_2O)	298	Fuel combustion, fertilizers

Note: Table content from CEQs' Federal Greenhouse Gas Accounting and Reporting Guidance, January 17, 2016
Legend: CO_2-Carbon Dioxide; CH_4-Methane; N_2O -Nitrogen Oxide; GWP-Global warming Potential

3.6.3 Environmental Consequences

Overall construction emissions from the Proposed Action are estimated to have a maximum combined annualized emission of criteria pollutants shown in **Table 3-6**. Compared to Pennington County's most recent available data from the EPA's National Emissions Inventory (NEI), the actions would account for less than 1 percent of local air emissions. NEI data is not available for Meade County.

Air emissions are expected to be generated only from temporary construction-related activities, as no new construction of permanent stationary air emissions sources are proposed. The Proposed Action is expected to remain below the *de minimis* threshold under the General Conformity rule and result in only the temporary increases of GHGs as CO_2e (**Table 3-6**). Any impact through point source and/or fugitive emission as part of the Proposed Action would be permitted in compliance with local regulations.

Table 3-6. Total Annual Emissions Increase for Proposed Action Compared to Pennington County CY17 NEI Emission Totals

Activity	Emissions (Tons per year)					
	NOx	**VOC**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
All Construction [a] (CY23)	9.16	1.54	10.41	0.024	1.85	1.85
CY17 NEI Reported Emissions for Pennington County	5732.7	23884.6	36220.6	580.8	7810.3	2791.6
Construction Emissions as % of County Emissions	0.16%	0.01%	0.03%	0.004%	0.02%	0.07%

Note: [a.] Estimated emissions shown are for the Proposed Action. All Alternatives considered resulted in a lower estimated increase to regional emissions. Totals for all proposed actions were considered individually in the assessment.
Legend: CY-Calendar Year; NOx-Nitrogen Oxides; VOC-Volatile Organic Compounds; CO-Carbon Monoxide; SO_2-Sulfer Dioxide; PM_{10}-Particulate Matter 10 Microns; $PM_{2.5}$-Particulate Matter 2.5 Microns

Annual emissions estimated for the project actions fall below the General Conformity rule *de minimis* thresholds as shown in **Table 3-7** and below the 250 ton per year (tpy) Prevention of Significant Deterioration (PSD) limits that would be an indicator of potentially significant air quality impacts for attainment areas. Based on estimated emissions, the proposed actions would be considered insignificant and would not contribute to a violation of any federal, state, or local air regulations.

Table 3-7. Estimated Construction Emissions for Proposed Actions and No Action Alternative Compared to General Conformity De Minimis Thresholds

Activity [a]	Emission (tpy)						Exceedance of *De Minimis* Threshold?
	NO_x	VOC	CO	SO_2	PM_{10}	$PM_{2.5}$	
Proposed Action	9.16	1.54	10.41	0.024	1.85	1.85	No
No Action Alternative	0	0	0	0	0	0	No
***De Minimis* threshold [b]**	**100**	**50**	**100**	**100**	**100**	**100**	-

Note: [a]. Assumes all construction would is completed within a single year.
[b]. EAFB is located within an attainment zone; therefore, *De Minimis* values used in the assessment are conservatively for non-attainment areas from EPA Table 5-2 General Conformity *De Minimis* Values.
Legend: tpy-Tons Per Year; NOx-Nitrogen Oxides; VOC-Volatile Organic Compounds; CO-Carbon Monoxide; SO_2-Sulfer Dioxide; PM_{10}-Particulate Matter 10 Microns; $PM_{2.5}$-Particulate Matter 2.5 Microns

Because of the nature of the emissions totals and short duration, implementing the Proposed Action would not cause significant air quality impacts. The emissions would end with the completion of construction activities, and there would be no long-term effects on air quality.

Short-term GHG emissions from construction and construction-related activities are estimated to be a maximum of 2,413 tpy or 2,189 metric tpy and are well below the proposed reference point of 27,563 tons per year of GHG and represent approximately 0.014% of South Dakota's annual CO_2e emissions based on data reported to the NEI in 2017 (**Table 3-8**). Because of the estimated emissions totals and short duration of the project, implementing the Proposed Action at EAFB would not be expected to have significant air quality impact. Additionally, the emissions produced from the Proposed Action would cease once construction is completed, and no long-term (stationary) sources would remain.

Table 3-8. Estimated GHG Emissions from Proposed Action compared to State and County Levels

Project	Estimated GHG (CO2e) Emissions (tpy)	Percent of County's Total GHG Emissions	Percent of State's Total GHG Emissions
CY17 NEI South Dakota Emissions Totals	17687066.65	-	-
CY17 NEI Pennington County Emissions Totals	1923579.6	-	10.9%
Proposed Action	2412.34	0.13%	0.014%
No Action Alternative	0.00	0.00%	0.000%

Legend: CO2e- carbon dioxide equivalent; tpy-Tons Per Year; GHG-Greenhouse Gas; CY-Calendar Year

3.6.4 No Action Alternative

Under the No Action Alternative, air emissions would remain at their current baseline levels, and there would be no impact on air quality.

4.0 REASONABLY FORESEEABLE ACTIONS AND CUMULATIVE IMPACTS

4.1 PAST, PRESENT, AND REASONABLY FORESEEABLE ACTIONS

CEQ Defines cumulative impacts as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7). These impacts can include any action taken by any federal or state agency, recognized Native American tribes, private entities, or local governments.

Cumulative impacts can occur when a proposed project and unrelated projects adversely affect the same resource area both temporally and spatially. The Proposed Action would affect, but not significantly impact, infrastructure, water resources, biological resources, cultural resources, hazardous materials, or air quality. Past, present, and planned future actions at EAFB that could contribute to cumulative effects are listed in **Table 4-1** below.

Table 4-1. Past, Present, and Future Projects on EAFB

Most Recent Implementation Date	Project Name	Project Description	Potentially affected Resources
Implementation beginning in 2026	Feasibility Study/Proposed Plan/ Record of Decision	After the RI is completed, this plan will take action to determine remedial actions for PFAS impacts	Surface water, ground water, hazardous materials
Implementation occurs from 2020-2026	Basewide Remedial Investigation (RI)	Remedial Investigation to determine the nature and extent of PFAS impacts to soil, groundwater, surface water and sediments.	Water resources, socioeconomic, cultural, hazardous material, solid waste, pollution prevention
Implementation occurs from 2022-2025	B-21 Beddown	Construction of Main Operating Base (MOB) 1 for the new B-21 "Raider" aircraft	Socioeconomic, infrastructure, wetlands, floodplains, cultural resources,
Implementation occurs from 2021-2026	INRMP Work Plans	Includes a variety of projects regarding natural resources within EAFB	Surface water, wetlands, biological resources
Implementation occurs from 2021-2026	ICRMP Work Plans	Includes a variety of projects regarding cultural resources within EAFB	Cultural resources
Implementation occurs from **2021 - 2023**	Environmental Restoration Program	Installed reactive barriers along 400' of South Slough creek bed to test effectiveness of PFAS removal from groundwater discharging to surface water	Water resources, biological resources, hazardous material, solid water, pollution prevention

Most Recent Implementation Date	Project Name	Project Description	Potentially affected Resources
Implementation occurred from 2015-2020	Five-Year Review Report	Includes a description for OUs and the current cleanup plans and procedures, and management recommendations for OUs	Hazardous materials, contaminated sites, or toxic substances

Legend: B-21-Bomber-21; MOB-Main Operating Base; INRMP-Integrated Natural resource Management Plan; EAFB-Ellsworth Air Force Base; ICRMP-Integrated Cultural Resource Management Plan; OU-Operable Units

4.2 ASSESSMENT OF CUMULATIVE IMPACTS BY RESOURCE

4.2.1 Infrastructure

The proposed projects would have short-term, minor adverse effects on transportation. The B-21 Beddown may alter the road system at EAFB but is not anticipated to affect transportation within the site adversely. The regional transportation system is adequate to handle the increases in traffic attributable to the proposed projects. Regarding stormwater infrastructure, each project greater than 1 acre would require a SWPPP. The only project greater than 10 acres, the B-21 Beddown, would require stormwater management incorporated into the project design. No fundamental changes to the capacity or function of the stormwater infrastructure are expected, and no cumulative impacts to stormwater infrastructure would be expected.

4.2.2 Water Resources

Each project would have the potential to affect water resources through inadvertent pollutant releases to surface waters through stormwater runoff. Each construction or ground-disturbing activity affecting one acre or more must be permitted. Its proponent must implement BMPs to limit soil and pollutant loss to stormwater and ensure that post-construction runoff does not exceed the pre-construction runoff rate. In addition, each project impacting wetlands would be required to obtain a permit and provide mitigation to ensure no net loss of wetlands. Cumulative effects on water resources would be held at less than significant through the permitting process

4.2.3 Biological Resources

Each project would cause short-term disturbances that could affect wildlife during construction and long-term impacts to habitat. Across all projects, impacts to biological resources are associated with mowed, maintained lawn and drainage features and the habitats these areas provide to plants and wildlife. No significant adverse cumulative impact to biological resources would be expected considering the disturbed nature of these areas and relatively low-quality habitat,

4.2.4 Cultural Resources

Each project would require review and coordination with the EAFB CRM to ensure requirements within Section 106 NHPA and other applicable cultural resource regulations are met. The CRM, through administration of the ICRMP, monitors installation-wide impacts to cultural resources. Further, the ICRMP specifies the protocol that all ground-disturbing activities must adhere to for unanticipated discoveries of potential cultural resources. Therefore, no cumulative effects on cultural resources would be expected.

4.2.5 Hazardous Materials, Contaminated Sites, and Toxic Substances

A cumulative effect on hazardous materials, contaminated sites, or toxic substances would result from

such materials and wastes from individual projects not being managed per regulations and plans. Adherence to project and base management plans would limit the potential impacts of individual projects and their cumulative effects. Further, projects that involve ground disturbance of impacted soils would require removal of impacted soils and replacement with clean fill, if required. Therefore, no cumulative effects associated with hazardous materials, contaminated sites, or toxic substances would be expected.

4.2.6 Air Quality

Other than the B-21 Beddown, estimated emissions generated by the proposed projects would be *de minimis.* It is understood that activities of this limited size and nature would not contribute significantly to adverse cumulative effects on air quality. The quantity of GHGs associated with the proposed projects and similar actions would be negligible. The B-21 Beddown project, which will ultimately replace B-1 operations at EAFB, is anticipated to decrease all criteria pollutants except nitrogen oxides, which would increase by 1.54 percent. Cumulative effects on air quality and climate change across all projects would be minimal.

5.0 SUMMARY OF ENVIRONMENTAL MANAGEMENT AND MITIGATION

Because there is no practicable alternative for the Proposed Action, mitigation is anticipated to be required for impacts to wetlands and possibly floodplains. The Proposed Action would eliminate a maximum of 9.26 acres of wetlands. Wetland permitting and mitigation would be coordinated with USACE prior to the start of construction. Wetland mitigation would likely consist of wetland creation and/or enhancement, purchase of mitigation bank credits from another approved Mitigation Bank, or a combination of those options. Floodplain mitigation, should it be required, would likely consist of floodplain creation and/or preservation within the same watershed. Mitigation requirements would be finalized during the project's permitting and final design phase.

No mitigation would be required for impacts on other resource areas.

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