Philip Wind Energy Center Interconnection Request

Final Environmental Assessment
Haakon County, South Dakota

Western Area Power Administration

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Prepared by:

U.S. Department of Energy
Western Area Power Administration
Upper Great Plains Region
2900 4th Avenue North
Billings, Montana 59101-1266
Phone: (406) 255-2800

Contractor Assistance Provided by:

SWCA Environmental Consultants
20 East Thomas Road, Suite 1700
Phoenix, Arizona 85012
Phone: (602) 274-3831

Project Applicant:

Philip Wind Partners, LLC
One South Wacker Drive, Suite 1800
Chicago, Illinois 60606
Phone: (312) 224-1400

Western Area Power Administration (WAPA) is aware that on February 25, 2025, the Council on Environmental Quality (CEQ) issued an interim final rule to remove its National Environmental Policy Act (NEPA) implementing regulations at 40 Code of Federal Regulations (CFR) 1500–1508. Based on CEQ guidance, and to promote completion of its NEPA review in a timely manner and without delay, in this Environmental Assessment, WAPA is voluntarily relying on the CEQ regulations, in addition to the U.S. Department of Energy's own regulations implementing NEPA at 10 CFR 1021, to meet its obligations under NEPA, 42 United States Code 4321 et seq.

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ABBREVIATIONS

ADLS	aircraft detection lighting system
APE	area of potential effects
APLIC	Avian Power Line Interaction Committee
BBCS	Bird and Bat Conservation Strategy
BCA	Beaver Creek Archaeology, Inc.
BCC	Bird of Conservation Concern
BLM	Bureau of Land Management
BLS	Bureau of Labor Statistics
BMP	best management practice
CFR	Code of Federal Regulations
CO_2	carbon dioxide
CO_2e mt	metric ton CO_2 equivalent
dB	decibel
dBA	A-weighted decibel
DOE	U.S. Department of Energy
EA	environmental assessment
EMF	electric and magnetic field
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FR	*Federal Register*
ft	feet
gen-tie line	generation tie line
GHG	greenhouse gas
GIS	geographic information system
HAP	hazardous air pollutant
HUC	hydrologic unit code
Invenergy	Invenergy Wind Development LLC
IPaC	Information for Planning and Consultation
kV	kilovolt
mt	metric tons
MET tower	meteorological tower
MOVES3	Motor Vehicle Emission Simulator
MW	megawatt
NEPA	National Environmental Policy Act
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act
NLCD	National Land Cover Database
NLEB	northern long-eared bat
NRCS	Natural Resources Conservation Service

NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
O&M	operations and maintenance
OATT	Open Access Transmission Tariff
PBA	Programmatic Biological Assessment
PEIS	programmatic environmental impact statement
PFYC	Potential Fossil Yield Classification
Philip Wind Partners	Philip Wind Partners, LLC
PM	particulate matter
PM_{10}	PM with a diameter of 10 microns or less
$PM_{2.5}$	PM with a diameter of 2.5 microns or less
PTRCS	property of traditional religious and cultural significance
Project	Philip Wind Energy Center, consisting of the Philip North Switchyard and the private Philip Wind Facility
ROI	region of influence
SCBB	Suckley's cuckoo bumble bee
SDDANR	South Dakota Department of Agriculture and Natural Resources
SDGFP	South Dakota Game, Fish and Parks
SDPUC	South Dakota Public Utilities Commission
SGCN	Species of Greatest Conservation Need
SHPO	State Historic Preservation Office
SPP	Southwest Power Pool
SWCA	SWCA Environmental Consultants
Switchyard	Philip North Switchyard
t-line	transmission line
TCB	tricolored bat
TCS	Tribal Cultural Specialist
TWI	The Wetlands Institute
UGP	Upper Great Plains
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compound
WAPA	Western Area Power Administration
WEST	Western EcoSystems Technology, Inc.
Wind Facility	Philip Wind Facility

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1 INTRODUCTION

Western Area Power Administration (WAPA) is one of four power-marketing administrations within the U.S. Department of Energy (DOE). WAPA's mission is to "safely provide reliable, cost-based hydropower and transmission to [its] customers and the communities [it] serve[s]." WAPA's customers include federal and state agencies, cities and towns, rural electric cooperatives, public utility districts, irrigation districts, and Native American Tribes. WAPA's customers, in turn, provide retail electric service to millions of consumers in the west.

Since October 2015, WAPA's Upper Great Plains (UGP) Region has been a transmission owner member of the Southwest Power Pool (SPP), and its qualifying facilities are under the functional control of SPP. Transmission capacity above the amount WAPA requires for the delivery of long-term firm capacity and energy to current contractual electrical service customers of the federal government is offered in accordance with SPP's Open Access Transmission Tariff (OATT), which is approved by the Federal Energy Regulatory Commission. Excess transmission capacity on and interconnection to WAPA-UGP's facilities must be done in accordance with SPP's OATT.

Philip Wind Partners, LLC (Philip Wind Partners or Applicant), requested interconnection to WAPA's existing Oahe to New Underwood 230-kilovolt (kV) transmission line (t-line) at a new Philip North Switchyard (Switchyard) for the Applicant's proposed private Philip Wind Facility (Wind Facility) (i.e., the wind energy generating facility, generation tie line [gen-tie line], and related infrastructure). Together, the Switchyard and private Wind Facility make up the Philip Wind Energy Center (Project). The Wind Facility would be on ≈ 68,300 acres of private land north of the town of Philip in Haakon County, South Dakota (proposed Project area) (Figures 1-1 and 1-2). Philip Wind Partners has secured leases for over 50,000 acres of land in the proposed Project area. On these leases, the Project would temporarily disturb 1,247 acres and permanently disturb 117 acres for the life of the Project.

The proposed Project area represents the greater area studied to site Project infrastructure. However, the Project infrastructure would be permanently sited on a much smaller area (≈ 1,247 acres would be temporarily disturbed during construction, and 117 acres would be permanently disturbed during operation). For the Wind Facility to interconnect with the existing line, WAPA would need to construct the Switchyard to control transmission to WAPA's existing system. Philip Wind Partners executed an interconnection agreement with WAPA and SPP. Prior to executing an interconnection agreement, Philip Wind Partners' interconnection request was studied in accordance with SPP's OATT and the Federal Power Act.

Since WAPA's decision to respond to Philip Wind Partners' interconnection request constitutes a "major Federal action" under the National Environmental Policy Act (NEPA), WAPA must conduct an environmental review of the Federal action and connected actions in accordance with NEPA. WAPA's consideration of the approval of the Switchyard constitutes the proposed Federal action, and the private Wind Facility constitutes a connected action to the proposed Federal action. Together, approval of the Federal action and the connected action make up the Proposed Action evaluated by WAPA pursuant to NEPA. WAPA follows the DOE's regulations implementing NEPA at 10 Code of Federal Regulations (CFR) 1021 to meet the agency's obligations under NEPA (42 United States Code [USC] 4321 et seq).

This environmental assessment (EA) analyzes and discloses potential environmental impacts associated with the Proposed Action, consistent with NEPA. This EA tiers to the analysis conducted in the UGP Wind Energy Final Programmatic Environmental Impact Statement (PEIS), a document prepared jointly

by WAPA and the U.S. Fish and Wildlife Service (USFWS) (WAPA and USFWS 2015).[1] The UGP PEIS was prepared to assess environmental impacts associated with wind energy development in the UGP and to streamline future individual wind project environmental reviews by identifying best management practices (BMPs) to avoid, minimize, and mitigate potential impacts. As stated in the Executive Summary of the UGP PEIS, wind energy projects willing to implement the applicable evaluation process, BMPs, and conservation measures identified in the UGP PEIS may tier the NEPA evaluation for that wind energy project to the analyses in the UGP PEIS. Applicable material from the UGP PEIS is incorporated by reference in this EA in accordance with 10 CFR 1021.210(e). The analysis in this EA is Project-specific and focuses on site-specific issues not already addressed in detail in the UGP PEIS. This EA is intended to be read with the UGP PEIS, and this EA and the UGP PEIS comprise WAPA's NEPA evaluation for the proposed Federal action.

This EA is supplemented by several appendices. Appendix A provides the Preconstruction Wind Turbine Noise Analysis. Appendices B through I are results of natural resources surveys conducted in the proposed Project area. Appendix J is Philip Wind Partners' responses to public comments and public involvement outreach efforts to date. Appendix K contains the USFWS Programmatic Biological Assessment (PBA) Consistency Evaluation Forms. Appendix L is the Whooping Crane Monitoring and Contingency Plan. Appendix M is the Shadow Flicker Report. Appendix N contains the archaeological and architectural resources survey reports and correspondence with the South Dakota State Historic Preservation Office (SHPO). Appendix O is a list of BMPs based on resource-specific BMPs identified in the UGP PEIS. Appendix P is the Project's Bird and Bat Conservation Strategy (BBCS).

1.1 PURPOSE AND NEED FOR THE FEDERAL ACTION

In accordance with SPP's OATT and the Federal Power Act, as detailed in Section 1.1.1 of the UGP PEIS, WAPA must consider whether to proceed with the Applicant's interconnection request at WAPA's existing Oahe to New Underwood 230-kV t-line, which includes the construction and operation of a new WAPA-owned Switchyard.

1.2 PHILIP WIND PARTNERS, LLC, GOAL AND OBJECTIVE

Philip Wind Partners' goals and objectives for the Project are to provide a source of domestic, clean energy to the power grid. To accomplish this, the Project must be technically, environmentally, and economically feasible.

1.3 PROJECT HISTORY AND DESIGN REFINEMENT

The Project was originally proposed by Philip Wind Partners (formerly owned by Southern Power Company) to WAPA in 2017. The Project is in an area of "excellent" wind energy resource with "high suitability" for wind energy development (WAPA and USFWS 2015). When Invenergy Wind Development LLC (Invenergy) acquired Philip Wind Partners (and with it the Project) from Southern Power Company in September 2019, the former Project area encompassed ≈ 71,000 acres and was designed with a layout focused on maximizing energy production. Since Invenergy's acquisition of Philip Wind Partners, Invenergy modified the Project area to address comments from regulatory agencies and the public to avoid, minimize, or mitigate potential adverse impacts to environmental resources based on collected field data (see Figure 1-2). For example, the Project layout Invenergy acquired included turbines sited on grasslands, including unbroken grasslands (see Appendix H for additional information on

[1] The UGP PEIS is referred to frequently throughout this EA, and therefore the author-date citation is provided here at first mention only.

grasslands). Through design refinements, Philip Wind Partners shifted turbine locations to avoid unbroken grasslands (Table 1-1, Figure 1-3).

Invenergy conducted additional natural resources surveys and introduced the new Philip Wind Partners Project team to the USFWS and South Dakota Game, Fish and Parks (SDGFP). During an initial meeting with USFWS and SDGFP in May 2022, the Project team shared the natural resources survey methods and incorporated the agencies' feedback into the survey plans. In addition, Philip Wind Partners kicked off monthly meetings with WAPA in September 2022 and incorporated WAPA's resource specialists' feedback into survey plans. Philip Wind Partners met with the USFWS and the SDGFP again in January 2023 to provide updates on previously completed studies and plans for 2023 through 2024. In that meeting, Philip Wind Partners demonstrated how field data was incorporated into the Project design to avoid and minimize potential impacts to species habitat and sensitive resources.

Philip Wind Partners presented to the USFWS the Project's proposed approach to Endangered Species Act (ESA) compliance pursuant to the USFWS's PBA, which provides for expedited programmatic Section 7 consultation through adherence to the BMPs and conservation measures in the PBA, as documented in the PBA Consistency Evaluation Forms (see Appendix K). A project applicant's voluntary commitment to implement the measures in the PBA Consistency Evaluation Forms results in an effects determination of "no effect" or "not likely to adversely affect" pursuant to the ESA Section 7 process. Between September 2022 and April 2023, Philip Wind Partners worked with the USFWS and WAPA to ensure the Project's adherence with the PBA's Consistency Evaluation Forms to address ESA compliance. The PBA Consistency Evaluation Forms were finalized and signed by Philip Wind Partners, the USFWS, and WAPA in April 2023; updated Consistency Evaluation Forms were signed again in April 2025.

Philip Wind Partners presented findings of the 2023 prairie grouse (sharp-tailed grouse [*Tympanuchus phasianellus*] and greater prairie-chicken [*Tympanuchus cupido*] collectively) lek and raptor nest surveys to the USFWS and the SDGFP in July 2023, along with changes to the turbine layout made in response to survey results. Philip Wind Partners removed four turbine locations from the layout due to proximity to prairie grouse leks and Tier 3 modeled priority sharp-tailed grouse habitat (Runia et al. 2021) (see Section 3.8.2.3.7 and Figure 1-3). Also, six turbines were relocated to comply with BMPs identified in the UGP PEIS. Revisions to the Project design by removal and relocation of turbines, and minor shifts in other Project infrastructure described in Section 2.1, resulted in reductions of impacts to environmental resources. Overall impacts by removing or modifying turbines are now < those described in the Draft EA. Philip Wind Partners will continue to coordinate with the USFWS and the SDGFP throughout Project development using the established collaborative process.

In January 2023, Philip Wind Partners engaged the Bureau of Land Management (BLM) in Project consultation, providing a data package before the scoping meeting, and confirmed during a March 18, 2024, meeting that no new Project infrastructure would be sited on the BLM inholding in the proposed Project area, with existing road right-of-way deemed sufficient to access Project components adjacent to the BLM inholding.

Table 1-1 and Figure 1-3 demonstrate design revisions and setbacks Philip Wind Partners applied to turbine sites to minimize disturbance to natural resources. Turbine sites were selected to minimize impacts to sensitive resources identified in natural resources surveys (see Appendices B–I) and in adherence to the PBA Consistency Evaluation Forms (see Appendix K), thus complying with Section 7 of the ESA. Natural resources and PBA Consistency Evaluation Forms setbacks were applied to all turbine sites (see Table 1-1 and Figure 1-3).

Philip Wind Partners worked with WAPA to support consultation with federally recognized Native American governments early in the planning process. In 2018, Philip Wind Partners' third-party

archaeological consultant, Beaver Creek Archaeology, Inc. (BCA), and Tribal Cultural Specialists (TCSs) from several Native American governments participated in cultural resources surveys. In 2023, Philip Wind Partners engaged BCA to continue evaluating the area of potential effects (APE) for potential archaeological sites. Philip Wind Partners and WAPA also requested that TCSs evaluate the APE for potential traditional cultural properties. Philip Wind Partners and WAPA have continued to rely on Native American governments to complete site-specific assessments to inform the cultural resources survey and support WAPA's consultation under Section 106 of the National Historic Preservation Act (NHPA).

Table 1-1. Applicant-Committed Natural Resources Setbacks for Turbine Locations

Category	Setback	Description	Setback Origination
Wetlands with TWI scores of 4–11	1,000 ft	No turbines ≤ 1,000 ft from wetlands with TWI scores of 4–11.	Applicant-committed setback based on natural resources surveys
Wetlands with TWI scores of 12–14	0.5 mile	No turbines ≤ 0.5 mile from wetlands with TWI scores of 12–14.	Applicant-committed setback based on natural resources surveys
Native (unbroken) sod grasslands	–	No turbines on native (unbroken) sod grasslands.	Applicant-committed setback based on natural resources surveys
Prairie grouse leks	1 mile	No turbines on unbroken grasslands ≤ 1 mile from active prairie grouse leks.	Applicant-committed setback based on natural resources surveys
Prairie grouse habitat models	–	No turbines on the SDGFP Tier 1 or 2 modeled priority habitat areas.	Applicant-committed setback based on natural resources surveys
Prairie dog colonies	500 meters	No turbines ≤ 500 meters from active prairie dog colonies.	Applicant-committed setback based on natural resources surveys
Eagle nests	2 miles	No turbines ≤ 2 miles from eagle nests.	Applicant-committed setback based on natural resources surveys
Red-tailed hawk nests	800 meters	No turbines ≤ 800 meters from red-tailed hawk nests.	Applicant-committed setback based on natural resources surveys
Northern long-eared bat (NLEB)	0.5 mile	No turbines ≤ 0.5 mile from known or presumed occupied foraging, roosting, and commuting NLEB habitat.	Applicant-committed setback in adherence with PBA Consistency Evaluation Forms
NLEB	10 miles	No turbines ≤ 10 miles from NLEB hibernacula (nearest known is ≈ 68 miles away).	Applicant-committed setback in adherence with PBA Consistency Evaluation Forms
Piping plover	1.5 miles	No turbines in the Missouri (including Niobrara River), Platte (including Loup and Elkhorn Rivers), and Yellowstone River system floodplains or < 1.5 miles from suitable sandbar habitat and reservoir shorelines with nesting, resting, and foraging areas. The nearest piping plover record is a 2014 sighting ≈ 20 miles south of the proposed Project area. Designated critical habitat is ≈ 30 miles northeast.	Applicant-committed setback in adherence with PBA Consistency Evaluation Forms
	1.5 miles	No turbines < 1.5 miles from known sandpit nesting, resting, and foraging areas along the Platte River (including Loup and Elkhorn Rivers) system.	Applicant-committed setback in adherence with PBA Consistency Evaluation Forms
	3 miles	No turbines < 3 miles from alkali lakes with documented piping plover nesting or those designated as critical habitat.	Applicant-committed setback in adherence with PBA Consistency Evaluation Forms
	3 miles	No turbines between alkali lakes identified with a 3-mile buffer where the outer limit of the buffer zones is < 3 miles apart.	Applicant-committed setback in adherence with PBA Consistency Evaluation Forms
	1.5 miles	No turbines < 1.5 miles from designated riverine critical habitat or < 3 miles from designated alkali wetland critical habitat.	Applicant-committed setback in adherence with PBA Consistency Evaluation Forms

Category	Setback	Description	Setback Origination
Whooping crane	5 miles	No turbines ≤ 5 miles from designated critical habitat (the nearest is > 200 miles away near Lexington, Nebraska).	Applicant-committed setback in adherence with PBA Consistency Evaluation Forms

Note: TWI = The Wetlands Institute.

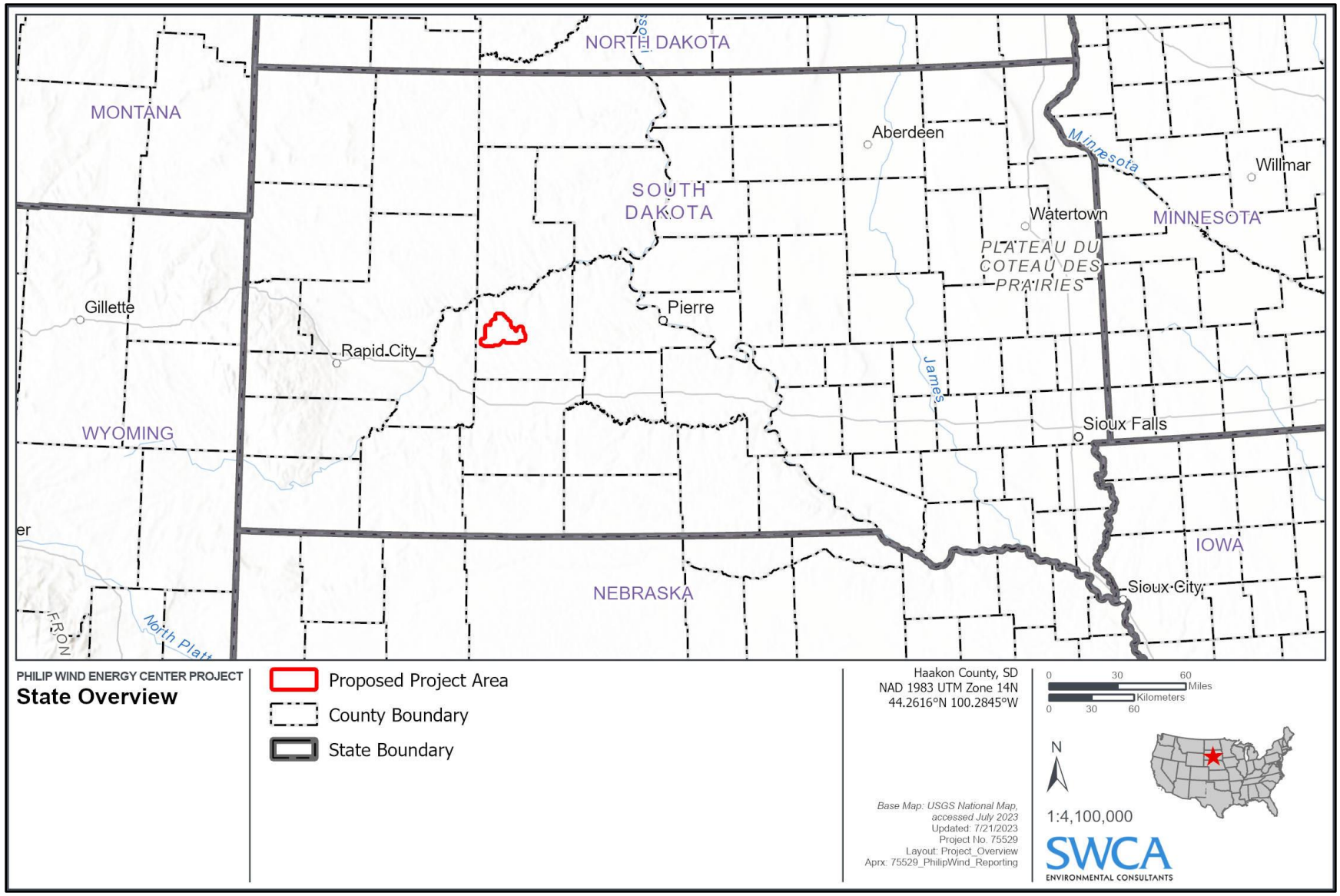

Figure 1-1. Proposed Project area in South Dakota.

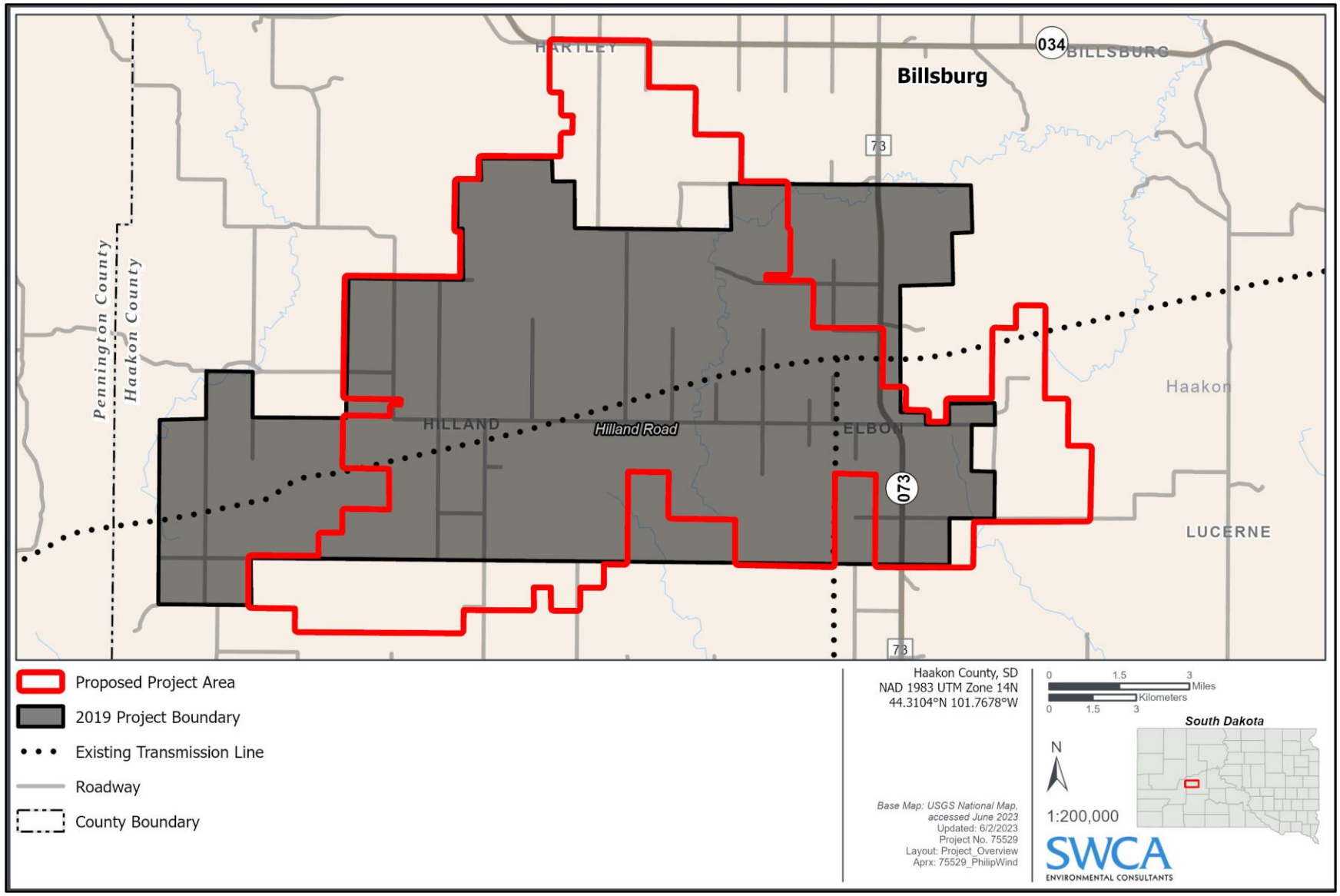

Figure 1-2. Proposed Project area and former boundary.

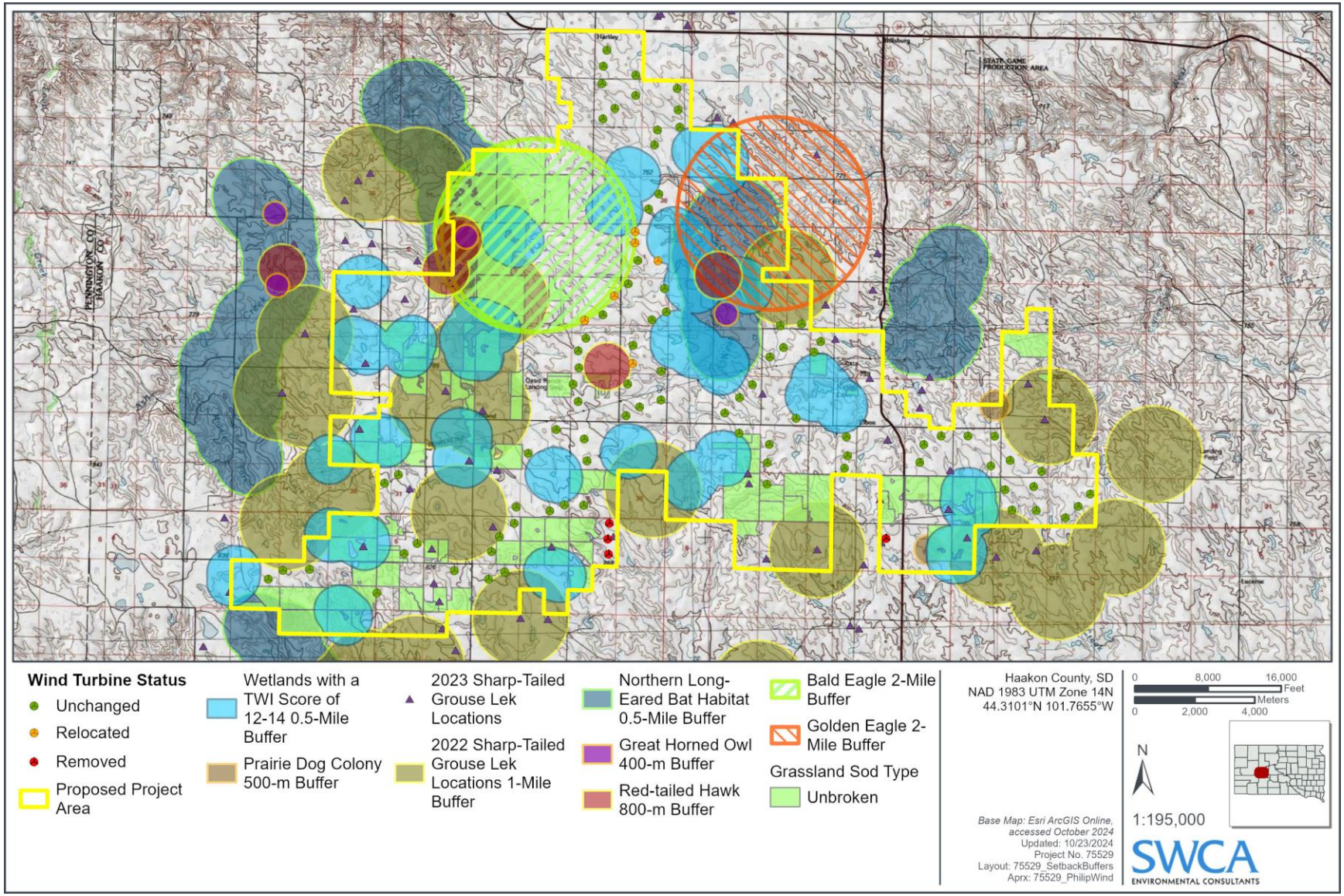

Figure 1-3. Natural resources setbacks and turbine locations.

Notes: Wetlands with TWI scores of 4–11 and tiered prairie grouse habitat not depicted for clear viewability; sharp-tailed grouse lek locations represent 2023 survey results finalized as of publication.

2 DESCRIPTION OF PROPOSED ACTION AND NO ACTION ALTERNATIVES

This EA analyzes two alternatives, the Proposed Action and the No Action Alternative.

2.1 PROPOSED ACTION

WAPA must consider whether to proceed with Philip Wind Partners' interconnection request in accordance with SPP's OATT and the Federal Power Act. The proposed Federal action is for WAPA to proceed with construction and operation of a new WAPA-owned Switchyard to interconnect Philip Wind Partners' privately owned and operated Wind Facility at the existing Oahe to New Underwood 230-kV t-line. WAPA has regulatory authority to consider and act upon requests for interconnection; these requests are evaluated on a case-by-case basis.

As defined in Section 2.1.1 of the UGP PEIS, "WAPA uses the NEPA process to evaluate and disclose potential environmental effects of granting interconnection requests" (WAPA and USFWS 2015). Although WAPA has decision-making authority to act upon interconnection requests, WAPA "does not directly authorize or permit developer projects, including wind energy development projects[,]" such as the Project (WAPA and USFWS 2015).

The proposed Wind Facility is a private action; Philip Wind Partners would construct, own, and operate the private Wind Facility. As part of the NEPA scoping process and requirements of 10 CFR 1021.410(b)(3), WAPA determined the private Wind Facility (i.e., the wind energy generating facility, gen-tie line, and related infrastructure) is a connected action to the proposed Federal action because if WAPA were to approve the interconnection request, Philip Wind Partners would develop the Project. For the purpose of analyzing and disclosing potential environmental impacts of the proposed Federal action, this EA evaluates both WAPA's proposed Federal action and Philip Wind Partners' private development of the Wind Facility (the connected action). Collectively, these activities make up the Proposed Action and are referred to as the Project. Table 2-1 provides a summary of the maximum potential disturbance associated with the Project, and Figure 2-1 displays the current Project layout.

Proposed infrastructure listed in Table 2-1 for the Project includes factors resulting in an overestimation of potential impacts. The Project's calculated disturbances are based on a conservative design incorporating extra facilities to be refined through final engineering. Since release of the Draft EA, Philip Wind Partners refined designs to minimize impacts while still accounting for an overestimation of impacts. This resulted in adjustments throughout Section 2.1 and Table 2-1 to represent the updated design. This analysis assumes the largest turbine model would be built at each of the potential turbine sites, although based on these assumptions, the Project would exceed the total nameplate generation capacity of 300 megawatts (MW). For the purposes of this EA analysis, overestimation of actual disturbance was intentional to ensure the maximum potential for Project impacts is considered.

Table 2-1. Maximum Potential Project Impact Summary

Proposed Infrastructure	Assumptions	Temporary Construction & Decommissioning Footprint (dimensions)	Temporary Construction & Decommissioning Footprint (acres)	Permanent O&M Footprint (dimensions)	Permanent O&M Footprint (acres)
Switchyard	1 switchyard	≈ 300 × 300 ft	2 acres	≈ 515 × 515 ft	5 acres
Subtotal for the Switchyard	–	–	*2 acres*	≈ 515 × 515 ft	*5 acres*
Wind Facility					
Wind turbines*	≤ 90 turbines on 91 potential sites	225-foot radius	296 acres	50-foot radius	14 acres
Access roads	≤ 44 miles	40 ft wide	124 acres	16 ft wide	84 acres
Crane paths	≤ 46 miles	75 ft wide	257 acres	–	–
Underground collection lines†	≤ 109 miles; 700 aboveground junction boxes	40 ft wide	415 acres	5 × 5 ft per junction box	< 1 acre
Project substation	1 substation location	–	–	≈ 600 × 600 ft	8 acres
Meteorological towers (MET towers)	≤ 3 MET towers (free-standing)	150-foot radius	4 acres	35 × 35 ft	< 1 acre
Aircraft detection lighting system (ADLS) towers	≤ 3 ADLS towers	150-foot radius	4 acres	35 × 35 ft	< 1 acre
O&M facility	1 O&M building	–	–	470 × 470 ft	5 acres
Temporary laydown yards (x3)	1 ≈ 15 acres 2 ≈ 10 acres	1 ≈ 810 × 810 ft 2 ≈ 660 × 660 ft	35 acres	–	–
Gen-tie line structures footprint & work area easement	≤ 7 miles long; 62 structures spaced 600 ft & 2 poles/structure	200 ft wide	82 acres	14-inch radius per pole	< 1 acre
Gen-tie line access road	1 access road ≤ 7 miles long	15 ft wide	9 acres	–	–
Basin Electric t-line structures footprint & work area easement	≤ 1 mile long; 9 structures spaced 600 ft, 2 poles/structure	200 ft wide	14 acres	14-inch radius per pole	< 1 acre
Basin Electric t-line access road	1 access road ≤ 1 mile long	15 ft wide	2 acres	–	–
WAPA transmission tie-in line structure footprint & work area easement	≤ 0.25 mile long; 4 structures spaced 600 ft, 2 poles/structure	200 ft wide	2 acres	14-inch radius per pole	< 1 acre
Subtotal for the Wind Facility	–	–	*1,245 acres*	–	*112 acres*
Project total (Switchyard & Wind Facility)	**–**	**–**	**1,247 acres**	**–**	**117 acres**

Note: Sum of values may not equal total shown due to rounding. Acreage calculations do not include areas of overlapping infrastructure (i.e., areas used for more than one purpose, such as access roads through turbine pads).

* Number of wind turbines depends on final turbine model selected but would be ≤ 90 turbines.

† Underground collection line design includes multiple collection line routes per turbine, which overestimates collection line distance. Final collection line design would require one connection between each set of turbines (e.g., linear connection network instead of mesh connection network).

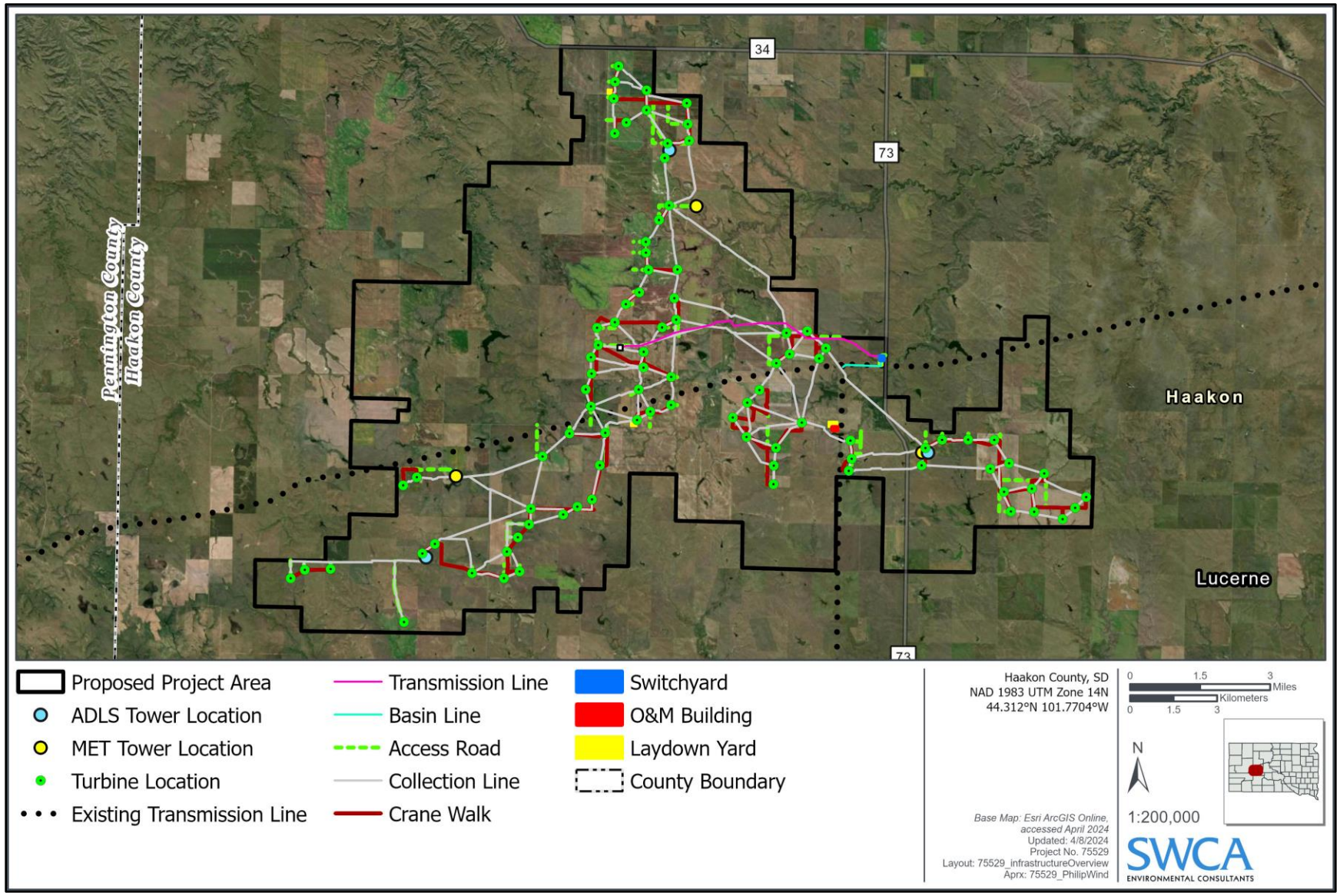

Figure 2-1. Project layout.

2.1.1 Switchyard

The Switchyard would be at the northeast corner of the proposed Project area along South Dakota Highway 73 and 213th Street. An existing transmission facility is nearby: the Philip Tap, which is the interconnection point for the Basin Electric 230-kV t-line to WAPA's Oahe to New Underwood 230-kV t-line. The Switchyard would be ≈ 1 mile east of Philip Tap (see Figure 2-1). To accommodate the existing Basin Electric interconnection, the Project interconnection, and improve access to the Switchyard, WAPA proposes to construct the Switchyard at the more accessible site in the proposed Project area. The Switchyard would replace the existing Philip Tap, and t-lines for the Project and Basin Electric would interconnect at the proposed Switchyard.

The Switchyard would be a WAPA-owned 230-kV switchyard and consist of four breaker ring buses with four 230-kV circuit breakers, twelve 230-kV disconnect switches, instrument transformers, associated control and protection equipment, high-voltage buses, four t-line take-off structures, one conductor, one overhead optical ground wire, communication equipment, and new t-line structures to re-terminate the four lines (Oahe 230-kV t-line, New Underwood 230-kV t-line, Basin Electric 230-kV t-line, and the Project 230-kV t-line) in the Switchyard.

Construction and operation of the Switchyard would result in ≈ 5 acres of permanent land disturbance and 2 acres of temporary land disturbance (see Table 2-1).

2.1.2 Wind Facility

2.1.2.1 Wind Turbines

The Wind Facility would consist of installation of ≤ 90 turbines on 91 potential sites (see Figure 2-1). Multiple turbine models are being considered, with the highest turbine rating ≤ 6.1 MW. The number and model of turbines selected would have a total nameplate generation capacity ≤ 300 MW. The wind turbine generators would be supported by three-section tubular towers ≤ 370 feet (ft) tall and have rotors ≤ 545 ft in diameter. Anticipated blade tip height would be ≤ 644 ft. Towers, blades, and generators would be white. Table 2-2 lists representative turbine options; a specific model has not yet been finalized. For purposes of impact assessment in this EA, the largest turbine model and the highest number of turbines were analyzed, representing an overestimation of potential impacts.

Table 2-2. Representative Turbine Options

Model Name	Current Nameplate Capacity (MW)	Hub Height (ft)	Rotor Diameter (ft)	Tip Height (ft)	Rotor-Swept Area (square ft)
GE 140	3.4	334	460	564	165,700
Vestas 166	6.1	370	545	644	190,285
Vestas 163	4.5	370	535	637.5	190,210

2.1.2.2 O&M Facility

The operations and maintenance (O&M) building, as shown in Figure 2-1, would result in ≈ 5 acres of permanent, long-term disturbance. To support the construction of the O&M building and other Project infrastructure, 35 total acres would be required for the use of three temporary laydown yards (see Table 2-1). One laydown yard would be sited in the same location as the O&M building, and the other two would be sited elsewhere in the proposed Project area (see Figure 2-1). All three laydown yards, apart from the O&M building footprint and gravel parking area, would be revegetated once construction is complete.

The O&M building would be a two-story building to house operating personnel, offices, operations and communication equipment, and storage for parts and maintenance. Construction tools, materials, equipment, and vehicles would be stored at the laydown yard until needed for construction activities. The O&M building would include a gravel parking area and outdoor storage area for larger equipment and materials, which would be fenced for safety and security. The building would have running water provided by the existing rural system.

2.1.2.3 Project Substation

The Project substation would be in the eastern portion of the proposed Project area (see Figure 2-1) and surrounded by a security fence. At the Project substation, voltage would be stepped up from 34.5 kV from the underground collection lines to 230 kV for the Project gen-tie line. Construction of the substation would cause ≈ 8 acres of permanent land disturbance (see Table 2-1). No temporary land disturbance would be needed for construction of the substation. The substation would consist of two transformers, circuit breakers, switching devices, auxiliary equipment, a control enclosure (with equipment for controls, protection, monitoring, and communications), and other miscellaneous equipment.

2.1.2.4 Generation Tie Line, Basin Electric T-Line Extension, and WAPA Transmission Tie Lines

Originating from the Project substation, a 7-mile gen-tie line would connect the Project to the new Switchyard. The gen-tie line would be a single-circuit power line with a structure height of ≤ 200 ft tall. The gen-tie line would be supported by ≈ 62 transmission structures (two poles per structure) spaced 600 ft apart. An access road to each structure would be required during construction, and access road areas would be reclaimed upon completion of construction. The 230-kV gen-tie line would transmit power from the Project substation to the Switchyard.

The gen-tie line would avoid USFWS wetland and grassland easements, as none exist in the proposed Project area. Bird flight diverters and marking devices specified in the PBA Consistency Evaluation Forms (see Appendix K) would be installed and maintained for the life of the Project on constructed overhead lines following Avian Power Line Interaction Committee (APLIC) suggestions.

The Project would require the extension of the existing Basin Electric t-line by ≈ 1 mile from its current interconnection point at the Philip Tap to the new Switchyard, requiring ≈ nine new transmission structures. No other lines would be upgraded as part of the Proposed Action.

During construction of the gen-tie line, the construction easement would be 200 ft wide and include transmission structures. Ground disturbance would occur at structure erection sites, temporary work areas, and access roads during construction; these areas would be reclaimed when construction is completed. Following construction, Philip Wind Partners would retain 32 acres of right-of-way for O&M; permanent disturbance would be the physical transmission structure locations, which would require a total operational footprint of < 1 acre (see Table 2-1).

The Basin Electric t-line relocation construction easement would be 200 ft wide and require ≈ 14 acres of temporary work areas. Permanent disturbance resulting from the Basin Electric t-line relocation would be 16 t-line pole foundations, requiring a total operational footprint of < 1 acre (see Table 2-1).

The proposed Switchyard would be offset to the north from the existing Oahe to New Underwood 230-kV t-line by ≈ 500 ft, requiring construction of two new WAPA transmission tie-in lines. The tie-in lines would need a 200-foot-wide construction easement and a temporary work area of ≈ 2 acres of temporary

disturbance. Permanent disturbance would be eight t-line pole foundations, requiring a total operational footprint of < 1 acre (see Table 2-1).

2.1.2.5 Access Roads and Crane Paths

For construction and maintenance of the wind turbines, existing, temporary, and permanent access roads would be used. Existing access roads (e.g., public and private roads) would be used to the extent possible. Philip Wind Partners expects to use ≤ 44 miles of new access roads; however, some existing access roads may require improvements (e.g., adding gravel, widening, or repairing potholes). During construction, new and improved access roads would be maintained at 40 ft wide for a temporary disturbance total of 124 acres. Following construction, access roads would be maintained at 16 ft wide for a permanent disturbance total of 84 acres (see Table 2-1). Following construction, 40 acres of land used for access roads would be reclaimed.

In addition to access roads, ≤ 46 miles of crane paths would be needed for construction. The crane paths would be 75 ft wide and only used during construction. Following construction, 257 acres of temporary disturbance needed for crane paths would be revegetated. If soils are firm enough to support the weight of the crane, minimal matting would be placed as the crane would be able to crawl over the land. For reclamation, compacted soils would be tilled following construction. Philip Wind Partners would use pads and crane mats for crane paths on soft soils.

2.1.2.6 Underground Collection Lines

An underground 34.5-kV collector system would be used to route power from each turbine to the aboveground collector Project substation, which would consist of two main transformers where electrical voltage would be stepped up from 34.5- to 230-kV. Communication fiber-optic lines would be co-located with the collector system, facilitating direct communication between the turbines and the O&M facility and/or remote-control locations.

Construction of the underground collection lines would temporarily disturb a 40-foot-wide path for ≈ 109 miles, or 415 acres (assuming construction of 90 turbines). The collection lines would be buried to ≥ 48 inches, with marking tape and tracer wire to meet appropriate national electrical codes. Ground surface above the lines would be revegetated, but no trees would be permitted above the lines. Philip Wind Partners estimates 700 permanent aboveground junction boxes would be needed, and the total permanent disturbance would be < 1 acre (see Table 2-1).

2.1.2.7 Meteorological Towers

Five temporary MET towers are currently in the proposed Project area. These towers would be removed as part of Project construction; however, three new permanent free-standing MET towers would be installed as part of the Project activities at new locations shown in Figure 2-1.

Permanent MET towers would be ≤ 200 ft tall, marked and lighted as specified by the Federal Aviation Administration (FAA), and would have FAA-approved aircraft detection lighting systems (ADLSs).

Construction of the MET towers would temporarily disturb ≤ 4 acres (a 150-foot radius area per tower). O&M of the MET towers would permanently impact < 1 acre.

2.1.2.8 Aircraft Detection Lighting System Towers

South Dakota Codified Law 49-41B-25.2 requires wind energy facilities to include ADLS towers meeting requirements set forth by the FAA. The Project would construct ≤ three ADLS towers, requiring temporary disturbance of 4 acres during construction. Total permanent disturbance would be < 1 acre.

2.1.2.9 Project Life Cycle and Decommissioning

Section 2 of the UGP PEIS describes activities likely to occur during major phases of a typical wind energy project's lifecycle as: site testing and monitoring, construction, O&M, and decommissioning. The same project phases, with similar types of activities for each phase, would occur for the Project. Construction would begin as soon as 2025, with the Project expected to become operational as early as 2026. The expected life of the Project is ≈ 30 years, after which time the Project would either be repowered or decommissioned. Any future decommissioning activities would be completed consistent with general requirements described in Sections 3.5 – Site Decommissioning; 3.6.4 – Hazardous Materials and Wastes; and 3.6.6 – T-Line Decommissioning, of the UGP PEIS; and applicable federal, state, and local requirements at that time. According to the South Dakota Codified Law § 49-41B 27 (2021), any retrofits and/or upgrades after 30 years may require further approvals from the South Dakota Public Utilities Commission (SDPUC).

2.1.2.10 Environmental Protection Measures

Philip Wind Partners has committed to BMPs based on the resource-specific BMPs identified in the UGP PEIS (see Appendix O) and to the BMPs and species-specific conservation measures identified in the PBA Consistency Evaluation Forms (see Appendix K). In addition to the Applicant-committed natural resources setbacks described above (see Table 1-1), Philip Wind Partners has committed to implementing additional voluntary environmental protection measures to further minimize the Project's impact to the landscape during construction and operation (Table 2-3).

2.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, WAPA would not enter into an interconnection agreement with SPP and Philip Wind Partners and would not allow the Project to interconnect with WAPA's transmission system. The new Switchyard would not be constructed. Although this would not preclude the Project from being constructed and connected to a non-WAPA-managed transmission system, for the purposes of analysis, this EA assumes the Project would not be built. However, WAPA recognizes Philip Wind Partners would seek an alternative interconnection point for the Project. For comparison in this EA, the No Action Alternative assumes Philip Wind Partners would not construct the Project.

Table 2-3. Applicant's Additional Voluntary Environmental Protection Measures

Resource	Applicant's Additional Voluntary Environmental Protection Measures
Land use & public facilities	• Coordinate turbine siting and operation activities with landowners to reduce interference with farming or livestock operations. This may include agreed-upon turbine sites, maintenance of gates and cattle guards where access roads cross existing fence lines, access control, signing of open range areas, traffic management (e.g., vehicle speed management), and safe operations of agricultural aviation activities.
Geology, soil resources, & paleontology	• Perform soil borings at wind turbine sites to assist with specific designs and construction parameters. • Test soil samples to determine engineering characteristics of the site subgrade soils. • Obtain coverage under the General Permit for Stormwater Discharges Associated with Construction Activities issued by the South Dakota Department of Agriculture and Natural Resources (SDDANR). This permit requires development and implementation of a stormwater pollution prevention plan. The Project's Stormwater Pollution Prevention Plan would be developed during civil engineering design of the Project and include BMPs to control erosion and sedimentation. • Regularly inspect access roads, utility and t-line corridors, and structure site areas for damage from erosion, washouts, and rutting. Initiate corrective measures immediately upon evidence of damage. • Correct drainage problems caused by construction to avoid damage to agricultural fields. • De-compact subsoil in temporarily disturbed areas following completion of construction and during decommissioning. • Salvage and segregate topsoil from excavation and construction activities to reapply to disturbed areas once construction is completed. • Remove turbines and ancillary structures from the proposed Project area during decommissioning. Do not bury or leave in place excess concrete in active agricultural areas, excluding belowground portions of decommissioned turbine foundations intentionally left in place. • Where practicable, place ground-disturbing activities and structures in areas previously disturbed through prior human activities. • Based on the presence of Potential Fossil Yield Classification (PFYC) 4 and U (unknown) geological units, a qualified paleontologist would review the final Project design and conduct field reconnaissance of exposures of geological units designated as PFYC 4 and a portion (at least 50% of exposures, e.g., drainage cuts and human-made exposures) of units designated as PFYC U. • If paleontological resources are found in the proposed Project area, their disposition would be in accordance with agreements between the surface estate owner and the Project proponent.
Wildlife	• Design and construct the Project's aerial power lines to minimize avian electrocution and collision risks as outlined in APLIC's *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* and *Reducing Avian Collisions with Power Lines: The State of the Art in 2012* (APLIC 2006, 2012). • Implement a Bird and Bat Conservation Strategy (BBCS) (see Appendix P) in accordance with the USFWS's *Land-Based Wind Energy Guidelines* (USFWS 2012) to minimize impacts to avian and bat species during construction and operation of the Project. • Turbine blades will be feathered below the cut-in wind speed November 1 to August 15. Curtailment will occur from 30 minutes before sunset to 30 minutes after sunrise when the temperature is above 40 degrees Fahrenheit and following the cut-in wind speeds and related timeframes specified below (adapted from USFWS [2024a, 2024b, 2024c, 2024d]; Jordan 2020): August 16 to October 31 at 5 meters per second. • Train O&M staff to recognize sensitive species as described in the BBCS (see Appendix P). Report observations of listed species fatalities to the appropriate state or federal agency within 48 hours of species identification. • Instruct employees, contractors, and visitors to avoid harassment/disturbance of wildlife, especially during reproductive (e.g., courtship and nesting) seasons. • Use designs for permanent MET towers that do not require guy wires. • Dispose of garbage or human waste generated on-site promptly to avoid attracting nuisance wildlife.
Hazardous materials & solid waste	• If contamination is caused by or encountered during on-site construction activity, report the contamination to the SDDANR at (605) 773-3296. Contaminated soil that has been excavated would be segregated from clean soil and sampled to determine disposal requirements. Piping, equipment, or other material to be placed in locations where it would be in contact with contaminated soil or groundwater would be evaluated to determine compatibility with the contaminant.

2.3 ALTERNATIVES CONSIDERED BUT DISMISSED

The Applicant and WAPA considered several alternative interconnection location options for interconnection to WAPA's Oahe to New Underwood 230-kV t-line. One option considered was a line break and construction of a new switchyard ≈ 5 miles west of the existing Philip Tap. Interconnection at this location would have required a new interconnection switchyard and upgrade of the Philip Tap to a switchyard. Construction of two switchyards would be more expensive than one improved switchyard, so WAPA evaluated alternative locations for placement of a single switchyard to facilitate interconnection to WAPA's Oahe to New Underwood 230-kV t-line. Three alternative options for removing the existing tap and replacing it with a switchyard were evaluated: 1) a new switchyard south of the existing Philip Tap, 2) the existing Philip Tap location, and 3) the preferred location carried forward for detailed analysis.

New Switchyard South of the Existing Philip Tap: Construction of a new switchyard ≈ 1 mile south of the existing Philip Tap Basin Line would have involved building two parallel WAPA lines traversing south for 1.3 miles from the existing tap and removing 1.3 miles of Basin line. This alternative switchyard location would require space for the Project gen-tie to access this switchyard site. Access to this site would be from Hilland Road, which is unpaved and not as regularly plowed in the winter as South Dakota Highway 73. This alternative would involve construction of 8.6 miles of new t-line. Due to the difficulty of routing 1.3 miles of WAPA's lines in parallel to this location and still allowing space for the Project gen-tie and the impracticability of accessing the site from an unpaved road, WAPA determined this was not a reasonable alternative due to the access constraints and increased t-line length.

New Switchyard at Existing Philip Tap Location: Constructing a new switchyard adjacent to the north of the existing Philip Tap would minimize the need for ≈ 6 miles of new gen-tie lines to be built for the interconnection of the Project. Constructing the switchyard at the existing Philip Tap would avoid extending the existing Basin Electric t-line and would reduce the length of the new gen-tie line by ≈ 1 mile; however, current road access to the Philip Tap requires travel on 2.7 miles of unpaved road from the paved South Dakota Highway 73. The route from the highway onto unpaved roads traverses private land, passes through a homesite, and crosses a private reservoir's dam. Philip Wind Partners proposed a new route to avoid the homesite and dam by improving 1 mile of 213th Street and constructing 0.5 mile of a new north-south access road to the current tap location.

This option was eliminated by WAPA because the preferred location of the switchyard is already sited adjacent to South Dakota Highway 73, providing better year-round access to the new facility and reducing the need for new road construction. Based on the lack of access to the switchyard from a paved road with year-round maintenance, WAPA determined this was not a reasonable alternative.

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3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This section identifies baseline environmental conditions and analyzes potential impacts for the Proposed Action and No Action alternative, organized by resource. The Proposed Action section for each resource is separated into potential impacts associated with the Switchyard and those associated with the Wind Facility, to clearly define the impacts associated with each Proposed Action component. This analysis tiers to the analysis conducted in the UGP PEIS, which analyzes potential direct, indirect, and cumulative environmental impacts of wind energy development across the UGP Region and identifies BMPs to reduce impacts. This section incorporates and tiers to the UGP PEIS analysis, focusing on site-specific information and potential impacts relevant to the Proposed Action.

Each resource section identifies existing baseline conditions in a specified analysis area. Depending on resources, the analysis areas may be the same as the proposed Project area (see Figure 2-1). Temporary and permanent disturbance acreages are disclosed by facility type in Table 2-1.

Each section describes potential impacts of the Proposed Action to the relevant resource. The analysis identifies environmental protection measures (i.e., resource-specific BMPs identified in the UGP PEIS [see Appendix O], BMPs and species-specific conservation measures identified in the PBA Consistency Evaluation Forms [see Appendix K], and the Applicant's additional voluntary environmental protection measures [see Table 2-3]) to be incorporated in the Proposed Action to reduce potential impacts.

Each section has a conclusion evaluating impacts of the Proposed Action in terms of context and intensity to determine the significance of the impact. The issue of context considers the geographic, biophysical, and social context in which the effects would occur. The issue of intensity refers to the severity of the impact and is classified in this EA using the following definitions:

- **Negligible:** Resources would be essentially unchanged or unaltered from the Project; these changes would not be detectible and/or measurable beyond normal environmental variability.
- **Minor:** Project would cause a slight change or alteration to specific resources; changes to resources may be detectable and/or measurable; resources as a whole would continue to function as prior to the Project.
- **Moderate:** Project would have an obvious, appreciable impact on resources; changes to resources would be detectable and/or measurable; resources may be affected through decreased functionality or may continue to function but in a diminished capacity.

Each resource section concludes with a determination of the significance of the impact. One of two conclusions is reached: either the Project would not have a significant impact on the resource considering context and intensity, or the Project would not have a "new" significant impact on the resource compared to what was analyzed in the UGP PEIS to which this EA is tiered. For Project impacts that may be significant, those impacts must have been fully analyzed in the UGP PEIS to reach a finding of no "new" significant impact.

Finally, the sections conclude with a description of the anticipated impact of the No Action Alternative to the resource.

3.1 LAND USE AND PUBLIC FACILITIES

3.1.1 Existing Conditions

3.1.1.1 Land Use

Land use in the proposed Project area was determined by use of the National Land Cover Database (NLCD) (U.S. Geological Survey [USGS] 2019). The proposed Project area and proposed Project features were compared to the NLCD, and areas of overlap were extracted using a geographic information system (GIS). The comparison provides a table of land cover types and allows for determination of temporary and permanent impacts from development of the Proposed Action.

Land use in the proposed Project area consists predominantly of herbaceous and planted/cultivated land. Herbaceous land is prairie and grasslands dominated by native or naturalized grasses. Planted/cultivated land is pasture/hayland and cultivated cropland and is referred to as "agricultural" land in this section. Developed land is areas of anthropogenic modification for commercial, residential, and industrial use. This includes buildings, impervious surfaces, and other constructed features. Vegetation associated with developed land is primarily lawn grass and landscaping in association with constructed facilities. Water represents open water such as rivers, ponds, and lakes with < 1% cover by vegetation or soil. Wetlands include forested and herbaceous vegetation where soil is periodically inundated or saturated. Forest and shrubland are dominated by woody plant species, which cover ≥ 2% of the land surface. Forest and shrubland land cover types differ in that forest cover is generally > 16 ft tall, and shrubland cover is < 16 ft tall. Barren land comprises exposed soil, bedrock, sand, talus, strip mines, or gravel pits. Vegetation represents < 15% of the land surface in the barren land cover type (USGS 2019).

The extent and distribution of land cover types in the proposed Project area are shown in Table 3-1 and Figure 3-1.

Table 3-1. Land Cover Types in the Proposed Project Area

National Land Cover Database Type	Acres	% of Proposed Project Area
Herbaceous	35,491	52%
Agricultural	30,721	45%
Developed	878	1%
Water	616	< 1%
Wetlands	543	< 1%
Forest	54	< 1%
Shrubland	14	< 1%
Barren	4	< 1%
Total	**68,318**	**100%**

Source: USGS (2019).
Note: Sums of values may not add to total value shown, due to rounding.

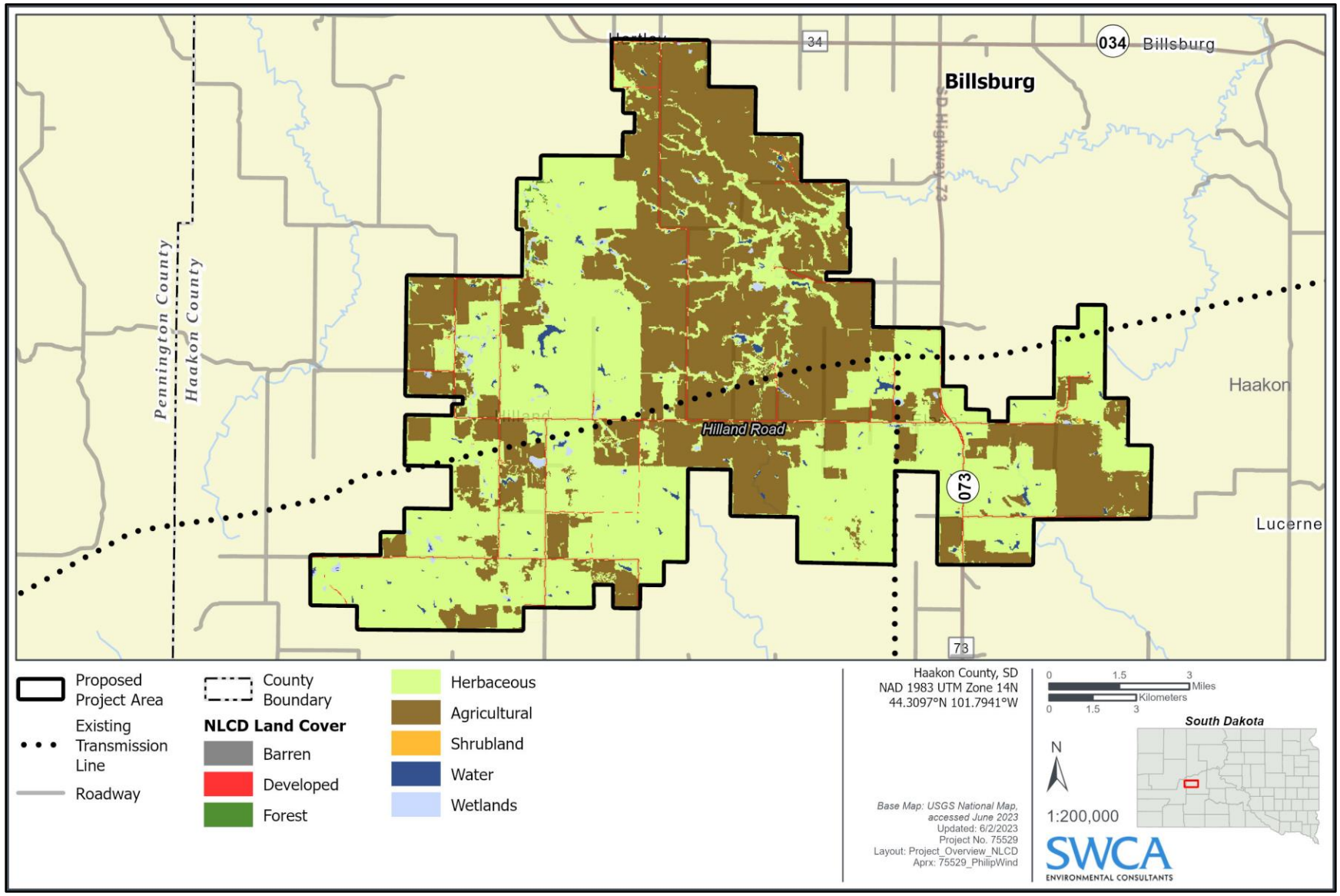

Figure 3-1. National Land Cover Database types in the proposed Project area.

3.1.1.2 Public Facilities

The closest public facilities to the proposed Project area are in the town of Philip, ≈ 13 miles south. In Philip, there is a hospital, police department, fire station, ambulance services, schools, places of worship, parks, and recreational facilities. In the proposed Project area, there is one cemetery; however, all Project infrastructure would avoid the cemetery. There are no places of worship or other public spaces or publicly accessible facilities in the proposed Project area. There are no municipal or commercial airports in the proposed Project area. The closest airport is the Philip Municipal Airport, ≈ 14 miles south of the proposed Project area. Commercial airports < 100 miles from the proposed Project area consist of Rapid City Regional Airport and Pierre Regional Airport, 86 miles to the west and 92 miles to the east, respectively. Google Earth aerial imagery shows one possible private landing strip in the proposed Project area, the Ferguson Landing Strip, near the intersection of 213th Avenue and 215th Street.

One BLM inholding is in the proposed Project area, and three State of South Dakota School and Public Land parcels are outside but directly adjacent to the boundary of the proposed Project area. As discussed in Section 5, BLM attended the agency scoping meeting held by Philip Wind Partners in January 2023. Prior to the meeting, Philip Wind Partners provided BLM with a data package of the proposed Project area to help engage BLM in Project consultation. Philip Wind Partners verified no infrastructure would be sited on the BLM inholding in the proposed Project area. Philip Wind Partners held a meeting with BLM on March 18, 2024, to provide updates regarding layout and transportation of Project components adjacent to the BLM inholding. Philip Wind Partners confirmed with BLM the width of the existing road right-of-way maintained by the county would be sufficient for the Project and no encroachment onto the BLM inholding would be anticipated to occur.

Primary access to the proposed Project area is via South Dakota Highway 73, which cuts south from South Dakota Highway 34. Secondary points of entry to the proposed Project area off South Dakota Highway 73 are via 213th Street heading west, Hilland Road heading west, Noack Road heading east, and 217th Street heading west. Additional access roads in the proposed Project area that would be used are listed in Table 3-2.

Table 3-2. Existing Access Roads in the Proposed Project Area

Road	Surface Type	≈ Width (ft)
211th Avenue	Gravel or crushed rock	14
211th Street	Gravel or crushed rock	16
213th Street	Gravel or crushed rock	16
215th Avenue	Gravel or crushed rock	22
216th Avenue	Gravel or crushed rock	18
217th Avenue	Gravel or crushed rock	14
217th Street	Primitive	10
218th Avenue	Primitive	10
224th Avenue	Primitive	10
Hilland Road	Gravel or crushed rock	24
Noack Road	Gravel or crushed rock	24
West Fork Road	Gravel or crushed rock	16

Source: South Dakota Department of Transportation (2022).

Along South Dakota Highway 73 and surrounding highways, average daily traffic volumes in 2021 ranged from 500 to 700 vehicles/day (South Dakota Department of Transportation 2021). In the proposed Project area, existing access roads would be used to the extent practicable. New access roads would be required to support construction and O&M of the Proposed Action infrastructure (see Figure 2-1).

3.1.1.3 Conservation Easements and Protected Lands

There are no USFWS wildlife refuges, USFWS conservation easements, USFWS wetland management district properties, U.S. Department of Agriculture (USDA) Agricultural Conservation Easement Program lands, SDGFP properties, or State of South Dakota School and Public Land parcels in the proposed Project area. There is one BLM inholding in the proposed Project area; however, no new Project infrastructure would be sited on the BLM inholding.

3.1.2 Environmental Consequences: Proposed Action

3.1.2.1 Environmental Commitments

Philip Wind Partners has committed to implementing BMPs derived from the UGP PEIS (see Appendix O) and the Applicant's additional voluntary environmental protection measures in Table 2-3. BMPs relating to land use and public facilities include the following (see Appendix O and Table 2-3):

- Plan and site wind energy development to minimize impacts to other land uses.
- Coordinate turbine siting with landowners to minimize interference with agricultural production.

3.1.2.2 Switchyard

Construction and O&M of the Switchyard would disturb ≈ 7 acres of land, including 5 acres of permanent disturbance and 2 acres of temporary disturbance. Of the 2 acres of temporary disturbance, < 1 acre would take place on already developed land; the remaining temporary disturbance would occur on herbaceous land. This disturbance would occur due to construction access, construction activities, and staging of equipment and supplies. Following construction, the Switchyard would permanently impact < ½ acre of developed land and ≈ 4.5 acres of herbaceous land. No other land cover types would be impacted by permanent disturbance associated with the Switchyard. No USFWS wetland easements, wildlife refuges, or USDA Agricultural Conservation Easement Program lands would be impacted by permanent disturbance associated with the Switchyard.

3.1.2.3 Wind Facility

Construction of the Wind Facility would temporarily disturb ≤ 1,245 acres of land (Table 3-3). This disturbance would be land used for construction access, construction activities, and staging of equipment and supplies. Existing land cover types that would be temporarily disturbed are agricultural, herbaceous, developed, and wetlands, in descending order. Much of the existing land cover in these areas would be revegetated or returned to prior land use immediately following construction. Temporary land use for construction is anticipated to last only one or two growing seasons at any given location.

Table 3-3. Wind Facility Disturbances by Land Cover Type

Land Cover Type	Temporary Disturbance (acres)	Permanent Disturbance (acres)
Agricultural	914	90
Herbaceous	314	21
Developed	16	1
Wetlands	1	0
Water	< 1	0
Forest	0	0
Shrubland	0	0
Barren	0	0
Total	**1,245**	**112**

Source: USGS (2019).
Note: Sums of values may not add to total value shown, due to rounding.

Following construction, ≤ 112 acres of land would be permanently impacted during the operation of the Wind Facility (see Table 3-3). Existing land cover types that would be permanently disturbed are classified as agricultural, herbaceous, developed, and wetlands, in descending order. The remaining 1,133 acres of land would be returned to their existing land cover types following construction. During O&M, agricultural activities may still occur up to the edge of access roads and turbine pads because no fences or gates would surround the access roads and turbine pads, unless installed by the landowner. The collector system would be buried underground and would not permanently affect agricultural activities. Permanently impacted land cover types would be converted to primarily turbine pads and access roads.

Existing access roads may require improvement for construction, which may include adding gravel and repairing potholes. Philip Wind Partners would obtain an appropriate South Dakota Department of Transportation permit for any highway use and a haul route agreement with Haakon County to acquire the appropriate access and use permits to conduct this work and to minimize and mitigate temporary impacts to area transportation during improvements. New access roads would provide unrestricted and improved access to landowners and livestock based on provisions in lease agreements and local statutes, resulting in overall improvements in transportation use.

No impacts to public facilities or publicly accessible facilities are anticipated. No public facilities are in the proposed Project area, apart from public roads. No infrastructure would be sited on BLM land in the proposed Project area. No impacts to airports are anticipated, as the nearest airport is ≈ 14 miles from the proposed Project area. Philip Wind Partners would follow FAA regulations for marking structures and would implement necessary safety lighting.

Decommissioning impacts would be ≤ those described for construction. Temporary impacts would occur while land is used for deconstruction and removal of infrastructure. Permanently impacted land would be restored to pre-Wind Facility land uses.

Post-construction impacts to land use would be minimal, as ≈ 1,133 acres of the 1,245 acres of disturbed land would be returned to their existing land cover types. No impacts to public facilities are expected.

3.1.2.4 Land Use and Public Facilities Conclusion

Of the 68,318 acres in the proposed Project area, 1,247 acres would be temporarily disturbed by construction of the Project, and ≤ 117 acres would be permanently disturbed by the Project. Remaining

acres would be returned to their previous land cover and land use. Public roads may require improvements such as new gravel and pothole repair, but no other impacts to public facilities are anticipated. Although there is one BLM inholding in the Project area, this property would not host facilities or Project infrastructure. Based on these findings, disturbance throughout the Project area to existing land uses and public facilities would be minor. The proposed Project's impacts to current land uses and public facilities would be less than significant.

3.1.3 Environmental Consequences: No Action Alternative

The No Action Alternative would have no direct or indirect impacts to land uses and public facilities, and existing activities would continue.

3.2 GEOLOGY, SOIL, AND PALEONTOLOGICAL RESOURCES

3.2.1 Existing Conditions

Geology, soil, and paleontological resources in the proposed Project area were determined by use of the Mineral Resources Data System (USGS 2023a) and Quaternary Fault and Fold Database for the United States (USGS 2023b), other geological publications cited below, the Web Soil Survey (Natural Resources Conservation Service [NRCS] 2023), and the BLM National Potential Fossil Yield Classification (PFYC) Geologic Formation 2022 Polygons (BLM 2022a). The proposed Project area and proposed Project features were compared to the reference data, and areas of overlap were extracted using a GIS. The comparison provides a table of mapped resources and features and allows for determination of temporary and permanent impacts from Project development.

The physiographic features of the proposed Project area consist of rolling plains, hills, and ridges with shallow meandering drainages. These features formed due to erosion of softer underlying bedrock through actions of wind and water along tributaries to the Cheyenne and Bad Rivers. Soils in the proposed Project area consist of clay to silty clay textures derived from weathering of underlying shale and siltstone bedrock (National Cooperative Soil Survey 2023). These soils are moderately susceptible to rill erosion and can lose on average 5 tons of soil through water and wind erosion without affecting crop productivity (NRCS 2023). Other soil properties include a low resistance and medium susceptibility to compaction and are moderately well drained (NRCS 2023). The depth to bedrock in the proposed Project area ranges from 20–80 inches (NRCS 2023).

Prime farmland and farmland of statewide importance are subject to protection under the Farmland Protection Policy Act (Public Law 97-98; 7 USC 4201–4209). The proposed Project area is classified as ≈ 51% farmland of statewide importance, ≈ 42% as not prime farmland, and ≈ 7% as prime farmland if irrigated (Table 3-4, Figure 3-2).

Table 3-4. Farmland Types in the Proposed Project Area

Farmland Type	Area (acres)	% of Proposed Project Area
Farmland of statewide importance	34,821	51%
Not prime farmland	28,835	42%
Prime farmland if irrigated	4,662	7%
Total	**68,318**	**100%**

Source: NRCS (2023).

Commercially viable mineral deposits in Haakon County are limited to sand and gravel. Information from the South Dakota Department of Agriculture and Natural Resources (SDDANR) Minerals and Mining Program and a review of USGS 7.5-minute quadrangles shows no such deposits developed in the proposed Project area. The closest gravel pit to the proposed Project area is ≈ 14 miles south (USGS 2023a).

Geological hazards in the proposed Project area may include seismic ground shaking, ground rupture, liquefaction, slope instability, subsidence, expansive soils, and flooding. The seismic risk is low in the proposed Project area, with no active faults or earthquakes recorded in Haakon County, South Dakota (South Dakota Geological Survey 2023; USGS 2023b). Subsidence risk is considered negligible because the underlying bedrock is not known to develop karst topography or contain layers susceptible to dissolution by water. There are no reclaimed or underground mining operations in the proposed Project area (USGS 2023a). Landslide incidence is low, but susceptibility is high, which can result in slumping especially along steep slopes, in channel cuts, or during excavations (Radbruch-Hall et al. 1982). No other geological hazards were reported from the proposed Project area.

Bedrock geology in the proposed Project area mainly consists of dark shales of the shallow marine Pierre Shale and tan to dark-gray sandstones, siltstones, and shale of the marginal marine Fox Hills Sandstone (Martin et al. 2004; Patrick et al. 2002; Waage 1968) (Table 3-5). Bedrock outcrops may exist at the surface in places but are likely to be weathered and eroding into unlithified soils. Other geological units present in the proposed Project area make up < 10% when combined and include Quaternary alluvial and eolian deposits (see Table 3-5).

Previously the BLM assigned each geological unit a PFYC value from 1 (very low) to 5 (very high), or in some cases U (unknown). These values are based on taxonomic diversity and abundance of previously recorded scientifically important paleontological resources associated with the unit and the potential for future discoveries (BLM 2022b). PFYC U values represent geological units that may exhibit conditions suggesting important paleontological resources may be present but lack information about the presence of these resources in the unit. Guidelines suggest these units be treated as high to very high (like PFYCs 4 or 5) until a provisional for formal assignment is made (BLM 2022b).

Paleontological resources are nonrenewable fossilized remains, traces, or imprints of organisms, preserved in or on the Earth's crust, that are of paleontological interest and provide information about the history of life on Earth. BLM PFYC 2022 data and published geological mapping (Martin et al. 2004) indicate the proposed Project area contains one PFYC 2 geological unit (Quaternary eolian deposits), two PFYC 4 geological units (Pierre Shale and Fox Hills Sandstone), and one PFYC U geological unit (Quaternary alluvium) (BLM 2022a). Table 3-5 summarizes the PFYC value, typical fossils, and acreage for each geological unit in the proposed Project area.

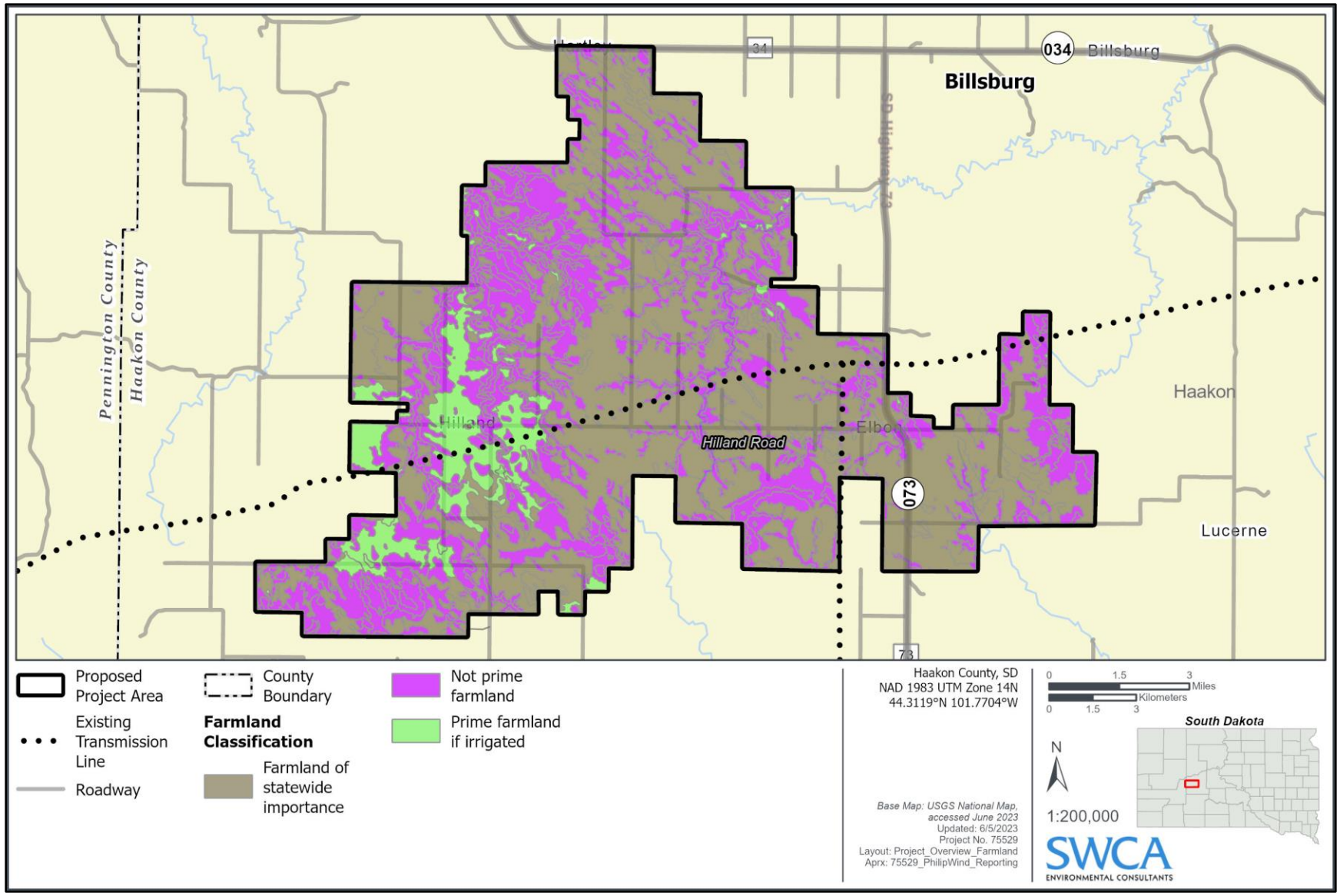

Figure 3-2. Farmland types in the proposed Project area.

Table 3-5. Geological Units, Potential Fossil Yield Classification, and Typical Fossils within the Proposed Project Area

Geological Unit*	Period	PFYC	Typical Fossils	Area (acres)	% of Proposed Project Area
Alluvium	Quaternary	U	Unknown; possible depending on age and environmental setting of deposits. Holocene-age deposits are too young to contain in situ fossils but may contain unfossilized remains of modern taxa. Pleistocene-age deposits may contain mineralized or partially mineralized mammoth, camel, bison, horse, and rodent remains (fossils).	1,734	3%
Eolian deposits	Quaternary	2	Unlikely; possible depending on age of deposits. Holocene-age deposits are too young to contain in situ fossils but may contain unfossilized remains of modern taxa. Pleistocene-age deposits may contain mineralized or partially mineralized plant and animal remains (fossils).	4,174	6%
Fox Hills Sandstone	Cretaceous	4	Invertebrates: bivalves, cephalopods, and gastropods; vertebrates: fish, sharks, mosasaurs, amphibians, turtles, crocodiles, dinosaurs, birds, and mammals.	15,824	23%
Pierre Shale	Cretaceous	4	Invertebrates: bivalves, cephalopods, decapods; vertebrates: fish, sharks, sea turtles, marine reptiles, flying reptiles, dinosaurs, and birds.	46,586	68%
Total				**68,318**	**100%**

Source: Martin et al. (2004).

* In descending stratigraphic order (youngest to oldest).

Pierre Shale and Fox Hills Sandstone have a long history of geological and paleontological research in western South Dakota and surrounding regions. Locally, Fox Hills Sandstone contains mostly sandy sequences with some thin zones of coal-bearing beds and gradates rapidly into the underlying Pierre Shale (Waage 1968). In South Dakota and North Dakota, Fox Hills Sandstone contains numerous fossils, including invertebrates (bivalves, cephalopods, and gastropods) and vertebrates (fish, sharks, rays, marine reptiles, amphibians, turtles, crocodiles, dinosaurs, birds, and mammals) (Case and Martin 2007; Chamberlain et al. 2023; Hoganson et al. 2007; Waage 1968). Pierre Shale locally comprises black marine shales, mudstone, and claystones and contains numerous fossils mostly representing marine fauna, including invertebrate (bivalves, cephalopods, and decapods) and vertebrates (fish, sharks, sea turtles, and marine reptiles), and, on rare occasion, terrestrial vertebrates (flying reptiles, dinosaurs, and birds) (Carpenter 1996; Gregory 1948; Ross 2004; Waage 1968; Wieland 1896). Based on literature reviews, review of the Paleobiology Database (2023) locality data, and results of a previous locality search request received from the South Dakota School of Mines and Technology, no previously recorded localities are ≤ 1 mile from the proposed Project area. The closest localities contain Pleistocene-age fossils documented ≈ 9 miles to the northeast and 15 miles to the south (Fox 2023). Paleontological resources are most likely to exist in PFYC 4 geological units (i.e., Pierre Shale and Fox Hills Sandstone), which are more extensive in the proposed Project area.

SWCA Environmental Consultants (SWCA) conducted a desktop analysis in relation to the proposed infrastructure components that included background research for the analysis area and an aerial imagery review of the Project infrastructure. SWCA used that information and the PFYC ranking of the underlying geological unit to evaluate the paleontological potential of the analysis area and to assess the possibility for construction to disturb paleontological resources. SWCA's research included previous paleontological resources reports, geological maps, and literature reviews; previous locality data searches; and discussion with paleontologists conducting active research in the area. The purpose of the analysis of existing data was to 1) determine whether previously recorded fossil localities are in the Project area, 2) assess potential for disturbance of these localities during construction, and 3) evaluate paleontological potential in the Project area. The desktop analysis included a review of preliminary geotechnical

subsurface boring logs near the proposed wind turbine locations, where construction excavations would be the deepest for foundations. No potential fossil-bearing units were identified in the proposed excavation depths. Following the desktop analysis, a paleontologist conducted a field survey to evaluate the analysis area for 1) surface fossils, 2) exposures of potentially fossiliferous rock, and 3) areas where future construction would expose or affect potentially fossiliferous rock. Results of this analysis and field survey indicated a low potential of encountering paleontological resources during construction.

Fossils, including paleontological resources, are the property of the surface estate owner. Because the proposed Project infrastructure would be on private land, there are no federal or state laws requiring assessment, management of, or protection for paleontological resources other than NEPA. General guidelines and best practices for mitigating paleontology can be found in Murphey et al. (2019). BMPs for projects tiering from the UGP PEIS are stated in UGP PEIS Section 5.8.1.6.

3.2.2 Environmental Consequences: Proposed Action

3.2.2.1 Environmental Commitments

Philip Wind Partners has committed to implementing BMPs derived from the UGP PEIS (see Appendix O) and the Applicant's additional voluntary environmental protection measures in Table 2-3. BMPs related to geology, soil, and paleontological resources include (see Appendix O and Table 2-3):

- Preserve the health and function of soils by minimizing or controlling ground-disturbing activities.
- Complete regular inspections of disturbed areas or newly reclaimed areas for damage from erosion, washouts, and rutting.
- Correct adverse impacts such as erosion or compaction.
- Plan placement of turbines and access roads to minimize erosion and geological risks.
- Based on the presence of PFYC 4 and U geological units, a qualified paleontologist would review the final Project design and conduct field reconnaissance of exposures of geological units designated as PFYC 4 and a portion (≥ 50% of exposures; e.g., drainage cuts and human-made exposures) of units designated as PFYC U.
- If paleontological resources are found in the proposed Project area, their disposition would be in accordance with agreements between surface estate owners and the Project proponent.

3.2.2.2 Switchyard

Primary impacts to soil resources include ground-disturbing activities (e.g., grading, trenching, and excavating) that cause effects such as increased compaction, horizon mixing, erosion and deposition by wind or water, and soil contamination. Such impacts to farmland of statewide importance and prime farmland may reduce the quality, quantity, or productivity of the soils.

Direct impacts to paleontological resources may include breakage, crushing, or displacement or similar indirect impacts caused from increased erosion of newly exposed sediments and resources they contain through ground-disturbing activities such as grading, excavation, or trenching. Increased human activity during Project activities and from improved access may result in impacts to paleontological resources by increasing the potential for displacement, removal, or breakage of fossils by unauthorized collection or vandalism. Risk of impacts to paleontological resources would be highest where Project-related ground-disturbing activities or increased human activity overlap PFYC 4 and PFYC U geological units.

Construction and O&M of the Switchyard would temporarily and permanently disturb 7 acres of soil, comprising 2 acres of farmland of statewide importance and 5 acres of not prime farmland. Impacts to 7 acres of PFYC 4 Pierre Shale (5 acres of permanent disturbance and 2 acres of temporary disturbance) would occur during construction of the Switchyard. In accordance with the UGP PEIS, Philip Wind Partners engaged SWCA to conduct a desktop review and paleontological resources fieldwork in fall 2023. The desktop analysis and field survey results indicate a low potential to encounter paleontological resources at or near the surface due to few bedrock outcrops present across most of the Project area. Risk of geological hazards at the Switchyard is low, other than the potential for slumping during excavations.

3.2.2.3 Wind Facility

Impacts to geology, soil, and paleontological resources from the Wind Facility would be the same as those described for the Switchyard. Heavy equipment would compact soils; however, in areas temporarily disturbed by construction and not needed for O&M, disturbed subsoil would be decompacted and salvaged and segregated topsoil would be redistributed.

Construction of the Wind Facility would temporarily impact 1,245 acres (Table 3-6), of which 960 acres would be farmland of statewide importance, 39 acres of prime farmland if irrigated, and 246 acres of not prime farmland. The Wind Facility would temporarily disturb ≈ 1,118 acres of PFYC 4 geological units, 115 acres of PFYC 2 units, and 12 acres of PFYC U units.

The Wind Facility would permanently impact 112 acres of soils, of which 84 acres would be farmland of statewide importance, 3 acres of prime farmland if irrigated, and 25 acres of not prime farmland. The Wind Facility would permanently disturb ≈ 101 acres of PFYC 4 geological units, 11 acres of PFYC 2 units, and no acres of PFYC U units. Risk of geological hazards in the proposed Project area is low, aside from slumping potential that exists along steeper slopes, in channel cuts, and during excavations.

Table 3-6. Wind Facility Disturbances by Farmland Types in the Proposed Project Area

Soil Category	Temporary Disturbance (acres)	Permanent Disturbance (acres)
Farmland of statewide importance	960	84
Not prime farmland	246	25
Prime farmland if irrigated	39	3
Total	**1,245**	**112**

Source: NRCS (2023).
Note: Sums of values may not add to total value shown, due to rounding.

During decommissioning, impacts to soils would be similar to those during construction. Temporary impacts would occur while land is used for deconstruction and removal of infrastructure. Impacts to paleontological resources during decommissioning would include increased human activity in the area and ground-disturbing activities extending into areas outside the Wind Facility's previous disturbance.

The Wind Facility would temporarily and permanently impact 960 acres of the 34,821 total acres of farmland of statewide importance (3%) and 39 acres of the 4,662 total acres of prime farmland if irrigated (< 1%). The Wind Facility would disturb 1,188 acres of the 62,410 total acres (2%) of paleontological resource sensitivity (PFYC 4) and 12 acres of the 1,734 total acres of PFYC U. In accordance with the UGP PEIS, Philip Wind Partners engaged SWCA to conduct a desktop review and paleontological resources fieldwork in fall 2023. Based on the results of the desktop analysis and field survey, there is a low potential to encounter paleontological resources at or near the surface due to few bedrock outcrops

present across most of the Project area. Impacts to geology, soil, and paleontological resources would be minor. Unanticipated discoveries of paleontological resources would comply with the UGP PEIS.

3.2.2.4 Geology, Soil, and Paleontological Resources Conclusion

Of the 34,821 acres of farmland of statewide importance in the proposed Project area, ≤ 960 acres would be temporarily disturbed, and 86 acres would be permanently disturbed. Of the 4,662 acres of prime farmland if irrigated, ≤ 3 acres would be permanently disturbed. Of the 62,410 acres with PFYC 4 classification, indicating an increased potential for paleontological resources, ≤ 105 acres would be permanently impacted. To minimize impacts, the Project has committed to voluntary environmental protection measures, such as minimizing erosion and compaction, and hiring a qualified paleontologist to assess the final Project design for paleontological resources. Based on the results of the desktop analysis, preliminary geotechnical boring logs review, and field survey, there is a low potential to encounter paleontological resources at or near the surface due to lack of outcrops across most of the Project area. The Project's impact on the geology, soils, and paleontological resources is minor, and the proposed Project's impacts to such resources would be less than significant.

3.2.3 Environmental Consequences: No Action Alternative

The No Action Alternative would have no direct or indirect impacts to geology, soil, and paleontological resources, and existing activities would continue.

3.3 HYDROLOGIC SETTING AND WATER RESOURCES

3.3.1 Existing Conditions

Hydrologic setting and water resources of the proposed Project area were determined through desktop analysis of watershed data from the National Map Viewer and Watershed Boundary Dataset (USGS 2023c, 2023d); mapped waterbodies, including ponds, lakes, streams, and rivers, from the National Hydrography Dataset (NHD) (USGS 2023e); wetlands from the National Wetlands Inventory (NWI) (USFWS 2023a); and groundwater from the Ground Water Atlas of the United States (USGS 1996).

The NHD and NWI databases include some categories redundant with the NLCD database used in Section 3.1, such as open water and wetlands. Discrepancies among different databases are common. The NLCD is used for a coarse assessment of land use and land cover. The NHD and NWI databases are much more sensitive to aquatic features through consideration of topography, soil types, and evidence of inundation and soil saturation. The NHD and NWI databases use different classification systems. Some aquatic features are mapped by both but labelled differently. For example, streams and rivers are mapped as one-dimensional flowlines by the NHD but are mapped as two-dimensional riverine wetlands by the NWI. Under the NWI mapping, riverine polygons may include stream channels and associated emergent wetlands adjacent to the channels. For the impact assessment, a linear distance is provided for temporary and permanent impacts to NHD flowlines, whereas an acreage is provided for impacts to NWI polygons.

A site reconnaissance visit was conducted October 13 and 14, 2022, and NWI and NHD features inconsistent with the desktop analysis were documented if observed while traveling publicly accessible roads. Based on the site visit, the desktop analysis overestimated water resources; several wetland polygons mapped by the NWI and NHD waterbodies appeared absent when viewed from publicly accessible roads. The extent of inaccuracy of the NWI data cannot be quantified using these methods. For this reason, the impact assessment relies on the desktop methods while recognizing estimated impacts are likely overestimated. The Water Resource Analysis Report is provided in Appendix I.

Wetland delineations were conducted in accordance with the U.S. Army Corps of Engineers (USACE) *Wetlands Delineation Manual* and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0)* (USACE 1987, 2010) methodologies from June 13–16, 2023, and June 19–22, 2023. Field wetland delineations focused on a survey area of ≈ 2,068 acres, covering the wind turbines, access roads, O&M building, and associated buffers rather than the entire proposed Project area. The objective of the wetland delineations was to identify and map the extent of potential USACE- or state-jurisdictional wetlands and waterways within the survey area. A certified wetland scientist identified probable locations of wetlands and other potential waters of the United States by reviewing desktop data and aerial photography. The pedestrian survey was completed to identify wetlands and water bodies and to record locations and boundaries via GPS.

Although the NWI and NHD features used in this section have not been field-verified and do not represent an official jurisdictional determination of waters of the United States, key infrastructure siting was informed by the results of the completed in-field wetland delineations. Additional delineation surveys will be conducted for the remaining infrastructure prior to construction. The completed and planned delineations will determine the location and extent of potential jurisdictional water features on site, allowing for a more refined quantification of water resources to inform siting decisions. Following finalization of the Project design, Philip Wind Partners would obtain required Clean Water Act permits.

The proposed Project area is ≈ 2,270 to 2,806 ft above mean sea level (USGS 2023c) in the following watersheds: Ash Creek (hydrologic unit code [HUC] 012011204), Bridger Creek (HUC 1012011205), Buzzard Creek-Bad River (HUC 1014010208), Grindstone Creek-Bad River (HUC 1014010206), Harding Creek-Cheyenne River (HUC 1012011206), North Fork Bad River (HUC 1014010204), and West Plum Creek (HUC 1012011208) (USGS 2023d). No Wild and Scenic Rivers are in the proposed Project area (National Wild and Scenic Rivers System 2023). No impaired waters listed under Clean Water Act Section 303(d) are in the proposed Project area (U.S. Environmental Protection Agency [EPA] 2015). According to the Federal Emergency Management Agency, a study to determine flood hazards has not been completed for Haakon County (Federal Emergency Management Agency 2021).

A desktop analysis of the watersheds in the proposed Project area was conducted to review the watersheds' existing NHD water features; the results are summarized below. In the proposed Project area, there are 1,190 NHD features (USGS 2023e). Stream/River Intermittent accounted for most of the NHD features. Table 3-7 and Figure 3-3 provide NHD features in the proposed Project area. Drainages occurring in the proposed Project area are tributaries to the Cheyenne and Bad Rivers.

Table 3-7. National Hydrography Dataset Features Mapped in the Proposed Project Area

Resource Type	Count	Length (miles)	Area (acres)
Stream/River Intermittent	556	325.1	N/A
Artificial Path	278	32	N/A
Lake/Pond	350	N/A	814
Stream/River Perennial	5	20.5	N/A
Swamp/Marsh	1	N/A	4
Total	**1,190**	**377.6**	**818**

Source: USGS (2023e).
Note: N/A = not applicable.

There are 1,691 NWI features in the proposed Project area (USFWS 2023a) (Table 3-8; see Figure 3-3). Freshwater emergent wetlands account for most of the NWI features.

Table 3-8. National Wetlands Inventory Features Mapped in the Proposed Project Area

Resource Type	Count	Area (acres)
Freshwater Emergent Wetland	480	751
Riverine	973	682
Freshwater Pond	224	333
Freshwater Forested/Shrub Wetland	14	34
Total	**1,691**	**1,800**

Source: USFWS (2023a).

The proposed Project area is located over the regional Northern Great Plains aquifer system (USGS 1996). In this aquifer system, water movement occurs from recharge areas at high elevations, down the dip of the aquifers, and then upward to discharge into shallower aquifers or discharge to the land surface. Recharge to this aquifer system is primarily from precipitation or snowmelt. Local recharge includes seepage of excess irrigation water. Discharge from this aquifer system is primarily from upward leakage of water into shallower aquifers where the hydraulic head in a shallower aquifer is < that of a deeper aquifer. Permeable rocks of this aquifer system were grouped into five major aquifers, including lower Tertiary, upper Cretaceous, lower Cretaceous, upper Paleozoic, and lower Paleozoic (USGS 1996).

A sole-source aquifer is defined by the EPA as an aquifer that supplies ≥ 50% of the drinking water for its service area (EPA 2023a). The proposed Project area lies outside of sole-source aquifers (EPA 2023b).

The SDDANR developed surface water quality standards for waters of the state based on beneficial uses assigned to each waterbody, as required by the Clean Water Act and the state's administrative rules. One surface water feature in the Project area, Kroetch Lake, has assigned beneficial uses (SDDANR 2023):

- (6) Warmwater marginal fish life propagation waters
- (8) Limited contact recreation waters
- (9) Fish and wildlife propagation recreation, and stock watering waters
- (10) Irrigation waters

Water quality standards for Kroetch Lake are based on these beneficial uses and consist of daily maximum total suspended solids of 263 mg/L and 30-day average total suspended solids of 150 mg/L.

3.3.2 Environmental Consequences: Proposed Action

3.3.2.1 Environmental Commitments

Philip Wind Partners has committed to implementing BMPs derived from the UGP PEIS (see Appendix O) and the Applicant's additional voluntary environmental protection measures in Table 2-3. These measures would reduce long-term erosion and runoff from disturbance areas, protecting water resources. Impact summaries below consider water-resources-specific BMPs (see Appendix O and Table 2-3):

- Reduce impacts to water resources to the extent practicable through Project layout and design.
- Use appropriate erosion and sediment and spill control measures.
- Remove temporary fills where aquatic features are crossed for construction, restoration, or preconstruction elevations and revegetation (where applicable for nonagricultural use).

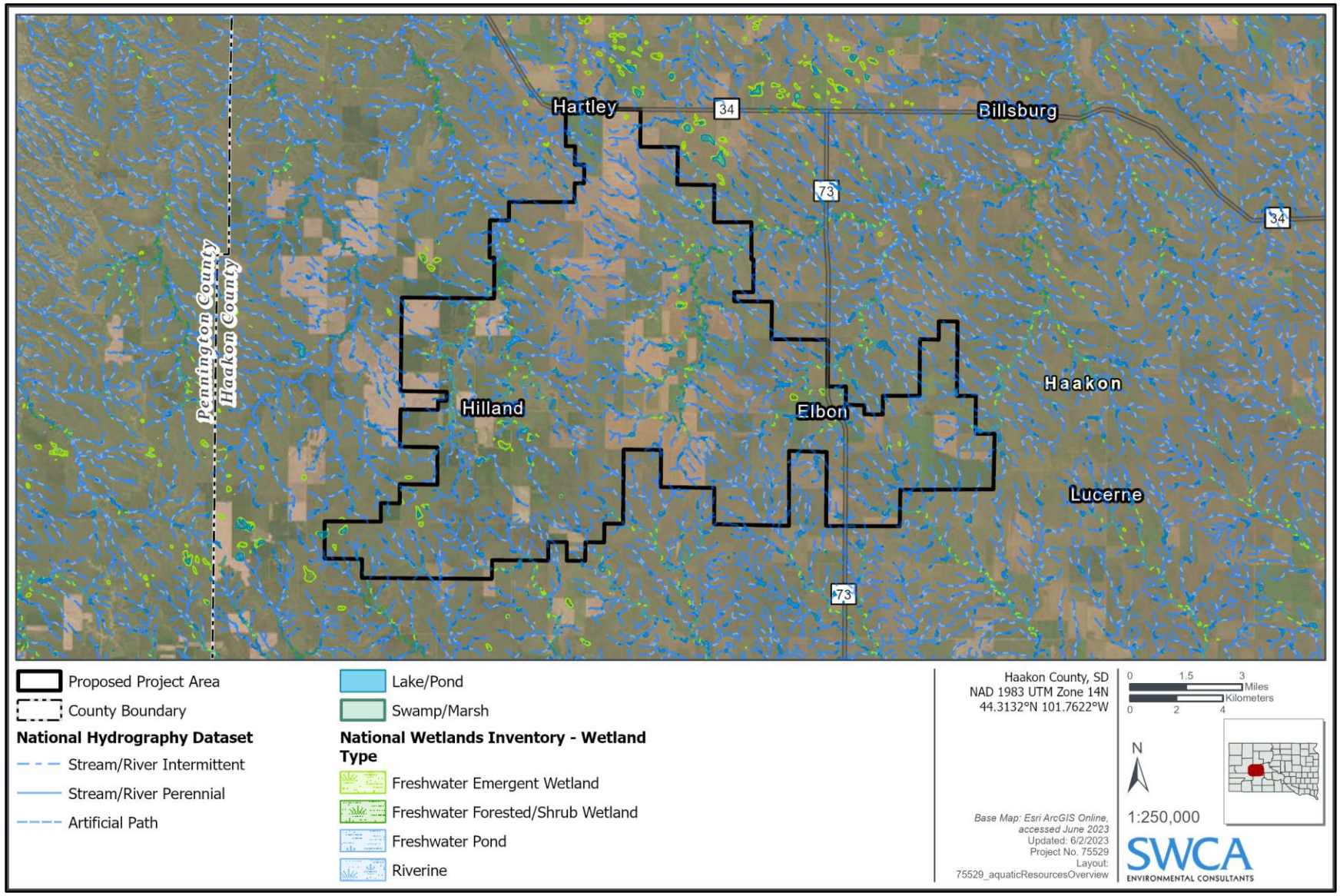

Figure 3-3. National Hydrography Dataset and National Wetlands Inventory features in the proposed Project area.

Note: Width of map symbols for aquatic features are expanded for visibility and are not to scale.

3.3.2.2 Switchyard

The Switchyard would be in upland areas with one waterbody (Kroetch Lake) ≈ 50 ft from its southwest corner. Because of the beneficial uses defined for Kroetch Lake by the SDDANR, Philip Wind Partners would use stormwater control measures to limit erosion and sediment transport from the Switchyard site to comply with water quality standards listed in Section 3.3.1. No temporary or permanent impacts to water resources are expected to occur with construction or operation of the Switchyard.

3.3.2.3 Wind Facility

Estimated impacts to the NHD and NWI features are summarized in Tables 3-9 and 3-10. The NHD and NWI databases track many of the same resources but classify and quantify them slightly differently. Therefore, the impacts, as presented in Tables 3-9 and 3-10, are largely redundant. The NHD data in Table 3-9 describes crossings of linear waterbodies as one-dimensional crossings with the length of the features expressed in ft. The NWI data in Table 3-10 describes impacts as two-dimensional construction footprints expressed in acres. Potential impacts to water resources are primarily temporary in nature and relate to construction of collection lines, use as crane paths, construction of t-lines, and access roads across streams (classified as riverine wetlands by NWI). For estimation of impacts, maximum widths were assumed for access and construction work areas (see Table 2-1), although smaller areas may be needed on-site.

The dispersed nature of turbines allows for strategic placement of turbines, access roads, collection lines, and other infrastructure to reduce impacts to water resources. Temporary and permanent impact assumptions represent an overestimation of impacts, as noted in Section 2.1. The proposed Project assumes multiple paths for collection to a turbine to maintain flexibility in siting, but not all collection paths would be built. Permanent impacts may result from access roads requiring stream crossings to access turbine locations.

Impacts to water resources defined through the NHD (i.e., streams or drainages) are listed in Table 3-9 where the number of impact sites identifies the count of water features intersected by Project facilities (i.e., one site is one stream crossing), the average length is the length of stream at each site that would be directly disturbed by the Project facility, and the total length of stream is the sum of the length of individual features impacted. Temporary impacts are estimated to occur at 220 NHD features, with a cumulative linear distance of 14,989 ft (≈ 2.8 miles) of the NHD flowlines affected. Permanent impacts may occur at 35 NHD features with a cumulative linear distance of 994 ft (≈ 0.2 mile) of the NHD flowlines.

Impacts to water resources defined through the NWI (i.e., wetlands) are listed in Table 3-10 where the number of impact sites identifies the count of water features intersected by Project facilities (one site is one wetland crossing), the average impact is the area of wetland at each site directly disturbed by the Project facility, and the total area of wetland is the sum of areas of individual features impacted. For NWI features, these estimates are temporary impacts at 198 individual resources with a cumulative area of 7 acres and permanent impacts at 32 individual resources with a cumulative area < 1 acre. While no direct impacts would occur in Kroetch Lake, because of the beneficial uses defined for Kroetch Lake by the SDDANR, special construction measures may be incorporated upslope of Kroetch Lake to maintain water quality standards listed in Section 3.3.1.

Table 3-9. Maximum Wind Facility Impacts to National Hydrography Dataset Features

Feature Type	Infrastructure	Temporary Impacts			Permanent Impacts		
		# of Sites	Average Stream Length (ft)	Total Stream Length (ft)	# of Sites	Average Stream Length (ft)	Total Stream Length (ft)
Stream/River	Access roads	35	38	1,341	35	28	994
	Basin Electric t-line	3	294	882	–	–	–
	Collection lines	124	54	6,756	–	–	–
	Crane paths	34	73	2,492	–	–	–
	T-lines	11	191	2,105	–	–	–
	Wind turbines	4	203	812	–	–	–
	WAPA tie-in lines	1	204	204	–	–	–
	MET towers	1	128	128	–	–	–
	ADLS towers	–	–	–	–	–	–
Artificial Flow Path	Access roads	7	38	269	–	–	–
Total		**220**	**N/A**	**14,989**	**35**	**N/A**	**994**

Note: N/A = not applicable.

Table 3-10. Maximum Wind Facility Impacts to National Wetlands Inventory Features

Feature Type	Infrastructure	Temporary Impacts			Permanent Impacts		
		# of Sites	Avg. Impact (acres)	Total Impact (acres)	# of Sites	Avg. Impact (acres)	Total Impact (acres)
Freshwater Emergent Wetland	Access roads	–	–	–	–	–	–
	Basin Electric t-line	2	< 1	< 1	–	–	–
	Collection lines	11	< 1	< 1	–	–	–
	Crane paths	–	–	–	–	–	–
	T-lines	2	< 1	< 1	–	–	–
	Wind turbines	–	–	–	–	–	–
	MET towers	–	–	–	–	–	–
	WAPA tie-in lines	–	–	–	–	–	–
	ADLS towers	–	–	–	–	–	–
Freshwater Forested/Shrub Wetland	Access roads	1	< 1	< 1	1	< 1	< 1
	Basin Electric t-line	–	–	–	–	–	–
	Collection lines	2	< 1	< 1	–	–	–
	Crane paths	–	–	–	–	–	–
	T-lines	1	< 1	< 1	–	–	–
	Wind turbines	–	–	–	–	–	–
	MET towers	–	–	–	–	–	–
	WAPA tie-in lines	–	–	–	–	–	–
	ADLS towers	–	–	–	–	–	–

Feature Type	Infrastructure	Temporary Impacts			Permanent Impacts		
		# of Sites	Avg. Impact (acres)	Total Impact (acres)	# of Sites	Avg. Impact (acres)	Total Impact (acres)
Riverine	Access roads	32	< 1	< 1	31	< 1	< 1
	Basin Electric t-line	1	< 1	< 1	–	–	–
	Collection lines	99	< 1	3	–	–	–
	Crane paths	32	< 1	1	–	–	–
	T-lines	7	< 1	< 1	–	–	–
	Wind turbines	6	< 1	< 1	–	–	–
	MET towers	1	<1	<1	–	–	–
	WAPA tie-in lines	–	–	–	–	–	–
	ADLS towers	–	–	–	–	–	–
Freshwater Pond	Access roads	–	–	–	–	–	–
	Basin Electric t-line	–	–	–	–	–	–
	Collection lines	1	< 1	< 1	–	–	–
	Crane paths	–	–	–	–	–	–
	T-lines	–	–	–	–	–	–
	Wind turbines	–	–	–	–	–	–
	MET towers	–	–	–	–	–	–
	WAPA tie-in lines	–	–	–	–	–	–
	ADLS towers	–	–	–	–	–	–
Total		**198**	**N/A**	**7**	**32**	**N/A**	**< 1**

Note: N/A = not applicable.

Where streams are crossed for access roads, a wider access road width is assumed for construction (40 ft on average) than for permanent operation (16 ft on average), consistent with Table 2-1. Whether water resources are defined by the NHD or NWI databases, permanent impacts represent < 5% of the stream length or wetland area of temporary impacts (i.e., 95% of temporary impacts would be reclaimed).

Although a wetland delineation was conducted in June 2023 as discussed in Section 3.3.1, the NWI and NHD features used in this section have not been field-verified and do not represent an official jurisdictional determination of waters of the United States. Additional in-field water resources delineation surveys, however, will be conducted with the methodologies provided in Section 3.3.1 to determine precise locations of potential waters of the United States, which will be used to determine the final temporary and permanent impacts. Following finalization of the Project design, Philip Wind Partners would obtain required Clean Water Act permits.

No impacts to the Northern Great Plains aquifer system are projected. If dewatering were required for construction of turbine foundations, the dewatering would be temporary and of limited spatial extent. Post-construction groundwater levels would be anticipated to return to preconstruction conditions.

Decommissioning impacts would be the same or fewer than those described for construction. Temporary impacts would occur while streams and wetlands are crossed for deconstruction and removal of infrastructure; however, decommissioning would not use large cranes for disassembly, and therefore

would not require the disturbance of crane paths. Permanently impacted land would be restored to pre-Wind Facility land use.

Philip Wind Partners would minimize ground disturbance and control stormwater through runoff, erosion, and sediment control measures. Average disturbance at wetlands and waterbodies would be < 0.1 acre during construction at 220 crossings according to the NHD and 198 crossings according to the NWI; all but 35 streams (NHD) or 31 riverine (drainage channel crossings) and one wetland crossing (NWI) would be returned to preconstruction conditions after completion of construction. Permanent impacts to water resources that may occur are crossings of streams for access roads, which would be < 1 acre total. As a result, impacts to hydrologic setting and water resources would be negligible.

3.3.2.4 Hydrologic Setting and Water Resources Conclusion

Of the 378 miles of waterways in the proposed Project area, ≤ 0.2 mile would be permanently impacted, and ≤ 2.8 miles would be temporarily impacted. Of the 1,800 acres of wetlands in the proposed Project area, < 1 acre would be permanently impacted, and ≤ 7 acres would be temporarily impacted by the proposed Project. These impacts would be dispersed throughout the proposed Project area. The Project committed to BMPs including use of erosion and sediment controls and restoring areas impacted temporarily during construction. Impacts to water features under the jurisdiction of the state or USACE would be permitted as required. The proposed Project's impacts to the hydrologic setting and water resources would be negligible and considered less than significant.

3.3.3 Environmental Consequences: No Action Alternative

The No Action Alternative would have no direct or indirect impacts to hydrology or water resources and existing activities would continue.

3.4 AIR QUALITY

3.4.1 Existing Conditions

The Clean Air Act requires the EPA to set National Ambient Air Quality Standards for six criteria air pollutants: carbon monoxide, lead, ground-level ozone, nitrogen dioxide, particulate matter (PM), and sulfur dioxide (EPA 2022a). Volatile organic compounds (VOCs) are also regulated by the EPA due to their ability to participate in photochemical reactions that form ozone, and VOCs are often components of petroleum fuels, hydraulic fluids, paint thinners, and dry-cleaning agents.

The EPA tracks emissions of greenhouse gases (GHGs). GHGs are gases that trap heat in the atmosphere and include carbon dioxide (CO_2), methane, nitrous oxide, and fluorinated gases. In 2020, CO_2 made up most GHGs at 79% (EPA 2022b). GHGs enter the atmosphere through burning fossil fuels, solid waste, trees, and other biological material. GHGs also are released through production and transport of coal, natural gas, and oil, and from livestock and other agricultural uses (EPA 2022b).

Hazardous air pollutants (HAPs) are monitored by the EPA and are known to cause cancer and damage immune systems, among other serious health problems (EPA 2023c). The Clean Air Act requires the EPA to regulate 188 toxic air pollutants, including those that can deposit from the air into soils or surface waters (EPA 2023c).

Primary emission sources close to the proposed Project area are agriculture equipment and emissions from vehicles driving on South Dakota Highway 73. The nearest ambient air quality monitoring site is the Badlands of South Dakota, 45 miles southwest of the proposed Project area. At this site, PM, sulfur

dioxide, nitrogen dioxide, and ozone levels are tested. The Badlands site monitors daily levels of PM with a diameter of 10 microns or less (PM_{10}), PM with a diameter of 2.5 microns or less ($PM_{2.5}$), sulfur dioxide, nitrogen dioxide, and ozone (SDDANR 2020). According to the *South Dakota Ambient Air Monitoring Network 5-Year Assessment of Air Monitoring Sites*, the trend for PM_{10} annual average shows decreasing concentrations, and the trend for $PM_{2.5}$ shows slightly increasing concentrations. $PM_{2.5}$ usually comes from fuel combustion and burning activities (SDDANR 2020). PM_{10} usually comes from roads, construction projects, and farm tillage. For sulfur dioxide, the trend for the yearly 99th percentile, 1-hour concentrations during the 5 years (2014–2019) shows increasing concentrations (SDDANR 2020). The trend for nitrogen dioxides average annual concentrations has been steady. Lastly, the trend for ozone 8-hour daily maximum concentrations during the 5-year segment shows slightly increasing levels.

The air quality analysis below was conducted for the Project using the EPA's Motor Vehicle Emission Simulator model (MOVES3). The MOVES3 model is a state-of-the-science emission modeling system estimating emissions for mobile sources at the national, county, and project level for criteria air pollutants, GHGs, and air toxics (EPA 2022c). For this Project, primary GHGs of concern are CO_2, methane, nitrogen dioxide, and sulfur hexafluoride.

Emissions of CO_2 lead to long-lasting increases in atmospheric concentrations, persisting for thousands of years, whereas methane typically remains in the atmosphere for ≈ 20 years, and nitrous oxide for ≈ 100 years (EPA 2023d). The results of the GHG emissions from the Project are displayed in a 20-year and 100-year timeframe because the global warming potential of CO_2, methane, and nitrogen dioxide changes over time. Emissions were separated into three time periods: direct emissions associated with Project construction, assumed to occur in 2025; direct emissions associated with Project O&M, assumed to occur from 2026–2055; and direct emissions associated with Project decommissioning, assumed to occur in 2056.

3.4.2 Environmental Consequences: Proposed Action

3.4.2.1 Environmental Commitments

Philip Wind Partners has committed to implementing BMPs derived from the UGP PEIS (see Appendix O). Impact summaries below consider air-quality-specific BMPs (see Appendix O):

- Use surface access roads, on-site roads, and parking lots with aggregates or that maintain compacted soil conditions to reduce dust generation.
- Water unpaved roads, disturbed areas (e.g., scraping, excavation, backfilling, grading, and compacting), and loose materials impacted by Project activities to reduce fugitive dust generation.
- Install wind fences around disturbed areas if windborne dust is likely to impact sensitive areas beyond site boundaries (e.g., nearby residences).

3.4.2.2 Switchyard

Table 3-11 represents typical equipment used for the Switchyard construction period. These estimates are conservative (more equipment than anticipated) based on construction of wind projects of equal size. Associated air quality impacts were analyzed with the Wind Facility in Section 3.4.2.3.

Table 3-11. Switchyard Construction Equipment List

Type of Equipment	# of Units
Bulldozer	1
Compactor	1
Concrete truck	2
Crane	1
Excavator	1
Grader	1
Haul truck	1
Passenger truck (workers commuting)	10
Semi delivery truck	2
Telehandler	1

Air quality may temporarily be impacted by construction of the Switchyard through fugitive dust created from soil disturbances and engine exhaust from vehicles and equipment. Fugitive dust, measured in the form of PM_{10}, from increased vehicle traffic on dirt roads has a higher impact to ambient air quality than machinery engine exhaust, which is measured as $PM_{2.5}$.

The operation period of the Switchyard would not directly result in air emissions. Operation associated with the t-line would produce very small amounts of VOCs and HAPs during inspection and maintenance. During operation, emissions would include fugitive dust and engine exhaust from vehicles during regular Switchyard site inspections, infrequent maintenance activities, and wind erosion from access roads. Negligible VOC emissions may be released during routine maintenance activities such as applying lubricants, cooling fluids, and greases, which are used in the wind turbines. Combustion-related emissions may be released when using diesel emergency generators during routine preventative maintenance. Emissions from dust, vehicles exhaust, and combustion-related emissions would not exceed air quality standards (WAPA and USFWS 2015).

Decommissioning activities, including dismantling the Switchyard and associated structures, would mimic construction activities, but would be on a smaller scale and for shorter duration. Potential emissions impacting ambient air quality would be temporary, minor, and less than for construction, and the same mitigation measures would be applied during decommissioning.

3.4.2.3 Wind Facility

Table 3-12 contains typical construction equipment used for the Wind Facility. These estimates are conservative (more equipment than anticipated) based on construction of wind projects of this size.

Table 3-12. Wind Facility Construction Equipment List

Type of Equipment	# of Units
Belt truck	2
Boring drill	2
Bucket truck	5–6
Bulldozer	8

Type of Equipment	# of Units
Cable truck/trailer	2
Compactor	8
Concrete truck	10–30
Crane	9–12
Dump truck	8
Excavator	8
Generator	5
Grader	3
Haul truck	5
Heavy haul truck	10
Boom lift	3–6
Passenger truck (workers commuting)	40
Semi delivery truck	20
Street sweeper	1
Telehandler	12–15
Trencher	2
Water truck	3

Estimated emissions emitted from Project construction was calculated using the MOVES3 tool and the equipment information in Table 3-11 and Table 3-12. During a 20-year period ≈ 23,883 mt of CO_2 equivalent (CO_2e mt) would be emitted, and ≈ 23,845 CO_2e mt during a 100-year period. As mentioned in Section 3.4.1, methane emissions in the atmosphere degrade over time (approximately 20 years), so emissions in the 100-year period are typically lower than those in the 20-year period.

Project construction may release air emissions of criteria pollutants, VOCs, GHGs, CO_2, and small amounts of HAPs. Because the proposed Project area is in a rural area, nearby residences would be temporarily exposed to pollutants; however, impacts to air concentration levels would be negligible. Air quality may temporarily be impacted by O&M of the Wind Facility through fugitive dust from soil disturbances due to wind erosion and from engine exhaust due to routine maintenance. Increased levels of $PM_{2.5}$ may occur from burning fuel emitted by vehicles. Table 3-13 represents the off-road equipment that would be used during Project operation.

Table 3-13. Project Operation Equipment List

Type of Equipment	# of Units
Crane	1
Generator	5
Helicopter	1
Passenger truck (workers commuting)	10
Utility truck	5

The estimated annual emissions emitted from the operation of the Project is 275 CO_2e mt. If the Project operates for 30 years, ≈ 8,250 total CO_2e mt would be omitted by O&M activities.

During operation, fugitive dust from increased vehicle traffic on dirt roads would have a higher impact to ambient air quality than fugitive dust from vehicle or machinery engine exhaust. Additional emissions would include 1) negligible VOC emissions during routine O&M activities such as applying lubricants, cooling fluids, and greases, and 2) a small amount of combustion-related emissions using diesel emergency generators during routine preventative maintenance. Collectively, emissions from dust, vehicles exhaust, and combustion-related emissions would not exceed air quality standards (WAPA and USFWS 2015).

Table 3-14 represents the type of equipment to be expected during Project decommissioning.

Table 3-14. Project Decommissioning Equipment List

Type of Equipment	# of Units
Bulldozer	6
Compaction equipment	4
Crawler crane	1
Dump truck	5
Grader	5
Loader/backhoe	5
Boom lift	2
Passenger truck (workers commuting)	10
Rough terrain crane	4
Utility truck	7
Wire puller	2

Decommissioning activities would include dismantling the wind turbines and would mimic construction activities. During decommissioning, ≈ 10,874 CO_2e mt would be emitted over a 20-year period, and ≈ 10,860 CO_2e mt over a 100-year period. The decommissioning period is shorter and on a smaller scale than the construction period; therefore, emission impacts are 46% less than the construction period (EPA 2022c). Emissions impacting ambient air quality would be minor, temporary, and have less impact than for construction, and the same mitigation measures would be applied during the decommissioning period.

3.4.2.4 Air Quality Conclusion

Gross lifetime emissions for the construction, O&M, and decommissioning of the Project would result in reduction in CO_2 because of the Project. The proposed Project's impacts to air quality would be less than significant.

3.4.3 Environmental Consequences: No Action Alternative

Under the No Action Alternative, the Project would not be developed, existing activities and impacts to air quality would continue, and GHG emissions offsets gained from the Project would not be realized.

3.5 NOISE

3.5.1 Existing Conditions

Section 4.5 – Acoustic Environment of the UGP PEIS discusses the existing acoustic environment in the UGP Region and describes sound pressure level as a logarithmic ratio of the measured value to a reference level or "decibel" (dB). The UGP PEIS notes audible sounds ranges from 0 dB ("threshold of hearing") to ≈ 140 dB ("threshold of pain"). The UGP Region noise level estimates are relatively low due to the proposed Project area's in a rural and underdeveloped setting, with levels ranging from 33 to 47 A-weighted dB (dBA) (Section 4.5.1.5 – Background Noise Levels in the UGP Region of the UGP PEIS).

The proposed Project area is in rural Haakon County and consists of cropland, pastureland, grasslands, and scattered rural residences. This area is a windy region, and wind is a natural contributor to noise in the area. Other contributing factors to noise in the proposed Project area include farming activities and vehicle traffic. There are no noise-related federal, county, or local regulations applicable to the Project.

A preconstruction wind turbine noise analysis, which analyzed noise associated with the proposed Project, was conducted in April 2023 (see Appendix A for the Preconstruction Wind Turbine Noise Analysis report). The analysis found other projects have used county limits of 45 dBA at nonparticipating residences and local limits of 50 dBA. The range of 45 to 50 dBA is consistent with limits applied to wind turbine projects nationally. The proposed Project has been designed to meet the goal of a 48-dBA limit.

3.5.2 Environmental Consequences: Proposed Action

3.5.2.1 Environmental Commitments

Philip Wind Partners has committed to implementing BMPs derived from the UGP PEIS (see Appendix O) and the Applicant's additional voluntary environmental protection measures in Table 2-3. The impact summaries below consider the noise-specific BMPs, including the following (see Appendix O and Table 2-3):

- Establish suitable setback distances from sensitive receptors where practicable. Noise complaints rarely exist for people living > 1–1.5 miles from wind farms (Stewart 2006).
- Schedule noisy activities to occur at the same time when practicable, as additional sources of noise generally do not greatly increase noise levels at site boundaries.

3.5.2.2 Switchyard

Construction of the Switchyard is anticipated to take ≤ 1 year to complete. Section 5.5.1.2 – Noise Impacts of the UGP PEIS indicates combined noise level for typical construction equipment likely used at a wind turbine project site is ≈ 90 dBA at 50 ft, and noise level at ≈ 0.75 mile is ≈ 40 dBA, which would be typical of the daytime rural background level. The nearest noise receptor to the Switchyard is a nonparticipating residence, which is ≈ 0.5 mile away. Noise levels associated with the construction of the Switchyard would be temporary in nature and would occur during the daytime when background noises tend to be higher.

The Switchyard would temporarily impact noise in a small portion of the proposed Project area. Noise generated during construction of the Switchyard in the proposed Project area would return to preconstruction noise levels, except for occasional sources of sound due to regular Switchyard site

inspections and infrequent vehicle visits for routine maintenance. Noise impacts from the construction and O&M of the Switchyard would be minor.

Decommissioning noise impacts are anticipated to be ≤ those described for construction. Temporary noise impacts would occur while deconstruction and removal of infrastructure are in progress.

3.5.2.3 Wind Facility

Construction of the Wind Facility is anticipated to take ≤ 2 years to complete. During construction, noise levels would increase temporarily in the proposed Project area due to the use of construction equipment. Noise generated by construction equipment would vary depending on the type of work being conducted. Section 5.5.1.2 – Noise Impacts of the UGP PEIS indicates combined noise level for typical construction equipment likely used at a wind turbine project site is ≈ 90 dBA at 50 ft, and noise level at ≈ 0.75 mile is ≈ 40 dBA, which would be typical of the daytime rural background level.

Construction of wind turbines at one location would occur for a few days before moving to other wind turbine locations. Construction sound would vary throughout the overall proposed Project area. Construction would mostly occur during the day when background noises tend to be higher. It is possible some construction activities would carry through the night, but such activities would be infrequent and dependent on weather and timing of a concrete pour, which must be continuous.

During O&M of the Wind Facility, the wind turbines and substation would be a permanent source of sound, whereas the 230-kV gen-tie line would be representative of noise typical of background sound levels in a rural environment. The Preconstruction Wind Turbine Noise Analysis predicts noise levels for the full, continuous, and normal operation of the proposed facility at 24 nonparticipating and 13 participating residences near the Wind Facility (see Table 5-1 in Appendix A) using the loudest turbine model under consideration, the Vestas V163-4.5 with standard blades. The analysis found the highest predicted noise level at a nonparticipating residence is 44.7 dBA, which is < the 48-dBA noise level goal. Predicted noise levels at participating residences may be ≤ 48 dBA if Philip Wind Partners uses the loudest turbine model under consideration. To provide a visual demonstration of compliance, the predicted noise levels are shown in the form of noise level contours for the loudest turbine model in Figures 5-1 to 5-3 of Appendix A.

Noise levels reported in the noise analysis are the highest turbine noise levels expected because they represent the case where all turbines are operating at full capacity; lower noise levels are expected when turbines are not producing full acoustic output due to low winds or when atmospheric conditions are not being conducive to sound propagation, as assumed by the acoustic models (see Appendix A).

Underground collection lines would not be a permanent source of sound, whereas the O&M facility would be an occasional source of sound due to O&M of the diesel generator and vehicles/equipment.

The Wind Facility would temporarily and permanently impact noise levels in the proposed Project area. Increased noise levels in the proposed Project area from construction would be transient across the proposed Project area as construction progressed and would be temporary. Noise levels during O&M of the wind turbines would remain below 48 dBA, which is in the range of a rural and underdeveloped area as described in Section 3.5.1. Impacts to noise in the proposed Project area would be negligible to minor.

Decommissioning noise impacts are anticipated to be the same or less than those described for construction. Temporary noise impacts would occur while deconstruction and removal of infrastructure are in progress.

3.5.2.4 Noise Conclusion

The UGP PEIS states that background noise levels in rural and undeveloped areas in the UGP Region range from 33–47 dBA (see Section 4.5.1.5 – Background Noise Levels in the UGP Region of the UGP PEIS). Haakon County is a rural area presumed to fall in that range.

The Project initially projected a maximum operational noise level of 48 dBA, which assumed all proposed 95 turbines were operating simultaneously (see Appendix A). Philip Wind Partners has since reduced the number of proposed wind turbines to 90. This adjustment reduces the maximum operational noise level below the initially projected 48 dBA. The original analysis showed only a 1-dB difference between background noise and maximum O&M noise levels, a difference deemed negligible and "not perceptible" according to Section 4.5.1.1 – Fundamentals of Acoustics of the UGP PEIS. The reduction in turbines further reduced potential noise impacts. Due to the Project's reduced number of turbines and the initial noise analysis consistent with the analysis in the UGP PEIS, the proposed Project's impacts would not result in new or more severe significant impacts than described in the UGP PEIS.

The UGP PEIS states that most construction equipment would have noise levels ranging from 75–90 dBA and combined noise levels for typical construction equipment are ≈ 90 dBA at 50 ft (Section 5.5.1.2 – Construction of the UGP PEIS). Because this Project has noise levels from construction equipment ≤ 90 dBA, it fits in the UGP PEIS's anticipated range. The UGP PEIS states that construction noise levels at 0.75 mile would be ≈ 40 dBA; typical of daytime rural background levels (Section 5.5.1.2 of the UGP PEIS). Even if there are sensitive receptors, the UGP PEIS provides BMPs and mitigation measures applicable to this issue (e.g., limiting construction activities to times when nearby sensitive receptors are least likely to be disturbed [Section 5.5.2 – BMPs and Mitigation Measures of the UGP PEIS]). The proposed Project's impacts to noise during construction are consistent with the analysis in the UGP PEIS and would not result in new or more severe significant impacts than described in the UGP PEIS.

3.5.3 Environmental Consequences: No Action Alternative

The No Action Alternative would have no direct or indirect impacts to noise, and existing activities would continue.

3.6 VEGETATION

3.6.1 Existing Conditions

The dominant vegetation type in the proposed Project area is Northwestern Great Plains Mixedgrass Prairie, a vegetation type common to the region and makes up 25,856 acres of the proposed Project area (LANDFIRE 2023) (Table 3-15). This system is one of the most disturbed grassland systems in South Dakota (LANDFIRE 2023). The Western Cool Temperate Wheat and Western Cool Temperate Row Crop vegetation types make up 22,951 combined acres of the proposed Project area. Sections of wetlands, deciduous forests, and shrublands are very limited around the proposed Project area (Figure 3-4; see Figure 3-1). The vegetation data differ from the land use/land cover data in Section 3.1 because results were derived from two databases using different methods and classification systems. The LANDFIRE database used for vegetation in this section represents a more detailed and nuanced classification of land cover than the NLCD used in the previous section. The dominant land cover types of Section 3.1 are herbaceous and agricultural, but those categories are split into ≥ a dozen subtypes (i.e., vegetation types) in Table 3-15. For purposes of a coarse description of land use, the NLCD is appropriate. For a detailed description and impact analysis of vegetation, the LANDFIRE database is a better data source.

Table 3-15. Vegetation Types in the Proposed Project Area

LANDFIRE Database Vegetation Type	Acres	% of Proposed Project Area
Northwestern Great Plains Mixedgrass Prairie	25,856	38%
Western Cool Temperate Row Crop	13,436	20%
Western Cool Temperate Wheat	9,515	14%
Western Cool Temperate Pasture and Hayland	5,246	8%
Western Cool Temperate Fallow/Idle Cropland	3,042	5%
Western Cool Temperate Row Crop – Close Grown Crop	2,750	4%
Western Cool Temperate Close Grown Crop	2,359	4%
Northwestern Great Plains Riparian Herbaceous	2,320	3%
Northern and Central Plains Ruderal and Planted Grassland	1,411	2%
Developed-Roads	851	1%
Western Cool Temperate Urban Herbaceous	688	1%
Open Water	537	< 1%
Western Great Plains Closed Depression Wetland	147	< 1%
Western Cool Temperate Urban Shrubland	75	< 1%
Western Cool Temperate Developed Herbaceous	21	< 1%
Developed-Low Intensity	16	< 1%
Western Great Plains Tallgrass Prairie	10	< 1%
Great Plains Wooded Draw and Ravine Woodland	7	< 1%
Northwestern Great Plains Shrubland	7	< 1%
Western Cool Temperate Urban Deciduous Forest	7	< 1%
Developed-Medium Intensity	6	< 1%
Northwestern Great Plains Riparian Forest	3	< 1%
Western Cool Temperate Urban Mixed Forest	3	< 1%
Western Great Plains Badlands	2	< 1%
Northern and Central Plains Ruderal and Planted Shrubland	1	< 1%
Northwestern Great Plains Riparian Shrubland	1	< 1%
Western Cool Temperate Urban Evergreen Forest	1	< 1%
Developed-High Intensity	< 1	< 1%
Northwestern Great Plains-Black Hills Ponderosa Pine Woodland & Savanna	< 1	< 1%
Western Great Plains Open Freshwater Depression Wetland	< 1	< 1%
Total	**68,318**	**100%**

Source: LANDFIRE (2023).
Note: Sums of values may not add to total value shown, due to rounding.

3.6.1.1 Grasslands

A grassland habitat assessment was conducted in and around the proposed Project area to identify parcels of grassland and to identify sod types as unbroken or broken. Undisturbed grassland was defined as grassland (e.g., Northwestern Great Plains Mixedgrass Prairie) that has not been cultivated or mechanically disrupted for agriculture or other uses (Bauman et al. 2013) later defined as unbroken

grassland (Bauman 2021) and is more likely to represent native prairie habitat. The assessment started with a desktop analysis of the proposed Project area using available databases and aerial imagery before culminating in field surveys. Imagery was derived from the USDA (2023), and existing land cover data pulled from the NLCD (USGS 2019) and the USDA National Agricultural Statistics Service (2021) (see Appendix H). Surveys were done on the ground by a biologist who visually assessed the appearance of grassland to identify portions of broken sod. Via desktop analysis, 27,678 acres were grassland habitat (see Appendix H). Of the grassland habitat, 12,192 acres were broken grassland, and 14,915 acres were unbroken grassland. The remaining 571 acres were not surveyed due to access issues. The Grassland Habitat Assessment report in Appendix H provides details about methods and the cumulative area.

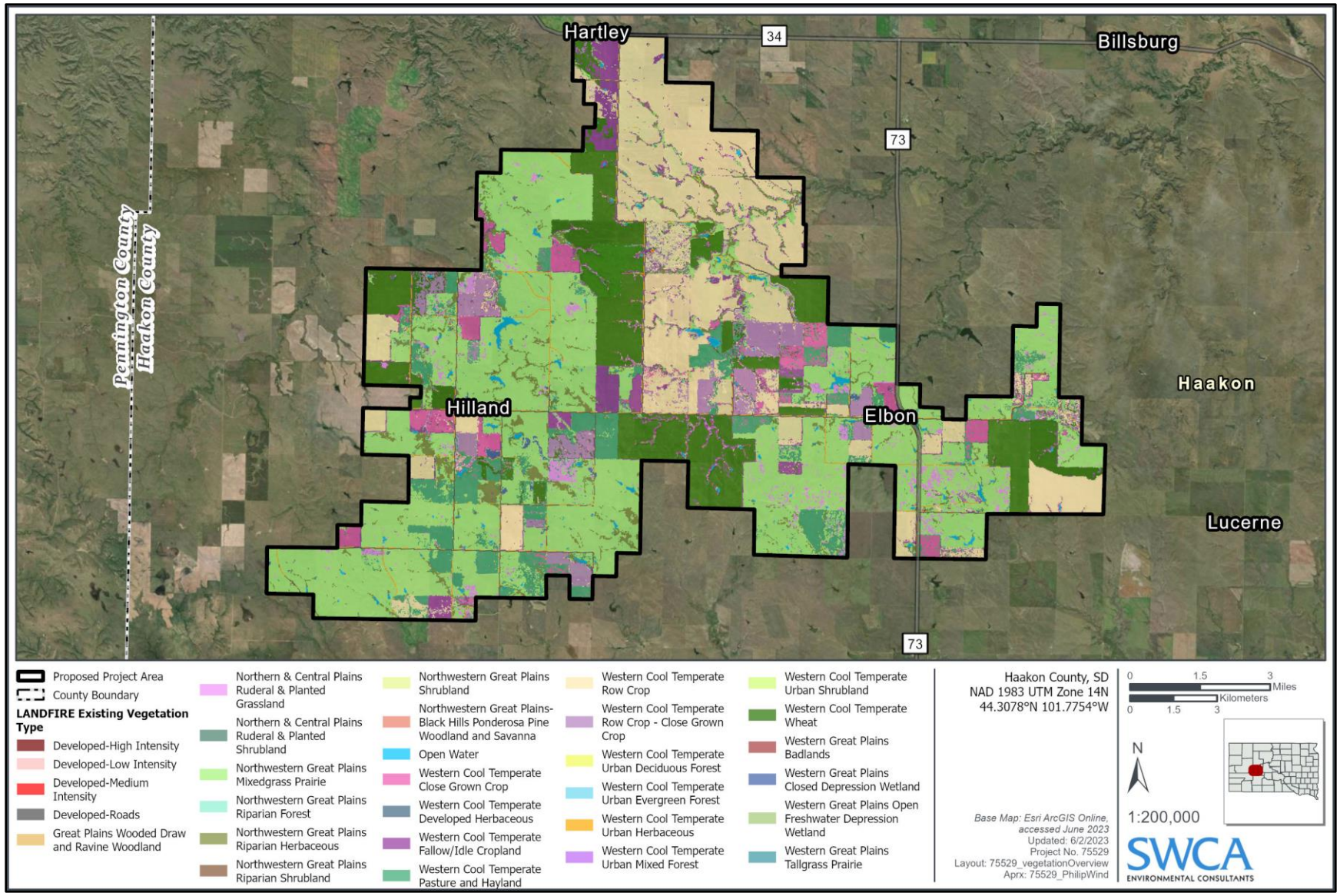

Figure 3-4. Vegetation types in the proposed Project area.

3.6.1.2 Noxious Weeds

According to the SDDANR, two state-listed and one locally recognized noxious weed species occur in Haakon County (Table 3-16).

Table 3-16. State and Local Noxious Weeds of South Dakota

State Noxious Weeds	County Noxious Weeds
Canada thistle (*Cirsium arvense*)	Common mullein (*Verbascum thapsus*)
Hoary cress (*Lepidium draba*)	–

Sources: SDDANR (2017a, 2017b).

3.6.2 Environmental Consequences: Proposed Action

3.6.2.1 Environmental Commitments

Philip Wind Partners has committed to implementing BMPs derived from the UGP PEIS (see Appendix O) and the Applicant's additional voluntary environmental protection measures in Table 2-3. These measures would reduce the spread of noxious weeds and minimize disturbance area to vegetation, thereby protecting vegetation resources. The impact summaries below consider the vegetation-specific BMPs (see Appendix O and Table 2-3):

- Reduce impacts to native vegetation to the extent practicable through Project layout and design.
- Use appropriate erosion, sediment, spill control, and equipment cleaning measures.
- Revegetate areas of temporary construction impacts to pre-Project conditions.

3.6.2.2 Switchyard

The main impacts to vegetation from the Switchyard would be the temporary loss of vegetation in construction access areas, laydown yards, and work areas and the permanent loss of existing vegetation and broken grasslands where new facilities are constructed. Movement of construction equipment and soil disturbance creates potential for exotic, weedy, invasive species to establish, including noxious weeds.

In accordance with LANDFIRE classifications, construction of the Switchyard would temporarily impact ≈ 2 acres of vegetation, including ≈ 1 acre of Northwestern Great Plains Mixedgrass Prairie, < 1 acre of Western Cool Temperate Pasture and Hayland, and < 1 acre of Western Cool Temperate Urban Shrubland. Broken grasslands make up ≈ 1 of these acres; no unbroken grasslands would be affected.

The Switchyard would permanently impact ≈ 5 acres of vegetation, including ≈ 4 acres of Northwestern Great Plains Mixedgrass Prairie, < ½ acre of Western Cool Temperate Pasture and Hayland, and < ½ acre of Western Cool Temperate Urban Shrubland. Broken grasslands make up ≈ 4 of these 5 acres. Impacts to vegetation from the construction and O&M of the Switchyard would be minor.

3.6.2.3 Wind Facility

Impacts to vegetation from the Wind Facility would be the same as those described for the Switchyard. Assuming construction of 90 turbines, ≤ 1,245 acres of vegetation would be temporarily disturbed by the construction of the Wind Facility. The largest affected vegetation type would be cropland (including Western Cool Temperate close grown crop, fallow/idle cropland, row crop, and row crop-close grown

crop), accounting for 681 acres of temporary disturbance. The Western Cool Temperate Wheat vegetation type accounts for 202 acres of temporary disturbance.

The largest vegetation disturbance would come from construction of underground collection lines, estimated at ≤ 415 acres of vegetation (< 1 acre would be permanently disturbed). The Wind Facility turbine areas would disturb ≤ 310 acres of vegetation (296 acres would be temporarily disturbed and would be reclaimed after construction, leaving 14 acres of permanent disturbance). Isolated trees may need to be cleared as part of the temporary construction impacts. None of the temporary construction impacts overlap forest classifications (Table 3-17). Remaining Wind Facility components, including the O&M building, gen-tie line, t-lines, MET and ADLS towers, laydown yards, crane paths, substation, and access roads, would disturb ≤ 632 acres of vegetation (534 acres would be temporarily disturbed and would be reclaimed after construction, leaving 98 acres of permanent disturbance). Temporary vegetation disturbance would total 1,245 acres (see Table 3-17) and permanent disturbance would total 112 acres.

No turbines would be constructed on unbroken grassland. Of the 27,678 acres categorized as grassland in the proposed Project area, the Wind Facility construction disturbance would temporarily impact ≤ 41 acres of unbroken grassland and 160 acres of broken grasslands. Areas where access roads and aboveground junction boxes would be sited would result in ≤ 3 acres of permanent disturbance to unbroken grasslands. Areas where access roads, aboveground junction boxes, transmission towers, substation, and turbines would be sited would result in permanent impacts to 7 acres of broken grasslands.

Invasive and noxious weeds may be spread by construction activities. Groundbreaking activities, erosion, and sedimentation may create pathways for invasive weed establishment. Noxious weeds may travel throughout the proposed Project area on vehicles, construction equipment, or workers clothing. The proposed Project area is especially susceptible to 1) grass-like invasives because their life strategy is like that of native vegetation and 2) woody trees and shrubs, which outcompete native species and change the structure of the ecosystem (Gaskin et al. 2021).

The Wind Facility would temporarily and permanently impact 1,245 and 112 acres of vegetation resources respectively. Areas temporarily impacted during construction and not needed for O&M would be returned to pre-Wind Facility land use through revegetation. Impacts to vegetation from construction and O&M of the Wind Facility would be minor.

Decommissioning impacts would be ≤ those described for construction. Temporary impacts would occur while grasslands and other nonagricultural plant communities are crossed for deconstruction and removal of infrastructure. Permanently impacted land would be restored to pre-Wind Facility land uses.

Table 3-17. Vegetation Disturbance from the Wind Facility

LANDFIRE Classification	Permanent Disturbance Area (acres)	Temporary Disturbance Area (acres)	% of Permanent Disturbance Area	% of Temporary Disturbance Area
Northwestern Great Plains Mixedgrass Prairie	9	186	8%	15%
Western Cool Temperate Row Crop	49	518	44%	42%
Western Cool Temperate Wheat	26	202	23%	16%
Western Cool Temperate Pasture and Hayland	10	127	9%	10%
Western Cool Temperate Fallow/Idle Cropland	5	59	5%	5%
Western Cool Temperate Row Crop – Close Grown Crop	5	64	5%	5%
Western Cool Temperate Close Grown Crop	2	40	2%	3%

LANDFIRE Classification	Permanent Disturbance Area (acres)	Temporary Disturbance Area (acres)	% of Permanent Disturbance Area	% of Temporary Disturbance Area
Northwestern Great Plains Riparian Herbaceous	0	10	0%	< 1%
Northern and Central Plains Ruderal and Planted Grassland	<1	10	< 1%	< 1%
Developed-Roads	<1	16	< 1%	1%
Western Cool Temperate Urban Herbaceous	3	11	3%	< 1%
Open Water	0	0	0%	0%
Western Great Plains Closed Depression Wetland	<1	2	< 1%	< 1%
Western Cool Temperate Urban Shrubland	1	1	< 1%	< 1%
Western Cool Temperate Developed Herbaceous	< 1	<1	< 1%	< 1%
Developed-Low Intensity	0	0	0%	0%
Western Great Plains Tallgrass Prairie	0	0	0%	0%
Great Plains Wooded Draw and Ravine Woodland	0	0	0%	0%
Northwestern Great Plains Shrubland	0	0	0%	0%
Western Cool Temperate Urban Deciduous Forest	0	0	0%	0%
Developed-Medium Intensity	0	0	0%	0%
Northwestern Great Plains Riparian Forest	0	0	0%	0%
Western Cool Temperate Urban Mixed Forest	0	0	0%	0%
Western Great Plains Badlands	0	0	0%	0%
Northwestern Great Plains Riparian Shrubland	0	0	0%	0%
Western Cool Temperate Urban Evergreen Forest	0	0	0%	0%
Developed-High Intensity	0	0	0%	0%
Northwestern Great Plains-Black Hills Ponderosa Pine Woodland and Savanna	0	0	0%	0%
Western Great Plains Open Freshwater Depression Wetland	0	0	0%	0%
Total	**112**	**1,245**	**100%**	**100%**

Source: LANDFIRE (2023).

Note: Sums of values may not add to total value shown, due to rounding.

3.6.2.4 Vegetation Conclusion

During Project construction, ≤ 1,247 acres would be temporarily disturbed and 117 acres would be permanently disturbed. The dominant vegetation type in the proposed Project area is Northwestern Great Plains Mixedgrass Prairie (25,856 acres), and the Project has been designed to reduce temporary impacts to 187 acres and permanent impacts to 14 acres. The second most dominant vegetation type is Western Cool Temperate Row Crop; 518 acres of which may be temporarily disturbed and 49 of which may be permanently disturbed by construction activities.

Of the 12,192 acres of broken grassland, ≤ 12 acres would be permanently disturbed, and ≤ 161 acres would be disturbed temporarily. Of the 14,915 acres of unbroken grassland, ≤ 41 acres would be temporarily disturbed, and ≤ 3 acres would be permanently disturbed by access roads and aboveground junction boxes. No turbines would be constructed on unbroken grassland. Invasive and noxious weeds may be spread by proposed Project activities resulting in ground disturbance. According to SDDANR (2017a, 2017b), two state-listed and one locally recognized noxious weed species occur in Haakon

County. The Project has committed to limit establishment and spread of these species through industry BMPs.

Impacts to vegetation would be dispersed throughout the proposed Project area and distributed over 16 different vegetation types. The Project reduced impacts to native vegetation resources in Project layout and design and has committed to BMPs, including use of appropriate equipment cleaning measures and revegetating areas temporarily impacted during construction to pre-Project conditions. The Project's proposed impacts to vegetation would be minor and considered less than significant.

3.6.3 Environmental Consequences: No Action Alternative

The No Action Alternative would cause no impacts to vegetation, and existing activities would continue.

3.7 WILDLIFE

3.7.1 Existing Conditions

Section 4.6.2 – Wildlife of the UGP PEIS discusses general descriptions of wildlife species that may be affected by wind energy development projects in the UGP Region. The proposed Project area is in the Northwestern Great Plains Level III ecoregion (Wiken et al. 2011).

Several wildlife studies were conducted for the Project and are listed in Table 3-18. Wildlife study reports completed by Philip Wind Partners are included in Appendices B through G. Previously completed studies are considered as cited and included in the Project record. Study results are summarized below.

Table 3-18. Wildlife Studies Conducted for the Project

Study	Survey Period
Eagle use survey	August 2017–July 2018; August 2018–July 2019
Eagle nest aerial survey	April 2018
Eagle nest ground survey	June 2018
Eagle utilization distribution monitoring	May–June 2022
Prairie grouse lek survey	July 2018; April–May 2022; March–May 2023
Whooping crane habitat assessment	August 2018; February 2023
Bat acoustic survey	April–November 2018
Avian use survey	August–November 2017; March–August 2018; January 2022–March 2023; April 2023–August 2024
Prairie dog colony status and mapping	January–October 2022
NLEB habitat assessment	May–October 2022
Raptor nest survey	January–June 2022; February–June 2023

In addition to wildlife and habitat studies, Philip Wind Partners conducted grassland assessments and mapping in July 2018 and September 2022, which is discussed in Section 3.6.1.1. A water resources analysis was conducted in October 2022. Section 3.3.1 describes the findings of the desktop water resources analysis and the completed in-field wetland delineations, as well as methods for the additional in-field wetland delineations to be conducted prior to construction.

3.7.1.1 General Wildlife

Common Northwestern Great Plains Level III ecoregion species include white-tailed deer (*Odocoileus virginianus*), pronghorn (*Antilocapra americana*), bobcat (*Lynx rufus*), cougar (*Puma concolor*), prairie dog (*Cynomys* spp.), jackrabbit (*Lepus* spp.), and prairie rattlesnake (*Crotalus viridis*) (Wiken et al. 2011).

Wildlife habitats are defined by vegetation covers identified in Section 3.6.1. Anthropogenic land uses, including cropland, have lower wildlife habitat values than higher quality habitats such as forests, wetlands, and native prairie grasslands. Wildlife is more likely to be present in quality habitats. Although birds fly over all land cover types, their nesting habitats and food sources are primarily found in forests and grassland habitats.

Prairie dog colonies provide habitat and a food source for several protected species of wildlife with their own setback requirements identified in the UGP PEIS. To define turbine setbacks from prairie dog colonies, surveys were conducted according to methodologies reported in Appendix D. Based on historical data and desktop review of aerial imagery, 12 sites were surveyed for presence of prairie dog colonies in the proposed Project area and a 2-mile buffer. Six historical colonies were surveyed; three were still active and three were absent. Six additional sites were surveyed; three were inactive based on evidence of unused burrows, two were active based on presence of fresh burrows, tracks, fecal droppings, and prairie dogs, and one site identified during the desktop digitizing as a potential prairie dog colony was determined to be nonexistent in the field.

3.7.1.2 Birds

Common Northwestern Great Plains Level III ecoregion bird species include western meadowlark (*Sturnella neglecta*), sage thrasher (*Oreoscoptes montanus*), northern pintail (*Anas acuta*), golden eagle (*Aquila chrysaetos*), and ferruginous hawk (*Buteo regalis*) (Wiken et al. 2011).

There are no Important Bird Areas or other lands designated specifically as bird habitat in the proposed Project area (National Audubon Society 2023). Point count surveys were conducted to catalog bird species observed and estimate bird use at numerous sites in the proposed Project area (Tetra Tech 2017, 2018). A site reconnaissance visit was conducted on September 13, 2022, which identified seven small and large bird species. The observed small and large bird species, exclusive of the raptors described below, were black-billed magpie (*Pica hudsonia*), common raven (*Corvus corax*), dark-eyed junco (*Junco hyemalis*), horned lark (*Eremophila alpestris*), lark bunting (*Calamospiza melanocorys*), ring-necked pheasant (*Phasianus colchicus*), and sharp-tailed grouse. No federally listed species were observed during the September 13, 2022, site reconnaissance visit. Discussion of prairie grouse is found in Section 3.8.

In addition to avian surveys conducted from 2017–2019, Philip Wind Partners reinitiated monthly avian surveys in January 2022 focusing on eagles and large birds. Large birds are defined as waterbirds, waterfowl, shorebirds, gulls/terns, diurnal raptors (i.e., kites, accipiters, buteos, eagles, falcons, harriers, and osprey), owls, vultures, upland game birds, doves/pigeons, nightjar, and large corvids. Initially 38 points were surveyed, with 12 additional survey points added in response to Project area modifications, totaling 50 survey points. A biologist documented large birds observed over 60 minutes at each point per month. There were 52 species observed throughout the 15-month survey. Large bird species observations were highest during spring (40 species) followed by summer (39), fall (25), and winter (16). Large birds observed during these surveys averaged 8.59 observations per 60-minute survey, ranging from 2.29 in winter to 18.20 in spring, showing a similar trend as number of species observed.

Between April 2023 and August 2024, Philip Wind Partners conducted additional eagle and large bird use surveys to identify temporal and spatial use of all large birds in the proposed Project area, with a focus on eagles in accordance with the USFWS's *Eagle Conservation Plan Guidance* (USFWS 2013).

Raptor nest surveys were conducted from 2017–2019 in accordance with the USFWS *Eagle Conservation Plan Guidance* (USFWS 2013) to identify and record the location and status of raptor nests in the proposed Project area, and to update results of previous raptor surveys. Between January 13 and June 15, 2022, raptor nest surveys were conducted in an earlier iteration of the proposed Project area and a 2-mile buffer surrounding the proposed Project area during six survey events (three ground-based surveys; three aerial flight surveys).

The 2022 surveys resulted in observation of one occupied bald eagle (*Haliaeetus leucocephalus*) nest in the proposed Project area and one occupied golden eagle nest in a 2-mile buffer surrounding the proposed Project area. Six non-eagle raptor nests were documented in the proposed Project area and a 2-mile buffer, consisting of three unidentified raptor nests in the proposed Project area and three occupied red-tailed hawk (*Buteo jamaicensis*) nests in the 2-mile buffer. During a site reconnaissance visit conducted on September 13, 2022, five raptor species were observed: bald eagle, golden eagle, northern harrier (*Circus hudsonius*), red-tailed hawk, and turkey vulture (*Cathartes aura*). Additional information on bald and golden eagles can be found in Section 3.8.

Additional raptor nest surveys were completed between February 2 and June 1, 2023, in the proposed Project area displayed in Figure 1-2. These surveys included two ground-based surveys and two aerial surveys in the proposed Project area and a 2-mile buffer surrounding the proposed Project area. The known bald eagle and golden eagle nests in ≤ 2 miles of the proposed Project area were occupied during the first two mobilizations (February–March 2023). During the last two mobilizations (May– June 2023), the bald eagle nest was taken over by a great horned owl with young and the golden eagle nest by a red-tailed hawk. One new eagle nest was discovered just east of the previously occupied eagle nest.

In total, 12 non-eagle raptor nests were documented in the proposed Project area and 2-mile buffer; two occupied great horned owl nests, three occupied red-tailed hawk nests, and three unidentified raptor nests were documented within the Project area; and two occupied great horned owl nests and two occupied red-tailed hawk nests were identified in the 2-mile buffer. One occupied great blue heron (*Ardea herodias*) rookery was identified in the 2-mile buffer.

3.7.1.3 Bats

According to the South Dakota Bat Management Plan, 13 species of bats occur currently or historically in South Dakota (Table 3-19) (South Dakota Bat Working Group 2004). In September 2022, the USFWS proposed listing the tricolored bat (*Perimyotis subflavus*) (TCB) as endangered under the ESA, and USFWS guidance recommends consideration of the TCB when developing a wind energy facility (USFWS 2024a, 2024b). The northern long-eared bat (*Myotis septentrionalis*) (NLEB) is a federally listed endangered species. Given these species' status under the ESA, they are both further analyzed in Section 3.8.

Table 3-19. Bat Species Potentially Occurring in the Proposed Project Area

Common Name	Scientific Name	Status (federal; state)
Big brown bat	*Eptesicus fuscus*	–
Eastern red bat	*Lasiurus borealis*	SGCN
Evening bat	*Nycticeius humeralis*	–
Fringed bat	*Myotis thysanodes*	SGCN
Hoary bat	*Lasiurus cinereus*	SGCN
Little brown myotis	*Myotis lucifugus*	SGCN

Common Name	Scientific Name	Status (federal; state)
Long-eared bat	*Myotis evotis*	SGCN
Long-legged bat	*Myotis volans*	SGCN
Northern long-eared bat	*Myotis septentrionalis*	FE; SGCN
Silver-haired bat	*Lasionycteris noctivagans*	SGCN
Townsends big-eared bat	*Corynorhinus townsendii*	SGCN
Tricolored bat	*Perimyotis subflavus*	Proposed FE; SGCN
Western small-footed myotis	*Myotis ciliolabrum*	–

Sources: SDGFP (2014, 2023).
Note: FE = federally listed endangered; SGCN = South Dakota Species of Greatest Conservation Need.

Two preconstruction studies were completed to evaluate bats. The first was a passive acoustic study using five detection stations for 892 detector nights (Tetra Tech 2019) over as many as 211 nights per detector from April to November 2018. This type of study records bat calls and uses a combination of software and manual review to analyze and classify calls to document bats species present and their activity level. This study resulted in 14,262 bat calls. A breakdown of acoustic detections is provided in Table 3-20. The most common bat species detected (32%) was the big brown bat. Other species accounting for 10% to 20% of detections included the hoary bat, little brown myotis, silver-haired bat, and western small-footed myotis. Three groups of detected bats were not identifiable to species: unidentified high frequency bats, unidentified low-frequency bats, and unidentified myotis. Each of these groups were < 1% of bat calls.

Table 3-20. Acoustic Detections of Bats in the Proposed Project Area

Common Name	Scientific Name	% of Detections
Big brown bat	*Eptesicus fuscus*	32%
Eastern red bat	*Lasiurus borealis*	4%
Hoary bat	*Lasiurus cinereus*	18%
Little brown myotis	*Myotis lucifugus*	17%
Long-legged bat	*Myotis volans*	4%
Silver-haired bat	*Lasionycteris noctivagans*	12%
Western small-footed myotis	*Myotis ciliolabrum*	12%
Unidentified high frequency bats	N/A	< 1%
Unidentified low-frequency bats	N/A	< 1%
Unidentified *Myotis* spp.	N/A	< 1%

Note: N/A = not applicable.

The second bat study was a summer foraging and roosting habitat evaluation specific to NLEB (see Appendix E), which is discussed in Section 3.8.1.

3.7.2 Environmental Consequences: Proposed Action

3.7.2.1 Environmental Commitments

Philip Wind Partners has committed to implementing BMPs derived from the UGP PEIS (see Appendix O) and the Applicant's additional voluntary environmental protection measures in Table 2-3. These

measures would reduce impacts to wildlife. The impact summaries below consider the wildlife-specific BMPs (see Appendix O and Table 2-3):

- Complete preconstruction surveys to identify wildlife presence and habitat areas for avoidance.
- Reduce impacts to wildlife resources to the extent practicable through Project layout and design.
- Prepare and implement a BBCS (see Appendix P) in accordance with USFWS *Land-Based Wind Energy Guidelines* (USFWS 2012).
- Revegetate areas of temporary construction impacts to pre-Project conditions to restore habitat.

3.7.2.2 Switchyard

Primary impacts to wildlife from the Switchyard would be 1) temporary and permanent loss of habitat or potential displacement of wildlife where new facilities are constructed, and 2) temporary loss of habitat in construction access areas, laydown yards, and work areas. Ground clearing would affect habitats for birds, mammals, and other wildlife species. Loss and fragmentation of prairie habitat, represented as unbroken grasslands described above, can negatively affect migratory and non-migratory birds. Construction of the Switchyard would temporarily impact ≈ 1 acre and permanently impact ≈ 4 acres of Northwestern Great Plains Mixedgrass Prairie. These grassland acres in the Switchyard are mapped as broken grassland.

During construction, wildlife may avoid the area due to increased traffic and noise, but once construction is complete this temporary impact would cease. During Switchyard construction and O&M, direct mortality may result from collisions with vehicles, but this would be minimized through BMPs derived from the UGP PEIS and the Applicant's additional voluntary environmental protection measures. Disturbance to wildlife species and habitat would be minor.

Switchyard decommissioning impacts would mirror those for construction of the Switchyard. BMPs and mitigation measures applicable to Project construction activities would be applicable to Project decommissioning activities, which would reduce direct and indirect impacts to wildlife.

3.7.2.3 Wind Facility

Ground-based impacts to wildlife from the Wind Facility would mirror those described for the Switchyard. During O&M, the Project may impact wildlife through collisions with turbines, aboveground gen-tie lines, or vehicle traffic. Ground clearing, which causes habitat degradation, alteration, loss, and fragmentation, would affect habitats for birds, mammals, and other wildlife species. Natural resources setbacks were applied to turbine sites to avoid sensitive resources and are presented in Table 1-1 and Figure 1-3. Direct and indirect impacts to wildlife species and their habitats may occur from construction of the Wind Facility, increased vehicle traffic, and long-term disturbance during Wind Facility O&M.

Temporary impacts to ≈ 186 acres and permanent impacts to ≈ 9 acres of Northwestern Great Plains Mixedgrass Prairie vegetation would be expected. Temporary impacts to ≈ 10 acres of Northwestern Great Plains Riparian Herbaceous vegetation would be expected; however, no permanent impacts would occur to this vegetation type. The Wind Facility would permanently impact ≈ 9 acres of grasslands. This would be a minor area of disturbance to wildlife habitat.

The Wind Facility may affect raptor, migratory bird, and bat species through habitat degradation or displacement of individuals. During construction, wildlife may avoid the area due to increased traffic and noise, but once construction is complete this temporary impact would cease. Potential impacts from construction may include nest or burrow abandonment or loss of eggs or young. This may result in a

decrease in reproductive success for certain individuals, but this impact would be reduced through BMPs derived from the UGP PEIS and the Applicant's additional voluntary environmental protection measures.

During Wind Facility construction and O&M, direct wildlife mortality may result from collisions with vehicles, aboveground gen-tie lines, or turbines. Turbines would be feathered to reduce collisions with bats (see Section 3.8.2.3).

Wind Facility decommissioning impacts would mirror those described for construction of the Wind Facility. BMPs and mitigation measures applicable to Wind Facility construction activities would be applicable to Wind Facility decommissioning activities.

3.7.2.4 Wildlife Conclusion

Section 5.6.1.2 – Wildlife of the UGP PEIS describes potential impacts to wildlife during a wind energy project's life cycle. The proposed Project would have limited impacts to wildlife, including habitat disturbance and mortality from collisions with vehicles, gen-tie lines, and turbines in the species types and range of impacts identified in the UGP PEIS. The Project completed preconstruction surveys to identify wildlife presence and habitat areas, and reduced impacts to wildlife resources through Project layout and design. The BBCS (see Appendix P) would be implemented, and areas of temporary construction impacts would be revegetated to pre-Project conditions to restore habitat. The proposed Project's impacts to wildlife resources are consistent with the analysis in the UGP PEIS and would not result in impacts greater than those described in the UGP PEIS.

3.7.3 Environmental Consequences: No Action Alternative

Under the No Action Alternative, the Project would not be developed, and impacts to wildlife would be anticipated to continue at existing levels.

3.8 SPECIAL-STATUS SPECIES

3.8.1 Existing Conditions

Special-status species include any species listed, or proposed for listing, as threatened or endangered by the USFWS, as well as species of special concern. Species of special concern include species listed as USFWS Birds of Conservation Concern (BCCs) (USFWS 2021a, 2024e), SDGFP South Dakota Species of Greatest Conservation Need (SGCN) (SDGFP 2014, 2023), and sensitive species such as prairie grouse.

The USFWS Information for Planning and Consultation (IPaC) report identified one federally listed endangered species, two federally listed threatened species, two federally proposed threatened species, and two federally proposed endangered species that may occur in the proposed Project area (USFWS 2024e). Species on this list and their potential for occurrence in the proposed Project area are identified in Table 3-21. The proposed Project area does not contain designated critical habitat for federally listed ESA species (USFWS 2023b, 2024e). Although not identified on the IPaC species list, the Project also occurs within the TCB and NLEB range for wind energy projects and the USFWS presumes presence of TCB in the Project area during migration (USFWS 2024a, 2024b, 2024c, 2024d).

Table 3-21. Federally Listed and Proposed Species with Potential to Occur in the Proposed Project Area

Common Name	Scientific Name	Federal Status	Potential to Occur in the Proposed Project Area
Birds			
Rufa red knot	*Calidris canutus rufa*	Threatened	Low
Piping plover	*Charadrius melodus*	Threatened	Low
Whooping crane	*Grus americana*	Endangered	Low
Mammals			
Northern long-eared bat	*Myotis septentrionalis*	Endangered	Low
Tricolored bat	*Perimyotis subflavus*	Proposed Endangered	Low
Insects			
Monarch butterfly	*Danaus plexippus*	Proposed Threatened	Moderate
Regal fritillary	*Argynnis (Speyeria) idalia occidentalis*	Proposed Threatened	Moderate
Suckley's cuckoo bumble bee	*Bombus suckleyi*	Proposed Endangered	Low

Source: USFWS (2024e).

3.8.1.1 Rufa Red Knot

The rufa red knot (*Calidris canutus rufa*) was listed as federally threatened on January 12, 2015 (79 FR 73705 [December 11, 2014]). The rufa red knot is a medium-sized shorebird (USFWS 2023c). The rufa red knot is typically found along sandy beaches and shorelines, or on large mudflats (Cornell Lab of Ornithology 2023). The rufa red knot migrates long distances between nesting areas in mid- and high-arctic latitudes and southern nonbreeding habitats as far north as the coastal United States (low numbers) and southward to southern South America. Populations, including subspecies of rufa, migrate in large flocks northward through the contiguous United States mainly between March and early June, and southward in July and August (Harrington 2001).

The rufa red knot has potential to occur in the region during spring and fall migration periods, and every county in South Dakota is included as a potential stopover site during migration. Rufa red knots were observed along the Missouri River Valley, but there are no consistent stopovers in the Central Flyway.

The nearest reported rufa red knot observation, detected in 2002, was ≈ 74 miles east of the proposed Project area (eBird 2023). A second observation was recorded ≈ 76 miles east of the proposed Project area and included nine individuals in May 2016 (eBird 2023). As identified in the PBA Consistency Evaluation Forms, the nearest suitable habitat is 30 miles from the proposed Project area. It is unlikely for the rufa red knot to occur in the proposed Project area or in a 2.5-mile buffer surrounding the proposed Project area (Piorkowski et al. 2023). During the site reconnaissance visit conducted on September 13, 2022, and avian use studies in 2017, 2018, 2022, and 2023, no rufa red knots were observed.

3.8.1.2 Piping Plover

The piping plover (*Charadrius melodus*) was listed as federally threatened in 1985 (50 FR 50726 [December 11, 1985]), with the Northern Great Plains and Atlantic Coast populations listed as threatened and the Great Lakes population listed as endangered (USFWS 2023d). The piping plover is a small shorebird that breeds in three geographic regions of North America: The Atlantic Coast, the Northern Great Plains, and the Great Lakes (USFWS 2023d). In South Dakota, piping plovers nest mainly along

the Missouri River, and rarely on alkaline wetlands in northeastern South Dakota or along lakeshores in western South Dakota (SDGFP 2019).

The nearest reported piping plover observation was made in 2014, ≈ 20 miles southwest from the proposed Project area (eBird 2023). Most reported observations of piping plover occur around Pierre, South Dakota, ≈ 60 miles east of the proposed Project area in designated critical habitat for the species (designated critical habitat begins ≈ 30 miles to the northeast of the proposed Project area). No alkali lakes were observed in the proposed Project area (see Appendix K), but in dry years, the piping plover may occur in dried wetland habitat. There is limited to no suitable habitat in the proposed Project area. During a site reconnaissance visit conducted on September 13, 2022, and avian use studies in 2017, 2018, 2022, and 2023, no piping plovers were observed.

3.8.1.3 Whooping Crane

The whooping crane (*Grus americana*) was listed as federally endangered in 1967 (32 FR 4001 [March 11, 1967]) in the United States by the USFWS and in 1978 in Canada by the Committee on the Status of Endangered Wildlife in Canada (USFWS 2023e). Historically, population declines were caused by shooting and destruction of nesting habitat in the prairies from agricultural development. Current threats to the species include collisions with human-made objects (i.e., power lines and fences), shooting, chemical spills (in the Intracoastal Waterway in their winter habitat), predators, disease, habitat destruction, severe weather, and loss of genetic material (USFWS 2023e).

The whooping crane has one natural wild population of ≈ 543 individuals (Butler et al. 2022). Members of this population nest in and adjacent to Wood Buffalo National Park in the Northwest Territories and Alberta, Canada, and winter mainly in and adjacent to Aransas National Wildlife Refuge along the central Texas coast (Government of Canada 2015; USFWS 2023e). The proposed Project area is in the migration corridor containing 95% of the whooping crane sightings (Pearse, Rabbe, Bidwell et al. 2018; Pearse, Rabbe, Juliusson et al. 2018).

Whooping cranes may probe the soil subsurface with their bills for foods in/on the soil or vegetation substrate (USFWS 2023e). Whooping cranes are omnivores, and foods typically include agricultural grains, as well as insects, frogs, rodents, small birds, minnows, berries, and plant tubers. Whooping cranes spend the largest amount of time during migration feeding in harvested grain fields (USFWS 2023e). Studies indicate whooping cranes use a variety of habitats during migration and generally roost in small palustrine (marshy) wetlands ≤ 0.6 mile from suitable feeding areas (Howe 1987, 1989).

Philip Wind Partners conducted a whooping crane habitat assessment in the proposed Project area in February 2023 using methods defined in Appendix C. The assessment assisted Philip Wind Partners in determining potentially suitable whooping crane stopover habitat in the proposed Project area by considering three distinct methodologies of quantifying suitable habitat and whooping crane habitat use. The first methodology considers wetland habitat suitability through The Watershed Institute Wetland Suitability Model (The Watershed Institute 2012); the second considers a predicted habitat use model by Niemuth et al. (2018) that predicts the use of habitat by whooping crane; and the third considers an additional approach by Niemuth et al. (2018) that calculates high use areas by deciles (or 1/10 parts) and defines suitable wetland stopover habitat as wetlands in the five highest use deciles. Based on this three-method approach, it was determined the proposed Project area contains 415 acres of potentially suitable habitat, of which 5 acres are considered suitable wetland stopover habitat, with a 0.4% chance whooping cranes would use that habitat over any given year (see Appendix C).

3.8.1.4 Northern Long-Eared Bat

The USFWS listed the NLEB as federally threatened in 2015 (80 FR 17974 [April 2, 2015]). In November 2022, the USFWS reclassified the NLEB as federally listed endangered, resulting in removal of the species-specific rule issued under Section 4(d) of the ESA (87 FR 73488 [November 30, 2022]). The primary threat to this species is the fungus *Pseudogymnoascus destructans*, which causes white-nose syndrome; however, other factors impacting this species include wind energy development, climate variability, and habitat loss (87 FR 73488 [November 30, 2022]). White-nose syndrome has not been confirmed in Haakon County; however, occurrence was confirmed in neighboring Pennington County to the west in 2021 and 2022 (White-Nose Syndrome Response Team 2022).

The range of the NLEB extends throughout most of southern Canada, as well as the eastern and midwestern United States (excluding parts of the southeastern United States), and is primarily associated with North American forests (USFWS 2023f). The NLEB hibernates during winter months in caves and mines with constant temperatures and very high humidity (USFWS 2023g). Summer habitat for the NLEB consists of forested areas with trees > 3 inches in diameter at breast height (USFWS 2023g). NLEBs roost in live trees and/or snags that have exfoliating bark, cracks, crevices, and/or cavities (USFWS 2023g). The species typically forages in forest interiors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure (USFWS 2022). The NLEB may roost in human-made structures such as buildings, barns, bridges, and bat houses (USFWS 2023g). The NLEB migrates from summer habitat to hibernacula in the fall. NLEBs typically travel ≤ 35 miles from summer foraging habitat to hibernacula (USFWS 2022).

Two North American Bat Monitoring Program detectors in South Dakota documented NLEBs: one in Custer County in 2020 and one in Lawrence County in 2022 in the Black Hills National Forest (USGS 2023f). The proposed Project area is ≈ 68 miles from the nearest known hibernaculum in the Black Hills, South Dakota.

Two preconstruction studies were completed to evaluate bats, specifically NLEBs. The first was an acoustic study using five detection stations for 892 detector nights, as defined in methods contained in Appendix E and Tetra Tech (2019). This study resulted in 14,262 bat calls, none of which were classified as NLEB. The acoustic software used auto-classified 32 NLEB recordings; however, further manual analysis determined these to be western small-footed bat, long-legged myotis, or unidentified myotis.

The second study was a NLEB summer foraging and roosting habitat evaluation (see Appendix E) completed following guidance from the USFWS's *Range-wide Indiana Bat & Northern Long-eared Bat Survey Guidelines* (USFWS 2022) and field validated on September 13, 2022. Suitable summer foraging and roosting habitat was defined as patches of trees 10 acres or greater and included a 1,000-foot buffer (hereafter, connected habitat buffer) as recommended by USFWS guidance. As a result of this habitat evaluation, 65 acres of potential summer habitat and 1,508 acres of connected habitat were identified in the proposed Project area.

3.8.1.5 Tricolored Bat

On September 13, 2022, the USFWS proposed listing the TCB as an endangered species under the ESA. USFWS guidance recommends consideration of the TCB for operation of wind turbines (USFWS 2024a, 2024b). As of the date of publication of this EA, the USFWS has not issued a final listing decision on the TCB. The TCB faces extinction due to impacts of white-nose syndrome; however, other factors impacting this species' viability include habitat loss, climate variability, conservation efforts, and wind turbine operations (USFWS 2021b).

The range of the TCB extends throughout most of southern Canada, as well as the eastern, southeastern, and midwestern United States. The proposed Project area occurs at the western edge of the TCB range. The TCB hibernates during winter months in caves and mines with constant temperatures and very high humidity. The TCB is more of a habitat generalist than the NLEB. Summer habitat for the TCB consists of forested areas that may include live and dead leaf clusters of live or recently dead deciduous hardwood trees. The TCB needs suitable roosting and foraging habitat near abundant food and water in the spring, summer, and fall; habitat with appropriate microclimate conditions for extended torpor and brief arousal periods in the winter; and adequate connectivity between summer and winter habitats. The TCB migrates from summer habitat to hibernacula in the fall (USFWS 2021b).

As discussed in Sections 3.7.1.3 and 3.8.1, two preconstruction studies were completed to evaluate bats. The first was an acoustic study using five detection stations for 892 detector nights, as defined in the methods contained in Appendix E and Tetra Tech (2019). This study resulted in 14,262 bat calls. Over 99% of calls were identified to bat species other than TCB and fewer than 1% of the calls were classified as "unidentified high frequency bats," which lacked sufficient data to identify species.

The second study was a NLEB summer foraging and roosting habitat evaluation (see Appendix E) completed following guidance from the USFWS's *Range-wide Indiana Bat & Northern Long-eared Bat Survey Guidelines* (USFWS 2022) and field validated on September 13, 2022. Given the NLEB and the TCB both prefer forested habitats, this habitat evaluation is also relevant to the TCB. Suitable summer foraging and roosting habitat for the NLEB, and therefore the TCB, was defined as patches of trees 10 acres or greater, including a 1,000-foot connected habitat buffer as recommended by USFWS guidance for NLEB. As a result of the habitat evaluation, 65 acres of potential summer roosting habitat and 1,508 acres of connected summer foraging habitat were identified in the proposed Project area.

3.8.1.6 Monarch Butterfly and Regal Fritillary

The monarch butterfly (*Danaus plexippus*) was proposed as a threatened species under the ESA on December 10, 2024. Monarch butterflies breed year-round in many regions. In temperate climates, the monarch butterfly will undergo long-distance migration and live for an extended length of time. Monarch butterflies lay their eggs on obligate milkweed host plants (primarily *Asclepias* spp.). Larvae emerge after 2–5 days and develop through five larval instars (the time between molts) over 9–18 days. The larvae feed on milkweed and sequester toxic chemicals (cardenolides) as a defense against predators. Larvae pupate into a chrysalis and emerge 6–14 days later as an adult butterfly. Multiple generations of monarch butterflies are produced during the breeding season, and adults live ≈ 2–5 weeks. Overwintering adults enter reproductive diapause and live 6–9 months (USFWS 2023h). Monarch butterflies in South Dakota belong to a population that breeds east of the Rocky Mountains and overwinters in Mexico (Monarch Watch 2010).

No monarch butterflies were identified during the site reconnaissance in the proposed Project area or in the 2-mile buffer (Piorkowski et al. 2023). It is important to note that the site reconnaissance was conducted on September 13 and October 13–14, 2022, when monarch butterflies are migrating (Bird Watching HQ 2023).

The regal fritillary (*Argynnis [Speyeria] idalia occidentalis*) is a large, non-migratory butterfly belonging to the brush-footed family of butterflies. Regal fritillary larvae feed exclusively on the leaves of violets (*Viola* spp.), and adults feed on a variety of nectar sources. Adult males are generally present earlier in summer than females, beginning in mid-May, but females are generally present later into the fall, until about the end of October. Eggs are typically laid in prairie landscapes August 15–October 31, and individuals overwinter as larvae, before pupating approximately May 1–July 31 (USFWS 2023i).

On August 6, 2024, the USFWS proposed listing the regal fritillary under the ESA. The western population, whose range overlaps the proposed Project area, is proposed for listing as threatened. According to the USFWS (2023i), there are historical records of the regal fritillary occurring in Haakon County, South Dakota, but there are no current records. The proposed Project area is in the Northwestern Great Plains Regal Fritillary Species Status Assessment Analytical Unit, which has a high resiliency and habitat condition score for regal fritillaries, and even under the most extreme future scenario modeled by the USFWS was still ranked as having a medium resiliency (USFWS 2023i).

Aerial imagery analysis indicates grasslands in and adjacent to the proposed Project area have potential to contain milkweeds and violets that may be used by monarch butterflies and regal fritillaries, respectively. There is the potential for suitable habitat in the Project area, most likely in areas classified as Northwestern Great Plains Mixedgrass Prairie and Northwest Great Plains Riparian Herbaceous vegetation (see Table 3-15).

3.8.1.7 Suckley's Cuckoo Bumble Bee

The Suckley's cuckoo bumble bee (*Bombus suckleyi*) (SCBB) has a broad distribution across North America and has been known to occur in 17 U.S. states and every Canadian province and territory except Nunavut. The SCBB is one of six cuckoo bumble bee species in North America and is a medium-sized, obligate social parasite, invading the nests of bumble bees of the subgenus *Bombus* (Committee on the Status of Endangered Wildlife in Canada 2019; USFWS 2024f). Confirmed host species for the SCBB include the western bumble bee (*B. occidentalis*) and Nevada bumble bee (*B. nevadensis*). Female SCBB do not have the ability to collect pollen for their offspring and rely on worker bees from a host colony to raise young (USFWS 2024f). Both the western and Nevada bumble bee species nest underground in crevices and abandoned rodent burrows (Montana Natural Heritage Program 2025, Xerces Society for Invertebrate Conservation 2023). The SCBB is found in a wide variety of habitats including meadows, grasslands, farms, woodlands, with the transition zone between habitat types being especially valuable for nesting. Ultimately, the SCBB is entirely dependent on host bumble bee colonies, making these colonies a critical habitat need for the species (USFWS 2024f). Information on the life history, foraging, and habitat requirements for the SCBB is lacking; however, this species is considered a generalist forager that requires a wide variety of floral and nectar resources (Hines and Hendrix 2005). Threats to the SCBB include widespread use of pesticides and herbicides, competition from commercial/managed bees, decline of host species populations, and habitat loss due to conversion and fragmentation (USFWS 2024f).

The SCBB has not been detected in the United States since 2016. The most recent detection of SCBB within the state of South Dakota occurred prior to 2000, despite increased efforts to survey bumble bees in the Great Plains (USFWS 2024f; Xerces Society for Invertebrate Conservation 2025). One of the host species for the SCBB, the Nevada bumble bee, has been documented most recently near the town of Scenic in Pennington County, South Dakota, in 2024, approximately 45 miles away from the Project area. The western bumble bee has only been documented in the Black Hills region of South Dakota, approximately 80 miles west of the Project area (Xerces Society for Invertebrate Conservation 2025).

Potentially suitable habitat for the SCBB and its host species could occur wherever native flowering plants occur in the Project area. Similar to the western regal fritillary and monarch butterfly, the 27,678 acres of grassland identified in the Grassland Habitat Assessment (see Appendix H) may contain the necessary floral and nectar components to provide potential habitat for SCBB and associated host species.

3.8.1.8 Species of Special Concern

Species of special concern include species listed as USFWS BCC (USFWS 2021a, 2024e), SDGFP South Dakota SGCN (SDGFP 2014, 2023), and sensitive species, such as prairie grouse. Bald and golden eagles

are also considered species of special concern due to their protection under the Bald and Golden Eagle Protection Act of 1940.

As discussed in Section 3.7.1.2, eagle and large bird use surveys were conducted in the proposed Project area in 2022, 2023, and concluded in August 2024. The avian use surveys from January 2022 through March 2023 noted the presence of bald and golden eagles. Survey methods in the avian use surveys for eagle observations are described in Section 3.7.1.2. Data was collected for eagles based on recommendations in the USFWS *Eagle Conservation Plan Guidance* (USFWS 2013) and the 2016 Final Eagle Rule.

There were 24 observations of bald eagles and 50 observations of golden eagles. The bald eagle observations averaged 0.01 observations per survey and was highest during winter (0.08), followed by spring (0.04), summer (0.01), and fall (0.01). Golden eagle observations averaged 0.03 observations per survey and was highest during winter (0.11), followed by spring (0.10), fall (0.07), and summer (0.03).

Because one active bald eagle nest with an egg and/or nestling was identified in the proposed Project area, Philip Wind Partners conducted eagle use distribution monitoring in the proposed Project area at the nest between May 14 and June 22, 2022. The objective of eagle use distribution monitoring was to gain information on how bald eagles use the area around the active nest spatially by mapping flight paths to and from the nest. One bald eagle observation was recorded during a total of 28 hours (seven 4-hour surveys) of nest monitoring. Nest failure was confirmed on June 22, 2022, because no eagle observations were made during two consecutive surveys occurring on June 15 and June 22, 2022.

The USFWS IPaC report identified 10 species listed as USFWS BCC that may occur in the proposed Project area (USFWS 2024e): bobolink (*Dolichonyx oryzivorus*), chestnut-collared longspur (*Calcarius ornatus*), ferruginous hawk, lark bunting, lesser yellowlegs (*Tringa flavipes*), marbled godwit (*Limosa fedoa*), northern harrier, prairie falcon (*Falco mexicanus*), red-headed woodpecker (*Melanerpes erythrocephalus*), and Sprague's pipit (*Anthus spragueii*) (Piorkowski et al. 2023). The USFWS IPaC report also identified the bald eagle, which is protected under the Bald and Golden Eagle Protection Act (USFWS 2024e). As discussed above, the lark bunting and the northern harrier were observed during the September 2022 site reconnaissance visit; the bald eagle was observed during raptor nest surveys, eagle use distribution monitoring, and the September 2022 site reconnaissance visit.

The SDGFP identifies 132 animal species and 32 plant species listed as SGCN: 41 bird species, 16 mammal species, 16 reptile or amphibian species, 12 terrestrial insect species, 11 freshwater mussel species, four gastropod species, 28 fish species, and four aquatic insect species (SDGFP 2014, 2023). SGCNs observed during the September 2022 site reconnaissance visit included the bald eagle and lark bunting. Greater prairie-chicken, an SGCN, was observed in a 2-mile buffer surrounding the proposed Project area during prairie grouse lek surveys conducted in April and May 2022.

Prairie grouse lek surveys were conducted in the proposed Project area and a 2-mile buffer surrounding the proposed Project area during three aerial flights between April 4 and May 11, 2022. No ground-based surveys were conducted during the 2022 surveys. A lek is an assembly area where animals (such as prairie grouse) display courtship behaviors. Leks can vary in number and location on an annual basis. These surveys followed guidance from the SDGFP *Prairie Grouse Management Plan for South Dakota 2017–2021* (SDGFP 2017). During the surveys, 31 new and historical leks were observed. Table 3-22 presents the 2022 grouse lek survey results, with the location (in the proposed Project area or in the 2-mile buffer), species, and lek status.

Philip Wind Partners conducted additional prairie grouse lek surveys in 2023, revisiting the 2022 active leks via one aerial survey, and conducted three ground surveys per feedback received from the SDGFP. Ground surveys were conducted between March 27 and May 6, 2023 (during the active lekking period).

The aerial survey was conducted in the same timeframe to cover areas not accessible by the ground surveys. During the 2023 surveys, 69 new and historical leks were observed (see Table 3-22). Philip Wind Partners shared survey results with the USFWS and SDGFP and committed to the agencies that four turbines would be removed that had been planned in proximity to leks and suitable prairie grouse habitat.

Turbine siting modifications were completed, and Philip Wind Partners removed four turbines in proximity to leks and Tier 3 modeled priority sharp-tailed grouse habitat (Runia et al. 2021) (see Figure 1-3). Philip Wind Partners also modified the locations of six turbines in response to eagle and raptor nest field survey data. The revised layout of the infrastructure is illustrated in Figure 2-1.

Table 3-22. Prairie Grouse Lek Survey Results

Location	Species	Active Status	Inactive Status	Total
2022 Results				
Proposed Project area	Sharp-tailed grouse	11	2	13
2-mile buffer	Sharp-tailed grouse	15	2	17
Proposed Project area	Greater prairie-chicken	0	0	0
2-mile buffer	Greater prairie-chicken	1	0	1
2022 Total	*Both species*	*27*	*4*	*31*
2023 Results				
Proposed Project area	Sharp-tailed grouse	12	N/A*	12
2-mile buffer	Sharp-tailed grouse	18	N/A*	18
Proposed Project area	Greater prairie-chicken	19	N/A*	19
2-mile buffer	Greater prairie-chicken	18	N/A*	18
Proposed Project area	Mixed species	1	N/A*	1
2-mile buffer	Mixed species	1	N/A*	1
2023 Total	*Both species*	*69*	*N/A**	*69*

* N/A = not applicable. Inactive prairie grouse leks were not included in the 2023 survey results. Only prairie grouse leks identified as active during the 2022 survey were revisited in 2023.

3.8.2 Environmental Consequences: Proposed Action

3.8.2.1 Environmental Commitments

Philip Wind Partners has committed to implementing BMPs derived from the UGP PEIS (see Appendix O) in addition to the Applicant's additional voluntary environmental protection measures (see Table 2-3).

Philip Wind Partners also committed to BMPs and species-specific conservation measures identified in the PBA Consistency Evaluation Forms. The PBA Consistency Evaluation Forms were completed for the following federally listed, candidate, or proposed species that may occur in the proposed Project area: NLEB, piping plover, whooping crane, and rufa red knot. The Project complies with Section 7 of the ESA per the PBA Consistency Evaluation Forms for these species.

The impact summaries listed below consider threatened, endangered, and special-status-species-specific BMPs identified in Table 2-3 and measures outlined in Appendix K. Additional BMPs and mitigation measures outlined in Table 2-3 for water resources (see Section 3.3), vegetation (see Section 3.6), and

wildlife (see Section 3.7) would also apply. BMPs and mitigation measures presented for wildlife (see Section 3.7) would also be considered generally protective for threatened, endangered, and special-status species and their habitats.

- Complete pre-Project surveys to document wildlife resources and important habitat areas.
- Reduce impacts to wildlife resources to the extent practicable through Project layout and design.
- Prepare and implement a BBCS (see Appendix P) in accordance with the USFWS *Land-Based Wind Energy Guidelines* (USFWS 2012).
- Revegetate areas of temporary construction impacts to pre-Project conditions to restore habitat.

3.8.2.2 Switchyard

Sections 3.8.2.2.1 through 3.8.2.2.6 describe species identified in the USFWS IPaC report (USFWS 2024e) that may occur in the proposed Project area and the Switchyard's potential effects. Section 3.8.2.2.7 describes impacts to the species of special concern, including prairie grouse and eagles.

3.8.2.2.1 RUFA RED KNOT

The PBA Consistency Evaluation Forms were completed and accepted by the USFWS, and the Project would comply with conservation measures outlined in the PBA for the rufa red knot (see Appendix K). Bird flight diverters and marking devices specified in the PBA Consistency Evaluation Forms would be installed and maintained on newly constructed overhead lines following industry suggestions (APLIC 2012) for the life of the Project. WAPA determined the Proposed Action may affect but is not likely to adversely affect the rufa red knot.

3.8.2.2.2 PIPING PLOVER

The PBA Consistency Evaluation Forms were completed and accepted by the USFWS, and the Project would comply with conservation measures outlined in the PBA for the piping plover (see Appendix K). Bird flight diverters and marking devices specified in the PBA Consistency Evaluation Forms would be installed and maintained on newly constructed overhead lines following industry suggestions (APLIC 2012) for the life of the Project. WAPA determined the Proposed Action may affect but is not likely to adversely affect the piping plover.

3.8.2.2.3 WHOOPING CRANE

The PBA Consistency Evaluation Forms were completed and accepted by the USFWS, and the Project would comply with conservation measures outlined in the PBA for the whooping crane (see Appendix K). Bird flight diverters and marking devices specified in the PBA Consistency Evaluation Forms would be installed and maintained on newly constructed overhead lines following industry suggestions (APLIC 2012) for the life of the Project. A Whooping Crane Monitoring and Contingency Plan (see Appendix L) has been developed to minimize potential impacts to whooping cranes during construction and O&M of the Project. WAPA determined the Proposed Action may affect but is not likely to adversely affect the whooping crane.

3.8.2.2.4 NORTHERN LONG-EARED BAT

The Switchyard would be constructed in an area where summer occupancy of NLEBs is not anticipated. Switchyard construction would not remove any habitat known to be used by NLEB and no operational

effects are expected from the Switchyard. WAPA determined the Proposed Action, including the potential effects of the Switchyard, may affect but is not likely to adversely affect the NLEB.

3.8.2.2.5 TRICOLORED BAT

The Switchyard would be constructed in an area where summer occupancy of TCB is not anticipated, and construction of the Switchyard would not remove TCB habitat. There would be no construction or operational effects of the Switchyard to TCB.

If the TCB is listed as threatened or endangered under the ESA while WAPA is still engaged in a discretionary Federal action and WAPA determines that building the Switchyard may affect the TCB, then WAPA would initiate consultation with the USFWS regarding effects on TCB. If the TCB is listed as threatened or endangered under the ESA after conclusion of WAPA's discretionary Federal action, the Applicant would be responsible for determining risk to TCB and whether to initiate Section 10 consultation with the USFWS.

3.8.2.2.6 MONARCH BUTTERFLY AND REGAL FRITILLARY

Impacts to monarch and regal fritillary butterflies could occur from mortality to individuals during construction as well as from the conversion of potential habitat to Project infrastructure. Construction and O&M of the Switchyard would permanently disturb ≈ 5 acres of prairie habitat that may include milkweeds and/or violets. This disturbance would permanently impact a minor portion of potential habitat (<0.1% of potential habitat in the Project area) compared to the availability of similar habitat in the vicinity, and therefore would not likely cause a noticeable change in the local abundance or general distribution of either butterfly population.

If either butterfly is listed as threatened or endangered under the ESA while WAPA is still engaged in a discretionary Federal action and WAPA determines that building the Switchyard may affect either butterfly, then WAPA would initiate consultation with the USFWS regarding effects on the monarch or regal fritillary. If either butterfly is listed as threatened or endangered under the ESA after conclusion of WAPA's discretionary Federal action, the Applicant would be responsible for determining risk to the species and whether to initiate Section 10 consultation with the USFWS.

3.8.2.2.7 SUCKLEY'S CUCKOO BUMBLE BEE

Impacts to SCBB could occur from construction, operation, and decommissioning of Project infrastructure. Disturbance, injury, or mortality of SCBB individuals could occur while the species is active between April and October; loss, degradation, or alteration of SCBB or host bumble bee habitats or floral and nectar resources could occur, resulting in reduced survivorship or reproductive success. Construction and O&M of the Switchyard would permanently disturb ≈ 4 acres of potential habitat (Northwestern Great Plains Mixedgrass Prairie) for the SCBB or its associated host species. This disturbance would permanently impact a minor potion of potential habitat (<0.1% of potential habitat in the Project area) compared to the availability of similar habitat in the vicinity, and therefore would not likely cause a noticeable change in the local abundance or general distribution of the species.

If the SCBB is listed as endangered under the ESA while WAPA is still engaged in a discretionary Federal action and WAPA determines that building the Switchyard may affect the SCBB, then WAPA would initiate consultation with the USFWS regarding effects on the SCBB. If the SCBB is listed as threatened or endangered under the ESA after conclusion of WAPA's discretionary Federal action, the Applicant would be responsible for determining risk to the species and whether to initiate Section 10 consultation with the USFWS.

3.8.2.2.8 SPECIES OF SPECIAL CONCERN

Loss and fragmentation of grasslands may negatively affect species of special concern, including prairie grouse. The Switchyard would temporarily impact ≈ 1 acre and permanently impact ≈ 4 acres of Northwestern Great Plains Mixedgrass Prairie. These acres are previously broken grassland. The overall disturbance to wildlife species and habitat would be minor.

The Switchyard avoids the top two habitat tiers of both prairie grouse species' habitat (SDGFP 2023).

The Switchyard's small size and lack of large aerial components reduces its impact to bird species of special concern, including bald and golden eagles. The BBCS (see Appendix P) outlines the design features implemented that comply with the APLIC suggestions to avoid and minimize impacts from electrocution hazard and t-line collision. Because of these conservation measures, impacts to bird species of special concern, including eagles, from the Switchyard would be negligible.

3.8.2.3 Wind Facility

Sections 3.8.2.3.1 through 3.8.2.3.6 describe species identified in the USFWS IPaC report (USFWS 2024e) that may occur in the proposed Project area and the Wind Facility's potential effects. Section 3.8.2.3.7 describes impacts to the species of special concern, including prairie grouse and eagles.

3.8.2.3.1 RUFA RED KNOT

Because the rufa red knot has not been known to be in the proposed Project area, there is negligible risk of direct or indirect impacts to the rufa red knot. The PBA Consistency Evaluation Forms were completed and accepted by the USFWS, and the Project would comply with conservation measures outlined in the PBA for the rufa red knot (see Appendix K). Bird flight diverters and marking devices specified in the PBA Consistency Evaluation Forms would be installed and maintained on newly constructed overhead lines following industry suggestions (APLIC 2012) for the life of the Project. WAPA determined the Proposed Action may affect but is not likely to adversely affect the rufa red knot.

3.8.2.3.2 PIPING PLOVER

There is limited to no suitable piping plover habitat in the proposed Project area (Piorkowski et al. 2023). Although piping plovers can occur in open water land cover types, the proposed Project area is < 1% open water. Philip Wind has committed to turbine setbacks identified in Table 1-1 to minimize the impact to the piping plover and associated habitat, resulting in an insignificant risk of direct or indirect impacts to piping plovers. The PBA Consistency Evaluation Forms were completed and accepted by the USFWS, and the Project would comply with conservation measures outlined in the PBA for the piping plover (see Appendix K). Bird flight diverters and marking devices specified in the PBA Consistency Evaluation Forms would be installed and maintained on newly constructed overhead lines following industry suggestions (APLIC 2012) for the life of the Project. WAPA determined the Proposed Action may affect but is not likely to adversely affect the piping plover.

3.8.2.3.3 WHOOPING CRANE

According to the predicted habitat use model, there is potential for whooping cranes to use the proposed Project area during migration, resulting in possible direct or indirect impacts to whooping cranes consistent with those disclosed in the UGP PEIS. The PBA Consistency Evaluation Forms were completed and accepted by the USFWS, and the Project would comply with conservation measures outlined in the PBA for the whooping crane (see Appendix K). Invenergy has agreed to contribute

funding to a third-party entity to complete 5 acres of perpetual wetland easement offsets to adhere to conservation measures outlined in the whooping crane PBA Consistency Evaluation Forms. The third-party mitigation provider would be responsible to use the funding to perpetually protect wetlands in the 95% whooping crane migration corridor of South Dakota. These may include existing, restored, or created wetlands. Documentation of funding by the Project to the third-party offset provider would be provided to WAPA prior to Project interconnection. A Whooping Crane Monitoring and Contingency Plan (see Appendix L) has been developed to minimize impacts to whooping cranes during construction and operation of the Project. Bird flight diverters and marking devices specified in the PBA Consistency Evaluation Forms would be installed and maintained on newly constructed overhead lines following industry suggestions (APLIC 2012) for the life of the Project. WAPA determined the Proposed Action may affect but is not likely to adversely affect the whooping crane.

3.8.2.3.4 NORTHERN LONG-EARED BAT

No NLEBs have been detected in the proposed Project area, and it is unlikely that NLEBs would migrate through the proposed Project area given the distance from the nearest known hibernaculum (≈ 68 miles away).

The original PBA NLEB Consistency Evaluation Forms were completed and accepted by the USFWS in April 2023 and determined that the Proposed Action may affect but is not likely to adversely affect the NLEB. Since completion and acceptance of the PBA Consistency Evaluation Forms (see Appendix K), the USFWS released the final *Land-based Wind Energy Voluntary Operational Avoidance Guidance for the Northern Long-eared Bat* in October 2024 (USFWS 2024d), which includes recommended conservation measures (e.g., curtailment windows) that differ from those in the 2015 version of PBA Consistency Evaluation Form. The PBA allows for amendments to be made when new information reveals effects on species or critical habitat (WAPA and USFWS 2015). WAPA and USFWS completed an amendment to the PBA in December 2024. Philip Wind Partners has committed to the following conservation measures for the NLEB listed in the Consistency Evaluation Forms to help reduce the impacts of the proposed Project to the NLEB.

- Avoid siting turbines ≤ 0.5 mile from suitable summer NLEB habitat, following avoidance measures outlined in the UGP PEIS and PBA Consistency Evaluation Forms for NLEB. This exceeds the current NLEB guidance of 1,000 ft (0.19 mile) and would benefit NLEB by avoiding suitable NLEB summer habitats.
- The Project would be sited to minimize tree clearing. Tree clearing would occur on ≈ 2 acres (1.9% of all forested habitat in the proposed Project area).
- Tree clearing would occur outside the bat active season (tree clearing would occur only from November 1–April 14).
- Turbines would be feathered below the cut-in speed. Turbines would be curtailed following the cut-in speeds listed below during the related timeframes from half hour before sunset to half hour after sunrise when the temperature is > 40 degrees Fahrenheit (USFWS 2024d):
    - November 1–August 15: Manufacturer's cut-in speed
    - August 16–October 31: 5 meters per second
- The Project would conduct 1 year of post-construction monitoring following the first year of commercial operation and would subsequently conduct post-construction monitoring during the bat active season every 7 years.
- The Project would report any found NLEB carcass to USFWS within 24 hours of discovery and would submit annual reports by January 31.

USFWS signed the updated NLEB Consistency Evaluation Forms on March 18, 2025, and WAPA signed the updated NLEB Consistency Evaluation Forms on April 21, 2025 (see Appendix K). Based on the commitments concurred with, there is negligible risk of direct or indirect impacts to NLEB. Additionally, there is no change in the significance of impacts to NLEB between the publication of the Draft EA and the Final EA following issuance of the final NLEB guidance (USFWS 2024d). WAPA determined that the Proposed Action may affect but is not likely to adversely affect the NLEB.

3.8.2.3.5 TRICOLORED BAT

Philip Wind Partners has committed to conservation measures for the NLEB, as outlined in the final *Land-based Wind Energy Voluntary Operational Avoidance Guidance for the Northern Long-eared Bat* (USFWS 2024d) and listed in Section 3.8.2.3.4. Those conservation measures also help reduce the impacts of the proposed Project to the TCB.

Western EcoSystems Technology, Inc. (WEST), maintains a database on bird and bat fatalities associated with wind energy facilities (WEST 2023). A total of 759 TCB fatalities have been reported at wind facilities since 2001 across the United States and Canada. This analysis accounts for the following considerations regarding potential impacts of the Project to TCBs:

- There are no reported fatalities of TCB at operating wind facilities in South Dakota.
- There are no reported fatalities at any of the 19 operating wind facilities in the West-Central Semi-Arid Prairies EPA Level II Ecoregion (Omernik 1987) that submitted information to the WEST database from 2006 to 2017 (WEST 2023).
- A 5-meter-per-second cut-in speed reduces bat fatalities by an average of 62% for tree-roosting species in North America (Whitby et al. 2021).

No TCB calls were detected in the bat acoustic monitoring surveys conducted for the Project. The bat acoustic monitoring results were speciated and more than 99% of the total calls were identified to species other than TCB, with only <1% classified as “unidentified high frequency” calls. Therefore, TCB are unlikely to be present in the Project area. Based on the lack of evidence of TCB fatalities at existing wind facilities within the state and Level II Ecoregion, and the fact the Project is implementing curtailment measures that are likely to further reduce the risk of direct mortality to the TCB, the Wind Facility would pose minor risk of direct impacts to the TCB and negligible risk of indirect impacts to the TCB. Because the Project does not fully conform to the USFWS final *Land-based Wind Energy Voluntary Operational Avoidance Guidance for the Tricolored Bat* (USFWS 2024b), potential risk to TCBs should be re-evaluated further if the species is listed under the ESA.

If the TCB is listed as threatened or endangered under the ESA while WAPA is still engaged in a discretionary Federal action and WAPA determines that building or operating the Wind Facility may affect the TCB, then WAPA would initiate consultation with the USFWS regarding effects on TCB. If the TCB is listed as threatened or endangered under the ESA after conclusion of WAPA’s discretionary Federal action, the Applicant would be responsible for assessing the risk of take of TCB and determining whether to initiate Section 10 consultation with the USFWS.

3.8.2.3.6 MONARCH BUTTERFLY AND REGAL FRITILLARY

Impacts to monarch and regal fritillary butterflies could occur from mortality to individuals during construction as well as from the conversion of potential habitat to Project infrastructure. Construction and O&M of the Wind Facility would temporarily disturb ≈ 196 acres of Northwestern Great Plains Mixedgrass Prairie and Northwest Great Plains Riparian Herbaceous vegetation, and permanently impact ≈ 9 acres of Northwestern Great Plains Mixedgrass Prairie. There would be temporary impacts to 0.8%

and permanent impacts to <0.1% of Northwestern Great Plains Mixedgrass Prairie and Northwest Great Plains Riparian Herbaceous vegetation in the Project area. This disturbance would impact a minor portion of potential habitat compared to the availability of similar habitat in the vicinity, and therefore would not likely cause a noticeable change in the local abundance or general distribution of either butterfly.

If either butterfly is listed as threatened or endangered under the ESA while WAPA is still engaged in a discretionary Federal action and WAPA determines that building or operating the Wind Facility may affect the listed butterfly, then WAPA would reinitiate consultation with the USFWS regarding effects on the listed butterfly. If either butterfly is listed as threatened or endangered under the ESA after conclusion of WAPA's discretionary Federal action, the Applicant would be responsible for assessing the risk of take of western regal fritillary and/or monarch butterfly and determining whether to initiate Section 10 consultation with the USFWS.

3.8.2.3.7 SUCKLEY'S CUCKOO BUMBLE BEE

Disturbance, injury, or mortality of SCBB individuals could occur while the species is active between April and October; loss, degradation, or alteration of SCBB or host bumble bee habitats or floral and nectar resources could occur, resulting in reduced survivorship or reproductive success.

Construction and O&M of the Wind Facility would temporarily disturb ≈ 196 acres of Northwestern Great Plains Mixedgrass Prairie and Northwest Great Plains Riparian Herbaceous vegetation, and permanently impact ≈ 9 acres of Northwestern Great Plains Mixedgrass Prairie. There would be temporary impacts to 0.8% and permanent impacts to <0.1% of Northwestern Great Plains Mixedgrass Prairie and Northwest Great Plains Riparian Herbaceous vegetation in the Project area. This disturbance would impact a minor portion of potential habitat compared to the availability of similar habitat in the vicinity, and therefore would not likely cause a noticeable change in the local abundance or general distribution of SCBB or its host species.

If the SCBB is listed as endangered under the ESA while WAPA is still engaged in a discretionary Federal action and WAPA determines that building or operating the Wind Facility may affect the species, then WAPA would reinitiate consultation with the USFWS. If the species is listed as endangered under the ESA after conclusion of WAPA's discretionary Federal action, the Applicant would be responsible for assessing the risk of take of SCBB and determining whether to initiate Section 10 consultation with the USFWS.

3.8.2.3.8 SPECIES OF SPECIAL CONCERN

Loss and fragmentation of grasslands described above can negatively impact species of special concern, including prairie grouse. The Wind Facility would temporarily impact ≈ 186 acres and permanently impact ≈ 9 acres of Northwestern Great Plains Mixedgrass Prairie vegetation. The Wind Facility would also temporarily impact ≈ 10 acres of Northwestern Great Plains Riparian Herbaceous vegetation. This level of permanent disturbance (≈ 9 acres) to potential prairie habitats in the area would be considered minor and impacts to species of special concern from habitat loss or fragmentation would be negligible.

The Wind Facility avoids the top two habitat tiers of prairie grouse habitats as defined by the SDGFP (2023). In response to 2023 prairie grouse lek surveys, Philip Wind Partners coordinated with the SDGFP to remove four turbine locations to reduce impacts to sharp-tailed grouse, consistent with setbacks in Table 1-1 (see Figure 1-3). Philip Wind Partners also relocated six turbines in response to eagle and raptor nest field survey data. During Wind Facility construction and O&M, direct wildlife mortality may result from collisions with vehicles, aboveground gen-tie lines, or turbines. Impacts to eagles would be consistent with those identified in the UGP PEIS.

3.8.2.4 Special-Status Species Conclusion

Section 5.6.1.4 – Threatened, Endangered, and Special Status Species of the UGP PEIS describes impacts that may occur to threatened, endangered, and special-status species in the UGP Region during a typical wind energy project's life cycle. Section 5.6.2.6 – Threatened, Endangered, and Special Status Species of the UGP PEIS finds the BMPs and conservation measures presented in Section 5.6.2 – BMPs and Mitigation Measures of the UGP PEIS for addressing potential effects on ecological resources would also benefit many sensitive species and habitats. In conjunction with the UGP PEIS, a PBA was prepared under Section 7 of the ESA to address potential impacts of wind energy development to federally listed, candidate, and proposed threatened or endangered species in the UGP Region. The UGP PBA identified programmatic avoidance criteria and species-specific minimization measures that applicants may elect to follow to address impacts to particular species, and it presents determinations regarding the potential for adverse effects on federally listed, candidate, or proposed species if the conservation measures are met. These measures are summarized in Table 2.3-2 of the UGP PEIS.

Four federally listed species (rufa red knot, piping plover, whooping crane, and NLEB), and four federally proposed threatened or endangered species (regal fritillary, monarch butterfly, TCB, and SCBB) may occur in the Project area. Based on the lack of presence (rufa red knot); negligible suitable habitat (piping plover); minor risk according to predicted habitat use models (whooping crane); long distance to hibernacula (NLEB); and likely absence (TCB, NLEB, and SCBB), there is low potential for occurrence of these species in the proposed Project area. There is moderate potential for monarch butterfly and regal fritillary to occur in the Project area; however, impact to habitats with potential to contain milkweed species and/or violets would be minor (Piorkowski et al. 2023). WAPA has received concurrence from the USFWS on a determination of "not likely to adversely affect" for the rufa red knot, piping plover, whooping crane, and NLEB through the Project's commitment to the programmatic conservation measures identified in the UGP PBA and revised Consistency Evaluation Forms for NLEB (see Appendix K). The Project is committed to reducing impacts to these species by following the programmatic conservation measures found in the PBA and revised guidance for NLEB and by implementing the BMPs and conservation measures in Section 5.6.2 – BMPs and Mitigation Measures of the UGP PEIS. These impacts would be consistent with the analysis and findings in the UGP PEIS, and the Project would not result in new or additional significant impacts compared to those described in the UGP PEIS.

Prairie grouse are also identified as species of special concern. Out of 25,856 acres of potential prairie grouse habitat in the Project area, ≈ 9 acres would be permanently disturbed (~ 0.03% of available habitat). Given the small amount of permanent disturbance to potential prairie grouse habitat and the Project's commitment to reduce impacts by following the BMPs and conservation measures in Section 5.6.2 – BMPs and Mitigation Measures of the UGP PEIS, these impacts would be consistent with the analysis and findings in the UGP PEIS, and the Project would not result in new or additional significant impacts compared to those described in the UGP PEIS.

3.8.3 Environmental Consequences: No Action Alternative

Under the No Action Alternative, the Project would not be developed, and impacts to threatened, endangered, and special-status species would continue at existing levels.

3.9 VISUAL RESOURCES

3.9.1 Existing Conditions

Visual and scenic resources in the UGP Region are discussed in Section 4.7 – Visual Resources of the UGP PEIS. Rangeland, cropland, large open vistas, and gently rolling topography visually dominate the proposed Project area landscape. Visual impacts to the landscape attributable to the Project would depend on the extent to which the existing landscape is already altered from its natural condition, the number of viewers (i.e., residents, travelers, visiting recreational users, etc.) in visual range of the area, and the degree of public or agency concern for the landscape. Agriculture is the dominant land use with large, geometric agricultural plots occupying most of the proposed Project area. Occupied residences are scattered throughout the proposed Project area, and a few rural residences are adjacent to, but outside, the proposed Project area. South Dakota Highway 73 is the only major transportation corridor intersecting the proposed Project area from north to south. South Dakota Highway 34 directly abuts the northern edge of the proposed Project area and would likely experience visual impacts despite being outside the proposed Project area. Several rural roads bisect the proposed Project area. The current landscape includes numerous lakes and reservoirs, a cemetery, roadside ditches, and existing t-lines.

The nearest designated scenic resources to the proposed Project area are the Native American Scenic Byway (35 miles northeast), Minuteman Missile National Historic Site (25 miles south), Badlands Loop Scenic Byway (25 miles southwest), and Badlands National Park (35 miles southwest).

3.9.1.1 Shadow Flicker

Shadow flicker occurs when wind turbine blades pass in front of the sun to create reoccurring shadows. Such shadows occur under specific conditions, including sun position, wind direction, time of day, and other similar factors. Shadow flicker becomes less noticeable with increasing distance from a wind turbine, and shadow flicker becomes imperceptible beyond ≈ 4,920 ft (≈ 0.9 mile) (see Appendix M). At such distances, shadow flicker is usually caused at sunrise or sunset, when shadows are sufficiently long.

No regulations regarding shadow flicker were identified in South Dakota. Haakon County has no published ordinances regarding shadow flicker limits. Effects on nearby residences or other sensitive viewing locations would be reduced through considerations during the siting process (see Section 3.9.2).

3.9.2 Environmental Consequences: Proposed Action

3.9.2.1 Environmental Commitments

Philip Wind Partners committed to implementing BMPs derived from the UGP PEIS (see Appendix O) and the Applicant's additional voluntary environmental protection measures in Table 2-3. These measures would reduce visual impacts, as usually addressed during the siting process. The impact summaries below consider the visual resources-specific BMPs (see Appendix O and Table 2-3):

- Turbines would be sited to eliminate shadow flicker effects on nearby residences or other highly sensitive viewing locations, or reduce them to the lowest achievable levels, as calculated using appropriate siting software and procedures. Accurately determined shadow flicker estimates would be made available to stakeholders in advance of Project approval. If turbine sites are changed during the siting process, shadow flicker effects would be recalculated and made available to affected stakeholders.
- Turbines would be visually uniform in shape, color, and size of rotor blades, nacelles, and towers.

3.9.2.2 Switchyard

Construction activities may result in visual impacts from vegetation clearing and grading; road building or upgrading; construction and use of staging areas and laydown yards; construction of facilities; vehicles, equipment, worker presence, and activity; dust; and emissions. Construction visual impacts would vary in frequency, duration, and location throughout construction. Periods of intense activity followed by periods with less activity, and associated visual impacts, would vary in accordance with construction activity levels. Site monitoring, adherence to standard construction practices, and restoration activities would reduce potential construction impacts. Vehicle activity would be reduced once the Switchyard reached commercial O&M. Visual impacts from construction of the Switchyard would cease once the Switchyard becomes operational. Permanent visual impacts in the proposed Project area would be minor.

3.9.2.3 Wind Facility

Due to the large size of wind turbine towers, blades, and other components, the transport and installation of wind turbines would be visually conspicuous during construction (transport and installation would cease at the end of construction).

The primary direct visual impacts associated with O&M of the Wind Facility would result from the introduction of the numerous vertical lines of ≤ 90 wind turbines into the strongly horizontal landscape in the proposed Project area. The proposed gen-tie line would also be a new visual feature, but impacts would mirror those of the existing t-lines in the proposed Project area. To reduce visual impacts, the Wind Facility was designed according to SDPUC ordinances.

Turbine marker lights and other lighting on facilities would result in visual impacts. To reduce visual impacts of the Wind Facility, towers would be painted off-white to reduce glare, in accordance with FAA regulations. As required by South Dakota Codified Law 49-41B-25.2, Philip Wind Partners would install ≤ three ADLS towers to comply with FAA requirements (see Figure 2-1 for the ADLS tower locations). ADLSs involve installation of radar units around the perimeter of the Wind Facility. When radar does not detect an aircraft, it would send a signal to the wind turbine lighting to keep the light off. When radar detects an aircraft, it would stop sending a signal and the wind turbine lighting would activate. Visual impacts would be increased for a short time when an aircraft is detected. ADLS towers would reduce long-term lighting impacts as ADLS towers would use innovative technologies to eliminate the need for continuously flashing lights.

The construction and O&M of the Wind Facility would result in visual impacts. Magnitude of those visual impacts would depend on many factors, including distance of the proposed facility from viewers, weather and lighting conditions, the presence and arrangements of lights on turbines and structures, and viewer attitudes. Viewer attitudes would be subjective, and viewer reactions to visual changes may be influenced by several nonvisual factors, such as perceptions of renewable energy, wind power, and financial considerations.

Based on the UGP PEIS, visual impacts would dominate the views of casual viewers out to 3–5 miles; this would include rural residents and travelers along South Dakota Highways 73 and 34. Out to 10–12 miles, the Wind Facility would be prominent to the casual viewer but would not dominate the view; this would include the same categories of viewers. The UGP PEIS indicates that viewers from ≥ 15 miles would observe much smaller impacts; the town of Philip is ≈ 15 miles from the southern edge of the Wind Facility. According to the UGP PEIS, turbines ≈ 650 ft high would be visible ≈ 30 miles away.

Decommissioning impacts would be ≤ those described for construction. Temporary visual impacts would occur when removing infrastructure. Once the Wind Facility is decommissioned, visual resources would

return to pre-Wind Facility conditions and permanently impacted land would be restored to pre-Wind Facility land uses.

3.9.2.3.1 SHADOW FLICKER

Visual impacts from O&M of the Wind Facility may result from shadow flicker. Philip Wind Partners conducted and published a Shadow Flicker Study. Results demonstrated the Wind Facility may be operated with minimal disturbance to sensitive receptors (see Appendix M).

The Shadow Flicker Study surveyed areas within 1.25 miles of turbines to be conservative of the 0.9-mile area of perception. In the area surveyed, 16 receptors (inhabited residences, schools, hospitals, churches, and cemeteries) were identified. Participating landowners own 10 of the 16 receptors. Results of the Shadow Flicker Study were based on 95 turbine locations. If 95 turbines were constructed, 11 receptors would be expected to receive 0–10 hours of annual shadow flicker (three nonparticipating), three receptors would receive 10–20 annual hours (two nonparticipating), and two receptors would receive 20–30 annual hours (one nonparticipating) (see Appendix M). The average annual sunlight hours in South Dakota are ≈ 2,900 hours (Turbine Generator 2018). The 11 receptors that would receive ≤ 10 hours of shadow flicker annually represent 0.34% of annual sunlight hours. The three receptors receiving ≤ 20 hours of shadow flicker annually represent 0.69% of annual sunlight hours. The two receptors that would receive ≤ 30 hours of shadow flicker represent 1.0% of annual sunlight hours. Shadow flicker from the Wind Facility would be reduced through siting and design to limit duration and area of effect. Turbine numbers were reduced from 95 to 90 (on 91 potential sites) (see Figure 1-3), resulting in reduced visual impact than those reported in the Shadow Flicker Study. The remaining shadow flicker would be spread across many days, where only a small number of minutes of shadow flicker would be encountered daily. Shadow flicker may be further reduced by using window blinds and/or landscape screening.

Haakon County has no published shadow flicker regulations. To comply with SDPUC ordinances, shadow flicker effects would be reduced to the extent practicable through modeling, analysis, and proper turbine siting.

3.9.2.4 Visual Resources Conclusion

Section 5.7 – Visual Resources of the UGP PEIS describes potential visual impacts that may occur from wind energy projects, including alteration of the landscape and shadow flicker. The proposed Project is in an area where rangeland, cropland, large open vistas, and gently rolling topography visually dominate the landscape. Based on the UGP PEIS, visual impacts of a wind energy facility may dominate the views of casual viewers out to 3–5 miles. The proposed Project would be prominent to the casual viewer out to 10–12 miles but would not dominate the view. Areas ≤ 10–12 miles of the proposed Project area include rural residents and travelers along South Dakota Highways 73 and 34. The UGP PEIS indicates viewers from ≥ 15 miles would have lower visual impacts. The town of Philip is ≈ 15 miles south of the Wind Facility, and the nearest designated scenic resource to the proposed Project area is 25 miles away.

Shadow flicker has been reduced through siting and design to be limited in duration and area of effect. The remaining shadow flicker would be spread across many days, where a small number of minutes of shadow flicker would be encountered daily.

The Applicant has committed to implementing BMPs derived from the UGP PEIS (see Appendix O) and using turbines exhibiting visual uniformity in shape, color, and size of rotor blades, nacelles, and towers. The use of ADLS technology would reduce long-term lighting impacts.

The proposed impacts to visual resources align with those discussed in the UGP PEIS, and the Project would not result in new or more severe significant impacts than those described in the UGP PEIS.

3.9.3 Environmental Consequences: No Action Alternative

The No Action Alternative would have no impact to visual resources, and existing activities would continue.

3.10 CULTURAL RESOURCES

Cultural resources can include different site types, including archaeological, historical, and architectural sites, that may or may not be eligible for the National Register of Historic Places (NRHP). Cultural resources can also include properties of traditional religious and cultural significance (PTRCSs), which are of importance to Native American Tribes. In most cases, cultural resources are unique, fragile, and nonrenewable. Cultural resources that meet the eligibility criteria for the NRHP are characterized as "historic properties" under the NHPA. Historic properties, as defined in the NHPA (54 USC 300308), consist of any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP, including artifacts, records, and material remains related to such a property or resource. Historic properties can consist of any historic or prehistoric district, site, building, structure, or object (usually) over 50 years of age.

The UGP PEIS provides a brief overview of the cultural context of what is known about the settlement and past use of the Great Plains region; however, to identify new or previously recorded cultural resources eligible or potentially eligible for the NRHP, Philip Wind Partners engaged BCA to conduct a cultural resources survey in 2018 within the original APE for the Project and BCA conducted a second cultural resources survey in 2023 for the updated APE (see Appendix N). The APE is defined in 36 CFR 800.16(d) as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist." The direct APE encompasses approximately 1,641 acres and includes the locations where Project infrastructure will be built, such as turbine pads, the O&M building, and the substation/Switchyard; corridors mapped over the center of the proposed collection lines, access roads, and t-lines; as well as areas of temporary disturbance such as laydown yards and staging areas. The indirect APE includes locations where Project infrastructure might visually, or through other means, alter the characteristics and impact the integrity of a cultural resource and its eligibility for NRHP listing. In accordance with requests from SHPO, the indirect APE has been defined as a 1-mile buffer around the t-line, and a 2-mile buffer around each turbine location (actual and alternative).

3.10.1 Existing Conditions

Cultural resources surveys were initiated in 2023 for the updated direct APE. In addition, an architectural survey was completed within the indirect APE to identify historic properties that could be visually impacted by the Project. The field surveys were concluded and consultation with SHPO as part of WAPA's NHPA Section 106 consultation was completed in July 2024. The survey reports and SHPO concurrence letter are provided in Appendix N.

3.10.1.1 Records Search

In 2023, BCA searched the SHPO files to identify previously recorded archaeological resources and previously conducted cultural resources surveys within the direct APE and a 2-mile buffer. The search identified 10 previously recorded archaeological resources within the 2-mile search radius: eight sites and two isolated finds comprising Native American Tribal and historic Euro-American artifact scatters, foundations, a well, a dump, and a farmstead. One Euro-American artifact scatter site is considered

eligible for the NRHP. All sites and isolated finds were formally determined not eligible for the NRHP listing. None of these archaeological resources are located within the direct APE.

The file search also identified 12 previously conducted cultural resources surveys that have taken place within 2 miles of the direct APE, six of which intersect the direct APE. These surveys were conducted for power, telecommunication, and pipeline projects.

A search of the SHPO files for architectural resources within the 2-mile buffer identified three previously recorded historic-age structures, comprising a barn, a fence, and a series of destroyed buildings. All three sites are determined not eligible for the NRHP. None of these architectural resources are located within the direct APE.

3.10.1.2 Field Survey and Reporting Methods

3.10.1.2.1 LEVEL III PEDESTRIAN INVENTORY

Archaeologists initiated the Level III pedestrian inventory in the direct APE in fall 2023. The survey was conducted in accordance with SHPO survey requirements as well as any additional survey requirements from the Tribal Historic Preservation Officer(s) of the participating TCSs (BCA 2023). The surveys were completed in November 2023, and a summary of their findings is provided below. The results and outcomes from WAPA's consultation with SHPO are provided in Appendix N.

BCA archaeologists conducted the survey within the direct APE by walking parallel linear pedestrian transects 50 ft or less apart, based on terrain and on the probability for the presence of cultural resources. Throughout the survey, field observations were recorded as field notes, and digital photographs were taken.

During the survey, when a cultural resource was encountered, the location was marked with pin flags, and the surrounding area was intensely scrutinized to determine the nature and extent of the resource. Shovel test probes were conducted at newly documented archaeological sites and isolated finds to determine the presence of intact subsurface deposits and/or to define the extent of the cultural resource boundary. The number and placement of the shovel test probes were determined by factors encountered during the documentation of the resource, such as features, thin soils, heavy erosion, topography, or the presence of pre-Holocene gravels on the surface. All soil excavated from the shovel test probes was screened for cultural material. No cultural material was collected. As all shovel test probes were negative for cultural material at each cultural resource, the resource boundaries were thus defined by the surface expression of the resources, whether as a site or isolated find. Following the survey, the resources were evaluated for NRHP eligibility.

A cultural resources inventory report was prepared detailing the results of the Level I records search and Level III pedestrian inventory and providing recommendations regarding potential site NRHP eligibility. The report also included the results of the PTRCS inventory. WAPA submitted this report to SHPO during the Section 106 consultation process in June 2024 (see Appendix N). SHPO concurred with WAPA's finding of No Adverse Effect and the recommendations presented in the report on July 11, 2024 (see Appendix N).

3.10.1.2.2 PTRCS INVENTORY

Several federally recognized Native American Nations indicated to WAPA that they were interested in consulting on the Project, as identified in the initial Project scoping in 2018. As a result, WAPA will consult with the interested Tribes for the duration of the Project. TCSs from the Rosebud Sioux Tribe, the Standing Rock Sioux Tribe, the Cheyenne River Sioux Tribe, and the Santee Sioux Nation previously

participated in the 2018 cultural resources survey, during which time no Tribal cultural resources or PTRCSs were identified. Interested Tribes were invited again to participate in the 2023 Level III pedestrian inventory to assist the archaeologists and review the updated direct APE for potential PTRCSs. Four federally recognized Tribes, consisting of the Standing Rock Sioux Tribe, Rosebud Sioux Tribe, Cheyenne River Sioux Tribe, and Northern Cheyenne Tribe, participated in the 2023 survey effort. The results of the PTRCS inventory were included in the Level III cultural resources inventory report, which was provided to SHPO for review and concurrence in June 2024. SHPO concurred with the conclusions and recommendations presented in the report on July 11, 2024 (see Appendix N).

3.10.1.2.3 RECONNAISSANCE ARCHITECTURAL INVENTORY

As requested by SHPO, BCA conducted a reconnaissance architectural inventory within the indirect APE, which inherently includes the direct APE, in fall 2023 (BCA 2023). The purpose of the architectural inventory was to photographically document architectural buildings and structures within the indirect APE and determine their eligibility for the NRHP. The assessment followed the guidance presented in the 1994 Homesteading and Agricultural Development Context, which states that "[a]n agricultural property is an interrelated set of buildings, structures, and archaeological features, all of which are part of a production system," and "[t]herefore, whenever possible, a building, structure or archaeological feature should be evaluated as part of a whole, rather than individually" (Brooks and Jacon 1994:31).

Prior to the reconnaissance fieldwork, BCA completed a literature review of SHPO records, historic aerial imagery, and historic USGS topographic maps to identify potential architectural sites within the indirect APE. Fieldwork was then conducted from public roads, including identification and collecting photographs of each standing building or structure within the indirect APE. Upon completion of the reconnaissance fieldwork, each building and structure within the indirect APE was evaluated by an architectural historian to determine its age and NRHP eligibility based on its potential significance and integrity. A reconnaissance architectural inventory report was prepared detailing findings and recommendations for NRHP-eligible or unevaluated architectural resources within the indirect APE (BCA 2023). WAPA submitted this report to SHPO during the Section 106 consultation process in June 2024 (see Appendix N). SHPO concurred with the conclusions and recommendations presented in the report on July 11, 2024 (see Appendix N). For each property identified as historic in age (i.e., of 45 years of age or older), new structure and bridge records will be added to SHPO's Cultural Resource Geographic Research Information Display online database.

3.10.1.3 Field Survey Results

3.10.1.3.1 LEVEL III PEDESTRIAN INVENTORY RESULTS

In November 2018, archaeologists from BCA and TCSs from the Rosebud Sioux Tribe, the Standing Rock Sioux Tribe, the Cheyenne River Sioux Tribe, and the Santee Sioux Nation completed joint archaeological and PTRCS surveys within the original APE for the Project. No previously recorded cultural resources were revisited because none were present in the direct APE. No previously unrecorded cultural resources were identified during the 2018 survey.

BCA conducted a Level III pedestrian survey and a PTRCS inventory of the updated direct APE in 2023. TCSs from Standing Rock Sioux Tribe, Rosebud Sioux Tribe, Cheyenne River Sioux Tribe, and Northern Cheyenne Tribe participated in the 2023 field survey. During the intensive pedestrian survey, seven cultural resources were encountered, consisting of three historic sites (39HK0182, 39HK0183, 39HK0184) and four precontact isolated finds (39HK0089, 39HK0095, 39HK0180, and 39HK0181). All of these sites lacked integrity and significance and were recommended as not eligible for the NRHP. No

PTRCSs were identified by the TCSs during the survey. SHPO concurred with these recommendations on July 11, 2024 (see Appendix N).

3.10.1.3.2 RECONNAISSANCE ARCHITECTURAL INVENTORY RESULTS

The reconnaissance architectural survey commenced after identifying potential architectural locations using topographic maps and satellite imagery. In total, 83 locations that were or appeared to be architectural sites were investigated in accordance with SHPO reconnaissance survey requirements and photographed from the public right-of-way. Of these 83 locations, 14 had no remaining standing structures, 28 were entirely modern, two were not visible from the public right-of-way and were therefore not recorded or updated following guidance from SHPO, and 39 contained recordable, historic architectural structures. All of the architectural sites are located within the indirect APE; none of the architectural sites are within the direct APE. Of the 39 sites that possessed buildings and structures of historic age, five of these sites contained at least one building or structure that is recommended potentially eligible but unevaluated for the NRHP (see Appendix N) (BCA 2023). In WAPA's Determination of Effect for the proposed undertaking, WAPA stated that they disagreed with BCA's NRHP eligibility recommendations for certain buildings within these five sites and determined that four structures within two of these sites should be not eligible for the NRHP (see Appendix N). However, based on correspondence between WAPA and SHPO on July 11, 2024, SHPO agreed with and upheld BCA's NRHP eligibility recommendations for all sites and structures and concurred that a total of 16 structures within these five sites should be considered unevaluated and four structures should be considered not eligible for listing in the NRHP (see Appendix N).

3.10.2 Environmental Consequences: Proposed Action

3.10.2.1 Environmental Commitments

Philip Wind Partners has committed to implementing the BMPs derived from the UGP PEIS (see Appendix O) and the Applicant's additional voluntary environmental protection measures in Table 2-3. These measures would reduce impacts to cultural resources. The impact summaries below consider the cultural resources-specific BMPs, including the following (see Appendix O for more detail on these BMPs):

- The appropriate federal agency should consult with federally recognized Native American governments early in the planning process for a wind energy development to identify issues and areas of concern. Consultation is required under the NHPA. Consultation is necessary to establish whether the Project is likely to disturb PTRCSs, affect access rights to particular locations, disrupt traditional cultural practices, affect trust resources such as eagles, and/or visually impact areas important to the Tribe(s).
- The presence of archaeological sites and historic properties in the APE should be determined on the basis of a records search of recorded sites and properties in the area and/or an archaeological survey. The SHPO is the primary repository for cultural resources information.
- Cultural resources discovered during construction should be brought to the attention of the responsible federal agency immediately. Work should be immediately halted in the vicinity of the find to avoid further disturbance to the resources while they are being evaluated and appropriate mitigation plans are being developed.

3.10.2.2 Switchyard

Based on the results of the 2023 records search, no previously recorded cultural resources have been documented within the direct APE. The Level III survey identified seven archaeological sites within the direct APE, consisting of three historic sites and four precontact isolates. All of these sites have been determined ineligible for the NRHP. No PTRCSs were identified. During the reconnaissance architectural inventory, several sites were identified within the indirect APE; however, in a letter dated July 11, 2024, SHPO concurred with WAPA's determination that the Project as proposed would have No Adverse Effect on cultural resources (see Appendix N). Decommissioning impacts would be the same or fewer than those described for construction.

3.10.2.3 Wind Facility

Based on the results of the 2023 records search, no previously recorded cultural resources have been documented within the direct APE. The Level III survey identified seven archaeological sites within the direct APE, consisting of three historic sites and four precontact isolates. All of these sites have been determined ineligible for the NRHP. No PTRCSs were identified. During the reconnaissance architectural inventory, several sites were identified within the indirect APE; however, in a letter dated July 11, 2024, SHPO concurred with WAPA's determination that the Project as proposed would have No Adverse Effect on cultural resources (see Appendix N). Decommissioning impacts would be the same or fewer than those described for construction.

3.10.2.4 Cultural Resources Conclusion

Section 5.9 – Cultural Resources of the UGP PEIS summarizes the potential impacts that could occur to cultural resources during a typical wind energy project's life cycle and the possible mitigation measures. Determining the appropriate mitigation measures must be completed on a project-specific basis following identification of cultural resources. Findings during desktop research identified 10 previously recorded archaeological sites and three previously recorded architectural sites; none of these resources are located within the direct APE. The Level III field survey identified three historic sites and four precontact isolates within the direct APE. All of these cultural resources have been determined ineligible for the NRHP. No PTRCSs were identified during field surveys with participation from TCSs. During the reconnaissance architectural inventory, several sites were identified within the indirect APE; five of these sites possessed buildings or structures that are recommended as potentially eligible but unevaluated for the NRHP. In a letter dated July 11, 2024, SHPO concurred with WAPA's determination that the Project as proposed would have No Adverse Effect on cultural resources (see Appendix N). Given the site-specific assessments completed to identify cultural resources, and a commitment by the Project to observe the applicable mitigation measures in Section 5.9.1.6 of the UGP PEIS, including consultation under Section 106 of the NHPA to be overseen by WAPA, the cultural resources findings and analysis are consistent with the UGP PEIS, and no new or more severe significant impacts are anticipated. If affected cultural resources are identified in subsequent analysis, impacts to those resources will be avoided or managed in coordination with SHPO and WAPA.

3.10.3 Environmental Consequences: No Action Alternative

The No Action Alternative for the Project would have no impact to cultural resources, and existing activities would continue.

3.11 SOCIOECONOMICS

3.11.1 Existing Conditions

Section 5.10 – Socioeconomics of the UGP PEIS breaks down the socioeconomic environment potentially impacted by development of wind resources in the UGP Region. The UGP PEIS identifies 10 key measures of economic development: employment, unemployment, personal income, sales tax revenues, income tax revenues, population, vacant rental housing, state and local government expenditures, state and local government employment, and recreation. Since the proposed Project area is in Haakon County, it was the only county analyzed for the Project. Table 3-23 lists key measures of economic development applicable to the proposed Project area. Data for this section compares the 10 measures for Haakon County to South Dakota. South Dakota does not have state income tax, so this measure was not included in the table. The median household income is $51,016 in Haakon County, < the state median income of $63,920. The 2021 unemployment rate is 2.8% in Haakon County, < the state at 3.1% (Headwaters Economics 2021).

Table 3-23. Socioeconomic Key Measures for Haakon County and South Dakota (2021)

Socioeconomic Key Measures	Haakon County	South Dakota
Population	1,868 people	895,376 people
Employment	1,605 people (87.5%)	622,335 people (69.5%)
Unemployment rate	2.8%	3.1%
Median household (annual average)	$51,016	$63,920
State sales tax revenues	N/A	$2.7 billion (2022)*
Rental vacancy rate	2%	2%
State and local government expenditures	N/A	$6.8 billion (2021)†
Government employment‡	8.2%; 132 people	13.9%; 86,695 people
Recreation sector total employment (2021)	N/A	430,807 people

Source: Headwaters Economics (2021), unless otherwise noted.
Note: N/A = not applicable.
* South Dakota Department of Revenue (2022).
† National Association of State Budget Officers (2022:Table A-1).
‡ Federal, military, state, and local government enterprise.

3.11.2 Environmental Consequences: Proposed Action

3.11.2.1 Environmental Commitments

Philip Wind Partners committed to implementing BMPs derived from the UGP PEIS (see Appendix O) and the Applicant's additional voluntary environmental protection measures in Table 2-3. No additional separate socioeconomic measures were identified in the BMPs of the UGP PEIS.

The Project is projected to create short-term and long-term positive impacts for the local economy. There would be temporary increases in construction jobs, population, and revenue for local businesses. Construction activities would be short term, and short-term impacts to local businesses would likely be beneficial. Long-term benefits would include full-time employment for O&M of the proposed Project for ≈ 12 employees.

3.11.2.2 Switchyard

Jobs generated from construction of the Switchyard would include grid management, transmission services, and utility services. According to the Bureau of Labor Statistics (BLS), the mean annual wage of maintenance workers in the electric power generation, transmission, and distribution industry was $77,350 (BLS 2021a). The Switchyard would generate $200,000 in direct economic benefits to landowners, local and state governments, and school districts. Private landowners would benefit the most from purchase of the Switchyard land and transmission easement payment.

The Switchyard is projected to create short-term positive impacts to the local economy. There would be temporary increases in construction jobs, population, and revenue for local businesses. Nonlocal construction workers would likely be employed to construct the Switchyard. Workers would commute to the site, so the need for temporary housing would be unlikely. Construction activities would be short term, and short-term impacts to local businesses would likely be beneficial. Because a full-time employee would not be on-site and routine maintenance would occur intermittently at the Switchyard, no long-term impacts to the local economy would be expected.

3.11.2.3 Wind Facility

For every 100 MW of installed wind power, 67 short-term contracting and installation jobs are expected to be generated (Ayee et al. 2008). As such, the Wind Facility would generate ≈ 201 construction jobs. The Wind Facility would generate ≈ 12 permanent O&M jobs. Employees may be from Haakon County or brought in from outside areas, thereby bringing people to the county to positively contribute to the local economy. Construction of the Wind Facility would include crane operators, specialized transport, concrete and steel foundations, structural engineers, mechanics, construction equipment operators, and wind turbine operators.

Long-term impacts from the Wind Facility would result in permanent economic benefits from lease payments, operation, and property taxes paid to local governments, state governments, and local school districts. The mean annual salary for wind turbine operators in the electric power generation, transmission, and distribution industry was $64,830 per year (BLS 2021b), which exceeded the Haakon County household median income of $51,016. Economic benefits for O&M are calculated by multiplying the number of O&M employees by the median annual salary. The Wind Facility would generate $3,875,000 total in direct economic benefits to the entities listed above. Table 3-24 shows estimated direct economic benefits to be generated by the Wind Facility. Local spending at businesses during O&M is not included in this table but would have additional benefits. Landowners would benefit most from lease payments for wind turbines and associated roads on their property. These payments would provide a predictable source of income for the ≈ 30-year life of the Wind Facility.

Government revenue comes from an annual nameplate capacity tax and production tax. The nameplate capacity tax equals $3 per kilowatt multiplied by the generating capacity of the wind energy facility. As such, the 300-MW Project would generate $900,000 per year. Annual production tax is calculated by multiplying $0.00045 per kilowatt-hour, and revenue is deposited in the renewable facility tax fund. The renewable tax fund distributes revenue from nameplate taxes and 20% of the production taxes to the school districts, counties, and organized townships (DOE 2018). Since production tax is dependent on kilowatt-hours in real time, production tax is not incorporated in total tax revenues in Table 3-24.

Table 3-24. Direct Long-Term Economic Benefits from the Wind Facility

Payment	Direct Beneficiary	≈ $/Year
Wind lease easement payments*	Project landowners	$2,200,000
Operation	≈ 12 employees	$778,000
Taxes†	Townships, counties, school districts, and South Dakota	$900,000

* Wind lease easement payments are based on signed land as of June 2023, 300 MW of installed turbine capacity, and are the average annual value of expected payments over 30 years (i.e., payments increase over time; the annual figure is based on expected payments over 30 years divided by 30). If installed turbine capacity is < 300 MW, payments to landowners would be < this estimate.

† Taxes from South Dakota nameplate taxes.

There is no statistical evidence that property (residential) prices near wind turbines were affected during the post-construction, post-announcement, or preconstruction periods of time; and if effects exist, they are relatively small (Hoen et al. 2015). Property values would increase via wind lease payments when wind facilities, Switchyard facilities, or associated roads are constructed directly on properties.

The Wind Facility would create short-term and long-term beneficial impacts for the local economy. There would be a temporary increase in construction jobs, population, and revenue for local businesses. Nonlocal construction workers would likely be employed to construct the Wind Facility. Workers would commute to the site, so the need for temporary housing would be unlikely. Construction activities would be short term, and short-term impacts to local businesses would likely be beneficial. A small labor force would be required for O&M of the Wind Facility. Impacts to rental housing markets or to local government expenditures and employment long term would be negligible.

3.11.2.4 Socioeconomics Conclusion

During construction, the Project would generate ≈ 201 jobs and add to local economies through housing and increased use of restaurants and businesses. During O&M, ≈ 12 permanent jobs with an average annual salary of $64,830 to $77,350 per year would be expected, which significantly exceeds the Haakon County median household income of $51,016. The Project would further generate ≈ $4 million per year in direct economic benefits to landowners, local governments, state governments, and school districts. Based on the analysis of the proposed Project, impacts to the socioeconomic status of Haakon County would likely be beneficial, and adverse effects would be negligible. The proposed Project's impacts to socioeconomics would be less than significant.

3.11.3 Environmental Consequences: No Action Alternative

The No Action Alternative would result in the continuation of agricultural use within the Project area. This would result in no new jobs for construction or operation of the Project and no new tax revenue for Haakon County.

3.12 HEALTH AND SAFETY

3.12.1 Existing Conditions

Section 5.13 – Health and Safety of the UGP PEIS discusses health and safety impacts of construction and O&M of wind projects on workers and environmental health concerns in areas near wind power facilities.

3.12.1.1 Electric and Magnetic Fields

Electric and magnetic fields (EMFs) are invisible areas of energy, referred to as radiation, associated with the use of electrical power and various forms of natural and human-made lighting. Human-made sources of EMFs range in size and intensity from household objects like cellular telephones, calculators, and microwaves to large electric-producing and transmitting structures, such as t-lines, substations, and wind farms. Strength of EMFs decreases with increased distance from their source; EMF levels from high-voltage t-lines decreases by ≥ 95% at 200 ft (National Institute of Environmental Health Sciences 2023). Furthermore, EMF levels have been shown to be indistinguishable from background levels at distances < 6.5 ft from the base of a turbine (McCallum et al. 2014). There have not been substantial scientific conclusions on EMFs tied to adverse health effects in adults. The International Agency for Research on Cancer, a component of the World Health Organization, reviewed available evidence on static and extremely low-frequency EMFs and determined "static electric, magnetic, and extremely low-frequency electric fields are *not classifiable as to their carcinogenicity to humans*" (World Health Organization International Agency for Research on Cancer 2002:338).

There are no state or federal regulations related to maximum EMF intensity or exposure, but separate guidelines were issued by the International Commission on Non-ionizing Radiation Protection (1998) and the Institute of Electrical and Electronics Engineers (2002). The EPA's recommended exposure to EMFs ranges from 0.5 to 2.5 milligauss (WAPA and USFWS 2015).

3.12.1.2 Noise and Infrasound

General audible noise, typically frequencies of 20–20,000 hertz, is discussed in Section 3.5.

Human-made machinery (e.g., wind turbines) may generate infrasound. Infrasound, referred to as low-frequency sound, occurs at smaller frequencies and is typically unable to be heard by the human ear (< 20 hertz). Sources of infrasound range from very low-frequency atmospheric fluctuations to lower audio frequencies. These sources include natural occurrences, industrial installations, and low-speed machinery (Leventhall 2007). High levels of infrasound can be audible (≥ 110 dBA) and derive from human machinery or natural processes (e.g., ocean waves or volcanoes). Infrasound levels created by wind turbines is like those made by anthropogenic sources, such as heartbeats or lungs inhaling (Roberts 2018). The effect of infrasound exposure has been studied vigorously, yielding different results across studies. An independent study conducted by a panel of experts for the Massachusetts Department of Public Health and the Massachusetts Department of Environmental Protection found varied evidence suggesting wind turbines have annoyance and sleep disturbance effects, but not enough to provide a reliable link on whether this disturbance was caused by the audible levels of the turbines themselves (Schomer and Pamidighantam 2013). More recent studies have found that wind turbine noise (audible noise and infrasound) has no significant impact on sleep, given reasonable siting of turbines (studies tested impacts on sleep with simulating sounds at approximately 45 dBA) (Marshall et al. 2023; Michaud et al. 2016a; Michaud et al. 2016b; Smith et al. 2020). Testimony filed before the SDPUC found no correlation between infrasound from wind turbines and adverse health effects, including sleep disturbance or vertigo (Roberts 2018).

3.12.1.3 Occupational and Physical Hazards

Wind farms present potential physical hazards, including mechanical failure, aviation risks, intentional destructive acts, ice throw from turbine blades, fire, and occupational accidents. The proposed Project does not create additional risk of physical hazard beyond those inherent to most wind farm developments and is consistent with conclusions provided in the UGP PEIS.

As stated in the UGP PEIS, mechanical failure is a primary physical safety hazard of wind turbines, which typically occurs when operation exceeds specific turbine model operation parameters. Turbine rotor overspeed would be an example of this, and modern turbine models have safety controls to avoid such rare incidents. Blade failure is another rare example of mechanical failure, in which turbine blades fail and break, endangering nearby residents and structures.

Wind farms can be hazardous to aviation because of their tall structures with the potential to come into conflict with low-flying aircraft. FAA guidelines in 14 CFR 77 for marking and lighting of wind farms require lights that flash white during the day and twilight, and red at night (FAA 2015); terrain, weather, and other local factors may influence FAA requirements. Wind farm developers must file a notice with the FAA for construction that may present an obstruction to air navigation due to height and/or location relative to airports.

Wind projects may be targeted by intentional destructive acts ranging from vandalism and theft to sabotage and acts of terrorism. Vandalism and theft are more likely for projects in remote areas. Theft of substation and switchyard equipment containing salvageable metal (e.g., copper and aluminum) is most likely when metal prices are high. Vandalism is more likely to take place in remote areas and more likely to involve acts of opportunity (e.g., shooting out t-line insulators) than premeditated acts. Sabotage or terrorist acts would be expected to target larger electrical facilities, where a loss of service would have substantial regional impacts.

Ice throw, or ice build-up on a wind turbine blade being thrown off, may present a safety hazard as it can cause injuries to people and damage to buildings. Available data suggests many factors determine what happens to ice thrown from a wind turbine blade. Most ice falls from the blades and lands on the ground near the base of the towers as air temperatures warm. Large ice pieces may be thrown away from the tower base (Wahl and Giguere 2006). A general setback distance of 1.5 times the blade tip height is observed in the industry to avoid damages related to ice throw.

Fires have started at wind farm facilities for a variety of reasons, such as electrical shorts, insufficient equipment maintenance, contact with power lines, and lightning. Increased human activity increases potential for fires. The International Electrotechnical Commission requires the design of electrical systems for wind turbine generating systems to comply with relevant International Electrotechnical Commission standards.

Occupational physical hazards in the proposed Project area are commonplace in industrial workplaces, including slips, trips, falls, and vehicle accidents. Environmental factors may present hazards, including weather events (e.g., extreme heat/cold, thunderstorms, high winds, blizzards), poisonous plants, venomous snakes, and biting/stinging insects. See Section 3.8 – Health and Safety Aspects of Wind Energy Projects of the UGP PEIS for additional information on physical hazards.

3.12.1.4 Hazardous Materials and Solid Waste

Hazardous materials are unlikely to be encountered during Project construction in the proposed Project area. Eight known spills/environmental events and five registered storage tanks are in and around the proposed Project area, and all are either closed or inactive (SDDANR 2023). Solid waste handling and recycling would be conducted in accordance with federal, state, and local regulations. Philip Wind Partners plans to conduct a Phase I Environmental Site Assessment prior to Project construction and would develop a Spill Prevention Control and Countermeasures plan.

3.12.2 Environmental Consequences: Proposed Action

3.12.2.1 Environmental Commitments

Philip Wind Partners committed to implementing BMPs derived from the UGP PEIS and the Applicant's additional voluntary environmental protection measures. The impact summaries below consider health and safety-specific BMPs (see Appendix O and Table 2-3):

- Conduct site characterization, construction, O&M, and decommissioning activities in compliance with applicable federal and state occupational safety and health standards.
- Develop a Project health and safety program that addresses protection of public health and safety during Project site characterization, construction, O&M, and decommissioning activities.
- If on-site construction activity causes contamination or if contamination is encountered, the contamination would be reported to the SDDANR (SDDANR 2023).

3.12.2.2 Switchyard

3.12.2.2.1 ELECTRIC AND MAGNETIC FIELDS

EMFs may exist in electrical portions/devices of the Switchyard and along other existing t-lines. Portions of the Switchyard where EMFs may exist are usually not accessible to the public. The public may have greater access to transmission-related EMFs. The EPA recommended exposure to EMFs range from 0.5 to 2.5 milligauss (WAPA and USFWS 2015).

Given the National Institute of Environmental Health Sciences (2023) reports EMF levels from high-voltage t-lines decreases by ≥ 95% at 200 ft, and given the nearest residences would be ≈ 0.5 mile from the Switchyard, it is expected EMFs produced would dissipate before reaching residences, causing no measurable effect above background levels. There is little scientific consensus on adverse effects caused from EMFs created at the Switchyard.

3.12.2.2.2 NOISE AND INFRASOUND

There would be no measurable effects on public health related to noise and infrasound from the construction and O&M of the Switchyard. Further consequences due to noise are discussed in Section 3.5.2.

3.12.2.2.3 OCCUPATIONAL AND PHYSICAL HAZARDS

The Switchyard may be at risk of being a target of sabotage or terrorism. It is impossible to predict the frequency or severity of terrorism or acts of sabotage. Due to the remote nature and size of the Switchyard, damage/risk to nearby residences (the nearest is ≈ 0.5 mile away) would be negligible. Natural events, fire, and electric failure are risks that would be reduced as recommended in the UGP PEIS.

Exposure to occupational hazards by the Project staff would be minimal and would be similar to hazards present in other electrical industries. Workers would be near energized systems and would be responsible for handling heavy machinery and vehicles, which would add to hazard risks. Occupational hazards in the Switchyard would be like those in other industrial electrical facilities.

3.12.2.2.4 HAZARDOUS MATERIALS AND SOLID WASTE

Switchyard construction would use hazardous materials and generate solid waste. Hazardous materials, such as fuels and lubricants, would be handled according to regulations and industry BMPs, and disposed of at suitably permitted facilities. Solid waste generated that would not be reused would be disposed or managed at a permitted solid waste facility. Although there are eight known spills/environmental events and five registered storage tanks in and around the proposed Project area, all are closed or inactive (SDDANR 2023), so no impacts related to previous contamination within the proposed Project area are expected to occur.

Switchyard decommissioning impacts would be like those described for the construction of the Switchyard. Although decommissioning would entail increased temporary risks to worker safety due to increased activity and temporary increases from hazardous materials and solid wastes, decommissioning would ultimately remove operational risks from EMF, physical hazards, hazardous materials, and solid waste.

3.12.2.3 Wind Facility

3.12.2.3.1 ELECTRIC AND MAGNETIC FIELDS

The Wind Facility would produce the greatest EMFs near the substation, gen-tie line, and Basin Electric t-line. Given the National Institute of Environmental Health Sciences (2023) reports EMF levels from high-voltage t-lines decreases by ≥ 95% at 200 ft, and given the nearest residence would be ≈ 9,232 ft from the substation, ≈ 233 ft from a gen-tie line, and ≈ 2,310 ft from a Basin Electric t-line, it is expected EMFs produced would dissipate before reaching residences, causing no measurable effect above background levels.

3.12.2.3.2 NOISE AND INFRASOUND

Multiple studies have shown that there is no measurable correlation between infrasound from wind turbines and adverse health effects (Marshall et al. 2023; Michaud et al. 2016a; Michaud et al. 2016b; Schomer and Pamidighantam 2013; Smith et al. 2020; Roberts 2018). There would be no measurable effects on public health related to noise and infrasound from the construction and O&M of the Wind Facility. Further consequences due to noise are discussed in Section 3.5.2.

3.12.2.3.3 OCCUPATIONAL AND PHYSICAL HAZARDS

Wind farms create possibilities of physical hazards, both natural and anthropogenic. Based on the location of the nearest residents and the rarity of mechanical failure or ice throw, the proposed Project does not present a likely risk. Aviation risks will require turbine marking and lighting in compliance with the FAA's final marking and lighting plan (FAA 2015; 2020) and should not impact commercial aviation safety. Local aviation risks are consistent with the findings in the UGP PEIS. Natural hazards/events (i.e., earthquakes, intense storms, or tornadoes) may occur at all stages of the Project and may cause damage to the facility, creating economic damage and environmental consequences.

The Wind Facility may be a target for sabotage or terrorism, both of which are impossible to predict.

Exposure to occupational hazards by the Wind Facility staff would consist of similar hazards present in other electrical industries. Workers would likely be around energized systems, at high altitudes, and responsible for handling heavy machinery and vehicles, which would entail additional hazard risks.

3.12.2.3.4 HAZARDOUS MATERIALS AND SOLID WASTE

Construction of the Wind Facility would use hazardous materials and generate solid waste. Hazardous materials, such as fuels and lubricants, would be handled according to regulations and industry BMPs, and disposed of at suitably permitted facilities. Solid waste generated would be disposed of or managed at a permitted solid waste facility. Although there are eight known spills/environmental events and five registered storage tanks in and around the proposed Project area, all are closed or inactive (SDDANR 2023), so no impacts related to previous contamination within the proposed Project area are expected to occur.

Wind Facility decommissioning impacts would be like those described for construction of the Wind Facility. Decommissioning would entail increased temporary risks to worker safety due to increased activity and temporary increases from hazardous materials and solid wastes. Decommissioning would remove operational risks from EMF, physical hazards, hazardous materials, and solid waste.

3.12.2.4 Health and Safety Conclusion

The UGP PEIS assessed potential health and safety aspects of wind energy projects (Section 5.13 – Health and Safety), as well as hazardous materials and waste management (Section 5.12 – Hazardous Materials and Waste). Project components, such as the substation and t-line, may emit EMFs; however, EMFs dissipate to background levels in ≤ 200 ft (National Institute of Environmental Health Sciences 2023). Since no residences are ≤ 200 ft from these facilities, the EMF impacts of the Project would be negligible. The UGP PEIS considered potential impacts of infrasound. Sound levels of the Project would fall in ranges of those analyzed in the UGP PEIS, so effects would be consistent with those disclosed in the UGP PEIS. The UGP PEIS assessed occupational and physical hazards associated with construction and O&M of wind facilities, and expected impacts of this Project would not constitute a new or more severe significant impact. The UGP PEIS evaluated common hazardous materials and waste products associated with construction and O&M of wind facilities. This Project would use and manage those resources under relevant regulations and Project permits, so no new or more severe significant impacts would occur. The UGP PEIS analyzed health and safety risks consistent with those anticipated for the Project; therefore, no new or more severe significant impacts to health and safety would be anticipated.

3.12.3 Environmental Consequences: No Action Alternative

The No Action Alternative would not impact health and safety, and existing activities, conditions, and hazards would continue.

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4 CUMULATIVE IMPACTS

Cumulative impacts related to past, present, and reasonably foreseeable future actions on resources in the UGP Region are analyzed in Section 6 – Cumulative Impacts of the UGP PEIS. Cumulative impacts of the Project are within those analyzed in the UGP PEIS. Section 2.4 – Description of Potential Development Scenarios of the UGP PEIS projected increased wind energy development in the UGP Region through the year 2030. The geographic scope of the cumulative impacts analysis is dependent on the region of influence (ROI) for each resource. The UGP PEIS defines ROIs as the "encompassing areas of affected resources and distances at which impacts associated with the preferred alternative may occur." ROIs for the cumulative impact analysis by resource are discussed further in Table 6.1-1 of the UGP PEIS.

Past and present actions are reflected in the affected environment descriptions above in Section 3. These include conversion of native grassland to naturalized pasture and tilled cropland, water impoundments (dammed lakes and ponds), agricultural and rural residential structures, electric transmission and distribution infrastructure, and roadways (paved, gravel, and two-track roads). There are no energy conversion facilities operating, under construction, or reasonably foreseeable in or adjacent to the proposed Project area. There are no other wind projects proposed or under construction in Haakon County. No other large-scale energy developments exist or are proposed in the proposed Project area.

The construction and O&M of the Project would contribute to cumulative impacts to resources in the UGP Region. A summary of cumulative impacts associated with the UGP PEIS's preferred alternative, which the Project is a part of, is provided in Table 6.3-2 of the UGP PEIS. Table 4-1 below specifies resources with potential for cumulative impacts from the Project, and includes visual resources, cultural resources, noise, vegetation, wildlife (including special-status species), and land use. These impacts would be reduced during the construction and O&M of the Project through implementation of BMPs and conservation measures. Adverse impacts to other resources (e.g., water resources) resulting from the Project are anticipated to be negligible or nonexistent and therefore would not contribute to cumulative impacts and are not included in Table 4-1. The No Action Alternative would have no impacts to any resources, would not contribute to any cumulative impacts, and therefore is not included in Table 4-1.

Cumulative impacts would be minor due to the Applicant's implementation of associated UGP PEIS BMPs and voluntary environmental protection measures.

Table 4-1. Cumulative Impact Summary for the Proposed Action

Impacted Resource	Past, Present, & Reasonably Foreseeable Future Activities	Potential Cumulative Impact
Visual Cultural	Distribution and t-lines Residential and urban development Roads & highways	The Proposed Action would increase contrast on the surrounding landscape, which may impact cultural resources. Impacts would be reduced by adhering to UGP PEIS BMPs and voluntary environmental protection measures.
Noise	Agriculture Distribution and t-lines Hunting Residential and urban development Roads and highways	The Proposed Action would increase ambient sound. Impacts would be reduced by adhering to UGP PEIS BMPs and voluntary environmental protection measures.
Vegetation Wildlife (including special-status species) Land use	Agriculture Distribution and t-lines Grazing Hunting Residential and urban development Roads and highways	The Proposed Action would disturb vegetation, occupy land suitable for or adjacent to habitat or anthropogenic uses. These impacts are part of the historic trend of undeveloped land transitioning to development and agriculture. Impacts would be reduced by adhering to UGP PEIS BMPs, the PBA Consistency Evaluation Forms, and voluntary environmental protection measures.

5 CONSULTATION AND COORDINATION

A virtual public scoping meeting was held Thursday, January 19, 2023, from 5:00 to 7:00 p.m. Mountain Standard Time via the online meeting platform Zoom. Announcements about the scoping meeting were published in the local Pioneer Review newspaper and sent to landowners, stakeholders, and state and federal agencies. Members from WAPA, SWCA, Philip Wind Partners, and 20 individuals from the public attended this meeting.

Comments received during the public scoping period were considered while identifying issues and evaluating impacts in this EA. The public scoping meeting documentation and comments received from agencies and the public regarding the Project, as well as WAPA's responses, are provided in Appendix J.

Upon completion of the scoping meeting, agencies, the public, and stakeholders were invited to review and comment on the scope of the NEPA document during a 30-day public scoping period from January 19 to February 13, 2023. During this period, WAPA received 19 submissions. Comments were submitted verbally and by email, mail, and telephone. Submissions were received from two landowners or other stakeholders, three state agencies (SDDANR, SDGFP, and SHPO), and four federal agencies (U.S. Department of Transportation, BLM, Bureau of Indian Affairs, and EPA), which included 74 total comments. Comment topics included air quality and GHGs, wildlife and special-status species, vegetation, socioeconomics, noise, cultural resources and Native American concerns, water resources, hazardous materials and solid waste, public health and safety, the public involvement process, transportation and access, and the NEPA process. In total, 61 of the comments resulted in responses included in Appendix J, which were addressed in the Draft EA. The remaining 13 comments provided information or statements that did not require a response.

The Draft EA was released for public comment on February 14, 2024, and comments were received through March 16, 2024. During this public review period, WAPA received seven public comment submissions. Submissions were received from two landowners or other stakeholders and three state agencies (SDDANR, NRCS South Dakota State Office, and SHPO), which included 22 total substantive comments. Public review comments and responses are provided in Appendix J. Comments focused on water resources, socioeconomics, land use, air quality and GHGs, hazardous materials and solid waste, vegetation, soils, wildlife, and cultural resources. This document has addressed those comments where applicable.

5.1 FEDERAL AGENCIES

The following federal agencies were contacted for the purpose of the EA scoping process:

- Advisory Council on Historic Preservation
- Federal Emergency Management Agency, Region VIII
- Federal Energy Regulatory Commission, Office of Energy Projects
- Federal Highway Administration, South Dakota Division
- NRCS, South Dakota State Office
- USACE, South Dakota Regulatory Office
- U.S. Department of the Interior, Bureau of Indian Affairs, Great Plains Regional Office
- U.S. Department of the Interior, BLM, South Dakota Regional Office

- EPA Region 8
- USDA, Rural Utilities Service, Water and Environmental Program
- USDA, South Dakota State Farm Service Agency
- USGS, Midwest Region
- U.S. Department of Transportation, FAA, Great Lakes Region
- USFWS
- USFWS, South Dakota Field Office
- U.S. House of Representatives
- U.S. Senate

5.2 STATE AND LOCAL AGENCIES

The following state and local agencies were contacted for the purpose of the EA scoping process:

- Governor's Office of Economic Development
- Haakon County Conservation District
- Haakon County Historical Society
- SDDANR
- SDDANR, Division of Agriculture and Environmental Services
- South Dakota Department of Transportation
- South Dakota Department of Tribal Relations
- SDGFP
- South Dakota House of Representatives, District 27
- South Dakota Office of the Governor
- SDPUC
- South Dakota School and Public Lands
- South Dakota Senate, District 27
- South Dakota SHPO

5.3 NATIVE AMERICAN TRIBES

Pursuant to Section 106 of the NHPA, WAPA initiated Tribal consultations with the following 10 Tribes, by letter on December 7, 2022, regarding the Project:

- Apache Tribe of Oklahoma
- Cheyenne and Arapaho Tribes, Oklahoma
- Cheyenne River Sioux Tribe
- Crow Creek Sioux Tribe

- Fort Belknap Indian Community
- Lower Brule Sioux Tribe
- Oglala Sioux Tribe
- Rosebud Sioux Tribe
- Santee Sioux Nation
- Standing Rock Sioux Tribe

The Standing Rock Sioux, the Rosebud Sioux, the Cheyenne River Sioux, and the Northern Cheyenne Tribes all participated in consultation. No responses were received from the other invited Tribes.

5.4 NON-GOVERNMENTAL ORGANIZATIONS

The following non-governmental organizations were contacted to participate in the EA scoping process:

- Midland Historical Society
- West River Historical Society

No response to the invitation to participate was received from these organizations.

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6 LIST OF PREPARERS

Table 6-1 identifies personnel responsible for preparing this EA.

Table 6-1. List of Environmental Assessment Preparers

Name	Position	Role
John Russell	WAPA Environmental Manager	UGP NEPA compliance officer
Spenser Kuhn	WAPA Environmental Compliance Specialist	UGP NEPA coordinator
Staffan Peterson	WAPA Archaeologist	Cultural specialist and Tribal liaison
Lisa Meyer	WAPA Archaeologist	Deputy federal preservation officer
Brian Pauly	WAPA Biologist	Headquarters biologist
Hilary Morey	WAPA Biologist	UGP regional biologist
Martin Piorkowski	Western EcoSystems Technology, Inc. Consulting Ecologist	Project management
Johanna Sievewright	Philip Wind Partners, LLC	Permitting manager
Michelle Phillips	Philip Wind Partners, LLC	Permitting manager
Alexander Chandler	Philip Wind Partners, LLC	Project developer
Carleigh Houghtling	Philip Wind Partners, LLC	Project developer
Matt Zoss	SWCA Project Manager, NEPA Specialist	Project management, NEPA oversight
Julia Aaronson	SWCA Assistant Project Manager	Project management
Victoria Edwards	NEPA Specialist	Project management, land use and public facilities, noise
David Fetter	SWCA Senior NEPA Lead	Senior NEPA oversight
Sarah Lupis	SWCA NEPA Specialist	Public involvement specialist
Matt Hull	SWCA Cultural Resources Specialist	Cultural resources
Andrea Hannan	SWCA Biologist	Wildlife; threatened, endangered and special-status species; hydrologic setting and water resources
Andrew Gerwitz	SWCA Paleontologist	Geology, soil resources, paleontology
Annie Ng	SWCA NEPA Specialist	Socioeconomics, air quality
Mallory Phillips	SWCA NEPA Specialist	Visual resources
Trevor Herritt	SWCA NEPA Specialist	Vegetation, health and safety
Seth Gately	SWCA Air Quality Specialist	Air quality oversight

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