Application to the South Dakota Public Utilities Commission for a Facility Permit

Dakota Range III, LLC

Dakota Range III Wind Power Facility

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Grant and Roberts Counties, South Dakota

prepared by

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LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
ADLS	Aircraft Detection Lighting System
ADT	Average Daily Traffic
AMSL	above mean sea level
ANSI	American National Standards Institute
APE	area of potential effects
Apex	Apex Clean Energy Holdings, LLC
APLIC	Avian Power Line Interaction Committee
Applicant	Dakota Range III, LLC
Application	Application for Facility Permit
ARSD	Administrative Rules of South Dakota
BBCS	Bird and Bat Conservation Strategy
BCC	Birds of Conservation Concern
BCR	Bird Conservation Region
BGEPA	Bald and Golden Eagle Protection Act
BMPs	best management practices
CFR	Code of Federal Regulations
CMWS	composite mean wind speeds
Commission	South Dakota Public Utilities Commission
CWA	Clean Water Act
Dakota Range III	Dakota Range III, LLC
DASK	Dakota skipper

Abbreviation	Term/Phrase/Name
dB	Decibel
dBA	A-weighted decibels
DoD	Department of Defense
ECPG	Eagle Conservation Plan Guidance
EIA	U.S. Energy Information Administration
Energy Facility Siting Rules	SDCL Chapter 49-41B and ARSD Chapter 20:10:22
EPA	U.S. Environmental Protection Agency
ERA	European Centre for Medium-Range Weather Forecasts Re-Analysis
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
GW	gigawatt
HDD	horizontally directionally drill
HPAs	High Probability Areas
Hz	Hertz
IEC	International Electrotechnical Commission
IPaC	Information for Planning and Conservation
IRAC	Interdepartmental Radio Advisory Committee
IRP	Integrated Resource Plan
ITC	Interstate Telecommunications Cooperative, Inc.
JPO	Joint Program Office

Abbreviation	Term/Phrase/Name
Ksat	saturated hydraulic conductivity
kV	kilovolt
kWh	kilowatt hour
Manual	Corps of Engineers Wetland Delineation Manual
m/s	meters per second
MERRA	Modern Era Retrospective-Analysis for Research and Application
MISO	Midcontinent Independent System Operator, Inc.
MVA	megavolt-ampere
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NASS	National Agricultural Statistics Service
NCAR	National Center for Atmospheric Research
NCEP	National Centers for Environmental Prediction
NLCD	National Land Cover Database
NLEB	northern long-eared bat
NNRP	NCEP/NCAR Reanalysis Project
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRI	Nationwide Rivers Inventory
NTIA	National Telecommunications Information Administration
NWI	National Wetland Inventory

Abbreviation	Term/Phrase/Name
NWP	Nationwide Permit
O&M	operations and maintenance
PEM	Palustrine Emergent
PFO	Palustrine Forested
PGA	peak ground acceleration
POSK	Poweshiek skipperling
PPA	Power Purchase Agreement
Project	Dakota Range III Project
Project Area	18,717-acre area
PSS	Palustrine Scrub-Shrub
PTC	Production Tax Credit
RD	rotor diameter
RF	radio frequency
RPSs	renewable portfolio standards
ROW	right-of-way
ROWs	rights-of-way
RUSLE	Revised Universal Soil Loss Equation
SCADA	supervisory control and data acquisition
SDCL	South Dakota Codified Laws
SDDENR	South Dakota Department of Environment and Natural Resources
SDDLR	South Dakota Department of Labor and Regulation
SDDOA	South Dakota Department of Agriculture

Abbreviation	Term/Phrase/Name
SDDOT	South Dakota Department of Transportation
SDGFP	South Dakota Game, Fish, and Parks
SDGS	South Dakota Geological Survey
SGCN	Species of Greatest Conservation Need
SHPO	State Historic Preservation Office
SLM	sound level meter
SWAP	State Wildlife Action Plan
SWO	Sisseton-Wahpeton Oyate
SWPPP	Storm Water Pollution Prevention Plan
TCP	Traditional Cultural Property
THPO	Tribal Historic Preservation Officer
TMDL	total maximum daily load
Transmission Easement	Grant of Easement and Easement Agreements for Transmission Facilities
Transmission Facility	345-kV interconnection transmission line
TSS	total suspended solids
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USLE	Universal Soil Loss Equation
Vaisala	Vaisala, LLC
WEG	Wind Energy Guidelines

Abbreviation	Term/Phrase/Name
WES	Wind Energy Systems
WEST	Western Ecosystems Technology, Inc.
Wind Lease	Wind Energy Lease and Wind Easement Agreement
Wind Project	151.2-MW wind energy conversion facility
WNS	white-nose syndrome
WPAs	Waterfowl Production Areas

1.0 INTRODUCTION

Dakota Range III, LLC (Dakota Range III or Applicant) is requesting Facility Permits from the South Dakota Public Utilities Commission (Commission) for an up to 151.2-megawatt (MW) wind energy conversion facility (Wind Project) and associated approximately 8-mile 345-kilovolt (kV) interconnection transmission line (Transmission Facility) to be located in Grant County and Roberts County, South Dakota. The Wind Project and the Transmission Facility are collectively referred to as the Dakota Range III Project (Project).

The Project would be situated within an approximately 18,717-acre area ([Project Area], Figure 1 in Appendix A), and the total installed capacity of the Project would not exceed 151.2 MW. Project components would include:

- Up to 42 wind turbine generators;
- Access roads to turbines and associated facilities;
- Underground 34.5-kV electrical collector lines connecting the turbines to the collection substation;
- Underground fiber-optic cable for turbine communications co-located with the collector lines;
- A 34.5- to 345-kV collection substation;
- Up to 3 permanent meteorological towers;
- An approximate 8-mile, 345-kV interconnection transmission line connecting the collector substation and the interconnection switching station;
- An operations and maintenance (O&M) facility; and
- Additional temporary construction areas, including laydown and batch plant areas.

Dakota Range III is wholly owned subsidiary of Apex Clean Energy Holdings, LLC (Apex), which is assisting Dakota Range III in Project development. Apex is an independent renewable energy company based in Charlottesville, Virginia. Apex has diversified portfolios of renewable energy resources capable of producing more than 14,000 MW of clean energy. Apex has brought over 2,200 MW online since 2012, and operating assets under management are approximately 1.2 gigawatts (GW) as of the third quarter of 2018. Apex has one of the nation’s largest, most diversified portfolios of renewable energy resources and has the experience, skills, personnel, and proven capability to successfully manage wind and solar project development. Apex offers comprehensive in-house capabilities, including site origination, financing, construction, and long-term asset management services, and works with

corporations, utilities, and government entities, including Northern States Power Company d/b/a Xcel Energy, AEP, Southern Power, IKEA, the U.S. Army, and Steelcase.

2.0 PROJECT DEVELOPMENT SUMMARY

In March 2015, Apex acquired the Project assets from a small local developer, Wahpeton Wind. At the time of acquisition, approximately 10,000 acres were under lease. Because the Project was acquired after initial site selection, and a specific area was offered for sale, Apex was not involved in considering alternative locations outside of Grant and Roberts Counties. Apex's interest in acquiring the Project was due to the high wind resource, available transmission capacity, and strong interest from the landowners within the area. Since acquisition of the Project, the Applicant has undertaken extensive development activities, consisting of landowner outreach and easement acquisition, detailed studies of resources in the Project Area, coordination with resource agencies, county outreach, design and refinement of the Project layout, and off-take marketing. Environmental and wildlife survey information collected to date has been used to inform siting of Project infrastructure to avoid and minimize potential impacts to cultural and wildlife resources. Following is a summary of these activities:

Community Outreach and Land Acquisition – The Applicant began meeting with landowners in March 2018. A landowner open house was hosted to review site plans on July 11, 2018 in Grant County, and another open house was held for the public in Roberts County on October 2, 2018. Please see Table 2.1 below for a complete list of community outreach for this Project. In addition to open houses, other community outreach events/activities conducted between mid-May through early October 2018 included, Brookings County outreach, advertising of the Project via radio on KXLG and Big Stone Radio; newspaper ads in Grant County Review and Watertown Public Opinion; sponsorship of the Cones and Kites event in Grant County; and, sponsorship and attendance at the Sisseton Wahpeton College Rodeo.

Table 2-1: Community Outreach and Land Acquisition for Dakota Range III Project

Meeting	Date
Presentation of Project to Milbank Chamber of Commerce	January 15, 2018
Landowner Open House	March 13, 2018
Presentation to First District	April 17, 2018
Landowner newsletter update	April/May 2018
Landowner Update Presentation	May 9 & September 26, 2018
Pre-permitting meetings – Grant and Roberts Counties	May 14 & 15, 2018
Roberts County meeting	May 23, 2018
Small landowner meetings	June 11, July 9, & August 13, 2018
Rotary Club Presentation	June 28, 2018

Meeting	Date
Meetings with Sisseton Chamber of Commerce, Tri-State Extension Group, and Roberts County 4-H and toured Lake Area Technical Institute	August 15, 2018
Grow Sisseton Presentation	September 12, 2018
Meeting with Pheasant Country Radio and a Meet and Greet with Sisseton Chamber of Commerce	September 25, 2018
Meeting with Grant County Economic Development Cooperation and Grant County Review	September 27, 2018
Meeting with Sisseton Wahpeton College Vice President and President	October 11, 2018

Land rights were obtained through voluntary Wind Energy Lease and Wind Easement Agreement (Wind Lease) from the property owners within the Wind Project boundary. Along the four miles of the Transmission Facility route that is outside of the Wind Project boundary, but within the Dakota Range I and Dakota Range II Project boundary, Dakota Range III secured Grant of Easement and Easement Agreements for Transmission Facilities (Transmission Easement).

Agency Coordination – The Applicant conducted coordination with various agencies throughout Project planning and development. The Applicant conducted a wildlife coordination meeting with the U.S. Fish and Wildlife Service (USFWS) and South Dakota Game, Fish, and Parks (SDGFP) on October 24, 2017, to agree on study plans and discuss impact avoidance and minimization measures. The Applicant will meet with the USFWS and SDGFP to discuss the results of the Tier III USFWS Wind Energy Guidelines (WEG) and agency recommended studies conducted to date in November 2018. A follow up communication occurred on June 26, 2018 to discuss the placement of acoustic detection locations. A coordination meeting with the State Historic Preservation Office (SHPO) was held on July 25, 2018. Furthermore, the Applicant has engaged in ongoing coordination with the Sisseton-Wahpeton Oyate (SWO) regarding impact avoidance for sensitive tribal resources. Agency coordination is discussed in Section 28.2, and Appendix B provides copies of agency correspondence.

Environmental Analysis – The environmental studies and field surveys conducted for the Project are summarized in Table 2-2.

Table 2-2: Studies and Surveys for the Dakota Range III Project

Study	Dates	Status
Radio Frequency Impact Study	September 19, 2018	Complete

Study	Dates	Status
Raptor nest surveys	April 2018	Complete
Avian use surveys	December 2015 – May 2017 and September 2017 – August 2018	Complete
Prairie grouse lek surveys	April – May 2018	Complete
Dakota skipper/Poweshiek skipperling habitat survey	June 2018 and September 2018	Field survey complete, report pending*
Bat acoustic surveys	May 1 – October 15, 2018	Field survey complete; report pending*
Level I cultural resources records search	August 2018	Complete
Level III intensive cultural resources survey within Project disturbance footprint	August, September, and October 2018	Ongoing*
Additional cultural resources survey for sensitive tribal resources in coordination with Sisseton-Wahpeton Oyate	August, September, and October 2018	Ongoing*
Historical/Architectural survey	August 2018	Ongoing*
Wetland and Waterbodies delineation	July, August, September, and October 2018	Ongoing*
Noise modeling	October 2018	Complete
Shadow flicker analysis	October 2018	Complete

* Although these studies are listed as either "Ongoing" or "Field survey complete; report pending," applicable resource and field survey data from these efforts have been incorporated into the impact conclusions provided in this Application, unless otherwise noted in the respective resource sections. The results of the bat study is the only respective section where results have not been included.

County Permitting – The Applicant conducted pre-application meetings with Grant and Roberts Counties in May 2018. Dakota Range III plans to submit the Conditional Use Permit applications in November 2018. County permitting is discussed in Chapter 17.0.

Purchase and Off-Take Agreements – Apex does not currently have a Purchase Agreement or Off-Take Agreement (such as a Power Purchase Agreement [PPA]) for the Project, but is currently in discussions with interested parties.

Project Design – The results of the various studies and coordination activities listed above, along with applicable setback requirements, have been used to inform the site layout and design of the Project. Final micro-siting of Project facilities will continue to occur between now and the spring of 2019, Phase I Environmental Site Assessment, wetland and waterbodies evaluations, cultural and tribal resource surveys, geotechnical analysis, and final engineering design. As discussed in more detail in the sections

that follow, the remaining study work is not anticipated to affect the environmental analysis set forth in this Application for Facility Permit (Application), nor will it prevent the Project from meeting all applicable local, State, and federal permitting requirements.

3.0 FACILITY PERMIT APPLICATION

In accordance with South Dakota Codified Laws (SDCL) Chapter 49-41B and Administrative Rules of South Dakota (ARSD) Chapter 20:10:22, the Application provides information on the existing environment, potential Project impacts, and proposed avoidance, minimization, and/or mitigation measures for the following resources:

- Physical (geology, economic deposits, soils) (see Chapter 12.0);
- Hydrology (surface water and groundwater) (see Chapter 13.0);
- Terrestrial ecosystems (vegetation, wetlands, wildlife, threatened and endangered species) (see Chapter 14.0);
- Aquatic ecosystems (see Chapter 15.0);
- Land use (agriculture, residential, displacement, sound, aesthetics, electromagnetic interference, safety and health, real estate values) (see Chapter 16.0);
- Water quality (see Chapter 18.0);
- Air quality (see Chapter 19.0); and
- Communities (socioeconomics, transportation and emergency response, cultural resources) (see Chapter 21.0).

Based on the analysis completed by Dakota Range III, the Project is not expected to have significant impacts on the environment. Approximately 132 acres of permanent disturbance is expected during the life of the Project. This represents less than 1 percent of the total acreage within the Project Area, and disturbances would be dispersed throughout the Project Area.

The Project has minimized impacts to wetland areas. Wind turbines, transmission line structures, and access roads are generally located in upland areas, avoiding low-lying wetlands and drainage ways. Based on the impact avoidance and minimization measures described above, impacts to wetlands and waterbodies are minor and would be authorized under the U.S. Army Corps of Engineers (USACE) Nationwide Permit (NWP) 12 for utility lines and associated facilities in waters of the U.S. Any revisions to the layout would ensure compliance with the federal Clean Water Act (CWA) Section 404 permitting process.

Most land proposed to be directly affected by Project construction is cropland. Siting of Project infrastructure has been implemented to maximize placement in areas previously disturbed by agricultural activities. Construction of Project facilities and temporary and permanent disturbances in cropland or

grassland is not expected to negatively affect terrestrial ecosystems. Best management practices (BMPs) would be utilized to avoid or reduce impacts to the vegetation and water resources within the Project Area during construction. The Project avoids USFWS Grassland, Conservation, or Wetland Easements. However, a collection line between alternate turbine G12 and turbine G13 could potentially occur on a USFWS Wetland Easement, if both alternate wind turbines were selected for operation. However, to avoid any impact to the USFWS Wetland Easement, the Applicant would propose to horizontal directionally drill (HDD) the collection line under the defined wetland easement boundary to avoid any impacts.

The USFWS WEG, Tiers I and II site assessments, Tier III studies completed to date, and agency coordination with USFWS and SDGFP indicate the Project presents a low risk of impacts to threatened or endangered species. The Project will implement further avoidance and minimization measures to further reduce potential impacts to protected species (see Section 14.3.2).

Existing land uses are not anticipated to be significantly changed or impacted by the Project. Sound from the Project construction activities would be temporary. Once the Project is operational, sound from the turbines and other facilities would be limited per applicable county requirements (see Section 16.3.2).

Construction activities for this Project would be short-term, and no negative impact to the socioeconomics of the area is expected. Project construction is anticipated to provide economic benefits to businesses and landowners in the region.

During Project construction, fugitive dust emissions would increase due to vehicle and equipment traffic in the area. The additional particulate matter emissions would not exceed the National Ambient Air Quality Standards (NAAQS). The wind turbines would not produce air emissions during operation.

A cultural resource Level I records review for the Project Area identified previously recorded archaeological and historic resources located within or near the Project Area. Intensive cultural resource surveys will be completed in October 2018 in coordination with the SHPO. In addition, the Applicant has engaged in ongoing voluntary coordination with the SWO Tribal Historic Preservation Officer (THPO). Coordination has included having THPO-trained cultural staff involved in the intensive field surveys to identify traditional cultural property (TCP) locations. The Applicant will work cooperatively with the SHPO to avoid impacts to National Register of Historic Places (NRHP) eligible cultural resources and will coordinate with SWO to avoid identified TCPs.

Additional avoidance and minimization measures proposed for the Project include the following:

- Wind turbines will be illuminated as required by Federal Aviation Administration (FAA) regulations and will also employ an Aircraft Detection Lighting System (ADLS), subject to availability and FAA approval.
- Existing roads will be used for construction and maintenance, where possible;
- Access roads created for the Project will be located to limit cuts and fills;
- Temporarily disturbed uncultivated areas will be reseeded with either Natural Resource Conservation Service recommended seed mixture and/or a seed mixture specifically requested by the landowner;
- BMPs to be implemented in accordance with the Storm Water Pollution Prevention Plan (SWPPP) will be used during construction to control erosion and avoid or reduce impacts to drainage ways and streams from sediment-laden runoff from exposed soils;
- The Applicant will avoid permanent impacts to land held for conservation purposes via USFWS Wetland and Grassland Easements. Temporary impacts to USFWS Wetland and Grassland Easements are not expected; as noted above, should the alternate turbine G12 and turbine G13 be utilized for the Project, the Applicant would propose to use HDD at these locations, to avoid impacts to USFWS easements areas in proximity to these two alternate turbines.
- The Applicant will avoid or minimize impacts to undisturbed grasslands;
- The Applicant will comply with applicable setbacks, conditions, and siting standards required by State and local governing bodies;
- The Project will comply with the Grant and Roberts County noise requirements; and
- The Project will limit shadow flicker to 30 hours per year or less at non-participating residences, businesses, and buildings owned and/or maintained by a governmental entity. The Applicant will take steps to mitigate shadow flicker concerns at residences that could experience shadow flicker levels above 30 hours per year.

In this Application, the Applicant has addressed each matter set forth in SDCL Chapter 49-41B and in ARSD Chapter 20:10:22 (Energy Facility Siting Rules) related to wind energy facilities. Included with this Application is a Completeness Checklist (Table 4-1) that sets forth where in the Application each rule requirement is addressed.

Pursuant to SDCL 49-41B-22, the information presented here establishes that:

- The proposed wind energy facility complies with applicable laws and rules;
- The facility will not pose a threat of serious injury to the environment or to the social and economic condition of inhabitants in, or near, the Project Area;

- The facility will not substantially impair the health, safety, or welfare of the inhabitants; and
- The facility will not unduly interfere with the orderly development of the region, having considered the views of the governing bodies of the local affected units of government.

4.0 COMPLETENESS CHECKLIST

The contents required for an application with the Commission are described in SDCL 49-41B and further clarified in ARSD 20:10:22:01(1) et seq. The Commission submittal requirements are listed in Table 4-1 with cross-references indicating where the information can be found in this Application.

Table 4-1: Completeness Checklist

South Dakota Codified Law (SDCL)	Administrative Rules of South Dakota (ARSD)	Required Information	Location
49-41B-22	N/A	**Applicant's burden of proof.** The applicant has the burden of proof to establish that: (1) The proposed facility will comply with all applicable laws and rules; (2) The facility will not pose a threat of serious injury to the environment nor to the social and economic condition of inhabitants or expected inhabitants in the siting area; (3) The facility will not substantially impair the health, safety, or welfare of the inhabitants; and (4) The facility will not unduly interfere with the orderly development of the region with due consideration having been given the views of governing bodies of affected local units of government.	Chapter 3.0

South Dakota Codified Law (SDCL)	Administrative Rules of South Dakota (ARSD)	Required Information	Location
49-41B-11(1-12)	20.10.22.05	**Application contents.** The application for a permit for a facility shall contain the applicable information specified in §§ 20:10:22:06 to 20:10:22:25, inclusive, 20:10:22:36, and 20:10:22:39. If the application is for a permit for an energy conversion facility, it shall also contain the information specified in §§ 20:10:22:26 to 20:10:22:33, inclusive. If the application is for a permit for a transmission facility as defined in SDCL subdivision 49-41B-2.1(1), it shall also contain the information in §§ 20:10:22:34 and 20:10:22:35. If the application is for a permit for a transmission facility as defined in SDCL subdivision 49-41B-2.1(2), it shall also contain the information in §§ 20:10:22:37 and 20:10:22:38. If the application is for a permit for a wind energy facility, it shall also contain the information in §§ 20:10:22:33.01 and 20:10:22:33.02. The application for a permit for a facility shall contain a list of each permit that is known to be required from any other governmental entity at the time of the filing. The list of permits shall be updated, if needed, to include any permit the applicant becomes aware of after filing the application. The list shall state when each permit application will be filed. The application shall also list each notification that is required to be made to any other governmental entity.	Chapters 5.0-29.0
49-41B-11(1)	20:10:22:06	**Names of participants required.** The application shall contain the name, address, and telephone number of all persons participating in the proposed facility at the time of filing, as well as the names of any individuals authorized to receive communications relating to the application on behalf of those persons.	Chapter 5.0

South Dakota Codified Law (SDCL)	Administrative Rules of South Dakota (ARSD)	Required Information	Location
49-41B-11(7)	20:10:22:07	**Name of owner and manager.** The application shall contain a complete description of the current and proposed rights of ownership of the proposed facility. It shall also contain the name of the project manager of the proposed facility.	Chapter 6.0
49-41B-11(8)	20:10:22:08	**Purpose of facility.** The applicant shall describe the purpose of the proposed facility.	Chapter 7.0
49-41B-11(12)	20:10:22:09	**Estimated cost of facility.** The applicant shall describe the estimated construction cost of the proposed facility.	Chapter 8.0
49-41B-11(9)	20:10:22:10	**Demand for facility.** The applicant shall provide a description of present and estimated consumer demand and estimated future energy needs of those customers to be directly served by the proposed facility. The applicant shall also provide data, data sources, assumptions, forecast methods or models, or other reasoning upon which the description is based. This statement shall also include information on the relative contribution to any power or energy distribution network or pool that the proposed facility is projected to supply and a statement on the consequences of delay or termination of the construction of the facility.	Chapter 7.0
49-41B-11(2)	20:10:22:11	**General site description.** The application shall contain a general site description of the proposed facility including a description of the specific site and its location with respect to state, county, and other political subdivisions; a map showing prominent features such as cities, lakes and rivers; and maps showing cemeteries, places of historical significance, transportation facilities, or other public facilities adjacent to or abutting the plant or transmission site.	Chapter 9.0 Figures 1, 10, 12, and 13 in Appendix A

South Dakota Codified Law (SDCL)	Administrative Rules of South Dakota (ARSD)	Required Information	Location
49-41B-11(6); 49-41B-21; 34A-9-7(4)	20:10:22:12	**Alternative sites.** The applicant shall present information related to its selection of the proposed site for the facility, including the following: (1) The general criteria used to select alternative sites, how these criteria were measured and weighed, and reasons for selecting these criteria; (2) An evaluation of alternative sites considered by the applicant for the facility; (3) An evaluation of the proposed plant, wind energy, or transmission site and its advantages over the other alternative sites considered by the applicant, including a discussion of the extent to which reliance upon eminent domain powers could be reduced by use of an alternative site, alternative generation method, or alternative waste handling method.	Chapter 10.0

South Dakota Codified Law (SDCL)	Administrative Rules of South Dakota (ARSD)	Required Information	Location
49-41B-11(2,11); 49-41B-21; 49-41B-22(2)	20:10:22:13	**Environmental information.** The applicant shall provide a description of the existing environment at the time of the submission of the application, estimates of changes in the existing environment which are anticipated to result from construction and operation of the proposed facility, and identification of irreversible changes which are anticipated to remain beyond the operating lifetime of the facility. The environmental effects shall be calculated to reveal and assess demonstrated or suspected hazards to the health and welfare of human, plant and animal communities which may be cumulative or synergistic consequences of siting the proposed facility in combination with any operating energy conversion facilities, existing or under construction. The applicant shall provide a list of other major industrial facilities under regulation which may have an adverse effect on the environment as a result of their construction or operation in the transmission site, wind energy site, or siting area.	Chapters 11.0, 12.0, 13.0, 14.0, 15.0, 16.0, 18.0, 19.0, and 21.0

South Dakota Codified Law (SDCL)	Administrative Rules of South Dakota (ARSD)	Required Information	Location
49-41B-11(2,11); 49-41B-21; 49-41B-22(2)	20:10:22:14	**Effect on physical environment.** The applicant shall provide information describing the effect of the proposed facility on the physical environment. The information shall include: (1) A written description of the regional land forms surrounding the proposed plant or wind energy site or through which the transmission facility will pass; (2) A topographic map of the plant, wind energy, or transmission site; (3) A written summary of the geological features of the plant, wind energy, or transmission site using the topographic map as a base showing the bedrock geology and surficial geology with sufficient cross-sections to depict the major subsurface variations in the siting area; (4) A description and location of economic deposits such as lignite, sand and gravel, scoria, and industrial and ceramic quality clay existent within the plant, wind energy, or transmission site; (5) A description of the soil type at the plant, wind energy, or transmission site; (6) An analysis of potential erosion or sedimentation which may result from site clearing, construction, or operating activities and measures which will be taken for their control; (7) Information on areas of seismic risks, subsidence potential and slope instability for the plant, wind energy, or transmission site; and (8) An analysis of any constraints that may be imposed by geological characteristics on the design, construction, or operation of the proposed facility and a description of plans to offset such constraints.	Chapter 12.0 Figures 6, 7a, 7b, 8, and 9

South Dakota Codified Law (SDCL)	Administrative Rules of South Dakota (ARSD)	Required Information	Location
49-41B-11(2,11); 49-41B-21; 49-41B-22(2)	20:10:22:15	**Hydrology.** The applicant shall provide information concerning the hydrology in the area of the proposed plant, wind energy, or transmission site and the effect of the proposed site on surface and groundwater. The information shall include: (1) A map drawn to scale of the plant, wind energy, or transmission site showing surface water drainage patterns before and anticipated patterns after construction of the facility; (2) Using plans filed with any local, state, or federal agencies, indication on a map drawn to scale of the current planned water uses by communities, agriculture, recreation, fish, and wildlife which may be affected by the location of the proposed facility and a summary of those effects; (3) A map drawn to scale locating any known surface or groundwater supplies within the siting area to be used as a water source or a direct water discharge site for the proposed facility and all offsite pipelines or channels required for water transmission; (4) If aquifers are to be used as a source of potable water supply or process water, specifications of the aquifers to be used and definition of their characteristics, including the capacity of the aquifer to yield water, the estimated recharge rate, and the quality of groundwater; (5) A description of designs for storage, reprocessing, and cooling prior to discharge of heated water entering natural drainage systems; and (6) If deep well injection is to be used for effluent disposal, a description of the reservoir storage capacity, rate of injection, and confinement characteristics and potential negative effects on any aquifers and groundwater users which may be affected.	Chapter 13.0 Figure 10

South Dakota Codified Law (SDCL)	Administrative Rules of South Dakota (ARSD)	Required Information	Location
49-41B-11(2,11); 49-41B-21; 49-41B-22(2)	20:10:22:16	**Effect on terrestrial ecosystems.** The applicant shall provide information on the effect of the proposed facility on the terrestrial ecosystems, including existing information resulting from biological surveys conducted to identify and quantify the terrestrial fauna and flora potentially affected within the transmission site, wind energy site, or siting area; an analysis of the impact of construction and operation of the proposed facility on the terrestrial biotic environment, including breeding times and places and pathways of migration; important species; and planned measures to ameliorate negative biological impacts as a result of construction and operation of the proposed facility.	Chapter 14.0
49-41B-11(2,11); 49-41B-21; 49-41B-22(2)	20:10:22:17	**Effect on aquatic ecosystems.** The applicant shall provide information of the effect of the proposed facility on aquatic ecosystems, and including existing information resulting from biological surveys conducted to identify and quantify the aquatic fauna and flora, potentially affected within the transmission site, wind energy site, or siting area, an analysis of the impact of the construction and operation of the proposed facility on the total aquatic biotic environment and planned measures to ameliorate negative biological impacts as a result of construction and operation of the proposed facility.	Chapter 15.0

South Dakota Codified Law (SDCL)	Administrative Rules of South Dakota (ARSD)	Required Information	Location
49-41B-11(2,11); 49-41B-22(2)	20:10:22:18	**Land use.** The applicant shall provide the following information concerning present and anticipated use or condition of the land: (1) A map or maps drawn to scale of the plant, wind energy, or transmission site identifying existing land use according to the following classification system: (a) Land used primarily for row and non-row crops in rotation; (b) Irrigated lands; (c) Pasturelands and rangelands; (d) Haylands; (e) Undisturbed native grasslands; (f) Existing and potential extractive nonrenewable resources; (g) Other major industries; (h) Rural residences and farmsteads, family farms, and ranches; (i) Residential; (j) Public, commercial, and institutional use; (k) Municipal water supply and water sources for organized rural water systems; and (l) Noise sensitive land uses; (2) Identification of the number of persons and homes which will be displaced by the location of the proposed facility; (3) An analysis of the compatibility of the proposed facility with present land use of the surrounding area, with special attention paid to the effects on rural life and the business of farming; and (4) A general analysis of the effects of the proposed facility and associated facilities on land uses and the planned measures to ameliorate adverse impacts.	Chapters 16.0 and 21.0 Figure 12

South Dakota Codified Law (SDCL)	Administrative Rules of South Dakota (ARSD)	Required Information	Location
49-41B-11(2,11); 49-41B-28	20:10:22:19	**Local land use controls.** The applicant shall provide a general description of local land use controls and the manner in which the proposed facility will comply with the local land use zoning or building rules, regulations or ordinances. If the proposed facility violates local land use controls, the applicant shall provide the commission with a detailed explanation of the reasons why the proposed facility should preempt the local controls. The explanation shall include a detailed description of the restrictiveness of the local controls in view of existing technology, factors of cost, economics, needs of parties, or any additional information to aid the commission in determining whether a permit may supersede or preempt a local control pursuant to SDCL 49-41B-28.	Chapter 17.0
49-41B-11(2,11); 49-41B-21; 49-41B-22	20:10:22:20	**Water quality.** The applicant shall provide evidence that the proposed facility will comply with all water quality standards and regulations of any federal or state agency having jurisdiction and any variances permitted.	Chapter 18.0
49-41B-11(2,11); 49-41B-21; 49-41B-22	20:10:22:21	**Air quality.** The applicant shall provide evidence that the proposed facility will comply with all air quality standards and regulations of any federal or state agency having jurisdiction and any variances permitted.	Chapter 19.0
49-41B-11(3)	20:10:22:22	**Time schedule.** The applicant shall provide estimated time schedules for accomplishment of major events in the commencement and duration of construction of the proposed facility.	Chapter 20.0

South Dakota Codified Law (SDCL)	Administrative Rules of South Dakota (ARSD)	Required Information	Location
49-41B-11(3); 49-41B-22	20:10:22:23	**Community impact.** The applicant shall include an identification and analysis of the effects the construction, operation, and maintenance of the proposed facility will have on the anticipated affected area including the following: (1) A forecast of the impact on commercial and industrial sectors, housing, land values, labor market, health facilities, energy, sewage and water, solid waste management facilities, fire protection, law enforcement, recreational facilities, schools, transportation facilities, and other community and government facilities or services; (2) A forecast of the immediate and long-range impact of property and other taxes of the affected taxing jurisdictions; (3) A forecast of the impact on agricultural production and uses; (4) A forecast of the impact on population, income, occupational distribution, and integration and cohesion of communities; (5) A forecast of the impact on transportation facilities; (6) A forecast of the impact on landmarks and cultural resources of historic, religious, archaeological, scenic, natural, or other cultural significance. The information shall include the applicant's plans to coordinate with the local and state office of disaster services in the event of accidental release of contaminants from the proposed facility; and (7) An indication of means of ameliorating negative social impact of the facility development.	Chapter 21.0

South Dakota Codified Law (SDCL)	Administrative Rules of South Dakota (ARSD)	Required Information	Location
49-41B-11(4)	20:10:22:24	**Employment estimates.** The application shall contain the estimated number of jobs and a description of job classifications, together with the estimated annual employment expenditures of the applicants, the contractors, and the subcontractors during the construction phase of the proposed facility. In a separate tabulation, the application shall contain the same data with respect to the operating life of the proposed facility, to be made for the first ten years of commercial operation in one-year intervals. The application shall include plans of the applicant for utilization and training of the available labor force in South Dakota by categories of special skills required. There shall also be an assessment of the adequacy of local manpower to meet temporary and permanent labor requirements during construction and operation of the proposed facility and the estimated percentage that will remain within the county and the township in which the facility is located after construction is completed.	Chapters 21.0 and 22.0
49-41B-11(5)	20:10:22:25	**Future additions and modifications.** The applicant shall describe any plans for future modification or expansion of the proposed facility or construction of additional facilities which the applicant may wish to be approved in the permit.	Chapter 23.0

South Dakota Codified Law (SDCL)	Administrative Rules of South Dakota (ARSD)	Required Information	Location
49-41B-35(3)	20:10:22:33.01	**Decommissioning of wind energy facilities.** Funding for removal of facilities. The applicant shall provide a plan regarding the action to be taken upon the decommissioning and removal of the wind energy facilities. Estimates of monetary costs and the site condition after decommissioning shall be included in the plan. The commission may require a bond, guarantee, insurance, or other requirement to provide funding for the decommissioning and removal of a wind energy facility. The commission shall consider the size of the facility, the location of the facility, and the financial condition of the applicant when determining whether to require some type of funding. The same criteria shall be used to determine the amount of any required funding.	Chapter 24.0

South Dakota Codified Law (SDCL)	Administrative Rules of South Dakota (ARSD)	Required Information	Location
49-41B-11(2,11)	20:10:22:33.02	**Information concerning wind energy facilities.** If a wind energy facility is proposed, the applicant shall provide the following information: (1) Configuration of the wind turbines, including the distance measured from ground level to the blade extended at its highest point, distance between the wind turbines, type of material, and color; (2) The number of wind turbines, including the number of anticipated additions of wind turbines in each of the next five years; (3) Any warning lighting requirements for the wind turbines; (4) Setback distances from off-site buildings, rights-of-way (ROWs) of public roads, and property lines; (5) Anticipated noise levels during construction and operation; (6) Anticipated electromagnetic interference during operation of the facilities; (7) The proposed wind energy site and major alternatives as depicted on overhead photographs and land use culture maps; (8) Reliability and safety; (9) Right-of-way (ROW) or condemnation requirements; (10) Necessary clearing activities; (11) Configuration of towers and poles for any electric interconnection facilities, including material, overall height, and width; (12) Conductor configuration and size, length of span between structures, and number of circuits per pole or tower for any electric interconnection facilities; and (13) If any electric interconnection facilities are placed underground, the depth of burial, distance between access points, conductor configuration and size, and number of circuits.	Chapter 9.0, 25.0, and 26.0

South Dakota Codified Law (SDCL)	Administrative Rules of South Dakota (ARSD)	Required Information	Location
49-41B-11	20:10:22:34	**Transmission facility layout and construction.** If a transmission facility is proposed, the applicant shall submit a policy statement concerning the route clearing, construction and landscaping operations, and a description of plans for continued right-of-way maintenance, including stabilization and weed control.	Chapter 9.0
49-41B-11(2,11)	20:10:22:35	**Information concerning transmission facilities.** If a transmission facility is proposed, the applicant shall provide the following information: (1) Configuration of the towers and poles, including material, overall height, and width; (2) Conductor configuration and size, length of span between structures, and number of circuits per pole or tower; (3) The proposed transmission site and major alternatives as depicted on overhead photographs and land use culture maps; (4) Reliability and safety; (5) ROW or condemnation requirements; (6) Necessary clearing activities; and (7) If the transmission facility is placed underground, the depth of burial, distance between access points, conductor configuration and size, and number of circuits.	Chapter 9.0, 25.0, and 27.0
49-41B-7; 49-41B-22	20:10:22:36	**Additional information in application.** The applicant shall also submit as part of the application any additional information necessary for the local review committees to assess the effects of the proposed facility pursuant to SDCL 49-41B-7. The applicant shall also submit as part of its application any additional information necessary to meet the burden of proof specified in SDCL 49-41B-22.	Chapter 28.0

South Dakota Codified Law (SDCL)	Administrative Rules of South Dakota (ARSD)	Required Information	Location
49-41B-11	20:10:22:39	**Testimony and exhibits.** Upon the filing of an application pursuant to SDCL 49-41B-11, an applicant shall also file all data, exhibits, and related testimony which the applicant intends to submit in support of its application. The application shall specifically show the witnesses supporting the information contained in the application.	Chapter 29.0 and Jointly Filed Testimony

5.0 NAMES OF PARTICIPANTS (ARSD 20:10:22:06)

ARSD 20:10:22:06. Names of participants required. *The application shall contain the name, address, and telephone number of all persons participating in the proposed facility at the time of filing, as well as the names of any individuals authorized to receive communications relating to the application on behalf of those persons.*

The Applicants' full names, business address, and business telephone number are:

- Dakota Range III, LLC
  c/o Apex Clean Energy Holdings, LLC
  310 4th Street NE, Suite 200
  Charlottesville, VA 22902
  (434) 220-7595

Individuals who are authorized to receive communications relating to the Application on behalf of the Applicant include:

- Brenna Gunderson
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6.0 NAME OF OWNER AND MANAGER (ARSD 20:10:22:07)

ARSD 20:10:22:07. Name of owner and manager. *The application shall contain a complete description of the current and proposed rights of ownership of the proposed facility. It shall also contain the name of the project manager of the proposed facility.*

Dakota Range III is a Delaware limited liability company and wholly owned indirect subsidiary of Apex. Dakota Range III will own, manage, and operate the Project, and hold the land rights and interconnection requests necessary to facilitate development of the Project as proposed. Dakota Range III has obtained a Certificate of Authority from the South Dakota Secretary of State to conduct business in South Dakota. As a limited liability company, sole-member managed by Apex, Dakota Range III does not have officers and directors. Brenna Gunderson, Director of Project Development, Apex, is managing development of the Project.

7.0 PURPOSE OF, AND DEMAND FOR, THE WIND ENERGY FACILITY (ARSD 20:10:22:08, 20:10:22:10)

ARSD 20:10:22:08. Purpose of facility. *The applicant shall describe the purpose of the proposed facility.*

ARSD 20:10:22:10. Demand for facility. *The applicant shall provide a description of present and estimated consumer demand and estimated future energy needs of those customers to be directly served by the proposed facility. The applicant shall also provide data, data sources, assumptions, forecast methods or models, or other reasoning upon which the description is based. This statement shall also include information on the relative contribution to any power or energy distribution network or pool that the proposed facility is projected to supply and a statement on the consequences of delay or termination of the construction of the facility.*

Electricity generated by the Project would interconnect to the high-voltage transmission grid via an 8-mile long, 345-kV overhead transmission line that will carry the electricity to a switching station connected to the Big Stone South to Ellendale 345-kV transmission line.

The specific electricity generated by the Project would be utilized as needed on the Midcontinent Independent System Operator, Inc. (MISO) regional grid and cannot be tracked to its exact delivery location or final use. The electricity generated by the Project would help MISO operators meet electricity demand in both the immediate and surrounding MISO control areas. This Project would also provide zero-emission cost electricity to the grid, as well as firm price stability due to the availability of a renewable resource that would replace the need for ongoing fuel costs. Demand for this power and the benefits it provides are discussed in Section 7.2.

Additionally, Dakota Range III would provide a variety of local benefits. During construction, a 150-MW wind project, such as this Project, typically generates an immediate need for up to 150 temporary construction jobs over approximately 7 months. Construction and operation of a typical 150-MW wind project results in the injection of millions of dollars into the local economy throughout the life of the Project. These investments would be seen throughout the community, including at hotels, restaurants, gas stations, auto repair companies, tire companies, grocery stores, and countless other local businesses. During operation, the Project would employ approximately 10 full-time personnel as facility managers, site managers, and turbine technicians. Furthermore, the Project represents approximately a $200 million investment in Grant and Roberts Counties. Dakota Range III would pay taxes on the Project, which would significantly increase the revenue available for a variety of local needs.

7.1 Wind Resource Areas

The Applicant has retained the services of Vaisala, LLC (Vaisala) to perform a Wind Energy Due Diligence report for Dakota Range III. To obtain an accurate representation of the wind resources within the Project Area, Vaisala performed a comprehensive analysis using the following data:

- Onsite data collected at the Project's four temporary meteorological towers;
- Data from 11 additional meteorological towers near the Project Area boundary;
- Long-term correlation from NASA's Modern Era Retrospective-Analysis for Research and Application (MERRA), European Centre for Medium-Range Weather Forecasts Re-Analysis (ERA), and National Centers for Environmental Prediction/National Center for Atmospheric Research (NCEP/NCAR) Reanalysis Project (NNRP) upper-air data points;
- Project Area topographic and land cover data;
- Potential turbine locations within the Project Area;
- Power curve from the Vestas V136-4.2 MW turbine at a 105-meter hub height; and
- State and County standards and setbacks.

Based on data collected, wind speeds are highest in November and December and lowest in July and August. Composite mean wind speeds (CMWS) are generally above 8.5 meters per second (m/s) during winter, spring, and fall, but drop below 8.5 m/s during the months of July, August, and September. Wind speeds at hub height generally fall off in the morning as solar warming causes increased mixing of the winds at different levels aboveground. After sunset, less mixing occurs, and the winds at hub height tend to increase.

Vaisala compared the onsite data to long-term wind data near Dakota Range III. The analysis showed that daily correlation coefficients of the towers average about 0.87 to all reference stations. This high correlation lends confidence to the assessment in that the site-specific data can accurately be placed in a long-term climatological context. The Project is classified as an International Electrotechnical Commission (IEC) Classification Class II wind site. IEC Classifications are a set of design requirements that ensure wind turbines are engineered against damage from hazards within their planned lifetime. An IEC Class II wind site has an annual average wind speed at the hub height greater than 8.5 m/s and less than 10 m/s.

7.2 Renewable Power Demand

Regional demand for wind energy is as strong as ever, both from utilities in the region, as well as from end-use customers. This is seen in regulatory filings and announcements from utilities and public

sustainability commitments from large corporations. As costs have fallen and technology has improved, wind energy has proven to be both a cost-effective, reliable source of energy generation for utilities and a valuable hedge against volatile fossil fuel prices.

For example, Xcel Energy's most recent Integrated Resource Plan (IRP) in Minnesota demonstrates that adding 1,800 MW of new wind energy generation over the next several years is both necessary and cost effective.[1] [2] Xcel Energy has also stated its intent to meet 85 percent of their customers' needs with carbon-free resources, including wind energy, by 2030. Otter Tail Power Company's most recent IRP shows it will be adding 400 MW of wind in the near term.[3] Great River Energy, a large generation and transmission cooperative, recently committed to 50 percent renewable energy by 2030.[4]

Beyond the growing demand from utilities, non-traditional power buyers, such as Google, IKEA, Apple, eBay, Facebook, General Motors, Johnson & Johnson, Kellogg's, Microsoft, Nike, and Wal-Mart, have announced plans to purchase renewable energy, like wind power. In fact, over two-thirds of the Fortune 100 companies have sustainability or renewable energy procurement goals, and over 3,800 MW of renewable energy have been purchased by non-utilities as of August 2018.[5] [6] That compares to 2,890 MW procured by non-utilities in 2017 and approximately 1,700 MW in 2016. These businesses have a rapidly growing appetite for affordable clean energy, and South Dakota wind is poised to help meet that demand.

Beyond the market for wind energy, the public has also shown support for the use of renewable energy. According to a Gallup National poll in March 2018, 73 percent of Americans are in favor of "emphasizing the development of alternative energy such as wind and solar power" compared to 21 percent in favor of emphasizing production of oil, gas, and coal (Gallup, Inc., 2018).

This support can also be seen in legislation throughout the nation. Twenty-nine states have adopted renewable portfolio standards (RPSs). These standards require utilities to sell a specified percentage or amount of electricity generated from renewable resources annually. An additional eight states, including South Dakota, and two territories have adopted renewable energy goals. Dakota Range III would provide

[1] MN PUC Docket No. 15-21, MPUC Order; MN PUC Docket No. 16-777, MPUC Order
[2] 2020-2034 Upper Midwest Resource Plan Informational Letter, MN PUC Docket No. E002/RP-15-21, June 8, 2018;
https://www.xcelenergy.com/company/corporate_responsibility_report/library_of_briefs/climate_change_and_greenhouse_gas_emissions
[3] MN PUC Docket No. 16-386, MPUC Order
[4] Great River Energy Fact Sheet: "50% Renewable Energy by 2030"; June 5, 2018 - https://greatriverenergy.com/wp-content/uploads/2018/06/50x30_Fact_Sheet.pdf
[5] http://businessrenewables.org/corporate-transactions/
[6] https://info.aee.net/growth-in-corporate-advanced-energy-demand-market-benefits-report

a new source of low-cost energy for South Dakota and the United States, helping the nation move towards the goal of energy independence while reducing pollution and carbon emissions.

The cost of energy from wind has declined by nearly two-thirds over the past decade, while the average output has increased by more than one-third during that same period.[7] According to Lazard, an international economics firm, wind energy in the interior/Great Plains region is the least costly sources of new power generation, even without accounting for available federal tax incentives, which further reduce the cost to customers (Lazard, 2016).

7.3 Consequences of Delay

If the Dakota Range III Project is delayed, the Project's benefits would be greatly reduced. It must be constructed by the end of 2020 to receive a 2.5-cents per kilowatt hour (kWh) Production Tax Credit (PTC). If the Project does not reach operation until 2021 or later, the Project will not qualify for 100 percent of the PTC; the PTC per kWh amount will decrease by 20 percent each year until the Project is placed in service.

[7] https://emp.lbl.gov/wind-technologies-market-report

8.0 ESTIMATED COST OF THE WIND ENERGY FACILITY (ARSD 20:10:22:09)

ARSD 20:10:22:09. Estimated cost of facility. *The applicant shall describe the estimated construction cost of the proposed facility.*

The current estimated capital cost of the Project is approximately $200 million based on indicative construction and wind turbine pricing cost estimates for the proposed Vestas V136-4.2 MW turbine layout. This estimate includes lease acquisition; permitting, engineering, procurement, and construction of turbines, access roads, underground electrical collector system, Project collection substation, 8-mile transmission line, O&M facility, supervisory control and data acquisition (SCADA) system, and meteorological towers; and Project financing.

The total installed capital costs for the Transmission Facility are estimated to be $5.2 million. Ongoing O&M costs and administrative costs are estimated to be approximately $100,000 per year, including payments to landowners for easements rights.

9.0 GENERAL SITE AND PROJECT COMPONENT DESCRIPTION (ARSD 20:10:22:11)

ARSD 20:10:22:11. General site description. *The application shall contain a general site description of the proposed facility including a description of the specific site and its location with respect to state, county, and other political subdivisions; a map showing prominent features such as cities, lakes and rivers; and maps showing cemeteries, places of historical significance, transportation facilities, or other public facilities adjacent to or abutting the plant or transmission site.*

9.1 Site Location and Overview

The Project would be located on approximately 18,717 acres of land in Grant and Roberts Counties, north of Watertown, South Dakota (Figure 1). Figure 2 in Appendix A provides the layout of the Project in relation to locations of State, county, and town boundaries; lakes and rivers; railroads; and major highways and roads. There are no active transportation facilities (e.g., airports) other than roads and railroads within or adjacent to the Project Area. Figure 2 also shows the locations of cemeteries, places of historical significance, and other community facilities (e.g., schools, religious facilities) within or near the Project Area. Table 9-1 shows the counties, townships, sections, and ranges that intersect the Project Area.

Table 9-1: Sections that Intersect the Project Area

County	Township Name	Township	Range	Sections
Wind Project				
Grant	Farmington	121 N	51 W	4-8; 18-19; 30
	Blooming Valley	121 N	52 W	1-4; 9-16; 21-27; 35-36
Roberts	Summit	122 N	51 W	28-33
	Ortley	122 N	52 W	21-23; 25-28; 33-36
Transmission Facility				
Grant	Farmington	121 N	51 W	31-33
	Blooming Valley	121 N	52 W	13; 24-25; 36
	Mazeppa	120 N	52 W	10-12

9.2 Wind Project

The Wind Project would include up to 42 wind turbines with an aggregate nameplate capacity of up to 151.2 MW. The Wind Project would also include underground electric collector and communication lines, a central collection substation, an O&M facility, access roads connecting turbines and associated

facilities, up to three permanent met towers, a SCADA system (installed with the collector lines and interconnection facility), and additional temporary construction areas (batch plant/laydown areas). Figure 2 shows the proposed layout of the Wind Project facilities. Table 9-2 lists the sections within the Project Area containing the proposed Wind Project facilities.

Table 9-2: Sections Containing Wind Project

County	Township Name	Township	Range	Sections
Grant	Farmington	121 N	51 W	7, 19, 30
	Blooming Valley	121 N	52 W	1-3; 10-15; 22-25
Roberts	Summit	122 N	51 W	29-33
	Ortley	122 N	52 W	22; 25-28; 33-36

Figure 2 shows the proposed primary wind turbine locations, as well as the proposed alternate turbine locations, for the Vestas V136-4.2 MW turbine (see Section 9.2.1). As a result of final micro-siting, minor shifts in the turbine locations may be necessary to avoid newly identified cultural resources – cultural resource studies in coordination with the SWO are ongoing – or due to geotechnical evaluations of the wind turbine locations, landowner input, or other factors. Therefore, the Applicant requests that the permit allow turbines to be shifted within 250 feet or less from the turbine location identified in the Application without prior Commission approval, so long as the turbine shifts comply with county and State setback requirements and specified noise and shadow flicker requirements; cultural resource impacts are avoided or mitigated in consultation with SHPO; environmental setbacks are adhered to as agreed upon with the USFWS and the SDGFP; and wetland impacts are avoided. Prior to implementing the turbine adjustment, the Applicant would file in the docket an affidavit demonstrating compliance with the limitations set forth above. Any turbine adjustment that does not comply with the aforementioned limitations would be considered a "material change," and the Applicant shall file a request for approval of the "material change' prior to making the adjustment pursuant to the following approval process:

- Applicant will file with the Commission and serve on the official Service List a request for approval of the adjustment that includes:
    - An affidavit describing the proposed turbine adjustment, the reason for the adjustment, the reason the adjustment does not comply with one or more turbine flexibility limitations set forth above, and information regarding compliance with all other applicable requirements; and

  - A map showing both the approved location and the proposed adjustment (in different colors).

- Once received, the information would be reviewed by Commission staff, and Commission staff will have 10 calendar days within which to request further Commission review.

- If no further review is requested, Applicant may proceed with the adjustment.

- If further review is requested, the Commission will issue a decision regarding Applicant's request at its next available regularly scheduled Commission meeting, subject to notice requirements, after the request for further review is made by Commission staff.

Figure 2 also shows the proposed access road and underground collection system locations. As a result of final micro-siting and the utility coordination needed to facilitate Project interconnection, shifts in the access roads and collector system, as well as changes in the locations of the O&M facility, meteorological towers, Project substation, concrete batch plant, and laydown/staging areas, may be necessary. Therefore, the Applicant requests that the permit allow those facilities to be modified, as needed, so long as the new locations are on land leased for the Project; cultural resources are avoided or mitigated, and environmental setbacks are retained; wetland impacts are avoided; and all other applicable regulations and requirements are met.

9.2.1 Turbines

Each wind turbine consists of three major components: the tower, the nacelle, and the rotor. These components are mounted on a concrete foundation, also known as a turbine pad, to provide structural support to the assembled turbine. The nacelle sits atop the tower, and the rotor hub is mounted on a drive shaft that is connected to the gearbox and generator contained within the nacelle.

Turbine Type: The Project is considering turbines in the 3.6 MW to 4.5 MW range with a hub height of up to 105 meters (345 feet), a rotor diameter of up to 150 meters (492 feet), and a tip height of up to 180 meters (591 feet). A specific turbine model has not been selected at this time, but Applicant currently anticipates using the Vestas V136-4.2 MW turbine at a 105-meter hub height and 136-meter rotor diameter (RD) with a tip height of 173 meters, and the figures in Appendix A showing primary and alternate turbine locations are based on this turbine model. Figure 3 is a representative diagram depicting hub height and RD of the Vestas V136-4.2 MW turbine. However, all setback distances are calculated using the maximum potential rotor diameter of 150 meters (492 feet) and tip height of 180 meters (591 feet). In addition, to be conservative, the impact calculations discussed throughout this application include

all 45 proposed turbine locations. The Applicant plans to select the most appropriate technology for the Project in terms of cost efficiency and optimization of wind and land resources. Regardless of the turbine model selected, the Project layout will comply with all applicable County and State setback and sound requirements.

Tower: The tubular towers proposed for the Project would be conical steel structures or a combination of steel and concrete depending on final turbine selection. Each tower has a lockable access door, internal lighting, and an internal ladder and lift to access the nacelle. In accordance with FAA regulations, the towers would be painted off-white to minimize visual impact.

Nacelle: The main mechanical and electrical components of the wind turbine are housed in the nacelle. The nacelle is mounted on a sliding ring that allows it to rotate, or "yaw," into the wind to maximize energy capture. The nacelle components include the drive train, gearbox, generator, and generator step-up transformer. The nacelle is housed in a steel-reinforced fiberglass shell that protects internal machinery from the environment. The housing is designed to allow for adequate ventilation to cool internal machinery. It is externally equipped with an anemometer and a wind vane to measure wind speed and direction. The generated electricity is conducted through cables within the tower to a switch enclosure mounted at the base of the turbine tower. The FAA determines lighting specifications, and the Applicant will use an ADLS, subject to FAA approval.

Rotor: A rotor assembly is mounted on the drive shaft and operates upwind of the tower. Electric motors within the rotor hub vary the pitch of each blade according to wind conditions to maximize turbine efficiency at varying wind speeds.

9.2.2 Access Roads

Existing public roads, private roads, and field paths are being utilized to access the Wind Project. The existing roads may require improvements before, during, or following construction. Where necessary, new access roads would be constructed between existing roadways and Wind Project components. The new and improved access roads would be all-weather, gravel surfaced, and generally 16 feet in width. During construction, some of the access roads would be widened to accommodate movement of the turbine erection crane, with temporary widths generally not exceeding 50 feet.

Separate access may be required for the cranes used to erect the wind turbines. In such cases, temporary crane paths would be constructed between turbine locations. Following completion of construction, the temporary crane paths would be removed, and the area restored, in accordance with industry standards.

The final access road design would be dependent on geotechnical information obtained during the engineering phase. It is anticipated that the access road network for the Project would include approximately 8 miles of new private roads. For purposes of calculating access road impacts in this Application, the Applicant has conservatively assumed approximately 75 acres of temporary disturbance and 24 acres of permanent disturbance during the life of the Project for access roads. Final turbine placement would determine the amount of roadway and disturbance for the Project.

9.2.3 Underground Electrical Collector Lines

The electrical collector lines would consist of an underground cable system between the collection substation and the individual turbine locations. The collector system would be designed for operation at 34.5 kV. The collector lines would be installed in a trench at least 42 inches below the ground to avoid potential impact from the existing land uses. A fiber-optic cable and an additional separate ground wire would also be installed with the collector system. The fiber-optic cable would be used for telemetry, control, and communication purposes. Aboveground junction boxes would be installed as required for connections or splices. For purposes of calculating temporary impacts in this application, the Applicant has conservatively assumed approximately 155 acres of total temporary disturbance from underground collector system construction. The Applicant assumes that some of the construction disturbance for the underground collector system would be shared with construction disturbance for access roads where these facilities overlap. Ground disturbance impacts during the operational life of the Wind Project are assumed to be approximately 25 square feet for the aboveground junction boxes. Where damage to landowner field tile from the Project will be unavoidable, Dakota Range III will be responsible for locating and repairing drain tile that is damaged during construction or the operational life of the Project.

9.2.4 Collector Substation

The collector substation would be located generally in the center of the Wind Project footprint and would consist of one substation transformer, circuit breakers, switching devices, auxiliary equipment, a control enclosure (containing equipment for proper control, protection, monitoring, and communications), and associated equipment and facilities. The principal function of the substation is to increase the voltage from the collector system (34.5 kV) to the voltage of the transmission line (345 kV), which would transport the electricity of the Wind Project to the MISO grid via the interconnection switching station. The collector substation would be located within a fenced area. The fence would be designed in accordance with industry standards to provide safety and security.

9.2.5 Meteorological Towers

Up to three permanent meteorological towers would be installed as part of the Wind Project. These meteorological towers are used to obtain wind data for performance management once the Wind Project is operational. The meteorological towers would be self-supporting with heights not to exceed the hub height of the wind turbines. The permanent meteorological towers would be marked and lighted as specified by the FAA. The Applicant will use an ADLS on the meteorological towers. Each meteorological tower would result in a permanent impact of approximately 75 feet by 75 feet (0.44 acre). As discussed in Section 9.2, the Applicant requests that the permit allow the meteorological tower location to be modified, as needed, as long as the final locations are on land leased for the Project, cultural resources and habitats for listed species are avoided, wetland impacts are avoided, and all other applicable regulations and requirements are met.

9.2.6 O&M Facility

An O&M facility would be constructed within the Project Area at a location well-suited for access to the turbines, as well as the substation and switching station. One potential O&M facility location, as shown on Figure 2, is currently being evaluated. As discussed in Section 9.2, the Applicant requests that the permit allow the O&M facility location to be modified, as needed, so long as the final location is on land leased for the Project; cultural resource impacts are avoided or minimized; environmental setbacks are adhered to as agreed upon with USFWS and SDGFP; wetland impacts are avoided; and all other applicable regulations and requirements are met. The facility would comprise a single- or two-story, 4,000- to 6,000-square-foot building, which would house operating personnel, offices, operations and communication equipment, parts storage and maintenance activities, and a vehicle parking area. An area for outdoor storage of larger equipment and materials would also be included within a fenced area for safety and security.

For purposes of calculating temporary impacts in this Application, the Applicant has assumed approximately 8 acres of total temporary disturbance from O&M facility construction. After construction, total permanent disturbance from the O&M facility, including parking, would be approximately 5 acres. Dakota Range III would purchase up to 8 acres to facilitate construction and use of the O&M facility, however a maximum of 5 acres would be permanently disturbed.

Station power for Dakota Range III facilities would be provided through the Project interconnection. Back-up power for the Dakota Range III substation would be provided by the local electrical cooperative(s), providing power to operate communications, relaying, and control systems, indefinitely.

9.2.7 SCADA System

The Wind Project's design includes safety and control mechanisms. These mechanisms are generally monitored using a SCADA system. Each turbine is connected to the SCADA system via fiber-optic cable, which allows the turbines to be monitored in real time by the O&M staff. The SCADA system also allows the Wind Project to be remotely monitored, thus increasing Wind Project oversight, as well as the performance and reliability of the turbines. Not only would the local O&M office have full control of the wind turbines, but a 24/7 remote operations facility would also have control of the individual turbines. These two teams coordinate to ensure that the wind turbines operate safely and efficiently.

A third mechanism for safety and control is the turbines themselves. Each turbine monitors the wind speed and direction to ensure its current position is most efficient to produce electricity. This data is also used for feathering the blades; applying the brakes in high wind speeds or if there is ice build-up on the blades; and to tell the turbine when the wind is strong enough to begin turning the generator and producing electricity at the "cut-in" wind speed.

9.3 Transmission Facility

The land rights for the 8-mile-long, 345-kV Transmission Facility, were obtained through voluntary Wind Leases from 6 property owners along the four miles of the Transmission Facility route that is within the Wind Project boundary. The remaining four miles within the Dakota Range I and Dakota Range II Project area were acquired through voluntary Transmission Easements from 8 property owners. Both the Wind Leases and Transmission Easements included exhibits that depicted the location of the easement area. The agreements were delivered by a land agent, and the type of structure expected to be installed was discussed in detail with the landowners. The easement area will be entirely on private property and not within county right-of-way (ROW), except where it will cross public roads, and again in one area where the county road curves sharply. Dakota Range III will comply with Grant County's transmission facility requirements.

Associated with the Project is an interconnection switching station being constructed by Otter Tail Power Company; which will serve as the electrical interconnection between the Project and the MISO electrical grid. This facility has already undergone local permitting and has received approval. The switching station would be situated south of the Project, adjacent to the Big Stone South to Ellendale 345-kV transmission line. This switching station would be constructed by Otter Tail Power Company.

9.3.1 Transmission Corridor

In order to transmit the power generated by the Project, an approximate 8-mile feeder line will be built from the Project's substation located in section 13 of Blooming Valley Dakota Township, outside of the public ROW along 455th Avenue, then turning east on to 159th Street (Farmington Township) to the Ottertail Power switchyard that is located in section 14 of Mazeppa Township. At the Otter Tail Power-constructed switchyard, the power would transfer to the Big Stone South to Ellendale 345-kV transmission line, part of the MISO transmission line portfolio. This Otter Tail switchyard is also being used for the Dakota Range I & II Wind Project. Table 9-3 lists the sections within the Project Area containing the proposed Transmission Facility easement. Figure 1 provides the Transmission Facility location, and Figure 4 provides the Transmission Facility layout. Approximately 4 miles of the Transmission Facility are located outside the Project, but within the Dakota I & II project areas.

Table 9-3: Sections Containing Transmission Facility Easement

County	Township Name	Township	Range	Sections
Grant	Farmington	121 N	51 W	31-33
	Blooming Valley	121 N	52 W	13; 24-25; 36
	Mazeppa	120 N	52 W	10-12

The Transmission Facility permanent easement corridor would be 150 feet wide and would abut the road ROW, with an additional 50 feet of temporary construction workspace on the non-road side of the permanent easement. Preliminary locations of the transmission line structures are shown on Figure 4 in Appendix A. The easement for the Transmission Facility would be situated on approximately 192 privately owned acres. Temporary construction impacts along the transmission line easement are anticipated to be approximately 200 feet wide along the route. Permanent impacts would be limited to the 150-foot ROW area required for the transmission line structures. Temporary construction workspace would be restored upon completion of construction. Vegetation in the easement area would be maintained to avoid interference with the conductors, allow for ground-based inspections, and enable access to transmission line structures when maintenance is required. Restoration, operations, and maintenance are further discussed in Section 9.5.

Applicant requests the ability to adjust structures so long as they remain within the 150-foot-wide right-of-way identified in the Application, impacts to cultural resources and sensitive habitat are avoided, and wetland impacts are avoided. Any adjustments that fall outside of the 150-foot-wide right-of-way identified in the Application, or do not meet the above-stated limitations, would be considered a "material

change." If there were a "material change" the Applicant would follow the same process for review of the proposed "material change" as is outlined in Section 9.2 for turbine adjustments.

9.3.2 Configuration of Pole and Conductors

The Transmission Facility design selected for the Project would be a 3-phase, single circuit transmission line constructed on wooden H-frame (Class Wood – H1) structures. Figure 5 in Appendix A is a transmission line structure diagram for the Project. The H-frame structures would be buried in the ground to a depth of 14 to 15.5 feet and would be 80 to 105 feet tall. Spacing intervals for the H-frames would be approximately 600 feet apart, and the conductor would be located approximately 30 feet above the ground. Guy wires may be used to secure turning structures or other structures as recommended to ensure safety; it is not anticipated more than 6 guy wires would be used for each turning structure. Dakota Range III would use 795 KCMIL "Tern" reinforced conductors or conductors of comparable capacity.

9.3.3 Temporary Laydown/Staging Area

An approximate 5-acre temporary laydown/staging area has been identified for use by the Transmission Facility, however the Wind Project staging areas will likely be used (Figure 4). The laydown/staging area would be restored once construction is complete. The Applicant is considering three potential locations for the laydown/staging area. The factors that will influence the final decision will be based on landowner and construction input. As discussed in Section 9.2, the Applicant requests that the permit allow the laydown/staging area location to be modified, as needed, so long as the final location is on land leased for the Project; cultural resource impacts are avoided or mitigated in consultation with SHPO; environmental setbacks are adhered to as agreed upon with the USFWS and SDGFP; wetland impacts are avoided; and all other applicable regulations and requirements are met.

9.4 Wind Farm Facility Construction and Operations

Once the Facility Permit is approved and other county, State, and federal approvals are obtained, the Applicant would complete engineering-scale design of the access roads, construction areas, turbine foundations, and the electrical components. Construction of the onsite roads, tower foundations, feeder lines, and substation would take approximately 7 to 9 months. The actual installation of the turbines would take approximately 2 to 3 months. Figure 6 in Appendix A shows a typical site layout during construction. Collector lines would be installed by trenching or, if necessary based on site conditions, by other non-trenching means (e.g., directional boring). For collection system trenching during construction, Dakota Range III personnel and its contractors would remove topsoil prior to trenching and restore topsoil after trenching is complete. The contractor would typically decompact up to 10 inches below grade for crane paths post construction. The Applicant would work closely with affected landowners to ensure their

fences are maintained and livestock is protected not only during construction activities, but throughout the operation of the Project. For road construction, topsoil will be removed and stockpiled in the temporary construction area. If necessary for drainage and access, temporary culverts and field approaches will be installed. For turbine foundation installation, topsoil and subsoil will be removed, separated, and stockpiled at each turbine site. After construction, the subsoil and topsoil will be restored over the spread footer concrete foundation. Temporary construction areas will be restored after construction, including removing gravel, decompacting subsoil, and replacing topsoil. Where necessary, temporary and permanent stabilization measures will be implemented, including mulching, seeding with appropriate seed mix, and installing slope breakers.

Dakota Range III personnel and its contractors would confer and coordinate closely with the South Dakota Department of Transportation (SDDOT), Grant and Roberts Counties, and affected townships to manage construction traffic and safely deliver the various turbine components. Highway Access and Utility Permits would be obtained from the SDDOT prior to construction, and contractors would be required to obtain any necessary overheight or overweight haul permits. County road permits required for ROW occupancy, utility crossings, road approaches, and overweight loads would be obtained from Grant and Roberts Counties prior to the construction activities for which the permit is required.

The Wind Project would be operated and maintained by a team of approximately ten personnel, including facility managers, a site manager, and a certified crew of technicians. This team would be at the Wind Project site or O&M facility during normal business hours and would perform routine checks, respond to issues, and optimize the performance of the wind farm. The team would also have specified personnel on-call 24 hours per day, 7 days per week, should an issue arise outside of normal business hours. The onsite team will work in coordination with offsite operations staff at a Remote Operation Control Center in accordance with Federal Energy Regulatory Commission guidelines. This offsite team will assist in identifying turbines operating at non-peak efficiency and helping onsite staff quickly locate turbines with potential operating issues so they can be quickly resolved to ensure safety and optimal performance of the wind farm. The onsite team will also conduct frequent visual assessments of the wind turbines to check for issues that are not impacting performance of the wind farm. A plan for addressing emergency incidents will be in place and is discussed in Section 21.3.3.

During operations, the O&M staff would perform scheduled, preventive maintenance on the turbines. This is typically done in conjunction with representatives from the turbine manufacturer for the first 1 to 3 years. Turbine maintenance is performed twice a year as a semiannual and annual maintenance. Semiannual maintenance is conducted on the turbine for 10 hours with a crew of 3 technicians. It consists

of lubrication, fluid checks, minor electrical inspections and turbine functionality. The annual maintenance is a 36-hour inspection with a crew of 3 technicians. During this inspection, the entire turbine is maintained, including bolt torque checks on tower and all major components, lubrication and filter changes, electrical inspections, pitch calibrations, and blade inspections amongst other tasks. The onsite operations team also drives throughout the Project on a daily basis conducting unrecorded visual inspections of the Project.

9.5 Transmission Facility Construction and Operations (20:10:22:34)

ARSD 20:10:22:34. Transmission Facility Layout and Construction. *If a transmission facility is proposed, the applicant shall submit a policy statement concerning the route clearing, construction and landscaping operations, and a description of plans for continued right-of-way maintenance, including stabilization and weed control.*

9.5.1 Mobilization, Site Preparation, and Clearing

Once the applicable federal, State and local approvals have been obtained, soil conditions are established, and final design is completed, construction of the Transmission Facility would begin. Precise timing of construction would consider various requirements that may be in place due to permit conditions, system loading issues, weather, and available workforce and materials.

The Transmission Facility easement has been routed to minimize tree clearing to the extent feasible. Isolated trees may need to be cleared to allow safe operation of the transmission line. Dakota Range III would work closely with affected landowners to verify their fences are maintained and livestock is protected not only during construction activities, but throughout operations. Surveyors would stake the construction corridor within the approved construction workspace and the pole locations of the approved alignment in preparation for the construction crew arriving onsite. Once the construction crew arrives, they would begin by clearing and grubbing out the workspace to ensure that vegetation meets the standards and that the construction crew would have easy access to the construction site. The crew would use chain saws, lifts, tractors, and bulldozers only where needed to clear vegetation. The crew would install temporary culverts and field approaches where needed to access the route and to maintain adequate access and drainage throughout construction.

Silt fence and other erosion control measures would be installed in accordance with the Project's SWPPP and applicable permit conditions, and sensitive areas would be marked for avoidance. Appropriate safety measures would be implemented before pole foundation excavation begins, including notification through the One-Call system to verify third-party utilities and adjacent pipelines are properly marked. Equipment and vehicles would be transported to the Project Area and staged at the temporary laydown or staging area. During construction activities, dust control measures would be applied to manage dust along access

roads, laydown/staging area, and construction workspaces. In addition, safety would be a top priority during all aspects of construction activities, especially on public roads.

Dakota Range III has conducted pre-construction natural community surveys, which included observations of noxious and invasive weeds (see Section 14.1.2). A Noxious and Invasive Weed Management Plan would be developed to identify and establish the procedures to limit the introduction and spread of noxious and invasive weeds during construction and ongoing operations.

Potable water and sanitary facilities would be established to support the construction crews at the construction site. Potable water would be provided from offsite facilities, and sanitary facilities would be provided in the form of portable latrines by an outside vendor. Active construction areas and laydown/staging areas would be fenced to limit access by wildlife or unauthorized personnel.

9.5.2 Transmission Facility Construction Procedures

Transmission line structures are generally designed for installation at existing grades. Typically, structure sites with 10 percent or less slope would not be graded or leveled. Sites with more than 10 percent slope would have working areas graded level or fill brought in for working pads. Dakota Range III anticipates that only minimal grading would be needed because the route has very little elevation change. Where grading is required, the topsoil would be removed and stored for replacement after construction is complete. If the landowner permits, it is preferred to leave the leveled areas and working pads in place for use in future maintenance activities. If permission is not obtained, the site would be graded back to as close to its original condition as possible, and all imported fill, including temporary culverts and road approaches, would be removed from the site, and disturbed areas would be returned to pre-disturbance conditions.

The staging area required for construction of the Transmission Facility would be partially shared with the associated Wind Project. Staging involves delivering the equipment and materials to construct the new Transmission Facility. Structures are delivered to staging areas, sorted, and loaded onto structure trailers for delivery to the staked location. The materials are stored until they are needed for construction of the Transmission Facility. Sufficient rights to use the temporary laydown areas, outside of the Transmission Facility easement, would be obtained from affected landowners through rental agreements. Insulators and other hardware are attached to the structure while it is on the ground in the laydown area.

When it is time to install the poles, structures are moved from the staging areas, delivered to the staked location, and placed within the ROW until the structure is set. Typically, access to the Transmission Facility easement corridor is made directly from existing roads or trails that run parallel or perpendicular

to the easement. In cases where construction traffic and activities are within proximity to local, county, or State roadways, the contractor would coordinate with the governing body on traffic control and safety measures. In some situations, private field roads or trails are used. Permission from the property owner is obtained prior to accessing the Transmission Facility easement outside of public rights-of-way (ROWs). Where necessary to accommodate the heavy equipment used in construction (including cranes, concrete cement trucks, and hole-drilling equipment), existing access roads may be upgraded, or new roads may be constructed. Once construction is complete, the temporary field approaches and access roads installed for the Transmission Facility easement would be removed and revegetated. The construction workspace would be allowed to regenerate naturally so long as it does not encroach on typical utility best practice prescribed clearances.

The H-frame structures for the Transmission Facility would be secured using concrete foundations. Then, the topsoil and subsoil would be excavated for the pole foundation, concrete poured, and pile driven to establish the foundation. The spoils from the excavated foundation would be removed from site unless other arrangements are made with the landowner. The concrete foundation is typically 1 foot above grade.

9.5.3 Switchyard Construction Procedures

This switching station would be constructed by Otter Tail Power Company.

9.5.4 Restoration Procedures

The construction workspace would be disturbed during the normal course of work (as is typical of most construction projects), which can take several weeks in any one location. Dakota Range III would take the steps necessary to lessen the impact of the Transmission Facility on the surrounding environment by restoring areas disturbed by construction in accordance with BMPs and the Project's permit conditions. As construction on each parcel of land is completed, disturbed areas would be restored to their original condition to the extent practicable. In addition, Dakota Range III would develop a Noxious and Invasive Weed Management Plan to limit the spread of noxious and invasive weeds during construction and ongoing operations.

Dakota Range III or their contractor would contact each property owner after construction is completed to identify and address any damage that may have occurred as a result of the construction of the Transmission Facility. If damage has occurred to crops, fences, or the property, Dakota Range III would fairly compensate the landowner for the damages sustained in accordance with the terms and conditions agreed upon in the Transmission Easement Agreement entered into by Dakota Range III and the landowner.

In some cases, the Applicant may engage an outside contractor to restore the damaged property. Portions of permanent vegetation that are disturbed or removed during construction of transmission lines would be reestablished to pre-disturbance conditions. Resilient species of common grasses and shrubs typically reestablish naturally with few problems after disturbance. Areas with significant soil compaction and disturbance from construction activities along the route would require assistance in reestablishing the vegetation stratum and controlling soil erosion. Commonly used BMPs to control soil erosion and assist in reestablishing vegetation that may be used on the Transmission Facility include, but are not limited to:

- Erosion control blankets with embedded seeds,
- Silt fences,
- Hay bales,
- Hydro seeding, and
- Planting individual seeds or seedlings of non-invasive native species.

9.5.5 Operations and Maintenance

Transmission lines are designed to operate for decades. Typically, they require only minimal maintenance, particularly in the first few years of operation. The estimated service life of the proposed Transmission Facility is approximately 40 years.

The principal operating and maintenance cost for transmission facilities is the cost of inspections, which would be performed semi-annually by either truck, utility terrain vehicle, on foot, or by air. Inspections would be conducted to verify that the transmission line is fully functional and that no vegetation has encroached so as to violate good utility best practice prescribed clearances. Dakota Range III would prune or remove vegetation as required to avoid physical contact between the transmission lines and nearby vegetation that could cause the transmission line to fail. Annual operating and maintenance costs for 345-kV transmission lines in South Dakota and the surrounding states are expected to be approximately $10,000. Actual line-specific maintenance costs depend on the amount of vegetation management necessary, storm damage occurrences, structure types, materials used, and the age of the line.

10.0 ALTERNATE SITES AND SITING CRITERIA (ARSD 20:10:22:12)

ARSD 20:10:22:12. Alternative sites. *The applicant shall present information related to its selection of the proposed site for the facility, including the following:*
(1) The general criteria used to select alternative sites, how these criteria were measured and weighed, and reasons for selecting these criteria;
(2) An evaluation of alternative sites considered by the applicant for the facility;
(3) An evaluation of the proposed plant, wind energy, or transmission site and its advantages over the other alternative sites considered by the applicant, including a discussion of the extent to which reliance upon eminent domain powers could be reduced by use of an alternative site, alternative generation method, or alternative waste handling method.

Following is a description of the general Project location site selection process, a discussion of the turbine and site configuration alternatives considered for the Project, and a summary of the siting criteria applied to the Project.

10.1 General Project Location Selection

In March 2015, Apex acquired the Project from a small local developer, Wahpeton Wind. At the time of acquisition, approximately 10,000 acres were under lease. Because the Dakota Range III Project was acquired after initial site selection, and a specific area was offered for sale, Apex was not involved in considering alternative locations outside of Grant and Roberts Counties. Factors that led to acquiring this Project were due to the high wind resource, available rare transmission capacity, and a strong interest from the landowners within the project area. Once Apex acquired the project, it evaluated how best to expand the site. Due to existing constraints from USFWS grassland easements to the east, the Dakota Range I & II Project to the south, and an adjacent competing wind energy development project directly to the east, Dakota Range III determined that staying within approximately 8 square miles from the initial location was the best area to focus leasing efforts in order to meet a commercial operation date in 2020.

In addition to existing constraints, Apex considered several factors in selecting the final Project site, including:

- The site has strong wind speeds, which is key for development of a competitive, economically viable wind project.
- The site is near the Big Stone South to Ellendale 345-kV transmission line.
- The Project is compatible with the existing land uses, which are primarily agricultural (e.g., crop production, pasture land, hay production). Wind development is particularly compatible with agricultural land because the existing uses can continue around the wind energy facility. As a result, wind development allows landowners to diversify their operations with minimal disruption to existing agricultural uses.

- The proposed Project has received support from landowners within the Project Area through the signing of voluntary Wind Leases and Transmission Agreements. The Applicant has secured 100 percent of the necessary Wind Leases and Transmission Agreements on private parcels necessary for the Project.
- Through preliminary desktop analysis, site-specific field studies, and ongoing coordination with agencies, such as the USFWS and SDGFP, the Project was able to avoid or minimize potential adverse impacts to cultural resources, wetlands, grasslands, and wildlife species of concern. Given the need to acquire a Facility Permit for the Project, and to comply with applicable federal and State permitting requirements, minimal impacts to existing resources is key to enabling Project development.

With respect to the Transmission Facility, Dakota Range III considered locating the route on the east side of 455th Avenue. However, Dakota Range III ultimately selected the west side of 455th Avenue to avoid a home and to accommodate the landowner's request that the transmission line not be located on the east side of 455th Avenue.

10.2 Site Configuration Alternatives

The 45 turbine locations proposed reflect an optimal configuration to best capture wind energy within the Project Area, while avoiding impacts to residences, known cultural resources, wetlands, grasslands, and sensitive species and their habitats. As discussed in Section 9.2, final micro-siting could result in minor turbine adjustments. However, the final Project layout will comply with all applicable local, State, and federal requirements and will remain on land leased for the Project. Cultural resource impacts will be avoided or mitigated in consultation with SHPO; environmental setbacks will be adhered to as agreed upon with the USFWS and SDGFP; and wetland impacts will be avoided. In addition, all other applicable regulations and requirements will be met, including the State and local requirements and/or commitments set forth in Table 10-1 below. The buildable area for turbines, after considering the setbacks in Table 10-1 as well as further environmental setbacks, are visually depicted on the siting constraints map provided as Figure 7. All setback distances are calculated using the maximum potential rotor diameter of 150 meters (492 feet) and tip height of 180 meters (591 feet).

The Grant County setbacks in Table 10-1 are the current setback requirements; however, the Project will comply with both the existing and the currently proposed Grant County setbacks. A copy of the current Roberts County ordinance and current and proposed Grant County ordinance for setbacks can be found in Appendix C.

Table 10-1: Dakota Range III Siting Requirements/Commitments

Category	Requirements/Commitments
State Requirements	
Setbacks	Turbines shall be set back at least 500 feet or 1.1 times the height of the tower, whichever is greater, from any surrounding property line, unless the owner of the wind turbine tower has a written agreement with an adjacent land owner allowing the placement of the tower closer to the property line (SDCL 43-13-24).
Grant County	
Setbacks[1,2]	- Distance from existing off-site residences, businesses, churches, and buildings owned and/or maintained by a governmental entity shall be at least one thousand (1,000) feet. Distance from on-site or lessor's residence shall be at least five hundred (500) feet. Distance to be measured from the wall line of the neighboring principal building to the base of the WES tower. - Distance from centerline of public roads shall be at least five hundred (500) feet or one hundred ten percent (110%) the height of the wind turbines, whichever distance is greater, measured from the ground surface to the tip of the blade when in a fully vertical position. - Distance from any property line shall be at least five hundred (500) feet or one hundred ten percent (110%) the height of the wind turbine, whichever distance is greater, measured from the ground surface to the tip of the blade when in a fully vertical position unless wind easement has been obtained from adjoining property owner.
Noise	Noise level shall not exceed 50 dBA, including constructive interference effects at the perimeter of the principal and accessory structures of existing offsite residences, businesses, and buildings owned and/or maintained by a governmental entity.
Turbine Spacing	The turbines shall be spaced no closer than three (3) rotor diameters (RD) within a string and 10 RDs between strings. If required during final micro-siting of the turbines to account for topographic conditions, up to 10 percent of the towers may be sited closer than the above spacing, but the permittees shall minimize the need to site the turbines closer.
Shadow Flicker (Voluntary)	Voluntary commitment of no exceedance of a maximum of 30 hours of shadow flicker per year at any existing, non-participating residence, business, or building owned and/or maintained by a governmental entity, unless otherwise agreed to by the landowner. Applicant will take steps to mitigate shadow flicker concerns at residences that could experience shadow flicker concerns at residences that could experience shadow flicker levels above 30 hours per year.
Roberts County	
Setbacks[3]	- 1,275 feet from participating and non-participating residences, businesses, churches, or schools (plus 2.5 feet for each additional vertical foot more than 500 feet in height) - 110 percent the height of the wind turbines from the centerline of public right-of-way.[4] - 110 percent the height of the wind turbines from any property line unless a wind easement has been obtained from adjoining property owner.[5]

Category	Requirements/Commitments
Noise[6]	Noise level shall not exceed 50 dBA, average A-weighted sound pressure including constructive interference effects as measured at the exterior wall of the closest principal and accessory structures.
Turbine Spacing	The turbines shall be spaced no closer than two and one-half (2.5) rotor diameters (RD) (measurement of blades tip to tip) within a straight line. If required during final micrositing of the turbines to account for topographic conditions, up to 10 percent of the towers may be sited closer than the above spacing but the permittees shall minimize the need to site the turbines closer.
Shadow Flicker[7]	A Flicker Analysis shall include the duration and location of flicker potential for all schools, churches, businesses and occupied dwellings within a one (1) mile radius of each turbine within a project. The applicant shall provide a site map identifying the locations of shadow flicker that may be caused by the project and the expected durations of the flicker at these locations from sun-rise to sun-set over the course of a year. The analysis shall account for topography but not for obstacles such as accessory structures and trees. Flicker at any receptor shall not exceed thirty (30) hours per year within the analysis area.

[1]As of October 16, 2018, this is the proposed ordinance for setbacks in Grant County under review. A copy of the current ordinance and proposed ordinance can be found in Appendix C.
[2] The Board of Adjustment may allow setback/separation distances to be less than the established distances identified above, if the adjoining landowners agree to a lesser setback/separation distance. If approved, such agreement is to be recorded and filed with the Register of Deeds.
[3]The Board of adjustment may allow setback/separation distances to be less than the established distances identified above if the participating or non-participating landowners agree to a lesser setback/separation distance. If approved, such agreement is to be recorded and filed with the Roberts Count Zoning Officer. Said agreement will be binding upon the heirs, successors, and assigns of the title holder will pass with the land.
[4]The horizontal setback is measured from the base of the tower to the public ROW.
[5]The horizontal setback is measured from the base of the tower to the adjoining property line unless wind easement has been obtained from adjoining property owner.
[6]The Board of Adjustment may allow for a greater decibel level than identified above if the participating or non-participating landowners agree to said decibel level. If approved, such agreement is to be recorded and filed with the Roberts County Zoning Officer. Said agreement will be binding upon the heirs, successors, and assigns of the title holder and will pass with the land.
[7]The Board of Adjustment may allow for a greater amount of flicker than identified above if the participating or non-participating landowners agree to said amount of flicker. If approved, such agreement is to be recorded and filed with the Roberts County Zoning Officer. Said agreement will be binding upon the heirs, successors, and assigns of the title holder and will pass with the land.

10.3 Lack of Reliance on Eminent Domain Powers

Dakota Range III will not use eminent domain powers to acquire easements for the Wind Project or Transmission Facility. All land rights required for the Wind Project and Transmission Facility were obtained through voluntary Wind Energy Leases or Transmission Easements with property owners. Private land and public road ROWs would be used for all facilities. Further, the Applicant will coordinate with federal, State, and local agencies to obtain appropriate permits for the Project. Thus, selection of an alternative site would not reduce reliance on eminent domain powers.

11.0 ENVIRONMENTAL INFORMATION (ARSD 20:10:22:13)

ARSD 20:10:22:13. Environmental information. *The applicant shall provide a description of the existing environment at the time of the submission of the application, estimates of changes in the existing environment which are anticipated to result from construction and operation of the proposed facility, and identification of irreversible changes which are anticipated to remain beyond the operating lifetime of the facility. The environmental effects shall be calculated to reveal and assess demonstrated or suspected hazards to the health and welfare of human, plant and animal communities which may be cumulative or synergistic consequences of siting the proposed facility in combination with any operating energy conversion facilities, existing or under construction. The applicant shall provide a list of other major industrial facilities under regulation which may have an adverse effect on the environment as a result of their construction or operation in the transmission site, wind energy site, or siting area.*

Chapters 12.0 through 16.0 and Chapters 18.0, 19.0, and 21.0 provide a description of the existing environment at the time of the Application submittal, the potential changes to the existing environment that are anticipated as a result of Project construction and operation, and the irreversible changes that are anticipated to remain beyond the operational lifetime of the facility. These chapters also identify the avoidance, minimization, and mitigation measures that will be implemented for the Project. Table 11-1 identifies the ground disturbance impacts (both temporary impacts during construction and operational impacts during the life of the Project) assumed for the Project. To be conservative, the impact calculations set forth in Table 11-1 include impacts for all 45 proposed turbine locations.

11-1: Summary of Project Ground Disturbance Impacts

Project Component	Construction Impacts (Temporary)		Operational Impacts (Long-Term)	
	Dimensions	*Total Acreage*	*Dimensions*	*Total Acreage*
Wind Project				
Turbines	150-foot radius	83	25-foot radius	2
Access roads	50-feet-wide	75	16-feet-wide	24
Crane paths	50-feet-wide	135	N/A	N/A
Collector lines	30-feet-wide	155	5-foot by 5-foot junction box	0.0006
Collection substation		10		10
Meteorological towers	75-foot by 75-foot area	0.44	75-foot by 75-foot area	0.44
O&M facility	Apx. 400X600	8	Apx. 400X600	5
Laydown/staging/ batch plant areas	Apx 800X1200	20	Apx 800X1200	20
Wind Project Subtotals:		**408 acres**		**60 acres**
Transmission Facility				

Project	Construction Impacts (Temporary)		Operational Impacts (Long-Term)	
Transmission workspace	200-feet-wide*	24 acres per mile*	N/A	N/A
Structures	N/A	N/A	36-inch diameter poles approximately 30 feet apart	0.15 acre (~70 poles)
Switchyard	0	0	0	0
Temporary laydown/staging area	5 acres but will likely use Wind Project staging area	5 acres but will likely use Wind Project staging area	N/A	N/A
Transmission Facility Subtotals:		**192 acres (8 miles)**		**72 acres (8 miles)**
Project Totals:		**600 acres**		**132 acres**

*This assumes maximum area of impact. Actual impact should be much smaller.

A cumulative impacts analysis that accounts for the impacts of the proposed Project and other energy conversion facilities that are operating or under construction is required (ARSD 20:10:22:13). The phrase "energy conversion facility" is defined as "any new facility, or facility expansion, designed for or capable of generation of one hundred megawatts or more of electricity, but does not include any wind energy facilities (SDCL 49-41b-2(6))." There are no other operating energy conversion facilities, existing or under construction, or other major industrial facilities under regulation by the Commission within or adjacent to the Project Area. Although not included in the definition of "energy conversion facility," and not existing or under construction, the Dakota Range I and II Project has been taken into consideration, as appropriate, in the applicable resource sections. Overall, the cumulative impact of the two projects is not expected to significantly affect any resource.

12.0 EFFECT ON PHYSICAL ENVIRONMENT (ARSD 20:10:22:14)

ARSD 20:10:22:14. Effect on physical environment. *The applicant shall provide information describing the effect of the proposed facility on the physical environment. The information shall include:*

(1) A written description of the regional land forms surrounding the proposed plant or wind energy site or through which the transmission facility will pass;

(2) A topographic map of the plant, wind energy, or transmission site;

(3) A written summary of the geological features of the plant, wind energy, or transmission site using the topographic map as a base showing the bedrock geology and surficial geology with sufficient cross-sections to depict the major subsurface variations in the siting area;

(4) A description and location of economic deposits such as lignite, sand and gravel, scoria, and industrial and ceramic quality clay existent within the plant, wind energy, or transmission site;

(5) A description of the soil type at the plant, wind energy, or transmission site;

(6) An analysis of potential erosion or sedimentation which may result from site clearing, construction, or operating activities and measures which will be taken for their control;

(7) Information on areas of seismic risks, subsidence potential and slope instability for the plant, wind energy, or transmission site; and

(8) An analysis of any constraints that may be imposed by geological characteristics on the design, construction, or operation of the proposed facility and a description of plans to offset such constraints.

The following sections describe the existing physical environment within the Project Area, the potential effects of the proposed Project on the physical environment, and measures that will be utilized to avoid, minimize, and/or mitigate potential impacts.

12.1 Geological Resources

The existing geological resources within the Project Area are described below, followed by a discussion of the potential effects of the proposed Project, and mitigation and minimization measures.

12.1.1 Existing Geological Resources

This section describes the regional landforms, surficial geology, bedrock geology, economic deposits, seismic risk, and subsidence potential within the Project Area.

12.1.1.1 Regional Landforms/Surficial Geology

The topography within the Project Area is generally characterized by gently rolling hills. Relief within the Project Area is low with site elevations ranging from approximately 1,800 to 1,996 feet above mean sea level (AMSL). Within the Project Area, perennial streams and drainages bisect the terrain. The northern and central portion of the Project Area drains southwest into the Big Sioux River via unnamed tributaries. Drainage in the southeastern portion of the Project Area is southwest into the Indian River via unnamed tributaries. Figure 8 in Appendix A is a topographic map of the Project Area.

The Project Area is located within the Central Lowland province of the Interior Plains physiographic region. The Central Lowland province is characterized by flat lands and geomorphic remnants of glaciation (National Park Service [NPS], 2017a). The Central Lowlands were subject to repeated Pleistocene glaciations. Underlying glacial deposits are largely horizontal Paleozoic sandstones, shales, limestones, conglomerates, and coals.

The following surficial geologic units are mapped within the Project Area (South Dakota Geological Survey [SDGS], 2004a):

- Qal - Alluvium (Quaternary): Clay- to boulder-sized clasts with locally abundant organic material. Thickness up to 75 feet (23 meters).
- Qlo - Outwash, undifferentiated (Upper Wisconsin): Heterogeneous sand and gravel with minor clay and silt, of glaciofluvial origin, including outwash plains, kames, kame terraces, and other undifferentiated deposits. Thickness up to 30 feet (9 meters).
- Qlot - Outwash, terrace (Upper Wisconsin): Heterogeneous clay to gravel of glaciofluvial origin. Thickness up to 60 feet (18 meters).
- Qlov - Outwash, valley train (Upper Wisconsin): Heterogeneous silt to gravel. Confined to valleys of glaciofluvial origin. Thickness up to 60 feet (18 meters).
- Qlt - Till, moraine (Upper Wisconsin): Compact, silty, clay-rich matrix with sand- to boulder-sized clasts of glacial origin. Exhibits a distinctive weathered, dissected surface. Typically overlain by up to 10 feet (3 meters) of loess. Thickness up to 150 feet (46 meters).
- Qlte - Till, end moraine (Upper Wisconsin): Compact, silty, clay-rich matrix with sand- to boulder-sized clasts of glacial origin. A geomorphic feature characterized by elevated linear ridges with hummocky terrain locally at former ice sheet margins. Composite thickness of all Upper Wisconsin till may be up to 300 feet (91 meters).

Figure 9a illustrates the surficial geology within the Project Area, and Figure 9b is a geologic cross-section of the Project Area (Appendix A).

12.1.1.2 Bedrock Geology

The uppermost bedrock unit underlying the entire Project Area is the Pierre Shale (Figure 10, Appendix A). The Pierre Shale, is an Upper Cretaceous-aged blue-gray to dark-gray, fissile to blocky shale with persistent beds of bentonite, black organic shale, and light-brown chalky shale (SDGS, 2004b). The Pierre Shale contains minor sandstone, conglomerate, and abundant carbonate and ferruginous concretions, with thickness up to 1,000 feet (205 meters).

12.1.1.3 Economic Deposits

Commercially viable mineral deposits within Grant and Roberts Counties are limited to sand, gravel, and construction aggregates. Information from the South Dakota Department of Environment and Natural Resources (SDDENR) Minerals and Mining Program and a review of the U.S. Geological Survey (USGS) 7.5-minute quadrangle mapping indicates there is one quarry, LG Everest, located within the Project Area. There are 4 additional quarries located outside the Project area including Rauville Pit (14 miles south), F.J. Mclaughlin Pit (23 miles south), Sand & Gravel Operation (23 miles northeast), and Dakota Mahogany Quarry (23 miles east) (SDDENR, 2017a).

A review of information from the SDDENR Oil and Gas Initiative Program reveals that most of the current and historic oil and gas development in South Dakota occurs in the western half of the State. The Project Area does not lie within an identified oil and gas field, and there are no active or historical oil and gas developments within or near the vicinity of the Project Area (SDDENR, 2017b).

12.1.1.4 Seismic Risks

The risk of seismic activity near the Project Area is low. The USGS Earthquake Hazards Program estimates less than 1 percent chance of damage from earthquakes in 2018 (USGS, 2018a). Further, the 2014 USGS National Seismic Hazard Map indicates the peak ground acceleration (PGA) with a 2 percent chance of exceedance in 50 years is 0.02 to 0.04 g (USGS, 2018a). According to the SDGS, one magnitude 3.7 earthquake was recorded in Roberts County approximately 33 miles from the Project Area in 1995 (SDGS, 2013). No other earthquakes have been recorded for Grant or Roberts County from 1872 to 2013. Available geologic mapping and information from the USGS Earthquake Hazards Program do not indicate any active or inactive faults within the Project Area (USGS, 2018b).

12.1.1.5 Subsidence Potential

The risk for subsidence within the Project Area is considered negligible. The Pierre Shale bedrock is not known to exhibit karst topography or contain layers or members susceptible to dissolution by water. There is no evidence of any historic underground mining operations, which could lead to subsidence potential, existing within the Project Area.

12.1.2 Geological Resources Impacts/Mitigation

The geological conditions, including geologic formations, seismic risk, and subsidence potential, within the Project Area are favorable and are not anticipated to control or impact construction or operation of the Project. Excavation would be required to install the turbine foundations and transmission line structures, and trenching would be required to install collector lines. Prior to construction, geotechnical borings

would be performed at all wind turbine locations and every two miles for the Transmission Facility (approximately 4 borings) to develop the specific design and construction parameters. Laboratory testing of soil samples obtained from the site and geophysical surveys would be performed to determine the engineering characteristics of the site's subgrade soils. If necessary, modifications to roadway and foundation subgrade design would be made to account for specific site conditions. As discussed in Chapter 24.0, the facility would be decommissioned after the end of the Project's operating life. Facilities would be removed in accordance with applicable State and County regulations, unless otherwise agreed to by the landowner. After decommissioning of the Project is complete, the portions of underground facilities that have been abandoned in place would remain beyond the operational lifetime of the facility. However, these remaining facilities would not result in irreversible changes to the underlying geological conditions of the Project Area.

One quarry (owned and operated by LG Everest) is located within the Project Area; however, the Project facilities have been sited outside the quarry to avoid impacts. In addition, the Project will comply with applicable setback requirements with respect to the quarry (Table 10-1 in Section 10.2).

Due to the lack of developed oil and gas fields within the Project Area, construction and operation of the proposed Project poses no impact to oil and gas resources. Therefore, no mitigation is required for impacts to oil and gas resources.

12.2 Soil Resources

The existing soil resources within the Project Area are described below, followed by a discussion of the potential effects of the proposed Project and mitigation and minimization measures.

12.2.1 Existing Soil Resources

This section describes the existing soil types, erosion potential and slopes, and prime farmland soils within the Project Area.

12.2.1.1 Soil Types

The soils within the Project Area primarily consist of fine-loamy or fine-silty soils derived mostly from glacial till, alluvium, and the underlying Pierre Shale bedrock. The soils in the Project Area are not highly susceptible to erosion and are generally conducive to crop production (Natural Resources Conservation Service [NRCS], 2017). Nearly all the soils within the Project Area have the potential to be highly corrosive to buried steel, while less than half of the soils within the Project Area have the potential to be moderately corrosive to concrete. Most soils in the Project Area are well drained, and only approximately 11 percent of the soils have a significant hydric component; 30 to 100 percent of the soil is hydric.

Approximately 7 percent of the soils are considered to have a high potential for frost action (NRCS, 2017). Table 12-1 lists the soil types comprising more than 1 percent of the Project Area and the characteristics of these soils, and Figure 11 in Appendix A illustrates the soil types and distributions within the Project Area.

Table 12-1: Soil Types within the Project Area

Soil Type	Soil Taxonomy	Soil Texture	Parent Material	Natural Drainage Class	Depth to Restrictive Feature (inches)	Acres in Project Area	Percent of Project Area
Z192A (Vienna-Brookings complex, coteau, 0 to 2 percent slopes)	Fine-loamy, mixed, superactive, frigid Calcic Hapludolls	Silt loam	Loess over loamy till	Well drained	Greater than 201	4,890	26.13%
Z192B (Vienna-Brookings complex, coteau, 1 to 6 percent slopes)	Fine-loamy, mixed, superactive, frigid Calcic Hapludolls	Silt loam	Loess over loamy till	Well drained	Greater than 201	3,170	18.88%
Z171A (Renshaw-Fordville loams, coteau, 0 to 2 percent slopes)	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Calcic Hapludolls	Loam	Alluvium over outwash	Somewhat excessively drained	Greater than 201	2,487	14.82%
Z159A (Divide loam, 0 to 2 percent slopes, occasionally flooded)	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Aeric Calciaquolls	Loam	Loamy alluvium over outwash	Somewhat poorly drained	Greater than 201	1,123	6.69%

Soil Type	Soil Taxonomy	Soil Texture	Parent Material	Natural Drainage Class	Depth to Restrictive Feature (inches)	Acres in Project Area	Percent of Project Area
Z194A (Barnes clay loam, coteau, 0 to 2 percent slopes)	Fine-loamy, mixed, superactive, frigid Calcic Hapludolls	Fine loamy	Loamy till	Well drained	Greater than 201	1,018	5.49%
Z199B (Vienna-Barnes-Forestville loams, 1 to 6 percent slopes)	Fine-loamy, mixed, superactive, frigid Calcic Hapludolls	Loam	Loess over loamy till	Well drained	Greater than 201	953	5.68%
Z153A (Lamoure-Rauville silty clay loams, channeled, 0 to 2 percent slopes, frequently flooded)*	Fine-silty, mixed, superactive, calcareous, frigid Cumulic Endoaquolls	Silty clay loam	Silty alluvium	Poorly drained	Greater than 201	531	3.16%
Z158A (Marysland loam, 0 to 1 percent slopes, occasionally flooded)*	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Typic Calciaquolls	Fine-loamy over sandy or sandy-skeletal	Loamy alluvium over outwash	Poorly drained	Greater than 201	506	3.01%

Soil Type	Soil Taxonomy	Soil Texture	Parent Material	Natural Drainage Class	Depth to Restrictive Feature (inches)	Acres in Project Area	Percent of Project Area
Z142B (Barnes-Buse-Svea loams, coteau, 1 to 6 percent slopes)	Fine-loamy, mixed, superactive, frigid Calcic Hapludolls	Fine-loamy	Loamy till	Well drained	Greater than 201	468	2.79%
Z117A (McKranz-Badger silty clay loams, 0 to 2 percent slopes)	Fine-silty, mixed, superactive, frigid Aeric Calciaquolls	Silty clay loam	Loess over loamy till	Somewhat poorly drained	Greater than 201	387	2.31%
Z194B (Barnes clay loam, coteau, 2 to 6 percent slopes)	Fine-loamy, mixed, superactive, frigid Calcic Hapludolls	Clay loam	Loamy till	Well drained	Greater than 201	782	2.09%
Z142C (Barnes-Buse-Svea loams, coteau, 2 to 9 percent slopes)	Fine-loamy, mixed, superactive, frigid Calcic Hapludolls	Loam	Loamy till	Well drained	Greater than 201	319	1.90%
Z177 (Udorthents, coteau (gravel pits)	Udorthents	Not used	Outwash	Excessively drained	Greater than 201	253	1.51%

Soil Type	Soil Taxonomy	Soil Texture	Parent Material	Natural Drainage Class	Depth to Restrictive Feature (inches)	Acres in Project Area	Percent of Project Area
Z114A (Hamerly-Tonka complex, coteau, 0 to 2 percent slopes)	Fine-loamy, mixed, superactive, frigid Aeric Calciaquolls	fine-loamy	Loamy till	Somewhat poorly drained	Greater than 201	215	1.28%

Source: NRCS, 2017
*designates hydric soil

12.2.1.2 Erosion Potential and Slopes

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and saturated hydraulic conductivity (Ksat). Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water. The soils in the Project Area are moderately susceptible to erosion and have K Factors ranging from 0.15 to 0.37, with the majority between 0.24 and 0.32. Slopes in the Project Area range from 1 to 30 percent, with the majority of slopes at 1 to 7 percent.

12.2.1.3 Prime Farmland Soils

NRCS farmland classifications include “prime farmland” (i.e., land that has the best combination of physical and chemical characteristics for the production of crops), “farmland of statewide importance” (i.e., land other than prime farmland that has a good combination of physical and chemical characteristics for the production of crops), and “not prime farmland” (i.e., land that does not meet qualifications for prime farmland), among other classifications. Much of the farmland in the Project Area is classified as either “prime farmland” (69 percent) or “farmland of statewide importance” (5 percent). Approximately 10 percent is categorized as “not prime farmland.” The remaining 26 percent is divided among “prime farmland” categories with stipulations or areas with “no farmland data.” Farmland types within the Project Area are shown in Table 12-2.

Table 12-2: Farmland Types within the Project Area

Farmland Type	Area (acres)	Percentage of Project Area
Prime farmland	11,176	69%
Farmland of statewide importance	776	5%
Not prime farmland	1,631	10%
Prime farmland if drained	1,714	11%
Prime farmland if irrigated	201	15%
No farmland data	660	4%
Total	**16,158**	**100%**

*Farmland data is based on the available soils classification. Only soils representing more than 1% of the Project Area are considered.

12.2.2 Soil Resource Impacts/Mitigation

The following sections describe the potential effects of the proposed Project on soil resources. Where applicable, planned measures to avoid, minimize, or mitigate impacts are noted.

12.2.2.1 Potential for Impacts to Soil Resources

Construction of up to 36 wind turbine foundations, access roads, collector lines, substation, 3 permanent meteorological towers, 345-kV transmission line, O&M facilities, and additional temporary facilities would result in approximately 597 acres of temporary disturbance and approximately 132 acres of permanent impacts (see Table 11-1) to surface soils within the Project Area. Table 11-1 also provides permanent and temporary disturbance for the Wind Project and Transmission Facility. During construction, existing vegetation would be removed in the areas associated with the proposed Project components, potentially increasing the risk of erosion, which is discussed in more detail below. Potential impacts to agricultural soils from the Project, and associated mitigation measures, are discussed in Section 21.2.2. As discussed in Chapter 24.0, the facility would be decommissioned after the end of the Project's operating life. Facilities would be removed in accordance with applicable State and County regulations, unless otherwise agreed to by the landowner. Disturbed surfaces would be graded, reseeded, and restored as nearly as possible to their pre-construction conditions. After decommissioning of the Project is complete, no irreversible changes to soil resources would remain beyond the operating life of the Project.

12.2.2.2 Erosion, Slope Stability, and Sedimentation

The Applicant will design the Project layout to limit construction cut and fill work and limit construction in steep slope areas. Surface disturbance caused by construction of the wind turbines, transmission structures, and infrastructure would result in the soil surface becoming more prone to erosion. Another potential issue is soil compaction, which can occur from use of heavy equipment. Silt and clay soils are especially susceptible to compaction. Measures to reduce impacts to soils would be implemented during construction. These may include the use of erosion and sediment control BMPs during and after construction, noxious weed control, segregating topsoil from subsurface materials, reseeding of disturbed areas based on agency recommendations, the use of construction equipment appropriately sized to the scope and scale of the Project, verifying access road grades fit closely with the natural terrain, proper onsite disposal of soil cuttings from turbine foundation construction, and maintaining proper drainage.

Construction of the Project would require coverage under the General Permit for Storm Water Discharges Associated with Construction Activities issued by the SDDENR. A condition of this permit is the development and implementation of a SWPPP. The SWPPP would be developed during civil engineering design of the Project and would prescribe BMPs to control erosion and sedimentation. The BMPs may

include use of silt fence, straw wattles, erosion control blankets, temporary storm water sedimentation ponds, re-vegetation, or other features and methods designed to control storm water runoff and mitigate erosion and sedimentation. The BMPs would be implemented to reduce the potential for impacts to drainage ways and streams by sediment-laden runoff. During the facility design life, storm water runoff volume and flow rates are not anticipated to increase from those of pre-development conditions.

13.0 EFFECT ON HYDROLOGY (ARSD 20:10:22:15)

ARSD 20:10:22:15. Hydrology. *The applicant shall provide information concerning the hydrology in the area of the proposed plant, wind energy, or transmission site and the effect of the proposed site on surface and groundwater. The information shall include:*

(1) A map drawn to scale of the plant, wind energy, or transmission site showing surface water drainage patterns before and anticipated patterns after construction of the facility;

(2) Using plans filed with any local, state, or federal agencies, indication on a map drawn to scale of the current planned water uses by communities, agriculture, recreation, fish, and wildlife which may be affected by the location of the proposed facility and a summary of those effects;

(3) A map drawn to scale locating any known surface or groundwater supplies within the siting area to be used as a water source or a direct water discharge site for the proposed facility and all offsite pipelines or channels required for water transmission;

(4) If aquifers are to be used as a source of potable water supply or process water, specifications of the aquifers to be used and definition of their characteristics, including the capacity of the aquifer to yield water, the estimated recharge rate, and the quality of groundwater;

(5) A description of designs for storage, reprocessing, and cooling prior to discharge of heated water entering natural drainage systems; and

(6) If deep well injection is to be used for effluent disposal, a description of the reservoir storage capacity, rate of injection, and confinement characteristics and potential negative effects on any aquifers and groundwater users which may be affected.

The following sections describe the existing hydrology within the Project Area, the potential effects of the proposed Project on hydrology, and measures that will be utilized to avoid, minimize, and/or mitigate potential impacts.

13.1 Groundwater Resources

The existing groundwater resources within the Project Area are described below, followed by a discussion of the potential effects of the proposed Project, and avoidance, minimization, and/or mitigation measures.

13.1.1 Existing Groundwater Resources

The groundwater system underlying the parts of South Dakota that are east of the Missouri River, including the Project Area, is nearly exclusively based on glacial outwash aquifers. According to the SDGS, there are approximately 444 public water supply systems east of the Missouri River, and 392 of them utilize glacial outwash aquifers (Iles, 2008). This is consistent with the types of soils in the area, many of which were formed from glacial till or glacial drift. Glacial drift and alluvium aquifers in South Dakota vary in depth from 0 to 400 feet, with a range of yield from 3 to 50 gallons per minute (Chadima, 1994). Unlike bedrock-type aquifers, glacial outwash aquifers are extremely difficult to predict at the subsurface; however, the quality of water from glacial outwash aquifers tends to exceed that of water derived from bedrock-type aquifers.

13.1.2 Groundwater Resources Impacts/Mitigation

The construction of the Project may require dewatering of excavated areas because of shallow groundwater, particularly for wind turbine foundations and transmission line structures or collector line trenches. Construction dewatering may temporarily lower the water table in the immediate area and may temporarily lower nearby surface water elevations depending on the proximity and connectivity of groundwater and surface water and extent of the excavated area.

Groundwater dewatering is not anticipated to be a major concern within the Project Area because wind turbines and transmission line structures are most likely to be placed at higher elevation where the water table tends to be deeper. Should groundwater be encountered that must be dewatered, the necessary permits would be obtained and associated requirements implemented. In addition, the duration of dewatering would be limited to the extent practicable. Dewatered groundwater would be properly handled to allow sediments to settle out and be removed before the water is discharged, to reduce sedimentation of surface waters.

The introduction of contaminants into groundwater due to accidental release of construction related chemicals, fuels, or hydraulic fluid could have an adverse effect on groundwater quality, most notably near shallow water wells. Spill-related effects are primarily associated with fuel storage, equipment refueling, and equipment maintenance. Implementation of BMPs associated with spill prevention and countermeasures would minimize the impacts on groundwater. BMPs for spill-related effects would include storing fuels within secondary containment devices, checking vehicles and equipment for leaks, performing refueling and equipment maintenance away from wells, maintaining a spill response kit, and appropriate reporting protocols for any spills.

13.2 Surface Water Resources

The existing surface water resources within the Project Area are described below, followed by a discussion of the potential effects of the proposed Project, and avoidance, minimization, and/or mitigation measures.

13.2.1 Existing Surface Water Resources

This section describes the existing hydrology, floodplains, NPS Nationwide Rivers Inventory (NRI) resources, and impaired waters within the Project Area.

13.2.1.1 Hydrology

The majority of the Project Area is located within the Big Sioux watershed, part of the Missouri River Basin surface water drainage system. Drainage from the Project Area to the southwest is via the Big Sioux River and its tributaries (Figure 12, Appendix A). Drainage of the northeastern and eastern portions of the Project Area are to the east through Minnesota via numerous unnamed streams.

Prairie potholes, depressions formed by previous glacier activity, are common in the Upper Midwest region. These potholes fill with rain and snowmelt and become depression wetlands (primarily freshwater marshes). Many prairie potholes are temporary and are not connected to surface waters, but permanently filled prairie potholes also exist (U.S. Environmental Protection Agency [EPA], 2018a).

To more accurately characterize surface water resources, including wetlands, streams, and other surface waters, within the Project Area, a wetland delineation was completed on approximately 98 percent of the survey corridor in 2018. The results of the delineation and a discussion of Project impacts to wetlands and waterbodies are discussed in Section 14.2.

13.2.1.2 National Park Service Nationwide Rivers Inventory

The NRI is a "listing of more than 3,400 free-flowing river segments in the U.S. that are believed to possess one or more 'outstandingly remarkable' natural or cultural values judged to be of more than local or regional significance. Under a 1979 Presidential Directive, and related Council on Environmental Quality procedures, all federal agencies must seek to avoid or mitigate actions that would adversely affect one or more NRI segments" (NPS, 2017b). There are no NRI-listed rivers within the Project Area. The nearest NRI-listed rivers are the South Fork of the Yellow Bank River, located approximately 25 miles southeast of the Project Area, and the North Fork of the Whetstone River, located approximately 8 miles north of the Project Area.

13.2.1.3 Impaired Waters

The CWA requires states to publish biannually a list of streams and lakes that are not meeting their designated uses because of excess pollutants. These streams and lakes are considered impaired waters (EPA, 2018b). The list, known as the 303(d) list, is based on violations of water quality standards. States establish priority rankings for waters on the 303(d) list and develop the total maximum daily load (TMDL) of a pollutant that the water can receive and still safely meet water quality standards. There are no sections of the Big Sioux listed as impaired on South Dakota's 2018 303(d) list (SDDENR, 2018).

13.2.1.4 Floodplains

Within the Project Area, narrow floodplains exist along major streams, including Big Sioux and its tributaries (Figure 12). According to the Federal Emergency Management Agency (FEMA)-mapped floodplain zones, floodplains within the Grant County portion of the Project Area are areas of minimal flood hazard, and the Roberts County portion are mapped as areas of undetermined flood hazard (Zone D) (FEMA, 2017). One area within Roberts County, in the northeastern portion of the Project Area, is mapped as Zone A, a special flood hazard area.

13.2.2 Surface Water Resource Impacts/Mitigation

Potential impacts to water resources from the construction and operation of the Project may include deterioration of surface water quality through sedimentation, impacts to drainage patterns, and increased runoff due to the creation of impervious surfaces. Project facilities have been designed to avoid impacts on surface water resources. Therefore, the Project is not expected to cause significant changes in runoff patterns or volume of runoff, nor is it expected to have adverse impacts on existing hydrology.

In general, because wind turbines would be located at higher elevations within the Project Area to maximize wind exposure and transmission line structures are located outside these areas, impacts to streams and drainage ways are not anticipated. The underground collection system may temporarily impact surface drainage patterns during construction if the collection system is trenched through drainage ways; however, these impacts would be short-term, and existing contours and drainage patterns are expected to be restored within 24 hours of trenching. Where stream/drainage crossings cannot be avoided for construction of access roads, appropriately designed culverts or low water crossings would be placed to maintain the free flow of water. As such, the Project would not result in changes to existing drainage patterns in the Project Area.

The creation of impervious surfaces reduces the capacity of an area to absorb precipitation into the soil and tends to increase the volume and rate of storm water runoff. The Project would create up to 132 acres of impermeable surface through the construction of turbine and transmission structure pads, access roads, meteorological equipment, the O&M facility, and the collection substation (see Table 11-1). The wind turbine pads, access roads, and parking lots for the O&M facility and substation yards would be constructed of compacted gravel and would not be paved. The O&M facility, substation, and switching station will consist of cement foundations. However, this level of compaction may inhibit infiltration and may increase runoff in these areas. As discussed in Section 12.2.2.2, appropriate storm water management BMPs would be implemented during construction and operation of the Project to control erosion and reduce the potential for sediment-laden runoff from exposed soils during precipitation events. These

BMPs are anticipated to adequately mitigate for runoff due to the increase in impervious surface. After decommissioning of the Project is complete, no irreversible changes to surface water resources would remain beyond the operating life of the Project.

Due to the lack of NRI-listed rivers within the Project Area, construction and operation of the proposed facility poses no impact to these resources. Therefore, no mitigation is required for impacts to NRI-listed rivers.

13.2.2.1 Impacts to Impaired Waters and Mitigation

There are no CWA 303(d) listed waters within the Project Area; therefore, no impacts or special construction measures to mitigate impacts to impaired water would be necessary.

13.2.2.2 Impacts to Flood Storage Areas and Mitigation

In natural systems, floodplains serve several functions that include storing excess water during high-flow/high-runoff periods, moderating the release of water during high-flow/high-runoff periods, reducing flow velocity, and filtering out sediments and other pollutants. The placement of fill into floodplains reduces the effectiveness of these functions.

As noted previously, wind turbines and transmission line structures would be located at higher elevations, and the current layout avoids placing the turbines, transmission structures, and new access roads in floodplains. Based on the current layout, the underground collector system would cross potential floodplains associated with the Big Sioux River and its tributaries. The underground collection system may temporarily impact flood storage areas during construction if the collection system is trenched through these stream floodplains; however, these impacts would be short-term, and existing contours and drainage patterns are expected to be restored within 24 hours of trenching. Where floodplain crossings cannot be avoided for construction of access roads, appropriately designed culverts or low water crossings would be placed to maintain the free flow of water. Construction or fill within floodplains would be designed in accordance with Grant or Roberts County floodplain development regulations.

13.3 Current and Planned Water Uses

The current and planned water uses within the Project Area are described below, followed by a discussion of the potential effects of the proposed Project, and avoidance, minimization, and/or mitigation measures.

13.3.1 Current and Planned Water Uses within the Project Area

The Grant-Roberts Water District supplies rural water to the Project Area and maintains a network of distribution lines within the Project Area. Private wells that supply water for domestic and irrigation

purposes are also located throughout the Project Area. Perennial streams within the Project Area, including the Big Sioux River and its tributaries (Figure 12) provide habitat for fish and wildlife and support recreational activities, such as fishing.

13.3.2 Effect on Current or Planned Water Use

The proposed Project facilities would not have impacts on either municipal or private water uses in the Project Area. Water storage, reprocessing, or cooling is not required for either the planned construction or operation of the facilities. The Project facilities would not require deep well injection. The Project operation would not require the appropriation of surface water or permanent dewatering. SDDENR's Drinking Water Program reviewed the Project and does not anticipate any adverse impacts to drinking waters of the State (see letter from SDDENR dated July 26, 2017, in Appendix B).

The Applicant would connect the O&M facility to the rural water system. Water usage at the O&M facility would be similar to household volume, less than 5 gallons per minute. The Applicant would coordinate with the Grant-Roberts Water District to locate and map its network of distribution lines within the Project Area and determine if a rural water supply connection is necessary for the Project. Existing water lines would be avoided by Project design and construction. If necessary, the Applicant would obtain required permits or crossing agreements from the Grant-Roberts Water District.

Alternatively, a water supply well would be required if rural water service is not available. The Applicant would work with the SDDENR to obtain the necessary water rights permit. The specific aquifer to be used and the characteristics of that aquifer would depend on the final location of the O&M facility. Water usage at the O&M facility would be negligible (similar to household volume as stated above). Therefore, regardless of the water supply well location and aquifer source, the Project would not affect aquifer recharge rates. The Project would comply with applicable permit requirements for water rights and the protection of groundwater quality.

The construction of wind farm or transmission line facilities can interrupt the availability of groundwater through construction dewatering. Construction dewatering may temporarily lower the water table such that nearby wells may lose some of their capacity. However, the Project is not anticipated to require major dewatering; therefore, interruption of groundwater availability caused by dewatering is unlikely. As a result, no negative impacts on groundwater resources are anticipated.

The Project would have no impact on surface water availability or use for communities, agriculture, recreation, fish, or wildlife. As discussed in Section 14.2.2, HDD may be used for the installation of

collector lines under intermittent surface water features, should alternate turbine G12 and turbine G13 be utilized for the Project.

14.0 EFFECT ON TERRESTRIAL ECOSYSTEMS (ARSD 20:10:22:16)

ARSD 20:10:22:16. Effect on terrestrial ecosystems. *The applicant shall provide information on the effect of the proposed facility on the terrestrial ecosystems, including existing information resulting from biological surveys conducted to identify and quantify the terrestrial fauna and flora potentially affected within the transmission site, wind energy site, or siting area; an analysis of the impact of construction and operation of the proposed facility on the terrestrial biotic environment, including breeding times and places and pathways of migration; important species; and planned measures to ameliorate negative biological impacts as a result of construction and operation of the proposed facility.*

The following sections describe the existing terrestrial ecosystems within the Project Area, potential effects of the proposed Project on these terrestrial systems, and avoidance and minimization measures planned to ameliorate potential impacts to terrestrial systems. Terrestrial ecosystem data were collected from literature searches, federal and State agency reports, natural resource databases, and agency recommended field surveys completed for the Project. Specific resources discussed in the following sections include vegetation, wetlands, and wildlife, including federally and State-listed species.

14.1 Vegetation (Flora)

The existing vegetation within the Project Area is described below, followed by a discussion of the potential effects of the proposed Project and mitigation and minimization measures.

14.1.1 Existing Vegetation

The approximately 18,717-acre Project Area is in the Big Sioux Basin Level IV Ecoregion within the Northern Glaciated Plains Level III Ecoregion (EPA, 2016). According to the USGS National Land Cover Database (NLCD), cultivated crops (55.7 percent) and herbaceous/grassland (34.6 percent) compose the majority of the land cover/land use within the Project Area, while the remaining land cover/land use types account for less than 6.0 percent of the Project Area (USGS NLCD, 2011; Homer et al., 2015). The most common cultivated croplands in 2017 were corn (*Zea mays*) and soybeans (*Glycine max*) (U.S. Department of Agriculture [USDA] National Agricultural Statistics Service [NASS], 2018).

Remnant grassland tracts are dominated by a mix of grasses, such as smooth brome (*Bromus inermis*), sideoats grama (*Bouteloua curtipendula*), big bluestem (*Andropogon gerardii*), and quackgrass (*Elymus repens*). Additional vegetation includes goldenrod (*Solidago spp*.), white sagebrush (*Artemisia ludoviciana*), thistles (*Cirsium spp*.), asters (*Symphyotrichum spp*.), and areas of sunflowers (*Helianthus spp*.).

Trees within the Project Area are found mainly around farm residences and shelterbelts. The most common tree species in the Project Area include eastern cottonwood (*Populus deltoides*), bur oak

(*Quercus macrocarpa*), and green ash (*Fraxinus pennsylvanica*). Dense stands of Siberian peashrub (*Caragana arborescens*) are common in many of the windbreaks.

Wetlands, discussed further in Section 14.2, are found in low-lying depressions around crops and in some of the remnant grassland swales and drainages. Vegetation in the wetlands is dominated by prairie cordgrass (*Spartina pectinata*) and cattail (*Typha spp*.).

14.1.1.1 Undisturbed Grasslands

The USFWS and SDGFP provided a recommendation to avoid or minimize impacts to undisturbed grasslands during the October 2017 agency coordination meeting. The Applicant completed an analysis to identify these features as part of the undisturbed grassland habitat assessment completed for the Dakota skipper (DASK; *Hesperia dacotae*) and Poweshiek skipperling (POSK; *Oarisma Poweshiek*) within the Project Area. Areas of potentially undisturbed (unbroken) grassland areas were identified within the Project Area using 2016 USDA National Agriculture Imagery Program aerial photography and USDA NASS crop data. This data was detailed in a digital layer with the delineated land use/land cover into undisturbed grassland features. The undisturbed grassland features were further evaluated by comparison with the Quantifying Undisturbed (Native) Lands in Eastern South Dakota: 2013 digital data layer (Bauman et al., 2016). The field review determined potentially undisturbed grassland features identified during the desktop review via visual inspection by a qualified biologist. These undisturbed grassland areas are displayed on Figure 13 in Appendix A.

A review of the undisturbed grasslands in the Project Area reveal localized fragmentation impacts due to land conversion and vegetation loss primarily associated with agriculture, but also to invasive and noxious species, pesticides, urbanization through road construction, distribution and transmission lines, pipelines, fiber optic lines, gravel pits, and residential development. Most of the agricultural land conversion activities have occurred in the past and led to extensive undisturbed grassland removal, fragmentation and loss decades ago.

14.1.1.2 Noxious Weeds

Noxious weeds are regulated by state (SDCL 38-22) and federal (U.S. Code of Federal Regulations [CFR] 2006) rules and regulations designed to stop the spread of plants that are detrimental to the environment, crops, livestock, and/or public health. According to the South Dakota Department of Agriculture (SDDOA), ten listed species of noxious weeds are known to occur and are regulated within Grant and/or Roberts Counties (SDDOA, 2016a and 2016b) (Table 14-1).

Table 14-1: State and Local Noxious Weeds of South Dakota

Common Name	Scientific Name	Weed Status
Canada thistle	*Cirsium arvense*	State noxious weed
Leafy spurge	*Euphorbia esula*	State noxious weed
Salt cedar	*Tamarix aphylla, T. chinensis, T. gallica, T. parviflora, and T. ramosissima*	State noxious weed
Absinth wormwood	*Artemisia absinthium*	Local noxious weed – Roberts/Grant Counties
Field bindweed	*Convolvulus arvensis*	Local noxious weed – Roberts/Grant Counties
Common tansy	*Tanacetum vulgare*	Local noxious weed – Grant County
Musk thistle	*Carduus nutans*	Local noxious weed – Roberts/Grant Counties
Plumeless thistle	*Carduus acnthoides*	Local noxious weed – Roberts/Grant Counties
Spotted knapweed	*Centaurea maculosa*	Local noxious weed – Grant County
Yellow toadflax	*Linaria vulgaris*	Local noxious weed – Roberts County

Source: SDDOA, 2016a and 2016b

14.1.2 Vegetation Impacts/Mitigation

Temporary and permanent impacts to vegetation would occur due to construction of the wind turbine foundations, access roads, Project substation, meteorological equipment, and O&M facility during the life of the Project. However, the Project has been sited to maximize the placement of facilities in previously disturbed agricultural lands, and the majority of the temporary and permanent vegetation impacts would occur to cultivated or previously disturbed agricultural fields. Specifically, of the 45 proposed wind turbine locations, 44 would be constructed in previously disturbed agricultural lands.

Table 14-2 provides the estimates of vegetation disturbances associated with the construction and operation of the Project.

Table 14-2: Potential Permanent and Temporary Construction Impacts to Undisturbed Grasslands

Construction Activity	Undisturbed Grassland
Permanent	**10.7**
Access Road	1.0
Met tower	0.1
O&M Facility	4.6
Substation	4.9
Turbine - Primary	0.1
Temporary	**75.7**

Access Road	2.3
Crane Path	58.0
Met Tower	0.1
Turbine - Primary	0.9
Underground collection	14.4
Grand Total	**86.4**

Noxious Weeds

Project activities have the potential to result in the spread of noxious weed species resulting from construction equipment introducing seeds into new areas, or erosion or sedimentation due to clearing ground in the construction areas. The spread of noxious weeds is will be managed via use of appropriate seed mixes in non-cultivated areas and SWPPP compliance to restore vegetation in disturbed areas. If listed noxious weed infestations are found in non-cultivated disturbed areas after construction activities are completed, each area would be evaluated and addressed separately, in coordination with landowners. Areas temporarily disturbed due to construction would be re-vegetated with vegetation types matching the surrounding agricultural landscape. The construction contractor would coordinate with the Natural Resources Conservation Service and/or the landowner on seed mixes for revegetation. Restoration would be initiated as soon as possible after construction activities are completed.

Fragmentation

The remnant undisturbed grassland tracts are primarily located in drainages and swales, and mostly exist in a degraded state due to ongoing land management practices, the application of agricultural pesticides, and noxious weed expansion. In an effort to further minimize fragmentation, the Project sited infrastructure in areas that have undergone previous disturbances from agricultural or other development activities and limiting permanent disturbances to undisturbed grassland area. The minimization measures have included using existing roads for access, limiting construction of new roads, and restoration of temporarily disturbed areas to minimize impacts.

Transmission Facility

The entire 8-mile lineal length of the Transmission Facility has been collocated to parallel existing rights-of-way of public roads and the corresponding right-of-way, which reduces habitat fragmentation and vegetation impacts. In addition, the transmission corridor has been routed to minimize tree clearing.

Cumulative Vegetation Impacts

The minimal amount of permanent vegetation loss from this Project would not have an additive effect or significantly impact localized and remnant vegetation resources when combined with the Dakota Range I and II Wind Project.

14.2 Wetlands and Waterbodies

The wetlands and waterbodies identified within the Project Area are described below, followed by a discussion of the potential effects of the proposed Project and avoidance, minimization, and/or mitigation measures. While aquatic in nature, wetlands and waterbodies. are important functional components of the terrestrial ecosystem and are thus discussed in this section.

14.2.1 Existing Wetlands and Waterbodies

Wetlands are defined in the *Corps of Engineers Wetland Delineation Manual* (Manual) (Environmental Laboratory, 1987) as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." The Manual identifies three wetland criteria that must be met for a wetland to be present: dominance of hydrophytic vegetation, hydric soils, and sufficient hydrology. Some wetlands, as well as other waterbodies, are considered Waters of the U.S. under Section 404 of the CWA and are, therefore, regulated by the USACE with respect to discharge of fill material into the water features.

Based on a desktop review of USFWS National Wetland Inventory (NWI) maps, there are approximately 424 acres of wetlands or other waterbodies within the Project Area. These wetlands and waterbodies are displayed on Figure 10 and summarized in Table 14-3.

Table 14-2: NWI Wetlands and Waterbodies Mapped Within the Project Area and Survey Corridors

Wetland Type	Acres Within Project Area and Along Transmission Line Alignment	Acres Within Survey Corridors
Freshwater emergent wetland	273	70
Freshwater forested wetland	2	1
Freshwater pond	58	2
Riverine	91	22
Total	424	95

Source: USFWS NWI data

A wetland and waterbodies delineation was completed for the Project in July, August, September, and October 2018, in accordance with USACE-approved methodology. A 250-foot buffer around all proposed Project facilities (turbines, access roads, collection lines, potential substation locations, transmission line,

O&M building location etc.) was surveyed. It should be noted that three turbines, F10, G07, and G11 had a 350-foot survey buffer. A total of 6,024 acres were surveyed for the waters of the U.S. delineation. Wetland delineations were completed on approximately 98 percent of the survey corridor. Prior to construction, the remainder of the environmental survey corridor will be surveyed for wetlands in October 2018.

To date, a total of 79 wetlands were delineated during field surveys, for a total of 63 acres of wetland within the survey corridor. The majority (n=75) of wetlands were identified as emergent (Palustrine Emergent [PEM]). Three wetlands were dominated by scrub-shrub vegetation (Palustrine Scrub-Shrub [PSS]), and only one wetland was identified as forested (Palustrine Forested [PFO]). In addition to the delineated wetlands, a total of 44 other waterbodies were delineated during field surveys. These waterbodies consisted of 11 constructed ponds and 33 stream reaches. All streams were identified as intermittent within the Project Area. The delineated potentially jurisdictional wetlands and waterbodies. are summarized in Table 14-4.

Table 14-3: Delineated Wetlands and Waterbodies.

Wetland Type	Acres Delineated
Freshwater emergent wetland	42
Freshwater pond	2
Scrub-shrub wetland	2
Forested wetland	<1
Riverine	16
Total:	63

Source: Blanton and Associates Waters of the U.S. Delineation Report, (In progress)

14.2.2 Wetlands and Waterbodies Impacts/Mitigation

The Applicant conducted a wetland and Waters of the U.S. delineation according to the USACE Wetlands Delineation Manual (Environmental Laboratory, 1987) and applicable Regional Supplements. Project infrastructure has been sited to avoid and/or minimize impacts to wetlands and waterbodies. Through these Project design, siting, and avoidance measures, Dakota Range III has minimized permanent wetland impacts to four areas, consisting of minor impacts associated with four access roads crossings of emergent wetlands. Where surveys have not been completed, NWI data are used to calculate impacts.

Table 14-5 provides an estimate of the potential temporary and permanent impacts to potentially jurisdictional wetlands and waterbodies.

Table 14-4: Potential Permanent and Temporary Construction Impacts to Potentially Jurisdictional Wetlands and Waterbodies.

Construction Activity	Freshwater Emergent Wetland	Stream / Water of the U.S.
Permanent	**0.2**	**0.0**
Access Road	0.2	0.0
Temporary	**2.9**	**1.6**
Access Road	0.2	0.0
Crane Path	0.8	0.2
Transmission Line	1.2	1.0
Underground collection	0.7	0.4
Grand Total	**3.1**	**1.6**

Any temporary and permanent impacts to potentially jurisdictional wetlands and waterbodies are minor and would be authorized under the USACE Nationwide Permit (NWP) 12 for utility lines and associated facilities.

Transmission Facility

Transmission Facility construction activities would span delineated wetlands and Waters of the U.S., thereby avoiding any permanent impacts.

Cumulative Wetland and Waterbodies Impacts

The Project infrastructure has been sited to avoid and/or minimize impacts to potentially jurisdictional wetlands and waterbodies. Based on the impact avoidance and minimization measures enacted, Project impacts to wetlands and waterbodies are minor, would be authorized under the USACE NWP program, and would not have an additive effect when combined with the Dakota Range I & II Wind Project.

14.3 Wildlife (Fauna)

To reduce the potential impacts of wind energy facilities on wildlife species and habitat, the USFWS has developed the Land-Based WEG (USFWS, 2012) and the Eagle Conservation Plan Guidance (ECPG; USFWS, 2013). These voluntary guidelines provide a structured, scientific approach for assessing wildlife risks at wind energy facilities, promote communication between project proponents and federal/state agencies, and provide a practical approach to address wildlife conservation concerns at all stages of land-based wind energy development. The South Dakota Bat Working Group in cooperation with the SDGFP compiled siting guidelines for wind power developers in South Dakota (Siting Guidelines, Undated). These guidelines are generally consistent with the WEG, but also provide guidance for other non-wildlife resources (e.g., land use, noise, visual resources, soil erosion, and water quality).

The Applicant followed the processes outlined in the WEG, ECPG, and Siting Guidelines for the development, construction, and operation of the proposed Wind Project. The Applicant has engaged in ongoing coordination with the USFWS and SDGFP to seek input on wildlife resources potentially occurring within the Project Area and to seek guidance on the appropriate studies to evaluate risk and inform development of impact avoidance and minimization measures for the Project. Summaries of agency coordination meetings occurring on October 24, 2017 and November 02, 2017 are included in Appendix B.

14.3.1 Existing Wildlife

The wildlife identified within the Project Area is described below, followed by a discussion of the potential effects of the proposed Project's construction and operation and avoidance and minimization measures.

14.3.1.1 Initial Site Assessment

In accordance with Tiers 1 and 2 of the WEG, Stage 1 of the ECPG, and the Siting Guidelines, a review of readily available desktop information was completed to assess potential adverse effects to species of concern and their habitats. Data sources included USFWS Information for Planning and Conservation (IPaC) website, South Dakota Natural Heritage Database, USGS Breeding Bird Survey, aerial imagery, and non-governmental organization websites (e.g., Audubon Society, American Wind Wildlife Institute Landscape Assessment Tool, e-Bird, and the Hawk Migration Association of North America). In addition, agency input was requested from USFWS and SDGFP regarding any instances of federally and State-listed animals and plants, significant natural communities, and other species of concern or significant habitats that occur in the area of interest.

14.3.1.2 Federally Listed Terrestrial Species

According to a review of the USFWS IPaC, there are five federally listed species protected under the Endangered Species Act (ESA) that have the potential to occur in the Project Area (Table 14-5). Table 14-6 identifies the potential for each of the federally listed terrestrial species to occur in the Project Area.

Table 14-5: Federally Listed Terrestrial Species Potentially Occurring in the Project Area

Species	Status	Potential to Occur
Dakota skipper	Threatened	Potential to occur within suitable habitat
Poweshiek skipperling	Endangered	Largely extirpated from region; unlikely to occur

Species	Status	Potential to Occur
Northern long-eared bat	Threatened	Summer habitat lacking, potential seasonal migrant
Red knot	Threatened	Rarely observed in Midwest; unlikely to occur
Western prairie fringed orchid	Threatened	Commonly associated with big and little bluestem, switchgrass, and Indiangrass dominated tall grass prairie and wet meadows. Species believed to be extirpated in SD; unlikely to occur

Source: USFWS IPaC, September 2018

Western Prairie Fringed Orchid

The western prairie fringed orchid was listed as federally threatened on September 28, 1989. The western prairie fringed orchid is presently known to occur in six states (Iowa, Kansas, Minnesota, Missouri, Nebraska, and North Dakota) and Manitoba, Canada; and appears to be extirpated from Oklahoma, and no populations are known to exist in South Dakota. The western prairie fringed orchid is most commonly found in moist, undisturbed mesic to wet calcareous prairies, sedge meadows and mesic swales. The Project Area does not contain any designated Critical Habitats.

Northern Long-Eared Bat

The NLEB is a federally threatened species throughout its range listed under the ESA; however, the take due to operation of wind projects is exempt under a 4(d) rule (81 Federal Register 9: 1900-1922, 2016). Due to declines caused by and the continued spread of white-nose syndrome (WNS) caused by a fungus (*Pseudogymnoascus destructans*), the NLEB was listed as threatened under the ESA on April 2, 2015. In addition, the USFWS issued the final 4(d) rule for the NLEB on January 14, 2016. The Project Area does not contain any designated Critical Habitats.

The final 4(d) rule retained a two-tiered framework to regulate incidental take both inside and outside the designated WNS zones and reduced the scope of take prohibitions. The WNS zone includes U.S. counties within 150 miles of counties where hibernacula with WNS or the fungus that causes WNS (*Pseudogymnoascus destructans*) has been documented. Based on the October 1, 2018 USFWS data, the WNS zone includes both Grant and Roberts counties in South Dakota (USFWS, 2018). Therefore, since the Project occurs within the WNS zone, there is no prohibition against incidental take so long as the project does not: 1) result in the incidental take of the bat in hibernacula, 2) result in the incidental take of the bat by altering a known hibernaculum's entrance or interior environment if the alteration impairs an

essential behavioral pattern, including sheltering bats, or 3) result in tree-removal activities that incidentally take bats when the activity either occurs within 0.25 mile of a known hibernaculum, or cuts or destroys known occupied maternity roost trees, or any other trees within a 150-foot radius from the maternity roost tree, during the pup season from June 1 through July 31.

The NLEB is a forest-dependent species that tends to avoid open habitats, generally relying on forest features for both foraging and roosting during the summer months and requiring forest interior habitat with adequate canopy closure for both roosting and foraging. Abundance of NLEB prey items, particularly beetles and moths, are typically higher in more closed forest stands than in forest openings, and wing morphology makes this bat species ideally suited for the high maneuverability required for gleaning-type foraging within a cluttered forest interior. Additionally, riparian areas are considered critical resource areas for many species of bats because they support higher concentrations of prey, provide drinking areas, and act as unobstructed commuting corridors. Lastly, it is unlikely that the NLEB crosses over large open areas (i.e., land lacking suitable habitat) to search for foraging and roosting habitats.

Dakota Skipper

The Dakota skipper is listed as threatened under the ESA. The Project Area does not contain any designated Critical Habitats. Dakota skippers are obligate residents of remnant (untilled) high-quality prairie, habitats that are dominated by native grasses and that contain a high diversity of native forbs (flowering herbaceous plants). Dakota skipper habitat has been categorized into two main types. Type A habitat is described as high-quality, low (wet-mesic) prairie with little topographic relief that occurs on near-shore glacial lake deposits, dominated by little bluestem grass (*Schizachyrium scoparium*), with the likely presence of wood lily (*Lilium philadelphicum*), bluebell bellflower (*Campanula rotundifolia*), and mountain deathcamas (*Zigadenus elegans*). Type B habitat is described as rolling native-prairie terrain over gravelly glacial moraine deposits and is dominated by bluestems and needlegrasses (*Hesperostipa* spp.) with the likely presence of bluebell bellflower, wood lily, purple coneflower (*Echinacea angustifolia*), upright prairie coneflower (*Ratibida columnifera*), and blanketflower (*Gaillardia aristata*).

Poweshiek Skipperling

The Poweshiek skipperling is listed as endangered under the ESA and is believed to have been extirpated in the state of South Dakota. The Project Area does not contain any designated Critical Habitats. Poweshiek skipperling habitat preferences include high-quality prairie fens, grassy lake and stream margins, remnant moist meadows, and wet-mesic to dry tallgrass remnant (untilled) prairies. These areas are dominated by native prairie grasses, such as little bluestem and prairie dropseed, but also contain a

high diversity of native forbs, including black-eyed Susan (*Rudbeckia hirta*) and palespike lobelia (*Lobelia spicata*). Poweshiek skipperlings depend on a diversity of native plants endemic to tallgrass prairies and prairie fens.

14.3.1.3 State-Listed Terrestrial Species

State-listed terrestrial species identified as potentially occurring within Grant and Roberts Counties are identified in Table 14-7. SDGFP agreed that these species are unlikely to occur wihthin the Project Area; therefore, risk to these sepcies is considered low, and species-specific surveys were not necessary.

Table 14-6: State-Listed Terrestrial Species in Grant and Roberts Counties

Species	State Status	Potential to Occur
Osprey	Threatened	Found near aquatic areas, rare outside Black Hills; unlikely to occur.
Northern river otter	Threatened	Riparian vegetation along wetland margins; unlikely to occur.
Whooping crane	Endangered	Project is over 60 miles east of migration corridor; unlikely to occur.

Source: https://gfp.sd.gov/wildlife/docs/ThreatenedCountyList.pdf (Accessed September 2018)

Whooping Crane

The whooping crane is listed as Endangered by the SDGFP. A review of the USFWS migration corridor (USFWS 2009) shows that the western Project Area boundary is 60 miles east of the designated eastern edge and 150 miles from the central designated migration core corridor, respectively. Additionally, there are no USFWS (2009) historic whooping crane sightings documented in the Project Area. Using the historic South Dakota-specific whooping crane observations, the Project is seven miles east of the designated eastern edge of the migration boundary. Also, the Transmission Facility has been co-located near existing public roads and is located further east of the designated migration corridors. Lastly, theTransmission Facility does not cross any major waterbodies or areas for concentrating migrating waterfowl or potential suitable habitat for the whooping crane. Therefore, the Project Area occurs outside of both of the designated USFWS (2009) and state specific migration corridors, and the whooping crane is unlikely to occur within the Project.

14.3.1.4 Studies Conducted to Date

The following wildlife studies have been completed or are ongoing for the Project in accordance with USFWS and SDGFP recommendations (Appendix B).

14.3.1.4.1 Birds

To determine the presence of bird species that occur within the Project Area, the Applicant completed various surveys in accordance with Tier 3 of the WEG, Stage 2 of the ECPG, and USFWS and SDGFP guidance. Surveys included raptor nest surveys, eagle/avian use surveys, and prairie grouse lek surveys. General avian use point-count surveys were completed in the winter and spring periods from December 2015 to May 2017, and fixed-point avian use surveys were conducted approximately once monthly from September 2017 to August 2018.

The reports detailing the methods and results of the avian surveys are included in Appendices D through G and summarized below.

Raptor and Eagle Nest Surveys

Aerial raptor nest surveys were completed in April 2018 (Appendix E) to characterize the raptor nesting community and locate nests for raptors within the Project Area and 1-mile buffer, and for eagles within the Project Area and 10-mile buffer. Aerial surveys were completed prior to leaf-out and during the breeding season when raptors would be actively tending nests, incubating eggs, or brood-rearing. Raptor nest surveys focused on locating stick nest structures in suitable raptor nesting substrate (trees, transmission lines, shelter belts, etc.) within each respective survey area.

Non-Eagle Raptor Nests – During the April 2018 survey, four active raptor nests (two great horned owl [*Bubo virginianus*] and two red-tailed hawk [*Buteo jamaicensis*]) and seven inactive non-eagle raptor nests of undetermined species were located within the raptor nest survey area. One of the active nests (great horned owl) and five of the inactive nests were within the 1-mile of the Project boundary. None of the unoccupied nests exhibited characteristics of eagle nests.

Transmission Line

No raptor nests were located within the transmission line corridor. One occupied red-tailed hawk nest, one occupied great-horned owl nest, and three inactive/unoccupied unidentified nests were located approximately within one mile of the transmission line.

Eagle Nests – During the April 2018 survey, no eagle nests were located within the Project Area. Within the 10-mile survey area, five occupied active eagle nests, one occupied inactive bald eagle (*Haliaeetus leucocephalus*) nest, two unoccupied potential eagle nests, and one nest (nest ID #8) occupied by a great horned owl that was previously occupied by bald eagles in 2017 (Western EcoSystems Technology, Inc. [WEST], 2017), were identified. The nearest occupied bald eagle nests are approximately 2.9 miles east

and 4.9 miles northeast of the Project Area, and the nearest unoccupied bald eagle nest is approximately 4.8 miles north. Two eagle nests were located outside the survey area: nest ID #4 was an occupied-active eagle nest located approximately 11 miles southeast of the Project Area, and nest ID #7 was an unoccupied potential bald eagle nest located just over 10 miles west of the Project Area.

Transmission Line

No eagle nests were located near the transmission line corridor. The closest eagle nest was located approximately 5 miles east of the transmission line.

Avian Use Surveys

Avian/eagle use point-count surveys were completed for the Project to evaluate species composition, relative abundance, and spatial characteristics of avian use in accordance with agency recommendations (Appendix D). The avian use survey was completed following the study plan, as discussed with the USFWS and SDGFP. Fixed-point avian use surveys were completed approximately once monthly during winter and spring from December 2015 to May 2017 at 40 survey points and 12 consecutive months from September 2017 to August 2018 at 14 survey points. The 40 survey points associated with the December 2015 to May 2017 surveys represented a larger area previously proposed for development. However, 14 of the 40 survey points occurred in the current Dakota Range III project boundary and encompassed approximately 30 percent of the current Project Area consistent with the WEG and ECPG for survey area coverage.

Large bird surveys were completed for 60 minutes during each visit, with an 800-meter survey radius, to achieve approximately 30 percent spatial coverage of the Project to meet the survey level recommended in the USFWS ECPG (USFWS, 2013). Small bird surveys were completed for 5 minutes before the 60-minute large bird surveys at the same 14 points. The surveys also recorded data for small and large bird species, eagles, and species of concern (i.e., federally or State-threatened and endangered species [ESA 1973], USFWS Birds of Conservation Concern [BCC; USFWS, 2008], and South Dakota Species of Greatest Conservation Need [SGCN; SDGFP, 2017a]).

A total of 26 unique large bird species were identified during the large bird surveys. The most common species groups observed included waterfowl, waterbirds, and upland game birds. Only one bald eagle was observed during the one year of survey. The eagle was observed on June 29, 2018 along the northern edge of the Project. A total of 29 small bird species were recorded during the small bird surveys. The most common species included chestnut-collared longspur (*Calcarius ornatus*), red-winged blackbird

(*Agelaius phoeniceus*), and snow bunting (*Plectrophenax nivalis*). A full analysis and report are currently being prepared.

Transmission Line

No eagles have been observed within the 800-m survey points that overlap the transmission line. The closest bald eagle was observed approximately one mile southeast of the transmission line.

Birds of Conservation Concern

The 1988 amendment to the Fish and Wildlife Conservation Act mandates that the USFWS "identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the ESA of 1973." Because of this mandate, the USFWS created the BCC list (USFWS, 2008). The goal of the BCC list is to prevent or remove the need for additional ESA bird listings by implementing proactive management and conservation actions and coordinating consultations in accordance with Executive Order 13186.

Eight species listed on the BCC for the Prairie Pothole Region were observed during the avian use survey and included bald eagle, Hudsonian godwit (*Limosa haemastica*), marbled godwit (*Limosa fedoa*), Swainson's hawk (*Buteo swainsoni*), upland sandpiper (*Bartramia longicauda*), chestnut-collared longspur (*Calcarius ornatus*), and grasshopper sparrow (*Ammodramus savannarum*).

Species of Greatest Conservation Need

The SDGFP has developed the South Dakota State Wildlife Action Plan (SWAP) (SDGFP, 2014), which is a comprehensive planning document that establishes the framework and information for setting conservation priorities for the State of South Dakota. The SWAP identifies and focuses on SGCN and ecosystems that require conservation strategies to avoid future ESA listing. SGCN are not afforded protections under the State endangered species law statute.

Three species listed on the South Dakota SGCN list were observed during the avian use survey and included chestnut-collared longspur, marbled godwit, and bald eagle.

Prairie Grouse Lek Surveys

Prairie grouse lek surveys were completed from late March to early May in 2018 in accordance with protocols outlined in the SDGFP Wildlife Survey Manual (SDGFP, 2009) and direction received during an October 2017 agency coordination meeting with the SDGFP and USFWS. Because a large portion of the Project Area is cultivated cropland, a desktop assessment of suitable habitat was completed to refine

the lek survey area prior to field surveys. Grassland habitats greater than 60 acres were considered optimal habitat and most likely to support lekking grouse if present within the Project Area. Approximately 1,903 acres of grassland habitat greater than 60 acres were identified via desktop evaluation of the Project Area and surveyed for prairie grouse. These larger grassland areas were identified and thus comprised the lek survey area.

Ground-based lek surveys were completed in three separate sampling rounds completed from March 29 to May 12, 2018 (Appendix F). Historic lek locations were provided by SDGFP for the Project Area and vicinity, which included one sharp-tailed grouse lek approximately 0.75 mile southwest of the Project Area. This lek location was also specifically evaluated three times.

No grouse were seen or heard during any of the three survey rounds. Therefore, no prairie grouse leks were documented within the Project Area. The historic lek located southwest of the Project Area was also confirmed inactive during the ground-based surveys.

Transmission Line

There are no prairie grouse leks were located within the transmission line corridor. The closest lek was approximately 3 miles east of the eastern terminus.

14.3.1.4.2 Bats

There are thirteen species of bats that inhabit South Dakota (SDGFP, 2017b), six of which have the potential to occur within the Project Area (Table 14-8). Of these species, the NLEB is the only State- and federally listed bat with the potential to occur within the area.

Table 14-7: Bat Species Potentially Occurring in the Project Area

Common Name	Scientific Name
Red bat	*Lasiurus borealis*
Hoary bat	*Lasiurus cinereus*
Silver-haired bat	*Lasionycteris noctivagans*
Northern long-eared bat	*Myotis septentrionalis*
Little brown myotis	*Myotis lucifugus*
Big brown bat	*Eptesicus fuscus*

Source: South Dakota Bat Working Group, 2004

Based on coordination with the USFWS and SDGFP, it was agreed that risk to the regional bats and the NLEB is low due to the lack of suitable habitats associated with the cropland dominated siting area and

limited forested tracts. However, the Applicant agreed to survey for bats using acoustic recorders. Two recorders were installed on met towers, with one recorder or microphone elevated approximately 50 meters on the tower and the other located near the base. Two other ground recorders were placed near a wetland and treed habitat areas. The acoustic surveys were conducted from approximately May 1 through October 15, 2018. The Applicant will share the results of the year 1 surveys and discuss the necessity to conduct a second year of acoustic surveys with the USFWS and SDGFP. Of note, the bat acoustic surveys provide information on the number of bat passes per unit time and is used as an index of bat use in the Project Area. More importantly, data on bat pass rates represent indices of bat activity and do not represent numbers of individuals nor present a probability or correlation of mortality.

14.3.2 Wildlife Impacts/Avoidance and Minimization Measures

Terrestrial wildlife species could be potentially impacted at various spatial and temporal scales during the construction and operation of the Project. The following sections detail the potential impacts and avoidance and minimization measures to reduce those potential impacts.

14.3.2.1 Federally Listed Species

The western prairie fringed orchid, Poweshiek skipperling, Dakota skipper, and NLEB federally listed species have the potential to occur within the Project Area.

Western Prairie Fringed Orchid

As stated previously, no western prairie fringed orchid is known to exist in South Dakota. Accordingly, no Project impacts are anticipated, and no mitigation is proposed.

Dakota Skipper and Poweshiek Skipperling

A desktop habitat assessment was completed for the Project Area in June 2018 to identify grasslands with potentially suitable Dakota skipper and Poweshiek skipperling habitat (i.e., areas of undisturbed grasslands that meet species specific habitat criteria). A total of approximately 2,494 acres of potentially undisturbed grassland within the Project Area were identified as warranting field evaluation. Pedestrian field surveys were then completed June 25 through 28, 2018 to evaluate areas identified during the desktop review as potentially suitable habitat and to confirm areas of unsuitability.

Two parcels (designated as North and South) totaling 114 acres were evaluated potential habitat for either or both butterfly species. A further habitat evaluation survey was conducted on September 21 and 22, 2018 by a regional butterfly expert to determine if habitat suitability criteria were met for either or both species in the North and South Parcels.

North Parcel

The North Parcel was deemed to contain some areas of fair to good quality habitat for either for both butterfly species during the June 2018 habitat assessment and field evaluation. The September 21 and 22, 2018 evaluation determined that there were patches of prairie dropseed scattered through the wet-mesic areas and also a healthy forb component in those specific areas. There was also one small area in the southeast corner of the parcel where little bluestem, side-oats gramma, prairie dropseed, and purple coneflower were present, along with a good diversity of other species. Based on the grass and forb composition of this parcel, it was defined as potential Dakota skipper and Poweshiek skipperling habitat.

This habitat parcel was completely avoided, and Project infrastructure was shifted to the north of the parcel and into an area determined as previously tilled using the information from the Quantifying Undisturbed (Native) Lands in Eastern South Dakota: 2013 digital data layer (Bauman et al., 2016). Therefore, no potential direct or indirect impacts are anticipated to either listed butterfly species in this habitat parcel.

South Parcel

The South Parcel was deemed to contain some areas of potential fair to good quality habitat for the Dakota skipper during the June 2018 habitat assessment and field evaluation. The September 21 and 22, 2018 evaluation revealed an isolated nature of this grassland tract combined with a current and past grazing regimen. The land use management has resulted in a limited amount of larval resources and nectar resources. While larval host plant grasses and nectar plants may be present, they were very scarce and/or patchy in their distribution.

Transmission Line

Approximately 2,000 feet of the Transmission Facility traverses the South Parcel. However, based on the planned construction of the transmission line immediately adjacent to a public road and collocated to the ditch right-of-way, the South Parcel was determined unlikely to support either Dakota skippers or Poweshiek skipperlings. Therefore, no modifications to the Project layout were made with respect to this parcel.

Northern Longed Eared Bat

As previously detailed, the Project initiated a bat acoustic survey in May 2018 that concluded in mid-October 2018. Since the results of that survey are not currently available, desktop mapping and siting of potential NLEB habitat was also completed to inform siting and reduce potential impacts.

A desktop assessment was conducted for potential suitable NLEB habitat in the Project Area. The assessment included review of Google Earth aerial imagery within the Project area and delineating woodlots and shelterbelts in GIS. The layout was reviewed to determine if any wind turbines were within 1,000 feet of potential suitable small roost and foraging woodlots that are greater than 15 acres (USFWS, 2011, Foster and Kurta 1999; Henderson and Broders, 2008). Conversely, any wooded patches greater than 1,000 feet from forest patches less than 15 acres were not considered as suitable NLEB habitat.

The desktop assessment showed that the majority of the Project is cropland.. Most of the mapped treed habitats included woodlots near residences and shelterbelts in agricultural fields and were less than 15 acres in size. These habitats were not considered as suitable habitat for the NLEB. The assessment did identity four isolated woodlots and shelterbelts greater than 15 acres and which were of sufficient size to constitute potentially suitable NLEB habitat.

If tree removal is necessary, it will occur between August 1 and May 31. Therefore, per the final 4(d) Rule for the NLEB (USFWS, 2016), the Project will not result in prohibited incidental take because no clearing of known maternity roost trees or trees within 150 feet of known maternity roost trees between June 1 and July 31 nor remove trees within 0.25 mile of a known hibernacula at any time of the year. Also, to minimize potential impacts to NLEB, wind turbines were sited more than 1,000 feet from the four treed habitat features greater than 15 acres.. Lastly, risk of collision will be reduced by feathering[8] the turbines to manufacturer's cut in speed from sunset to sunrise during the primary bat active period (April 15-October 15) to avoid potential impacts to any NLEBs flying and/or migrating through the Project Area.

Cumulative NLEB Impacts

As previously discussed, the range of NLEBs is typically associated with mature interior forests and not the habitats associated with croplands and limited grasslands and forested areas in the Project area. NLEBs are unlikely to occur in the Project Area due to the lack of suitable habitats. Based on the foregoing, the proposed Dakota Range I and II and Dakota Range III Projects are not likely to adversely affect NLEBs and population-level impacts are not expected.

[8] In accordance with at least one protocol of the operator's control algorithm: as each blade approaches the tower base, it may be feathered to regulate its power loading. To offset resultant loss of torque, the remaining blades may be correspondingly pitched toward power (i.e., feathered into/away from the wind) to balance and/or smooth out the overall rotor torque curve, and thus to avoid torque ripples. This contributes to maximizing power production while minimizing stress on the turbine' s components.

14.3.2.2 State-Listed Species

No State-listed species were documented to occur during site-specific studies completed for the Project Area. Given the very low risk of impact to State-listed species, no additional species-specific avoidance or minimization measures are necessary per the recommendations received from the SDGFP October 2017 agency coordination meeting.

14.3.2.3 Avian Species

Potential impacts to avian species from the construction and operation of the Project include indirect impacts, such as the removal of habitat, and direct impacts, such as turbine blade strikes. Indirect impacts will be minimized by siting facilities within previously disturbed areas and avoiding untilled grassland habitats and forested areas where possible. Additionally, all areas of temporary disturbance will be reclaimed by seeding with vegetation consistent with the surrounding vegetation types.

Direct impacts to avian species are anticipated to be low based on pre-construction survey results. Raptor use documented for the Project Area was low compared to other wind projects sited in similar habitat. Most bird species observed during the surveys are widespread and abundant, and most are at low risk of collision with turbines and the transmission line, especially due to the high amount of agricultural lands and localized habitat fragmentation that has resulted in limited suitable habitat within the Project Area. Analysis of the data collected during the avian surveys generally indicated that potential impacts to birds, including species of concern, diurnal raptors, grassland species, and eagles are expected to be low as evidenced by several post-construction fatality monitoring studies completed in the cropland/grassland areas of South Dakota, North Dakota, and western Minnesota. Additional avoidance and minimization measures are identified in Section 14.3.2.5.

Transmission Line

Collisions and Electrocutions - Direct impacts to birds may also result from collisions with the transmission line and from electrocution. Mortality of birds from collision and electrocution due to transmission lines is well documented. The risk of collision is related primarily to specific behaviors; in particular, courtship displays, flushing, and aerial displays may increase the risk of collision because the birds are distracted. Risk is also increased if a transmission line is located between roosting, feeding, or nesting areas. Bird species with poor vision, that are young or less agile, or that are unfamiliar with the area may also be at increased risk of collision with transmission lines.

Electrocutions typically result when a bird’s wingspan is such that is equal to or greater than the distance between two energized and/or grounded components of a transmission line (Avian Power Line Interaction

Committee [APLIC], 2012). To minimize any potential impacts with avian and electrocution potential, the transmission line has been colocated near existing public roads. In addition, the transmission line doesn't cross any major waterbodies or areas for concentrating migrating waterfowl. Lastly, the Project will use APLIC guidance to minimize the risk of electrocution and collisions of birds by power lines (APLIC, 2006; 2012). If required through ongoing agency coordination, area along the 8 mile lineal transmission line length would be reviewed for the necessity to install flight diverters and other devices to reduce the potential for collision and electrocution.

Cumulative Impacts to Avian Species

Transmission Line

There are approximately 160,000 miles of high-voltage power lines and 5.5 million miles of distribution lines (e.g., of various sizes) (U.S. Energy Information Administration [EIA], 2016).

The Dakota Range I & II project interconnected to the grid via a short 0.1-mile intertie and the Dakota Range III will build approximately 8 miles of new high voltage line. Therefore, the 8 miles of new Dakota Range III high voltage line, plus the 0.1-mile Dakota Range I & II high voltage line, divided by the 160,000 of existing high voltage line, results in approximately 0.005 percent of new high voltage line construction. The combined 8.1-mile of transmission lines will incrementally add to the existing system of millions of miles of power lines. However, operation of the transmission line is not expected to be significantly increase the risk of collision or electrocutions of avian species due to the colocation along public roads, the lack of concentrating wetlands or other features and the Applicant proposed measures to reduce impacts to avian species from transmission lines using APLIC design recommendations.

Wind Farm

Mortality of bird collisions with manmade structures has in some circumstances been monitored and researched specific to communications towers, windows, and other tall structures including wind turbine generators. This analysis details potential bird mortality resulting from wind turbine towers and moving blades and transmission line, which can both pose a collision risk for birds. The USFWS acknowledges that bird mortality at wind projects does contribute to overall avian mortality. However, compared to other anthropogenic sources of avian mortality, the effect of avian mortality at wind energy facilities is minor.

The siting area falls within the Prairie Potholes Bird Conservation Region (BCR), of which the boundary extends west into South Dakota and northeastern Nebraska and northwest through Minnesota, North Dakota, northern Montana, and southern portions of Alberta, Saskatchewan, and Manitoba. The Prairie

Pothole BCR falls within the Prairie Biome, where monitoring has shown that small birds make up approximately 63 percent of all bird fatalities (Erickson et al., 2014). Based on the regional monitoring data detailing overall bird fatality rates, the construction and operation of the Dakota Range I and II projects and the Dakota Range III Project under consideration in the siting area are not expected to cause naturally occurring populations of common birds or BCC to be reduced to numbers below levels for maintaining viability at local or regional levels.

Threatened and Endangered Species

The combined Dakota Range I & II and Dakota Range III projects in the siting area will not result in substantial losses or degradation of habitat for state or federally designated threatened or endangered bird species or substantial changes in habitat conditions producing indirect effects that would cause naturally occurring species specific populations to be reduced in numbers below levels for maintaining viability at local or regional levels. Lastly, neither project will result in any impacts to designated Critical Habitats.

14.3.2.4 Bats

Potential impacts to regional bat species from the construction and operation of the Project include indirect impacts and direct impacts including turbine blade strikes. To minimize potential indirect impacts, turbines and access roads have been sited to avoid wooded draws and shelterbelts to the extent possible, and minimal tree removal is expected. However, if tree clearing is required, it would be avoided between June 1 and July 31 to avoid potential impacts during the maternal roost period. To minimize degradation of habitat, areas of temporary disturbance would be reclaimed with vegetation consistent with the surrounding vegetation types.

Publicly available curtailment studies to date show an inverse relationship between cut-in speeds and bat mortality. Feathering below the manufacturer's cut-in speed is expected to reduce overall bat mortality by a minimum of 35 percent (Good et al., 2012; Young et al., 2011; Baerwald et al., 2009). Therefore, risk of direct impact to bats would be reduced by feathering the turbines to manufacturer's cut-in speed from sunset to sunrise during the primary bat active period (April 15-October 15). Additional avoidance and minimization measures are identified in Section 14.3.2.5.

Cumulative Bat Impacts

The effect of cumulative mortality on grassland and agricultural cropland dwelling and tree-roosting migratory bat populations is highly uncertain because estimates of current population sizes are unknown. However, several post-construction fatality monitoring studies have been completed in the cropland and grassland areas of South Dakota, North Dakota, and western Minnesota, and review of these studies

indicates that bat fatality rates in this region are low. The Project Area has minimal bat habitat, and avoidance and minimization measures would further reduce potential impacts. Therefore, any potential impacts associated with the Project will likely not be additive when combined with the Dakota Range I & II Wind Project.

14.3.2.5 Avoidance and Minimization Measures

The following impact minimization and avoidance measures, developed in coordination with the USFWS and SDGFP, would be implemented for the Project to ameliorate potential negative biological impacts as a result of construction and operation of the proposed facility:

- Sited wind turbines more than 1,000 feet from four shelterbelts and woodlots greater than 15 acres in size to avoid potential impacts to NLEBs;
- Minimize ground disturbance/clearing of native grasslands;
- Avoid and/or minimize impacts to potentially suitable habitat for the Dakota skipper and Poweshiek skipperling;
- Avoid siting turbines in wetlands and waterbodieswaterbodies;
- Design transmission facilities using APLIC guidance to minimize the risk of electrocution and collisions of birds by power lines (APLIC, 2006; 2012);
- Feather blades to manufacturer's cut-in speed from sunset to sunrise during the bat active period (April 15 – October 15);
- Avoid tree removal from June 1 through July 31 to minimize risk of impact to potential maternal roosts and other tree roosting habitat for NLEBs and other bat species;
- Train staff to recognize eagles, and if observed, evaluate risk and respond appropriately; and
- Conduct monitoring for two years during operations to assess low risk conclusions.

15.0 EFFECT ON AQUATIC ECOSYSTEMS (ARSD 20:10:22:17)

ARSD 20:10:22:17. Effect on aquatic ecosystems. *The applicant shall provide information of the effect of the proposed facility on aquatic ecosystems, and including existing information resulting from biological surveys conducted to identify and quantify the aquatic fauna and flora, potentially affected within the transmission site, wind energy site, or siting area, an analysis of the impact of the construction and operation of the proposed facility on the total aquatic biotic environment and planned measures to ameliorate negative biological impacts as a result of construction and operation of the proposed facility.*

The following sections describe the existing aquatic ecosystems within the Project Area, the potential impacts to aquatic ecosystems as a result of the Project, and mitigation and minimization measures planned to ameliorate potential impacts to aquatic systems.

15.1 Existing Aquatic Ecosystems

As described in Section 13.2.1.1, the majority of the Project Area is located within the Big Sioux River watershed, and part of the Missouri River Basin surface water drainage system. The Big Sioux River traverses the northern extent of the Project Area in an east – west direction. No other major perennial streams bisect the Project Area; however, there are several unnamed intermittent drainages. As described in Section 14.2.1, a total of 79 wetlands were delineated during field surveys, for a total of 44 acres of wetlands within the area surveyed. In addition to the delineated wetlands, a total of 44 other waterbodies were delineated during field surveys. These waterbodies consisted of 11 constructed ponds and 33 stream reaches.

15.1.1 Federally Listed Aquatic Species

Based on the IPaC and agency reviews, there are no federally listed aquatic species that potentially occur in the Project Area. Therefore, there are no impacts anticipated to any federally listed aquatic species.

15.1.2 State-Listed Aquatic Species

State-listed aquatic species identified as potentially occurring within Grant and Roberts Counties are identified in Table 15-1. SDGFP agreed that these species are unlikely to occur within the Project Area; therefore, risk to these species is considered low, and species-specific surveys were not necessary.

Table 15-1: State-Listed Aquatic Species in Grant and Roberts Counties

Species	State Status	Potential to Occur
Blacknose shiner	Endangered	Project outside range; unlikely to occur.
Northern redbelly dace	Threatened	Unlikely to occur.

Source: https://gfp.sd.gov/wildlife/docs/ThreatenedCountyList.pdf (September 2018)

15.2 Aquatic Ecosystem Impacts/Mitigation

As described in Section 14.2.2, impacts to wetlands and other waterbodies would be minimal because these features have been avoided during design of the Project to the extent possible, and those impacts that are required are managed per State and federal requirements. The primary potential for impact to aquatic ecosystems would be from increased sedimentation or increased total suspended solids (TSS) due to soil erosion during Project construction; however, this risk is managed via implementation of the SWPPP required prior to construction. The USFWS and SDGFP have been consulted regarding the federally and State-listed aquatic species with potential to occur in or near the Project Area, and both agencies agree that the species are not anticipated to be affected by the Project.

16.0 LAND USE (ARSD 20:10:22:18)

ARSD 20:10:22:18. Land use. *The applicant shall provide the following information concerning present and anticipated use or condition of the land:*

(1) A map or maps drawn to scale of the plant, wind energy, or transmission site identifying existing land use according to the following classification system:

(a) Land used primarily for row and nonrow crops in rotation;

(b) Irrigated lands;

(c) Pasturelands and rangelands;

(d) Haylands;

(e) Undisturbed native grasslands;

(f) Existing and potential extractive nonrenewable resources;

(g) Other major industries;

(h) Rural residences and farmsteads, family farms, and ranches;

(i) Residential;

(j) Public, commercial, and institutional use;

(k) Municipal water supply and water sources for organized rural water systems; and

(l) Noise sensitive land uses;

(2) Identification of the number of persons and homes which will be displaced by the location of the proposed facility;

(3) An analysis of the compatibility of the proposed facility with present land use of the surrounding area, with special attention paid to the effects on rural life and the business of farming; and

(4) A general analysis of the effects of the proposed facility and associated facilities on land uses and the planned measures to ameliorate adverse impacts.

The following sections describe the existing land use, sound, and aesthetics within the Project Area, the potential land use impacts of the Project, and measures that will be utilized to avoid, minimize, and/or mitigate potential impacts.

16.1 Land Use

The existing land uses within the Project Area are described below, followed by a discussion of the potential effects of the proposed Project's construction and operation on land use, and the proposed mitigation and minimization measures to ameliorate impacts.

16.1.1 Existing Land Use

Land use within the Project Area is predominantly agricultural, consisting of a mix of cropland (row and non-row, in rotation), pasturelands and rangelands, and haylands. Occupied farm sites and rural residences are located throughout the southern half of the Project Area. Figure 14 is a land use map of the Project Area based on the classification system specified in ARSD 20:10:22:18(1). The following land use classifications occur within the Project Area:

- Land used primarily for row and non-row crops in rotation
- Pasturelands and rangelands

- Haylands
- Other (i.e., developed, open water, wetlands, forested, shrub/scrub)
- Irrigated lands
- Undisturbed native grasslands
- Rural residences and farmsteads, family farms, and ranches
- Public, commercial, and institutional use
- Noise sensitive land uses

The following land use classifications were not identified within the Project Area:

- Existing and potential extractive nonrenewable resources
- Other major industries
- Municipal water supply and water sources for organized rural water systems

In Grant County in 2012 (the latest available year for the USDA Census of Agriculture), approximately 68 percent of the farmland area was cropland, with corn for grain being the most common crop (USDA, 2012a). Soybeans for beans was the second most common cultivated crop in Grant County. Cultivated cropland in Grant County increased by 10 percent from 263,680 acres in 2007 to 290,676 acres in 2012 (USDA, 2012b). In Grant County in 2012, approximately 27 percent of the farmland area was pastureland (USDA, 2012a). Pastureland decreased by 28 percent from 10,115 acres in 2007 to 7,313 acres in 2012 (USDA, 2012b).

In Roberts County in 2012, approximately 69 percent of the farmland area was cropland, with soybeans for beans being the most common crop (USDA, 2012c). Corn for grain was the second most common cultivated crop in the county. Cultivated cropland in Roberts County increased by 4 percent from 412,361 acres in 2007 to 429,272 acres in 2012 (USDA, 2012b). In Roberts County in 2012, approximately 24 percent of the farmland area was pastureland (USDA, 2012c). Pastureland decreased 77 percent from 10,451 acres in 2007 to 2,380 acres in 2012 (USDA, 2012b).

Specific acreages of different crops within the Project Area, which change from year to year, are not available.

16.1.2 Land Use Impacts/Mitigation

Construction of the Project will result in the conversion of a small percentage of land (<1 percent) within the Project Area from existing agricultural land uses into a renewable energy resource and transmission line during the life of the Project. Temporary impacts to approximately 597 acres in the Project Area will

also occur as a result of Project construction, including construction staging and laydown areas, pulling/tensioning sites, crane paths, and underground collector lines would be temporary. Following construction, the areas would be returned to pre-construction land uses, which primarily consist of cultivated croplands and pastureland/grassland. Dakota Range III will work with landowners on decompaction efforts in addition to compensating for crop damage.

The proposed Project is compatible with the existing agricultural land uses in areas surrounding the Project facilities. Agricultural uses would continue within the Project Area during construction and operation. It is estimated that approximately 295 acres of agricultural land would be temporarily impacted by Project construction, and 22 acres of agricultural land would be impacted during the life of the Project (less than 0.5 percent of the total land within the Project Area; see Table 11-1). Areas disturbed due to construction that would not host Project facilities would be re-vegetated with vegetation types matching the surrounding agricultural landscape. Agricultural impacts are discussed further in Section 21.2.2. As discussed in Chapter 24.0, the facility would be decommissioned after the end of the Project's operating life. Facilities would be removed in accordance with applicable State and County regulations, unless otherwise agreed to by the landowner. Disturbed surfaces would be graded, reseeded, and restored as closely as possible to their preconstruction conditions. After decommissioning for the Project is complete, no irreversible changes to land use would remain beyond the operating life of the Project.

There are nine occupied residences within the Project Area. Based on the proposed Project layout of turbines, access roads, collector lines, and associated facilities, there would be no displacement of residences or businesses due to construction of the Project facilities.

16.2 Public Lands and Conservation Easements

The existing public lands and conservation easements within the Project Area are described below, followed by a discussion of the potential effects of the proposed Project's construction and operation, and potential avoidance, minimization, and mitigation measures.

16.2.1 Existing Public Lands and Conservation Easements

Figure 15 is a map showing publicly owned or managed lands and conservation easements within or adjacent to the Project Area.

USFWS Wetland and Grassland Easements – Based on data provided by the USFWS Habitat and Population Evaluation Team in January 2017, one wetland easement parcel, six grassland easement parcels, and one combined wetland/grassland conservation easement parcel managed by the USFWS are within the Project Area. USFWS wetland and grassland easements are part of the National Wildlife

Refuge System and are managed for the protection of wildlife and waterfowl habitat. Six of the grassland easements in the Project Area are Dakota Tallgrass Prairie Wildlife Management Areas, which are managed to protect tallgrass prairie.

USFWS Waterfowl Production Areas – There are no USFWS Waterfowl Production Areas (WPAs), within the Project Area. WPAs are satellite areas of the National Wildlife Refuge System and are managed for the preservation of wetlands and grasslands critical to waterfowl and other wildlife. The nearest WPA to the Project is Roberts County WPA 2, located 0.7 mile northeast from the Project at the nearest point.

SDGFP Game Production Areas – There is one Game Production Area (Dunn Game Production Area) located west adjacent to, but not within, the Project Area. Game Production Areas are State lands managed by the SDGFP for the production and maintenance of wildlife. SDGFP has not expressed concern about the Dunn Game Production Area adjacent to the Project Area.

SDGFP Walk-In Areas – There is one parcel of privately owned land partially within the Project Area that is leased for public hunting access by SDGFP (referred to as Walk-In Areas).

NRCS Emergency Watershed Protection Program – There are two parcels of NRCS Emergency Watershed Protection Program land within the Project Area. The Emergency Watershed Protection Program is a federal emergency recovery program that helps local communities recover after natural disaster strikes which impairs a watershed. The NRCS floodplain easements are restored to the extent practicable to restore the flood storage and flow, erosion control, and improve the practical management of the easement. Structures within these easements must be removed or relocated outside the 100-year floodplain or dam breach inundation area.

16.2.2 Impacts/Mitigation to Public Lands and Conservation Easements

The USFWS WPA and SDGFP Game Production Areas are located outside of the Project Area; therefore, no direct impacts to these public lands would occur from the Project. The Applicant coordinated with the USFWS regarding the exact boundaries of the USFWS Wetland and Conservation easements within the larger easement parcels shown on Figure 15. The actual easement is a subset of these parcels (i.e., actual wetland areas for wetland easements and the area defined in the lease amendments for the conservation easements). The Project has been designed such that no Project facilities (e.g., turbines, collector lines, access roads) would be placed on these USFWS Wetland, Conservation, or Grassland Easements, and thus, no direct impacts to these easement areas would occur. A collection line between alternate turbine G12 and turbine G13 could potentially occur on a USFWS Wetland Easement, if both alternate wind

turbines were selected for operation. However, to avoid any impact to the USFWS Wetland Easement, the Applicant would propose to horizontal directionally drill (HDD) the collection line under the defined wetland easement boundary to avoid any impacts.

There will be no disturbance to any privately owned Walk-In Areas, therefore no mitigation is recommended. No impacts to NRCS Emergency Watershed Protection Program parcels would occur because structures must be located outside the 100-year floodplain or dam breach inundation area of these parcels.

16.3 Sound

The existing sound levels within the Project Area are described below, followed by a discussion of the potential effects of the proposed Project's construction and operation, and potential avoidance, minimization, and mitigation measures.

16.3.1 Existing Sound Levels and Regulatory Framework

The Project Area is located in rural Grant and Roberts Counties. The Project Area contains cropland, pasturelands and rangelands, haylands, and rural residences scattered throughout. Farming activities and vehicular traffic are assumed to be the largest contributor to sound, although ambient sound measurements have not been recorded for the Project Area at this time. A sound level modeling study was conducted for the Project in October 2018 (Appendix H). Following is information from the report on sound terminology and noise regulations applicable to the Project.

16.3.1.1 Sound Terminology

There are several ways in which sound (noise) levels are measured and quantified. All of them use the logarithmic decibel (dB) scale. The dB scale is logarithmic to accommodate the wide range of sound intensities found in the environment. A property of the dB scale is that the sound pressure levels of two or more separate sounds are not directly additive. For example, if a sound of 50 dB is added to another sound of 50 dB, the total is only a 3-dB increase (53 dB), which is equal to doubling in sound energy but not equal to a doubling in dB quantity (100 dB). Thus, every 3-dB change in sound level represents a doubling or halving of sound energy. Relative to this characteristic, a change in sound levels of less than 3 dB is imperceptible to the human ear.

Another mathematical property of dBs is that if one source of noise is at least 10 dB louder than another source, then the total sound level is simply the sound level of the higher-level source. For example, a sound source at 60 dB plus another sound source at 47 dB is equal to 60 dB.

A sound level meter (SLM) that is used to measure sound is a standardized instrument.[9] It contains "weighting networks" (e.g., A-, C-, Z-weightings) to adjust the frequency response of the instrument. Frequencies, reported in Hertz (Hz), are detailed characterizations of sounds, often addressed in musical terms as "pitch" or "tone". The most commonly used weighting network is the A-weighting because it most closely approximates how the human ear responds to sound at various frequencies. The A-weighting network is the accepted scale used for regulatory sound level measurements; therefore, sounds are frequently reported as detected with a SLM using this weighting. A-weighted sound levels emphasize middle frequency sounds (i.e., middle pitched – around 1,000 Hz) and de-emphasize low and high frequency sounds. These sound levels are reported in decibels designated as "A-weighted decibels (dBA)". Sound pressure levels for some common indoor and outdoor environments are shown in Figure 16, Appendix A.

Because sounds in the environment vary with time, many different sound metrics may be used to quantify them. There are two typical methods used for describing variable sounds. These are exceedance levels and equivalent levels, both of which are derived from a large number of moment-to-moment, A-weighted sound pressure level measurements. Exceedance levels are values from the cumulative amplitude distribution of all the sound levels observed during a measurement period. Exceedance levels are designated L_n, where "n" is a value (typically an integer between 1 and 99) in terms of percentage. Equivalent levels are designated L_{eq} and quantify a hypothetical steady sound that would have the same energy as the actual fluctuating sound observed. The two sound level metrics that are commonly reported in regulatory noise monitoring are described below.

- L_{90} is the sound level in dBA exceeded 90 percent of the time during a measurement period. The L_{90} is close to the lowest sound level observed. It is essentially the same as the residual sound level, which is the sound level observed when there are no obvious nearby intermittent noise sources.
- L_{eq}, the equivalent level, is the level of a hypothetical steady sound that would have the same energy (i.e., the same time-averaged mean square sound pressure) as the actual fluctuating sound observed. The equivalent level is designated L_{eq} and is commonly A-weighted. The equivalent level represents the time average of the fluctuating sound pressure, but because sound is represented on a logarithmic scale and the averaging is done with time-averaged mean square sound pressure values, the L_{eq} is mostly determined by occasional loud noises.

[9] *American National Standard Specification for Sound Level Meters*, ANSI S1.4-1983 (R2006), published by the Standards Secretariat of the Acoustical Society of America, Melville, NY.

16.3.1.2 Noise Regulations

The portion of the Project within Grant County is subject to the following sound level requirements in Section 1211.04(13) of the Zoning Ordinance for Grant County, Noise subsection of General Provisions for Wind Energy Systems (WES):

> *Noise level shall not exceed 50 dBA, average A-weighted Sound pressure, including constructive interference effects at the perimeter of the principal and accessory structures of existing off-site residences, businesses, and buildings owned and/or maintained by a governmental entity.*

The portion of the Project within Roberts County is subject to the following sound level requirements in Section 1603.03(5) of Ordinance #20 of Roberts County, Noise subsection of General Provision for WES Requirements:

> *Noise level shall not exceed 50 dBA, average A-weighted Sound pressure including constructive interference effects as measured at the exterior wall of the closest principal and accessory structures.*

16.3.2 Sound Level Impacts/Mitigation

The sound level modeling results, conducted for the Project in October 2018, is included in Appendix H. The complete sound level report will be submitted to the Commission upon receipt.

16.3.2.1 Construction Sound Levels

Most of the construction activity related to the Project would occur around each of the wind turbine sites. Full construction activity would generally occur at one wind turbine site at a time; although, there would be some overlap at adjacent sites for maximum efficiency. There are generally three phases of construction at a wind energy project – excavation, foundations, and turbine erection. Table 16-1 presents the highest equipment sound levels for the louder pieces of construction equipment expected to be used at this site along with their phase of construction.

Table 16-1: Sound Levels for Construction Noise Sources

Phase	Equipment	Sound Level at 50 feet (dBA)
Excavation	Grader	85
Excavation	Bulldozer	82
Excavation	Front-end loader	79
Excavation	Backhoe	78
Excavation	Dump truck	76

Phase	Equipment	Sound Level at 50 feet (dBA)
Excavation	Roller	80
Excavation	Excavator	81
Excavation	Rock drill	89
Foundation	Concrete mixer truck	79
Foundation	Concrete pump truck	81
Foundation	Concrete batch plant	83
Turbine erection	Large crane #1	81
Turbine erection	Large crane #2	81
Turbine erection	Component delivery truck	84
Turbine erection	Air compressor	78

Source: Sound Level Modeling Report, Appendix H

Construction of the Project is expected to take multiple months. Construction of a single wind turbine from excavation to foundation pouring to turbine erection is roughly a 6-week process. However, work would not proceed in that order for each wind turbine to be erected. For example, all foundations would be poured before any turbine erection work begins. Sound impacts would be reduced by scheduling heavy construction work during daylight hours, to the extent practicable. Excavation work is expected to occur from early morning to the evening. Concrete foundation work and turbine erection work could extend into the overnight hours depending on the weather and timing of a concrete pour which must be continuous. Excavation work would be daytime only. Construction sound would comply with applicable County and State regulations.

16.3.2.2 Operational Sound Levels

The sound level modeling analysis conservatively includes all 45 turbine locations. The analysis used a technical report from Vestas which documented the expected sound power levels associated with the Vestas V136-4.2 wind turbine at 105m hub height. According to these technical documents, which included broadband and third octave-band A-weighted sound power levels for various wind speeds, the maximum sound power level for the V136-4.2 of 103.9 dBA occurs at hub height wind speeds of 9 m/s (and above). These sound power levels represent an “upper 95% confidence limit for the wind turbine performance” and do not include any additional uncertainty factor. Octave-band sound levels were calculated from the third octave-band levels representing the maximum sound power level for the sound modeling.

In addition to the wind turbines, there will be a collection substation associated with the Project. One 167 megavolt-ampere (MVA) transformer is proposed for the substation. Octave-band sound power levels were estimated using the MVA rating provided for the transformer and techniques in the Electric Power Plant Environmental Noise Guide (Edison Electric Institute), Table 4.5 Sound Power Levels of Transformers.

The noise impacts associated with the proposed wind turbines were predicted using the Cadna/A noise calculation software developed by DataKustik GmbH. This software uses the ISO 9613-2 international standard for sound propagation (Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation). The benefits of this software are a more refined set of computations due to the inclusion of topography, ground attenuation, multiple building reflections, drop-off with distance, and atmospheric absorption. The Cadna/A software allows for octave band calculation of sound from multiple sources as well as computation of diffraction. The inputs and significant parameters employed in the model are described in the Sound Level Modeling Table in Appendix H, a complete report is forthcoming.

The highest wind turbine sound power level for each wind turbine type plus an uncertainty factor of 2 dBA (total 105.9 dBA) was input into Cadna/A to model wind turbine generated sound pressure levels during conditions when worst-case sound power levels are expected. Sound pressure levels due to operation of all 45 wind turbines and the substation transformer were modeled at 204 sensitive receptors (i.e., occupied structures) in Grant and Roberts Counties. In addition to modeling at discrete points, sound levels were also modeled throughout a large grid of receptor points, each spaced 25 meters apart to allow for the generation of sound level isolines.

In the Sound Level Modeling Table (Appendix H) it shows the predicted broadband (dBA) sound levels for the 135 receptors within 1.5-miles of a wind turbine in Roberts County (not including those already counted in the Grant County Project area). These sound levels range from 28 to 43 dBA. In the Sound Level Modeling Table (Appendix H) shows the predicted broadband (dBA) sound levels for the 69 receptors within 1.5 miles of a turbine in Grant County (not including those already counted in the Roberts County Project area).

Grant County – The sound level limit in Grant County regulation for a WES is 50 dBA at the perimeter of principal and accessory structures of existing off-site residences, businesses, and buildings owned and/or maintained by a governmental entity. The predicted worst-case sound levels from the Project are below the 50-dBA limit at all modeled occupied structures in Grant County. The highest sound level at a

participating receptor in Grant County is modeled to be 43 dBA, and 41 dBA at a non-participating receptor. This is at an off-site occupied structure. Sound levels at the modeled accessory structures do not exceed 42 dBA. The Sound Level Modeling Table show no location where Project-related noise exceeds 50 dBA at any off-site property line. Therefore, the Project meets the requirements with respect to sound in the county regulation.

Roberts County – The sound level limit in the Roberts County regulation for a WES is 50 dBA at the closest principal and accessory structures. The predicted worst-case sound levels from the Project are below the 50-dBA limit at all modeled occupied structures in Roberts County. The highest sound level at a receptor in Roberts County is modeled to be 43 dBA, both at a participating house and non-participating accessory structure. Therefore, the Project meets the requirements with respect to sound in the County regulation. Because the wind turbines have been sited to avoid exceeding county regulatory sound level limits, no further mitigation for sound is required.

16.4 Shadow Flicker

A shadow flicker modeling study was initiated in October 2018. The modeling results are included in Appendix I. The complete shadow flicker report will be submitted to the Commission upon receipt.

16.4.1 Existing Shadow Flicker and Regulatory Framework

With respect to wind turbines, shadow flicker can be defined as an intermittent change in the intensity of light in a given area resulting from the operation of a wind turbine due to its interaction with the sun. While indoors, an observer experiences repeated changes in the brightness of the room as shadows cast from the wind turbine blades briefly pass by windows as the blades rotate. In order for this to occur, the wind turbine must be operating, the sun must be shining, and the window must be within the shadow region of the wind turbine, otherwise there is no shadow flicker. A stationary wind turbine only generates a stationary shadow similar to any other structure.

Shadow flicker was modeled using a software package, WindPRO version 3.2.669. WindPRO is a software suite developed by EMD International A/S and is used for assessing potential environmental impacts from wind turbines. Using the Shadow module within WindPRO, worst-case shadow flicker in the area surrounding the wind turbines was calculated based on data inputs including: location of the wind turbines, location of discrete receptor points, wind turbine dimensions, flicker calculation limits, and terrain data. Based on these data, the model was able to incorporate the appropriate sun angle and maximum daily sunlight for this latitude into the calculations. The resulting worst-case calculations assume that the sun is always shining during daylight hours and that the wind turbine is always operating.

The WindPRO Shadow module can be further refined by incorporating sunshine probabilities and wind turbine operational estimates by wind direction over the course of a year. The values produced by this further refinement, also known as the "expected" shadow flicker, are presented in the results.

The shadow flicker modeling analysis conservatively included the 45 turbine locations. The inputs and significant parameters employed in the model will be described in the Shadow Flicker Modeling Report, not yet submitted.

WindPRO was used to calculate shadow flicker at the 204 discrete modeling points in Grant and Roberts Counties and generate shadow flicker isolines based on the grid calculations (see Appendix I). Utilizing the conservative modeling parameters, the shadow flicker modeling results indicate that 15 of the 204 receptors may experience shadow flicker levels between 10 and 30 hours per year, with a maximum annual duration at non-participating sensitive receptors in Grant and Roberts Counties below 30 hours per year.

As discussed in Section 10.2 (see Table 10-1), the Project has a mandated requirement in Roberts County and a voluntary commitment in Grant County to limit shadow flicker to 30 hours per year or less at existing non-participating residences, businesses, and buildings owned and/or maintained by a governmental entity, unless otherwise agreed to by the landowner. Even using the conservative modeling methodology described above, the Project is not projected to result in shadow flicker levels above 30 hours per year at any non-participating residence, business, or building owned and/or maintained by a governmental entity.

16.4.2 Shadow Flicker Impacts/Mitigation

The modeling does indicate that 1 participating residence in Grant County could experience annual shadow flicker levels above 30 hours per year, since the modeling treated homes as all glass houses and assumed no vegetation or other existing structures, the "expected" levels will be higher than actual levels will be. Dakota Range III has approached this participating landowner and advised the landowner about these expected levels. These discussions are on-going that will invoke discussions regarding the expected levels of shadow flicker. If concerns are raised, mitigation measures, such as vegetative screening, an awning, or darkening shades, can be implemented to address shadow flicker concerns should they arise after the Project is operational.

16.5 Electromagnetic Interference

There is the potential for communication systems to experience disturbances from electric feeder and transmission and communication lines associated with wind farms. A study and analysis were conducted

to determine the locations of Federal Communications Commission (FCC) licensed microwave and fixed station radio frequency (RF) facilities that may be adversely impacted as a result of the Project (Appendix J). The study used industry standard procedures and FCC databases to identify existing microwave paths crossing the Project, land mobile and other RF facilities within or adjacent to the identified area, and broadcast signals receivable in the area.

There was one licensed microwave path identified within 0.5 kilometer from the turbine areas, but no planned turbines would be in the Fresnal Zone of the microwave path. There were no land mobile transmitter stations within 0.5 kilometer beyond the turbine area, and no adverse impact is expected to transmissions of FCC-licensed land mobile stations.

Of the television stations within the Grant and Roberts Counties South Dakota Designated Market Area, only three stations were determined to place a predicted FCC primary off-the-air service signal over at least a portion of the Wind Project or the immediate area. Based on engineering calculations, there are 350 households within an area likely to be affected (approximately 193 square miles) that could experience interference with over the air signals. It is conservatively estimated that 55 percent, or 193, of the households receive TV programming by satellite dish or cable. This leaves an estimated 157 households relying on transmitted off-the-air TV signals (Appendix J). Based on the 10 percent criteria described previously, up to 16 TV receiving locations may be affected to varying degrees in the worst-case. Any disruptions to over-the-air TV viewing caused by the Wind Project will be satisfactorily resolved by relocating the household antenna to receive a better signal, installation of a better outside antenna or one with higher gain, or installation of satellite or cable TV at Dakota Range III's expense. Dakota Range III shall take appropriate actions to minimize any such interference and shall make a good faith effort to restore or provide reception levels equivalent to reception levels in the immediate areas just prior to construction of the Project. This mitigation requirement shall not apply to any dwellings or other structures built after completion of the Project.

There were no AM broadcast stations up to 3 kilometers from the Project and no AM facilities within the required notification distance of 3 kilometers from any planned wind turbine. There should be no expectation of disruptions in transmitted signals on the AM band due to presence of the wind turbines. There were 11 full-service FM stations which place a predicted primary signal over at least part of the Project Area. FM broadcast station signals are fairly insensitive to wind turbines due to "capture effect" supported by the "discriminator" in FM receivers, and good quality FM radios should factor out time-varying signals caused by blade rotation from wind turbines.

The Department of Defense (DoD) and Department of Homeland Security Long Range Radar Joint Program Office (JPO) pre-screening tool was used to evaluate the impact of wind turbines on air defense long-range radar. The results are not anticipated to impact Air Defense and Homeland Security Radars. However, a definitive determination is obtained only after formal study by DoD triggered by the FAA 7460-1 notification process which is currently anticipated spring 2019.

Desktop analysis determined impacts were not likely to NEXRAD Weather Surveillance Doppler Radar Stations. However, a definitive determination is obtained only after the National Telecommunications and Information Administration (NTIA) review process. The NTIA manages operation of RF frequencies for federal government use, which are not available to the public. The NTIA review process consists of representatives from various government agencies, the Interdepartmental Radio Advisory Committee (IRAC). The IRAC reviews new proposals for wind turbine projects for impact on government frequencies. Notification of the Project was sent to the NTIA on September 18, 2018, and a determination is expected November 2018.

Dakota Range III has an agreement with Interstate Telecommunications Cooperative, Inc (ITC) to mitigate any interference that could result during construction. RC Communications is the other telecommunications provider within the Project Area. Dakota Range III has notified them of the Project and have offered to mitigate any interference that could result during construction.

16.6 Visual Resources

The existing visual resources within the Project Area are described below, followed by a discussion of the potential effects of the proposed Project's construction and operation, and mitigation and minimization measures.

16.6.1 Existing Visual Resources

Cropland, grassland, large open vistas, and gently rolling topography visually dominate the Project Area landscape. Vegetation in and near the Project Area is predominantly cropland and grassland/pasture. Existing structures in the Project Area consist of nine occupied residences dispersed throughout (Figure 14), as well as scattered farm buildings and a church. Interstate 29 and U.S. Highway 12 are situated east and north of the Project boundary and the northern Project limits are adjacent to these highways. Multiple county and township roads extend throughout the Project Area.

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 (residents, travelers, visiting recreational users, etc.) within visual range of the area, and the degree of public or

agency concern for the quality of the landscape. Travelers through the Project Area would include local or regional traffic along Interstate 29 and U.S. Highway 12. USFWS Wetland, Grassland, and Conservation Easements and a SDGFP Walk-In Area for public hunting and recreation are present within the Project Area.

16.6.2 Visual Impacts

Visual impacts can be defined as the human response to the creation of visual contrasts that result from the introduction of a new element into the viewed landscape. These visual contrasts interact with the viewer's perception, preferences, attitudes, sensitivity to visual change, and other factors that vary by individual viewer to cause the viewer to react negatively, positively, or neutrally to the changes in the viewed landscape.

Construction, operation, and decommissioning of the proposed Project would potentially introduce visual contrasts in the Project Area that may cause visual impacts. The types of visual contrasts of concern include the potential visibility of wind turbines, electric transmission structures and conductors, and associated facilities such as roads, marker lighting on wind turbines and transmission structures as well as security and other lighting, modifications to landforms and vegetation, vehicles associated with transport of workers and equipment for construction, operations, and maintenance, and facility decommissioning, and the construction, operation, maintenance, and decommissioning activities themselves. A subset of potential visual impacts associated with wind turbine generator structures are blade movement, blade glinting[10], and shadow flicker (discussed in Section 16.4).

The primary visual impacts associated with the Project would result from the introduction of the numerous vertical lines of the wind turbines and transmission structures into the generally strong horizontal landscape found in the Project Area. The visible structures would potentially produce visual contrasts by their design attributes (form, color, and line) and the reflectivity of their surfaces. In addition, marker lighting would be visible at night when planes are flying overhead.

For nearby viewers, including the rural residences dispersed throughout the Project Area, the large sizes and strong geometric lines of both the individual turbines themselves and the array of turbines could dominate views, and the large sweep of the moving rotors would tend to command visual attention. Structural details, such as surface textures, could become apparent, and the O&M facility and other structures could be visible as well, as could reflections from the towers, transmission structures, and

[10] Reflection of sunlight from moving wind turbine blades when viewed from certain angles under certain lighting conditions.

moving rotor blades (shadow flicker). Measuring the aesthetic value of a specific landscape is difficult and may vary based on an individual's personal values, experiences, or preferences. The degree of visual contrast will vary based on the viewpoint distance and location in relation to the Project.

As discussed above, viewers within the Project Area include the occupied residences, travelers along Interstate 29 and U.S. Highway 12, and hunters utilizing the public hunting areas. For these viewers, the magnitude of the visual impacts associated with the Project would depend on certain factors, including:

- Distance of the proposed wind energy facility and transmission line from viewers;
- Duration of views (highway travelers vs. permanent residents);
- Weather and lighting conditions;
- The intermittent presence and arrangements of lights on the turbines and other structures; and
- Viewer attitudes toward renewable energy and wind power.

To minimize visual impacts of the Project, Dakota Range III has incorporated setback requirements and commitments into the design of the Project. As identified in Table 10-1 (see Section 10.2), turbines must be set back at least 1,000 feet from offsite residences, businesses, churches, and government buildings and 500 feet from onsite or lessor's residences in Grant County and 1,513 feet in Roberts County. The Project's final design does not site turbines closer than 1,500 feet to offsite residences, businesses, churches, and government buildings in Grant County (exceeding the County's requirement) and meets the requirement in Roberts County. Turbines are required to be set back at least 2 times the height of the wind turbines from the centerline of the public ROW and from non-participating property lines in Grant County unless a waiver is signed by non-participating landowners. In Roberts County, turbines are required to be set back 110 percent the height of the turbines from the edge of the public ROW and from any surrounding property line unless a waiver is signed by either the participating or non-participating landowners. In accordance with FAA regulations, the towers would be painted off-white to reduce potential glare and minimize visual impact. In addition, pending FAA approval, Dakota Range III proposes to install an ADLS on Project turbines. ADLS involves the installation of radar units around the perimeter of the Project. When the radar does not detect an aircraft, it sends a signal to the wind turbine lighting telling it to stay turned off. When the radar detects aircraft, it stops sending that signal, and the wind turbine lighting activates. At other times, the wind turbine lighting remains off.

At the end of the Project's operating life, the facility would be decommissioned (see Chapter 24.0), and all wind turbines, electrical cabling, electrical components, roads, and any other associated facilities

would be removed in accordance with applicable State and County regulations, unless otherwise agreed to by the landowner. As such, no visual impacts would remain beyond the operating life of the Project.

Scenic resources with sensitive viewsheds can include national parks, monuments, and recreation areas; national historic sites, parks, and landmarks; national memorials and battlefields; national wild and scenic rivers, national historic trails, national scenic highways, and national wildlife refuges; State- or locally designated scenic resources, such as State-designated scenic highways, State parks, and county parks; and other scenic resources that exist on federal, State, and other non-federal lands. No scenic resources with sensitive viewsheds are located within the Project Area or within viewing distance of the Project. Therefore, no impacts to scenic resources would result from construction or operation of the Project.

17.0 LOCAL LAND USE CONTROLS (ARSD 20:10:22:19)

ARSD 20:10:22:19. Local land use controls. *The applicant shall provide a general description of local land use controls and the manner in which the proposed facility will comply with the local land use zoning or building rules, regulations or ordinances. If the proposed facility violates local land use controls, the applicant shall provide the commission with a detailed explanation of the reasons why the proposed facility should preempt the local controls. The explanation shall include a detailed description of the restrictiveness of the local controls in view of existing technology, factors of cost, economics, needs of parties, or any additional information to aid the commission in determining whether a permit may supersede or preempt a local control pursuant to SDCL 49-41B-28.*

As noted previously, the Project is located in portions of Grant County and Roberts County. Both counties have enacted zoning ordinances in which wind energy facilities and transmission lines are identified as conditional uses within the area zoned as the Agricultural District. As a result, proponents of wind energy facilities and transmission lines must obtain a conditional use permit prior to constructing a wind energy facility or transmission line in the Agricultural District of either county.

Dakota Range III will submit applications to both Grant and Roberts Counties for Conditional Use Permits in 2018. Prior to construction, Dakota Range III will submit a final Project layout to each county in connection with obtaining building permits. The final layout would comply with applicable zoning ordinance requirements and permit conditions, including the setbacks, noise standard, and shadow flicker commitment set forth in Table 10-1 in Section 10.2. No organized townships with separate zoning jurisdiction are located within the Project boundary.

Dakota Range III also plans to enter into road use and maintenance agreements with each county and township governing the use, improvement, repair, and restoration of roads within the applicable county. In addition, Dakota Range III would obtain from each road authority any road crossing, approach, and/or utility permits required for the Project.

18.0 WATER QUALITY (ARSD 20:10:22:20)

ARSD 20:10:22:20. Water quality. *The applicant shall provide evidence that the proposed facility will comply with all water quality standards and regulations of any federal or state agency having jurisdiction and any variances permitted.*

Groundwater and surface water resources are discussed in Chapter 13.0. As discussed in Section 13.2.2, the excavation and exposure of soils during the construction of wind turbines, transmission line structures, access roads, underground collector lines, and other Project facilities could cause sediment runoff during rain events. This sediment may increase TSS loading in receiving waters. However, erosion and sediment control BMPs would keep sediments onsite that might otherwise increase sediment loading in receiving waters.

As discussed in Section 12.2.2.2, construction of the Project would require coverage under the General Permit for Storm Water Discharges Associated with Construction Activities issued by the SDDENR. A condition of this permit is the development and implementation of a SWPPP. The SWPPP would be developed during civil engineering design of the Project and would prescribe BMPs to control erosion and sedimentation. The BMPs may include use of silt fence, wattles, erosion control blankets, temporary storm water sedimentation ponds, re-vegetation, or other features and methods designed to control storm water runoff and mitigate erosion and sedimentation. The BMPs would be implemented to reduce the potential for impacts to drainage ways and streams by sediment-laden runoff. Because erosion and sediment control would be in place for construction of the Project, impacts to water quality are not expected to be significant.

SDDENR's Ground Water Quality Program reviewed the Project for potential impacts to groundwater quality and does not anticipate the Project adversely impacting groundwater quality (see letter from SDDENR dated July 26, 2017, in Appendix B). SDDENR indicated that there are records of petroleum and other chemical releases near the Project, as there are throughout the State. The records for these releases indicate that all cases are either closed or require no further action, and none are indicated as open/being monitored. As such, it is not anticipated that Project construction activities would encounter soil contamination from these releases. However, should contamination be encountered during construction activities or caused by the construction work, Dakota Range III would report the contamination to SDDENR in accordance with State and federal regulations.

19.0 AIR QUALITY (ARSD 20:10:22:21)

ARSD 20:10:22:21. Air quality. *The applicant shall provide evidence that the proposed facility will comply with all air quality standards and regulations of any federal or state agency having jurisdiction and any variances permitted.*

The following sections discuss the existing air quality conditions within the Project Area and the potential air quality impacts from the Project.

19.1 Existing Air Quality

The entire State of South Dakota is in attainment for all NAAQS criteria pollutants (EPA, 2018c). The nearest ambient air quality monitoring site to the Project Area is located in Watertown, approximately 21 miles south of the Project Area (EPA, 2018d). The primary emission sources that exist within the Project Area include agricultural-related equipment and vehicles traveling along roads.

19.2 Air Quality Impacts/Mitigation

During construction of the Project, fugitive dust emissions would temporarily increase due to truck and equipment traffic in the Project Area. Additionally, there would be short-term emissions from diesel trucks and construction equipment. However, air quality effects caused by dust or vehicle emissions would be short-term, limited to the time of construction or decommissioning, and would not result in any NAAQS exceedances for criteria pollutants. Implementation of the Project components would not result in a violation to federal, State, or local air quality standards and, therefore, would not result in significant impacts to air quality. SDDENR's Air Quality Program reviewed the Project and does not anticipate any adverse impacts to air quality of the State (see letter from SDDENR dated July 26, 2017, in Appendix B). Temporary minor sources of air pollution emissions from Project construction equipment, such as a concrete batch plant, would be permitted by the balance-of-plant contractor or concrete batch plant operator through the SDDENR. The operation of the Project would not produce air emissions that would impact the surrounding ambient air quality. Potential complaints regarding fugitive dust emissions would be addressed in an efficient manner through implementation of BMPs to suppress fugitive dust emissions during construction such as spraying roads with water, covering open haul trucks when transporting material subject to being windblown, and removal of soil or mud deposited by construction equipment.

20.0 TIME SCHEDULE (ARSD 20:10:22:22)

ARSD 20:10:22:22. Time schedule. *The applicant shall provide estimated time schedules for accomplishment of major events in the commencement and duration of construction of the proposed facility.*

A variety of factors influence the timing of the Dakota Range III schedule. Table 20-1 includes a best estimate of the schedule at this time. The construction of the Project could be delayed or accelerated depending on several factors, including permitting, financing, turbine supply, and a PPA. After development of Dakota Range III is complete and the necessary development permits have been obtained, ownership may transfer from Apex to another company. Dakota Range III expects construction to be completed Q4 2020. Closeout activities from construction may not end until Q1 2021.

Table 20-1: Preliminary Permitting and Construction Schedule

Task	Expected Start Date	Expected Completion Date
Commission Siting Permit	October 2018	April 2019
Select Contractor	August 2019	October 2019
Construction Activities	November 2019	October 2020
Turbine Deliveries	July 2020	August 2020
Commercial Operation Date		October 2020

21.0 COMMUNITY IMPACT (ARSD 20:10:22:23)

ARSD 20:10:22:23. Community impact. *The applicant shall include an identification and analysis of the effects the construction, operation, and maintenance of the proposed facility will have on the anticipated affected area including the following:*

(1) A forecast of the impact on commercial and industrial sectors, housing, land values, labor market, health facilities, energy, sewage and water, solid waste management facilities, fire protection, law enforcement, recreational facilities, schools, transportation facilities, and other community and government facilities or services;

(2) A forecast of the immediate and long-range impact of property and other taxes of the affected taxing jurisdictions;

(3) A forecast of the impact on agricultural production and uses;

(4) A forecast of the impact on population, income, occupational distribution, and integration and cohesion of communities;

(5) A forecast of the impact on transportation facilities;

(6) A forecast of the impact on landmarks and cultural resources of historic, religious, archaeological, scenic, natural, or other cultural significance. The information shall include the applicant's plans to coordinate with the local and state office of disaster services in the event of accidental release of contaminants from the proposed facility; and

(7) An indication of means of ameliorating negative social impact of the facility development.

The following sections describe the existing socioeconomic and community resources within the Project Area, the potential community impacts of the proposed Project, and measures to avoid, minimize, and/or mitigate potential impacts.

21.1 Socioeconomic and Community Resources

The existing socioeconomic resources within the Project Area are described below, followed by a discussion of the potential effects of the proposed Project, and mitigation and minimization measures.

21.1.1 Existing Socioeconomic and Community Resources

The Project Area is located in northeastern South Dakota in Roberts and Grant Counties. The 2017 population estimates for Roberts and Grant Counties were 10,278 and 7,061, respectively (U.S. Census Bureau, 2017). Sisseton, with an estimated 2017 population of 2,402, is the largest city in Roberts County (U.S. Census Bureau, 2017). Sisseton is located approximately 24 miles north of the Project Area. In Grant County, Milbank is the most populous community with an estimated 2017 population of 3,133. Milbank is located approximately 22 miles east of the Project Area. The populations of these communities, as well as other communities in Roberts and Grant Counties, and their distances from the Project Area, are shown in Table 21-1.

Table 21-1: Population Estimates of Communities and Distance from Project Area

Community	2017 Population Estimate	County	Distance and Direction from Project Area
Sisseton	2,402	Roberts	23 miles north
Ortley	66	Roberts	1.4 miles west
Summit	291	Roberts	0.5 mile east
Corona	106	Roberts	14.5 miles east
Wilmot	502	Roberts	11.5 miles northeast
Marvin	29	Grant	8.75 miles east
Twin Brooks	68	Grant	15.25 miles east
Milbank	3,133	Grant	21.63 miles east

Source: U.S. Census Bureau, 2017

The population in Roberts County is mostly white (59.4 percent), while 36.7 percent of the population is American Indian. The remaining 3.9 percent is some other race. In Grant County, 97.3 percent of the population is white, while 2.0 percent is American Indian. The remaining 0.7 percent is black or African American and some other race (U.S. Census Bureau, 2016). In the State of South Dakota as a whole, 84.8 percent of the population is white, 8.7 percent is American Indian, and 6.5 percent is some other race (U.S. Census Bureau, 2016).

The median household income in 2016 in Roberts and Grant Counties was $50,108 and $54,180, respectively. In 2016, 20.6 and 7.8 percent of the population, respectively, were below the poverty level in Roberts and Grant Counties. By comparison, the median household income for the State ($50,078) was slightly lower than the median income for the counties, and the poverty level (14.0 percent) was in between the rate for both counties.

In Roberts County, the top industries in terms of employment in 2016 were: (1) educational services, health care, and social services (24.9 percent); (2) agriculture, forestry, fishing and hunting, and mining manufacturing (13.5 percent); and (3) arts, entertainment, and recreation, and accommodation and food services retail trade (11.0 percent). In Grant County, the top industries in terms of employment in 2015 were: (1) educational services, health care, and social services (19.9 percent); (2) agriculture, forestry, fishing and hunting, and mining (14.3 percent); and (3) manufacturing (10.9 percent). The unemployment rates in Roberts and Grant Counties in July 2018 were 3.4 and 2.2 percent, respectively, and the South Dakota unemployment rate for that same month was 2.6 percent (South Dakota Department of Labor and Regulation [SDDLR], 2018).

21.1.2 Socioeconomic and Community Impacts/Mitigation

This section describes the potential impacts of the proposed Project on economics, population and housing, and property values.

21.1.2.1 Economic Impacts

The Project is expected to create both short-term and long-term positive impacts to the local economy. Impacts to social and economic resources from construction activities would be short-term. Local businesses, such as restaurants, grocery stores, hotels, and gas stations, would see increased business during this phase from construction-related workers. Local industrial businesses, including aggregate and cement suppliers, welding and industrial suppliers, hardware stores, automotive and heavy equipment repair, electrical contractors, and maintenance providers, would also likely benefit from construction of the Project.

During construction, a typical 150-MW wind project such as Dakota Range III typically generates an immediate need for up to 250 temporary construction jobs over 9 months. As the Project is a 151.2-MW wind energy facility, approximately 250 temporary construction jobs over 7-9 months is expected. Construction and operation of a typical wind project results in the injection of millions of dollars into the local economy both immediately and throughout the life of the project. These investments would be seen throughout the community, including at hotels, restaurants, gas stations, auto repair companies, tire companies, grocery stores, and countless other local businesses. During operation, the facility would employ approximately 10 full-time personnel as facility managers, site managers, and turbine technicians. A breakdown of the typical construction and operation jobs for a 150-MW wind energy project are shown in Table 21-2. It is expected the construction of the Project would take approximately 300,000 man-hours.

Table 21-2: Construction and Operation Jobs for 150-MW Wind Energy Project

Project Phase	Job Title	Number Onsite	Approximate Hourly Salary
Construction	Site Superintendent	1	$75
Construction	Civil Superintendent	1	$50
Construction	Electrical Superintendent	1	$50
Construction	Site Administrator	1	$30
Construction	Tower Climbers	2	$90
Construction	Concrete Crews	12 (6 per crew)	$15
Construction	Re-Bars Crews	12 (6 per crew)	$22
Construction	Crane Crews	5 (5 per crew)	$30

Project Phase	Job Title	Number Onsite	Approximate Hourly Salary
Construction	Main Erection Crane	5 (5 per crew)	$30
Construction	Laborers	80	$15
Construction	Office Staff	6	$20
Construction	Electricians	25	$30
Construction	Heavy Equipment Operators	25	$20
Construction	Laborers	24	$15
Operation	Facility Manager	1	$100,000/year
Operation	Deputy Facility Manager	1	$90,000/year
Operation	Wind Turbine Technicians	6	$25
Operation	Lead Technician	1	$34
Operation	Site Admin	1	$15

Furthermore, the Facility represents an approximately $200 million investment in Grant and Roberts Counties. Dakota Range III would pay taxes on the Facility, which would significantly increase the revenue available for a variety of local needs. A breakdown of this tax information over 25 years is shown in Table 21-3.

Table 21-3: Projected Tax Revenue for the Dakota Range III Project

Recipient	Annual Tax Revenue[1] (approximate)	Total Tax Revenue (approximate)
Roberts County	$105,800	$3,174,000
Ortley Township	$23,700	$711,000
Summit Township	$21,600	$648,000
Grant County	$92,500	$2,775,000
Blooming Valley Township	$19,900	$597,000
Farmington Township	$17,700	$531,000
Mazeppa Township	$2,600	$78,000
Summit School District	$279,000	$8,370,000
South Dakota	$562,800	$16,884,000

[1] After the fifth year of receiving the total annual tax revenue as well as South Dakota State-aid funds for the school districts, the amount of the wind energy tax revenue that is considered local effort funding would increase by 20 percent each year until year 10, after which all wind energy tax revenue would be considered local effort funding in the South Dakota School Funding Formula, which may decrease the State-aid funds the school districts receive. However, as shown in the table, 100 percent of the wind tax revenue allocated to the school districts would still be received by the school districts.

Over the expected 30-year life of the Project, the Project would generate over $74 million in direct economic benefits for local landowners, new local employees, local communities, and the State of South Dakota. Some of these payments are outlined in Table 21-4. Further benefits that are not quantified below include local spending on O&M needs such as automotive repair, tires, and gas.

Table 21-4: Direct Economic Benefit from the Dakota Range III Project

Payment	Direct Beneficiary	Approximate Total
Lease Payments	Project Landowners	$26,000,000
Operations and Maintenance	~10 Employees	$18,000,000
Taxes	Townships, Counties, School Districts, and South Dakota	$30,200,000

21.1.2.2 Population and Housing

There is the potential for residents within 60 or more miles from the Project Area to take advantage of these employment opportunities during Project construction. During construction, non-local workers would relocate to the area, resulting in a temporary increase in population. These non-local construction workers would need temporary housing. Temporary housing for workers would likely include available facilities at several towns throughout the area, with larger towns, such as Sisseton, likely having more available facilities.

The proposed Project could increase demand on the local labor force and for local housing during construction; however, the construction period is only temporary. Overall, Dakota Range III anticipates that the Project would be socioeconomically beneficial to the local population and would not impact long-term population trends. Therefore, no mitigation measures are anticipated to be required.

21.1.2.3 Property Value Impacts

Extensive statistical studies have demonstrated that large-scale wind energy facilities do not substantially injure the value of adjoining or abutting property (Appendix K).

Michael MaRous, owner and president of MaRous & Co., prepared a market impact analysis report for Dakota Range I and II and He concluded that there is no market data indicating that Dakota Range I & II (a project adjacent to Dakota Range III) would have a negative impact on either rural residential or agricultural property values in the surrounding area. His conclusion was based on the following:

- The proposed use will meet or exceed the required development and operating standards;
- Controls, such as setbacks and noise limits, are in place for on-going compliance;

- There are significant financial benefits to the local economy and to the local taxing bodies from the development of the proposed wind farm;
- The proposed wind farm would create well-paid jobs in the area which would benefit overall market demand;
- An analysis of recent residential sales proximate to existing wind farms, which includes residential sales within three to five times turbine tip height, did not support any finding that proximity to a wind turbine had any impact on property values;
- An analysis of agricultural land values in the area and in other areas of the State with wind farms did not support any finding that the agricultural land values are negatively impacted by the proximity to wind turbines;
- Studies indicate that wind turbine leases add value to participant land owner's agricultural land;
- A survey of county assessors in six South Dakota counties in which wind farms are located concluded that there was no market evidence to support a negative impact upon residential property values as a result of the development of and the proximity to a wind farm, and that there were no reductions in assessed valuations;
- A survey of county assessors in eight Minnesota counties in which wind farms are located concluded that there was no market evidence to support a negative impact upon residential property values as a result of the development of and the proximity to a wind farm, and that there were no reductions in assessed valuations;
- A survey of county assessors in 26 Iowa counties in which wind farms are located concluded that there was no market evidence to support a negative impact upon residential property values as a result of the development of and the proximity to a wind farm, and that there were no reductions in assessed valuations; and
- A survey of county assessors in 18 Illinois counties in which wind farms are located concluded that there was no market evidence to support a negative impact upon residential property values as a result of the development of and the proximity to a wind farm, and that there were no reductions in assessed valuations.

MaRous & Co. will prepare also prepare a market analysis for Dakota Range III, and the results will be submitted to the Commission.

Based on Mr. MaRous' prior analysis and testimony, as well as the prior testimony of Commission Staff appraisal witness David Lawrence, the Commission concluded that there is "no record evidence that property values will be adversely affected." *In the Matter of the Application of Dakota Range I, LLC and*

Dakota Range II, LLC for a Permit of a Wind Energy Facility in Grant County and Codington County, South Dakota for the Dakota Range Wind Project, Docket No. EL18-003, Final Decision and Order Granting Permit to Construct Wind Energy Facility, Notice of Entry ¶ Para. 55 (July 23, 2018). The Commission found similarly in the Crocker Wind Farm docket: "There was no credible showing that there will be quantifiable or qualitative effect on property value." *In the Matter of the Application by Crocker Wind Farm, LLC for a Permit of a Wind Energy Facility and a 345 kV Transmission Line in Clark County, South Dakota, for Crocker Wind Farm*, Docket No. EL17-055, Final Decision and Order Granting Permit to Construct Facilities and Notice of Entry, ¶ 60 (June 12, 2018).

21.2 Commercial, Industrial, and Agricultural Sectors

No commercial or industrial sectors occur within the Project Area. The existing agricultural sector within the Project Area is described below, followed by a discussion of the potential effects of the proposed Project, and mitigation and minimization measures.

21.2.1 Existing Agricultural Sector

The Project Area is predominantly agricultural, consisting of a mix of cropland, rangeland, and pastureland. In 2012, Roberts County's 876 farms (totaling 623,105 acres of land) produced $251.17 million in agricultural products (USDA, 2012a). Twenty percent was from livestock sales, and 80 percent was crop sales. Cattle and calves were the top livestock inventory item in the county, and soybeans for beans was the top crop in terms of acreage. Roberts County ranked 10 out of the 66 South Dakota counties in total value of agricultural products sold (USDA, 2012a).

In 2012, Grant County's 618 farms (totaling 428,624 acres of land) produced nearly $240.8 million in agricultural products (USDA, 2012b). Forty-four percent was from livestock sales, and 56 percent was crop sales. Cattle and calves were the top livestock inventory item in the county, and corn (for grain) was the top crop in terms of acreage. Grant County ranked 12 out of the 66 South Dakota counties in total value of agricultural products sold (USDA, 2012b).

21.2.2 Agricultural Impacts/Mitigation

Minimal existing agricultural land would be taken out of crop and forage production by the proposed Project, primarily the area around wind turbine foundations, access roads, and electric collection and interconnection facilities. Landowners would be compensated by the Applicant for losses to crop production during construction. Agricultural activities can occur up to the edge of access roads and turbine pads. The buried underground collection system would not alter agricultural activities.

It is estimated that approximately 295 acres of agricultural land would be temporarily impacted by Project construction, and 22 acres of agricultural land would be impacted during the life of the Project (less than 0.5 percent of the total land within the Project Area, see Table 11-1). Areas disturbed due to construction and that would not host Project facilities would be re-vegetated with vegetation types matching the surrounding agricultural landscape.

21.3 Community Facilities and Services

The existing community facilities and services within the Project Area are described below, followed by a discussion of the potential effects of the proposed Project, and mitigation and minimization measures.

21.3.1 Existing Community Facilities and Services

Most community facilities and services near the Project Area are located in the towns of Sisseton and Milbank, which are approximately 23 miles north and 22 miles east of the Project Area, respectively. Sisseton and Milbank both contain a hospital, police, fire and ambulance services, schools, churches, and parks and recreational facilities. One church and two cemeteries are located within the Project Area (Figure 14).

Electrical service in the Project Area is provided by Whetstone Valley Electric Power Cooperative, and Traverse Electric Cooperative. The Grant-Roberts Water District supplies rural water to the Project Area and maintains a network of distribution lines within the Project Area.

21.3.2 Community Facilities and Services Impacts/Mitigation

The additional workers moving into the region during construction of the proposed Project could temporarily add an additional demand on some of the existing community facilities and services. However, this demand would be temporary, and it is anticipated that the existing facilities would have sufficient capacity to meet this demand. Therefore, no mitigation measures are anticipated to be required. SDDENR's Drinking Water Program reviewed the Project and does not anticipate any adverse impacts to drinking waters of the State (see letter from SDDENR dated July 26, 2017, in Appendix B). SDDENR's Waste Management Program also reviewed the Project and does not anticipate any adverse impacts because all waste material would be managed according to SDDENR's solid waste requirements (see same letter from SDDENR in Appendix B).

21.3.3 Emergency Response

The proposed wind farm is located within a rural portion of Roberts and Grant Counties. During the Project construction period and during subsequent operation, it is expected that the Project would have no

significant impact on the security and safety of the local communities and the surrounding area. Some additional risk for worker or public injury may exist during the construction phase, as it would for any large construction project. However, work plans and specifications would be prepared to address worker and community safety during Project construction. During Project construction, the Project's general contractor would identify and secure all active construction areas to avoid public access to potentially hazardous areas.

During Project construction, the Project contractor would work with local and county emergency management to develop procedures for response to emergencies, natural hazards, hazardous materials incidents, manmade problems, and potential incidents concerning Project construction. The contractor would provide site maps, haul routes, Project schedules, contact numbers, training, and other requested Project information to local and county emergency management.

During Project operations, the Project operator would coordinate with local and county emergency management to protect the public and the property related to the Project during natural, manmade, or other incidents. The Project would register each turbine location and the O&M building with the rural identification/addressing (fire number) system and 911 systems.

21.4 Transportation

The existing transportation resources within the Project Area are described below, followed by a discussion of the potential effects of the proposed Project, and mitigation and minimization measures.

21.4.1 Existing Transportation

This section describes the existing surface transportation and aviation within the Project Area.

21.4.1.1 Surface Transportation

Table 21-5 lists the major roads that intersect the Project Area. The primary access to the Project Area is via Interstate 29 which extends through the central portion of the Project Area (Figure 1). Secondary access to turbine locations would be via existing county and township gravel roads. Paved county roads would be avoided wherever possible due to their light construction. Roads would be assessed for strength and condition prior to construction. County and township gravel roads determined to be insufficient for construction use would be upgraded and strengthened prior to construction at the Project's expense. County and township gravel roads would be maintained during construction at the Project's expense. Paved roads would be returned to pre-construction or better condition if damage occurs. The Project would enter into road use agreements with each road authority, as required, to define use and restoration of roads utilized during construction of the Project.

Table 21-5: Project Area Roads

Road	Surface Type	Surface Width	Total Lanes
Interstate 29	Concrete	24 feet	4 (divided)
State Highway 12	Concrete	24 feet	4 (divided)
Secondary county roads	Gravel or crushed rock / Bituminous	22 to 28 feet	2
Secondary township roads	Gravel or crushed rock	16 to 20 feet	2

Source: SDDOT, 2017

In 2017, Average Daily Traffic (ADT) volume was 3,227 trips along Interstate 29 through the Project Area and 1,469 trips along State Highway 12 (SDDOT, 2017). ADT along the county roads through the Project Area were generally less than 200 trips.

21.4.1.2 Aviation

There are no airports located within the Project Area. The closest airports are Milbank Municipal Airport, approximately 25 miles east of the Project Area, and Sisseton Municipal Airport, approximately 24 miles north of the Project Area. The closest private airport to the Project Area is the Whipple Ranch airstrip, located approximately 8.5 miles northeast of the Project Area in Wilmot, South Dakota. The nearest U.S. air military installation is Grand Forks Air Force Base, located approximately 175 miles north of the Project Area. The nearest South Dakota Air National Guard installation is the 114th Fighter Wing, located approximately 113 miles south of the Project Area at Joe Foss Field Base in Sioux Falls, South Dakota.

21.4.2 Transportation Impacts/Mitigation

This section addresses the potential impacts of the proposed Project on ground transportation and air traffic.

21.4.2.1 Ground Transportation

The Project Area contains highways, one paved four-lane interstate highway, and several paved county roads as well as county and township gravel roads. During construction, it is anticipated that several types of light, medium, and heavy-duty construction vehicles would travel to and from the site, as well as private vehicles used by the construction personnel. Construction hours are expected to be from 6:00 a.m. to 9:00 p.m. on weekdays, and possibly on weekends. Some activities may require extended construction hours, and nighttime construction may be necessary to meet the overall proposed Project schedule. The movement of equipment and materials to the site would cause a relatively short-term increase in traffic on local roadways during the construction period. Most equipment (e.g., heavy earth-moving equipment and

cranes) would remain at the site for the duration of construction activities. Shipments of materials, such as gravel, concrete, and water, would not be expected to substantially affect local primary and secondary road networks. That volume would occur during the peak construction time when most of the foundation and tower assembly is taking place. At the completion of each construction phase, this equipment would be removed from the site or reduced in number, and replaced with equipment for the next phase, as appropriate.

The Project would not result in any permanent impacts to the area's ground transportation resources. There would be improvements to most gravel roads and temporary impacts to local roads during the construction phase of the Project. The Applicant would work with each county and township on road use agreements so that all parties understand how the Project would proceed prior to construction starting. Within the Project Area, oversized and overweight loads would be strictly confined to roads designated in the road use agreement. The Applicant would work with SDDOT, Roberts and Grant Counties, and the local townships to obtain the appropriate access and use permits and to reduce and mitigate the impacts to area transportation.

21.4.2.2 Air Traffic

The air traffic generated by the airports listed above would not be impacted by the proposed Project. The Applicant would follow FAA guidelines for safely lighting the Project and will use ADLS subject to availability and FAA approval.

Dakota Range III has submitted Form 7460-1, Notice of Proposed Construction or Alteration with the FAA. Notices of Proposed Construction for the final layout would be filed after construction is complete. The Applicant expects Determinations of No Hazard to be issued for the finalized layout and for the Determinations to include ADLS. Notification of construction and operation of Wind Project would be sent to the FAA, and the Project would comply with applicable FAA requirements. The Applicant would also file Tall Structures Aeronautical Hazard Applications with the South Dakota Aeronautics Commission for a permit approving the proposed wind turbine and permanent meteorological tower locations.

Air traffic may be present near the Project Area for crop dusting of agricultural fields. Crop dusting is typically carried out during the day by highly maneuverable airplanes or helicopters. The installation of wind turbine towers in active croplands and installation of aboveground collector and transmission lines would create potential hazards for crop-dusting aircraft. However, aboveground collection and

transmission lines are expected to be similar to existing distribution lines (located along the edges of fields and roadways), and the turbines and meteorological tower(s) would be visible from a distance.

21.5 Cultural Resources

The following sections provide information on the cultural resources potentially affected by the construction, operation, and maintenance of Project facilities and how impacts to these resources would be avoided and/or minimized.

21.5.1 Existing Cultural Resources

This section describes the existing cultural resources within the Project Area.

21.5.1.1 Regulatory Framework

South Dakota state law (SDCL 1-19A-11[1]) requires that State agencies or political subdivisions of the State, or any instrumentality thereof (e.g., county, municipal) not undertake any project which will encroach upon, damage, or destroy any historic property included in the National or State Registers of historic places until the SHPO has been given notice and an opportunity to investigate and comment on the proposed project. Any permits required by the State, county, or municipalities, including an Energy Facility Permit, would invoke this law.

Furthermore, ARSD 20:10:22:23 states that an application for an Energy Facility Permit shall include a forecast of the impact on landmarks and cultural resources of historic, religious, archaeological, scenic, natural, or other cultural significance. The Applicant has completed cultural resources investigations for the Project, as described in the following sections, in accordance with SDCL 1-19A-11(1) and ARSD 20:10:22:23, to enable forecasting of potential impacts and respond with appropriate field studies and impact avoidance or minimization measures.

21.5.1.2 Level I Records Search

A Cultural Resources Records Search was completed for the Project in August 2018 in accordance with SHPO guidelines to provide an inventory of previously recorded cultural resources within the Project Area and a 1-mile buffer. Data was collected from the State Historical Society, NRHP, National Historic Landmarks, county courthouses, local libraries and historical societies, U.S. General Land Office maps, aerial photographs and map atlases.

Review of SHPO data indicated no architectural resources within the Project footprint (direct area of potential effects [APE]); however, there is one unevaluated archaeological site 39RO0090 and one eligible archaeological site, railroad 39RO2007, in both the Project footprint and 1-mile buffer. There are

189 architectural and archaeological resources within the 1-mile buffer. Of these, one architectural resource is listed on the NRHP. One hundred and thirty-three cultural resources, which may also be tribal traditional cultural properties, are eligible for the NRHP. One is listed as future eligible (Summit School), and 28 cultural resources are unevaluated for the NRHP. Finally, 26 previously recorded cultural resources are not eligible for the NRHP. No cultural resources were identified that would require turbine location or other planned facilities modifications.

21.5.1.3 Level III Intensive Survey

Intensive cultural resource surveys will be completed in October 2018 in coordination with the SD SHPO. Field surveys will be conducted on areas of potential ground disturbance from Project construction activities or that may have high probability for cultural resources to be present based on the record search and environmental data. High Probability Areas (HPAs) consist of uncultivated and undisturbed land areas and around water sources such as rivers, streams, and lakes. A report will be prepared for SHPO review and concurrence, including NRHP recommendations, potential Project effects, and any mitigation measures that may be needed.

21.5.1.4 Architectural Survey

A historic architectural field survey was completed for the Project footprint and a 2-mile buffer (indirect or visual APE). It consisted of windshield reconnaissance to document resources 45-years-of-age or older that have not been recorded in previous surveys or have been previously recorded but have undetermined NRHP eligibility status. One hundred and fifty-two newly recorded historic architectural resources consisting of farmsteads, residences, commercial structures, and cemeteries are being evaluated for the State and NRHP as well as previously recorded unevaluated resources. Following field documentation, the SHPO was consulted, and additional research is being conducted to understand prior ownership, land usage, building distributions, configurations, materials, and ages. Each recorded structure is being evaluated for State and NRHP eligibility.

The results of the survey indicate a low concentration of NRHP-eligible architectural resources. No historic architectural resources were identified within the proposed Project footprint or direct APE. Within the 2-mile buffer, there were two additional historic structures potentially eligible for the NRHP and one cemetery recommended eligible for listing on the NRHP. While some turbines may be visible from these properties, the survey results indicate there will be no adverse effect to historic properties in the Project's visual APE.

21.5.1.5 Tribal Coordination

The Applicant has engaged in ongoing voluntary coordination with the SWO THPO to seek input on cultural resources in the Project Area. In July and August 2018, field surveys were carried out on 1,876 acres by the Project's archeological firm and the SWO THPO to identify cultural resource locations in and around the Project footprint. Seventy-nine sites were identified with the SWO, all of which are considered eligible for the NRHP. The Project's archeological firm and the SWO THPO will work cooperatively to prepare a report to review findings and participate in eligibility recommendations and avoidance plans for sensitive tribal resources.

21.5.2 Cultural Resource Impacts/Mitigation

Project infrastructure has been sited to avoid any identified Traditional Cultural Properties and other historic and cultural resources identified during the Project's July and August 2018 surveys. Any NRHP-eligible cultural and tribal resources that are identified during the intensive surveys are planned to be avoided by direct Project impacts. However, if this is not possible, the SHPO and SWO THPO would be consulted to design and agree on appropriate mitigation strategies.

If, during Project construction or operation, unanticipated discoveries of cultural or tribal resources occur, the following steps would be taken:

- The cultural resource specialist would make a recommendation on the NRHP eligibility of the resource and request SHPO concurrence on the recommendation. There is no federal agency with jurisdiction over this Project; therefore, this recommendation would be made directly to the SHPO.
- Sites identified as potentially eligible for NRHP listing would be addressed by micro-siting facilities to avoid impacts. If complete avoidance cannot be achieved, Dakota Range III would work with the SHPO to mitigate impacts to archaeological and historic resources in conformance with SHPO requirements.
- In accordance with the Siting Guidelines for Wind Power Projects in South Dakota 8(c), and in accordance with informal consultation completed between the Project and tribes, disruption of sensitive resources that are identified as important to Native Americans would be avoided by marking them with orange snow fencing and verifying facilities are set back in accordance with recommendations from the SWO, or as practicable and consistent with applicable State and federal regulations.

22.0 EMPLOYMENT ESTIMATES (ARSD 20:10:22:24)

ARSD 20:10:22:24. Employment estimates. *The application shall contain the estimated number of jobs and a description of job classifications, together with the estimated annual employment expenditures of the applicants, the contractors, and the subcontractors during the construction phase of the proposed facility. In a separate tabulation, the application shall contain the same data with respect to the operating life of the proposed facility, to be made for the first ten years of commercial operation in one-year intervals. The application shall include plans of the applicant for utilization and training of the available labor force in South Dakota by categories of special skills required. There shall also be an assessment of the adequacy of local manpower to meet temporary and permanent labor requirements during construction and operation of the proposed facility and the estimated percentage that will remain within the county and the township in which the facility is located after construction is completed.*

As discussed in Section 21.1.2, the Project is expected to employ approximately 200 temporary workers over 7-9 months for approximately 300,000 hours to support Project construction. It is likely that general skilled labor is available in either Grant or Roberts Counties or the State to serve the basic infrastructure and site development needs of the Project. Specialized labor would be required for certain components of Project construction. It is likely that this labor would be imported from other areas of the State or from other states, as the relatively short duration of construction makes special training of local or regional labor impracticable.

23.0 FUTURE ADDITIONS AND MODIFICATIONS (ARSD 20:10:22:25)

ARSD 20:10:22:25. Future additions and modifications. *The applicant shall describe any plans for future modification or expansion of the proposed facility or construction of additional facilities which the applicant may wish to be approved in the permit.*

With the exception of the final micro-siting flexibility requested in Section 9.2, the Applicant does not have any current plans for future additions to or modifications of the Project.

24.0 DECOMMISSIONING OF WIND ENERGY FACILITIES (ARSD 20:10:22:33.01)

ARSD 20:10:22:33.01. Decommissioning of wind energy facilities -- Funding for removal of facilities. *The applicant shall provide a plan regarding the action to be taken upon the decommissioning and removal of the wind energy facilities. Estimates of monetary costs and the site condition after decommissioning shall be included in the plan. The commission may require a bond, guarantee, insurance, or other requirement to provide funding for the decommissioning and removal of a wind energy facility. The commission shall consider the size of the facility, the location of the facility, and the financial condition of the applicant when determining whether to require some type of funding. The same criteria shall be used to determine the amount of any required funding.*

The Applicant has entered into long-term lease and easement agreements for placement of the wind turbines and associated Project infrastructure with private landowners within the Project Area. The Applicant anticipates that the life of the Project would be approximately 30 years but reserves the right to extend the life of the Project as well as explore alternatives regarding Project decommissioning. One such option may be to retrofit the turbines and power system with upgrades based on new technology, which may allow the wind farm to produce efficiently and successfully for many more years.

The Project would be decommissioned in accordance with applicable State and County regulations. Current decommissioning requirements in Grant and Roberts Counties require that all towers, turbine generators, transformers, overhead collector and feeder lines, foundations, buildings, and ancillary equipment be dismantled and removed to a depth of 4 feet no more than 18 months after the expiration of the conditional use permit. To the extent possible, the site shall be restored and reclaimed to its pre-Project topography and topsoil quality. All access roads shall be removed unless written approval is given by the landowner requesting roads be retained.

The Decommissioning Cost Analysis for the Project is included in Appendix M.

The estimated net decommissioning costs for the Project are summarized in Chapter 5 of the Decommissioning Cost Analysis in Appendix M. The net decommissioning cost (in 2018 U.S. dollars) is estimated to be $3,651,000, assuming salvage and no resale of Project components. The per wind turbine decommissioning cost with salvage and no resale would be $101,420. The estimates are based on the decommissioning approach outlined in the Decommissioning Cost Analysis.

25.0 RELIABILITY AND SAFETY (ARSD 20:10:22:33.02(8) AND ARSD 20:10:22:35(4))

The following sections discuss the reliability and safety of the Project.

25.1 Wind Farm Facility Reliability and Safety

Reliability (Availability) is defined as the ability of the turbine to generate electricity when sufficient wind is available. Vestas has over 59,000 wind turbines (85 GW) currently installed globally. In the Vaisala Wind Energy Due Diligence Report completed for the Project and discussed in Section 7.1, Vaisala "observed that turbine availability at newly constructed wind farms achieve 95.2 percent or higher availability when averaged over an entire calendar year." To further provide for reliability and to protect the Project financially, availability guarantees are included in turbine supply agreements with the turbine manufacturer. Availability guarantees require the turbine manufacturer maintain the turbine at 96 percent availability or higher. If the turbine manufacturer fails to maintain the required level of availability, then the turbine manufacturer is required to pay a project liquidated damages for the lost revenue from lost energy production. Typically, the turbine manufacturer maintains the turbine for the first 2 years; then the turbines are maintained under O&M service contracts with terms of 5 or 10 years.

To further improve reliable operation of the region's power grid, wind energy projects are required to provide short-term forecasts of wind speed and energy that would be produced. Accurately anticipating weather conditions allows wind energy project owners and operators to maximize facility output and efficiency. Transmission system operators need to know how much energy wind facilities can deliver and when to dispatch generators on the system to match load to generation. Typically, wind projects provide a next-day, next-hour, and next-15 minutes forecast, updated every 15 minutes to the off-taker, balancing authority, and/or regional transmission operator. These predictions of energy generation through in-depth, site-specific weather forecasting are used to integrate wind energy into the region's power grid and to schedule turbine and transmission maintenance windows, improving overall reliability. As wind forecasting has improved, the reliability of wind energy generation forecasts provided to the transmission operators has also improved.

The Project Area is located in an area of low population density; therefore, construction and operation of the Project would have minimal impacts on the security and safety of the local population. The following safety measures would be taken to reduce the chance of property damage, as well as personal injury, at the site:

- The towers would be placed at distances away from existing roadways and residences per the applicable setback requirements described in Section 10.2.
- Security measures would be implemented during the construction and operation of the Project, including temporary (safety) and permanent fencing, warning signs, and locks on equipment and wind power facilities.
- Turbines would sit on solid steel, enclosed tubular towers; access to each tower is through a solid steel door that would be locked and accessed only by authorized personnel.
- Tower exteriors would be designed to be unclimbable.
- A professional engineer would certify that the foundation and tower design of the turbines is within accepted professional standards, given local soil and climate conditions.
- Prior to construction, the Project contractor would request utility locates through the One-Call program to avoid impacting existing underground infrastructure.
- Prior to construction, the Project contractor would work with local and county emergency management to develop procedures for response to emergencies, natural hazards, hazardous materials incidents, manmade problems, and potential incidents concerning Project construction. The contractor would provide site maps, haul routes, Project schedules, contact numbers, training, and other requested Project information to local and county emergency management.
- During Project operations, the Project operator would coordinate with local and county emergency management to develop an emergency response plan to be implemented in the event of an emergency at the Project site. The Project would register each turbine location and the O&M building with the rural identification/addressing (fire number) system and 911 systems. The emergency response plan would be sent to Commission staff to make available to the public.
- Following construction, the Project would register underground facilities with the One-Call program.
- Turbines would use two methods to detect icing conditions on turbine blades: (1) sensors that would detect when blades become imbalanced or create vibration due to ice accumulation and (2) meteorological data from onsite permanent meteorological towers, on-site anemometers, and other relevant meteorological sources that will be used to determine if ice accumulation is occurring. These control systems would either automatically shut down the turbine(s) in icing conditions (per the sensors), or Applicant would manually shut down turbine(s) if icing conditions are identified (using meteorological data). Turbines would not return to normal operation until the control systems no longer detect an imbalance or when weather conditions either remove icing on the blades or indicate icing is no longer a concern. Dakota Range III would pay for any documented damaged caused by ice thrown from a turbine.

25.2 Transmission Facility Reliability and Safety

25.2.1 Transmission Facility Reliablity

Transmission lines are designed to operate for decades. Typically, they require only moderate maintenance, particularly in the first few years of operation. The estimated service life of the proposed Transmission Facility is approximately 40 years. Transmission infrastructure includes very few mechanical elements, which results in reliability. It is built to withstand weather extremes, with the exception of severe weather such as tornadoes and heavy ice storms. Transmission lines are automatically taken out of service by the operation of protective relaying equipment when a fault is sensed on the system. Such interruptions are usually momentary. Scheduled maintenance outages are also infrequent. As a result, the average annual availability of transmission infrastructure is very high, in excess of 99 percent.

25.2.2 Transmission Facility Safety

The Transmission Facility will be designed in compliance with local, State, and good utility standards regarding clearance to ground, clearance to utilities, clearance to buildings, strength of materials, and right-of-way widths. The Applicant's contracted crews will comply with local, State, and good utility standards regarding installation of facilities and standard construction practices. Dakota Range III will use proper signage and guard structures when stringing wire across roads and railroads. Installation of the guard structures and signage will be coordinated with the owner of the transportation corridor being protected. Guard structures can be temporary wood poles with a cross arm or line trucks with their booms used to hold the wire and protect the lanes of traffic.

The proposed Transmission Facility will be equipped with protective devices, such as breakers and relays, to safeguard the public from the transmission line if a transmission line or pole falls or other accident occurs. Breakers and relays are located where the line connects to the substation, and will de-energize the line in the event of an emergency. In addition to protective devices, proper signage will be posted warning the public of the safety risks associated with the energize equipment.

25.2.3 Electromagnetic Fields and Stray Voltage

The frequency of transmission line EMF in the United States is 60 hertz and falls in the extremely low frequency ("ELF") range of the electromagnetic spectrum (any frequency below 300 hertz). For the lower frequencies associated with power lines, the electric and magnetic fields are typically evaluated separately. The intensity of the electric field is related to the voltage of the line, while the intensity of the magnetic field is related to the current flow along the conductors.

Concerns about health effects of EMF from power lines were first raised in the late 1970s. Since then, considerable research has been conducted to determine if exposure to magnetic fields, such as those from high-voltage power lines, causes biological responses and health effects. Initial epidemiological studies completed in the late 1970s showed a weak correlation between surrogate indicators of magnetic field exposure (such as wiring codes or distance from roads) and increased rates of childhood leukemia (Wertheimer et. al, 1979). Toxicological and laboratory studies have not shown a biological mechanism between EMF and cancer or other adverse health effects. In 2007, the World Health Organization ("WHO") concluded a review of health implications from magnetic fields and concluded, "…virtually all of the laboratory evidence and the mechanistic evidence fail to support a relationship between low-level ELF magnetic fields and changes in biological function or disease status" (WHO, 2007).

Natural and human-made electromagnetic fields are present everywhere in our environment. Natural electric fields in the atmosphere range from background static levels of 10 to 120 volts per meter ("v/m") to well over several kilovolts per meter ("kV/m") produced by the build-up of electric charges in thunderstorms. The Earth itself has a magnetic field that ranges from approximately 300 to 700 milligauss ("mG"). In addition to the presence of the earth's steady state electric field, an average home experiences additional magnetic fields of 0.5 mG to 4 mG which arise from the general wiring and appliances located in a typical home.

Dakota Range III analyzed the potential EMF r the transmission line and estimated the maximum magnetic field at 66.8 mG. The maximum electric field for the transmission line is calculated to be 2.58 kV/m. The results of this analysis are presented in Appendix J.

Impacts from stray voltage are typically related to improper grounding of electrical service to the farm (distribution lines) or on-farm electrical wiring. Transmission lines do not, by themselves, create stray voltage because they do not connect to businesses or residences and they are typically grounded properly. However, transmission lines can induce stray voltage on a distribution circuit that is parallel to and immediately under the transmission line. Appropriate measures, such as proper grounding, will be taken to prevent stray voltage problems.

26.0 INFORMATION CONCERNING WIND ENERGY FACILITIES (ARSD 20:10:22:33.02)

ARSD 20:10:22:33.02. Information concerning wind energy facilities. *If a wind energy facility is proposed, the applicant shall provide the following information:*

(1) Configuration of the wind turbines, including the distance measured from ground level to the blade extended at its highest point, distance between the wind turbines, type of material, and color;

(2) The number of wind turbines, including the number of anticipated additions of wind turbines in each of the next five years;

(3) Any warning lighting requirements for the wind turbines;

(4) Setback distances from off-site buildings, rights-of-way of public roads, and property lines;

(5) Anticipated noise levels during construction and operation;

(6) Anticipated electromagnetic interference during operation of the facilities;

(7) The proposed wind energy site and major alternatives as depicted on overhead photographs and land use culture maps;

(8) Reliability and safety;

(9) Right-of-way or condemnation requirements;

(10) Necessary clearing activities;

(11) Configuration of towers and poles for any electric interconnection facilities, including material, overall height, and width;

(12) Conductor configuration and size, length of span between structures, and number of circuits per pole or tower for any electric interconnection facilities; and

(13) If any electric interconnection facilities are placed underground, the depth of burial, distance between access points, conductor configuration and size, and number of circuits.

The following information requirements concerning wind energy facilities have been discussed in previous sections of this Application, as indicated below.

1. Configuration of wind turbine – Section 9.2
2. Number of wind turbines – Section 9.1
3. Warning lighting requirements for wind turbines – Section 21.4.2.2
4. Setback distances – Section 10.2
5. Sound levels during construction and operation – Section 16.3.2
6. Electromagnetic interference – Section 16.5
7. Site and major alternatives – Chapter 10.0
8. Reliability and safety – Chapter 25.0
9. Right-of-way or condemnation requirements – Chapter 9.0 and Section 10.3
10. Clearing activities – Sections 9.4 and 14.1.2
11. Configuration of interconnection towers and poles – Section 9.3
12. Conductor and structure configurations – Section 9.3
13. Underground electric interconnection facilities – Section 9.2.3

Please refer to Chapter 4.0 Completeness Checklist (ARSD 20:10:22:33.02, Information concerning wind energy facilities) for additional requirement details.

27.0 INFORMATION CONCERNING TRANSMISSION FACILITIES (ARSD 20:10:22:35)

ARSD 20:10:22:35. Information Concerning Transmission Facilities. *If a transmission facility is proposed, the applicant shall provide the following information:*

(1) Configuration of the towers and poles, including material, overall height, and width;

(2) Conductor configuration and size, length of span between structures, and number of circuits per pole or tower;

(3) The proposed transmission site and major alternatives as depicted on overhead photographs and land use culture maps;

(4) Reliability and safety;

(5) Right-of-way or condemnation requirements;

(6) Necessary clearing activities; and

(7) If the transmission facility is placed underground, the depth of burial, distance between access points, conductor configuration size, and number of circuits.

The following information requirements concerning transmission facilities have been discussed in previous sections of this Application, as indicated below.

- Configuration of towers and poles – Section 9.3.1
- Conductor configuration and size, length of span, and number of circuits – Section 9.3.1
- Proposed transmission site and major alternatives – Sections 9.2 and 9.3.1
- Reliability and safety – Section 25.0
- Right-of-way or condemnation requirements – Section 10.2
- Necessary clearing activities – Sections 9.5 and 14.1.2
- Underground dimensions – Section 9.3.1

Please refer to Chapter 4.0 Completeness Checklist (20:10:22:35, Information concerning transmission facilities) for additional requirement details.

28.0 ADDITIONAL INFORMATION IN APPLICATION (ARSD 20:10:22:36)

The following sections discuss permits and approvals, agency coordination, public and agency comments, and burden of proof.

28.1 Permits and Approvals

The Project must comply with federal, State, and local laws requiring permits or approvals. Table 28-1 lists the permits and approvals that are applicable to the Project.

Table 28-1: List of Potential Permits, Approvals, and Coordination

Agency	Permit/Approval	Description	Status
U.S. Fish and Wildlife Service (USFWS)	Compliance with Section 10 of the Endangered Species Act (ESA)	Private non-federal entities undertaking projects may not result in the take of an endangered or threatened species, unless an incidental take permit is issued by the USFWS.	No permit required Wildlife studies and coordination with USFWS determined low risk to threatened and endangered species warranting permitting under the ESA. No incidental take permit warranted. Bird and Bat Conservation Strategy (BBCS) to be prepared and implemented for the Project.
USFWS	Compliance with the Bald and Golden Eagle Protection Act (BGEPA)	Projects may not result in the take of bald or golden eagles, unless an eagle take permit is issued by the USFWS.	No permit required. Wildlife studies and coordination with USFWS determined low risk to eagles. No permit warranted. BBCS to be prepared and implemented for the Project.

Agency	Permit/Approval	Description	Status
Federal Aviation Administration (FAA)	Form 7460-1, Notice of Proposed Construction or Alteration	Required if construction or alteration is within 6 miles of public aviation facility and for structures higher than 200 feet	Dakota Range III has submitted Form 7460-1, Notice of Proposed Construction or Alteration with the FAA, but has yet to receive final determinations. Notices of Proposed Construction for the final layout will be filed after final design is complete.
U.S. Army Corps of Engineers (USACE)	Section 404 permit	Authorization under the Clean Water Act for impacts to wetlands and waters of the U.S.	No individual permit will be required but, impacts will comply with USACE Nationwide Permit (NWP) 12 requirements.
South Dakota State Historic Preservation Office (SHPO)	Coordination	Coordination regarding potential effects on archaeological and historical resources	Cultural resources surveys will be completed in October 2018. Avoidance and mitigation measures will be implemented through avoidance and micro-siting in consultation with SHPO to protect archaeological and historic resources.
Native American tribes	Coordination	Coordination regarding potential effects on Native American cultural resources	Cultural resources surveys are being completed in coordination with the Sisseton-Wahpeton Oyate (SWO), allowing the SWO opportunities to review finds and participate in eligibility recommendations and avoidance plans for sensitive tribal resources.

Agency	Permit/Approval	Description	Status
South Dakota Public Utilities Commission	Energy Facility Permit	Application required for wind facilities with nameplate capacity greater than 100 megawatts	Submitted October 2018
South Dakota Game, Fish, and Parks (SDGFP)	Coordination	Coordination regarding effects on State-listed threatened or endangered species	Wildlife studies and coordination with SDGFP complete. Site determined low risk to State-listed species. Avoidance and minimization measures will be implemented to address potential impacts. BBCS to be prepared and implemented for the Project
South Dakota Department of Environment and Natural Resources	Section 401 Water Quality Certification	Complete an application under the Clean Water Act, only if Individual Permit is required for Section 404	Project-specific certification is not anticipated due to NWP 12 compliance.
	General Permit for Storm Water Discharges Associated with Construction Activities	Storm water permit is required for construction activities.	Storm Water Pollution Prevention Plan (SWPPP) will be prepared, and Notice of Intent will be submitted after final design is complete.
	Temporary Water Use Permit	Temporary permits for the use of public water for construction, testing, or drilling purposes; issuance of a temporary permit is not a grant of water right.	If necessary, will be obtained prior to construction.

Agency	Permit/Approval	Description	Status
	General Permit for Temporary Discharges	Temporary permit for the use of public water for construction dewatering	If necessary, will be obtained prior to construction.
	Water Rights Permit for Nonirrigation Use	Needed if water will be appropriated for O&M facility	If necessary, will be obtained prior to construction.
South Dakota Department of Transportation (SDDOT), Aeronautics Commission	Aeronautical Hazard Permit	Permit lighting plan determined with FAA coordination	Will be completed after final design is complete.
South Dakota Codified Laws 49-32-3.1	Notice to telecommunications companies	Telecommunication companies review the preliminary electrical layout and may suggest revisions to reduce impact to their systems.	Will be completed after final design is complete.
SDDOT	Highway Access Permit	Permit required for any access roads abutting State roads	If necessary, will be obtained after final design is complete.
	Utility Permit	Permit required for any utility crossing or use within State road right-of-way	If necessary, will be obtained after final design is complete.
	Oversize & Overweight Permit	Permit required for heavy equipment transport over State roads during construction	Will be obtained prior to transport of overweight/oversized loads.
Grant County	Conditional Use Permit	Permit required for construction of the Project	A Conditional Use Permit application will be submitted in 2018.
	Individual Building Permits	Permit required for construction of each turbine and building	Will be obtained prior to construction.
	County Road Permits	County Road Permits are required for right-of-way occupancy, utility crossings, road approaches, and overweight loads	Will be obtained prior to activity requiring permit.

Agency	Permit/Approval	Description	Status
	County and Townships Road Use Agreements	Road use agreement may be required	Will be obtained prior to improvement or use of roads.
Roberts County	Conditional Use Permit	Permit required for construction of the Project	A Conditional Use Permit application will be submitted in 2018.
	Individual Building Permits	Permit required for construction of each turbine and building	Will be obtained prior to construction.
	County Road Permits	County Road Permits are required for right-of-way occupancy, utility crossings, road approaches, and overweight loads	Will be obtained prior to activity for which permit is required.
	County and Townships Road Use Agreements	Road use agreement may be required	Will be obtained prior to improvement or use of roads.

28.2 Agency Coordination

Throughout Project planning and development, the Applicant has coordinated with various federal, State, Tribal, and local agencies to identify potential concerns regarding the proposed Project. Copies of agency correspondence and meeting summaries are included in Appendix B. Following is a summary of the primary agency meetings completed to date:

USFWS and SDGFP

October 24, 2017 Coordination Meeting at SDGFP Office in Pierre: The Applicant met with the USFWS and SDGFP to discuss the proposed Project. The purpose of the meeting was to introduce the agencies to Dakota Range, present results of the Tier 1 and 2/Stage 1 reviews, agree on Tier 3/Stage 2 studies to be completed to assess risk, and discuss potential impact avoidance and minimization measures for the Project.

On June 26, 2018, SDGFP provided comments on locations where Anabat acoustic units should be placed to assess bat use in the Project Area. SDGFP provided recommendations for locations and also recommended two years of pre-construction bat acoustic monitoring. Dakota Range III has completed

one year of acoustical monitoring and will review the results with SDGFP to determine whether a second year is appropriate.

November 02, 2017 Coordination Meeting with the USFWS at the Waubay Refuge in Waubay: The Applicant met with the USFWS to discuss the process for potentially locating wind turbines and associated facilities on grassland and wetland easements for the proposed for the Project. USFWS and SDGFP coordination and recommendations regarding federally listed species, State-listed species, eagles/avian species, and bats are discussed in Sections 14.3.1 and 15.1.

SHPO

July 25, 2018 Coordination Meeting at SHPO Office in Pierre: The Applicant consultant met with the SHPO to discuss the Project. The purpose of the meeting was to introduce the SHPO to Dakota Range III, discuss the Level I cultural resources records search, discuss recommendations for Level III cultural resources survey, and also detail the plans to survey for traditional cultural properties in coordination with the SWO including use of their trained archaeologists. SHPO coordination and recommendations regarding cultural resource surveys are discussed in Sections 21.5.1.3 and 21.5.2.

SWO

October 10, 2017 Coordination Meeting at SWO Office in Agency Village, SD: The Applicant met with the SWO to introduce the Project. The purpose of the meeting was to review Dakota Range III's proposed CRMMP and solicit SWO's recommendations on potential tribal concerns and recommendations on potential cultural resources occurring in or near the proposed Project.

October 26, 2017 Coordination Meeting at SWO Office in Agency Village, SD: The purpose of the meeting was to present a conceptual layout that was informed based on discussions in the October 10, 2017 meeting and solicit any potential SWO concerns.

November 02, 2017 Coordination Meeting at SWO Office in Agency Village, SD: The purpose of the meeting was to present a revised conceptual layout that was developed in response to SWO input provided during the October 10, 2017 and October 26, 2017 meetings, discuss the potential to site wind turbines in the area south of Highway 12 and within the historic reservation boundary and solicit any final SWO concerns.

Tribal coordination is discussed in Section 21.5.1.5.

Grant County

May 14, 2018, Pre-Application Meeting at County Planning and Zoning Office in Milbank, SD: The Applicant met with the Grant County Planning and Zoning Office to discuss county zoning and land use permitting requirements for the Project.

Grant County permitting is discussed in Chapter 17.0.

Roberts County

May 15, 2018 Pre-Application Meeting at Roberts County Zoning Office in Sisseton, SD: The Applicant met with the Roberts County Zoning Office to discuss county zoning and land use permitting requirements for the Project.

Roberts County permitting is discussed in Chapter 17.0.

Dakota Range III will continue coordinating with these agencies and local units of government throughout Project development.

29.0 TESTIMONY AND EXHIBITS (ARSD 20:10:22:39)

The Applicant is submitting testimony and exhibits in support of this Application. The individuals identified in Table 29-1 are providing testimony in support of the Application. Dakota Range III reserves the right to provide supplemental and/or rebuttal testimony, as needed, to further support this Application.

Table 29-1: List of Individuals Providing Testimony

Individual	Title	Company	Subject Matter
Brenna Gunderson	Director of Project Development	Apex Clean Energy Holdings, LLC	Project development; decommissioning
Ryan Henning	Environmental Manager	Apex Clean Energy Holdings, LLC	Wildlife; vegetation; cultural resources
Robert O'Neal	Certified Consulting Meteorologist	Epsilon Associates, Inc.	Sound; shadow flicker

29.1 Applicant Verification

Mr. Mark Goodwin, the President and Chief Executive Officer and authorized representative of the Applicant, is authorized to sign this Application on behalf of the Project Owner/Applicant, Dakota Range III.

He further states that he does not have personal knowledge of all the facts recited in the Application and Exhibits and Attachments attached hereto, but the information has been gathered from employees and agents of the Owner/Applicant, and the information is verified by him as being true and correct on behalf of the Owner/Applicant.

Dated this 26th day of October 2018.

Mr. Mark Goodwin
President and Chief Executive Officer
Apex Clean Energy Holdings, LLC
On Behalf of Dakota Range III, LLC

30.0 REFERENCES

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